PVFINANCING

Fact Sheets for Selected Financial Schemes

Germany

PV Financing Project

Deliverable 3.2

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1 Loan

The financial scheme "loan or debt-financing" is used in Germany in combination with a share of equity (generally with 20-30%). This scheme allows structuring the debt based on the Feed in Tariff. This approach assumes 100% FiT as a back option in case the purchaser cannot consume the forecasted volume.

Key Players	• Bank: generally a local bank. • Family: debtor, who gets the loan. Usually also acts as "investor" with an amount of equity 20-30%. • PV company: It delivers the PV plant and is responsible for O&M
Financial Terms / Conditions	The financial terms are established by the local bank, who generally offers the KFW credit line[1]: • Loan tenor: 5/10/20 years • Interest rate: from 1.20% to 8.80%[2] • Repayment-free start-up period • Interest method: fixed • Debt/equity split: Up to 100% of the investment costs eligible for financing, not more than EUR 25 million
Risks	Possible low performance of the system: low risk
Obligations	Additional to the loan, the purchaser should take into account: • The payment of the EEG- surcharge for self-consumption: in 2016 is 35% of the surcharge and from 2017 the amount will reach 40%. Systems up to 10 kWp and with an annual generation of less than 10MWh are exempt from this surcharge • The user has the obligation to have an electricity contract with a utility to secure the electricity supply
Criteria	• For private individuals and not-for-profit organisations which feed a part of the generated electricity/heat into the grid • German companies can receive the support for investment abroad • Foreign companies get the funding for investment in Germany and in border areas of 50 km
Legal Requirements	To feed part of the generated electricity into the grid to get the FiT. See obligations.

[1] For more information see: https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/index-2.html (15.12.15)

[2] This depends on the price class: https://www.kfw-formularsammlung.de/KonditionenanzeigerINet/KonditionenAnzeiger (9/12/15)

Application on the segment

The single family residential segment generally uses this scheme to finance the PV system in case they have not the enough funds to buy it through 100% equity and also due to the current good debt conditions.

The advantages and challenges are presented below:

Advantages	Challenges
• Long-term, low, fixed interest rate	• The reduction of FiT results in a higher equity share and shorter debt tenor
• Repayment-free start-up period	
• Low amount that can be paid back in a short period	

Application on business models

This financial scheme is generally used in the business model based on self-consumption. This model is used if there is “one” purchaser, meaning one family or one company.

In this case, 20% to 40% of the electricity produced (consumption profile of household in German) is consumed by the purchaser and the remainder electricity is feed into the grid. The percentage of the consumption profile depends on the size of the system.

2 Pacht

"Pacht"[3] is an innovative way of financing PV systems for self-consumption by an external investor. The main characteristic is that the risks of operating the system are transferred to the electricity consumer or lessee in order to qualify for self-consumption to avoid the complete payment of the EEG surcharge. The central conditions are that a single consumer should be the lessee of the PV system and that the plant operator and the consumer are the same entity.

Key Players	• Lessor: the investor, usually an electricity supply company or ESCO • Lessee: the user
Conditions	• There should be a single consumer as the lessee of the PV system • Contract duration: 10-20 years • Leasing rate: fixed fee for the entire term of the lease and cannot be linked to the performance of the system • The PV system can either become property of the lessee or can be renewed at the end of the lease; this depends on the terms of the contract negotiated
Risks	Risk regarding the low performance of the system, however this is low. The risks of operating the system are transferred to the electricity consumer /lessee.
Obligations	• The lessee is obligated to pay the fees stipulated in the contract • The lessee is also responsible for the operation of the system and the possible cost of maintenance (the lessee usually signs a contract for the maintenance with a service company) • The electricity which is not consumed by the lessee has to be feed into the public grid and will get the Feed in Tariff • Payment of the EEG-surcharge: in Germany the self-produced and consumed electricity is charged with the EEG-surcharge. In 2016 the charge will be 35% of the surcharge and from 2017 the amount will reach 40%. Systems up to 10 kWp and with an annual generation of less than 10MWh are exempt from this charge • The user has the obligation to have an electricity contract with a utility to secure the electricity supply
Criteria	To avoid the payment of the EEG-surcharge the conditions are: only for self-consumption and only for on user or consumer.

[3] In Germany the model of renting the system is called "Pacht", which differs from the "Leasing" in the contract conditions.

Application on the segment

This financial scheme is already used in Germany in the single residential sector and by small and medium-sized enterprises. However, dissemination activities of communicate the advantages of this model are needed.

