

2nd PV Financing Workshop

“How to develop PV in Europe: Implementation Guidelines – procedures and examples”

Date: 18th October 2016

Venue: Sheraton Brussels Hotel, Place Rogier 3, 1210 Brussels, Belgium



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646554

Objective of this event:

The aim of this event is to present one of the main deliverables of the PV Financing project: the national and European Implementation Guidelines. The workshop will present the best business models for the development of solar PV in Europe as well as national¹ best-practices and case studies.

Agenda:

Time	Topic
9:30	Welcome and current status of the project <i>BSW-Solar (project coordinator)</i>
9:50	Solar PV development in the EU <ul style="list-style-type: none"> - Status of solar PV development in the EU: policy and market analysis - Business models for the development of solar PV in Europe <ul style="list-style-type: none"> • Business models: structure and application across the various application segments for solar PV² • Financing schemes across the EU and their application to the different business models <p>Including:</p> <ul style="list-style-type: none"> • Self-consumption • PPA • Crowdfunding/cooperatives • Virtual Power Plants/aggregators <i>SolarPower Europe</i>
11:00	Best practice examples – the national implementation guidelines <ul style="list-style-type: none"> - Solar PV in shared multi-storey buildings - present and future <i>PV Austria</i> - Collective self-consumption in France - an ambitious legislative step <i>Observ'Er</i>
12:00	Lunch
13:00	Best practice examples – the national implementation guidelines <ul style="list-style-type: none"> - The neighbour (solar) supply model (“Mieterstrom”) in Germany – tenants sharing a PV system <i>BSW Solar</i>

¹ With “national” we refer to the 7 countries where PV Financing is being implemented, these include: Austria, France, Germany, Great Britain, Italy, Spain and Turkey

² Segments for PV refer to: single residential house, multi-residential house, commercial buildings, large office buildings, public and educational buildings and industrial parks.

	<ul style="list-style-type: none"> - Power Purchase Agreement for solar in Italy: opportunities and barriers <i>Ambiente Italia</i> - Development limited by regulation - self-consumption in Spain <i>Creara</i>
14:30	Coffee break
14:45	<ul style="list-style-type: none"> - Solar PV from outside the EU - Turkey's potential <i>Gunder</i> - Innovative PPA structures in the UK solar market <i>Solar Trade Association</i>
15:45	Recommendations at European level <i>SolarPower Europe</i>
16:00	End of the session

Registration: please send an email to aguiar@bsw-solar.de until the 7th of October with the subject: “PV Financing Workshop 18.10.16”

For more information about PV Financing please visit: <http://www.pv-financing.eu/>

Minutes of the workshop

18. February 2016, from 9:30 am to 4:30 pm

Topic & Outcomes

Welcome and current status of the project

Luz Aguilar – BSW Solar (project coordinator)

Luz Aguilar gave a brief introduction of the project structure and presented the last result of the project until month 22. These results include implementation guidelines as one of the most important result of the project, suitable business models & financial schemes in 7 countries, exchange of knowledge of different models in countries.

We started with the introduction of the partners/participants. The project extends for 30 months and we are currently in month 22. Work packages 2 and 3 have been closed and are now finalizing WP 4 – the implementation guidelines. The national implantation guidelines will be presented today by the NIPs and the EU implementation guidelines will be published at the end of November. First update of the PV database took place in the beginning of 2016.

The next steps of the project include:

- The next update of the database will happen in Q1 of 2017.
- One of the next deliverable under WP 6 is the national and EU advisory papers which will provide recommendations to the country and will be finalized by the end of the year.
- A strong dissemination campaign will start this year including press releases, newspaper articles, webinars, participation at conferences, etc.

Solar PV development in the EU

Sonia Dunlop, SolarPower Europe

The findings of the developments at the EU level were presented. These will be published as the EU implementation guidelines by the end of November. The implementation guidelines describe how different financial structures and business models help widen the reach of solar PV in different application segments and increasing the access to solar while controlling energy prices.

Policy and regulations help projects in overcoming barriers and risk to get access to finance. Tenant landlord dilemma is one of the barriers in residential sector PV sector growth. One of the solutions would be to implement in shopping centres where the common share of use of electricity is quite high. It is important to understand what business models will overcome barriers that have been difficult until now.

The guidelines also describe sources of finance and how they can be combined to overcome financing needs. It has also been seen that lack of finance is not the barrier to projects, but also like in case of Turkey initial barrier is lack of technical know inside the bank which has not seen investment in the sector in the area.



