

Euler Hermes Rating GmbH

**Project Rating
Methodology (General)**

7 April 2017

formally amended on 14 November 2017



Contents

Introduction	2
Project risk	2
Competitiveness	3
Profitability	3
Cash flow stability	4
Event risks	5
Weighting	5
Financial risk	6
Debt service coverage	6
Stress scenario analysis	7
Weighting	7
Anchor rating	8
Weighting the risk profiles	8
EHR rating matrix	8
Standalone rating	9
Operational risks	9
Modification 1	9
Project rating	10
Public sector	10
Modification 2	10
Appendices	
Appendix 1	Derivation of project rating
Appendix 1	Definition of financial ratios

Introduction

This methodology was introduced in April 2017 and was formally amended on 14 November 2017.

The rating categories, which are no longer contained in this rating methodology from 14 November 2017 on are included and explained in more detail in the Basic Principles for Assigning Credit Ratings and Other Services.

Transparent presentation of rating methodology; no impact on existing rating notations

This general methodology for project ratings (general project rating methodology) replaces and supersedes the project rating methodology from March 2012. Its main purpose is to more transparently describe how Euler Hermes Rating GmbH (EHR) arrives at its project ratings so that clients, investors and interested third parties can better understand which rating criteria are relevant and how they are combined into a final rating notation. The revised methodology does not change any rating criteria, weightings or assessment standards. Applying this methodology will not change rating notations.

Typical projects include utilities, logistics and infrastructure

This project rating methodology supplements the Basic Principles For Assigning Credit Ratings and Other Services, which are available on our website. The project rating methodology generally addresses all special purpose vehicles that use (debt) financed assets for a specific purpose and, in many cases, for a limited period of time and are not covered by a more specific rating methodology. Typical projects include utilities, logistics and infrastructure. Issue ratings of financial instruments are also covered by the issue rating methodology, which is also available on our website. The project rating methodology does not apply to the rating process for structured finance that is backed by an asset pool.

Case-by-case assessments are an integral part of the methodology

As with all of its rating methodologies, Euler Hermes Rating GmbH views the methodological principles set out below as guidelines for the rating process. However, each rating decision is ultimately made at the Rating Committee's discretion. A rating expresses the opinion of analysts and the rating agency, and so the rating methodology must include case-by-case evaluations and assessments. It must also accommodate different financing and organisational structures in these case-by-case assessments. The methodology thus provides a framework for the analysis and undergoes constant refinement.

Weighting of project risks and financial risks

The project rating methodology is organized into two major risk categories: project risk and financial risk. The following sections break down these categories as objects of analysis and explain the individual rating drivers. They also describe how these drivers are weighted and combined into a final rating notation, after factoring in rating modifications for project-specific operational risks and external factors. Appendix 1 lists all the rating drivers and shows how project ratings are derived.

Project risk

Internal and external market assessments as starting points for risk analysis

The analysis of project risk emanating from the market and competitive environment starts with information provided by the issuer as well as internal and external market analyses. External information primarily consists of industry analyses, supplementary information or expert reports and information material supplied by economic institutes and trade associations. Analysts gather information on cash flow quality from project finance documentation, contracts and discussions with management.

Analysis of profitability and general market and competition conditions

The project's competitiveness and profitability provide important initial indications of its long-term ability to service its debt (interest and principal payments for project financing). EHR's analysis focuses on general market and competitive conditions that could affect the future course of the project.

Competitiveness

Analysis of competitive intensity and competitive position

The competitiveness analysis first determines the current and future intensity of competition faced by products and services generated by the project. Next, it evaluates the project's current and future competitive position, particularly with regard to cost structure, geographical location and technical innovativeness. The project's competitiveness is determined by the results of the analysis of competitive intensity and competitive position.

Competitiveness	Assessment parameters
<ul style="list-style-type: none"> Competitive intensity Competitive position 	<ul style="list-style-type: none"> How fierce is the competition faced by products and services generated by the project or by final products derived from them? Competitiveness of the products and services generated by the project or the final products that can be derived from them, particularly with respect to cost structure, geographical location and technical innovativeness

Profitability

Analysis of structural demand drivers for products and services generated by the project

The profitability analysis assesses the structural demand drivers for the products and services generated by the projects or the final products that can be derived from them. It also looks at contract structures and evaluates whether they fairly balance the interests of all the key contracting parties.

Profitability	Assessment parameters
<ul style="list-style-type: none"> Structural demand Contract structures 	<ul style="list-style-type: none"> Is there structural demand for the products and services generated by the project or the final products derived from them? Are the contracts structured in a reasonable manner, particularly with regard to balancing the economic interests (prices, rights, obligations) of all the key contracting parties?

