No. 127/23, 71–80
ISSN 2657-6988 (online)
ISSN 2657-5841 (printed)
DOI: 10.26408/127.06

Submitted: 28.04.2023
Accepted: 23.05.2023
Published: 30.09.2023

DECISION PARAMETERS IN PROJECT FINANCING AND THEIR IMPLICATIONS FOR OFFSHORE WIND FARM PROJECTS

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Abstract: Offshore wind farms are one of the most important pillars of the successful implementation of the envisaged energy turnaround. However, so far, the States are all far from reaching their targets. Therefore, a great amount of capital is needed. Since a large part of offshore wind farms is financed by debt capital, it was examined which criteria are currently prevailing on the market. The main findings are that cover ratios are the most important key figures in the decision-making process and during the term. In addition, a large number of clauses are contractually fixed to reduce the risk of default.

Keywords: project financing, debt providers, offshore wind farms, key performance indicators.

1. INTRODUCTION

For financing large-scale projects, project financing has become increasingly established in Europe in recent years, but the contractual conditions have changed considerably. With this in mind, this study aims to answer the question of which criteria are used as a basis by lenders when evaluating and deciding on the financing of project plans. Furthermore, it also addresses the question of which effects the decision parameters have on the concrete design of offshore wind farm projects.

To answer these questions, the characteristics of project financing are defined first. The current developments of financing structures for the realisation of large projects are shown on the basis of eight qualitative expert interviews from the field of "structured finance" of international banks and other lenders. By means of a questionnaire, they were asked about the individual criteria they base decisions on, and how loan conditions can be influenced if criteria are either exceeded or not met.

Against this background, the current developments in the context of offshore wind farm financing are also examined.

2. PROJECT FINANCING

2.1. Market size and sectors

A project is a one-off, i.e. non-repetitive, undertaking with a clearly defined starting position, a goal to be achieved and a time-limited horizon (Projektmagazin 2022). A major proportion of large-scale projects is financed by project financing. In the context of project financing, a project company is founded by industrial and/or financial shareholders (sponsor(s)) and provided with equity capital. The sole objective of this Special Purpose Vehicle (SPV) is the planning, construction, operation and eventual dismantling of a large-scale project as e.g. an offshore wind farm. As a single-purpose company, it thus raises outside capital and has unlimited liability [Nevitt and Fabozzi 2000].

In 2021, the global credit volume for project financing in the fields of energy production, oil & gas exploration, transportation, telecommunications and many other sectors amounted to over US$300 billion. German lenders are also supporting important projects in this regard. For example, KfW Bank contributed €16.6 billion to project financing in 2020.

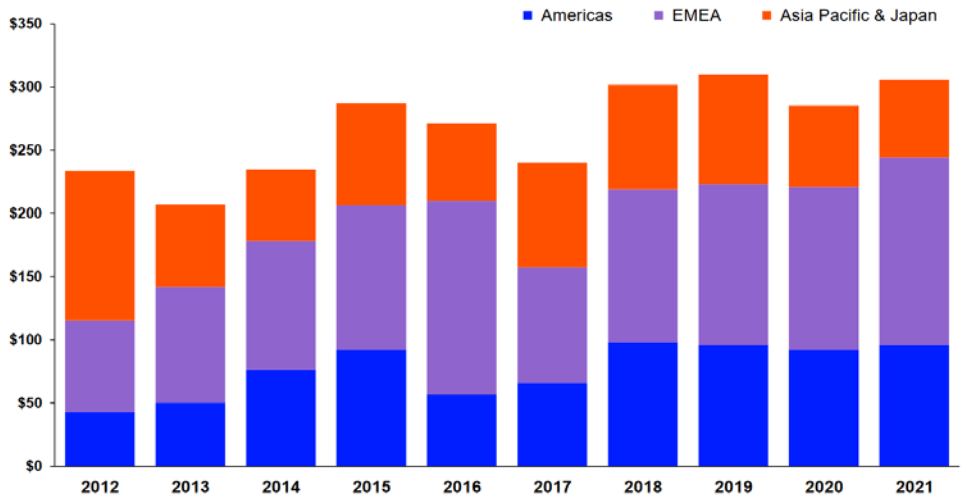

Fig. 1. Global project finance loans

Source: [Refinitiv 2021].

