EV Charging Systems Installation Model for ERP

Full Description

Proposed Structure of this Public Private Partnership (PPP) Model

The model will be leveraging a New-Build-Finance-User-Tariff arrangement for this project type. Given the highly technical and nascent nature of such charging infrastructure for this geography, the government may be best placed to support a private company with the appropriate experience to take on the core obligations in this model. The private-sector company in this model designs, finances and develops public transport program to generate emission reduction credits (ERCs). This company will also be tasked with owning the operation and maintenance of the public transport program under a long-term agreement from the government.

Table 1: Model Attributes

Dimension	Attribute	Description
Business	*New* *Existing*	The model involves the creation of a new business entity to build and operate the new EV charging infrastructure
Construction	*Build* *Refurbish*	The model involves installing EV charging stations across a region that would otherwise only have fuel stations
Private Funding	*Finance*	The private partner will be sourcing the financing for installing the EV infrastructure
Service	*Bulk* *User*	The resulting project company in the model will be servicing retail customers in this region, and, hence, will be assuming the commercial risks
Revenues	*Fees* *Tariffs*	Revenues in this model will originate from the tariffs paid by the vehicle owners using the charging ports

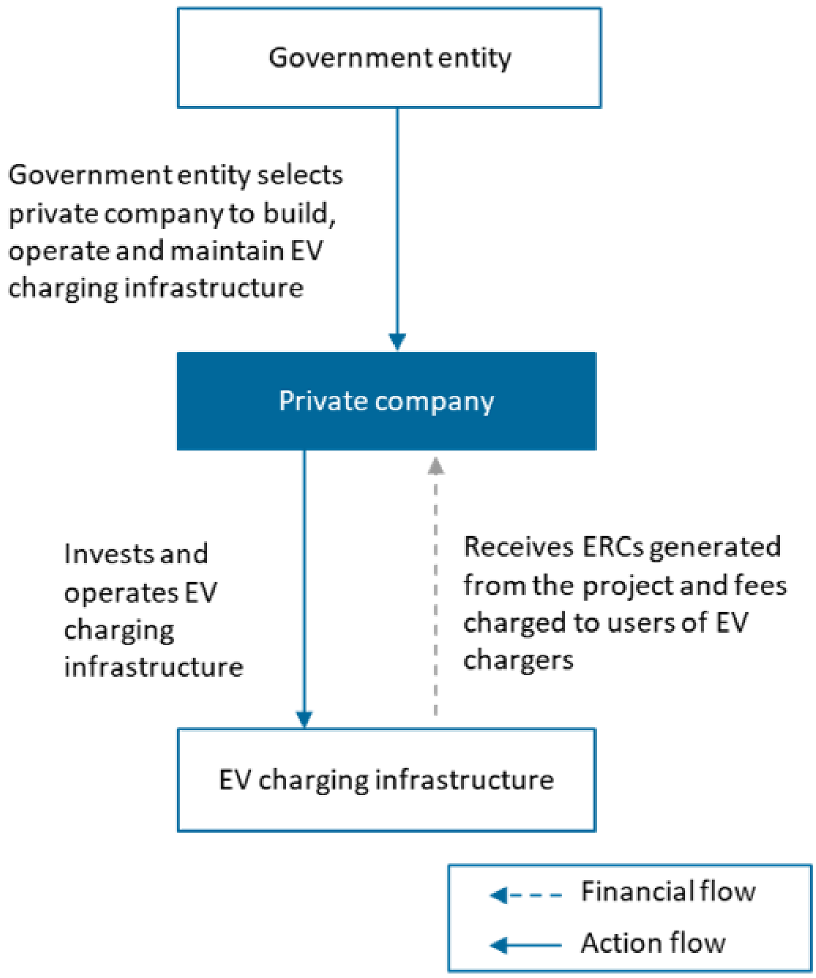
Proposed risk allocation of the Public Private Partnership Model

Risk allocation	Public	Private
Design		●
Build		●
Financing		●
Operations and maintenance		●
Demand/Revenue Upside		●

Key features of PPP structure

- Private sector entity is tasked to design, build, finance, operate and maintain EV chargers via agreement with the ministry/ government or state-owned entity
- The private sector entity acts as the implementation partner, and is responsible for all activities related to the implementation, management, monitoring and reporting of the project over the project crediting period
- In exchange, private sector entity can earn the carbon credits generated from the project as well as any potential fees charged to users of EV chargers