Analysis of existing contracts and other agreements

These rating drivers play a particularly important role in projects with high price and demand risks. This does not mean, however, that analysts can ignore these aspects for a project that has off-take agreements for its products and services. They should validate this kind of project's long-term competitiveness and profitability as well. It is EHR's opinion that economic attractiveness determines the reliability of an off-take agreement. The less profitable the project, the greater the likelihood that off-take agreements will be terminated or renegotiated.

Analysis of general legal and contractual conditions as well as technical and operating factors

The profitability assessment is partly based on existing off-take agreements. However, contracts regarding the purchase of materials and supplies, operations and maintenance, hedging and other services should also be examined for their long-term competitiveness and profitability.

Cash flow stability

Analysis of sensitivity to price and demand volatility and possible imbalances in cost structures

Cash flow stability is assessed by analysing and evaluating the general legal and contractual conditions and the technical and operational risk factors during the project period. Particular attention is paid to the issuer's ability to control project cash flows and the quality of the existing contract structures. Event risks are identified in a distinct step of the analysis (cf. "Event risks") and appraised separately. The assessment of cash flow stability is the most important element in evaluating the ability of a SPV to service its project debt.

Sustainability of project cash flows

Contractual and structural weaknesses and maturity mismatching can cause unstable project cash flows

EHR assesses the sustainability and forecast quality of project cash flows based on basic legal, regulatory and contractual data during the financing period. In particular, it analyses the sensitivity of these cash flows to price and demand volatility (price and quantity risks) and expense volatility (cost risks), frequently relying on external expert reports for this purpose (e.g. yield assessment studies, legal opinions, market price forecasts). EHR also evaluates the certainty of project revenues and expenses, paying close attention to possible mismatches between costs and revenues attributable to contractual or structural weaknesses or maturity mismatching, for example.

Analysis of risk from Business interruptions

Contractual weaknesses are deemed to exist when the project contracts impose fixed delivery obligations despite the presence of risks in material or equipment availability. Structural weaknesses, by contrast, occur when the SPV is exposed to external price and availability risks, but has fixed delivery obligations. Currency risks can also play an important role in this context (transaction risks). Maturity mismatching includes cases in which investment costs can only be repaid from revenues after a time lag (e.g. in regulated markets).

Technical and operational risks

Analysis of technological components and project partner quality

Technical or operational risks can cause downtime or business interruptions at the cash generating unit (CGU) and thereby significantly weaken the project. This can lead to lost revenue, higher expenses, higher investment costs and/or contract penalties under off-take agreements, particularly if the project is not very diversified.

Technical and operational risks include risks specific to project and design characteristics. EHR evaluates factors such as technical design, technological components and processes, and project partner quality (e.g. experience and commitment of sponsors and external service providers). Risk is reduced by using sufficiently proven technologies and processes (e.g. based on past experience), mature production processes and sufficiently experienced operators. For example, product and performance guarantees, which are often furnished by manufacturers of wind farm or photovoltaic equipment, can be positive for ratings since core system components often represent a large proportion of project costs and have a significant impact on project revenues.

Technical risks	Operational risks
<ul style="list-style-type: none"> Past experience, track record Complexity, including high availability requirements and high quality standards for materials and supplies Maintenance costs 	<ul style="list-style-type: none"> Experience / quality of project operator Commitment of sponsors

Event risks

Event risks represent considerable risks for project financing

Unforeseen events can cause revenues and expenses to vary considerably from their planned levels. It may not be possible to compensate for the variance completely or at all, depending on the project type and structure. In the worst case scenario, unforeseen events may trigger a complete default.

Event risks	Assessment parameters
<ul style="list-style-type: none"> Changes in regulatory environment, tax law and legislation Force majeure events Interruptions in the delivery of materials and supplies Disruptions in the sales market and the infrastructure Damage or destruction of project assets Interruptions in insurance coverage 	<ul style="list-style-type: none"> Number of possible event risks Probability of event risks occurring Value at risk of event risks

Weighting

Analyst-based weighting of sub-factors

To assess project risk, an EHR analyst assigns weights to four sub-factors: competitiveness, profitability, cash flow stability and event risks. The weighting reflects the analyst's assessment of which factors will have the biggest impact on the project's future performance. Once these sub-factors have been weighted, project risk is assigned to one of five categories:



Financial risk

Analysis of the financial model and historical data

The financial analysis evaluates the financial model developed by the project sponsors for the entire project lifecycle (including construction period, operating period and removal period, if applicable). If a project history is available, it will be assessed largely on the basis of annual, quarterly or monthly reports. Financial flexibility is estimated by analysing future free cash flow and available liquidity (including reserve accounts for debt service and major maintenance).