Financing schemes:

- Self-funding: most used but limited
- Equity: more expensive. With the reduction of Feed in tariffs equity share increases
- Mezzanine: finance can be used
- Leasing: can help unlock solar going forward. Third party easing possible
- Debt: personal loans depending on creditworthiness of borrowers
 - Project finance: based on viability of project
 - Balance sheet financed: developer puts on money
 - Revolving credit: repay and drawdown like in the UK
 - Notes and bonds: debt sliced up and sold on secondary market
 - Green bonds: potential towards end of project
 - Promotional loans from state
- Crowdfunding
- Cooperatives is not only financial model but also business model
- Joint purchasing power: helps to get costs down

Drivers of profitability were described. EU policy and market design will come in. PV is cheaper than retail price in most of western Europe. Barriers are a key issue as any change in tax or grid can massively affect solar prices and can lead to power consumers going bankrupt.

Overcoming bankruptcy and re-location:

- Steel plants going bust - find consumers that are replaceable
- Wholesale market - sell electricity on the market
- Take or pay clause - important clause for banks to provide funding
- Lift and shift - pick up modules and move them elsewhere

Templates for legal contracts have already been prepared for each country. Since the costs of legal documents are high, the templates should thus be pushed in dissemination of project results as standardization will help in bringing down costs for projects down.

The different **business models** implemented in Europe were discussed:

- Self-consumption: The guidelines describe how self-consumption works with different parties and stakeholders along with the steps for implementation.
- PPA: Ring fenced in SPV. Provides the process to be followed.
- Cooperatives
- Aggregate virtual power plant

Solar and services and products to offer as a package. An upcoming EU market design market to help solar going forward. Combination of financial models and business models is the future of solar PV.

Best practice examples – the national implementation guidelines

1. Solar PV in shared multi-storey buildings - present and future

Mira Teoh, PV Austria

In Austria the market is not that big and the focus is on self-consumption sector. With the current regulatory framework and future developments it is promising for all application segments. Market is characterized by small systems with vast majority are roof mounted. This is due to political reasons as ground mounted don't receive subsidy.

Self-consumption is most prominent and financed mostly through self-funding (from savings of owners). There also exists debt and other innovative financial schemes. Restricted framework that is costly and ineffective. Legislative amendment expected later this year.

Huge market population live in apartment building with lot of unused rooftop surface. Austrian Electricity Act is the biggest barrier because it is not possible to serve several people with 1 system. Also transmitting through public grid needs a special licence.

Models possible within framework where building owner invests and operates PV system for use for **general consumption**. This will be an advantage for tenants to reduce building costs. The biggest challenge is that this model is not economically attractive; option to use for heat supply. Other suitable application segment is shopping centres.

The second possibility is **several technically separate PV systems**. This includes several small systems on top of rooftop buildings allocated to specific flat via direct wire. Possible to consume electricity without your own unit; not possible to cover all demand; system price per unit are high. Separate rental contract for house and separate rental contract for PV system.

A legal amendment is expected by the end of this year with which users will be able to use **common PV system** by grid within a building where all participants own a common share and consumption would be measured via a smart meter. With this option, the use of self-consumption in PV will become a lot higher; sharing of electricity amongst users is a challenge. The new models would be applicable in all segments. The demand covered by PV system would be deleted from the electricity bill from the grid. The use or reimbursement of excess electricity is not yet clear and left open in the draft amendment act.

2. Collective self-consumption in France - an ambitious legislative step

Julien Courtel, Observ'Er

Julien Courtel summarized the development of PV sector in France in the past years – 7GWp of installed capacity with most large ground mounted projects in the range of 1-12 MW. Price is quite cheap because of nuclear plants and payback periods may be less than other countries. Solar PV contributes 1.6% of French electricity consumption.

History of PV - using FiTs and tenders. Financers know model and have project financing schemes with 80-20 debt equity split, 1.2 DSCR requirements. Now the trend is changing with energy transition law last year which took 2 years to be published. Other innovative financing schemes now introduced such as FIT premium shaping with electricity sold directly on the market. Complicated to implement so has been not put in practice; unsure on how financing scheme of this model will be shaped. Collective self-consumption is still not clear on how to implement it.

Self-consumption and collective self-consumption are popular models in France for single family houses. It is an attractive option such that the

consumers can manage their electricity bill by themselves. Another important segment is commercial sector; not waited for any law to use self-consumption; constitutes up to 40% of their expenses. Self-consumption has been long awaited as it didn't have any text to shape SC framework. Long wait until 2016 when things rushed. 1st document ordinance published in August. Tender for 40 MW that requires use of 50% for SC; provides many questions about SC. Ordinance has been ratified, conditions still have to be defined. Ordinance also created collective self-consumption. Legal entity could be a cooperative, private entity, etc.; no best practice yet. Entity has to be created with people inside the scheme. Two obligations (between consumer and producer) and to inform grid operator.

