PROJECT FINANCE

MARC RATING METHODOLOGY

INDEPENDENT POWER PRODUCER

OVERVIEW

In Malaysia, the power generation sector is principally dominated by three integrated power producer companies: Tenaga Nasional Berhad (TNB), Sabah Electricity Sdn Bhd (SESB) and Syarikat SESCO Berhad (SESCO). TNB and SESB fall under the jurisdiction of the Energy Commission (EC), while SESCO is under the jurisdiction of the Sarawak state government. TNB is the main electricity supplier for Peninsular Malaysia while East Malaysia is covered by SESB (Sabah) and SESCO (Sarawak). SESB is an 80%-owned subsidiary of TNB. These companies are complemented mainly by independent power producers (IPP) and, to a lesser extent, by dedicated power producers and co-generators.

In 1992, IPPs were allowed to enter the national power generation sector to transfer the burden of power plant financing from government-owned electricity utilities to the private sector. The impetus for the IPP programme also came from a prevailing shortage in generation capacity. The first five IPP licences were awarded to large corporate entities. The tariffs for first generation IPPs were also notably higher than for subsequent IPPs, which facilitated capital market financing for the first wave of IPP investments, along with the favourable risk allocation of IPP-related risks. The long-term power purchase agreement (PPA) under which generation capacity is sold to TNB insulates the IPP from demand and fuel cost risks. Subsequent PPAs have featured lower tariffs and a more balanced allocation of risks with required availability targets and some measure of demand risk sharing. The strong credit profiles of most issuers from this

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sector continue to be supported by their predictable and stable cash flow generation.

This methodology is to be read together with MARC's master criteria for Project Finance transactions.

ANALYTICAL FRAMEWORK

Most IPP debt is structured as limited or non-recourse financing of a single asset, in which case MARC's rating approach would mirror the analytical framework for rating projects with a focus on factors specific to IPP projects. In such instances, lenders are primarily looking to a specific generation facility to provide the cash flow needed to service the financing raised for the project according to the terms of the financing documents. MARC's project finance rating(s) on an IPP reflects its assessment of the project's ability to service the rated obligation(s) solely from project cash flow throughout the tenure of the obligation(s).

There are many risks to be analysed when rating IPP obligations. Pre-operational IPPs in particular are exposed to pre-completion or construction risks, namely cost overruns, delay risks, etc. The following are key rating considerations in MARC's IPP project finance ratings:

- Project sponsors/Management
- Principal project agreements
- Construction risk
- Operational risk
- Demand/Offtake risk
- Financial risk
- Issue structure risk

Where the rated obligation is structured with substantial recourse to project owners, MARC will assess the significance of the operational and financial linkages to determine the degree of parent-subsidiary relationships and implicit intra-group support before arriving at the issue rating.

For more details of MARC's approach to conducting analysis of an entity which is a member of a corporate group that consists of more than one legal entity which are linked by common ownership, see the criteria report "Group Rating Methodology".

PROJECT SPONSORS/MANAGEMENT

Based on documents related to the ownership structure (i.e. articles of incorporation and shareholders' agreements), financial data and other corporate information of project sponsors, MARC evaluates the following factors:

Assessment	Analytical Focus
Project sponsor's background and track record	A strong track record and experience in building and operating power plants would be positive rating factors. An assessment of the key management personnel, including for qualifications, skills and experience, is undertaken.
Financial strength	The audited accounts of the sponsors for the past three to five years will form the basis of this assessment. The credit quality of the sponsors is important to ensure that they are able to meet any future obligations, particularly contingent equity requirements in relation to undertakings to cover cost overruns and cash flow deficiencies.
Commitment	Higher levels of equity investment from the sponsors are considered a positive factor. The strategic importance of the project to the sponsor is also considered. Commitment may be tangibly demonstrated by way of undertakings to cover cost overruns or provide liquidity support and/or maintain a material interest in the project during the life of the financing facilities. Covenants in the financing documents may also restrict changes in ownership.

