

Global Renewables Performance Review

Solar and Wind Withstand the Pandemic

"Running counter to broad swaths of the infrastructure sector, performance-related downgrades in 2020 did not deviate from historical norms. The ongoing global pandemic has had a muted impact on this class of credits that are largely insulated from demand risk and have remained operationally stable."

Andrew Joynt, Fitch Ratings

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Solar Outperforms Wind

Fitch Ratings' portfolio of wind and solar project finance ratings spans countries, regions and continents. Key rating drivers and credit metrics are applied consistently to assign and monitor ratings, despite geographic disparities. With more than a decade of experience, Fitch's portfolio indicates solar projects consistently outperform wind operationally on a global scale.

Resource Stability Enhances Solar

The stability and predictability of solar resources relative to wind are the salient factor differentiating these asset types. Renewable revenues are inherently volatile as the resource is outside of the project's control. But rated solar projects consistently outperformed wind projects, as reflected in volume risk assessments and generally higher solar ratings.

Counterparty Dependence Tapering

In the early years of renewables project finance, individual revenue counterparties capped ratings and drove the majority of rating actions. But a growing trend of diversity among off-takers reduces dependence on individual counterparty risk. In some countries supportive market structures suggest that the risk embedded in power purchase agreements (PPAs) may be characterized as systemic, not individual.

Merchant Exposure Expanding

In more than half of all rated wind projects, Fitch's analysis of revenues contemplates some form of exposure to prevailing market prices. This is consistent across regions. About one-third of solar projects now retain such exposure, a globally growing trend reflective of shorter PPA terms and subsidy expirations.

Coverage – Differentiating Metric

The debt service coverage ratio (DSCR) is the key metric for renewables. Indicative metrics to achieve a rating level vary by asset type and the degree of merchant exposure. For fully contracted projects, the investment-grade DSCR threshold is 1.3x for wind and 1.2x for solar photovoltaic (PV). That threshold increases by 0.4x or more for projects with heavy reliance on merchant revenue.

Upgrades Outpaced Downgrades in 2020

Running counter to broad swaths of infrastructure segments, there were more upgrades than downgrades in 2020 in wind and solar. The upgrades were predominantly driven by the improved credit quality of a major U.S. utility restructuring through bankruptcy.

Also noteworthy is that downgrades due to performance issues in 2020 did not deviate from the historical rate of about 6%. The ongoing global pandemic has had a muted impact on this class of credits that are largely insulated from demand risk and have remained operationally stable.

Criteria Application

Fitch's *Renewable Energy Project Rating Criteria* outlines the approach to rating new and existing debt instruments where repayment depends on cash flow from the operation of renewable energy projects. These criteria primarily cover onshore and offshore wind projects, PV projects and concentrated solar power plants, but may also be applied to hydropower plants and geothermal power projects.

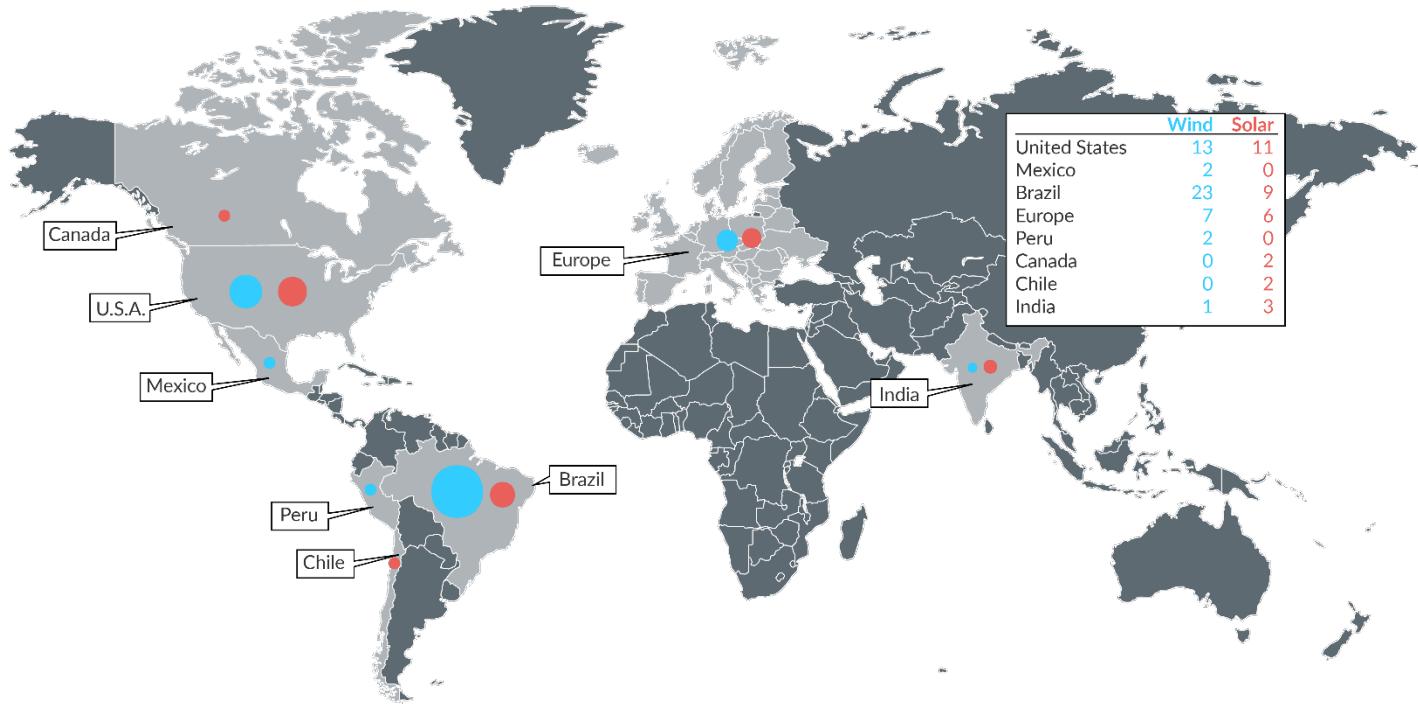
Fitch identifies four key rating drivers for debt financing for renewable energy projects: Revenue risk – volume (volume risk), revenue risk – price (price risk), operation risk and debt structure. As a general rule, volume risk and price risk have the most direct influence on renewable energy project ratings, but the weakest driver may attract greater analytical weighting. Fitch assesses the risk factors as "stronger," "midrange" or "weaker."