Critical assessment of model parameters and stress scenario analysis of the financial model

Analysts check the financial model provided by the project sponsors for plausibility and analyse it with regard to debt service coverage and financing structure. Financial ratios are calculated based on this information and assessed using EHR's internal ratio system. In addition, the project sponsors provide detailed information on the financial model and its underlying assumptions. All significant model parameters are scrutinized; the impact of various stress scenarios or simulations on debt service coverage is examined closely. During this process, analysts verify that the stress scenarios and probability distribution of simulated parameters meet EHR's minimum requirements for relevant financial ratios.

Debt service coverage

DSCR as a function of project risk and cash reserves

When assessing project cash flow, analysts consider its ability to cover debt service for all interest and principal payments. One key metric is the debt service coverage ratio (DSCR). The stability of this ratio and its minimum and average requirements can go up or down depending on project risk (cf. "Project risk"). Debt service coverage calculations do not consider cash from the debt service or major maintenance reserve accounts. These accounts must meet minimum requirements that are specific to each project (e.g. 6 months of debt service or 6 months of the maintenance budget). Arrangements that exceed or fall short of this standard may decrease or increase DSCR requirements.

Assessment of equity ratio, debt and repayment structure

Another key aspect of the financial analysis is an assessment of the financing structure. This assessment focuses on the ratio between debt and project sponsors' equity as well as the planned repayment structure. Project finance often relies on the cash flows generated by temporary concessions, rights or licenses (e.g. project rights or regulated prices) and makes uncertain assumptions regarding the periods after these rights expire. Complete repayment of project finance during regulated (subsidy) periods will result in lower DSCR requirements than partial repayment.

Assessment of Refinancing risks

In case of partial repayment, EHR also assesses the probability of successful refinancing. In this assessment, assumptions must be made about the project's net present value at the time of refinancing. Successful refinancing depends on factors such as market trends, technical innovativeness, hidden reserves, the amount of outstanding debt and the continued availability of project rights, concessions and licenses. EHR assesses the probability of successful refinancing using tools such as cash flow models or investment multiples (e.g. EBITDA multiples).

Key financial ratios for assessing debt service coverage:

Ratio	Parameter
<ul style="list-style-type: none"> Debt service coverage ratio (DSCR) 	<ul style="list-style-type: none"> CFADS / (interest + principal)
<ul style="list-style-type: none"> Cash flow coverage 	<ul style="list-style-type: none"> FFO / total debt
<ul style="list-style-type: none"> Loan life coverage ratio (LLCR) 	<ul style="list-style-type: none"> NPV of future cash flows / outstanding debt

Stress scenario analysis

Close scrutiny of main model parameters and derivation of stress scenarios

An extensive analysis of the base scenario closely scrutinizes all the main model parameters and examines the stress scenarios derived from these parameters to determine their impact on debt service coverage. These scenarios simulate variances in key income and expense categories. The variance analysis may simulate scenarios such as diverging price and quantity trends. The primary purpose of the analysis is to measure and assess the sensitivity of project cash flows to various factors, particularly event risks, technical risks and operational risks (cf. "Project risk").

Insight into the sustainability and stability of debt service coverage

In the renewable energy market, the variance analysis may simulate maintenance expenses and energy production, among other things. EHR's assessment is generally based on conservative scenarios with correspondingly high likelihoods of occurrence. The minimum required likelihood of occurrence may vary depending on the calculated project risk, simulation parameters and project diversification. Concrete break-even values (DSCR=1.0) are calculated for selected variables as well. Scenario analysis findings provide valuable insights into the stability and sustainability of debt service coverage during the project period.

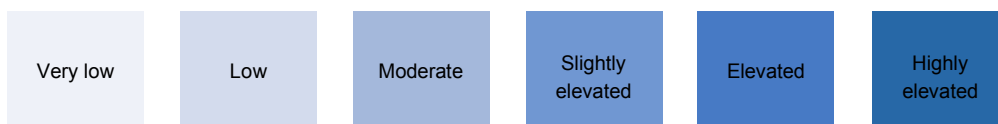
Key stress scenario analysis tools are:

Tools
<ul style="list-style-type: none">▪ Market price scenarios, inflation, interest rates (e.g. Pöyry/ISH/CERA scenarios)▪ Demand scenarios▪ Probability distributions/Monte Carlo simulation▪ Break-even analysis (goal seek value: DSCR=1.0)▪ Event risks and likelihoods of occurrence▪ Combination of various stress scenarios

Weighting

Coverage ratios given the highest weighting

Financial risk is assessed based largely on the findings from the scenario analysis. The impacts on coverage ratios are given the highest weighting. Financial risk is classified into one of six categories:



Anchor rating

Weighting the risk profiles

The estimated project and financial risk is used to calculate the project's anchor rating. The anchor rating combines the project and financial risk to form a (sub-)rating. It does not consider possible operational risks or external factors associated with public sector involvement.

