

Methodology
Rating Project Finance

APRIL 2011



Insight beyond the rating.

CONTACT INFORMATION

Michael J. Caranci
Managing Director – Energy
Tel. +1 416 597 7304
mcaranci@dbrs.com

Kent Wideman
Chief Credit Officer
+1 416 597 7535
kwideman@dbrs.com

DBRS is a full-service credit rating agency established in 1976. Privately owned and operated without affiliation to any financial institution, DBRS is respected for its independent, third-party evaluations of corporate and government issues, spanning North America, Europe and Asia. DBRS's extensive coverage of securitizations and structured finance transactions solidifies our standing as a leading provider of comprehensive, in-depth credit analysis.

All DBRS ratings and research are available in hard-copy format and electronically on Bloomberg and at DBRS.com, our lead delivery tool for organized, Web-based, up-to-the-minute information. We remain committed to continuously refining our expertise in the analysis of credit quality and are dedicated to maintaining objective and credible opinions within the global financial marketplace.

Rating Project Finance

TABLE OF CONTENTS

Introduction to DBRS Methodologies	4
Project Finance Overview	4
Structure	5
Financial Model	6
Risk Mitigants	6
One-Off Nature of Projects	6
Project Business and Financial Risk	7
Construction Risk (if applicable)	8
Rationale and Risk Management	8
Contractor Risk	9
Monitoring Construction Period Risk	9
Complexity and Technology	9
Revenue and Off-Take Agreement	10
Rationale	10
Quality of Revenues	10
Revenue and Cost Basis	10
Availability	11
Tenor and Refinancing Risk	11
Contingencies/Contract Outs	11
Renewable Resource	11
Competitiveness and Input Costs	12
Operating Risk	12
Availability and Efficiency (Heat-Rate)	13
Operating and Maintenance	13
Technology Risk	13
Sponsor Strength	14
Financial Risk	14
Debt Service Coverage Ratio	14
Scenario Analysis	14
Country and Political Risk	15
Review and Requirements of Project Framework & Structure	16
Special Purpose Entities	16
Security Provisions	16
Representations and Covenants	17
Creditor Cure of Contract Defaults	17
Insurance	17
Expert Reports and Legal Opinions	17
Summary	18

Introduction to DBRS Methodologies

- In general terms, DBRS ratings are opinions that reflect the creditworthiness of an issuer, a security or an obligation. They are opinions based on forward-looking measurements that assess an issuer's ability and willingness to make timely payments on outstanding obligations (whether principal, interest, dividend or distributions) with respect to the terms of an obligation.
- DBRS rating methodologies include consideration of applicable general business and financial risk factors as well as industry-specific issues and more subjective factors, nuances and intangible considerations. Our approach is not based solely on statistical analysis but includes a combination of both quantitative and qualitative considerations. The considerations outlined in DBRS methodologies are not intended to be exhaustive. In certain cases, a major strength can compensate for a weakness that would be more critical for a peer company and may also differ depending on the industry being considered. Conversely, there are cases where one weakness is so critical that it overrides the fact that the company may be strong in most other areas.
- DBRS rating methodology is underpinned by a stable rating philosophy, which means that in order to minimize the rating changes due primarily to economic changes, DBRS strives to factor the impact of a cyclical economic environment into its rating as applicable. Consequently, DBRS takes a longer-term "through the cycle" view of an issuer and, as such, rating changes are not based solely on normal economic cycles. Rating revisions do occur, however, when it is clear that a structural change, either positive or negative, has transpired or appears likely to transpire in the near future. An equally important aspect of DBRS analysis is its broad industry coverage, which it undertakes in order to understand the major differences and subtle nuances within a particular industry and to form an appropriate rating of an issuer relative to its competitors.
- Critical in the determination of a rating is the application of the analyst's experience and expertise in forming an initial rating opinion and recommendation for the DBRS rating committee and the role of the rating committee as the final decision maker. DBRS rating committees, which comprise experienced and knowledgeable DBRS personnel, strive to provide objective and independent rating decisions that are based on all relevant information and factors, incorporate both global and local considerations, apply DBRS-approved methodologies and constitute the opinion of DBRS.

Project Finance Overview

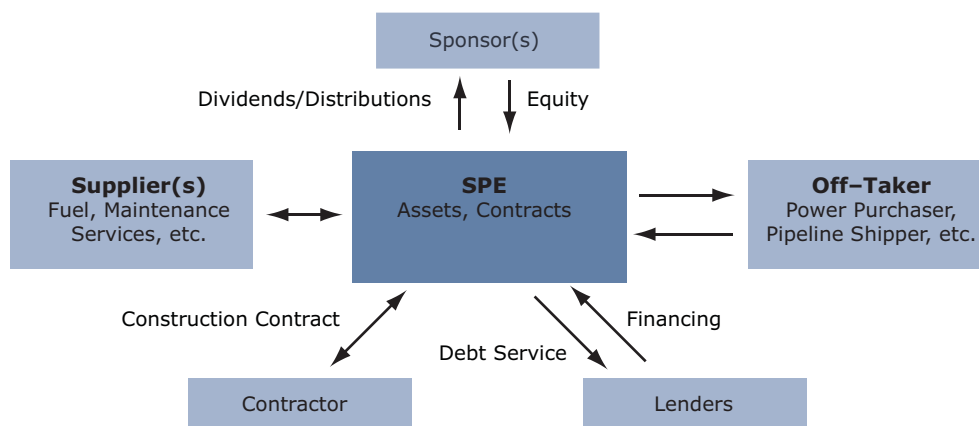
- Project finance transactions are non-recourse or limited-recourse investments in which lenders rely on project assets and cash flows. Lenders have limited or no recourse back to the project's equity-investor sponsors.
- While corporate debt holders benefit from multiple revenue streams with established operating histories and an entire corporate enterprise's credit strength, investors in non-recourse debt depend on a single (or limited) asset's performance, cash flows and value.
- Rating a project requires analysis of a host of factors. These include (but are not limited to):
 - The project structure and its contractual and legal framework.
 - Financial and execution risk of contractors and key project vendors.
 - Construction period and operating period risk.
 - Project model (a financial forecast, tested by scenario analysis).
 - Historical financials.
 - Country and political risk.
 - The commitment and credit quality of sponsors and off-takers.
- Ratings most typically focus on the project's standalone repayment ability. Limiting recourse to the project is achieved structurally and contractually.

