The Concepts of PV Prosumption and Potential in Europe

Side-Event Intersolar, Munich
20th June 2018

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PV Prosumers4Grid

Objectives:

To increase the market share & market value of PV by enabling consumers to become PV prosumers & to enable the suitable regulatory framework.

Better power system integration of PV with a focus on market integration. Incl. new management & business models to combine PV, storage, flexible demand into a commercially viable product.

8 target countries: Austria, Belgium, France, Germany, Italy, Portugal, Spain and the Netherlands

Duration: 30 months (until March 2020)

Project partners:

EREF, TU-Wien / Energy Economics Group, Ambiente Italia, portug. PV-Verband APESF, span. PV-Verband UNEF, Technalia-Institut Spanien, LNEG-Institut Portugal, Becquerel Institut,, Universiteit Utrecht, Eclareon

Self-consumption Definition

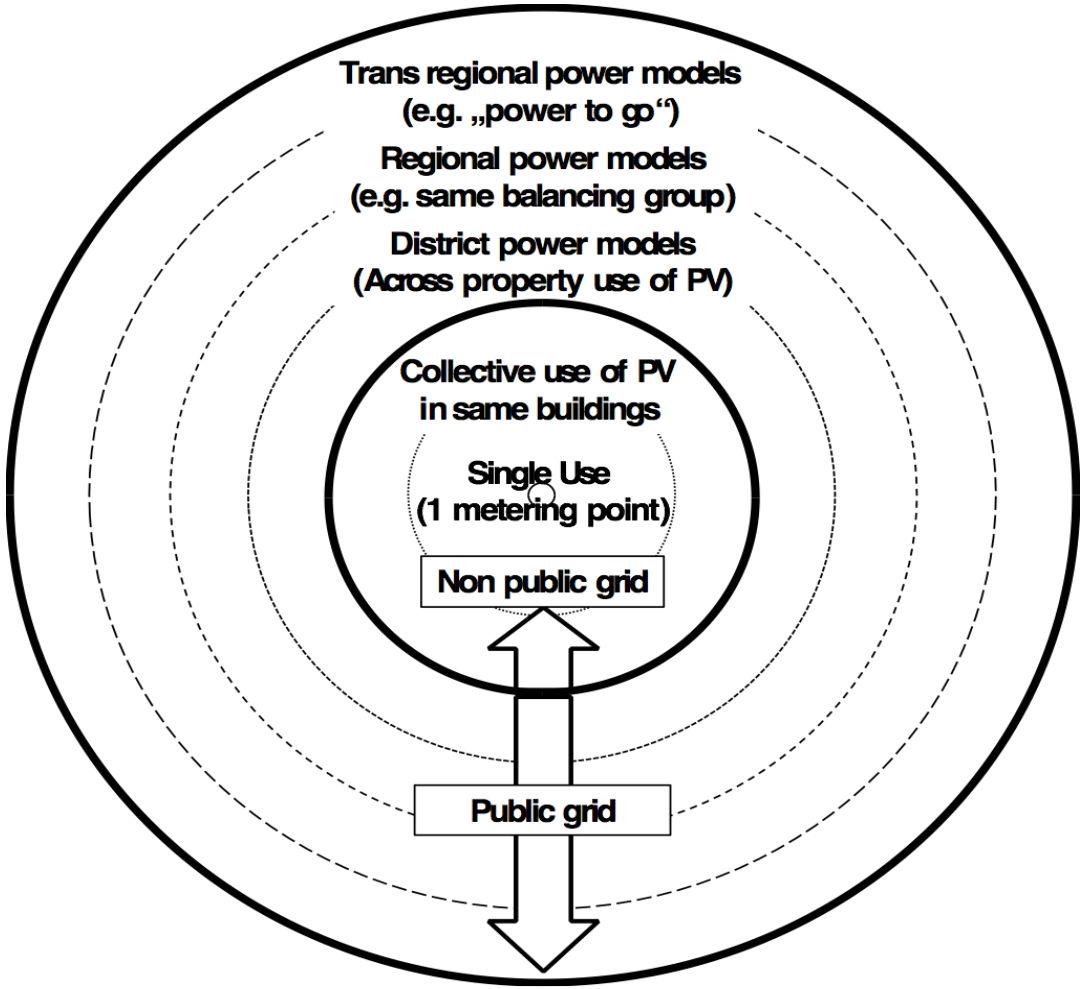
PV electricity aimed at reducing the purchase of electricity due to:

- **private local (on-site) self-consumption, where only one actor aims to consume PV electricity in one place,**
- **collective self-consumption, where a group of actors consumes electricity from a shared PV system,**
- **virtual self-consumption, where generation and consumption of PV happens at the same time but in differing locations.**

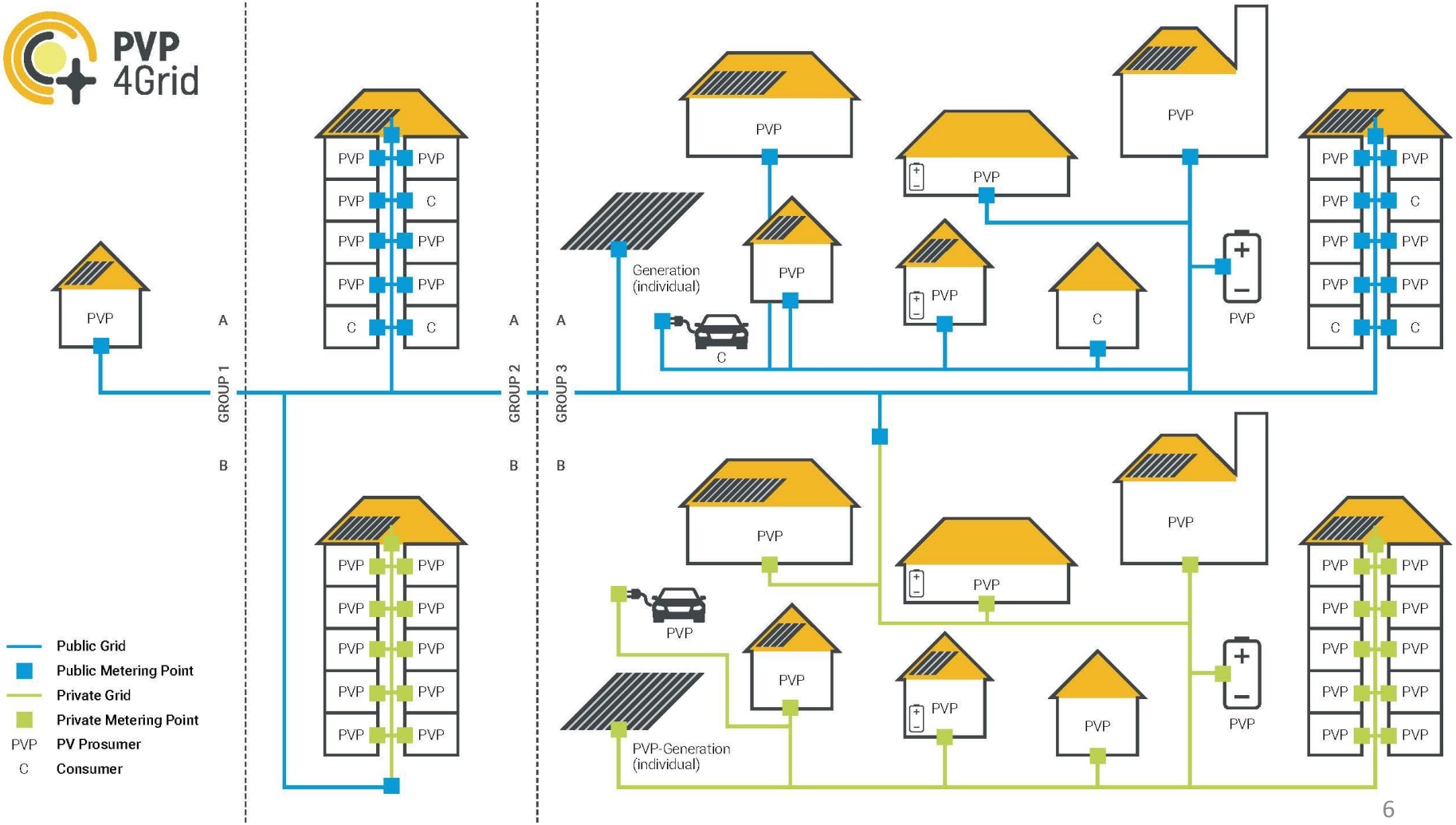
Parameters of Prosumption

PV self-consumption	1	Right to self-consume
	2	Revenues from self-consumed PV behind the meter
	3	Charges to finance T&D (transmission and distribution grid) impairing self-consumption savings
Excess PV electricity	4	Revenues from excess electricity
	5	Maximum timeframe for compensation
	6	Geographical compensation

