Criteria for rating power transmission projects

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Executive summary

Power transmission infrastructure helps transfer electricity from generating plants to substations located close to consumers. In India, there is disparity in access to power among regions because of bottlenecks at two levels. First, poor integration of regional grids leads to an asynchronous national grid, preventing efficient transfer of electricity from surplus to deficit regions. Second, poor last-mile connectivity spawns areas of darkness in power-surplus regions.

To overcome these limitations, the central government has been encouraging private sector participation in the transmission space by granting licences based on competitive bidding. Typically, transmission licensees are special purpose vehicles (SPVs) set up to construct, maintain, and operate transmission networks. The SPVs have definitive transmission service agreements (TSAs) with designated transmission system customers. The terms of TSAs are governed by the Central Electricity Regulatory Commission (CERC), which guarantees tariff-based payment, depending on line availability.

Till their projects begin commercial operations, SPVs face significant implementation risks of land acquisition and clearances. Once operational, they can expect stable cash flow, backed by pre-determined tariff, assured demand, and long tenure of contracts. As long as the SPVs maintain minimum line availability, cash inflow is assured. Cash outflow depends on operating and maintenance (O&M) cost, breakdowns due to topographical conditions, and costs incurred for replacement of transmission assets, such as insulators and transmission switches. As cash flow is predictable, these SPVs can operate with low debt service coverage ratio (DSCR), unlike toll road and renewable projects (wind and solar), which require a higher DSCR, as they face unpredictable demand and variability in plant load factors (PLFs), respectively.

While the quantum of cash flow is predictable, its timing is not. That's because of counterparty payment risk arising from exposure to state distribution companies (discoms), which may not have a uniform payment track record. Risks vary depending on whether the SPV is interstate or intrastate.

In interstate transmission projects, the counterparty risk to multiple state discoms is largely mitigated through the point of connection (POC) mechanism, under which, transmission charges are pooled and distributed among licensees in proportion to their annual transmission charges. Involvement of a central transmission utility (CTU) in billing, collection, and disbursement of transmission charges among licensees further reduces risk. Currently, Power Grid Corporation of India Ltd (PGCIL) plays the role of CTU.

In intrastate SPVs, state transmission utilities (STUs) are responsible for development of the transmission system. Here, discoms make the payment to the STU, which pays the SPV. In the absence of a pooling mechanism, the SPV is exposed to higher risk of delay in payment by the counterparty due to exposure to a single STU, whose cash flow depends on the state discom. Thus, CRISIL evaluates the counterparty payment delay risk, depending on the presence or absence of the pooling mechanism,

CRISIL believes transmission projects can mitigate counterparty payment risks by maintaining adequate DSCR and liquidity buffer. For SPVs with similar counterparty payment risk profiles, those with more liquidity buffer will be rated higher.
Scope

This criteria document focuses on risks that power transmission projects are exposed to, and CRISIL’s rating methodology for assessing their credit quality. These criteria are applicable to SPVs executing a single project. In the electricity ecosystem in Chart 1, the position of transmission licensees (SPVs) for which these criteria are applicable, is highlighted in red.

Chart 1: Electricity ecosystem

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1For accessing previous version of the document, kindly follow link: [https://crisil.com/content/dam/crisil/criteria_methodology/energy/archive/Criteria-for-Rating-power-transmission-projects.pdf](https://crisil.com/content/dam/crisil/criteria_methodology/energy/archive/Criteria-for-Rating-power-transmission-projects.pdf)
Methodology

Chart 2: CRISIL’s framework for rating power transmission projects

1. Project risk

For transmission projects under implementation and yet to become operational, the rating factors project risk (Table 1)