Fitch derives its rating by considering these assessments, along with the financial profile under the Fitch rating case (described in the *Coverage and Ratings* section) and a comparison of peer projects.

Fitch's Rated Portfolio

Fitch rates the debt instruments of 81 issuers, with repayment dependent on the operation of wind or solar projects. Within this portfolio, about 60% are wind projects and about 40% are solar projects (with the bulk of these being PV projects). Nearly half of these projects are in the LatAm region (including Mexico), one-third are located in the U.S. or Canada, 16% are in EMEA (all within Europe), and 5% in APAC. Fitch rates wind and solar projects in 13 countries— U.S., Canada, Mexico, Peru, Chile, Brazil, Spain, Germany, France, UK, Sweden, Italy and India.

Number of Fitch Rated Projects



Source: Fitch Ratings.

The typical wind project in the portfolio experienced more than six full years of operation, though Fitch has rated onshore wind transactions from the mid-2000s. Single-site wind projects (56% of the total) have an average capacity of 176MW. Projects encompassing wind farms on multiple sites have an average total capacity of 357MW.

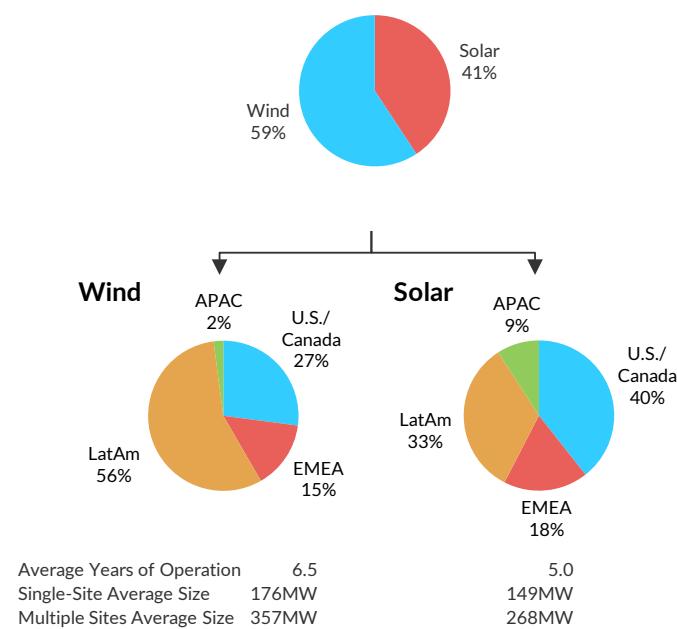
The offshore wind sector is relatively new and the rated transactions are very early into their operational life. These are big projects with an average capacity of 430MW.

The typical solar project in the portfolio experienced five full years of operation. Fitch rated its first solar PV transaction in 2011. Single-site solar projects (35% of the total) have an average capacity of 149MW. Projects encompassing multiple sites have a larger average capacity of 268MW. Over time the proportion of rated single-site projects has declined. Newly rated solar transactions largely have been multiple-site portfolio financings.

Limitations

There are inherent limitations when examining a portfolio of projects that represents just a sample of the world's installed base of renewable generation. Moreover, while Fitch has rated renewable projects for more than a decade, the bulk of the portfolio is early in its operational life. There are limitations in the ability to extrapolate the trends observed in Fitch's portfolio to the larger sector. As such, the report does not suggest any conclusions about the relative capability of wind and solar equipment manufacturers, operators or resource consultants.

