EthiFinance Ratings

Project Finance Methodology

1. Executive Summary

This methodology details the process by which EthiFinance Ratings assigns credit ratings to project finance transactions (PF). It captures both financial and extra-financial risks that qualify a project's credit quality defined as the issuer´s ability and willingness to honor its financial commitments fully and in a timely fashion.

Rating PFs that are in the Construction Phase (PFC). When a PF is in the construction phase, the methodological process involves a double assessment. First, the project will be rated following the framework applied to PFCs as described in Chapter 3 and illustrated in Table 2. This assessment will arrive at a Rating for PFs that are under Construction (RPFC). Secondly, the project will be rated following the framework applied to PFs that are in the Operational phase (PFO) as described in Chapter 4 and illustrated in Table 9. This assessment will arrive at a rating for PFs that are in their operational phase (RPFO). The final Rating of the PF (final RPF) will be the lower between the RPFC and the RPFO (see Table 1).

The RPFC captures all the risk factors to which a PF is exposed during its construction and is assessed using an expert-based scorecard (See Table 8) which considers the technical and execution risks, the contractual and parties involved risks and the sufficiency of the sources of funds to cover the completion of a PF. This assessment will lead to the preliminary RPFC which may be adjusted for potential counterparty risks.

Rating PFs that are in the Operational Phase (PFO). When a PF is operational, there is no construction risk so the project will be rated using the framework applied to PFOs.

The RPFO captures all the risk factors to which a PF is exposed during its operational phase and is assessed using an expert-based scorecard (See Table 11) to determine the business profile of the PF which is then combined through a double-entry table (See Table 10) with the minimum Debt Service Cover Ratio (DSCR) of the base case model. This combination results in the preliminary RPFO which may be adjusted using 7 modifiers (See Table 9) that are risk factors not captured in the scorecard.

Table 1 – EthiFinance PF Rating Methodology

Project's Environmental & Societal (E&S) considerations in rating PFOs. When including extra-financial factors, EthiFinance uses a double materiality approach in line with the EU definition. This means that we consider how environmental and societal issues affect a project and how projects in turn impact their environment and their community, both having an effect on the credit standing of a project. Therefore, E&S risk factors are incorporated into the rating process at different stages of the credit analysis as follows:

- The E&S profile is one of the credit factors within the PFO scorecard (See Table 11) with a weight of 10% and is based on its degree of alignment with the Equator Principles determined by analyzing the project's E&S due diligence documents. This analysis measures the impact that a project has on E&S issues (non-financial materiality).

- Additionally, using a wide data base and propriety models, EthiFinance assesses to what degree a project is exposed to physical risks originated by natural or climatic phenomena. If the impact is assessed as significant it may negatively affect the rating of a PF either in its construction or operational phase (See Tables 2 and 9). The integration of these physical risks into EthiFinance's credit ratings has been done following the analytical framework proposed by the European Central Bank which offers guidelines on how CRAs may incorporate climate change risk in their ratings in a systematic and consistent way[1]. The framework is based on 11 criteria classified into 5 disclosure areas (See Appendix A). Following this framework allows users of credit ratings to fully understand the impact of climate change risk on the creditworthiness assessment of the project finance. In conclusion, this analysis measures how the environment can financially impact a project (financial materiality).

- Finally, EthiFinance assesses the E&S double materiality of a Project based on the type of assets it operates. To do this, we classify different asset classes according to their impact on E&S and how E&S may impact them. PFs Projects with low E&S risks, will have their Operational & Performance risk factor upgraded by a notch while projects with high E&S risks will have this risk factor downgraded by 1 notch.

[1] European Central Bank (2022). "Disclosure of climate change risk in credit ratings". Occasional Paper Series.

2. Scope of Rated Universe

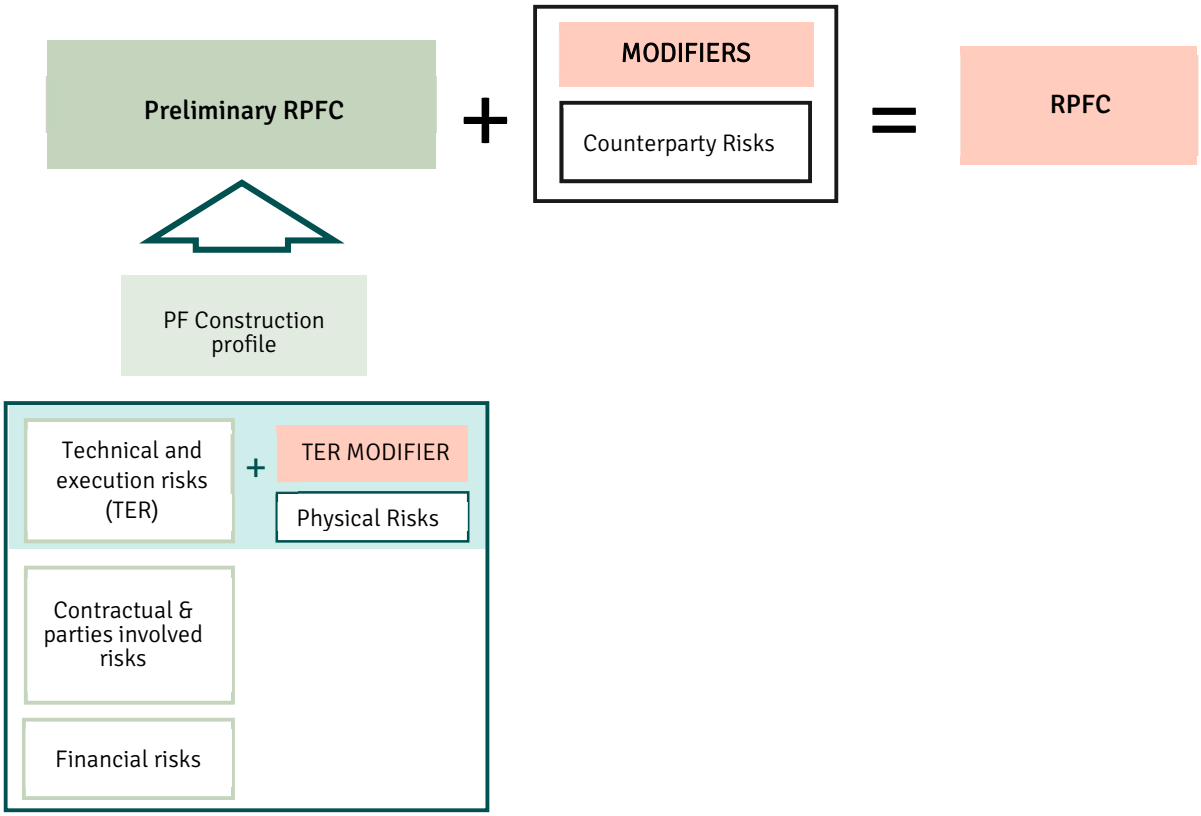
This methodology applies to Project Finance transactions whose main characteristics are:

- The existence of a ringfenced Special Purpose Vehicle (SPV) that holds one or several projects.
- Lenders have a pledge on the SPV's shares and a security on the project's assets, its money accounts, and its contractual payment rights (for example access to insurance payments).
- Existence of covenants that protect the interests of lenders during the life of the financing imposing obligations on the project sponsors to act or to abstain from acting under certain situations. These covenants aim at preserving cash within the structure and tend to discipline the financial behaviour of the project's sponsors. DSCR that reach certain thresholds allow lenders to pre-emptively declare a project in default or may lead to a dividend lock-up. Lenders also have step-in rights when a project is in breach of certain obligations that allow them to take control of the main contracts governing the project.
- In most cases, a Project finance transaction has limited or no recourse to its sponsor and at the same time the project is protected from possible claims from the sponsor's lenders. Therefore, PF lenders rely solely on the project's cash flows for debt repayment. Consequently, assets that can be financed through project financing will typically have stable and predictable cash flows governed by regulation, public concession contracts, or other agreements with private parties.
- The project SPV usually is limited to a predetermined asset or group of assets and a final date of expiry. The different risks of a project are usually assigned by contract to the different participants involved (construction company, Operation and Maintenance (O&M) providers, Banks, etc).

3. Rating Framework for PFs in their Construction Phase

EthiFinance Ratings uses a common framework to analyze the creditworthiness of a PFC (See Table 2). To determine the preliminary RPFC, EthiFinance uses a scorecard system (See Table 8) in which a score of between [1 and 8[is given to each of the analytical factors and subfactors that are involved in determining the preliminary RPFC, where 1 is the best valuation and 7.99 is the worst in terms of credit quality (a score of 1 is equated to a AAA and a score of 7.99 to a CCC-). In this stage, the technical and execution risk factor may be adjusted for the existence of material physical risks not covered by the project's insurance. The preliminary RPFC may then be adjusted if a material counterparty risk exists (See Section 5.1) resulting in the final RPFC.