- Structurally, the assets are typically located in a separate legal entity (generally a partnership, limited purpose or special purpose corporation).
- Contractually, the assets are isolated within the special purpose Borrower, securing all agreements, including debt agreements and third-party project agreements through the Borrower.
- As project finance is a financing structure used in various industries and sectors, such as energy, infrastructure, mining and natural resources, the applicable industry risk of any particular project varies accordingly. Although this methodology uses power generation and oil and natural gas pipelines projects as examples, the same principles and fundamentals can be applied to other types of energy assets, such as power transmission, as well as non-energy related projects (e.g., mining and forest products).
- This methodology does not apply to corporate power generators that sell electricity from multiple and dispersed power generating assets (covered in the *Rating Companies in the Non-Regulated Electric Generation Industry* methodology). Note that DBRS has separate methodologies for public-private partnerships and airport authorities, which can be found at www.dbrs.com.

STRUCTURE

- Project finance structures rely on contracts to manage risk during construction and operation.
- Reliability of debt repayment depends on the project's ability to generate a stable stream of revenues and incur predictable costs.
- Equity Sponsor commitment is typically injected according to contractual milestones during construction.
- The level of construction risk depends largely on an engineering, procurement and construction (EPC) contract with a general contractor (which could be cost-plus or on a fixed-price, lump-sum, turnkey basis).
- An independent engineer (IE) is engaged to assess the construction schedule, budget, design, technology, technical staffing, protections against completion delays and initial performance risk, the cost components of the financial model, as well as the EPC contract itself.
- Fuel supply and power purchase contracts are critical to the size and stability of operating margin and cash flow. In the case of pipelines, long-term take-or-pay contracts are typically required in order to secure debt financing.
- The financing documents, which could include a loan agreement, bond indenture and inter-creditor agreement, commit debt investors and oblige the project to carry out significant reporting of progress in construction and operating performance, including covenants and their compliance.

Simplified Typical Project Finance Structure



FINANCIAL MODEL

- The financial model captures the economics of the project and then analyzes the sensitivity of the project's debt service coverage ratio (DSCR) to various drivers such as:
 - Construction delays.
 - Cost overruns.
 - Equipment underperformance (capacity and availability below specification).
 - Higher fuel costs (for market-based, variable component fuel supply contracts).
 - Lower power prices (for market-based variable component power purchase agreements (PPAs)).
 - Production volumes.
 - Varying levels of inflation.

RISK MITIGANTS

- Some key structural risk mitigants include:
 - Provision for liquidated damages in the EPC contract.
 - Performance bonding covering delay or performance deficiency pre-completion.
 - Warranties in the EPC and/or the operating and management agreement (OMA) that would reduce operating performance risk.
- Covenants and conditions in the financing documents include:
 - Debt service reserves.
 - Major maintenance and capital expenditure reserves.
 - Cash flow waterfall.
 - Distribution restrictions to support debt service.
 - Limitations on additional debt.
- Reasonableness and enforceability of contracts is critical in project financing. Legal opinions are required to establish the integrity of a project's contractual framework and are a necessary condition to successful financial closing.
- Rigorous, detailed contract review is central to understanding the project structure and legal framework and central to identifying and measuring all project risks.

ONE-OFF NATURE OF PROJECTS

- While the discussion in this methodology focuses on a typical or generic project financing structure, many projects have unique features or characteristics that can significantly affect a rating and are evaluated accordingly.
- Significant differences can include:
 - Construction risk.
 - Technology utilized (hydroelectric, natural gas fired, wind, etc.).
 - Debt attributes (fully amortizing, partially amortizing, bullet maturities, etc.).
 - Commercial arrangements (revenues fully contracted or exposed to market prices, fuel supply, etc.).
 - Strength of sponsor.
 - In the case of pipelines, the presence of adequate supplies of energy (e.g., crude oil, natural gas) at one end of the pipeline and an adequate end-user market, or take-away capacity, at the other end is assessed.

Project Business and Financial Risk

- The table below summarizes the key factors in evaluating a project finance transaction. It should be noted that the various aspects of a project are often interrelated and interactive and should be assessed holistically, not in isolation. These factors, along with many others, are further explained in the following sections.