System boundaries of PVP concepts



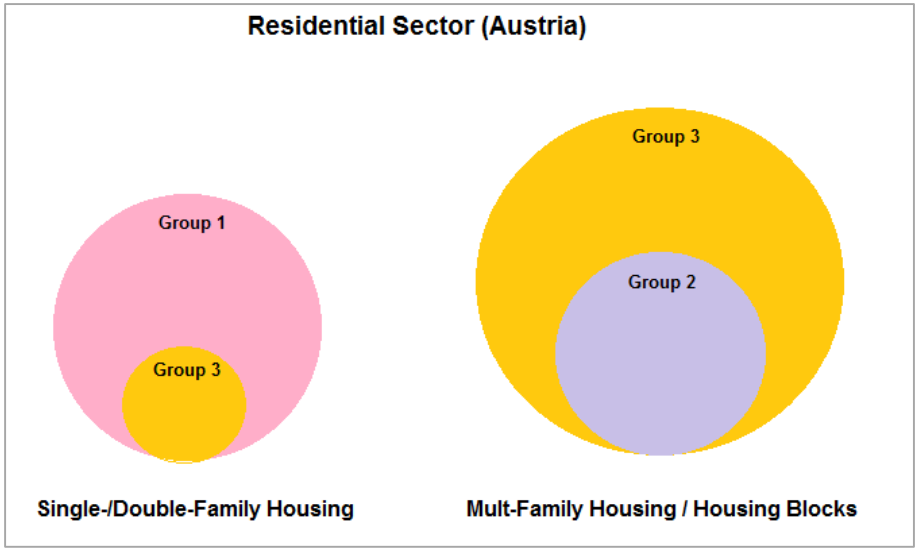
Classification of possible PVP4Grid concepts