Table 2 – EthiFinance Rating PFs in their Construction Phase (RPFC)



The PF's **Construction profile** is assessed using the following analytical factors and subfactors:

- **Technical and execution risks**: Assesses the technical and execution risks which are at the core of a project, taking into consideration the complexities of constructing the asset and the construction challenges posed by the site where the project is located. In addition to the complexity of the project, we assess the construction program and the progress of the project to determine if the project will be completed within the contractual deadline. This analytical factor may be adjusted if any physical risks are identified provided that they are material.
  - **Complexity of the work.**
  - **Assessment of the construction program and progress.**

- **Risks stemming from the Contracts and the parties involved:** Assesses the contractual and counterparty risks which relate to the type of contracts entered between the project and the parties involved. It assesses the split and allocation of the risks in the construction phase amongst the parties involved (construction contractors, insurance companies, financing providers, sponsors, etc.), and to what extent the contracts that define the obligations and guarantees pledged by all parties ensure the correct fulfilment of their obligations. Another important point is the degree of expertise of the contractors or other parties involved that will ensure a smooth delivery of their contractual obligations.
    - **Contractual and legal framework.**
    - **Profile of the parties involved.**

- **Financial risks**: Assesses the project's ability to mobilize the funding needed to complete the project, the potential for cost overruns, and to what degree the funding sources comfortably cover funds required to execute the project.
    - **Sources.**
    - **Uses.**

3.1. Technical and execution risks: analyzed through the following sub-factors

- **Complexity of the work:** The nature of the project and where it is located are the predominant drivers of the complexity of construction of a project. Generally, the higher the technical complexity of the project and the longer the construction period, the higher the related construction risks. The technical complexity is linked to the size and range of technologies involved in building the project. It also depends on whether a successful track record exists in the execution of similar constructions or by contrast the experience is limited. Lastly, the complexity of the work is also influenced by the characteristics of the localization which includes its topographical and geological conditions, existence of archeological remains, ease of access to the site, etc. These characteristics may increase the complexity of the construction.

Table 3 – Work complexity risks

Score	Description
[1 – 3[	Examples of projects with low to moderate construction risks include: low-rise office buildings, schools, and PV parks. More complex projects that would score at the riskier end of the range include hospitals, onshore wind farms, roads that do not require complex bridges or tunnels, and high-rise buildings.
[3 – 5[	Examples of projects with medium construction risks include, among others: roads with bridges and tunnels of certain complexity, geothermal, waste-to-energy and cogeneration plants. More complex projects that would score at the riskier end of the range include offshore wind farms and LNG regasification plants.
[5 – 7[	Examples of projects with high construction risks include, among others: LNG liquefaction plants, complex bridges or tunnels and large thermal or hydroelectrical plants. Also included are more complex projects such as oil refineries.
[7 – 8[	Example of projects with very high construction risks include, among others: complex chemical processing plants that handle toxic products, nuclear power plants and large-scale mining projects.

Notwithstanding the above guidance, to complement the assessment of the complexity of the construction work, the analyst will analyze the available technical due diligence reports.

- **Construction program and progress**

  This factor assesses the quality of the construction program based on the documentation of the project. The construction program should incorporate technical or reglementary milestones with a detailed planning of all the construction phases and which fully addresses all aspects of its complexity (technical, geographic, reglementary).

  The progress in the project's construction is measured using the percentage of the construction program that has been satisfactorily met. It also includes the identification of the more critical milestones that can indicate the degree of compliance with the construction schedule. For example, a highly complex project that has obtained a compliance certificate for passing a critical technical milestone will reduce its construction risk. Generally speaking, the assessment of the construction phase will evolve with time, decreasing as the project reaches its later phases. In any case, our analysis will heavily rely on the technical reports issued by independent consultants that have been contracted to monitor the construction process.

- **Technical and Execution risk scores adjusted for Physical risks**

  Although projects will be mainly exposed to chronic and acute physical risks during the operational phase given their typically long lifespan, acute risks such as natural disasters or extreme weather conditions can also affect the construction phase. These types of potential events have a direct impact on the Technical and Execution risk factor and therefore, EthiFinance will adjust the score of this factor down by one notch and in some cases may consider further downward adjustments provided that the risk can be determined to be material and imminent.
  The way in which EthiFinance takes these risks into account is described in section 4.3.2 of this document.

3.2. Contractual risks & expertise of parties involved: analyzed using the following sub-factors

- **Contractual and legal framework** The PF contracts drive the allocation of the risks between the different actors of the project as well as the remedies if one or several actors fail to deliver on the project. The legal framework is largely driven by the country of the project and how contracts can be expected to be enforced. EthiFinance will assess the attributes of the different contracts and the risks allocation mechanisms.

Table 4 – Contractual and legal risks

Score	Description
[1 – 3[	Examples of projects with low risks in this factor include: those that have turnkey contracts with a fixed-price and a fixed date, located in an OECD country, and with a strong bonus/penalty regime to incentivize the completion of the works in time and quality.
[3 – 5[	Examples of projects with medium risks in this factor include: contracts which are not turnkey with a fixed-price and a fixed date but that allow some deviations, usually located in an OECD country, and with a good bonus/penalty regime to incentivize the completion of the works in time and quality.
[5 – 7[	Examples of projects with high risks in this factor include: the absence of a general contractor, contracts based on a cost-plus basis and where the constructor has a limited responsibility if the delivery date is not met. Also, the bonus/penalty regime to incentivize the completion of the works in time and quality is limited.
[7 – 8[	Example of projects with very high risks in this factor include among others: contracts based on a cost-plus basis open to cost overruns and to late project delivery with no responsibility undertaken by the contractor and a poor or non-existing bonus/penalty regime to incentivize the completion of the works in time and quality.

- **Profile of the parties involved** is an assessment of the ability of the parties to meet their commitments or obligations regarding the construction work. The analysis focuses on identifying the materiality of the party in the overall construction program in order to assess if its replacement can be manageable in case the party abandons the project. Each stakeholder will be analyzed individually but scored in this factor in aggregate. It is worth noting that this subfactor concentrates on the expertise and track record of the parties and not on their credit standing which is analyzed in the counterparty section.

Table 5 – Assessing risk profile of parties involved

Score	Description
[1 – 3[	Examples of stakeholders with low risks in this factor include: highly regarded contractors with a strong track record and a good reputation that have successfully completed similar projects in similar locations. These types of stakeholders display a strong risk management and quality culture.
[3 – 5[	Examples of stakeholders with a medium risk in this factor include: contractors that have a reasonable reputation and an adequate track record in similar projects in similar locations. These types of stakeholders display a good risk management and quality culture.
[5 – 7[	Examples of stakeholders with high risks in this factor include: contractors that have a limited track record in similar projects in similar locations. These stakeholders display a limited risk management and quality culture in facing potential challenges during construction.
[7 – 8[	Example of projects with very high risks in this factor include among others: contractors that hardly have a reputation to uphold nor a track record in similar projects nor in similar locations. These stakeholders display a poor risk management and quality culture in facing potential challenges during construction.

3.3. Financial risks

Financial risks of a PFC are mainly concerned with the risk of a project running out of funds before completion.

By definition, all rateable projects are fully funded at the beginning of the construction period. Therefore, financial risks start to appear during the construction period caused by unexpected cost overruns, damages suffered by the project or even project abandonment by the contractor. Consequently, a project may, at some point, face a shortage of funds that could imperil its completion. To assess the risk of a project running out of funds before completion, EthiFinance first analyzes the risk of the appearance of unexpected increases in funding needs and then assesses how this risk can be offset by extra funding sources provided by the different PF contracts involved.

- **Funding needs** During the construction of a project, unexpected costs can arise that, when material, can lead a PF to a shortage of funds which may jeopardize its completion. These unexpected costs include potential cost overruns, damage costs and in extreme cases, costs of replacing the contractor. In Table 6 we provide guidance of factors that determine whether the risks of cost overruns are material.