Project Risks – Critical Factors

Rating Strength	A Superior	BBB Adequate	BB Weak
Construction Risk (if applicable)	<ul style="list-style-type: none"> • Proven technology; predictable construction process and costs; strong construction contracts with experienced contractor(s) of strong credit quality. • Robust lump-sum turnkey EPC with comprehensive protection against delay, cost overruns and performance defects. 	<ul style="list-style-type: none"> • Proven technology; construction contract with experienced contractor of reasonable credit strength. • Reasonable contract protections against delay, cost overruns and performance defects. 	<ul style="list-style-type: none"> • Relatively new technology or complex construction process; contractor with weaker credit quality. • Weak or no protection against delay, cost overruns or performance defects.
Revenue/Off-taker	<ul style="list-style-type: none"> • Stable and predictable revenues. • Contracts with strong off-takers or a consistent high-margin competitive position from un-contracted sales. • For hydro, revenues are quite resilient to hydrology variability. 	<ul style="list-style-type: none"> • Reasonably stable and predictable revenues. • Contracts with off-takers of acceptable credit quality, or a reasonably consistent high-margin competitive position from un-contracted sales. • For hydro, revenues are resilient to hydrology variability. 	<ul style="list-style-type: none"> • Less stable and predictable revenues. • Contracts with weak off-takers or off-taking contracts, or revenues exposed to lower-margin competitive position. • For hydro, revenues are less resilient to hydrology variability.
Competitiveness and Input Costs	<ul style="list-style-type: none"> • Superior competitive position providing strong economic rationale for the contracts and resulting in predictable profitability even without contracts. • Natural monopoly or substantial barrier to entry preserving the competitive position. 	<ul style="list-style-type: none"> • Reasonable cost-competitiveness protected by some degree of barrier to entry. 	<ul style="list-style-type: none"> • Weak or no competitive advantage. • Potential erosion of competitiveness in a market equilibrium process.
Operation	<ul style="list-style-type: none"> • Proven technology with predictable operating characteristics and performance. • Strong contract protections on key operating parameters. 	<ul style="list-style-type: none"> • Proven technology with reasonable operating performance and costs. • Some contract protection. 	<ul style="list-style-type: none"> • Relatively new technology or complex operation resulting in uncertainties in production interruption or reduction and/or cost escalation.
Sponsor	<ul style="list-style-type: none"> • Highly experienced sponsor(s) with acceptable credit quality and proven expertise in project type. • Demonstrated sponsor commitment to the project in the form of strong equity contribution and/or other business and credit supports. 	<ul style="list-style-type: none"> • Experienced sponsor(s) with acceptable credit quality. • Demonstrated sponsor commitment in the project with reasonable equity contribution and support. 	<ul style="list-style-type: none"> • Sponsor(s) with limited or no track record in the type of projects being developed and financed. • Sponsor(s) with weak credit quality. • Weak equity contribution and/or credit support.

Project Risks – Critical Factors

Rating Strength	A Superior	BBB Adequate	BB Weak
Financial Risk	<ul style="list-style-type: none"> Comprehensive and reliable financial projection for relatively new projects or established financial performance track record for long-existing projects. Strong debt service coverage given the contract and structure features. All other relevant metrics (such as leverage ratio for projects under construction) are robust. 	<ul style="list-style-type: none"> Acceptable financial track record or projection. Solid debt service coverage and other relevant ratios given the type of projects. 	<ul style="list-style-type: none"> Limited financial history or projection. Financial ratios are weak without adequate structural enhancement or protection.
Country and Political Risk	<ul style="list-style-type: none"> Countries with a mature and established legal framework for project finance, a reasonable presumption of due process. Stable political, regulatory and economic environments resulting in minimal or no uncertainties in terms of contract enforcement, currency conversion and transfer, asset ownership, or potential war or civil unrest. In most cases, this means OECD countries. 	<ul style="list-style-type: none"> Countries with reasonably stable political, regulatory or economic environments. In cases where there exist potential issues in terms of country or political risk, these risks are well-mitigated. 	<ul style="list-style-type: none"> Countries with one or more political risk factors that are difficult to gauge or mitigate due to weakness in the legal framework or uncertainty in political, regulatory or economic environments.

CONSTRUCTION RISK (IF APPLICABLE)

Rationale and Risk Management

- Assessing construction risk is critical.
- Failure to build and complete the project as expected could change the validity of the operating period assumptions and projected debt service coverage.
- The risk of failing to complete construction is generally low, if proven technology is used and highly experienced, technically and financially capable contractors are engaged.
- Risks of delay and cost overruns can be partially addressed with:
 - Fixed-price, turn-key EPC contracts or, in some cases, cost plus with incentives.
 - Performance bonds, warranties.
 - Liquidated damages.
 - The extent of the contractor's aggregate liability under the EPC contract.
 - The level of contingency built into the EPC budget.
 - Insurance products.
- Sufficient contingency must be included in the EPC budget and timeline to bear unanticipated costs and delays (in addition to Sponsor contingencies incorporated into the overall project budget).
- Penalties or damage payments should be sufficient to recoup opportunity costs but at a minimum cover debt service obligations for an extended construction period.
- Off-take contracts often have in-service 'drop-dead' dates. Accordingly, a thorough analysis of construction schedule feasibility and the probability that delays will not extend beyond such dates is closely reviewed by the IE. Failure to meet contracted in-service dates can cause legal disputes between the project and the EPC contractor and trigger penalty payments to the off-taker.
- As the complexity of a project increases, the importance of a comprehensive change orders process and dispute resolution mechanism increases. Dispute resolution, in particular, needs to be comprehensive, efficient, fair and timely.

