Solar PV business models from across Europe and how to implement them

Sonia Dunlop, Policy Adviser, SolarPower Europe

Improving the attractiveness of solar PV investment, Solar Bankability workshop, Brussels, 8 February 2017

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www.pv-financing.eu
EU-wide Solar PV Business Models

Guidelines for Implementation

A guide for investors and developers on how to put into place and finance the top business models for solar PV across the EU.

PV Financing Project | November 2016
Deliverable 6.4 – Public – EU Implementation Guidelines

Sonia Dunlop - Alexandre Roesch

Solar Power Europe

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EU Policy Advisory Paper

European Union

EU Policy Advisory Paper

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Self-consumption

Power Purchase Agreements

Figure 15. Typical self-consumption business model

Figure 23. Typical onsite private wire PPA business model structure
Self consumption
Shared generation facility in Austria
« Self-consumption is collective when the electricity supply is taking place between one or more electricity producers and one or more end consumers, linked together by a legal entity ... » (beginning of Art. L 315-2, Energy Code).

Collective self-consumption in France
Power Purchase Agreements

- Wholesale PPA
- Onsite direct wire PPA
- Synthetic PPA
- Mini-utility
- Sleeved off-site PPA

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Wholesale PPA

- PPA for all power produced by Generator
- £
- Title to power
- Licenced supplier/Balancing party
- Grid
Onsite private wire PPA
Overcoming offtaker risks
Sleeved PPA

PPA for all power produced by Generator

PPA3: Back to back PPA - Electricity Supplier purchases all power purchased by Consumer. Consumer repurchases power it uses (performing balancing function)

Generator → Corporate Consumer

£

Licenced Supplier/ Balancing Party

Grid
Synthetic PPA

PPA for all power produced by Generator
- Generator receives market price for power produced

Synthetic PPA: Contract (e.g. hedge or Contract for difference) where Generator and Consumer agree fixed price - Generator receives market price under PPA and Generator and Consumer split difference between market price and fixed price

Consumer purchases power requirements from licensed supplier

Title to power

www pv-financing.eu
Mini-utility PPA

- Generator
- Fund/Corporate Consumer
- Mini-utility/Trading SPV
- Grid

PPA for all power produced by Generator

Title to power

PPA - Consumer purchases power it uses from Mini-utility. Mini-utility performs balancing function

Power

Corporate Consumer

£
“Mieterstrom” in Germany

...onsite mini direct wire PPAs
### Other business models...

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[www.pv-financing.eu](http://www.pv-financing.eu)
National contract templates and business model guidelines
Cash flow models

Is a PV system a worthwhile investment for me?

The following calculation tool will answer this question by comparing the cost per kilowatt hour (kWh) PV system options which may be selected by you. In case the PV electricity will be self-consumed by you as the plant on grid electricity price and the net savings are presented as main result. In case you supply the PV electricity to the PV electricity cost and the net-profit is presented as main result. In addition, some key economic figures. The underlying excel tools can be downloaded on the bottom right. In order to adjust the calculations you by adjusting the sliders below each chart. Your adjustments directly influence the PV electricity cost of the PV enter in the box on the right.

United Kingdom | Self-consumption

How much does your PV system cost per kWp?

If you have received an quote from a PV installer simply divide your total cost by the system size in kWp. Please make sure to include or exclude sales tax as a private individual or a company. Reference values:

Typical residential systems cost between 1,300 - 1,500 €/kWp and commercial systems between 1,100 - 1,3
Index of national documents (1/2)

**AUSTRIA**
- Roof rental contract: Dachvermietung (Österreich)
- Leasing contract: Pachtvertrag (Österreich)
- Solar cooperative association by-laws: Vereinstatuten (Österreich)
- Self-consumption model guidelines: Leitfaden zu PV-Eigenverbrauchsmodellen
- Policy advisory paper Austria: Nationales Positionspapier

**FRANCE**
- Collective self-consumption contract: Modèle d’autoconsommation collective d’électricité (France)
- Surplus electricity in collective self consumption electricity contract: Modèle de contrat de vente du surplus d’électricité dans le cadre d’une autoconsommation collective (France)
- Solar business model implementation guidelines: Guide de Mise en Oeuvre de Projets PV en France
- Policy advisory paper France: Recommandations pour un deployment accru du photovoltaïque en France

**GERMANY**
- Neighbour electricity model implementation guidelines: “Geschäftsmodelle Mit Pv-Mieterstrom“
- Policy advisory paper Germany: Nationales Positionspapier

**ITALY**
- Operational leasing contract for a PV plant: Contratto di locazione operativa di impianto fotovoltaico (italia)
- Power Purchase Agreement contract for electricity supply through a PV plant: Accordo per la costruzione di impianto dedicato e somministrazione di energia elettrica secondo lo schema del sistema efficiente di utenza (italia)
- Solar business model implementation guidelines: Impianti fotovoltaici: linee guida per l’implementazione
- Policy advisory paper Italy: Fotovoltaico in Italia, quale politiche di supporto?
Index (2/2)

SPAIN
Contract template for the participation in the crowdfunding of a PV installation Contrato de cuentas en participación para la explotación de una instalación fotovoltaica ubicada en (España)
Contract template for representation in the electricity trading market for a prosumer with self-consumption 2 Contrato de representación de mercado para la venta de excedentes de una instalación del autoconsumo (España)
Cooperative by-laws template Plantilla de estatutos corporativa (España)
Solar business model implementation guidelines Pautas de Implementación Nacional
National report on regulatory framework Spain Informe nacional de asesoramiento regulatorio

TURKEY
Contract for lease of PV system FV sistemlerin kiralanması için Örnek Kontrat
Electricity utility, investor and solar supplier contract Kontrat tipi 1: Kamu Hizmetleri(Elektrik), yatırımcı ve solar tedarikçi model I (Türkiye)
Electricity supply contract for solar PV electricity supply and example electricity bill Fotovoltaik Elektrik Arzı ve Örnek Elektrik faturası için Örnek Elektrik Arzi Sözleşmesi (Türkiye)
Solar business model implementation guidelines Ulusal uygulama rehberi
Policy advisory paper Turkey Ulusal Politika Tavsiye Belgesi

UNITED KINGDOM
Power Purchase Agreement (United Kingdom)
Making Solar Pay: the future of the solar PPA market in the UK
UK National Policy Advisory Paper
Webinars and events

• National webinars (in national languages) for seven countries: Austria, Germany, France, Italy, Spain, Turkey and United Kingdom
  – Italy webinar on Mon 20 February 15:00-16:30
  – Germany webinar on “crowdinvesting” on Tues 4 April
  – Contact the national partners for more information

• Event in Brussels to present results to policymakers in April/May 2017
  – Contact SolarPower Europe for more information

• Possible national webinars in other EU Member States to disseminate project results
  – Check @PVFinancing on Twitter for more information.
Questions?

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