PRINCIPAL PROJECT AGREEMENTS

The PPA provides the contractual foundation for an IPP's revenue and cash flows. The PPA sets out the rights and responsibilities of the IPP and the power purchaser or offtaker. MARC also incorporates in its assessment some measure of the risk of PPA re-negotiation, taking cognisance of the visible absence of forcible negotiations in Malaysia's IPP sector to date on one hand, and the government's price affordability priority on the other. While the overall favourable tariff regime that has characterised PPAs to date has allowed IPPs to operate in a highly stable and predictable environment, MARC is mindful of the ongoing evolution of PPAs from being more to less lender-friendly over time.

Evolution of PPAs

The PPAs for first generation IPPs were signed in 1993 and 1994, second generation PPAs were signed between 1998 and 2001, and third generation PPAs were signed between 2002 and 2006.

Compared to the earliest PPAs signed in 1993 and 1994 which were unconditional (binding for 21 years) "take-or-pay" PPAs, the second generation PPAs allow for the renegotiation of the PPAs in the event of industry restructuring. The agreed purchase price of power was also lower than the agreed tariffs in the earlier PPAs. Unlike in the initial PPAs, TNB does not absorb the force majeure risks in the subsequent PPAs.

The first of the third generation PPAs, signed in July 2002 by TNB and SKS Power Sdn Bhd (SKS Power), introduced demand risk sharing. Prior to the advent of third generation PPAs, capacity payments were solely based on available generation capacity, the effect of which was to allocate demand risk wholly to the power purchaser. The PPAs have evolved to involve greater exposure to market and performance risks.

Capacity payments

Capacity payments are intended to address capital costs, fixed operating and maintenance costs and returns on equity. The nature and structure of capacity payments are of significant importance to the project's cash flow. Front-end loaded tariff structures allow faster amortisation of debt than level and back-end loaded tariff structures and provide greater repayment certainty. Fixing the capacity payments in nominal terms for the duration of the PPA imparts a "frontloading" effect. It allows capital to be returned to lenders earlier in the project's life cycle and reduces the power purchaser's incentive to renegotiate PPAs given the declining inflation-adjusted price of power.

The sensitivity of the capacity payment to electricity demand is an important consideration. "Take-or-pay" provisions ensure that IPPs are compensated to the level of the minimum power offtake whether the power purchaser is able to sell the power or not. Overcapacity will lead to power plants being dispatched at a much lower capacity utilisation level compared to the minimum offtake. This increases the IPP's reliance on the power purchaser to honour the offtake commitment. MARC would also give careful consideration to the circumstances under which capacity payments may be reduced, as set out in the PPA, and the IPPs' vulnerability to reduced payments.

Energy payments

The IPP's variable costs of generation are recovered through energy payments from the power purchaser. Apart from a pass-through of variable operating expenses, to date, PPAs also feature pass-through of fuel costs to the power purchasers, subject to specified heat rates.

Performance requirements

The performance requirements for IPPs have become increasingly stringent. For the first generation IPPs, scheduled and unscheduled outages are to be managed within a combined limit, allowing greater flexibility. Subsequent PPAs have more stringent performance requirements, with separate limits for scheduled and unscheduled outages. Penalties will be imposed if unscheduled outages exceed a certain limit and incentive payments for keeping plants at a certain level of readiness have been phased out. The performance standards of the IPPs are reviewed for achievability.

Reasons for non-compliance with the standards are evaluated and the impact on the capacity payments quantified. Ideally, fixed capacity payments should be sufficient to cover debt servicing obligations. Energy payments should be adequate to cover actual fuel costs and variable operating expenses associated with electricity generation. Energy payments should allow for full direct pass-through of actual fuel cost at different load factors.

Operations and maintenance (O&M) expenses may be higher than forecast due to an unanticipated major maintenance, higher-than-expected inflation and shortages in supply of labour or spare parts. An O&M reserve provides some cushion against surprises and ensures that the plant is adequately maintained to support projected availability.