Contractor Risk

- Contractor risk assessment is based on a separate DBRS methodology *Rating Companies in the Engineering and Construction Industry*. Critical factors for rating contractor-specific risk include:
 - Risk management and project control.
 - Project complexity and contractor expertise.
 - Scale of operations.
 - Nature of contracts.
 - Diversification.
- Proven technical capability of the EPC contractor is important, as is its financial capability. If needed, financial capability analysis may include review of the contractor's order book and available liquidity.
- Technically capable contractors can be victims of their own success, so to speak, if liquidity cannot match successful winning of mandates. Then future working capital requirements may stress contractor bank covenants and trigger delays on construction-in-progress.
- The 'fit' of the construction contractor with respect to the type and size of the project is assessed. DBRS evaluates the construction contractor's size, reputation and track record on completing similar projects on time and on budget, as well as the construction contractor's ability to self-perform some or all of the construction tasks.
- Where a contractor does not have an established track record in a specific sector or region, DBRS examines the strategies proposed to fulfill all obligations, including the use of experienced subcontractors and the timing of their engagement, planning for labour and materials acquisition, and securing permits necessary to complete the project.

Monitoring Construction Period Risk

- The IE can help identify and mitigate construction risk.
- Periodic reports by the IE comparing actual-to-plan percentage completion is common practice, enabling quick response to delays.
- Another discipline for construction performance is to require completion milestones to be certified by the IE at key stages. The language of the certification is important. A general opinion that the project can still be completed on time and on budget is less effective than a specific opinion that the milestone has been achieved and the project is actually on time and on budget.
- Linking IE milestone certificates to approval of phased lender advances and funding to the project focuses owners on problems and reduces risk.
- DBRS attributes significant importance to the report of the investors' IE, and its opinion with respect to the complexity of construction and the reasonableness of cost and timing estimates.

Complexity and Technology

- Construction risks increase with more complex schedules and technologies, and with difficult terrain and geographical location.
- Risk level is primarily driven by type of facility. For power generation, DBRS generally views complexity by technology (from most to least complex) as follows: nuclear, coal, natural gas, hydroelectric and wind.
- Technology and complexity risk during construction are affected by a number of factors, including:
 - Design and technical requirements.
 - Contractor's/manufacturer's technical and financial capabilities.
 - Nature of contract (fixed-price versus cost plus).
 - Level of enhancements (contractor guarantees, warranties, liquidated damages, performance bonding, letters of credit).
 - The experience level of the sponsor, EPC contractor and O&M contractor.
- For pipelines, technology tends to be relatively straightforward. However, complexity may be higher in rugged terrain, marshy areas, or when there are river crossing requirements.
- New-generation equipment can create uncertainty and may increase completion test requirements and time frames, ramp-up times, and add to completion and initial operation "teething" problems.

- Typically, the equipment vendor is motivated to support the early installations of new-generation equipment and will provide additional ramp-up and initial performance support, as well as increased warranty support.
- Due diligence should confirm that additional support is provided under the vendor sales contract where new-generation technology is being deployed.

REVENUE AND OFF-TAKE AGREEMENT

Rationale

- Revenue reliability reduces project risk.
- The terms and conditions of an off-take contract and the credit quality of the off-take counterparty can frame revenue stability.
- In general, the longer the contract term, the less conditional the contract, the more fixed the nature of the pricing, and the more closely matched to capital, financing and operating costs, then the more stable revenues and debt service coverage will be.
- The economics and reasonableness of the off-take contract is important – a contract is more likely to perform when it benefits all parties.
- DBRS notes that a project's revenue stream can be favourable without an off-take contract, if it has a proven, consistent, high-margin position; that is, an established hydroelectric asset in a region where higher-cost power sets the marginal price. An independent market study can assess a project's competitive position and its resiliency to market price fundamentals.

Quality of Revenues

- An off-taker's credit strength and its ability and motivation to honour the contract is a key determinant in the project rating.
- Off-takers with a strategic need that is met by the siting, technology type, capacity and load type of the project, are considered constructive for the durability of the power purchase contract and for credit quality.
- The rating of a project's debt is typically lower than the off-taker rating, to account for other project risks deemed significant – for example, construction, operating or financing risks.
- Changes in the off-taker rating could affect the project rating. For example, if a project were rated A (high) based primarily on an off-taker's AA (low) rating, and the off-taker were downgraded to A (high), all else equal, the project debt would likely be notched down to "A".
- For a project that has a superior market-based competitive position such as an established hydroelectric power generation project in a market region with higher-cost power and suitable transmission and market access, off-taker strength could be less important. Occasionally, such a project could have a rating higher than the off-taker rating. A low-cost project has the flexibility to easily replace its off-taker or might earn higher margins by selling power on an un-contracted market basis.

Revenue and Cost Basis

- For projects with revenue contracts, differences between the basis for revenue and costs have to be assessed.
- Fixed or variable revenue flows can increase or decrease risk, depending on how well they match the cost components and how the operating margin is protected.
- Variable revenues (revenues with a market-based pricing component) can increase risk if most costs are relatively fixed. Conversely, a fixed-price revenue contract can increase risk if costs, especially fuel costs, are variable.
- Contract pricing of power may include a fixed capacity payment, as well as a variable energy component. Fixed capacity payments are charged to the off-taker based on "availability" of power and not on actual dispatch of electricity. The capacity payment is independent of demand or off-take volume. Capacity payments are often sized to ensure that all fixed costs, including debt service obligations, are covered.
- Some pipelines have fixed/variable tolls under which contracted shippers pay the fixed component regardless of usage, and the variable component according to actual usage.
- The variable component of revenue should be compared with the underlying fuel and variable operating and maintenance costs. Where the variable component of power price is based upon a market index, fuel costs should mirror the index – any related basis risk needs to be identified and measured to reduce business risk.

