A View of “Project Finance” For Renewables Policymakers

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INTRODUCTION

This article intends to provide policymakers with a mercifully brief and readily applicable overview of the interdependency of project finance debt (don’t worry – we’ll explain terms later), private equity and governmental incentives for renewable energy projects. More pointedly we hope to assist your task of deciding what levels of governmental incentives will spur private sector investments in renewables in your jurisdiction without putting unnecessary strain on the government’s budget or subjecting commodities such as electricity and motor fuels to drastic price increases.

It is not meant as an exhaustive treatment of its subject, and it cuts some corners in an effort to provide some straightforward insights. Take it for what it is – the view of a bank that has loaned hundreds of million dollars to renewable energy projects and that shares the mindset and preferences of most other banks that make loans and consider themselves focused on the needs of infrastructure projects.

This article is a joint effort of REIL and Nordkap Bank AG

Renewable Energy and International Law (REIL; www.reilproject.org) is an international policy and law network, bringing together the business and finance communities, policymakers, scholars, lawyers, and science and technology experts to create enabling legislative and policy frameworks for clean energy on the international, national and subnational levels. REIL's hope is that this article will be a window for policymakers into the commercial and financing side of renewables.

Nordkap Bank AG (www.nordkapbank.com) is a niche investment bank located in Zurich, Switzerland. Current Nordkap-arranged project financings include a Hawaiian biomass facility, Russian mini-hydro, German biogas and Eastern European ethanol. Stefan Gerig and Eric W. Sievers, Nordkap's Chief Investment Officer and Senior Vice President, respectively, are REIL Project Partners.
The project’s costs

Let’s assume that the project your jurisdiction would consider a success is a ten megawatt wind farm located on four family farms. The wind turbines will not displace farming and, accordingly, such a power generation project mixes farming and energy. Despite concerns about noise, aesthetics, and impacts on birds, most jurisdictions generally accept such a project as socially and environmentally sustainable, which is why we use it here as our example.

The cost of this project is, simplified:

- the cost of preliminary wind studies of the area and project engineering, design and permitting, known as early stage development costs (which we round to €500,000);

- the cost of leasing or buying the land on which the wind turbines will be placed, known as site acquisition costs (which we assume here for convenience is zero – perhaps the farmers are owners of the project);

- the cost of the wind turbines and associated equipment and their installation, which are generally known as engineering, procurement and construction (“EPC”) costs (which we round to €10 million);

- the cost of interconnecting the wind farm to the power grid and upgrading the grid as necessary to accommodate and regulate this new supply, known as grid interconnection costs (which we for convenience will assume here is either zero or a cost that the grid operator will bear and pass on to the users of the grid in general and not to the project);

- in the event of a project financing, the costs of two sets of lawyers (one for the project and one for the lenders), an independent engineer (to assure the lenders that the project is a good project), other third party consultants (e.g. accountants and auditors) and closing costs of the lenders, known as financing costs (which we round to €500,000); and

- the cost of operation and maintenance of the wind turbines, including the cost of all employees, known as O&M costs (which we round to €1,500,000 per year).

As you can see, the project will cost €10,500,000 to complete without project finance debt and €11,000,000 to complete with project finance debt, and in either case €1,500,000 per year will be needed to operate the project. Also, in any case, the early stage development costs will be incurred before most lenders would consider loaning funds to the project.

What is bankable

Most policy papers you read will argue, when it comes to governmental incentives, for particular kinds of incentives, such as income tax credits, investment tax credits, loan guarantees, accelerated depreciation, feed-in tariffs, or any of dozens of other possible
ways to apply budgetary funds and the efforts of governmental and regulatory agencies in order to spur the private sector. This article, however, is not really concerned about “kinds” of incentives, but rather focuses on the “bankability” of incentives. Structured correctly, most kinds of incentives for renewables can be “bankable.”

The kind of debt discussed in this article is *project finance* debt. Like other types of asset-based *structured finance* (e.g. securitizations, leasing or home mortgages), project finance is more concerned with the future cash flows and underlying value of an asset than with the past credit history of the borrower. In contrast to project finance, past credit history and audited financial statements underlie most bank lending and are the lynchpins of the credit card industry and corporate debt. As a simple distinction, project finance wants a viable prediction of future income, while corporate finance wants a verification of past earnings.

The reason why project finance is suitable to *infrastructure* projects (anything where the underlying economically valuable asset can’t disappear overnight, such as power plants, toll roads, ports, biofuels refineries and airports) is because much more debt can be put into an infrastructure project through project finance than through corporate finance. As useful rules of thumb (that are by no means set in stone), a typical corporate finance loan is based upon an assumption of the capital structure of the borrower that is 50% debt and 50% equity, whereas a typical project finance loan is 70-80% debt. The amount of debt in the capital structure of a company is *leverage*.

