Methodology Note

Open Access (OA) Landed Cost Calculator

The calculator helps renewable energy (RE) project developers and corporate (commercial & industrial) electricity consumers to determine open access charges and tariffs

Decrease in renewable energy tariff is encouraging large commercial and industrial consumers (C&I) with a load > 1 MW to shift to independent power procurement. These users account for nearly 50 per cent of the total electricity consumption in India. Under open access regulations, a C&I consumer may procure electricity either from a third-party (by signing bilateral agreements for power purchase and through power exchanges) or set up their own (captive/group captive) power plant. They may use the state/central transmission and distribution infrastructure wherever required. Under the current regulations, a consumer may procure power on a short-term basis (up to a month), medium-term basis (three months to three years), or long-term basis (12-25 years).

Over the last few years, many Indian corporates have pledged to consume power generated from renewable energy. Still, complex open-access charges pose a key challenge for many consumers and project developers. Varying state policies inhibiting the broader adoption of open access by corporates.

In order to support their decision-making, CEEW Centre for Energy Finance has developed a tool that helps answer two fundamental questions for a corporate consumer, namely, “Which is the most attractive state to procure renewable energy through open access?” and “Which modes (third-party or captive/group captive) and technology (solar or wind) would be most economical?”.

Basic calculator

The basic open access landed cost calculator helps a user determine open access charges and potential economic savings for an industrial consumer to shift from discom electricity to open access. The calculator enables a user to do this by entering basic inputs such as states, mode of open access (captive or third-party) and fuel (solar or wind or conventional).

The calculator compares variable grid electricity tariffs for an industrial consumer with the following load profile:

- Load – 1 MW,
- Load factor – 80 per cent,
- Power factor – 1.0
- Grid voltage – 11 kV

The landed open access tariffs for conventional fuel third-party, solar (third-party and captive) and wind (third party and captive) modes can be compared. It allows a user to determine potential savings in electricity costs (in INR per kWh terms) if they shift from discom supply to open access. The basic calculator also provides a breakup of various components of the open access landed tariff including STU charges/losses, CTU charges/losses, wheeling charges/losses, cross subsidy surcharge, additional surcharge, and other charges such as banking and SLDC charges (see Annexure-1).

The other key assumptions for calculation are as follows:

- **Period** - One-month (short term open access) has been assumed for all calculations.

- **Power evacuation** - A power plant (conventional/solar/wind) is assumed to be connected at 11 kV voltage level to the distribution network of the state in which electricity is being injected.
- **CUF** – The CUF for conventional, solar and wind power plants have been assumed as 80 per cent, 25 per cent and 35 per cent, respectively.
- **Banking –** 15 per cent of energy generated in a month has been assumed to be banked.

Advanced calculator

The advanced open access landed cost calculator helps a user determine open access charges and potential economic savings for a commercial or industrial consumer to shift from discom electricity to open access. The calculator enables a user to do this by entering advanced inputs such as:

- Powerplant location state (injection)
- Consumer location state (drawal)
- Injection/Drawal level – CTU or STU/Discom
- Drawal voltage level – 11, 33, 66, 132 & 220 kV
- Mode of open access – Captive or third-party
- Duration of open access – Long/Medium term or short term
- Fuel – Solar, wind, solar-wind hybrid
- Solar/wind/hybrid project capacity utilisation
- Share of energy banked
- Consumer load, load factor & power factor

The advanced calculator provides a breakup of various components of the open access landed tariff including STU charges/losses, CTU charges/losses, wheeling charges/losses, cross subsidy surcharge, additional surcharge, and other charges such as banking and SLDC charges (see Annexure-1). In addition, it also indicates the extent of exemption on these charges for the selected renewable energy fuel versus conventional fuel.

All open access charges have been determined based on tariff orders and regulations applicable for FY 2021-22 and are as recent as December 2021.

Annexure-1: Key open access charges

Open access charge	Description
CTU/POC charges and losses	CTU/POC charges are those charges which are paid to central transmission utility for the use of transmission system and associated facilities by a consumer or generator for the conveyance of electricity. CTU/POC losses are those losses which are there in the central transmission system. The consumers and generators shall absorb apportioned energy losses in the transmission system in accordance with the provisions specified by the central commission.
STU/transmission losses	Transmission losses are those losses which are there in the transmission system. The buyers and sellers shall absorb apportioned energy losses in the transmission system in accordance with the provisions specified by the state electricity regulatory commissions.
STU/transmission charges	Transmission charges are those charges which are paid to state transmission utility for the use of transmission system and associated facilities by a consumer or generator for the conveyance of electricity.
STU/transmission losses	Transmission losses are those losses which are there in the state transmission system. The consumers and generators shall absorb apportioned energy losses in the transmission system in accordance with the provisions specified by the state commission.
Wheeling/distribution charges	Distribution charges are those charges which are paid to distribution companies for the use of distribution system and associated facilities by a consumer or generator for the conveyance of electricity.
Wheeling/distribution losses	Distribution losses are the technical losses for the distribution system. It is determined by the state commission for various voltage levels for the applicable year, based on prudence check of the submissions of the distribution companies during their tariff determination process and is apportioned in proportion to the actual energy withdrawal by the open access consumers and is payable in kind at relevant voltage level.
Cross subsidy surcharge	If open access facility is availed by a subsidising consumer of a distribution licensee of the State (typically C&I), then such consumer, in addition to transmission and/or wheeling charges, is required to pay a cross subsidy surcharge determined by the state commission.
Additional surcharge	Discoms typically have long term tie-ups or PPA with generators based on their sales forecast and pay a fixed/capacity charge & variable/energy charge to them. Once an open access consumer shifts, the fixed charges are still applicable to be paid and additional surcharge is levied on the consumer to recover the same.
Other charges	**SLDC charges:** Includes a composite state load despatch center (SLDC) operating charges (typically levied on a daily basis) and one-time application fee. **Banking charges:** Distribution companies charge (typically in terms a percentage of energy generated) allow power plants to bank a portion of the energy generated which is not required by their open access consumer.

Disclaimer

While utmost care has been taken to avoid any errors, user discretion is advised while using the tool. CEEW-CEF and CEEW assume no legal responsibility or financial liability for the omissions, errors and inaccuracies in the analysis. In case of any feedback on the tool or the methodology, please write to us at cef@ceew.in.