- The variable component of fuel pricing may have certain “fixed” rate factors – for example, total fuel costs may be “fixed” by a ceiling on recovered cost but vary with output volume up to that ceiling.
- If the fuel component in an off-take contract is fixed, basis risk is reduced by corresponding firm, fixed fuel supply contracts.
- Long-term fuel supply contracts can include certain “minimum takes,” which generate inventory charges. Minimum takes should be part of the operational risk evaluation.
- In summary, the cost basis for fixed costs (usually the capital costs of the project) and variable costs (usually fuel and operating costs) is compared with pricing mechanisms in the power purchase contract. Where basis exists, and widens in certain scenarios, risk increases.

Availability

- The contract definition of “availability” can vary. Availability clauses can demand onerous operating standards, such as high efficiency (i.e., low heat-rate) or very few outages, if close to the attainable plant and equipment performance range.
- Failure to meet such requirements could cause penalty payments flowing from the project to the off-taker, or a deduction in the revenue payments.
- Contracts with stringent availability conditions are considered less favourable to the project and increase risk.
- Accordingly, availability clauses are closely reviewed (normally within the IE’s scope), with peer group comparisons and known equipment ratings, to ensure that they are reasonably achievable.

Tenor and Refinancing Risk

- Contract term is typically less than the expected economic life of the project. A typical structure amortizes debt to remove or minimize refinancing and obsolescence risk. If debt term exceeds the term of the off-take contract, there is market risk following contract expiry.
- Depending on project type, unless there is a corresponding step down in debt service, the transition from fixed contract to market-based prices increases risk.
- Analysis of the project’s competitive position – both current and forecast – supports assessment of transition to market risk. If debt is refinanced beyond the term of an existing contract, interest rate risk is measured in addition to evaluation of transition to market exposure.
- On the other hand, if debt is refinanced when a substantial period still remains for the existing contract, the refinancing risk during the remaining term of the contract is mainly the DSCR impact of new debt with a substantially higher interest rate.
- If the DSCR is high, the ratings effect of refinancing risk may be relatively low, as the coverage could remain robust even for a sharp increase in interest rates at refinancing.
- If moderate increases in interest rates reduce DSCRs that were already close to the bottom of the range for the project’s rating, then the ratings effect of refinancing risk would be moderate to high.
- Hydro projects are better positioned to bear refinancing risk based on their long asset life and low operating costs.

Contingencies/Contract Outs

- Off-take contracts are reviewed to ensure that all obligations and contractual outs are assessed.
- Long-term contracts that impose onerous “above-market” obligations may be difficult to honour and no better than short-term contracts with few obligations.
- For example, if a long-term contract imposes abnormally high availability standards on a project (e.g., very limited downtime allowed for outages), and performance below the onerous standard becomes a termination event with tight cure periods, then contract risk is high.
- Provisions in an off-take contract can provide minimum performance relief under force majeure circumstances.

Renewable Resource

- For renewable generators, revenue variability can arise from the inherent volatility of the underlying resource (hydrology, wind, solar, etc.). For hydroelectric facilities, hydrology variability can be managed through contractual arrangements (i.e., floating for fixed water flows), storage, operational design characteristics, and so on.

- A detailed engineering study on available resource and achievable production level is needed.
- The quality of this study could be affected by the amount of historical data available; for example, a renewable project at a new site with limited on-site historical data could have increased risk.
- For pipelines, transportation of a non-renewable energy commodity requires an assessment of supply and demand conditions in the surrounding areas to evaluate the long-term usefulness of a pipeline.

COMPETITIVENESS AND INPUT COSTS

- For projects with off-take contracts, the cost of power can affect the level of commitment to a project for both off-taker and project.
- Regulatory and community support for a project declines if costs rise. If a project supplies a consistently economic source of power under most market conditions, stakeholders are motivated to keep the project operating.
- Contracts that pass fuel costs to the purchaser reduce market risk. However, if contracts increase the price to the end-consumer, this may provoke opposition from the purchaser, and the project may experience political pressure.
- Accordingly, market-market contract strategies can be inferior to fixed-fixed arrangements from a ratings perspective.
- On the other hand, fixed-fixed fuel contractual arrangements are not without risk either. Long-term prices may be fixed prior to a significant and sustained decline in spot prices, making the project expensive vis-à-vis other projects that have sourced market-priced fuel.
- In evaluating competitiveness and the input costs of a contracted project, DBRS considers, among others, the following factors:
 - Efficient and proven technology compared with current alternatives.
 - Fuel arrangements that provide stability against price hikes, including the credit strength of fuel suppliers.
 - Low fuel cost or other energy source cost.
 - Above-market pricing arrangements with related parties and/or politically motivated entities.
 - Any risky fuel, pricing or operating strategies.
 - Proximity to customer base and fuel supplies (lower transportation costs).
 - Potential for liability (e.g., environmental, land claims) that may cause expensive litigation or delays.
 - Potential emissions costs (a coal-fired project versus natural gas-fired or renewable).
- Of all the fuel/technology types, renewables are typically among the most competitive in terms of cash operating costs (i.e., excluding capital costs). Of the renewable asset types, hydroelectric has a very long proven history of low and predictable operating costs.

OPERATING RISK

- Assessment of operating risk and performance is facilitated by reporting requirements, which tend to be different for projects than for corporate entities.
- Operating project reporting commonly includes:
 - Annual and interim financial reporting.
 - Capital budgets.
 - Availability and efficiency data.
 - Energy sales volume data.
 - Covenant compliance certificates (confirming that DSCR tests have been met).
 - Other compliance certificates.
 - Annual insurance certificates.
 - IE reports where major unanticipated repairs have been made.
 - Environmental permits and licensing.
 - In general, reports on any unexpected change in plant condition or operating performance.
- Close attention to the steady stream of operating and financial performance data supports operating risk surveillance.