Table 6 – Financial risks of a PFC

Score	Description
[1 – 3[	Risk of construction cost overruns are low because the construction process is simple and the completion period is short (6 to 12 months). Potential damages and their costs are limited because of the characteristics of the building site and the materials and equipment used during the construction. Low costs of replacing the contractor as the project is simple to execute and there are many contractors available.
[3 – 5[	Risk of cost overruns is medium because the construction process is somewhat complex and the completion period is moderately long (12 to 24 months). Potential damages and their costs are medium because of the characteristics of the building site and the materials and equipment used during the construction. Medium costs of replacing the contractor as the project is somewhat complex and there are eligible contractors but fewer than in the previous category.
[5 – 7[	Risk of cost overruns are high because the construction process is complex and the completion period is long (24 to 48 months). Potential damages and their costs can be high because of the characteristics of the building site and the materials and equipment used during the construction. Replacing the contractor is costly as the project is complex and there are few eligible contractors.
[7 – 8[	Risk of cost overruns is very high because the construction process is complex and the completion period is very long (more than 48 months). Potential damages and their costs can be very high because of the characteristics of the building site and the materials and equipment used during the construction. Replacing the contractor is very costly as the project is very complex and there are very few eligible contractors.

- **Sources of Funds** include the debt financing package, equity contributions from the sponsor and any other sources of funds that benefit the project (i.e., revenues from a project's partial operation, support from third parties, execution of performance bonds, insurance payments, coverage from the contractor, etc.) that are deemed certain or that materialize to cover a

contingency. In Table 7 we provide guidance of liquidity sources that enable a project to draw from additional funding sources in case of cost overruns.

Table 7 – Financial risks of a PFC: Sources of Funds

Score	Description
[1 – 3[	Projects classified in this range have exceptional sources of funds that go beyond the standard PF funding package. These include committed equity cures by the sponsor, above-standard insurance protection that covers almost all possible damages including civil liabilities and natural disasters. Very robust construction contracts that oblige contractors to bear all the construction risks with maximum caps of at least 30% over total construction contract price. In case of a contractor abandoning the works, the PF is protected by a performance bond of greater than 15% of total contract price. Finally, if the project is divided into different phases, parts of the project may be generating earnings during construction that can reinforce a PF's liquidity sources.
[3 – 5[	Projects classified in this range have strong to standard sources of funds in their contractual package. These include standard insurance protection that cover most possible damages except some natural disasters. Robust construction contracts that oblige contractors to bear most construction risks with maximum caps of between 20% to 25% over total construction contract price. In case of a contractor abandoning the works, the PF is protected by a performance bond of between 10% to 15% of total contract price.
[5 – 7[	Projects classified in this range have below standard sources of funds in their contractual package. These include below standard insurance protection that only partially cover potential damages. Weak construction contracts that oblige contractors to bear some construction risks but with maximum caps of 5% to 10% over total construction contract price. In case of contractor abandoning the works, the PF is protected by a performance bond of less than 10% of total contract price.
[7 – 8[	Projects classified in this range have very weak sources of funds in their contractual package. These include weak insurance protection with a very limited coverage of possible damages. Very weak construction contracts that oblige contractors to bear very few construction risks with maximum caps of under 5% over total construction contract price. In case of a contractor abandoning the works, the PF is protected by a performance bond of less than 5% of total contract price.

3.4. Preliminary RPFC

To combine all of the above factors, EthiFinance uses a scorecard (See Table 8) to assess each of the analytical factors and subfactors which are assigned a weight and are scored from [1 to 8[. The preliminary RPFC is the result of the weighted average of the individual scores. Therefore, the higher the weight assigned to a factor the more important it is in determining the preliminary RPFC.

Table 8 – Preliminary RPFC

Analytical Factors	Weight
Technical and execution risks	**40%**
Complexity of the work	25%
Assessment of the construction program and progress	15%
Contractual & parties involved risks	**30%**
Contractual and legal framework	15%
Profile of the parties involved	15%
Financial risks	**30%**
Sources of funds	15%
Funding requirements	15%
TOTAL	100%

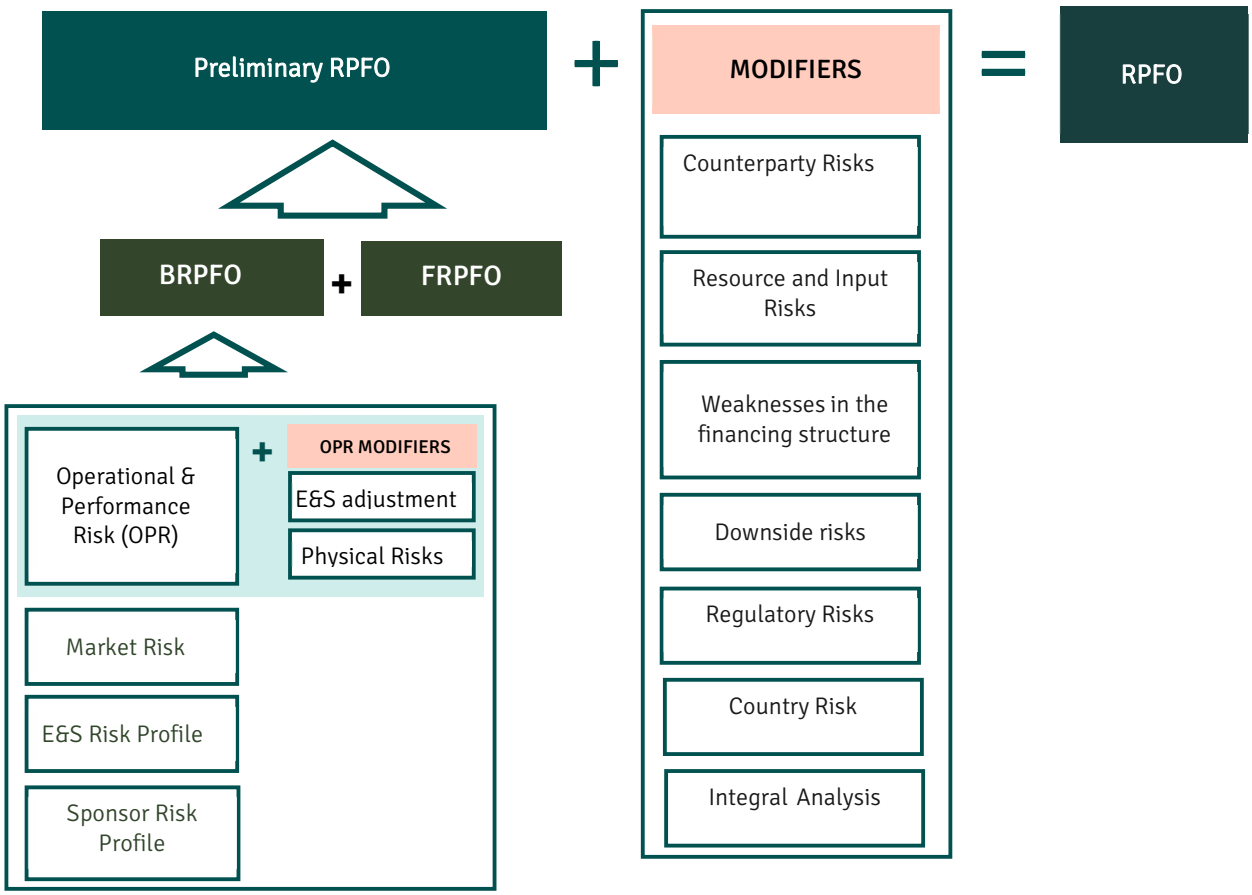
3.5. Counterparty risk modifier

Counterparty risk is applied as a modifier to the preliminary rating of both a PF under construction as well as an operational PF. Therefore, this modifier is explained jointly in Section 5.1.

4. Rating Framework for PFs in the Operational Phase

Ratings assigned by EthiFinance to project finance transactions that are in their operational phase are based on the analysis of qualitative and quantitative factors which are then adjusted with modifiers (see Table 9). The combination of the Business assessment, including Environmental and Societal factors, with the financial assessment, result in the Preliminary Rating. To arrive at the final RPFC, EthiFinance adjusts the Preliminary Rating based on the assessment of seven additional risk factors not included in the scorecard: counterparty risks, resource and input risks, structural weaknesses of the financing, downside risks, regulatory risks, country risks, and integral analysis.

Table 9 – EthiFinance Rating PFs in their Operation Phase (RPFO)



4.1. Deriving the Preliminary RPFO

Table 10 shows how EthiFinance arrives at the Preliminary RPFO. First, the business risk profile of the PFO (BRPFO) is analyzed using a scorecard based on its risk factors and subfactors (See Table 11). The business assessment captures the volatility of a project's cash flows that are caused by a combination of factors that are later explained. Secondly, the financial risk profile of the project is analyzed using the minimum Debt Service Cover Ratio (DSCR) that is derived from the project's base case financial model. These two profiles are combined in a double entry table (Table 10) in order to determine the Preliminary

RPFO. In some cases, if the minimum DSCR is not considered optimal for analytical purposes, the analyst may decide to use alternative indicators that better capture the project's financial situation such as average DSCR or the Project Life Coverage Ratio, amongst others.