The advantages and challenges are presented below:

Advantages	Challenges
• To avoid the complete or part of the payment of the EEG-surcharge	• The risks of operating the system are by the consumer
• Fixed fee payment	
• Profit from renewable energy without initial investment	

Application on business models

This financial scheme is generally used in the business model based on self-consumption. This model is only allowed when the plant operator and the consumer are the same entity.

The consumption profile in Germany is approx. 20% to 40% in households and 75% in educational and commercial office buildings. The remainder electricity must be feed into the grid. The percentage of the consumption profile depends on the size of the system.

1 Energy Cooperatives

Energy cooperatives bundle investments of private individuals in an organization, where every investor, regardless of their investment size, has the same voting rights. The cooperative can be composed by the inhabitants or users of the building, or by external people. The cooperative can supply the electricity produced direct to the user or cooperate with a local utility.

Key Players	• Green Cooperative: investor and plant owner. Depending on the investment amount, it can operate in full equity or use a bank loan • Bank: gives funding in the case the cooperative needs a loan • Multi-family building: buyer of the PV electricity. The tenants can be also part of the cooperative /owner of the system • Utility: in case the cooperative offers electricity supply through the utility
Financial Terms / Conditions	In case the cooperative uses a loan the financial terms are established by the local bank, who generally offers the KFW credit line[4]: • Loan tenor: between 5-20 years • Interest rate: fixed between from 1.20% to 8.80%[5]
Risks	• The invested capital could be reduced in case of partial or total default of the electricity consumer
Obligations	• Since there is more than one user of the system this cannot be considered as self-consumption. Hence the user has to pay the complete EEG-surcharge • The not consumed electricity has to be feed into the public grid and the cooperative will get the Feed in Tariff • The user has the obligation to have an electricity contract with a utility to secure the electricity supply. The cooperative could make an agreement for this with a utility
Investment Criteria	• Availability of surface and favourable roof conditions • Good relationship between the cooperative and the building administration (best case scenario: cooperative owned by the inhabitants) • High rate of self-consumption • Law of Protection of the investor: with the current law, the purpose and activities of a cooperative are not only investment; it should also act as a company with all the obligations and rights.[6]
Legal Requirements	• The duration of the contract for the electricity supply varies depending on the kind of costumer: – For private costumers / the residential sector the contract is up to 2 years – For small and medium-sized enterprises and industries the contract duration varies depending on how much the customer is economically restricted (between 3-20 years)

[4] For more information see: https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/index-2.html (15.12.15)
[5] This depends on the price class: https://www.kfw-formularsammlung.de/KonditionenanzeigerINet/KonditionenAnzeiger (9/12/15)
[6] The current law is being revised.

	• Duty of disclosure by the Federal Network Agency, the transmission network and distribution operator about the electricity supply • Payment obligation to the distribution system, the transmission network operator and the tax authorities

Application on the segments

The energy cooperatives work mainly with municipalities (in German "Kommunen") for the electricity supply of **public buildings** such as schools, swimming pools, etc. The second customer are **small and medium-sized enterprises and industries** and in the third place with **multi-family buildings**.

The energy cooperatives used to be very active in Germany during the Feed in Tariff "era". After the FiT became less attractive the activities of the cooperative decreased. However this financial scheme is still profitable but needs dissemination.

The advantages and challenges are presented below:

Advantages	Challenges
• **Profitability: the electricity priced offered or self-used is lower than the current price of the grid**	• **The invested capital could be reduced in case of partial or total default of the electricity consumer**
• **In case of loan, low and fixed interest rate**	

Application on business models

This financial scheme is used in the business model Power Purchase Agreement, since there is more than one purchaser using the electricity of the system. In this model, the purchaser has two contract options: the first option offers 100% of electricity supply, which includes the PV electricity produced from the system and electricity from the grid when needed. This tariff is cheaper than the grid tariff. The second contract option offers the supply of electricity produced from the PV system. In this case the tenant must have a contract with a utility for the supply from the public grid. The electricity bill will be a mix of both. PPA's are charged with the whole EEG surcharge.

Multi-Family Buildings / Shopping Centers / Office- / Educational Buildings

1 Portfolio Financing

Portfolio financing is the proper solution for financing a bundle of similar PV projects and reduce the relative high due diligence efforts and transaction costs. This is possible since each individual project is checked based on a standardized criteria catalogue. Additionally, the scheme makes possible the development of projects because the off-taker risks are distributed across the portfolio. This financial scheme is used successfully in the USA and is newly used by German banks.