EHR rating matrix

Asymmetrical weighting of project and financial risk

The anchor rating is a function of the categories previously assigned to the two risk profiles. The assigned financial risk category plays an outsized role in risk profile weighting. If the project has an elevated financial risk, the financial risk profile will tend to dominate the anchor rating. If the financial risk is low, the project risk will gain significance. The weighting, in other words, is asymmetrical. That means that a project must have a strong financial risk profile in order to obtain an investment grade anchor rating. An elevated financial risk, on the other hand, generally produces an anchor rating that is below-average or even well below-average.

Project and financial risk profiles are weighted in the EHR rating matrix, which combines the two risk profile categories into a single anchor rating:

Project risk	Financial risk					
	Very low	Low	Moderate	Slightly elevated	Elevated	Highly elevated
Very low	AAA / AA+	AA	A-	BBB-	BB-	B-
Low	AA	A+	BBB+	BB+	B+	CCC
Moderate	AA-	A	BBB	BB	B	CCC-
Slightly elevated	A	BBB+	BB+	BB-	B-	CC
Highly elevated	BBB	BB+	BB-	B	CCC+	C

The matrix provides guidance for analysts. However, analysts may elect to depart from this procedure in specific, justified cases.

Standalone rating

Operational risks

Operational risks are identified and assessed separately from project and financial risks. They primarily relate to structures and processes that are specific to the project.



Assessment of project planning, construction and marketing risks

The presence of typical project planning, construction and marketing risks often results in a negative modification of the anchor rating. However, the modification may be reversed once the project has been completed on schedule and successfully started up. During the assessment, analysts pay close attention to measures taken to limit typical risks posed by construction cost overruns, delays, start-up problems and liquidity shortages during the construction period.

Assessment of the relationships between all project stakeholders

The company's management is assessed based on factors such as external stakeholders' qualifications and dependence on specific individuals. If necessary, corporate governance policies are critically assessed as well, concentrating on interest, oversight and incentive structures and the ability of external stakeholders to gain reliable information about the project's situation and progress. The analysis of the company's organisation focuses on transparency, efficiency, sustainability and manageability. Planning and management tools, for their part, are assessed for their ability – along with the risk management system – to give the project team a sound basis for making project management decisions.

Analysis of the value creation process and legal risks

The business process analysis looks at the efficiency and flexibility of the project's value creation processes. Next, counterparty risks for key service providers and other transaction risks are evaluated against the project's specific structure (based on legal and tax opinions, etc.). The assessment of legal risks mainly considers risks from ongoing litigation or legal disputes.

Modification 1

Standalone rating as a modification of the anchor rating

Regarding the assessment of operational risks and the possible modification of the anchor rating, EHR initially assumes that the project stakeholders have all their internal structures and processes under control. For that reason, modifications generally have a negative effect. The extent of the modification is determined by analysts on a case-by-case basis and can result in a significant (negative) adjustment to the rating. In specific, justified cases, the modification may also result in a slight improvement in the standalone rating.

The result of Modification 1 is the standalone rating, which provides an opinion about the project's independent rating.

Project rating

Public sector

The creditworthiness of the project being rated may be affected by a public sector background.

Public sector impact

If public sector entities hold qualified voting or control rights or make up the majority of the project's sponsors, analysts will conduct a review to determine whether the facts justify a rating modification. A distinction is made between direct / de jure control and indirect / de facto influence due to the project's significance. If de facto influence is found to exist, various criteria are evaluated to determine the probability and possibility of the public sector intervening temporarily if necessary.