For purposes of this discussion, we assume that a *special purpose company or special purpose vehicle (“SPV”)* is formed to own the project and that it owns nothing other than the project. The owner of the SPV is the *sponsor* of the project, who may be one of the largest corporations in the world or may be a collection of farmers.

The chart below depicts a typical structure for a project finance transaction, linking the various involved parties through detailed contracts to the SPV implementing the project. Project documentation is designed to minimize the risks to the SPV (and, thence, to the lenders) in connection with the construction and operation of the project. The general rule is that each project participant should bear the risks that this participant is best in a position to control, *i.e.* the construction company should assume construction-related risks, the operating company should assume operations-related risks.
**Bankability** means that a particular renewables project can secure substantial project financing, that lenders are willing to loan money to the project. Please note that it doesn’t mean that lenders are or are not willing to loan money to the sponsor of a project. That is because most project financings are to a large degree *non-recourse* to the sponsor; if the underlying project fails and the loan is not capable of being repaid, the lenders can’t recover their loss from the sponsor. In the real world, almost every project financing is *limited recourse* instead of truly non-recourse; certain risks of the project are assumed by the sponsor. For example, a typical *limited guarantee* is a sponsor’s agreement with a lender (outside of any agreement that the lender has directly with the SPV) that if EPC costs exceed €10 million it will pay some or all of the excess.

At the end of the day, project finance lenders are not willing to accept much risk (since their debt is typically not even in the double-digit percentage rates), nor are they interested in potential upsides to a project (since lenders don’t share in profits). Accordingly, project finance intersects with governmental incentives because project finance loans are premised upon the *almost certain minimum* cash flows of a project. Assurance about cash flows comes not only from binding contracts (e.g. for O&M services, offtake of power, fixed price EPC services, etc.) with creditworthy counterparties and historic information about commodity prices, but also from regulatory mechanisms (e.g. tax credits and feed-in tariffs).

Despite rhetoric about the wonders of free markets in policy and academic circles, the reality in the trenches is that market price signals and mechanisms in the energy industry are about as ill-aligned to appropriate investment planning as is possible, due to a variety of objective realities, such as (i) several years being needed from a decision to build a facility until the actual commercial operation of the facility; (ii) the huge upfront costs of building infrastructure; (iii) energy markets are anyway subject to a very high degree of regulation in most of their activities anyway; and (iv) the near-impossibility of storing electricity. As a result, governments are often the market players best positioned to intervene in the face of a *market failure* and maximize overall economic efficiency through appropriate incentives.

**Leverage and equity returns**

At a certain point, the SPV may decide that it wants a loan for the project. There are three very good reasons why an SPV might seek a loan. The first reason, which is not salient to the issues discussed here, is for *insurance* – the project might receive ancillary benefits if a state bank or multilateral development bank is a lender (e.g. someone influential to lobby on its behalf if problems arise with a local or national government). The second reason is *desperation*; the SPV might not have any cash available for the project. The third reason is *return maximization*; the SPV would like to increase its investor’s *internal rate of return* (“IRR”). These latter two reasons are the subject of this article.

It is crucial for policymakers to understand IRR. Let’s assume, simply for illustration, that the project will generate €2,000,000 in profit every year (after all O&M costs, taxes, etc. have been paid) for 10 years after a one year construction
period. Is that an attractive return for investors? Too often policymakers assume that this question can be answered definitively if construction costs are known, but the following discussion argues that this is only half the story. While the €2,000,000 represents a return on equity of 20% (which is on its face an attractive return), the situation looks very different and has a lower return profile as a result if we assume that the investor would also expect a return on equity (and every sane investor would in fact expect to recoup its original investment).

First, let's unpack the scenario of the project being unleveraged, which is that there is no debt. We compare the return assumed against a risk-free alternative open to the sponsors, to invest the money instead in a 5% interest bearing account for 10 years, as shown in Example 1 below.

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In this example, only in year 7 is the initial investment recouped and is the investor realizing profit. The €9,500,000 cumulative profit of the sponsor at the end of year 11 is in this case the economic equivalent of its having been invested in an account yielding 11.2% per year; therefore, the IRR for its investment in the project is 11.2%. However, IRR is a determination that is not as simple as computing bank account interest – it also takes into account when payments are received and weights earlier payments over ones later in time. For example, the year of construction we assume when no revenues are received results in a drop in IRR from 13.8% to 11.2% as compared to a situation in which there are also only ten years of revenue but no time needed for construction.