Key Players	• Bank • Debtors • PV company who delivers the PV plant and is responsible for O&M
Financial Terms / Conditions	The financial terms are established by the bank, who generally offers the KFW credit line[7]. The conditions varies depending on the project: • Loan tenor: 5/10/20 years • Interest rate: from 1.20% to 8.80%[8] • Repayment-free start-up period • Interest method: fixed • Debt/equity split: Up to 100% of the investment costs eligible for financing, not more than EUR 25 million
Risks	Possible low performance of the system: low risk
Obligations	Additional to the loan, the purchaser should take into account: • Since there is more than one user of the system this cannot be considered as self-consumption. Hence the user has to pay the complete EEG-surcharge • The user has the obligation to have an electricity contract with a utility to secure the electricity supply
Investment Criteria	• For private individuals and not-for-profit organisations which feed a part of the generated electricity/heat into the grid • German companies can receive the support for investment abroad • Foreign companies get the funding for investment in Germany and in border areas of 50 km
Legal Requirements	To feed part of the generated electricity into the grid to get the FiT. See obligations.

[7] For more information see: https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/index-2.html (15.12.15)

[8] This depends on the price class: https://www.kfw-formularsammlung.de/KonditionenanzeigerINet/KonditionenAnzeiger (9/12/15)

Application on the segment

The portfolio financing can be used in different segments where it is possible to bundle similar projects. The applicable segments are multi-family buildings, shopping centers as well as office and educational buildings.

The advantages and challenges are presented below:

Advantages	Challenges
• Long-term, low and fixed interest rate	• Limited amount of projects in the portfolio. This can be overcome with venture capital
• Distribution of the risks among the portfolio	
• Repayment-free start-up period	

Application on business models

This financial scheme is used in the business model Power Purchase Agreement, since there is more than one purchaser using the electricity of the system.

1 On Balance Sheet Financing

In "on balance sheet financing" the capital expenditures, in this case the PV system, appear as a liability on a company's balance sheet. Hence, the company leverages an asset in order to borrow money from a bank, thus creating a liability (i.e., the outstanding loan) that must be reported as such on the balance sheet. Additionally, this scheme allows avoiding the payment of the whole EEG-surcharge in case of self-consumption, which applies when the plant operator and the consumer are the same entity.

Key Players	• Bank • Debtor • PV company who delivers the PV plant and is responsible for O&M
Financial Terms / Conditions	The financial terms are established by the bank, who generally offers the KFW credit line[9]. The conditions vary depending on the creditworthiness of the company. • Loan tenor: 5/10/20 years • Interest rate: from 1.20% to 8.80%[10] • Repayment-free start-up period • Interest method: fixed • Debt/equity split: Up to 100% of the investment costs eligible for financing, not more than EUR 25 million
Risks	Possible low performance of the system: low risk
Obligations	Additional to the loan, the purchaser should take into account: • The payment of the EEG-surcharge: – In case there is only one user of the PV system, it is considered self-consumption and the payment corresponds to 35% of the surcharge in 2016 and from 2017 the amount will reach 40%. Systems up to 10 kWp and with an annual generation of less than 10MWh are exempt from this surcharge – If there is more than one user of the system, the user has to pay the complete EEG-surcharge • The purchaser has the obligation to have an electricity contract with a utility to secure the electricity supply
Rights	• German companies can receive the support for investment abroad • Foreign companies get the funding for investment in Germany and in border areas of 50 km
Legal Requirements	To feed part of the generated electricity into the grid to get the FiT. See obligations.

[9] For more information see: https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/index-2.html (15.12.15)

[10] This depends on the price class: https://www.kfw-formularsammlung.de/KonditionenanzeigerINet/KonditionenAnzeiger (9/12/15)

Application on the segment

On balance sheet financing can be used in a segment, where the company or entity has sufficient creditworthiness. The industry is a suitable segment for this.

The advantages and challenges are presented below:

Advantages	Challenges
• Long-term, low and fixed interest rate	• The bank conditions vary depending on the creditworthiness of the company
• The expenditure appears as a liability on the company's balance sheet	• To compete with the low electricity prices
• Repayment-free start-up period	• Since it is a corporate loan it might reduce the company's ability to take on more debt
• To avoid the payment of the complete EEG-surcharge in self-consumption	

Application on business models

This financial scheme can be used in the business model self-consumption if the plant operator and the consumer are the same entity. Otherwise it will be used in the Power Purchase Agreement.