Termination risk

MARC is cognisant of PPA termination risk which can arise if the IPP's licence is revoked or expired without renewal, a PPA event of default occurs or the EC exercises its statutory rights to operate the power plant facility, among others. MARC shall take these factors into consideration during the normal course of rating surveillance.

Change of law risk

Change of law risk refers to the likelihood that a government body will change the legal and regulatory framework under which the project was developed. This could affect project economics and the ability of the IPP to service its debt. The willingness of the government to support concluded PPAs may be tested in periods of heightened public sector sensitivity to an increase in tariffs.

CONSTRUCTION RISK

Generally, construction risk refers to the risks that the IPP project will not be completed on time, within the scheduled budget and up to the required performance standards. In reviewing these risks, factors such as appointed contractors, projected costs, delay risk and cost overruns risk are considered. Where construction has reached an advanced stage, the IPP is less vulnerable to disruptions in the construction schedule.

Assessment	Analytical Focus
The engineering, procurement and construction (EPC) contract	This contract agreement governs the contractual relationship between the IPP and the turnkey contractor and outlines the scope of work, rights and responsibilities, the construction period during which the contractor is responsible to design, construct, complete and commission as well as the turnkey contract price. Construction risk should be mitigated through a fixed price and date contract with an experienced and financially strong EPC contractor, and with adequate overrun protection if the project is to attain a high investment grade rating.
Variation order and additional work processes	Examination of circumstances under which the contractors may be compensated if there are additional works requested by the IPP or necessitated by the contractor's default or variations arising from amendments to the approved design.
Extension of time and early completion	The contractor's entitlement to an extension of time and the right of the employer to levy liquidated ascertained damages (LAD) payment in the event of a delay under the contract are taken note of in MARC's analysis of construction risk, along with early completion incentives.
Major contractors, turbine and major equipment suppliers	The experience, track record and financial profile of the major contractors and equipment suppliers are considered in assessing the likelihood that construction and commercial operation milestones will be achieved. Failure to satisfy milestones can arise from late equipment deliveries, among other possible causes.

Performance bonds, guarantees, insurance policies, LAD and project delays	The adequacy of EPC contract's LAD payable in the event of delay is assessed relative to construction and completion risk. If the completion date is not achieved as per the PPA, the power purchaser can delay the start of capacity payments and levy liquidated damages for the delay. MARC evaluates the extent to which this risk is allocated to the contractor. MARC also looks at the nature and amount of guarantees provided by the EPC contractor and any additional protection such as the retention of a percentage of contract price. The contractor is usually required to provide a performance bond equivalent to 5% of the contract sum. The performance bond is usually assignable to the IPP for the contractor's due obligations to perform during the construction period as well as during the defect liability period specified under the contract. Construction works are insured against any loss or damage during the construction period up to the end of the defects liability period. The turnkey contractor is responsible for maintaining the contractor's all risks insurance policy, workmen's compensation and third-party liability insurance. MARC considers the adequacy of contingency reserves and credit lines available to cover instances of cost overruns/delays.
Independent consulting engineer's report, progress report, scheduled timeframe, project costing	During the construction period, construction progress is monitored by examining the report of the independent consulting engineer (ICE) who is responsible for overseeing and monitoring the construction progress on behalf of the IPP and its financiers. The ICE is responsible for the supervision of construction of the plant and ensures that construction works are executed in strict accordance with the turnkey contract. MARC pays careful attention to construction timelines as well as the beginning and end of the defects liability period while taking note of the existence of any project buffers between agreed completion dates with the contractor and power purchaser.

Other considerations	The contractor's plans for acquiring sufficient equipment, labour and materials necessary to complete the project; the local labour situation. Delay in obtaining access to site and design issues could affect construction progress as will a dispute with contractors and/or subcontractors. If delay has been encountered and/or a replacement contractor has taken over from the original contractor, MARC will assess the overall adequacy of measures taken to mitigate the increase in construction risks.