Figure 1: Financing and Activity Flows for the Model



Key considerations/risks for proposed project

- Extensive stakeholder engagement required to ensure buy-in from operators of public transport as well as any other relevant stakeholders

- Need to consider any regulatory requirements of minimum domestic company involvement according to local company law, and ensure close collaboration with government or state-owned entity in the permitting process
- Need to work with grid operators to ensure stable good energy grid capabilities to withstand increased electricity consumption from use of electric vehicles
- The government or state-owned entity will need to support the project company's business case robustness, especially for securing funding, by ensuring that there are demand-side policies or incentives in place that will encourage users to shift from internal combustion engine (ICE) vehicles to EVs
- Partnering with a service provider for the project's marketing, sales and pricing is needed to identify potential offset buyers, negotiate contracts, and secure good target price per tonne to enable the financial viability of ERC generation
- Contracting a monitoring, verification and reporting (MRV) service provider with experience in conducting MRV and preparing the necessary documents for generating ERCs in a voluntary carbon market standard will reduce risk of registration and issuance delays or bottlenecks, and strengthen credibility of project's carbon integrity quality

Case Study: Convergence Energy Services Ltd. (CESL) EV Charging Infrastructure Project, India

Project description

CESL, a wholly owned subsidiary of Energy Efficiency Services Limited (EESL) under the Ministry of Power, Government of India, is undertaking a project to install, operate, and maintain EV charging infrastructure across India through partnerships with public and private sectors. This project aims to scale up the EV market in the country. Chargers installed under this project include ARAl- certified slow chargers, Bharat EV chargers, a combination of fast chargers, and standalone CCS2 and Type-2 AC chargers.

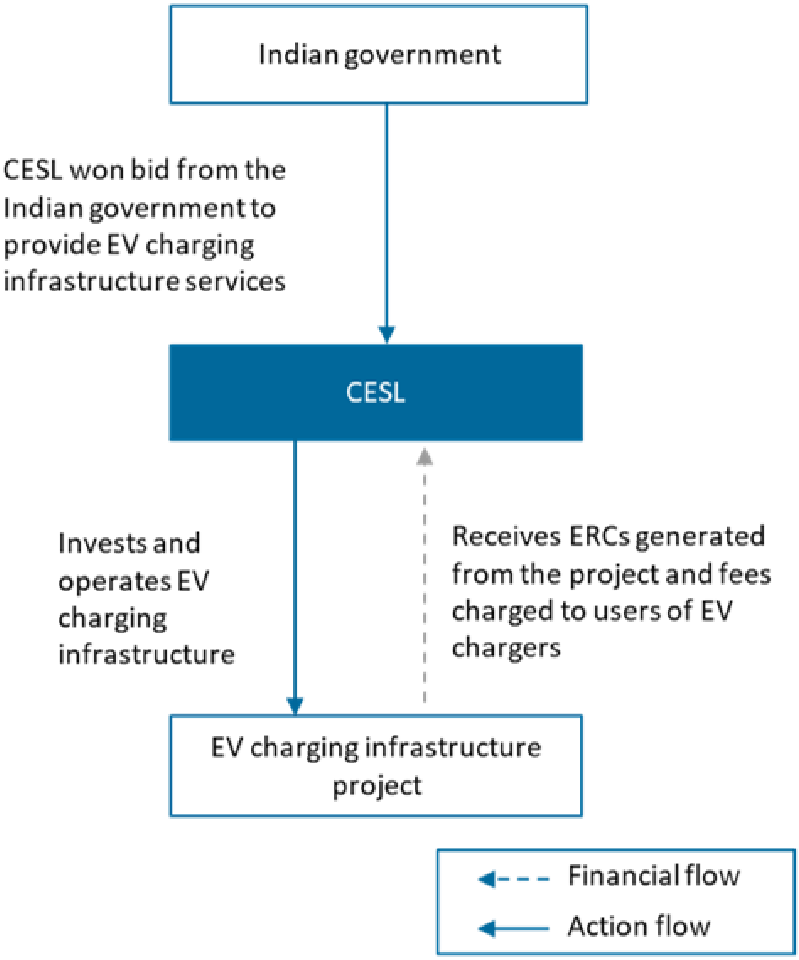
A total of 3,766 EV chargers will be installed across different locations across India which are New Delhi, Kolkata, Nagpur, Chennai, Kochi, and Thiruvananthapuram.