Now, locking up €10,500,000 in the hope of making an 11.2% return is not all that attractive an option unless you’re certain the project will be a success. As an equity investor, you’re interested in the risk/return profile of the project; you’re happy to earn 11.2% if that 11.2% is almost guaranteed and if there’s a good chance you’ll actually earn 50% (fabulous returns like that are upside potential); you’re not at all happy if that 11.2% is pretty much your maximum expected return, if it’s more likely to be 2% and if there’s a decent chance you’ll lose your investment. In that case, simply putting your money in the bank is more attractive. More infrastructure projects crash and burn than banks. For specifically these reasons, to ground the present conversation in some commercial experience, equity investors in infrastructure aren’t all that interested, in most cases, in a 11.2% projected return.

However, as an equity investor, that doesn’t mean you’re not interested in the project. Ideally you’d like not to invest so much and also get a better rate of return. Leveraging your project is the way to do this. Let’s assume that you find a bank willing to loan the SPV €5,000,000 for 11 years at 8% interest. What that means is that each year, in addition to €1,500,000 in O&M costs, you will have debt service costs (which need to be paid before the sponsor can put any of the cash generated in its pocket) as illustrated in Example 2:
All loans are split into principal and interest for purposes of debt service. Interest is calculated as “outstanding principal” multiplied by the interest rate. Payment of principal over time is amortization, as principal decreases, so will interest payments. Amortization rates can be played with so that the amount of debt service remains steady over the life of the loan (which is how many home mortgages are calculated). For the sake of simplicity, we assume “straight-line” amortization in our examples, even though this does not reflect the fact that most infrastructure loans are amortized more creatively. Please also note that we assume a fixed 8% interest rate; most infrastructure loans are instead expressed as a margin (like 2.5%) over LIBOR (the London Interbank Overnight Rate), and LIBOR can easily vacillate over a ten year period between 1% and 8%. Through interest rate “swaps” the interest margin can be fixed, but often this is not done.

With respect to the tables above and below, note that there is no principal repayment during year 1 construction (a principal holiday) since there is no revenue, but that €400,000 in interest is assumed to be paid. You can see how this is handled on year 1 of the Project column, where 6.4 equals €10,500,000 in project costs plus €500,000 in financing costs minus €5,000,000 in loans plus €400,000 in accrued interest. In other words, it is, due to the construction period, a €11,400,000 project. Further, in the Project row, whereas

### Example 2

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<td>500</td>
<td>500</td>
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<td>Interest</td>
<td>400</td>
<td>400</td>
<td>360</td>
<td>320</td>
<td>280</td>
<td>240</td>
<td>200</td>
<td>160</td>
<td>120</td>
<td>80</td>
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That will translate into having, instead of €2,000,000 every year to be distributed to the sponsor as profits, only €1,100,000 in year 2, but more in each year after that. It also means adding an extra €500,000 upfront in financing costs.

### Example 3

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<tr>
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<td>850</td>
<td>850</td>
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<tr>
<td>Interest</td>
<td>680</td>
<td>680</td>
<td>612</td>
<td>544</td>
<td>476</td>
<td>408</td>
<td>340</td>
<td>272</td>
<td>204</td>
<td>136</td>
<td>68</td>
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The cash flow modeled above reflects a growth in IRR from 11.2% to 11.7% despite the additional financing (€500,000) and accrued interest (€400,000) costs of the project.

However, let’s say that the loan is not for €5,000,000 but €8,500,000, which is the actual level of a true project finance loan (75%-80% of total project costs, going as high as 100% in some ideal cases). Debt service would be as illustrated in Example 3:

### Example 4

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<tbody>
<tr>
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<td>850</td>
<td>850</td>
<td>850</td>
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<td>850</td>
<td>850</td>
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</tr>
<tr>
<td>Interest</td>
<td>553</td>
<td>553</td>
<td>497</td>
<td>442</td>
<td>386</td>
<td>332</td>
<td>276</td>
<td>221</td>
<td>166</td>
<td>110</td>
<td>55</td>
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The resulting cash flow modeled below reflects a growth in IRR to 17.9%.
At this level, we would expect healthy, if not overwhelming, interest on the part of potential equity investors in a generic renewables project in most jurisdictions. However, particularly as the market has come to believe more in the upside potential of and downside limitation of wind power transactions, we would expect this to generate very robust equity interest in jurisdictions like Germany, Spain and the United States.