OPERATIONAL RISK

MARC's analysis of operational risks considers the ability of the IPP to perform according to contracted characteristics and to meet its availability obligations. The PPA will typically require the IPP to achieve a target level of performance at the generation facility, determined from the facility's availability and heat rate. Failure to achieve the agreed-upon levels would normally result in reduced capacity payments and excess fuel costs due to plant inefficiency.

The performance risk of the power plant is usually mitigated through the appointment of an O&M contractor. The O&M contract typically addresses the minimum performance standards of the plant, and will specify damages for operation-related losses. The O&M contractor will guarantee plant availability, heat rate and net plant output for the contracted period. MARC considers the track record of the O&M contractor and the extent to which O&M arrangements facilitate the transfer of operational risks.

Assessment	Analytical Focus
O&M contract	Understanding the operator's relationship with project owners, the scope of work, rights and responsibilities. To identify measures to cover instances where the operator's performance is below the required performance standards, for example, performance guarantees and associated liquidated damages and provisions to replace the contractor, if necessary.
Project experience and credibility of operator with power plant operations	Assessment of the experience and track record of the operator in operating similar power plants as well as the latest financial position of the operator. The availability of technical support from major equipment suppliers is assessed.

Technology	The type of power plant and the technology used in these plants affect the IPP's operating risks. For example, gas-fired IPPs and the use of combined cycle technologies are expected to enhance plant performance and fuel efficiency. Diesel-fired power plants are generally more susceptible to forced outages caused by human errors compared to gas-fired power plants.
Plant performance	Assessment of the plant's keys measures such as heat rate, plant availability, dependable capacity and emissions. To analyse the effects on cash flow due to higher operating costs, penalty payments under the PPA which should be covered by liquidated damages claimable from the operator, and loss of revenue due to breakdown of machinery or force majeure events. The motivation/incentive for the operator such as performance-based compensation and the importance of the project to the operator shall also be reviewed. The performance of the peaking power plant will not be similar with the performance of the base load plant. Peaking power plants are power plants that generally run when there is a high demand, known as peak demand, for electricity. This usually occurs during periods of hot weather when the air conditioning load is high. In contrast, base load power plants operate continuously, stopping only for maintenance or unexpected outages. Base load plants are used preferentially to meet electrical demand because the lower efficiencies of peaking plants make them more expensive to operate.
Fuel supply risk and volatility in fuel price risk	The reliability of fuel supplies such as coal supply, consistency in the quality of coal, the risk of the non-availability of fuel and the IPP's exposure to an escalation in fuel costs would be evaluated. Ideally, fuel supply risks should be mitigated as far as possible by a long-term fuel supply agreement(s) with the fuel supplier(s) and some reserve supplies. A pass-through of fuel costs Is important to eliminate exposure to fuel price volatility as a risk factor. Access to alternative fuel sources and suppliers is evaluated. The ability to pass through fuel cost escalations to the power purchaser is desirable from a ratings perspective.

The O&M costs during the bond tenure would be determined, as well as reasonable escalation rates for these costs to be used in the cash flow projections. The analyst would also conduct sensitivity and/or break-even scenarios to assess cash flow's resilience to support timely debt payments.

DEMAND/OFFTAKE RISK

The credit strength of the IPP's offtaker will be assessed in terms of the ability and willingness of the offtaker to pay its obligations. The rating of an IPP is capped by the rating of its offtaker. The offtaker's credit strength is usually derived from its strategic importance as a major utility and the essential nature of the electricity sector to national security and economic development.

FINANCIAL RISK

For a pre-operational IPP project, the financial risk analysis focuses on the projected cash-generating ability of the project and the robustness of the cash generated under adverse scenarios to meet debt burden.