Fitch's Rated Portfolio

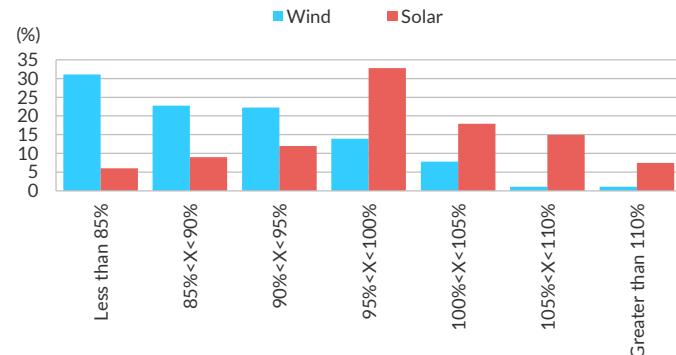


Source: Fitch Ratings.

Resource Stability Enhances Solar

Fitch's analysis of renewable energy projects across EMEA, the U.S., LatAm, and APAC shows electricity production from solar projects tended to meet or exceed initial independent estimates, while wind projects more often underperformed against expectations. This underperformance is the leading cause of ratings volatility among wind projects. For solar projects, volume risk had no negative impact on ratings.

Annual Production as % of P50



Note: This chart is based on 247 annual observations from 69 wind and solar projects.
Source: Fitch Ratings.

We compared actual production data from Fitch-rated renewable projects against the initial P50 forecasts (the annual production level the project is expected to exceed 50% of the time). The analysis takes into account data gathered since 2010 for wind and since 2011 for solar, and excludes ramp-up phases. We found 73% of annual observations across solar projects were within 5% or better of the original P50 levels, and only 6% were significantly (i.e.

more than 15%) below the initial forecasts, which are provided by independent resource consultants.

Wind, by contrast, does not measure up. Only 24% of wind project observations were within 5% or better of the original P50 levels. Nearly one-third of observations were more than 15% below. These figures exclude the onshore wind Breeze transactions (Breeze Finance S.A. and CRC Breeze Finance S.A., located in Germany and France), significant underperformers that are not considered representative of the broader wind portfolio.

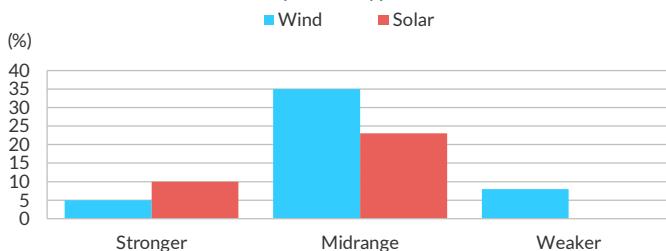
Wind project underperformance is often attributed to overestimation of power production due to the greater technical challenge in forecasting relative to solar projects. For some projects, equipment issues reduced availability and production. It is also conceivable that Fitch's dataset coincides with a period of lower natural resource that will revert over time. It can be difficult to isolate a precise cause for one particular wind project's underperformance, so extrapolating to the larger portfolio is equally challenging.

The chart below reflects the breakdown of volume risk assessments across Fitch's portfolio. Wind projects with a weaker score demonstrated poor historical performance or have resource forecasts that reflect a higher degree of uncertainty or volatility.

In contrast, solar projects benefited from better than expected solar irradiance and plant availability. The track record of solar projects is shorter, but they clearly demonstrate lower operational risk, better generation performance and lower volatility than wind projects. A much larger proportion of solar projects earned a stronger assessment for volume risk. None are assessed at weaker. Where solar project production has underperformed, it is often due to equipment malfunctions, rather than weak irradiance.

Resource Stability Enhances Solar

(Share of Assessment Score by Asset Type)



Note: The chart is based on 47 rated wind projects and 22 solar projects.
Source: Fitch Ratings.

Counterparty Dependence Tapering

Counterparty credit quality has been the largest driver of volatility in solar project ratings. This phenomenon emerged most prominently in the U.S. due to the erosion of credit quality of California's largest utilities. But a growing trend of diversity among off-takers is reducing dependence on any individual counterparty.

Nearly all rated renewable projects depend on some form of incentive structure underpinning revenue generation, providing stability and predictability. These mechanisms vary by country and will continue to evolve over time. But the contractual/market structure alone does not ensure revenue stability. The relative

strength of a projects' revenue counterparty can bolster or erode credit quality.

Utility ratings are often a cap on project ratings when PPAs are bilateral contracts where revenue is fully dependent on the creditworthiness of those off-takers. This contractual structure is present in the U.S., Mexico, and, more recently, in Brazil and Chile. The dependence on a single off-taker indicates that the project's revenue stream can be no stronger than the off-taker's credit quality.

In the U.S., solar projects performed so well operationally that some ratings are equivalent to those of the off-taker, which pays a fixed price for every megawatt-hour generated. In the wake of massive liabilities associated with the California wildfires over the past few years, the state's three largest investor-owned utilities have come under pressure. In particular, Pacific Gas & Electric Co. (PG&E) filed voluntary petitions for reorganization under Chapter 11 Bankruptcy in January 2019 and emerged 18 months later following its restructuring. The evolving creditworthiness of these entities resulted in downgrades and subsequent upgrades on numerous solar projects.

Utilities are exposed to potentially exorbitant costs and liabilities due to unexpected climate events, which are occurring with greater frequency. While an individual project may be insured or weatherized to shield against the effects of climate change, project ratings can still be affected.