Project finance as a policy tool

The problem with every renewable energy project from a policy perspective is that it produces (i) vital (ii) commodities. Wind-produced power and jatropha-produced biodiesel are in both cases almost no different than coal-produced and oil-produced counterparts, and while there are many social and environmental advantages to sustainably produced commodities, no government will be rewarded by voters, the business community or the international community for pursuing policies that result in dramatic increases in the prices of fuels and electricity or prices for fuels and electricity that are materially higher than regional norms. Alternately, the same is true for governmental policies that only keep prices low through direct or indirect subsidies.

That’s the policy dilemma. If a government provides incentives to the private sector to pursue renewable energy projects, won’t that lead to one or a combination of (i) increases in the prices of the underlying commodities, (ii) taxes or (iii) a reduction in other socially valuable governmental expenditures? We happen to take it for granted that government incentives for renewables are needed (since such incentives grew wind power from a hideously expensive form of power generation into a technology that is now in many cases cost-competitive with fossil-fuel derived power and promise to do the same for solar, biodiesel, etc.). Yet, the more profits (e.g., higher IRR) renewables sponsors put in their pockets each year, the more consumers are paying for fuels and power. Unless . . .

Unless, that is, a jurisdiction is able both to keep commodities prices down and provide attractive returns to investors. Hopefully not just because we are a project finance bank, we view project finance as an accessible and effective mechanism to balance these competing interests. There’s no avoiding the fact that true equity investors will need a double-digit return, but the larger the amount of project costs that are covered by low interest commercial bank loans, the less painful it will be to consumers and the budget to make equity investors happy.

Indeed, most governments have it in their power to craft incentives that are amenable to project financing loans with 85% leverage. There are, to be certain, considerable risks and expenses for any government attempting to provide such incentives, but the reward is the unlocking of a massive pool of funds for renewables investments without subjecting basic commodities to the risk of massive price increases.
Revisiting project risks

Project finance starts and ends with minimizing risk. Of course, all investing is about risk, but in contrast to, say, private equity, project finance lenders are largely unimpressed by any claims that an SPV is starting the next Microsoft or Google. In fact, neither of those efforts could have been project financed since neither was based on locking in cash flows.

Let’s look at how this impacts the mindset of lenders approaching a project as opposed to, say, how a venture capitalist approaches an opportunity. The typical venture capital firm only needs one in every five or so of its investments to be a success; the returns from that one success are sufficient not only to make up for losses on the other four projects but also leave quite a lot left over as profit. It’s probably safe to bet that if you gathered the ten most successful venture capitalists in the world, they’d tell you that most of the time they lose money on their investments.

In contrast, for a bank like us, our margins are so low and we (typically) have no upside in projects, so one bad loan can cancel out all profit made in a year from 40 good loans. When venture capitalists make an investment, they know that they are most likely parting with their money forever and that their loss is just part of the larger process they are a part of; in contrast, when project finance bankers make a loan, they know that they may be parting with their job if the loan goes bad.

Against this background of risk aversion, when a project finance lender reviews a project, it is primarily interested in certain types of common risks, such as:

- **Construction Risks:** What is the risk that the facility won’t be constructed properly, that a permit is not right, that the project can’t be interconnected to the grid, etc.? An ideal project has legal opinions stating that the permits are complete and sufficient and it has contracts with reputable and credit-worthy counterparties that essentially say “we will build your project for a fixed price, it will meet a set of clearly defined performance parameters and we will pay you if we don’t finish on time or do not meet our performance guarantees, and in the event of any technical problems, we will fix those problems at our own cost.”

- **Operational Risks:** The SPV has, to the extent practical, entered into long term contracts at fixed prices to staff the facility and maintain equipment. The SPV also has clearly and correctly projected its tax and other monetary liabilities.

- **Supply Risks:** While not applicable to a wind project, the project has long-term contracts to supply needed inputs at fixed prices (subject to the offtake comments below).

- **Offtake Risks:** The project has long-term contracts or other binding arrangements to sell its output (e.g. power). Where a fixed-price supply contract is not available, price risk for a raw input can be included in the pricing under an offtake agreement to remove supply risk. For example, a power offtake agreement may be for the sale of power at the price paid for gas by the SPV plus a certain amount per kilowatt.
To the extent that these risks are satisfactorily resolved (which may be either direct resolution or by having a third party such as a sponsor or a governmental entity provide a guarantee in respect of a given risk), a project finance loan is a distinct possibility. It is important, though, to appreciate that the least well-addressed risk really defines the risk profile of the project in the eyes of project finance lenders; project finance does not average risks, but rather focuses on what is perceived as the worst risk. In other words, an otherwise perfect project with a very weak offtake arrangement is little different in project finance from an average project with a very weak offtake arrangement.