In Germany no tender for roof top PV. If someone has to invest to tender and invest in planning, only few operators would do it. No new building would put rooftop p to just win a tender. Going into tender is lot of cost and the results of tender takes very long time. But it could give some sectors push that are not well developed.

Barriers?

- Role of producer -- Is producer an electricity supplier? → Needs ministerial approval to exist.
- If this criteria has to be met very difficult for any entity to be SC entity.
- What to do with excess electricity – can be sold or fed into grid for free?

Lunch

3. The neighbor (solar) supply model (“Mieterstrom”) in Germany – tenants sharing a PV system

Luz Aguilar, BSW Solar

GERMANY: the neighbourhood solar supply model for multifamily housing and commercial centre is allowed by the EEG law under certain conditions (delivery to third party and close proximity) and is subject to a charge/levy.

One of the issues is about the willingness of investors to finance the project. In particular, there is question when SMEs want to build PV systems. Is this profitable for them? Will banks lend them money? Very often, banks look at the credit worthiness of the companies rather than the project profitability.

In the model of self-consumption, it is a lot about small suppliers that will match the excess need.

Although between 3 and 4 million dwellings in Germany could use this model, there are some challenges like the EEG-levy. The self-consumption model requires the installation of meters within the dwellings. Those are installed by the owner of the PV system at a cost which is not big.

4. Power Purchase Agreement for solar in Italy: opportunities and barriers

Riccardo Battisti, Ambiente Italia

ITALY: power purchase agreement is a promising model but there are barriers, for instance the fact that there could only be one user per installation (and therefore 1 meter) (not adapted to multifamily buildings). In general the business model works if there is a high self-consumption rate and low system costs. But investors prefer to buy and refinance existing installation, rather than develop new ones.

However, there is a barrier related to the willingness of banks to invest in PV projects (in particular through the Power Purchase Agreement). Banks look rather at the credit worthiness of project promoters rather than the intrinsic profitability of the project itself.

Coffee Break

5. Solar PV from outside the EU - Turkey's potential

Sedat Yildirim, Gunder

TURKEY:

Limited financial options and lack of grants slow the market development down. Most banks are relatively new to the technology and may not evaluate the profitability of PV projects and do not accept the project itself as collateral yet due to PV system not having proven themselves in the Turkish market.

Thus most PV projects are shelved as they fail to find advantageous financing options. The net metering model (system has to be connected to the grid) with a maximum capacity of 1MWhp is permitted. However, no PPA model is allowed. The energy cooperative model is allowed for small projects (unlicensed systems).

6. Innovative PPA structures in the UK solar market

David Pickup, Solar Trade Association

UK: Power Purchase Agreement is the main model used but there is a lack of clarity at the moment about the financeability of the projects. Despite falling investment and integration cost, the profitability of projects is still too low to not rely on subsidies, particularly in the residential sector.

In the short term, business models are difficult to make profitable without subsidy. Our analysis shows that none of the models presented show a particularly attractive proposition using 2016 assumptions. In the medium term, costs need to come down through continued volume deployment to enable these models to develop in a lower-subsidy world, along the path to zero subsidies. Niches can be found, but these do not reflect a significant market. In the longer term, solar has a bright future as these models become more attractive to a wider market in a zero subsidy world, but how far away "long term", and the structure of the future industry, is highly dependent on current government proposals.

Recommendations at European level

Sonia Dunlop, SolarPower Europe

After having listened to the presentations from the seven countries in the workshop, an initial analysis suggests a number of key areas that require action. This will be covered in more detail in the EU Policy Advisory paper. They are:

- It should be allowed to supply several customers with a PV system (which is currently forbidden in several countries) and there shouldn't be any levies or taxes that decrease their profitability.
- The right to get remuneration from excess of PV electricity should be established
- There should be a legal framework that regulates and the access to the grid
- Subsidies, especially in the small and medium sector, are still important because the profitability is still too low to make the models work.
- One of the options available to facilitate access to finance is to group or bundle several projects in one (like the "Mieterstrom" model in Germany)
- There should be a framework that defines the "electricity supplier" and the "electricity seller" in order to avoid conflict when a PV consumer sells its electricity to another entity

List of participants:

	Company / Institution	Title	Name	Last Name
1	BSW	Ms.	Luz	Aguilar
2	BSW	Mr.	Jörg	Mayer
3	Eclareon	Mr.	Christian	Grundner
4	Frankfurt School of Finance	Ms.	Srishti	Gupta
5	STA	Mr.	David	Pickup
6	Observ'ER	Ms.	Diane	Lescot
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8	PV Austria	Ms.	Mira	Teoh
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11	Solar Power Europe	Ms.	Sonia	Dunlop
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13	Creara	Ms.	Dina	Löper
14	Cecodhas	Mr.	Julien	Dijol
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