Table 10 -Preliminary RPFO

		FRPFO: Minimum DSCRs (*) for a given rating and a given BRPFO					
		AA Category	A Category	BBB Category	BB Category	B Category	CCC Category
BRPFO	[1 – 3[	≥ 1.7	1.69-1.21	1.20-1.10	1.09-1.05	1.04-1.00	<1.00
	[3 – 4[	-	≥1.41	1.40-1.18	1.17-1.10	1.09-1.05	<1.05
	[4 – 5[	-	≥ 1.76	1.75-1.25	1.24-1.15	1.14-1.10	<1.10
	[5 – 6[	-	≥ 2.50	2.49-1.60	1.59-1.35	1.34-1.25	<1.25
	[6 – 7[	-	-	≥2.50	2.49-1.50	1.49-1.45	<1.45
	[7 – 8[					3.00-2.60	<2.60

(*) In certain cases, if the minimum DSCR is not considered optimal for analytical purposes, the analyst can decide to use alternative indicators that better capture the project's financial situation such as average DSCR or Project Life Coverage Ratio, amongst others.

4.2. Determining the Business Risk of the PFO

The **BRPFO** is assessed using risk factors and subfactors each of which are scored on a scale of [1 to 8[, 1 being the least risky and 7.99 the most. The analytical factors are included in a scorecard and weighed according to their importance (See table 11). The BRPFO assesses the ability of the project to operate and produce the required products or services in compliance with its contractual obligations. This ability together with the PFs exposure to market risk will in turn determine the project's capacity to generate cash flows for its debt service.

The proper performance of a PF is conditioned by the technical complexity of the asset, the difficulty of operating it, the expertise of the O&M operator and the reliability of the technology that runs the project. The Operational and Performance Risk score may be adjusted up or down by 0.5 (+/- 0.5) depending on the E&S score assigned to the asset class of the PF (See Section 4.3.1 and Table 14). Additionally, the score of this factor can be penalized by 0.5 (+0.5) if EthiFinance detects that a PF's assets are exposed to serious physical risks and no remedial actions have been taken (See Section 4.3.2).

This assessment which focuses on the operational performance of the project is then combined with its exposure to market risk, its E&S compliance with the Equator Principles[2] and the Sponsor Risk.

Table 11 – Business Risk of the PFO

Analytical Factors	Weight
Operational and Performance risk of PF's Asset	**40%**
Technical Complexity of Asset Class and difficulty of operating it	30%
Expertise of the O&M operator	5%
Technological Risk	5%
Market Risk	**40%**
Market risk (volatility of volumes and prices)	35%
Economic Rationale	5%
E&S risk profile	**10%**
E&S compliance with Equator Principles	10%
Sponsor risk profile	**10%**
Sponsor credit profile, expertise and potential support	10%
TOTAL	**100%**

4.3. Operational and Performance risk of PF's asset:

Assesses the ability of the PF to be fully operational and producing products or services which consistently meet the specifications and amounts required under the concessional or private contracts. Attaining these production thresholds will be essential for the project to generate sufficient cash flows to meet the DSCRs that are projected in the base case model. The assessment revolves around the risks inherent to the design, complexity, technology, and the O&M of the assets that conform the operating unit. To assess this risk the following subfactors are analyzed:

Technical Complexity of the Asset and difficulty of operating it.
Expertise of the O&M operator.
Technological Risk.

A PF's operational and performance risk score can be then adjusted by its asset class E&S assessment and by the physical risks.

[2] https://equator-principles.com/

- **Technical Complexity of the Asset and difficulty of operating it:** To assess the technical complexity of the asset and the difficulty of operating it we outline on Table 12 guidelines that enable the analyst to assign a score to this factor.

Table 12 – Technical Complexity Risk

Score	Description	Examples
[1 – 3[	Simple to moderately complex assets easy to operate and maintain that entail low risks in this factor.	Projects with low O&M risks include office buildings, hospitals, schools, PV plants and simple roads. Projects that are more difficult to operate and that would score at the riskier end of the range include roads with bridges and tunnels and onshore wind farms.
[3 – 5[	More complex assets involving mechanical or chemical processes which require skilled maintenance operators that entail medium risks. Additional sophistication generally leads to higher risks in this factor.	Projects with medium O&M risks include gas pipelines, geothermal, waste-to-energy and cogeneration power plants. Projects that are more difficult to operate and that would score at the riskier end of the range include LNG plants, offshore wind farms, oil refineries, chemical plants, or complex processing plants.
[5 – 7[	Highly complex assets with sophisticated mechanical and chemical processes that require highly specialized operators that entail high risks.	Projects with high O&M risks include underground mines, complex chemical plants that handle toxic products and nuclear power plants.
[7 – 8[	New technological highly complex assets with sophisticated engineering-based mechanical and chemical processes that require highly specialized operators that entail very high risks.	Projects with very high O&M risks include new, highly sophisticated engineering-based projects with no or little track record and untested new energy generation assets.

- **Expertise of the O&M operator:** The operational complexity of a project is analyzed in conjunction with the expertise of the O&M operator so that both factors are combined. A high credit assessment, from [1 to 4[, will be awarded to O&M providers that are industry-renowned operators with a very wide experience in operating similar projects and that are contractually bound to guaranteeing production that amply exceeds the volumes contemplated in the base case. In some cases, the O&M contract will have a fee structure that is partly tied to the project's revenues thereby providing incentives for a positive O&M performance. O&M that is performed by a company belonging to the Sponsor with extensive experience will also score high since interests of both parties will be aligned.
  A medium credit assessment, from [4 to 6[, will be awarded to O&M providers that are relatively well known within the market with a fair amount of experience in operating similar projects, and that are contractually bound to achieving production levels that exceed the volumes contemplated in the base case. The O&M contract usually has a fixed fee structure that contemplates penalties if the production thresholds are not met but also provides incentives if production exceeds these thresholds. These penalties are usually calculated as a percentage of the value of the O&M contract.

A low credit assessment, from [6 to 8[, will be awarded to an O&M provider that does not present relevant experience in similar project or if their experience is in smaller-scale projects, and that are contractually bound to achieving production levels that are close to those contemplated in the base case. Additionally, O&M providers in this category usually have weak contractual incentives to perform well.

- **Technological risk:** This factor (See Table 13) assesses the reliability of the technology being used by the project.

Table 13 – Technological risk

Score	Description
[1 – 3[	Transactions with low technological risks include projects that use a technology that has been thoroughly tested in many other similar projects and has demonstrated a good operational performance. Technologies such as Solar PV, wind turbines or waste to energy plants would fit under this category.
[3 – 5[	Transactions with medium technological risks include projects that use proven technology but are being used under circumstances that are other than standard in terms of operating conditions, lay-out or scale. The technology may have performed according to specifications but is still at an early stage of its ramp-up.
[5 – 7[	High technological risks are present in projects that use a technology that has been used in rare occasions.
[7 – 8[	Very High technological risks are present in projects that use a technology that has run into complications or technologies that remain untested.

4.3.1. E&S adjustment on a PF's Operational & Performance risk score:

- As we have seen throughout this section, the asset class of a PF strongly influences its operational and performance risks. E&S risks of a PF are also closely tied to its asset class. This is why EthiFinance has chosen to potentially adjust a PF's operational and performance risk score depending on the E&S assessment of its asset class (See Table 14). Consequently, our approach is to assess the financial impact that E&S factors may have on a project's assets (financial materiality), and the impact that these assets may have on the environment and society (non-financial materiality).
- Extra financial materiality represents real risks to projects as it may create needs to transform the way they operate to maintain profitability in a changing society / environment. Nevertheless, the interaction between environmental and societal factors on one side and PF assets on the other is a complex relation that must be taken into account when assessing the E&S impact. For example, infrastructures can provide a country and its population with basic needs, strong competitivity and robust GDP growth (directly or indirectly) but their construction may negatively impact the environment. Therefore, our assessment must incorporate a cost / benefit analysis. Many societies have strong and growing concerns for a PF's environmental & societal impacts and will weigh these against the benefits it brings, ultimately affecting the acceptance of a PF. This is why, all things being equal, less essential projects will be exposed to higher E&S risks.

- In the E&S PF Classification Chart, factors linked to i) environmental and ii) societal issues are considered. Environmental risk factors considered include climate change, intensity of resource uses, pollution and biodiversity, and Societal risk factors consider the interaction between PFs and states, regions, and communities.

EthiFinance scores each project's E&S exposure according to its asset class on a scale of [1 to 8[as shown in Table 14.