In addition to the permits, the equity capital contributed and the infrastructure assets to be constructed, the lenders have no further liability mass available to cover the debt service other than the future cash flows expected from the operations of the project company. This currently predominant form of project financing is referred to as "non-recourse". By contrast, in traditional corporate financing, the sponsors developing a project raise debt on their balance sheet, making the entire investing company liable with its assets, as shown in Figure 2. The repayment of debt could be impacted by other successful activities of the corporate.

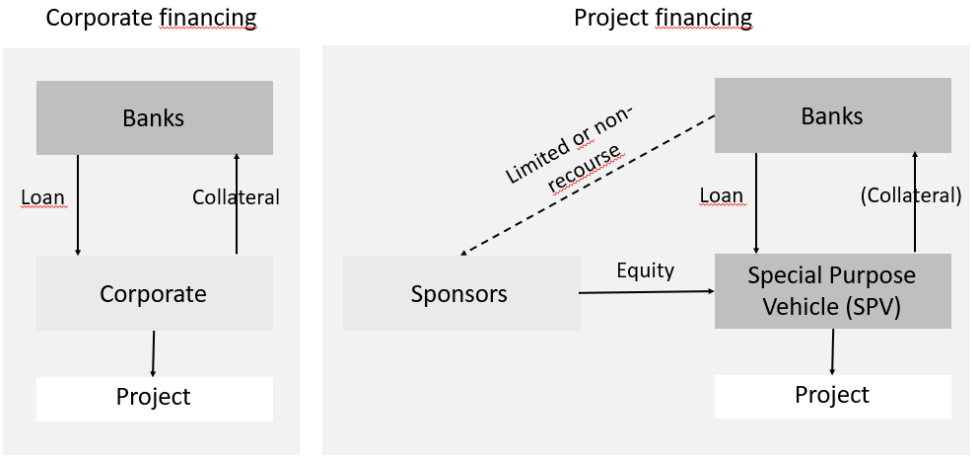

Fig. 2. Corporate financing vs. Project financing

Source: [Böttcher and Blattner 2013].

However, this is not the case with project financing, where financing is granted on a non-recourse or limited recourse basis. These clauses (especially the first) mean that banks have no access to the sponsors' assets should the project fail. Even if there is limited recourse instead of non-recourse, the situation remains unchanged. The difference is that the debt providers have rights of recourse towards the sponsors, which are contractually fixed in terms of time, amount, or situation.

For the construction of offshore wind farms, these rights of recourse traditionally expire at the time of commissioning. Even then, the conditions under which banks could have recourse to collateral, given by the vehicle company's sponsors, are mere possibilities. In any event, full enforcement of guarantees would not enable full recovery of the sums that were loaned. Consequently, debt holders bear part of entrepreneurial risk.

Besides said risk sharing, for the sponsors of project financing, the remaining intact financial flexibility is beneficial, and the sponsors are protected against any negative impact from the project [Larreur 2021].

2.2. Key performance indicators

Considering that the company has no history and is independent from the project initiators, capital providers cannot determine creditworthiness based on past business operations and balance sheets, e.g. "debt/equity ratios" or "liquidity ratios" which are common in corporate financing. Therefore, project financing is referred to as off-balance sheet financing. Project assessments are based on expected cash flows of the project company as these are the only source for repaying debt, e.g. for an offshore wind farm resulting from wind assessments in the form of full load hours and market price expectations (cash flow-related lending). Lenders base projected full load hours on P90 quantities. Thus, as expected, 90% of the expected wind volumes exceed the underlying values. This conservative basis for estimating wind volumes was confirmed by all interviewees.

The valuation is based on the „Cash Flows Available For Debt Service“ (CFADS), the difference of all cash in- and outflows related to the operation, and maintenance of the project. The CFADS can then be used to pay the debt service, i.e. the sum of interest and principal payments. In the past, „Debt Service Cover Ratios“ (DSCRs) have become established as key indicators for project evaluation for large-scale projects [Mohamadi 2021]. These ratios, which are calculated for 12-month slices, provide an estimate of the extent to which the expected available cash flow can cover the debt service for the period. Every annual DSCR should be at least 1.2, depending on the risk profile of the project under consideration. The buffer of required higher DSCRs is supposed to ensure that even in case of underperformance, the expected cash flow will exceed the debt service. So the amount of debt and margin are based on the predictability and quality of the expected cash flow.

For a project with a finite duration, such as renewable energy projects, the following cash inflow and outflow over time are expected, as shown in Figure 3. These are the basis for the Key Performance Indicators (KPI) of various capital providers. In the case of an offshore wind farm, cash outflow for decomissioning can be added at the end of the project.