For operational power plants, MARC assesses actual cash flow coverage of total debt service and the IPP's operating margin. The minimum power offtake that is guaranteed by the power purchaser is of major significance to MARC's financial analysis. The lower the level of minimum offtake, the higher the capacity payment tariff needs to be in order to cover all cash outflows to lenders, shareholders, O&M contractor, insurance, etc. The main critical factors that result in poor performance usually arise from top-line items such as lower-than-expected fixed capacity payments (due to penalties) and energy payments, resulting in lower-than-expected revenue.

Assessment	Analytical Focus
Cash flow coverage	The sensitised cash flow projections are matched against the debt repayment schedule of the project to ascertain the finance service coverage ratio (FSCR), a key indicator of the debt servicing ability, to determine how much revenue is needed to cover debt service and operating expenses. The FSCR under each scenario and the year in which the minimum FSCR would occur are noted and explanations obtained for the trend observed. The higher the FSCR under the various stressed scenarios, the lower the risk of financial default, and hence the higher the assigned rating. MARC would request for confirmation of the FSCR calculation from the monitoring accountant of the facility at computation dates to ascertain ongoing compliance with the FSCR covenant.

Capital structure/ financial flexibility	The equity requirement is to ensure commitment on the part of the project's sponsors. Projects with high equity participation will enjoy greater financial flexibility as returns on equity, such as dividend payments, can be deferred during times of stress as opposed to debt service, which follows a fixed repayment schedule. MARC monitors actual debt-to-equity (DE) ratios against the covenanted DE ratio in the course of its rating surveillance.

ISSUE STRUCTURE RISK

The issue structure spells out the principal terms, conditions and covenants of the debt facility, such as repayment, security, and designated accounts. Terms, conditions and covenants under the issue structure are directed towards ensuring the solvency of the project and the requirement of the IPP to manage its cash flows and service its debt obligations. Structural features and bond covenants that may provide additional bondholder protection as well as areas of focus in MARC's analysis of the issue structure are outlined in the following table.

Assessment	Analytical Focus
Minimum FSCR	The minimum FSCR is the minimum coverage of debt service by revenue generated by the IPP.
The order of priority in the payment waterfall	The order of priority within the payment waterfall that normally provides for the payments of operating expenses, debt service and deposits to required reserve accounts before payments of any other obligations, including dividends. Restrictions on making dividend payments if the coverage ratio falls below a certain level (distribution test) are also considered in MARC's analysis.
Designated accounts	The designated accounts to be opened and maintained include the finance service account, finance service reserve account, operating account, escrow account, disbursement account, etc. Requirements to maintain a minimum balance in the reserve account equivalent to at least six months to one year of debt service, for example, helps to mitigate the risk of intermittent cash flow shortfalls.
Maximum DE ratio	To monitor the trend in DE ratio historically and its forecast for the entire period of the facility.

Legal structure, credit enhancements and other financial covenants	To examine other features, including the legal structure, any measures to minimise cash leakage and tighter ring-fenced mechanisms to provide additional protection to bondholders. Generally, the higher the assigned rating, the more stringent the cash flow monitoring process and financial covenants that have been set.

Based on the debt issue structure for a power plant project, the analyst shall analyse how the issue structure addresses liquidity, refinancing and investment risks associated with the project.

Assessment	Analytical Focus
Refinancing risk	The risk of the issuer refinancing the existing debt issue is usually mitigated by the payment structure of the bonds with repayments spread over a long period. The first serial payment would normally be made after the power plant has been commissioned.
Liquidity risk	This risk is somewhat mitigated through the requirement to maintain a minimum amount equivalent to six months to one year of the profit or interest in a debt reserve account throughout the tenure of the financing facility.
Investment risk	The risk of capital loss in respect of the investment of funds in the designated accounts is mitigated by the requirement to restrict investments to liquid assets, government-issued instruments or capital market instruments with minimum rating of AAA or AA with maturity dates matching the debt obligation dates.

MARC has refined its methodology for rating Independent Power Producer and it should be read in relation to the "Project Finance" methodology which is available on the website at www.marc.com.my. This methodology partly amends and supersedes MARC's "Independent Power Producer" published in 2015.

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