Table 14 – E&S PF classification chart

Score	Description	Asset class
[1 – 2[	Projects with low E&S risks, typically in sectors that already stand to benefit from E&S related opportunities.	Projects that will be included in this category are: Renewable energy projects, environmental services assets including waste to energy or water treatment plants, and social infrastructures such as hospitals, schools, and nursing homes.
[2 – 4[	Projects with low to medium E&S risks, typically in sectors with E&S related opportunities but that require some "adaptation".	Projects that will be included in this category are: Telecom infrastructures, leisure-related projects that limit their environmental impact
[4-7[	Projects with medium to high E&S risks, typically in sectors which require a definite "transition" in terms of ES.	Projects that will be included in this category are: Toll roads that bring real societal benefits over existing routes, airports that are important to a region's prosperity
[7 – 8[	Projects with high E&S risks, typically in sectors which require a complete "transformation" in terms of ES.	Projects that will be included in this category are: Oil, gas or coal power related projects, heavy chemical and mining projects, toll roads and airports whose societal benefits are outweighed by environmental costs

Operational and Performance risk E&S score adjustment:

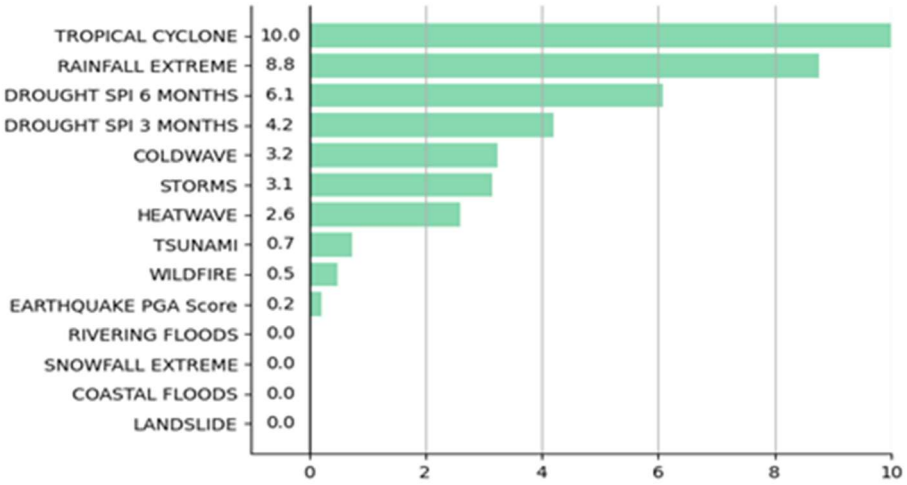
- Projects that entail a need to transform (score from 7 to 7.9) would see their Operational and Performance risk score penalized by adding 0.5 to the Operational and Performance risk score. Projects most exposed to E&S risk factors may face, among others, declining demand for their products or services, higher cost structures, difficult access to refinancing and/or increased regulatory oversight over the next five years.
- Conversely, projects that fall in the "already aligned" category (score from 1 to 1.9) i.e., with significant E&S related opportunities would see their Operational and Performance risk score benefited with by subtracting 0.5 to the Operational and Performance risk score.

4.3.2. Operational & Performance risk scores adjusted for Physical Risks:

Physical risks are a specific case of the environment impacting a PF through natural disasters or extreme weather conditions. These types of risks directly affect the operation and performance of a project and therefore EthiFinance could potentially adjust a PF's operational and performance risk score depending on our assessment of the physical risks that affect it. EthiFinance strongly believes that physical risks are a key credit factor when rating different types of corporates but especially in the case of PFs whose assets are situated in one or several locations and, by definition, cannot be relocated. EthiFinance uses a proprietary methodology (Physical Risks Scores Methodology – PRSM) to quantitively assess a wide range of physical risks for an asset or a portfolio of assets based on their geographical location. The entry data of the PRSM is the precise geographical position of the asset (i.e., latitude and longitude of a building), the shape of the asset (i.e., highway or power line), or the most precise administrative region to which the asset belongs. Then for each risk, one or several specific databases are used to determine the score based on an approach of damage functions, that quantify the risks related to climate change or based on limit values largely used by the scientific community. The damage functions convert the hazard intensities into a proportion of assets affected resulting in a score between 0 and 1, then converted to a scale of 0 to 10 where 0 is the lowest risk and 10 is the highest risk. High scores do not automatically impact the Operational & Performance factor but rather are used as an alert tool to signal that the potential risk must be further investigated by the analyst as described in the Qualitative Analysis paragraph.

- **Quantitative analysis.** Physical risks considered are i) chronic or, ii) acute. Chronic risks are related to a shift of the mean climate that can have ongoing effects on the asset or on its productivity. For instance, lower levels of wind speed or solar radiation for wind and solar projects, lack of water for agriculture or industry, or a rise of the sea level for assets located near river beds or coastal areas. Acute risks relate to extreme events that concern a wide range of hazards which can have potentially high adverse impacts from lower levels of productivity (i.e., the effect of a drought on an industrial process that requires large amounts of water) to very significant damages, temporary or permanent, with high remediation costs (i.e., a building or plant affected by earthquakes, cyclones, storms, or tsunamis). The quantitative assessment of an asset or a portfolio of assets results in a table with a score for each physical risk. Table 15 illustrates a real case of a PF located in Latam.

Table 15 – PRSM Scores



- **Qualitative analysis**. Once the different physical risk factors have been scored, the analyst will use the table as an alert tool and select the highest risks and will discuss them with the PF sponsor. Apart from the information gathered from this interchange, the analyst will rely heavily on the project's due diligence reports that address these risks for example, technical, topographical, geological or climate reports. Additionally, the analyst will analyze the insurance policy that covers the project to determine to what degree the project is protected from these types of risks, keeping in mind that there is a high likelihood that the time horizon of the insurance coverage will usually be shorter than the remaining life of the asset and there are no guarantees that the current coverage will be renewed on the same terms

  For instance, the qualitative analysis can take into account the geographic surroundings of an asset that has a high-risk score in terms of flooding or wildfire risks. Continuing with this example, an asset located in a region with a high wildfire hazard but within a precise location where there are no trees or other flammable materials will have its wildfire hazard assessed as negligible compared to an asset located in a forest. In this example, the rating analyst will interact with the PF's sponsor, in order to analyse possible remedial actions, put in place to reduce the risk (i.e. anti-fire area, water storage and capabilities for quick fire extinction after an early detection by fire sensors).

  Rating a portfolio of assets. In cases where a PF holds a portfolio of several assets, the rating analyst will also assess the materiality of those assets that have a significant physical risk assessment.

  If the PF only owns one asset, then the materiality of the asset for the project is maximum (i.e., a single wind farm or solar park project). If the PF has a portfolio of assets, the rating analyst will determine if these assets are unrelated (i.e., a portfolio of different types of renewable energy projects in several sites) or highly correlated (i.e., a toll road that is divided into several sections where the traffic of each section depends on the adjacent section's traffic). When the assets of a portfolio are unrelated, the materiality of each asset will be assessed using such metrics as its book value over total assets or its percentage of contribution to the PF's total cash flow.

Physical risk adjustment on Operational and Performance score: As a result of combining physical risks with the level of protection afforded by the insurance policy and other possible mitigants, EthiFinance will adjust the score of this factor down by one notch and in some cases may consider further downward adjustments provided that the risk can be determined to be material and imminent.

4.4. Market Risk:

- **Market (volatility of volumes and prices):** Assesses to what extent market conditions can impact the cash flows of a project (See Table 16), introducing uncertainty in terms of the project's ability to service its debt. It involves measuring the degree to which a project is exposed to volatility in demand and prices. Projects that contribute positively to ESG policies may elicit financial support from local, national, or multilateral authorities that would act as market risk mitigants, thus lowering the scores on Table 16. An example could be a merchant renewable energy plant that may enjoy a price floor which would protect it from prices below the floor.

Table 16 – Market risk

Score	Description
[1 – 3[	Examples of projects with no demand risks are Private Public Partnerships where the project receives an availability fee that does not depend on the demand for the services offered by the PPP facility. Energy plants that have their production pre-sold to an off-taker with a "take or pay" clause is another example of a project with low market risk. Projects with low to medium demand risks can include wind farms and PV solar parks or toll roads that have been operating for 10 or more years and have a fairly stable traffic flow. We would also include under this category a shadow toll highway.
[3 – 5[	Projects with medium to high demand risks include toll roads that have been operating for a short period.
[5 – 8[	Projects with high to very high demand risks include merchant energy plants and greenfield toll roads.