Furthermore, the Average Debt Service Cover Ratio (ADSCR) is also calculated. This describes the same ratio averaged over the entire loan term. In other words, the sum of all DSCRs of the remaining years of the loan term is divided by the number of remaining years of the loan term.

In addition to the annual DSCR', the "Loan Life Cover Ratio" (LLCR) has been proposed in the literature so far, at least at the beginning of the construction of the large-scale project. This figure, which is calculated on a certain point in time, puts the estimated discounted CFADS in relation to the open credit exposure at the point in time under consideration. Unlike the DSCR, this ratio thus includes the entire term of the loan; the threshold value has been named as 1.5 in the literature.

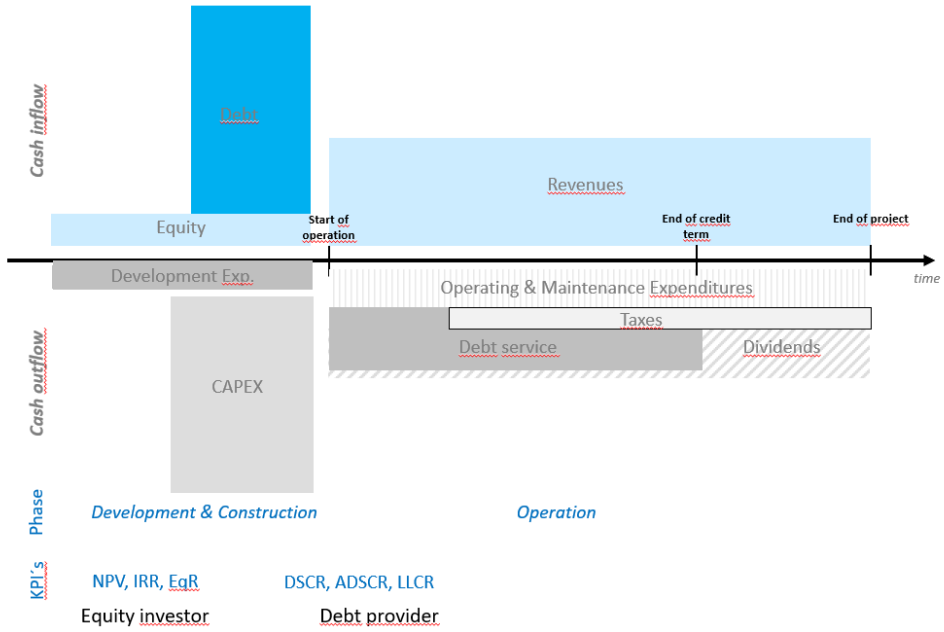

Fig. 3. Expected cash in- and outflow

Source: [Mohamadi 2021].

Cover ratios are used to determine how safe the project is and, in turn, the reliability of loan repayment. The riskier the industry and the project itself, the higher the cover ratios required by lenders.

If the cover ratios cannot be achieved in the initial planning, there are various ways of changing the parameters in order to achieve them and make project financing possible [Mazars 2021].

3. RESEARCH BACKGROUND

In order to gain knowledge of the reality regarding the criteria for the decision of granting external capital, techniques of questioning were used, which are assigned to the field of primary research. To ensure the necessary depth, expert interviews are used for this work, which are assigned to qualitative methods. In order to gather as broad a spectrum of data as possible and supplement the findings of the qualitative research, a survey is also conducted using a standardised questionnaire, which corresponds to a quantitative survey.

Using qualitative and quantitative empirical research, eight expert interviews were conducted via online sessions in spring 2022, using a pre-structured questionnaire. This included questions on the relevance and height of KPIs as well

as measures to be taken should the required limit values not be achieved. The interview sheet included 25 questions. To improve the scope for analysis, open-ended questions were mostly avoided and replaced by close-ended questions and/or supported questions. Participants for the expert interviews were recruited via the authors' existing network and events.

4. MAJOR FINDINGS

4.1. Determination of interest rates

The prerequisites for taking out loan financing are the existence of a permit from the Federal Office for Navigation and Hydography as well as wind assessments. All interview partners confirmed that, on average, the proportion of borrowed capital is 75 to 80%; in the case of traditional corporate finance, the target debt-equity ratio would thus be 3 to 4.