### Table 1: Factors for assessing project risk

<table>
<thead>
<tr>
<th>Key project risks</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Implementation risk</strong></td>
<td>Issues related to land acquisition and environmental clearances, and delays in awarding contracts may hamper timely implementation. Terrain complexity enhances implementation risk. While segments passing through plain terrain are easy to execute, those near hills, forests, and rivers are more complex.</td>
</tr>
<tr>
<td><strong>Funding risk</strong></td>
<td>Availability of funding—both debt and equity—is critical for timely completion of the project.</td>
</tr>
<tr>
<td><strong>Technology risk</strong></td>
<td>Technology associated with transmission networks is proven and involves standard electrical equipment, reducing risk of disruptions and need for maintenance.</td>
</tr>
<tr>
<td><strong>Demand and pricing risk</strong></td>
<td>Power transmission is a natural monopoly, as duplication of transmission lines (and hence, competition) is highly unlikely. Hence, demand risk is minimal.</td>
</tr>
</tbody>
</table>
Pricing risk is negligible as tariff is based on competitive bidding and approved by CERC. These contracts are of long duration (typically 25 years). Long-term transmission customers (LTTCs) pay SPVs in proportion to allocated capacity.

CRISIL also factors in the track record of sponsors, with regard to timely completion and the post-implementation debt-servicing ability and liquidity of projects. However, as power projects span long distances, cost overruns and delays are common. Hence, ratings may be lower during the project implementation stage.

Post construction, transmission assets do face some teething issues in maintaining line availability above normative levels and receiving payments from counterparties in time. It is only when the operations have stabilised that the operational metrics may be tested for base-case assumptions. This stabilisation phase can be as long as 18 months depending on the counterparty payment behaviour. For SPVs with PoC mechanism, the time taken to stabilise is lower.

**Operating efficiency**

Given the long-term nature of TSAs, transmission SPVs face limited demand risk. Tariff is determined through competitive bidding, and is unlikely to change once approved by CERC, ensuring healthy revenue visibility. However, cash inflow and outflow could vary depending on performance risk resulting from variations in line availability, O&M cost, and natural factors.

In its analysis of operating efficiency of transmission projects, CRISIL considers factors that may impact cash flow, including the SPV’s ability to maintain line availability higher than that specified in the TSA. As transmission assets are long-lasting, most of the expenses tend to be related to O&M. CRISIL evaluates the SPV’s ability to cover expected expenses and plan for unexpected circumstances (such as breakdown due to topographical conditions), so as to sustain debt-servicing ability.

A. **Performance risk:** Decline in line availability below the upper threshold (say 98%) reduces transmission charges. There is an additional penalty if line availability drops below the lower threshold (say 95%). Incentives are offered if line availability is maintained above the upper threshold, which result in higher cash inflow. CRISIL’s analysis indicates that most operational transmission assets have a strong track record of maintaining line availability of 99% and higher. Decline in line availability tends to be temporary and is soon restored. However, as cash flow depends on overall line availability, CRISIL considers the track record of transmission projects in maintaining higher-than-normative line availability as a key input in its credit risk assessment.

B. **O&M expenses:** Though O&M expenses do not constitute a substantial portion of cash outflow, periodic maintenance is crucial to avoid issues related to tripping of transmission lines, which ultimately impacts overall line availability. CRISIL evaluates the nature of the O&M contract, and adequacy of electrical components and technically qualified manpower for upkeep of transmission networks. Projects with a higher rating are likely to absorb escalation in O&M expenses without any adverse impact on their debt-servicing ability.

C. **Geographical risks and contingency plan:** Transmission assets have a long life of 30-35 years, which usually exceeds the loan tenure. While breakdowns are rare, assets in geographies prone to extreme weather conditions are more susceptible to this risk. For example, abnormal wind conditions or cyclones may damage transmission towers, or frequent lightning may cause line tripping and lead to wear-and-tear of insulators and other hardware fittings. Hence, geographical and topographical conditions are critical parameters factored into the risk assessment. Moreover, the management’s contingency plan to restore line availability fast becomes critical.
Hence, measures such as the availability of back-up transformers, provisions for replacement of insulators and other hardware fittings, and adequate insurance cover, are critically evaluated.

2. Counterparty risk

This risk arises in case of delay or non-payment of dues to SPVs. Non-payment of dues is not a major risk as discoms have limited alternatives in terms of transmission infrastructure, and because transmission, unlike generation, constitutes a small proportion of their payables. However, there is uncertainty whether discoms will pay on the due date. More-than-anticipated delay in payments can impair the ability of transmission SPVs to service debt on time. The timeliness of payment depends on the financial health of discoms and the type of collection mechanism adopted by SPVs (PoC or non-PoC).