- **Economic Rationale of the PF and its strategic importance** to the Country or Region. Projects that are operationally efficient and serve the economic and strategic interests of a country or region will receive a high rating assessment because under normal circumstances they will perform efficiently and under severe conditions will most probably receive institutional support because of their importance. On the contrary, a project that is heavily subsidized or is largely redundant may be subject to changes in its regulatory scheme when these assets distort the industry in which they operate. The following points are helpful as a guidance in assessing this factor
    - An example of a project with a high score is an LNG regasification plant that ensures that a country's natural gas resources can be exported through LNG tankers and where no alternative gas pipe exists or is at full capacity. We would also include in this category projects that are cost-efficient in themselves without the need of subsidies. In this category we could include tolls roads that serve a densely populated area where alternative routes are very congested, making the toll road a preferred choice. As technology has progressed, solar and wind parks have become cost-efficient in relation

to other thermal plants and therefore can compete in the electricity wholesale market without relying on a feed-in tariff system.

- An example of a project that would receive a low score in this factor would be the first renewable energy projects that, at that time, relied on very expensive technology and therefore needed high regulated feed-in tariffs in order to be economically feasible. These projects could potentially acquire an excessive weight in the country's energy mix, leading to exceptionally high end-consumer electricity prices that may be politically untenable. Another example is a toll road that serves a reduced catchment area and additionally may be redundant because of the alternative highway systems.

4.5. E&S risk profile:

- **E&S compliance with equator principles**: A project's E&S profile considers how projects impact their environment and their community, which in turn can affect the credit standing of the project.

  The environmental and societal aspects of project finance have long been a growing concern to all stakeholders of a project finance and more specifically to lenders, as highlighted by the adoption of the Equator Principles (EP) by currently 123 financial institutions in 37 countries. EthiFinance will score the E&S profile of a PF taking the Equator Principles´ categorization as the starting point of the assessment.

  - **Projects with Category C**, defined as Projects with minimal or no adverse environmental and societal risks and/or impacts by the Equator Principles practice, will score high in this factor (from 1 to 2.99).
  - **Projects with Category B**, defined by the Equator Principles as Projects with potential limited adverse environmental and societal risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures, will have a medium score (from 3 to 4.99).
  - **Projects with Category A**, categorized by the Equator Principles as projects with potential significant adverse environmental and social risk and/or impacts that are diverse, irreversible, or unprecedented, will have a low score in this factor (from 5 to 6.99).

This E&S analysis based on the Equator Principles scores project within broad ranges. To fine-tune the score within each range, the analysis will be complemented by the assessment of the environmental and societal due diligence of the project and the review of the potential environmental and social risks and impacts, including those related to Human Rights, climate change, and biodiversity. For projects lacking an EP category, EthiFinance will assess the environmental and societal information, on the sole basis of environmental and societal due diligence reports of the project but the score must not be less than 3.

4.6. Sponsor risk profile:

- **Sponsor credit profile, expertise and potential support.** Although EthiFinance recognizes that a PF transaction by definition has no recourse to the sponsor, we believe that under certain circumstances the PF´s sponsor will actively manage risks and react to unexpected operational issues as well as offering financial backup if needed, which translates into better financial

performance over time, and hence better credit quality. This course of action can respond to a variety of reasons which, to name a few include:

- Sponsor is going to continue tendering for other projects launched by the same Public Administration that awarded the impacted project
- Sponsor has a strong working relation with the banks providing the financing
- Sponsor wants to uphold his reputation in the markets
- Sponsor is negotiating with the entity that awarded the project to improve the contractual conditions of the PF (i.e., extension of the concessional period, increase un the regulated tariffs being charged by the project, etc.)

In conclusion, the ability and willingness of the Sponsor to support a PF in stressful situations can play an important role in lending his support to a specific PF.

The points on Table 17 are helpful as a guidance in assessing expected sponsor support:

Table 17 – Sponsor expertise & support

Score	Description
[1 – 3[	A high valuation would be given to this factor in situations where the sponsors are highly regarded companies with a good track record and a strong reputation in their field. These types of sponsors will enjoy solid credit metrics and may be managing an important portfolio of similar projects. In terms of willingness to support the project, a high valuation will be given to this factor if the sponsor is highly motivated to lend his support based on the existence of clear reasons for him to do so. Finally, sponsors that fall into this category may have lent their support to other of their projects in the past.
[3 – 5[	A medium valuation will be given to this factor for sponsors that have a reasonable reputation and an adequate track record in their field. These types of sponsors will display adequate credit metrics and may be managing a few projects that are similar. In terms of willingness to support the project, a medium score will be given to this factor if the sponsor has some motives to lend his support based on the existence of potential reasons for him to do so. Finally, sponsors that fall into this category may have, on rare occasions, lent their support to other of their projects in the past. Financial sponsors who prioritize the interests of equity over the project or debt will also have a medium to low valuation in this factor.
[5 – 8[	A low valuation will be given to this factor for sponsors that hardly have a reputation to uphold nor a track record in the field. These types of sponsors will display weak credit metrics and may have little or no experience in managing similar projects. In terms of willingness to support the project, a low valuation will be given to this factor if the sponsor has no apparent motives to lend his support based on the lack of potential reasons for him to do so. Finally, sponsors that fall into this category have no history of having lent their support to other of their projects in the past. In many occasions these sponsors are of a purely financial nature and who prioritize the interests of equity holders over lenders.

4.7. PFO's Financial Risk Profile

The financial risk profile (FRP) of a PF is captured in the PF's financial projections. For this, EthiFinance relies on the bank's base case financial model which consists of the projected cash flows during the life of the transaction. The two main metrics of the models are: i) the cash flow available for debt service (CFDS) which is the remaining cash after paying all the operational expenses including taxes and ii) the debt service which includes principal and interest payments. To analyze how comfortably can a PF meet its debt service, we use the DSCR which is calculated as $\frac{CFDS}{Debt\ Service}$. The PF's financial model projects

future DSCRs and to determine its financial profile, the lowest DSCR is used as it indicates the year in which the PF is in the greatest risk of not paying its debt service. In certain cases, if the minimum DSCR is not considered optimal for analytical purposes, the analyst may decide to use alternative indicators that better capture the project's financial situation such as average DSCR or the Project Life Coverage Ratio, amongst others.

In some cases, the financing facility under analysis may not cover the asset's life and in certain instances may even have a bullet structure. In these types of transactions, EthiFinance will calculate the Project Life Cover Ratio (PLCR) in the year the PF debt matures as an approximation to the refinancing risk. The PLCR is determined calculating the Net Present Value of the future cash flows available for servicing (CFAS) the debt divided by the remaining debt all referenced to the year in which the financing matures. Below we give more detail on the necessary calculations to determine the PLCR:

- NPV of CFAS: All CFAS are considered except for the one generated in the last year of the project's life in order to provide for a one-year tail.
- The interest rate to be used for calculating the debt service will be derived from the forward interest curve at the date of the analysis. This same figure will be used as the discount rate to determine the NPV of CFAS.
- Debt service will be sculptured according to the project's CFAS and will be paid in equal installments.

Once the PLCR is determined, it will be used in Table 10 as a substitute of the minimum DSCR.

4.8. Arriving at the Preliminary Rating (PR)

Once, the BRPFO is analyzed based on its risk subfactors (See Table 9) and the minimum DSCR has been calculated to derive the PF's financial risk profile, both profiles are combined in a double entry table (See Table 8) in order to determine the PR of the PFO.

5. Modifiers to the preliminary rating

The final PFO rating will be the result of applying the following modifiers to the PR:

- Counterparty risks
- Resource and Input Risks
- Weaknesses in the financing structure
- Downside risks
- Regulatory risks
- Country risks
- Integral analysis

5.1. Counterparty risk Modifier

A project finance involves different contractual arrangements that establish obligations and risk allocations amongst the parties that intervene in the project.

Counterparty risk strives to measure the negative impact that the exclusion, failure, or creditworthiness deterioration of a counterparty would have on the Preliminary Rating of a project. This impact will depend on the type of counterparty (See Table 18) and its materiality to the PF's viability (See Tables 19 and 20). Depending on the PF's project phase, counterparty risk will be applied as a modifier either to the PR of a PF under construction or to the PR of a PF that is operating.

Table 18 – Counterparty Framework

Type of Counterparty	Type of Contracts	Project Phase
Revenue providers	Offtake or purchase contracts; entity that granted the concession	During operation
Construction contractors and equipment suppliers	EPC contracts	During construction
O&M operators	O&M agreements	During operation
Raw material input suppliers	Supply or procurement agreements	During operation
Financial counterparties	Financing documents, Insurance policies, guarantees	During construction (Insurance Co. are also involved during operation)

If a counterparty is sufficiently material and its credit standing is below the project's PR then counterparty risk can lower the PR. Consequently, it is necessary to perform a rating estimate to determine the counterparty's creditworthiness (CCr) which is an indication of the counterparty's ability to fulfil its obligations to the project. EthiFinance will assess the materiality of a counterparty taking into account their criticality and their replaceability.