Availability and Efficiency (Heat-Rate)

- Plant availability below standard is a key operating risk since pricing under the revenue contracts could be tied to availability conditions and/or other operating performance criteria.
- In power projects, for example, plant availability and energy (or heat rate) efficiency are key factors in plant competitiveness.
- Analysis can review peer group data for comparisons with similar facility types and related industry average availability and heat rate data.

Operating and Maintenance

- Operating and Maintenance costs depend on an experienced O&M contractor or owner operator and correct staffing of the plant.
- An engineering report would provide a third-party opinion on the operating period risks, including:
 - The reasonableness of expected operating costs and maintenance costs.
 - Expected operating levels.
 - Expected repairs.
 - Future capital costs.
 - The useful life of the assets.
- Control of maintenance costs and the availability of spare parts are assessed.
 - Expected maintenance cost and potential variability through the life of the project.
 - Long-term fixed price contracts from the major equipment suppliers can minimize this risk.
 - If third-party service companies are responsible for maintenance, then appropriate controls ensure compliance with maintenance guidelines and contain costs.
 - The availability of spare parts for key components will reduce downtimes for unplanned outages.

Technology Risk

- Projects that employ proven technology are expected to have lower business risk levels than projects with newer technology.
- When new technology is involved, unit availability can be unpredictable, especially in the initial start-up phase.
- A manufacturer should be able to demonstrate success across its installed fleet of similar units and/or show that so-called “teething” issues have been resolved or are mitigated by greater warranties and technical support.
- Ineffective operating procedures and management can reduce plant availability and efficiency.
- Proven prior experience managing similar project facilities reduces operating risk.
- Close oversight by the manufacturer during the first few critical years is also constructive for achieving planned operating metrics.
- Given the long life of most projects, issues such as environmental compliance and capital costs associated with tightening environmental and emission controls are reviewed.
- The impact of these issues is more profound for technologies that are currently considered less desirable from an environmental standpoint (e.g., coal-fired power projects).
- Maintenance aspects of technology risks are consistent with operating factors. That is, where operating risks are high due to relatively new or sophisticated technology, maintenance risks increase.
- Proven capability on the part of an experienced O&M contractor in maintaining similar projects and/or a manufacturer-managed maintenance program mitigates technology risk.
- Hydroelectric facilities generally experience very high levels of reliability with the lowest forced outage rates. This is attributable to a stable, proven technology that has been in use for decades, and the fact that there is no thermal component to the production process. If properly maintained, hydroelectric facilities also feature very long asset lives compared with all other generating assets.

SPONSOR STRENGTH

- While a project's rating typically incorporates no "lift" from the sponsor, it can have a downward impact if the sponsor's abilities disadvantage the development, construction or operation of the project.
- A sponsor with a long and established track record in managing project assets is considered positive, from a credit standpoint.
- A sponsor's expertise can provide comfort that a project with construction risk will be delivered on time and on budget, and that once in operation the facility will be operated and maintained to minimize outages and achieve its expected useful life.
- The equity percentage of total capital invested in the project reflects the level of its owners' commitment and is also a key project metric, especially for projects under construction or newly completed.
- Sponsor equity decreases loan-to-value and benefits bondholders. A higher level of equity contribution also motivates the sponsor.
- A sponsor with modest investment in a project may be more inclined toward higher-risk strategies or less motivated to resolve issues for projects that underperform.
- For a project under construction, if equity is to be contributed in stages during construction, certainty of equity contributions must be assessed. Subject to the project rating and credit quality of equity participants, a bank letter of credit or other third-party support may be required.
- For example, if the equity sponsor has a BBB rating and the project a rating of "A" (assuming equity contributions have been made), any phased equity contribution would hamper the project rating. In this case, some form of "A"-rated third-party support would be consistent with the project rating.

FINANCIAL RISK

Debt Service Coverage Ratio

- Recognizing that any analysis of financial metrics may be prone to misplaced precision, DBRS has limited key metrics to a small universe of critical ratios. DBRS provides a range within which the issuer's financial strength would be considered supportive for the same level of business risk. For example, a company where the outlook for both business risk and financial risk metrics falls within the BBB category would be expected (all else equal), to have an issuer rating in the BBB range.
- For most projects, financial performance is measured by the DSCR.
- Level and certainty of cash flow coverage is assessed.
- In calculating the DSCR, all fixed charges are considered, including subordinated debt (unless these obligations have explicit deferability clauses that extend beyond the maturity of the senior debt and/or subordination of payments and cure of default).
- The financial model generates pro forma forecasted DSCRs and, after commissioning, regular project reporting includes actual quarterly DSCRs compared with the originally projected levels.
- Stable DSCRs based on conservative contract strategies and terms are favourable for ratings.
- Fuel costs can be fixed or variable, operating costs are a relatively modest percentage of total costs, debt and other fixed obligations are known, and the revenue stream can be uncertain or variable.

Scenario Analysis

- The financial model captures the project's contracted economics in a base case that can be stress-tested under a range of appropriate sensitivity scenarios.
- Other financial and structural features included in the financial model are:
 - Use of fixed- or floating-rate debt.
 - Fully amortizing versus balloon/bullet repayment.
 - The existence of debt and/or maintenance reserve funds.
 - Levels of distribution tests.
 - Additional debt tests.
 - Security.
 - Sponsor change of control provisions.
- Downside scenarios include higher margin pressures, construction period cost overruns, operating period cost increases, lower operating availability and efficiency, and negative consequences of take-or-pay provisions. Any investment-grade rating assigned must bear reasonable worst-case scenarios.

