PVFINANCING

Fact Sheets for Selected Financial Schemes

France

PV Financing Project

Deliverable 3.2

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1 Loan

A photovoltaic installation for a single family house can cost between 10 k€ and 16 k€ (with the grid connection included). A bank loan can be useful to raise part of this amount. It takes the form of a standard loan but house owners have to be careful about the partner they choose and they should prefer a bank that they already know. Below, the usual parameters encountered in the research:

Key Players	Banks and house owners
Financial Terms / Conditions	• Loan tenor: From 2 to 10 years • Interest rate: between 3 & 6% (fixed) • Grace period of one year is possible • Bank loans may be limited to a certain amount that can go from 20 k€ to 70 k€
Risks	• Panels not as effective as expected • Payment default
Investment Criteria	• Photovoltaic is a financial investment rather than a purchase for comfort. Therefore the gain from the installation is enough to cover the loan. The payback period is between 10 to 15 years. • The quality of the panels and of the installer has to be carefully screened.

Application on the segment

This scheme should be selected by families who want to invest in their own PV project because it is the easiest one for house owners. In such a scheme, banks should take a more active role in the evaluation of the project through the implementation of a screening process that could help house owners to avoid scams based on photovoltaic. It would certainly be beneficial to the image of the banks which would provide such a help to their clients.

The advantages and challenges are presented below:

Advantages	Challenges
• **Client is advised by its bank and is not facing such an investment alone**	• **Small banks know little about PV**
• **Some banks offer specific conditions for energy efficiency projects**	• **The troubled image of PV can influence banks**
• **Easiest scheme**	

Application on business models

A loan is the most common way to finance a photovoltaic project. It will be even more useful with the spread of self-consumption, not only for single-family houses but for larger installations up to 36 kWp, such as agricultural rooftops.

1 Loan

PV Financing focused on the opportunity to install photovoltaic on multi-family social houses. A bank can bring finance to the project, through a loan, as building owners may not have enough equity. For such a project, finance would come from building owners, banks and local authorities.

Key Players	Banks are providing finance, the building owners are part of the project and a local authority can complete the financing for social housing.
Financial Terms / Conditions	• Loan tenor: can go up to 18 years • Interest rate: From 3% to 6% • Interest method: Usually fixed • Debt/equity split: 70%/30%
Risks	• Legislative and fiscal risk • Technological risk
Rights	• The bank can take a security such as a mortgage or the owner can be backed by a financial collateral from an institutional partner (e.g. BPI
Investment Criteria	• Debt Service Coverage Ratio: 120% • Good technical screening of the installation • Competence of the project coordinator.

Application on the segment

This scheme is useful because it is the best known by owners of social multifamily housing. Managers of social housing could be lost with another financial scheme and more vulnerable. Moreover the loan can offer attractive conditions. The payback period targeted is usually around ten years.

The advantages and challenges are presented below:

Advantages	Challenges
• **Easy to implement**	• **The cost is supported by the building owner**
• **Attractive conditions are available**	

Application on business models

This scheme can be used when the electricity is sold under a Feed-In Tariff as banking tools are currently based on this model. Moreover, self-consumption can only be used for the commons, so it is not easy to implement an important PV project on social houses building.

2 Leasing

This scheme is spreading in the multi-family house segment. The project developer rents the roof of the building and installs the panels. He is the owner of the panels, pays a fee for the roof, but keeps the revenue derived from the sale of the electricity. Building owners do not have to pay the initial investment for the project. The installation of the panel can be completed with a roof maintenance service for a win-win deal.