A project finance lender, on the basis of available pricing information and taking a “worst case” scenario to ensure that the lender won’t lose its money, models the cash flows of the project (including monetizing indirect cash flows such as tax credits to the extent that they can be or are monetized). To the extent that these cash flows are sufficient for debt service (not necessarily debt service plus equity’s anticipated return, just enough to equity to make sure equity doesn’t abandon the project), the loan qualifies for project finance.

In renewables projects, the offtake risk more than anything else frustrates project financings. Offtake arrangements need to be meaningful and long-term. If a government provides a five year feed-in tariff, lenders will probably not make a six year loan. For infrastructure projects, unless there is at least 10 year amortization (such that repayment of principal is a modest annual cost6), the policy goal of using project finance to keep commodity prices reasonable will most likely not be achieved.

Turning project finance on its head

At this point, maybe you say that all this sounds good, but clearly we’re missing something. After all, if a project finance lender puts forth 90% of the capital for a renewables project, you’re saying the sponsor’s not that important? Why can’t anyone suddenly develop and own a renewables project? Moreover, most governments can get loans for 15 years at pretty decent rates and in amounts above what is needed for renewables projects. So why don’t project finance lenders just make loans to governments for those governments to pass on to projects? We say in response: for the first question, that’s a valid way to look at it; for the second question, lots of people can and do who probably don’t have good enough credit to get a credit card with a high limit; and, for the third question, the functional equivalent of that happens all the time.7

To provide some substance to those answers, it’s just a fact that projects are cancelled all the time when debt is unavailable in needed amounts or prices. Likewise, a good number of the loans that we make are to infrastructure projects initiated not by huge multinational corporations but by one or two non-wealthy individuals, groups of farmers or refugees from multinational corporations setting up their own shop with little more behind them than a cell phone and a printer. In other words, sponsors need lenders as much as lenders need sponsors, and so policymakers who are not apprised of what conditions are needed for a healthy infrastructure lending practice in their jurisdiction are limiting their field of vision. Too often policymakers

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6 This does not necessarily mean that the loan itself must be for 10 years. Since lenders can do whatever they want with amortization, a 4 year loan can amortize at 10% a year, with 60% of principal due at the end of the loan.

7 We should note that if the government were to provide debt financing to projects directly, the equity investor would nevertheless look for the same type of risk mitigation and contractual structure before making an investment decision. Hence, the government as a lending entity would not render the financing process easier, and to the contrary (and no offense intended to our readers), we believe that this typically creates additional bureaucracy and results in delays.
believe that the voices of large energy companies are the most relevant commercial voices in renewable energy. All one need do is look to the experience of the U.S. ethanol business in the past three years to see an example of the opposite; the growth of that industry has been premised almost entirely on project finance loans (albeit with comparatively low leverage of 60% due to nagging supply and offtake risks) to cooperatives of farmers, individual entrepreneurs, and start-up companies.

Moreover, in a case like our wind project where a government comes forward and says that for 10 years it will pay €0.10 for every kilowatt of wind power delivered to the grid (a feed-in tariff, which is common in Europe) or will make a payment to a wind generator to the extent that the price the generator receives on the wholesale market for a kilowatt is less than €0.10 (the approach of Ontario with respect to new gas-fired generation), a project finance lender’s reaction is to say that since the government is absorbing the worst risk for the project, its loan is really a loan to the government. Ignore the fact that the (nominal) borrower can hardly rub two pennies together, we argue structurally it’s almost as if the government is guaranteeing the debt. Naturally, when a project finance lender is able to take that step, debt costs decrease dramatically.

**Conclusion and kinds of incentives**

We began this discussion with a brief description of types of project costs. Naturally governments can facilitate renewables projects by resolving supply and offtake risks (such as with a feed-in tariff). However, in some cases, such strong measures may not be needed; perhaps small grants for early development costs are a more appropriate measure. It all depends on your particular context and capacity.

Perhaps this would be a good place to list the dozens of types of governmental interventions that could spur renewables, but doing so would invariably leave out something important or create the impression that we favor one type of intervention over another. At a policy level we don’t favor any incentive over any other (at a practical level, please give us an unconditional governmental guaranty of the debt!), because we recognize that every project is unique and that boilerplate policy solutions are a (dangerous) myth.

Likewise, project finance is not a boilerplate solution to spurring investments of any type of infrastructure. But it is a potentially effective tool, and the best part of our job is when a loan we spent a year structuring to the particular needs of a project is recognized as having been instrumental to the success of a renewables project that facilitates sustainability.