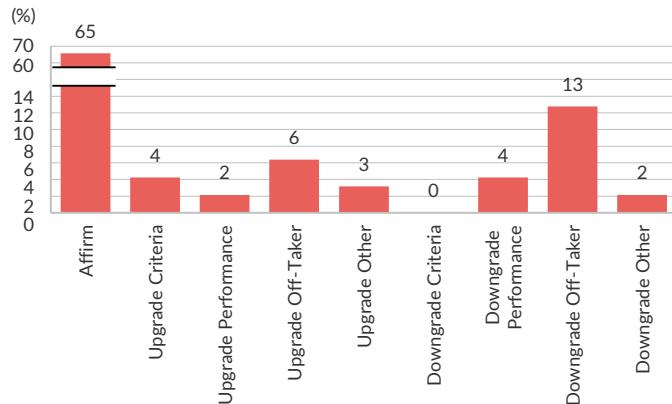
This strict adherence to counterparty caps eases when there is a supportive market structure backing the PPAs. For example, in Peru and Brazil, PPAs signed in these regulated markets carry more support from the larger power sector framework. We characterize PPA revenue risk here as systemic rather than specific to a particular counterparty, so ratings are not as strictly capped. Rated Canadian projects are similarly dependent on the overall system operator's creditworthiness.

Across Europe, revenue counterparties include government-related entities, transmission operators and market traders. However, the ratings are not constrained by the counterparties as the regulatory provisions and/or market structure envisage that the obligation to pay the incentives will apply to replacement counterparties or that the projects should be able to find alternative counterparties on similar terms.

In India, rated renewable transactions earn revenue across a group of state-owned distribution companies, diversifying counterparty risk. However, most of these entities are unrated and have a history of payment delays. To offset this risk, the transactions are structured with a more substantial financial cushion to account for potential periods of liquidity stress.

The stability and sustainability of regulatory frameworks are important considerations. Changes in law and regulations can alter market structures and introduce unforeseen risks to revenue generation. A recent example is in Mexico, where the current administration is attempting to pass legislation to prioritize dispatch from state-owned generators (mostly thermal and hydro) ahead of privately owned generators, including rated renewable energy projects. In general, Fitch does not rate to the risk of change in law unless there is an explicit forthcoming change.

Counterparties Drive Most Solar Downgrades



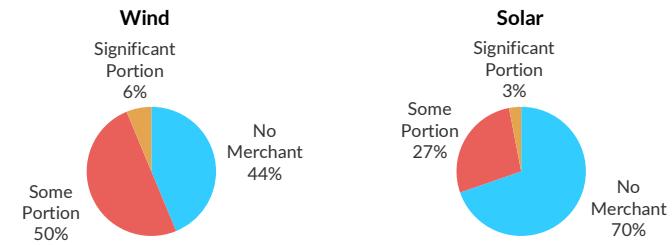
Source: Fitch Ratings.

Merchant Exposure Expanding

In more than half of all rated wind projects, Fitch's analysis of revenues contemplates some form of exposure to prevailing market prices, although rarely a significant portion over the full debt term. This is consistent across regions. Reliance on merchant revenue is a growing trend among solar projects in EMEA, LatAm and the U.S. as PPA terms, particularly those with corporate counterparties, shorten and the expiration of subsidies nears.

Exposure to market price risk reduces remuneration predictability depending on the level of exposure. Indexation of contractual prices may also result in lower stability depending on the complexity and transparency of indexation formulas. We evaluate exposure to merchant market power prices based on the ratio of merchant to total revenues that the project is forecast to receive under the Fitch rating case.

Merchant Exposure More Common for Wind



Source: Fitch Ratings.

In the U.S., the projects held within wind portfolio financings are typically all contracted with PPAs. But the contract termination dates are often staggered, resulting in a handful of projects that flip to merchant while the debt is still outstanding. Thus, merchant risk is more pronounced in the outer years, when there is the least certainty regarding market prices. Most newly rated U.S. solar portfolios also have such exposure. With PPA terms generally shrinking, we expect to see more projects financed with debt repayment beyond the contracted period, introducing potentially substantial merchant risk.

Merchant exposure is present in many projects throughout EMEA. Some earn a small portion of revenue through electricity sales at market prices on top of more secure revenue earned under a feed-in-tariff (FIT) framework. Others encounter merchant risk as

projects roll off of the FIT toward the end of the debt term. In these cases, revenue may be fully exposed to merchant risk in the debt tail when subsidies expire.

In Spain, Fitch-rated solar PV plants earn revenue under a regulatory asset base framework with a target rate of return and a small exposure to merchant prices. This framework has now been replaced with a pay-as-bid price established through auctions for new renewable projects that introduces substantial price risk.

In Brazil, wind projects under the LEN (new energy auctions) or LER (reserve auction) frameworks signed before December 2017 are subject to energy settlements if actual production yields a deficit to contractual commitments, considering the annual and quadrennial settlement mechanisms inherent to each respective PPA. In LEN PPAs, the penalties are settled at the higher of the PPA price or the spot price, thereby introducing market risk to project cash flow. For LER contracts, penalties are settled at a factor of the PPA price.