In Table 19, we provide guidance of how to assess the criticality of a counterparty using a score from 1 to 3, where 1 represents the lowest risk.

Table 19 – Counterparty Criticality

Score	Criticality of Counterparty	Examples
1	Low criticality: the absence of the counterparty barely has an impact on the PF's performance	Supplier of easily available goods and services, bank account providers, O&M providers of assets that are easy to maintain
2	Medium criticality: the absence of the counterparty impacts the PF's Performance	Suppliers of key equipment, bond and guarantee issuers, an offtaker that provides part of the revenue flows to the PF, O&M providers of somewhat complex assets
3	A highly critical counterparty whose absence can affect the viability of the PF	EPC contractors involved in highly complex projects, financing providers of a PFC, an offtaker that provides most of the PF's revenues

In Table 20, we provide guidance of how to assess the replaceability of a counterparty using a score from 1 to 3, where 1 represents the lowest risk.

Table 20 – Counterparty Replaceability

Score	Replaceability of Counterparty	Examples
1	Easily Replaceable: the abandonment of the counterparty is easy to replace because its services are of a common nature	Includes bank account providers, simple O&M providers
2	Replacement of the counterparty has some complications, will take several months, and may imply some extra costs	Suppliers of key equipment, bond and guarantee issuers, one out of several offtakers providing revenues to the PF at close to spot prices, O&M providers of somewhat complex assets, insurance providers, financing providers as long as the PF's debt still complies with banks' structuring criteria.
3	Replacement of the counterparty is complicated, will take more than 6 months and will imply significant extra costs to the PF	EPC contractors involved in highly complex projects, an off-taker that provides most of the PF's revenues and is paying above spot prices, financing providers that cease to provide funds, leaving a PF that must reduce debt before being a bankable transaction

Determining the impact of the CCr on the PR of a PF: The CCr of a counterparty will constrain a PF's preliminary only in cases that the CCr is not investment grade. In these cases, below is a guidance of the impacts.

- Counterparties that score 3 in Criticality and Replaceability: In these cases, the PR of a PF will be limited at best to the CCr of the counterparty + 2 notches and in some cases may be capped by the CCr, especially for revenue counterparties.
- Counterparties that Score 1 in criticality and replaceability: In these cases, PR will not be limited by the CCr of the counterparty.
- Counterparties that score 3 in criticality and 1 in replaceability (vice versa cases are unusual): In these cases, PR will be limited at best to CCr + 3 notches

- Counterparties that score 2 in criticality and replaceability: In these cases, PR will be limited at best to the CCr + 4 notches and for revenue counterparties, PR will usually be capped at CCr +3 notches.
- Construction and O&M counterparties that score 1 in criticality and 2 in replaceability or vice versa: In these cases, PR will be limited at best to the CCr + 6 notches. To determine the final outcome, EthiFinance will assess the cost of replacing the contractor and the PF's liquidity, usually provided by the execution of the performance bond (usually equivalent to 10% to 15% of the contract price) and any liquidity that the PF may have retained in the operational phase.

5.2. Resource / Input risks:

Some projects are more prone than others to a shortage of resources which in turn would lead to a reduction of their output. This factor assesses the risk of a project not receiving sufficient amounts of the required resource because of procurement cuts or other causes of unavailability. Resources include not only raw material but also natural resources such as wind, sun, or water.

Examples of projects that depend on the availability of raw materials or natural resources include: LNG liquifying plants (natural gas); wind farms (Wind), Solar PV parks (solar radiation) and Biomass plants (feedstock of an organic origin such as agricultural crops, wood and wood refuse, urban waste, animal manure, etc.). Resource / input risks are classified into 4 categories:

- Projects that have minimum or no input risks include expressways, electricity transmission lines, social infrastructure PPPs such as hospitals and other projects subject to availability payments.

- Projects with low to medium input risks include solar parks, wind farms and geothermal plants. In these cases, risks can be mitigated if there are thorough and precise resource availability studies carried out by independent experts. In the riskier end of this category, we include LNG plants, biomass plants and other installations that need to source raw materials for production purposes as a long as the sourcing risks can be largely mitigated with robust long-term procurement contracts with world-class providers or in their absence, when the provider can be easily substituted because there is a deep supplier base.

- Projects with medium to high input risks include LNG plants, biomass plants and other installations that need to source raw materials for production purposes but these risks can only be partially mitigated with medium-term procurement contracts with weaker providers or alternatively, if the provider cannot be easily substituted because the supplier base is limited.

- High to very high input risks are typically associated with projects in the prior category that have weak or no mitigants.

For resource risks that are medium to high, the PR of a PF should be lowered by 1 to 2 notches and if the resource risk is high to very high the PR should be lowered by 3 notches and may even be capped at the B rating category.

5.3. Financing structure weaknesses Modifier:

PF financing structures are for the most part quite standard amongst the financing community so any departure from this standard will negatively impact the PF's PR. Consequently, EthiFinance will revise

the PR rating down by one or more notches or may even impose a cap, depending on its view of the severity of the weakness in the debt structure. Below are the structural features that we expect in a standard PF transaction:

- **Amortization schedule of the PF**: Amortization profile should be sculptured so that debt service is adapted to the project's expected cash flow generation. This will lead to DSCRs that are even throughout the life of a project. Amortization profiles that are back-ended or that rely heavily on cash sweep mechanisms will be considered substandard.
- **Debt Service Reserve Accounts (DSRA) that support Liquidity**: Standard DSRA will be equal to 1 or 2 periods of debt service on the basis of half-yearly installments. Therefore, DSRAs that cover less than 1 half-yearly instalment or that are absent will be considered substandard.
- **Dividend lock-up mechanisms**. The existence of these mechanisms limits dividend payments when the project is performing with DSCRs that are below the base case. Usually, this mechanism comes into force when DSCRs are in the range of 1.10x. The sooner a dividend lock-up is activated (i.e., when it is closer to the base case DSCR) the more robust the structure. Lock-up mechanisms below a DSCR of 1.10x are considered substandard.
- **Guarantee package.** PF Lenders will almost always have a pledge on the SPV's shares and on its money accounts and its contractual payment rights (for example access to insurance payments) and usually have a mortgage security on the project's assets. Any departure from this scheme will be considered substandard unless securing the projects assets is not feasible as in the case of a fibre network that passes through many jurisdictions.
- **Covenant Structure**. Existence of covenants that protect the interests of lenders during the life of the financing imposing obligations on the project sponsors to act or to abstain from acting under certain situations. These covenants aim at preserving cash within the structure and tend to discipline the financial behaviour of the project's sponsors. An absence of a customary and bankable covenant package will be considered substandard.

5.4. Downside Analysis of the Base Case:

To determine the sensitivity of a PF's Cash Flow Available for Debt Service (CFADS) relative to drops in sales or increase in costs, EthiFinance will conduct a downside analysis in which the Agency will apply a series of stresses to the key variables of the PF's Base Case. Additionally, break-even scenarios will be run to determine how robust a PF's cash flows are relative to shocks in its key variables. Typically, these will include:

- Demand variations that lead to revenue and cash flow decreases.
- Operational stresses such as availability levels or underperformance penalties.
- Increases in OPEX.
- Macroeconomic variations: Interest rates, Inflation, etc.

Our downside case has its starting point in the PF's base case which we derive from the bank's base case model. The downside case will be determined after applying certain revenue and cost stresses. The steps taken to arrive at the downside case is as follows:

Determine the percentage drops of the CFADS that are commensurate to a crisis, using drops observed in historic downturns for the PF's asset class.

Determine the number of years that the stress scenario will be applied to the base case. To define the stress period, EthiFinance will take the average duration of a cycle which will vary depending on the products / services offered by the PF and which typically will range from 2 to 5 years.

Once the stress case has been simulated, EthiFinance will assess the resiliency of a PF using the DSCR as the metric.

Since stress scenarios are corelated to the PF's asset class, in Table 21 we give guidance on the CFADS declines and the number of years that we would typically use in simulating a crisis. As this downside analysis is applied case by case, our guidance is of a practical nature and is based on examples of asset classes.