Key Players	Building owner, project developer
Financial Terms / Conditions	• The project developer supports the construction cost (Between 1,68 & 2,05 €cts/W) • The project developer pays a small fee in order to rent the roof • The project developer keeps the revenue from the sale of the electricity produced • After 20 years, the project developer can either transfer the ownership of the the installation to the building owner or take care of the recycling
Risks	• Bankruptcy of the project developer • Change in ownership of the building • Low acceptation from residents • The roof may not be PV ready
Obligations	• The project developer should have a panel and roof maintenance obligation
Investment Criteria	• Payback period up to 12-15 years.
Legal Requirements	• The electricity can be sold to an electricity operator or to the building owner for the commons but not to the inhabitants of the building

Application on the segment

This scheme can be a win-win situation as the project developer sees its installation as an investment. The success of the investment is linked to the quality of its installation. For the building owner, the installation is costless, can improve its standard and be developed with useful services such as roof maintenance. The advantages and challenges are presented below:

Advantages	Challenges
• **No investment cost for the building owner**	• **The project developer needs to possess many competences**
• **Increase the responsibility of the project developer**	• **The electricity can't be sold to the residents**

Application on business models

This scheme will be interesting if models based on power-purchase agreement or self-consumption with electricity accessible to the residents are developed.

3 Crowdfunding

Crowdfunding is spreading in France. There is no crowdfunding platform for social housing projects yet but both sides are interested in each other. A crowdfunding platform can raise a part of one project financing through debt, bond or quasi-equity. The other sources of finance are coming from equity providers and banks.

Key Players	Project developer, crowdfunding platform, banks, and building owner.
Legal requirement	• A crowdfunding platform has to be accredited as so by the competent authority: ORIAS, the registry of banks, insurance and finance professionals. • A platform has to choose between two statuses. If it raises debt it will be an Intermediary for Participative Finance (IFP) and if it is financing a market product (equity or bond) it will be a Participative Investment Adviser (CIP).
Risks	• The multiplication of crowdfunding platforms could lead to a short-term consolidation of the market • Depending on the product, risk may differ: an equity investment would be riskier than a debt or bond investment.
Investment Criteria	• The rate of return for individuals can go from 3% to 7% depending of the platform model. • Payback can vary between one year to eight years in general • Depending on the platform model, the possibility for the lender to suspend his loan may influence its choice.
Financial terms	• The investment by a citizen in a project may be legally limited to 1 000€ in case of a loan

Application on the segment

The popularity of this mechanism is quickly rising in France as it gives the possibility to investors to target social/environmental projects in which they believe. It is best suited for a project with a strong social impact, which is the case for a project dedicated to social housing.

Advantages	Challenges
• **Better acceptance from citizens**	• **Crowdfunding is not enough to finance an entire PV project**
• **Sound investment decision for citizens**	• **Need of citizen education**

Application on business models

Many crowdfunding platforms specialized in renewable energy projects already exist. They can support a part of the financing for ground-mounted projects or rooftop mounted projects. In the latter case, it can be for the agricultural, the education building or sometimes the industrial segment. In each of these cases, the social impact of the building or the project has to be stressed.

1 Self-funded

A shopping centre has to look at photovoltaic as a real estate investment. Such an investment can offer a positive net present value with a payback period that is between twelve and eighteen years. Therefore, for big shopping centres a self-funded project can be sound for their investment policy.

Key Players	Shopping centres and project developers
Investment criteria	• Internal Rate of return between 6% and 10% • Payback period of at least ten years
Risks	• Roofs may not be PV ready • Technological risk • Risk on operation and maintenance contract

Application on the segment

A self-funded project is not easy to implement because it requires a high level of disposable liquidity to invest. Nevertheless it is a sound option for shopping centres because banks can be reluctant to propose a loan for a photovoltaic project of this scale (100 kWc – 250 kWc), depending of the business model that is used. The amount of necessary liquidity is not high enough for a national-scaled bank and smaller banks may not have a photovoltaic expertise that is strong enough.