Targeted results

Expected annual ERCs generated from the program will be 150,928 tonnes.

CESL was one among the selected bidders by the Indian government for implementing electric vehicle charging infrastructure at selected locations across India. CESL is given the mandate through established legally binding project agreements to install, own, operate, and maintain EV charging infrastructure in locations where it has installed EV chargers. CESL has ownership of the emission reductions that result from this project.

Figure 2: Structure of Case Study PPP



Summary of the model financials

Assuming a similar project context as the case study above, the estimated project's Net Present Value (NPV) without ERC in- and outflows – only considering non-ERC inflows through other revenue streams or cost savings enabled by the project – is positive at $1.4 million (M[1]). With ERC cashflows, the financial viability of the total project marginally improves to have a positive NPV of $1.6 M, which highlights the potential for ERCs to make at costly projects more financially viable. Incorporating ERC generation into these types of projects help to offset he high upfront capital requirements (e.g., investments and installation of EV chargers) before the continuous recurring fee for EV charger use helps make the project profitable.

Table 2: Summary of sources of inflows and outflows and key assumptions

Value component	Assumptions	Sources

ERC revenues or inflows	• Three issuances across the project's 10-year crediting period, at year 3, year 7 and year 10 • $4.58 per tonne today for 50,309 estimated tonnes of ERCs likely generated in the first issuance • 10% price increase to $5.04 for 100,619 estimated tonnes of ERCs likely generated for the second and third issuance	Based on average price of Transport project in, Verified Carbon Standard (VCS) and Gold Standard (GS)
Non-ERC revenues or inflows	• Median Asia Pacific (APAC) EV charging fee use: 0.27 per kilowatt hours (kWh) • Average daily vehicle kilometers (km) traveled by sedan car in Bangkok: 42.83 km • Average energy consumption by EV: 0.2 kWh per km • Global average EVs per charger: 10; Assumes that EV/charger ratio increases to 11 after Y5 • Non-ERC revenue calculated beyond ERC project period to year 20	International Energy Association (IEA), Press search
Project investment and implementation cost	• C122 investment cost per unit: $2300 • C122 implementation cost per unit: $400 • DC-50 investment cost per unit: $54500 • DC-50 implementation cost per unit: $2800 • DC001 investment cost per unit: $2800 • DC001 implementation cost per unit: $103 • AC001 investment cost per unit: $652 • AC001 implementation cost per unit: $103	Press search
ERC generation	• $10,000 for the project's registration and first issuance • $15,000 for each verification process across three issuance cycles • $0.14 per tonne for subsequent issuances	Verra Fee Schedule

Table 3: Net cashflows summary (in USD)

Components	Sum of initial outlays	Sum of in- or outflows from crediting period	Total cashflow
ERC Component			
Revenues/Inflows	0	737,334	737,334
Costs/Outflows	0	-76,130	-76,130
Net value	0	661,204	661,204
Primary/Non-ERC Component			
Revenues/Inflows	165,709	66,821,435	66,987,144
Costs/Outflows	-208,612	-77,747,966	-77,956,578
Net value	-42,903	-10,926,531	-10,969,434
Total Net Value			
NPV	$1,622,156		
NPV (ERC Component)	$198,724		
NPV (Non-ERC Component)	$1,423,432		

Footnote 1: All proces are expressed in United States Dollars

Related Content
Guidance for Countries in Assessing ERC Projects (Download PDF version) - coming soon!
Additional Resources
Climate-Smart PPPs
Finance Structures for PPP
Financing and Risk Mitigation
Page Specific Disclaimer

This section is intended to be a living document and will be reviewed at regular intervals. The Guidelines have not been prepared with any specific transaction in mind and are meant to serve only as general guidance. It is therefore critical that the Guidelines be reviewed and adapted for specific transactions. Unless expressly stated otherwise, the findings, interpretations, and conclusions expressed in the Materials in this Site are those of the various authors of the Materials and are not necessarily those of The World Bank Group, its member institutions, or their respective Boards of Executive Directors or member countries. For feedback on the content of this section of the website or suggestions for links or materials that could be included, please contact the PPPLRC at ppp@worldbank.org.