For auctions conducted after 2017, the exposure to spot prices increased further. The Brazilian regulator Agência Nacional de Energia Elétrica (ANEEL) changed the PPAs' clauses to no longer include the quadrennial mechanism. Instead, PPAs awarded through ANEEL auctions require wind projects to deliver a fixed energy output on a monthly basis, with penalties assessed at the spot price any time production falls below commitments. Bilateral PPAs in the unregulated market (known as Ambiente de Contratação Livre, ACL) followed suit with the same elevated price risk in the contract structure.

In India, tariffs are fixed for projects contracted with state-owned distribution companies. But projects that generate power for specific third-party customers (so called "captive projects") earn tariffs that are adjusted for changes in grid tariffs, introducing some price risk. These captive project PPAs are also shorter in tenor and, therefore, subject to contract renewal risk. These risks are partially offset by generally rising grid tariffs fuelled by strong growth in energy demand.

Strong Operational Track Record for Renewables

Aside from some ramp-up issues during the first years, few of Fitch's rated wind and solar projects were negatively affected by operational underperformance. Most projects employ proven technologies, and there now exists a pool of well-known operators with established track records. The average project in Fitch's wind portfolio achieved availability of at least 96% for seven straight years. Solar projects regularly top 98%.

Wind Availability Regularly Tops 96%



Note: This chart is based on 225 observations from 48 wind projects.

Source: Fitch Ratings.

The typical arrangement includes an operating agreement with a third-party service provider to perform regular maintenance at cost plus a service fee. There is often a reserve mechanism in place to cover the incurrence of larger maintenance costs. Unless there are particular technological or geographical concerns, the risk that an operator will need to be replaced is unlikely to constrain the rating. As such, operation risk scores are heavily clustered in the midrange assessment.

Due to their heightened complexity, offshore wind projects must withstand harsher operational stresses in Fitch's financial analysis. The offshore wind sector is relatively new and the rated transactions are in their early years of operations. These projects have more complex operations than onshore peers due to the more challenging operating environment offshore and, in some cases, face the risk of outages of the offshore transformers or transmission cables that connect wind farms to the onshore grids.

Portfolio financings generally benefit from a lower risk of operating volatility in terms of costs and availability, and display a tighter P50–P90 spread. Diversity among equipment manufacturers spread across a variety of geographic sites suggests that pervasive issues are less likely. However, Fitch's data set is not yet robust enough to support this conclusion. It is also possible that the management oversight required of portfolio financings offsets the benefit of diversified operating risk. As the historical record lengthens, we expect to be able to compare cost volatility of portfolio financings with single-site financings.

Debt Structures Adapted to Address New Risks

Debt structure has not often been a driver that differentiates ratings within the wind and solar portfolio. This is because the majority of financings in both asset classes contain a common set of structural elements. The typical financing is senior ranking and fully amortizing with interest accruing at a fixed rate (or fully hedged). There is typically a six-month debt service reserve, distribution lock-up (based on 1.2x DSCR trigger) and some restrictions on permitted additional indebtedness.

But as the sector evolves, project sponsors are adapting structures to address these new market dynamics and satisfy lenders' risk appetite. In many Brazilian deals, there is some exposure to floating-interest rates and inflation, though this is considered sufficiently hedged through inflation adjustments in the PPAs and debt instruments. In Germany, the WindMW GmbH (Meerwind) transaction issued a series of long notes that will mature with a balloon (and some merchant exposure). This refinance risk is considered manageable, as there is partial amortization and a cash sweep mechanism. In some fully merchant Fitch-rated transactions, price exposure is offset through target amortization to partially address the substantially more volatile revenue profile.

In India, renewable transactions usually have bullet maturities with debt tenors ranging from five to six years. In these cases, the financial analysis focuses on the achievable coverage ratio assuming the bullet is refinanced into an amortizing instrument over the remaining project life.

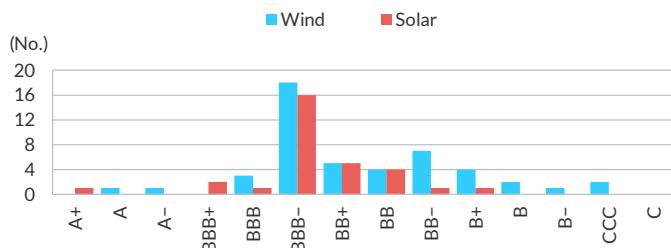
Portfolio financings are typically issued at a holding company level with cash flow structurally subordinated to the operating

companies (opco) and, in some cases, in the U.S., to a tax equity investor. Yet, the risk of subordination is often offset by limitations on debt at the opco level, flexible amortization combined with cash sweeps or strong resilience to various stress scenarios.

Coverage and Ratings

The more predictable nature of solar power is reflected in our ratings through the lower DSCR a solar project generally needs to achieve investment-grade status compared with a wind project. For fully contracted projects with no merchant risk, the investment-grade DSCR threshold in Fitch's rating case is 1.3x for wind and 1.2x for solar PV.