The advantages and challenges are presented below:

Advantages	Challenges
• **Independency of the shopping centre management**	• **Requires high level of liquidity**

Application on business models

Shopping centres have great interest in the development of photovoltaic. There is a match between the daily peak of electricity consumption of a shopping centre and the daily solar irradiation. Self-consumption is a sound business model for shopping centres; even though a roof mounted photovoltaic installation is not able to produce enough electricity for the overall consumption of the building. Self-consumption can be a protection against the rise of electricity price in the coming years.

In the case of an innovative business model such as self-consumption, banks may be even more reluctant to grant a loan. Therefore, other means of financing can be helpful, such as self-funded projects or leasing.

2 Leasing

The project developer rents the roof of the building and installs the panels. He is the owner of the panels, pays a fee for the roof, but keep the revenue derived from the sale of the electricity. Building owners do not have to pay the initial investment for the project. Moreover, the electricity produced can be sold to the shopping centre in a Power Purchase Agreement Scheme.

Key Players	Shopping centres and project developers.
Financial Terms / Conditions	• The project developer carries the construction cost (Between 1,68 & 2,05 €cts/W) • The project developer may pay a small fee in order to rent the roof • The project developer keeps the revenue from the sale of the electricity (FiT or PPA)
Rights	• The shopping centre has to carefully prepare a contract clause for an early exit in case of a strategic shift, during the 20 years of the contract, which seems a long period of time for shopping centre owners
Investment Criteria	• IRR between 7% and 10% • Payback period of at least ten years.
Legal Requirements	• Legal environment of PPAs still has to be clarified

Application on the segment

Banks may be reluctant to give a loan for such a project and self-funding can be hard to implement. A leasing scheme can be a good opportunity for shopping centres and project developers

The advantages and challenges are presented below:

Advantages	Challenges
• **Low initial cost for the shopping centre**	• **Need a long term partnership between the stakeholders (20 years).**
• **Possibility of a PPA**	

Application on business models

There is a match between the daily peak of electricity consumption of a shopping centre and the daily solar irradiation. Self-consumption is a sound business model for shopping centres as it can be a protection against the rise of electricity price in the coming years.

2 Leasing

This scheme is spreading for rooftop-mounted projects. The project developer rents the roof of the building and installs the panels. He is the owner of the panels, pays a fee for the roof, but keep the revenue derived from the sale of the electricity. Building owners do not have to pay the initial investment for the project. The installation of the panel can be completed with a roof maintenance service.

Key Players	Building owner, project developer
Financial Terms / Conditions	• The project developer carries the construction cost (Between 1,68 & 2,05 €cts/W) • The project developer pays a small fee in order to rent the roof • The project developer keeps the gain of the electricity sold (FiT or PPA) • After twenty years of exploitation, the project developer can either give the installation to the building owner or be in charge of the recycling
Risks	• Bankruptcy of the project developer • Building owners may want to sell the building prior to the end of the contract • Roof may not be PV ready
Rights	• The building management has to carefully prepare a contract clause for an early exit in case of a strategic shift.
Investment Criteria	• IRR between 7% and 10% • Payback period of at least ten years.
Legal Requirements	• Net metering is not allowed and PPA still has to be clarified

Application on the segment

Banks may be reluctant to give a loan for such a project and self-funding can be hard to implement. A leasing scheme can be a good opportunity for office owners and project developers.

The advantages and challenges are presented below:

Advantages	Challenges
• **Little initial cost for the building owner**	• **Need a long-term partnership between the stakeholders (20 years).**
• **Possibility of a PPA**	•

Application on business models

This scheme will be interesting if models based on power-purchase agreement or self-consumption with electricity available for consumption to the offices managers are developed.

1 Crowdfunding

Crowdfunding is spreading in France and it already helped a few projects for educational buildings. A crowdfunding platform can raise up to 20% of one project financing through debt, bond or quasi-equity. The other 80% can come from equity providers and banks. At the beginning of the project, there is often an association of citizens.