PoC mechanism: Interstate transmission projects

Under the PoC mechanism, which is typical in interstate projects, an inter-state transmission system (ISTS) licensee does not have direct exposure to a single discom. Rather, multiple ISTS licensees pool collections, as per respective tariffs. The CTU (typically PGCIL) is the collection agency responsible for billing, collecting, and distributing transmission charges. Each ISTS licensee will inform PGCIL of the amount due on its lines, while the designated customer will issue a statement on the extent of power drawn. The details are submitted to the national load dispatch centre, which fixes the rate per megawatt (MW) for that quarter, based on which, PGCIL issues bills for the quarter. On receipt of payment from customers, it is disbursed to each licensee based on the disbursement ratio for that quarter.

Any shortfall on account of delay in payment by a discom is borne collectively by the ISTS licensees, in proportion to their share in the pool. For example, in the figure below, ISTS licensees including PGCIL, collectively owe Rs 100 (Rs 25 each). Let us assume a scenario where the CTU collects Rs 90 within the due date. In this scenario, each licensee will receive Rs 22.5 i.e. a delay of Rs 2.5 for each licensees. In contrast, if the delay in payment of Rs 10 was on account of discom 3 delaying its dues to SPV 2, in the absence of the pooling mechanism, SPV 2 would have borne the entire impact of Rs 10 instead of the four SPVs bearing the impact of Rs 2.5 each.

Hence, the PoC mechanism leads to more collection efficiency for ISTS licensees than what individual entities would have in the absence of such a mechanism. Additionally, stringent regulations related to non-payment of transmission charges have led to significant improvement in collection efficiency, as indicated by the strong track record of PGCIL, which had stable collection of around 99% over the past few years.
Hence, counterparty payment risks are lower for interstate projects that collect payments through a pooling mechanism.

**Intrastate transmission projects: Exposure to a single transmission utility**

In case of intrastate transmission projects, the counterparty is an STU, which depends on state discoms for cash flow, and does not enjoy diversification benefits and bargaining power available to PoC pools. In such a scenario, CRISIL evaluates the track record of the STU’s payments to SPVs, and whether it is at significant variance with payments by discoms to transmission utilities. CRISIL also assesses state discoms based on their payment track record, among other credit quality factors and ranks them under different payment risk categories.

CRISIL believes maintenance of adequate liquidity by SPVs, in the form of debt service reserve account (DSRA) and other cash equivalents, is critical to mitigate counterparty payment risk. The greater the delay in payment by counterparties, the more liquidity the transmission licensee will have to maintain to lessen counterparty payment risks.

**3. Financial risk**

A DSCR-based cash flow approach is used to evaluate the financial strength of SPVs. This methodology takes into account line availability, operating expenses, asset replacement charges, and interest and principal obligations during the tenure of the debt. CRISIL also analyses liquidity maintained by SPVs in the form of DSRA to withstand any counterparty payment delay.

CRISIL uses combinations of DSCR and DSRA for different rating categories. For instance, for an SPV with DSCR of 1.05, counterparty in ‘Payment risk category 1’, and project-level DSRA of three months, the standalone rating may map to ‘CRISIL A’. Transmission projects can operate with thin DSCR because of the predictability of their cash flow. That’s in contrast to toll road and renewable (wind and solar) power projects. Toll projects have uncertain cash flow due to demand and price risk, as traffic volume is unpredictable and toll rates are subject to revision. For renewable power projects, seasonal PLFs lead to uncertain output. Hence, these projects need higher DSCR.

**Conclusion**

CRISIL’s rating methodology for transmission projects focuses on adequacy and stability of cash flow for servicing debt, and liquidity required to mitigate counterparty payment risks.

CRISIL also evaluates qualitative factors to arrive at the standalone rating of transmission SPVs, and may factor in parent/group support or external credit enhancements through guarantees (partial or full). Criteria for factoring in parent/group support and for evaluating partial guarantee instruments are covered under other articles on CRISIL’s website.
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