International Scale Ratings Clustered at 'BBB-'



Note: The Pirapora Solar Holding S.A. project rated 'A+' benefits from a guarantee from the Inter-American Development Bank.

Source: Fitch Ratings.

The Fitch rating case evaluates the resilience of the projected cash flows to a combination of stresses that together simulate a scenario of material underperformance. Typically, Fitch's rating case is based on a project's one-year P90, adjusted further downward based on the volume risk assessment to reflect the uncertainty in production assessments. Stresses that increase operating costs (ranging from 0%-20%) in the rating case are influenced by the operation risk assessment. Further stresses on production, curtailment, availability and degradation rate (for solar projects) may be included in the rating case as well.

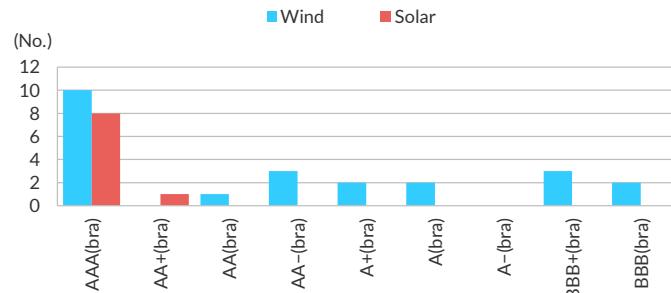
The structure of Brazilian wind contracts awarded in the regulated market prior to 2018 allows for generation deficits to be offset by previous or future surpluses (over defined four-year periods), which improves revenue predictability. Fitch uses the 10-year average P90 assessment in the rating cases for such projects.

Wind and solar projects rated on the international scale are clustered around 'BBB-'. Wind projects sustained more downgrades to sub-investment grade due to underperformance, while solar projects were due to weakness in counterparty credit quality. Those that achieved 'A' category ratings have strong counterparties rated at least as highly, and typically display strong DSCRs in line with indicative thresholds, with little expected volatility in cash flow.

Most of the renewable portfolios in India are rated in 'BB' category, driven largely by exposure to unrated counterparties and bullet maturities with sizeable refinance risk.

Most Brazilian projects only have national scale monitored ratings, as these debt instruments are issued in Brazilian real. Ratings are concentrated in the local 'AA' and 'AAA' categories reflecting investors' risk aversion and the fact that new issuances are rarely placed with ratings below the 'AA' category.

Brazilian Project Ratings



Source: Fitch Ratings.

What Is to Come

Future iterations of this report will benefit from the lengthening historical record and a growing portfolio of rated projects. Ever-growing corporate sustainability goals should continue to fuel the growth of commercial/corporate PPAs. The typically shorter tenors of these contracts suggest that we will continue to see more financings that stretch into a merchant period.

Fitch expects to see further rapid expansion of its ratings in LatAm, in particular in Brazil and Chile, and in the Middle East and Asia. In Europe, the ongoing retirement of thermal generation will lead to new capacity additions that may come through capacity auctions as well as financings on a fully merchant basis. In Asia-Pacific, we expect more portfolio-based transactions with a mix of both wind and solar, along with contributions from both fully contracted and merchant revenue sources.

In the U.S., climate events and off-taker credit issues may accelerate the push into larger and more diversified portfolio financings. We also expect to see battery storage applications become more commonplace, especially when paired with solar generation in future projects.