Key Players	Project developer, crowdfunding platform, banks, and local authority.
Legal requirements	• A crowdfunding platform has to be accredited as so by the competent authority: ORIAS • A crowdfunding platform has to choose between two statuses in order to raise either debt or equity and bonds.
Investment criteria	• The rate of return for individuals can go from 3% to 7% depending of the platform model. • Payback can start after a time that can varies and that goes from one year to eight years in general • The individual may cancel or not its loan depending on the platform model
Risks	• The multiplication of crowdfunding platforms could lead to a short-term consolidation of the market
Legal requirement	• The individual investment may be legally limited to 1 000€

Application on the segment

The popularity of this mechanism is quickly rising in France as it gives the possibility to investors to target social/environmental projects in which they believe. It is best suited for a project with a strong social impact, which is the case for a project dedicated to social housing.

The advantages and challenges are presented below:

Advantages	Challenges
• **Better social acceptance**	• **Crowdfunding is not enough to finance an entire PV project**
• **Sound investment decision for citizens**	• **Need of citizen education**

Application on business models

Many crowdfunding platforms specialized in renewable energy projects already exist. They can support a part of the financing for ground-mounted projects or rooftop mounted projects. In the latter case, it can be for the agricultural, the education building or sometimes the industrial segment. In each of these cases, the social impact of the building or the project has to be stressed.

2 Self-funding

An industrial park can finance by itself a solar project or a solar plan that concerns all corporations implemented in the park. Industrial park management have long payback period expectations and they are used to work with important investment projects.

Key Players	Industrial park management & project developers.
Investment criteria	• Internal Rate of return between 5% and 8% • Payback period of at least ten years
Risks	• Roofs may not be PV ready • Technological risk • Risk on operation and maintenance contract

Application on the segment

A self-funded project is not easy to implement because it requires a high level of disposable liquidity to invest. Nevertheless it is a sound option for industrial parks because banks can be reluctant to propose a loan for a photovoltaic project depending of the business model that is used. Industrial parks can be keen to develop models based on Power Purchase Agreement or net-metering for experimentations. For more autonomy on such projects, self-funding can be the best investment solution.

The advantages and challenges are presented below:

Advantages	Challenges
• **More autonomy for innovation**	• **High level of liquidity is needed**

Application on business models

Industrial parks are opportunities for innovative photovoltaic schemes to be developed, such as PPA and net metering. Therefore, each can be developed by an industrial park development in order to find ways to reduce the electricity cost for implemented companies and be more attractive.

2 Subordinated debt

A subordinated debt is paid back after a senior debt from a bank. It is a quasi equity tool that helps to close a financial gap in mature projects between equity and bank loans. Mostly used for ground-mounted projects, it can be helpful for any large project. It can be a way to raise up to 10% or 15% of the necessary financing.

Key Players	**Project developer,** subordinated debt provider, banks
Financial Terms / Conditions	• Loan tenor: from 2 to 7 years • Interest rate: from 7% to 12% • Subordinated debt can be fully paid back at the end of the tenor
Risks	• In case of a project failure, subordinated debt has to be paid back after a bank loan
Investment Criteria	• A subordinated debt provider accepts higher risk than banks for a higher rate of return.

Application on the segment

A subordinated debt is helpful when the other sources of finance are not important enough to raise the necessary amount of cash. It can be helpful for riskier projects. Moreover, as subordinated debt can be paid back at the end of the tenor, the debt raised can be used during the construction phase and paid during the exploitation, when the cash flow are positive.

The advantages and challenges are presented below:

Advantages	Challenges
• **Help to close a financial gap between debt and equity**	• **High rate of return expected**
• **Useful for large scale projects with mature financing mechanisms**	• **Only a small share of the financing scheme (10% - 15%)**
• **No loss of control of the project by the project developer**	

Application on business models

This mechanism is helpful for important projects that need well-developed financing mechanisms with precise return conditions. It appears in France for ground-mounted projects and could rise for projects implying important rooftops such as industrial parks.