Project Financial Metrics

Key Ratio	A	BBB	BB
DSCR	> 1.5x	1.6x to 1.3x	< 1.4x

- Identifying “typical” DSCR bands by rating category is difficult given the wide-ranging characteristics of projects.
- Overlapping ranges are therefore used to encompass the variance in underlying project characteristics.
- The table above provides an example DSCR for a “typical” natural gas-fired generation facility, and can be used to illustrate the wide range of rating outcomes for a particular type of project.
- For example, a 1.4 times (x) minimum/average DSCR for a natural gas-fired facility could result in:
 - A combined cycle power plant with a highly-rated toll counterparty having a rating in the low “A” area.
 - A combined cycle power plant with a traditional PPA with a highly-rated counterparty having a rating in the high BBB area.
 - A rating in the B range for a merchant gas peaker.
- Factoring in the other types of production (hydroelectric, coal, wind, solar, geothermal), as well as all of the other considerations described in this methodology, the range of assessed financial risk for any one DSCR level could be quite wide.
- It should be emphasized that qualitative factors affecting certainty of cash flows and related counterparty credit risk can have as much of an impact on a rating as absolute coverage ratios.
- For example, a “hell or high water” cash flow stream from a highly rated purchaser may achieve a higher rating than a project where coverage ratios are higher but cash flow is less stable.
- All else equal, higher coverage ratios support higher ratings. DBRS reviews forecast cash flow coverage ratios as well as forecast coverage ratios in stressed scenarios.
- The pattern of DSCRs over time can affect the rating, as lower coverage in early years may reduce credit quality or higher DSCRs in later years may be required where tail-end risks are significant.
- The debt-to-capital ratio is considered more relevant in a project under construction or newly completed.
- For existing hydroelectric power projects, non- or partially-amortizing debt is supported by the very long life of the assets. Given the existing operating history and audited financial reports, historical EBITDA-to-interest coverage is evaluated with a focus on trend and as a basis for future performance expectations.
- Where more than one class of debt resides at a project (i.e., senior and subordinate), the rating differential between the two is typically a matter of multiple notches. This differs from corporate analysis, wherein a one notch differential is generally observed.
- Typical ratios reviewed:
 - Debt service coverage ratio
 - EBITDA-to-interest
 - Cash flow-to-debt
 - (Cash flow minus capex)-to-debt
 - Debt-to-capital.

COUNTRY AND POLITICAL RISK

- The political, regulatory, legal and economic environment in which a project resides or engages in transactions could affect its performance and/or creditworthiness. The main country risk factors include:
 - Expropriation or “creeping” expropriation (arbitrary, unanticipated, uncontracted, adverse revenue-sharing by the host state including tax increases, import and export tariffs, licensing fees, local content and directed procurement rulings, and project-specific levies).
 - Currency conversion and transfer; both rules and regulation regarding the currency and economic environment that affects the exchange rate.

- The regulatory environment with respect to licenses, permits, and tariff or rate-setting, etc.
- The legal framework and environment such as contract enforcement, dispute resolution and other legal processes.
- War or civil unrest.
- A project's credit rating can be affected by the credit rating of the relevant country.
 - Where political insurance or structural features are used to mitigate the key country or political risk issues, careful review and assessment is part of the rating process to determine whether coverage is sufficient.
 - In cases of political risk insurance, the strength, track record and experience of the insurance provider(s) would also be reviewed.

Review and Requirements of Project Framework & Structure

In addition to a review and assessment of the various risks listed above, project finance analysis involves a detailed review of a number of project framework components, structural features and risk assessment tools.

SPECIAL PURPOSE ENTITIES

- Project finance issuers/borrowers are commonly structured as special purpose entities (SPEs). SPEs perform two risk reduction functions:
 - (i) They insulate the sponsor from project risk, and
 - (ii) They insulate the project bondholders from sponsor defaults and/or bankruptcy.
- The SPE may be a standalone entity or it may be a subsidiary of the sponsor. A subsidiary is more complicated and can be exposed to substantive consolidation in bankruptcy or being drawn into a bankruptcy filing of the sponsor. To insulate the SPE from the sponsor where the SPE is its subsidiary, a number of structuring features may be observed, including the following:
 - (1) The SPE should be restricted to engaging in activities permitted under the project agreements.
 - (2) There should be at least one independent director on the board, particularly where the sponsor has a substantially lower rating than the project (and the SPE is a corporation). Important decisions affecting the SPE should require the unanimous consent of the board. These decisions include:
 - (a) Any change in the articles or bylaws;
 - (b) Filing for bankruptcy and reorganization;
 - (c) Entering into any amalgamation, merger, consolidation or an agreement with respect to the sale, or other disposition, of the SPE's assets;
 - (d) The termination, amendment, waiver or replacement of project agreements; and
 - (e) Any change in the business activity or change in control of the SPE.
 - (3) The SPE should maintain an arm's-length relationship with the sponsor and affiliates of the sponsor. An exception to this may occur in cases where the sponsor is providing some limited recourse rights to the SPE.
 - (4) The SPE should not provide any guarantees, encumber or pledge its assets, or enter into any transaction, except in accordance with the project documents.

SECURITY PROVISIONS

- Security provisions are an essential feature of a project financing arrangement. Generally, bondholders will have a first-priority, perfected, senior security interest, mortgage, hypothec and/or other appropriate security over the assets of the SPE, including any cash flows and contractual rights of the SPE. On a default by the SPE, bondholders should be able to obtain control of the SPE's assets and should also have the right to take over any contractual rights and obligations of the SPE, including the assignment of cash flows.