Table 21 – Constructing the downside case

PF's Asset Class	Drop in CFADS	Stress period
PFs that enjoy availability-based payment schemes, fixed regulatory fees, or take-or-pay fixed fee tolling agreements	Not applicable	Not applicable
Toll Roads operating a consolidated corridor, PF's that derive most revenues from long-term contracts where market exposure is modest or are subject to regulatory fees that are partly variable. PPPs with minimum guaranteed payments covering a significant part of the DSCR	From 5% to 15%	Usually, 4 to 5 years or 2 years if project is an energy or commodity producer
PFs that mostly rely on demand volumes though some fixed income is received from the concession grantor. Examples include public transport concessions where most of the revenues are derived from ticket sales, bus stations where most of the revenues come from traffic volumes complemented by some fixed payments or the right to exploit adjacent commercial venues.	From 15% to 30%	Same as above
Greenfield toll roads before entering service, merchant power plants or LNG facilities that are partially covered by PPA agreements	From 30% to 50%	Same as above
Full merchant plants or other commodity producers fully exposed to market risk	Above 50%	Same as above

The downside case of a PF will be the result of applying the indications in Table 21 to its base case. The results of this stress will be used to determine the adjustment on the PR as follows:

- If the DSCRs of the downside case remain at 1x or above then the PR may be raised by up to 2 notches.
- If the DSCRs of the downside case remain at 1x in most cases and the average DSCR is at 1x or above then the PR will be capped at the BBB category.
- If the DSCRs of the downside case are below 1x in most cases then the PR will be capped at the BB category.

5.5. Regulatory risks:

Revenues of a PF can be heavily dependent on regulation and as such are exposed to the risk of negative regulatory changes. In these cases, changes in the regulatory landscape can seriously impact a project's revenues and therefore its cash flow generation. Regulatory risks are scored on a scale of 1 to 3 where 1 is the lowest risk 3 is the highest.

- Examples of projects that rely heavily on regulation are renewable energy projects that are under a feed-in tariff regime whereby all energy produced by the project is bought by the Electricity System at market prices plus a premium. These types of projects would receive a score of 3.
- Projects whose revenues depend partially on regulation are concessions in the mass public transport systems where the project derives part of its revenues from ticket sales that are usually regulated by a public authority but also relies on grants from the administration in order to make a profit. These types of projects would receive a score of 2.
- Examples where regulatory risks are not present are energy projects with a cost-competitive technology that are able to sell to the market with a profit or alternatively have in place a PPA with an off-taker. These types of projects would receive a score of 1.

For projects whose cash flows rely heavily on regulation and have a score of 3, the preliminary rating can be downgraded by up to two notches if there has been a history of negative regulation changes in the country or if the regulatory tariffs are causing serious imbalances in the market or becoming a burden to a country's fiscal discipline.

5.6. Country Risk:

Country risk represents the risk of doing business in a country. EthiFinance looks at many sources of information to assess country risk, including the country risk assessments provided by credit insurers Coface and CESCE. The assessment of country risk considers the macroeconomic and political environment, fiscal risks, transfer risk, the application of the rule of law in business (e.g., property rights, contracts, financial distress, insolvency) as well as safety issues.

Country Risk may act as a ceiling for projects that are located in countries with a non-investment grade. In these cases, a project will have its rating capped at one notch above the sovereign's rating estimate provided by EthiFinance.

5.7. Integral Analysis:

A PF transaction may be subjected to an integral analysis which treats the PF as a whole resulting in the appearance of risks which were not captured when analyzing each factor individually. This approach may lead to a downward or upward adjustment of the PR, the magnitude of which, will depend on the materiality of the risk measured by its impact on the PF's base case financial model. Situations where these adjustments may be used include, amongst others:

- Extraordinary opposition to the PF on the part of social pressure groups because of ESG considerations or other community-related issues.
- PF's that are politically divisive and that may be revoked if there is a change of government.

- A very weak sponsor that has had a poor track record in managing similar projects or who lacks sufficient experience.
- PFs that enjoy a great deal of regional or governmental support although of an implicit nature.
- In some cases, when a physical risk is considered extreme, it could lead to a downgrade of the PR by several notches.

6. Conversion of numeric scores into EthiFinance's Rating Scale

Final numeric ratings are then translated into EthiFinance 's rating grid as shown in the following table:

Numeric Rating	EthiFinance's Rating
1	AAA
2	AA+
	AA
	AA-
3	A+
	A
	A-
4	BBB+
	BBB
	BBB-
5	BB+
	BB
	BB-
6	B+
	B
	B-
7	CCC+
	CCC
	CCC-

Each whole number of the Table corresponds to the highest rating within each category.

Appendix A

The following chart lays out the framework proposed by the European Central Bank which offers guidelines on how CRAs may incorporate climate change risk in their ratings in a systematic and consistent way. The framework is based on 11 criteria mapped to 5 disclosure areas. For each of the 11 criteria, we have added a last column with our comments explaining why our approach of integrating climate change risks into our PF credit assessment complies with the ECB's framework.

Area of disclosure	Element of disclosure	Check	Comments
I. CCR methodologies and definitions	1. Definition and assessment of individual CCR (Climate Change Risks) sub-categories within the E, S and G pillars, including the linkage between sectoral and entity-specific considerations. For example, disclosure on the various CCR sub-categories of risk within the "E" pillar.	☒	The environmental and societal aspects of project finance and the way they are assessed in accordance to the Equator Principles´ categorization are presented in sections « 4.3.1 – E&S adjustment on a PF's Operational & Performance risk score » and « 4.5 – E&S risk profile » of the « Rating Methodology for Project Finance » document. In addition, physical climate risks are defined in the sections « 1.1 Typology of risks », « 3. Chronic risks » and « 4. Acute risks » of the accompanying document « Physical Risks Score Methodology » and illustrated in section « 4.3.2 Operational & Performance risk scores adjusted for Physical Risks » of the « Rating Methodology for Project Finance » document. Theirs assessments are done at the project and localization levels.
II. CCR assessment models and methods	2. Disclosure of models and methods used to assess CCR, in the credit opinion report or in the relevant rating criteria, including whether these are qualitative or quantitative, whether conducted at entity or sector level and their main inputs and key assumptions.	☒	Models and methods used to assess CCR including how raw satellite data are transformed into quantitative physical risk scores are described in sections « 1.2 Integration of physical risks into credit rating » and « 1.3 Hazard Conversion into Score Functions » of the « Physical Risks Score Methodology ». The way these quantitative scores are then combined with qualitative analysis is described in section « 4.3.2 Operational & Performance risk scores adjusted for Physical Risks » of the « Rating Methodology for Project Finance » document.
	3. Disclosure of the (qualitative or quantitative) results of the CCR assessment models and methods in the credit opinion report for the individual credit rating assessment, making it easier to comprehend the models and their impacts on the credit analysis.	☒	
III. Data and metrics	4. Disclosure of data and metrics used as input to assess CCR in the credit opinion report, preferably pertaining to	☒	Whether past data are used to evaluate present conditions and/or climate projection are used to evaluate future climate

	each climate change sub-category to indicate the data connected to material factors, i.e. those that had an influence on the creditworthiness assessment.		change risks, all chronic and acute physical risks' data and metrics along with their sources, granularities, types, and time horizon are specified in « Table 1: Typology of Physical chronic risks » and « Table 2: Typology of Physical acute risks. » of the « Physical Risks Score Methodology ».
	5. Disclosure of granularity of the data used, i.e. whether provided for a rated entity within the rating report or – less granular – for each asset class or sector within the same asset class (e.g. corporates).	☒	
	6. Disclosure of sources of data, including whether the data have been collected externally vs. internally, and of reported vs. modelled origin, if applicable.	☒	
	7. Disclosure of the time horizon of the data considered for the CCR factors, specifically providing differentiation between past and forecast data.	☒	
IV. Assessment of relevance and materiality of CCR	8. Disclosure of the assessment of relevance and materiality of CCR, specifically by indicating how the CCR assessment models and methods flow into the more general credit rating methodologies, i.e. which methodological factors/sub-factors are affected.	☒	Relevance, materiality and impact of CCR and E&S considerations on project finance credit rating are mentionned in the section « 1. Executive summary » and further detailed into specific sections of the methodology « 4.3.1- E&S adjustment on a PF's Operational & Performance risk score », « 4.3.2 - Operational & Performance risk scores adjusted for Physical Risks » and « 4.5 - E&S risk profile ».
	9. Disclosure of the main considerations around the decision on relevance and materiality of CCR, such as by providing the main considerations by the rating committee when agreeing on relevance and materiality of CCR for a given credit rating.	☒	
V. Impact of CCR on credit rating	10. The magnitude of adjustment in the creditworthiness assessment stemming from material CCR, to understand the overall CCR impact to credit ratings and/or to its methodological factors/sub-factors (in the event that an ECAI does not use a CCR overlay to adjust the credit rating but incorporates this risk into other areas of the methodology).	☒	
	11. Disclosure of the area within the credit rating methodology where material CCR had an impact to indicate whether this had an effect on the methodological components and subcomponents.	☒	