The determination of the interest rate for financing is based on Euribor plus a margin for European transactions. During the construction phase, an average of 140 basis points in addition to the Euribor is used to determine the construction period interest rate; after completion, only a premium of 120 basis points is applied. This range was confirmed by all participants and currently seems to be the standard for offshore wind farms.

All market participants have confirmed that the annual DSCRs as well as the ADSCRs are the most important key figures for assessing the feasibility of an offshore wind farm in advance. If these are too far outside the values prescribed internally by the banks, no further consideration is given.

The table below shows eight aspects, ranked by the experts, on how important the individual aspect is for deciding if a project is financed with external debt. Zero means „not important at all“, while four means „absolutely necessary“. The line shows the interim range which the experts used to rank the aspect, while the mark shows the average points given.

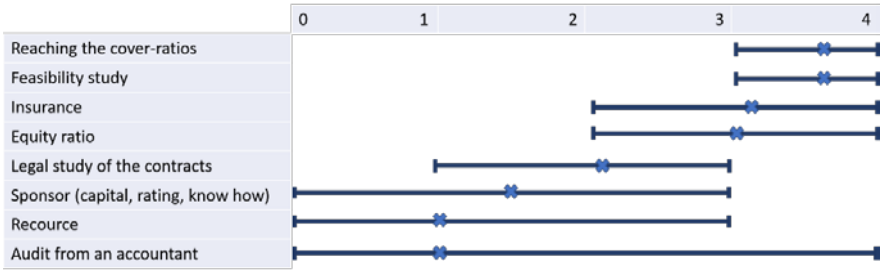

Fig. 4. Aspects of project financing

Source: author's own design.

In the event of a positive assessment of the key figures, a technical review is carried out. However, this is not done by the investors themselves. Instead, all respondents stated that the technical assessment was performed by an external expert.

However, it should be emphasised that the required DSCRs have been significantly reduced over the last few years. While, a few years ago, characteristics of 1.4 were still required for offshore wind farms, these are currently only 1.2 to 1.25. A buffer of up to 25% of the expected cash flows against debt service is thus considered sufficient to cover the assumed risks during operation. The experts cited two main reasons for this:

On the one hand, existing investors have had predominantly positive experiences with offshore wind projects, enabling the expected returns to be achieved in recent years. On the other hand, the important reason for the reduction of critical parameters, according to the interviewees, is that DSCRs – in the amount and form previously described – are no longer enforceable for offshore wind farms. Currently, there is an oversupply of liquidity in large-scale projects.

4.2. Current market participants

Capital providers for the first European offshore wind farms were mainly project developers, major banks and utilities via equity and large loans from bank consortia in the form of club deals. Most of these capital providers are still present, but the group of participants has since expanded significantly. According to experts, the main driver is the increased demand for "green assets" on the balance sheets of large companies and banks as a result of the EU taxonomy [European Commission 2022].

The classification system for sustainable economic activities promotes the demand for participation in large sections of offshore financing. Offshore wind farms fit very well, as their financial demand always exceeds one billion euros and thus require large sections for financing. According to the interviewed experts, U.S. investment banks with a previous focus on mergers & acquisitions as well as several Asian banks from Korea and Japan have recently also become involved in European offshore financings [Global Wind Energy Council 2021]. Other former parties, such as Copenhagen Infrastructure Partners or the Australian group Macquarie, are now financing the first offshore wind farms in Taiwan. However, they are currently no longer financing European wind farms.

Many financial investors also see offshore wind farms as an attractive investment as utilities have already acquired extensive experience in this area. The risk assessment is therefore significantly better than it was 10 years ago. Other reasons include securing their own power supply for industrial customers, such as BASF or steel companies. By contrast, participants in earlier financing schemes have already withdrawn from the European market. Turbine manufacturers, such as Siemens Gamesa or Vestas, are hardly to be found as equity providers any more.

Due to the increased supply of liquidity for offshore wind farms, many experts have spoken of a "sponsor market", which, supported by financing advisors, can set their conditions.

4.3. Current KPIs

The aforementioned DSCRs of 1.2 to 1.25 generally assume the existence of contracted revenues, such as power purchase agreements (PPAs). DSCRs of 1.4 continue to be contracted for operating years not backed by PPAs. Surprisingly, LLCRs are hardly used anymore. One participant said that they are only used for "projects with high risks, like waste incinerators." If the calculated DSCRs do not meet the expectations of the lenders, the consequence will be a reduction in debt rather than an interest rate adjustment. This was also confirmed by the banks that participated in the survey.