Appendix

Rated Portfolio – Wind

Project	Country	Site(s)	Size (MW)	Volume Risk	Price Risk	Operation Risk	Debt Structure	Current Rating
Alta Wind 2010 Pass-Through Trust	U.S.	Single	300+	Weaker	Stronger	Midrange	Midrange	BBB-
Caithness Shepherds Flat, LLC	U.S.	Multiple	300+	Weaker	Stronger	Midrange	Midrange	BB
Continental Wind, LLC (Exelon)	U.S.	Multiple	300+	Midrange	Midrange	Midrange	Midrange	BBB
Private Wind Project 1	U.S.	Multiple	300+	Midrange	Midrange	Midrange	Midrange	BBB-
Private Wind Project 2	U.S.	Multiple	300+	Stronger	Midrange	Midrange	Midrange	BB+
Private Wind Project 3	U.S.	Single	201–300	Stronger	Stronger	Midrange	Midrange	BBB-
Private Wind Project 4	U.S.	Single	101–200	Midrange	Midrange	Midrange	Midrange	BB
Private Wind Project 5	U.S.	Single	101–200	Midrange	Stronger	Midrange	Stronger	BBB-
Private Wind Project 6	U.S.	Single	101–200	Midrange	Stronger	Midrange	Midrange	BBB-
Private Wind Project 7	U.S.	Multiple	101–200	Midrange	Midrange	Midrange	Midrange	BBB
Private Wind Project 8	U.S.	Multiple	101–200	Midrange	Midrange	Midrange	Midrange	BB
Private Wind Project 9	U.S.	Single	0–100	Stronger	Midrange	Midrange	Midrange	BBB
Private Wind Project 10	U.S.	Single	0–100	Midrange	Midrange	Midrange	Midrange	BBB-
AES Tietê Eólica Participações S.A.	Brazil	Single	300+	Midrange	Midrange	Midrange	Stronger	AA(bra)
Ventos de Santo Estevão Holding S.A.	Brazil	Single	300+	Midrange	Midrange	Stronger	Midrange	AA-(bra)
Ventos de São Clemente Holding S.A.	Brazil	Single	201–300	Midrange	Midrange	Stronger	Midrange	AAA(bra)
Ventos de São Tito Holding S.A.	Brazil	Single	201–300	Midrange	Stronger	Midrange	Midrange	BBB(bra)
Itarema Geracão de Energia S.A.	Brazil	Single	201–300	Weaker	Midrange	Midrange	Midrange	BBB+(bra)
Omega Energia e Implantação 2 S.A.	Brazil	Multiple	201–300	Midrange	Midrange	Midrange	Midrange	AAA(bra)
Santa Vitória do Palmar Energias Renováveis S.A.	Brazil	Single	201–300	Midrange	Midrange	Midrange	Stronger	AAA(bra)
Copacabana Geração de Energia e Participações S.A.	Brazil	Single	201–300	Midrange	Stronger	Midrange	Midrange	AAA(bra)
Ventos de São Tomé Holding S.A.	Brazil	Single	101–200	Midrange	Stronger	Midrange	Midrange	BBB(bra)
Voltaíla São Miguel do Gostoso S.A.	Brazil	Multiple	101–200	Weaker	Stronger	Midrange	Midrange	A+(bra)
Complexo Morrinhos Energias Renováveis S.A.	Brazil	Multiple	101–200	Midrange	Midrange	Midrange	Midrange	AAA(bra)
Ventos de São Jorge Holding S.A.	Brazil	Single	101–200	Midrange	Stronger	Midrange	Midrange	A(bra)
VDB F2 Geração de Energia S.A.	Brazil	Multiple	101–200	Weaker	Stronger	Midrange	Midrange	AAA(bra)
Ventos do Sul Energia S.A.	Brazil	Multiple	101–200	Midrange	Stronger	Stronger	Weaker	AAA(bra)
Private Wind Project 11	Brazil	Single	101–200	Midrange	Stronger	Midrange	Midrange	AAA(bra)
Centrais Elétricas de Caetité Participações S.A.	Brazil	Single	0–100	Midrange	Stronger	Midrange	Midrange	A(bra)
Enel Green Power Damascena Elétrica S.A.	Brazil	Single	0–100	Midrange	Stronger	Midrange	Midrange	BBB+(bra)
Enel Green Power Manicoba Elétrica S.A.	Brazil	Single	0–100	Weaker	Stronger	Midrange	Midrange	BBB+(bra)
Elétrica Serra das Vacas Holding II S.A.	Brazil	Multiple	0–100	Midrange	Stronger	Midrange	Midrange	A+(bra)
Elétrica Serra das Vacas Holding S.A.	Brazil	Multiple	0–100	Midrange	Midrange	Midrange	Midrange	AA-(bra)
Potámi Energia S.A.	Brazil	Multiple	0–100	Midrange	Midrange	Midrange	Midrange	AA-(bra)
Vila Piauí 1 Empreendimentos e Participações S.A	Brazil	Single	0–100	Midrange	Midrange	Midrange	Midrange	AAA(bra)
Vila Piauí 2 Empreendimentos e Participações S.A	Brazil	Single	0–100	Midrange	Midrange	Midrange	Midrange	AAA(bra)
CE Oaxaca Dos, S. de R.L. de C.V.	Mexico	Single	101–200	Midrange	Stronger	Midrange	Midrange	BBB-
CE Oaxaca Cuatro, S. de R.L. de C.V.	Mexico	Single	101–200	Midrange	Stronger	Midrange	Midrange	BBB-
Energia Elétrica, S.A.	Peru	Multiple	101–200	Midrange	Midrange	Midrange	Midrange	BBB-
Parque Eólico Marcona S.A.C., Parque Eólico Tres Hermanas S.A.C.	Peru	Multiple	101–200	Midrange	Stronger	Midrange	Midrange	BBB-
Breeze Finance S.A., (Breeze III)	Germany	Multiple	300+	Weaker	Stronger	Weaker	Midrange	CCC

Rated Portfolio – Wind

Project	Country	Site(s)	Size (MW)	Volume Risk	Price Risk	Operation Risk	Debt Structure	Current Rating
CRC Breeze Finance S.A., (Breeze II)	Germany	Multiple	300+	Weaker	Midrange	Weaker	Midrange	CCC
WindMW GmbH	Germany	Single	201–300	Midrange	Stronger	Midrange	Stronger	BBB–
Private Wind Project 12	Spain	Multiple	300+	Stronger	Weaker	Midrange	Weaker	B–
Dudgeon Offshore Wind Limited	United Kingdom	Single	300+	Midrange	Stronger	Midrange	Stronger	A–
Private Wind Project 13	Western Europe	Multiple	300+	Stronger	Midrange	Midrange	Midrange	BBB–
Private Wind Project 14	Sweden	Single	0–100	Midrange	Weaker	Stronger	Stronger	BBB–
India Green Energy Holdings	India	Multiple	300+	Midrange	Midrange	Midrange	Midrange	BB–

Note: India Green Holdings is a mixed portfolio of wind and solar assets.