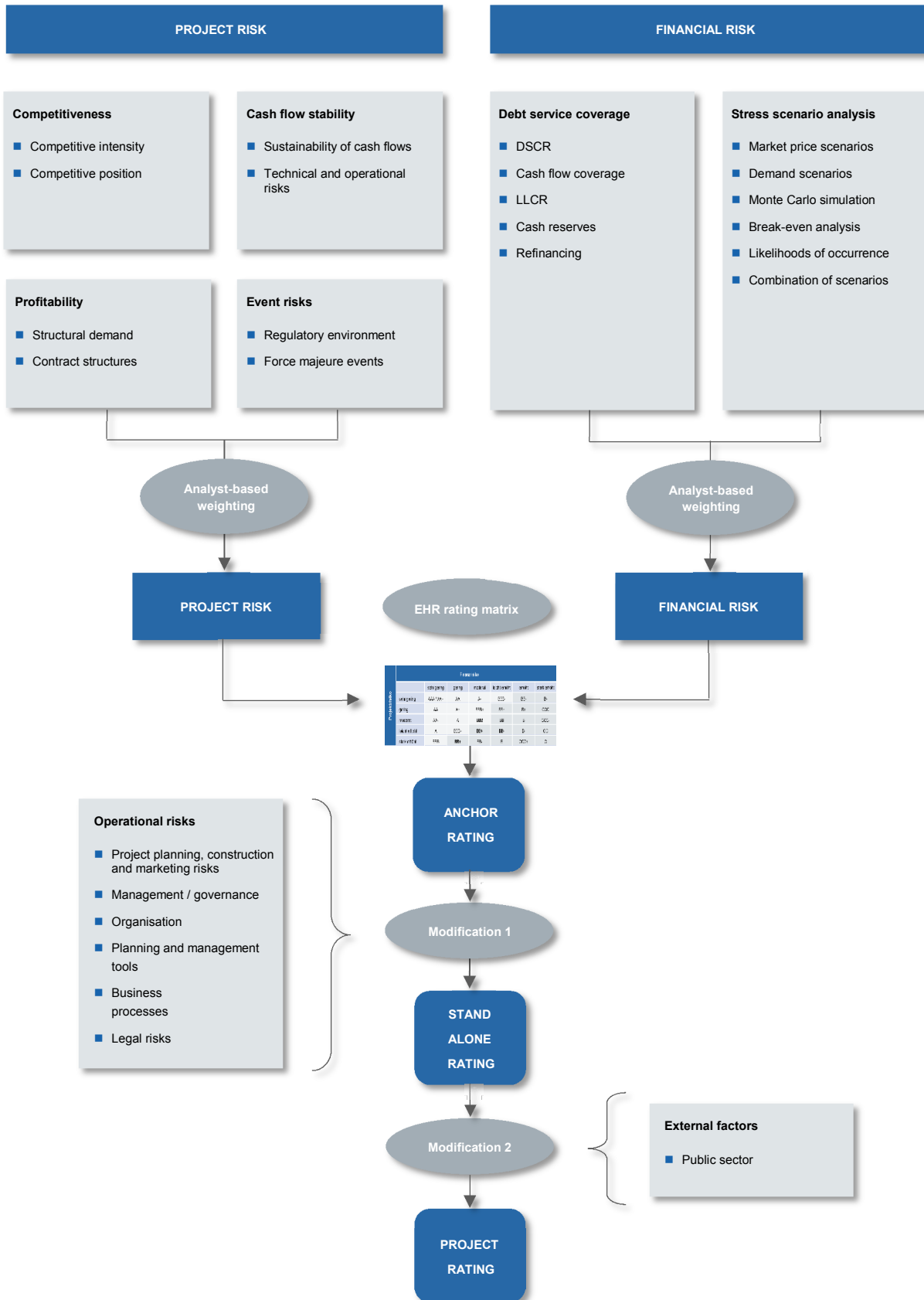
Modification 2

Project rating as the result of modifying the standalone rating

The standalone rating is modified after possible external factors associated with public sector involvement have been evaluated. The modification can be positive or negative depending on the specific facts of the situation, including the public sector rating. The extent of the modification is generally determined by analysts on a case-by-case basis.

The result of Modification 2 is the project rating, which provides an opinion about the creditworthiness of the project and/or the special purpose vehicle for the project.

Appendix 1: Derivation of project rating



Appendix 2: Definition of financial ratios

Debt service coverage ratio (DSCR)

DSCR
Numerator
Cash flow available for debt service (CFADS): cash flow from current project activities - significant maintenance expenses
Denominator
Debt service: interest and principal payments

Annual debt service coverage ratio (ADSCR)

ADSCR
Numerator
Annual cash flow available for debt service (ADSCR): cash flow from current project activities (p. a.) - significant maintenance expenses (p. a.)
Denominator
Debt service (p. a.)

Loan life coverage ratio (LLCR)

LLCR
Numerator
Net present value of future cash flow available for debt service
Denominator
Outstanding debt

FFO / total debt
Numerator
Funds from operations (FFO): CFADS - interest expenses
Denominator
Outstanding debt + leasing liabilities

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