The above-mentioned key figures of the lenders for project evaluation are monitored not only as part of the lending decision but also during the term as part of the affirmative covenants. The so-called forward DSCR is estimated on a rolling basis for the coming 12-month maturity bands, on the basis of updated actual and planned figures. If the threshold values are not met as expected, this will result in modified collateral requirements, which are already fixed in advance in the loan agreements.

In order to secure future debt service payments, reserve accounts used to be set up in which the operators had to keep a six-month debt service reserve as liquidity. These classic reserve accounts are currently only found in exceptional cases on European offshore wind farms. The current standard is the establishment of revolving temporary lines (debt service reserve facilities), which serve as bridge financing to secure debt service in the event of "poor wind" yields.

According to the interviewees, they do not see a significant increase in risk in these short-term financings as the assessment of total credit is based on the previously mentioned P90 values for estimating full load hours.

4.4. Other arrangements

Furthermore, the participants were asked to name further agreements that are part of the underlying contracts. As a measure to reduce the risk of default, all the respondents mentioned contracting additional agreements that take effect when defined lower limits for the key figures are reached during the term. This is what is called "lock-up events." Examples of this are cash flow caps, e.g. a prohibition on the distribution of dividends or the need for restructuring, in the form of equity injections by the sponsors, for example.

Ideally, all assets of the SPV are agreed on as a collateral for the lenders; according to the experts, it is not (or no longer) possible to enforce any further rights

of recourse against the sponsors due to the increased supply of capital on the equity and debt side. The previously mentioned limited recourse agreements are currently rarely encountered in offshore wind farm financings.

5. CONCLUSIONS AND CURRENT CHALLENGES

The main findings are that cover ratios are by far the most important key figures for determining the success of a project. However, it can be said that the feasibility of the project, the use of state-of-the-art technologies and the experience of the sponsors certainly influence lenders in their decision process. At the very least, lenders expect an equity share of around 20% plus proof of the most important types of insurance, such as liability, construction and force majeure insurance.

The surveys were conducted mainly in January and February 2022, before the Russian invasion of Ukraine. Developments since the beginning of the war could therefore not yet be taken into account. Worthy of note are the sharp rises in interest rates since that date, which extend across all maturity bands. These are reflected in long-term interest rate agreements, hence the debt service to be paid during the time of operation as well as the construction time interest, which will increase CAPEX as well as the amount of debt.

As shown in Figure 5, the 12-month Euribor has risen from -0.323% by February 24th to 2,834% by November 17th, an increase of 315.7 basis points.[1]

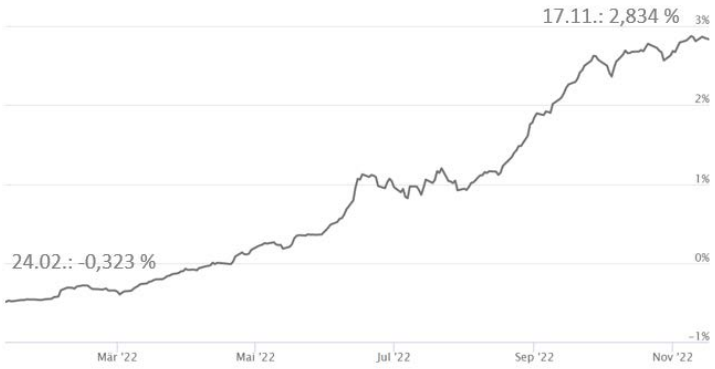

Fig. 5. 12-month Euribor increase since the start of the Ukraine crisis [Euribor 2022]

Even if there is a chance that the interest rate base will decrease again in the long term over the total lifetime of a wind farm, the impact of an interest rate increase by 100 basis points for a capital requirement of €2 billion is significant for the

[1] Currently, the Euribor is even by 4.169% (September 15th).

CAPEX activated and repayment, particularly for annual interest payments as well as the DSCR. It will be interesting to observe whether this development will be reflected in lower leverage ratios in the near future.

In addition to higher interest rates, the current high inflation rates are a challenge for project operators of offshore wind farms. In particular, the high volatility of steel prices is a further risk and might significantly increase CAPEX, compared to planning just one year ago. While, in the past, at least €2-2.5 million per megawatt were calculated for the construction of offshore wind farms, the current lower limit is more likely to be €3 million.

One challenge for planners is the estimating long-term compensation rates against the background of global changes.

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