Source: Fitch Ratings.

Rated Portfolio – Solar

Project	Country	Site(s)	Size (MW)	Volume Risk	Price Risk	Operation Risk	Debt Structure	Current Rating
Axiom Infinity Solar LP	Canada	Multiple	0–100	Stronger	Stronger	Midrange	Midrange	BBB
Ontario Solar Holdings LP	Canada	Multiple	0–100	Midrange	Stronger	Midrange	Midrange	BBB–
Topaz Solar Farms LLC	U.S.	Single	300+	Midrange	Midrange	Midrange	Stronger	BB
Solar Star Funding, LLC	U.S.	Single	300+	Stronger	Midrange	Midrange	Stronger	BBB–
Private Solar Project 1	U.S.	Multiple	300+	Midrange	Midrange	Midrange	Midrange	BB
Private Solar Project 2	U.S.	Multiple	300+	Stronger	Midrange	Midrange	Midrange	BBB–
Private Solar Project 3	U.S.	Multiple	300+	Midrange	Midrange	Midrange	Midrange	BB–
Private Solar Project 4	U.S.	Multiple	300+	Midrange	Midrange	Midrange	Midrange	BB+
Private Solar Project 5	U.S.	Multiple	300+	Midrange	Midrange	Midrange	Midrange	BBB–
Private Solar Project 6	U.S.	Multiple	101–200	Midrange	Midrange	Midrange	Stronger	BB
Private Solar Project 7	U.S.	Single	101–200	Stronger	Stronger	Midrange	Midrange	BBB+
Private Solar Project 8	U.S.	Multiple	101–200	Midrange	Stronger	Midrange	Midrange	BBB–
Private Solar Project 9	U.S.	Multiple	0–100	Midrange	Stronger	Midrange	Midrange	BBB–
Pirapora Solar Holding S.A.	Brazil	Single	101–200	Midrange	Stronger	Midrange	Stronger	AAA(bra)
Guimaraia I Solar SPE	Brazil	Single	0–100	Midrange	Stronger	Midrange	Midrange	AAA(bra)
Guimaraia II Solar SPE	Brazil	Single	0–100	Midrange	Stronger	Midrange	Midrange	AAA(bra)
Sertão I Solar Energia SPE S.A.	Brazil	Single	0–100	Midrange	Stronger	Midrange	Midrange	AAA(bra)
Sobral I Solar Energia SPE S.A.	Brazil	Single	0–100	Midrange	Stronger	Midrange	Midrange	AA+(bra)
Pirapora II Solar Holding S.A.	Brazil	Single	0–100	Midrange	Stronger	Midrange	Midrange	AAA(bra)
Eren Dracena Participacoes SA	Brazil	Multiple	0–100	Midrange	Stronger	Midrange	Midrange	AAA(bra)
Projeto Central Fotovoltaica São Pedro II Ltda	Brazil	Single	0–100	Midrange	Stronger	Midrange	Midrange	AAA(bra)
Projeto Central Fotovoltaica São Pedro IV Ltda.	Brazil	Single	0–100	Midrange	Stronger	Midrange	Midrange	AAA(bra)
Javiera SpA and Parque Solar Fotovoltaico Sol del Desierto SpA	Chile	Multiple	300+	Midrange	Midrange	Midrange	Midrange	BBB–
Private Solar Project 9	Chile	Multiple	0–100	Midrange	Midrange	Midrange	Weaker	B+
Andromeda	Italy	Multiple	0–100	Stronger	Midrange	Stronger	Midrange	BB+
Private Solar Project 10	Spain	Multiple	101–200	Stronger	Midrange	Midrange	Stronger	BBB–
Private Solar Project 11	Spain	Multiple	0–100	Stronger	Midrange	Midrange	Stronger	BBB+
Private Solar Project 12	Spain	Multiple	0–100	Stronger	Midrange	Midrange	Weaker	BBB–
Private Solar Project 13	Spain	Multiple	0–100	Stronger	Midrange	Midrange	Stronger	BBB–
Private Solar Project 14	Spain	Single	0–100	Stronger	Midrange	Midrange	Stronger	BBB–
Adani Renewable Energy (RJ) Limited, Kodangal Solar Parks Private Limited, Wardha Solar (Maharashtra) Private Limited	India	Multiple	300+	Midrange	Stronger	Midrange	Stronger	BBB–

Rated Portfolio – Solar

Project	Country	Site(s)	Volume	Operation	Debt	Current	
			Size (MW)	Risk	Risk	Structure	Rating
Azure Power Solar Energy Private Limited	India	Multiple	300+	Midrange	Stronger	Midrange	Midrange BB
Adani Green Energy (UP) Limited, Parampujya Solar Energy Private Limited, Prayatna Developers Private Limited	India	Multiple	300+	Midrange	Stronger	Midrange	Midrange BB+

Source: Fitch Ratings.

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