REPRESENTATIONS AND COVENANTS

- Representations will be provided by the SPE. These can include representations concerning existence, authority to enter into essential contracts, no defaults under essential contracts, and compliance with laws, including any environmental requirements. Covenants could include limitation on asset dispositions, negative pledge, compliance with material contracts, limitation on additional debt, and limitation on distributions, reserve accounts and payment priority, in addition to timely and full payment to bondholders.

CREDITOR CURE OF CONTRACT DEFAULTS

- Project financing relies on contracts with the SPE. Lenders should be informed of any default by the SPE under its contract obligations, and creditors should have the ability to cure any default by the SPE, maintaining the contract through its term.

INSURANCE

- In general, DBRS would evaluate the amount of insurance coverage compared with:
 - i) The force majeure provision of the key contracts;
 - ii) The replacement cost of the project; and
 - iii) The extent of business interruption coverage.
- Bondholders should be an additional insured party. Bondholders should then have a choice of whether the notes are paid out or the plant/asset is rebuilt or replaced. If insurance premiums are not paid by the SPE, bondholders should be notified. No changes to the insurance coverage should be made without the consent of bondholders. Insurance coverage must be from an institution with a reasonable credit rating vis-à-vis the project debt rating (generally not significantly lower than the project debt rating) and may be evaluated by an independent insurance consultant for bondholders.
- The SPE should be required to provide annual insurance certificates proving continuing adequacy of coverage and compliance with project terms.

EXPERT REPORTS AND LEGAL OPINIONS

- In most project finance transactions, bondholders retain experts such as independent engineers, insurance consultants, environmental consultants and market consultants in order to aid in assessing the level of many of the types of risk mentioned above.
- Issues that require expert evaluation may include environmental assessments of potential liability (such as pre-existing conditions and the risk of lender's liability by virtue of its security interest), construction process, schedule, and costs, operating and maintenance costs, operating requirements of the off-take agreements, technical inputs and variables of the financial projection, asset quality and condition of existing projects, adequacy of the insurance package, and, for renewable generation, a resource study outlining the expected production levels.
- It is preferable that experts be engaged on behalf of investors to minimize the possibility and even the appearance of any potential conflict of interest.
- On the closing of the transaction, legal opinions should be obtained. As a general matter, the opinions will cover the creation of the SPE, the authorization of parties to enter into the various project agreements, the binding nature and validity of the project agreements on the parties, the creation and perfection of any investor security and, if applicable, a bankruptcy remoteness opinion.



Summary

- The limited-recourse or non-recourse basis of most project financings creates a fixed-income class with specific differences from corporate debt.
- Many projects are built on a greenfield basis, so everything about the project begins as a forecast based on related project contracts.
- The contracts establish equity contribution amounts and timing, construction costs and obligations, revenues, operating costs and debt financing.
- Close analysis of the financial model is required to confirm that it has fairly and accurately captured the contracted project economics and to assess the range of economic outcomes and debt service coverage against a host of reasonable downside scenarios.
- In summary, detailed analyses of structure, revenues and costs, the financial model, construction and operating period risk including problems posed by new technology, and legal risk are the primary determinants of a project finance debt issue rating.

Copyright © 2011, DBRS Limited, DBRS, Inc. and DBRS Ratings Limited (collectively, DBRS). All rights reserved. The information upon which DBRS ratings and reports are based is obtained by DBRS from sources DBRS believes to be accurate and reliable. DBRS does not audit the information it receives in connection with the rating process, and it does not and cannot independently verify that information in every instance. The extent of any factual investigation or independent verification depends on facts and circumstances. DBRS ratings, reports and any other information provided by DBRS are provided "as is" and without representation or warranty of any kind. DBRS hereby disclaims any representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability, fitness for any particular purpose or non-infringement of any of such information. In no event shall DBRS or its directors, officers, employees, independent contractors, agents and representatives (collectively, DBRS Representatives) be liable (1) for any inaccuracy, delay, loss of data, interruption in service, error or omission or for any damages resulting therefrom, or (2) for any direct, indirect, incidental, special, compensatory or consequential damages arising from any use of ratings and rating reports or arising from any error (negligent or otherwise) or other circumstance or contingency within or outside the control of DBRS or any DBRS Representative, in connection with or related to obtaining, collecting, compiling, analyzing, interpreting, communicating, publishing or delivering any such information. Ratings and other opinions issued by DBRS are, and must be construed solely as, statements of opinion and not statements of fact as to credit worthiness or recommendations to purchase, sell or hold any securities. A report providing a DBRS rating is neither a prospectus nor a substitute for the information assembled, verified and presented to investors by the issuer and its agents in connection with the sale of the securities. DBRS receives compensation for its rating activities from issuers, insurers, guarantors and/or underwriters of debt securities for assigning ratings and from subscribers to its website. DBRS is not responsible for the content or operation of third party websites accessed through hypertext or other computer links and DBRS shall have no liability to any person or entity for the use of such third party websites. This publication may not be reproduced, retransmitted or distributed in any form without the prior written consent of DBRS. ALL DBRS RATINGS ARE SUBJECT TO DISCLAIMERS AND CERTAIN LIMITATIONS. PLEASE READ THESE DISCLAIMERS AND LIMITATIONS AT <http://www.dbrs.com/about/disclaimer>. ADDITIONAL INFORMATION REGARDING DBRS RATINGS, INCLUDING DEFINITIONS, POLICIES AND METHODOLOGIES, ARE AVAILABLE ON <http://www.dbrs.com>.



Insight beyond the rating.

www.dbrs.com

Corporate Headquarters

DBRS Tower
181 University Avenue
Suite 700
Toronto, ON M5H 3M7
TEL +1 416 593 5577