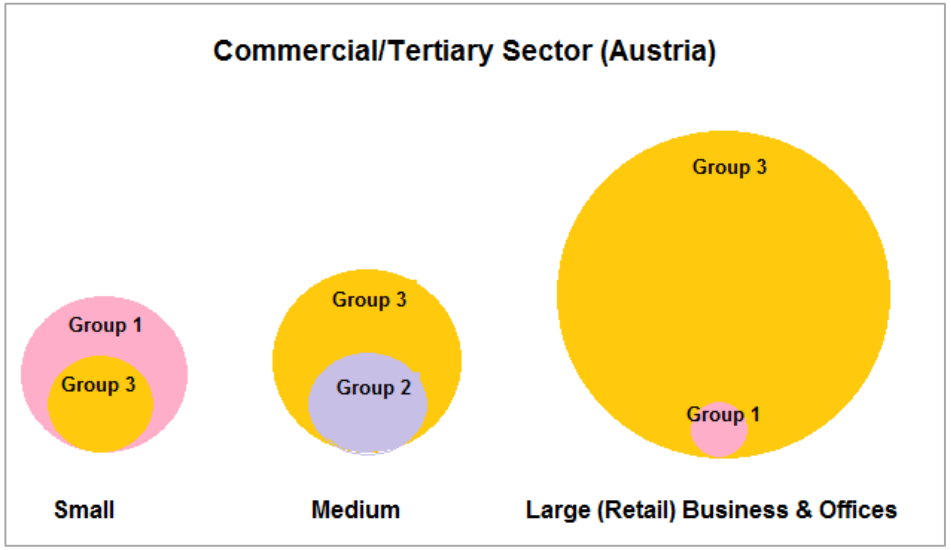


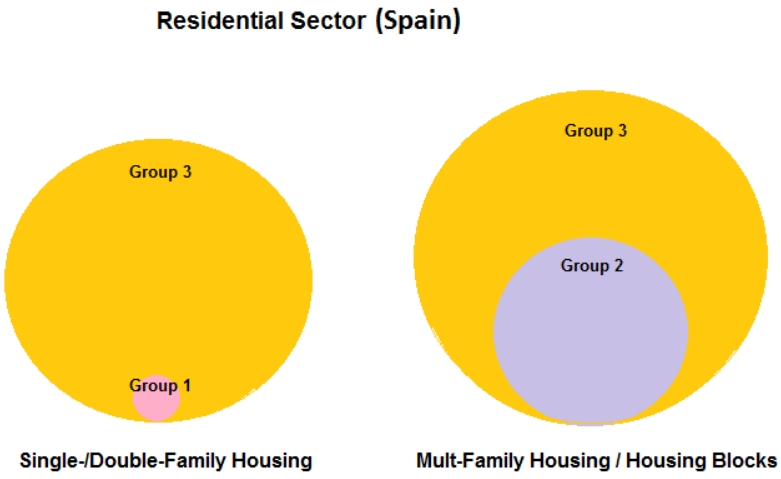
Framework in PVP4Grid target countries

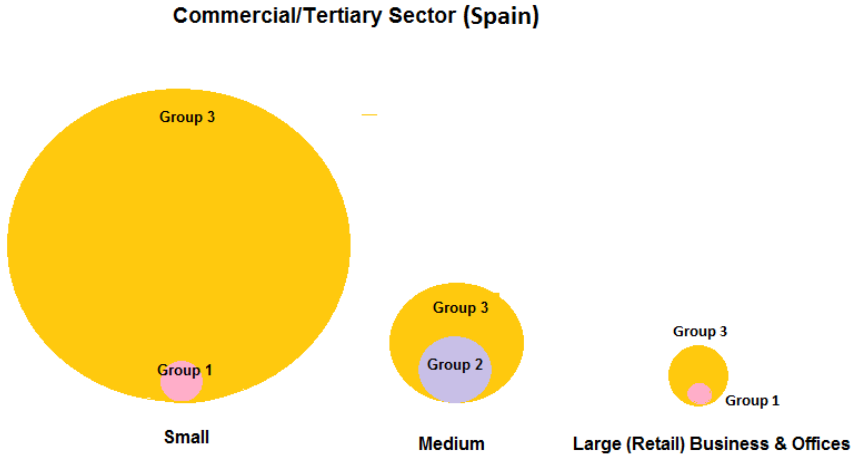
Country	Group 1	Group 2	Group 3	Comments
Austria	YES SC+market price or FiT	YES 2a) e.g. Multi-apartment buildings Not yet in commercial / office buildings	NO	Storage is promoted with financial support in CAPEX
Belgium	YES, 2 options: Pure SC Net-metering	NOT allowed yet, except for some exceptions at reginal level	NOT allowed yet, except for some exceptions at reginal level	Example for industrial park near Mery (demonstrative)
France	YES SC+fixed FiT+financial support	YES, designed as VPN embedded in the public network	Limitation to the same low voltage station, but allowed	Example of shared SC: Gironde Habitat/Les Souffleurs in a multidwelling
Germany	YES Very common SC+FIT	YES, Mieterstrommodelle" (neighbour solar supply model) PPA also possible	Allowed, however, hardly found due to condition of "consumer identity"	
Italy	YES SC+PPA or NM (or NB, as it exchanges money, not energy (*Scambio sul posto*)	NOT allowed	NOT allowed	Battery storage costs can be included for tax reduction purposes The last reform of the residential electricity bill, flatten the energy costs, making SC less convenient
Netherlands	YES Net-metering ("saldering")	YES. Well developed for apartments buildings	YES Postal Code Rose Policy	Analysis of optimal PV orientations and tilt for maximized SC (UU). Subsidy support scheme SDE+
Portugal	YES SC+ % of MIBEL)	YES, allowed, although strong barriers for its implementation	YES, allowed, although strong barriers for its implementation	Subsidies to investment for building renovation POSEUR
Spain	YES SC1: no remuneration for excess; SC2 + Market price No NM	NOT permitted yet. Collective self-consumption is not regulated yet	NOT permitted yet. Collective self-consumption is not regulated yet	Sun tax in force: charge for the electricity self-consumed. Storage is allowed

Potential of PV Prosumption





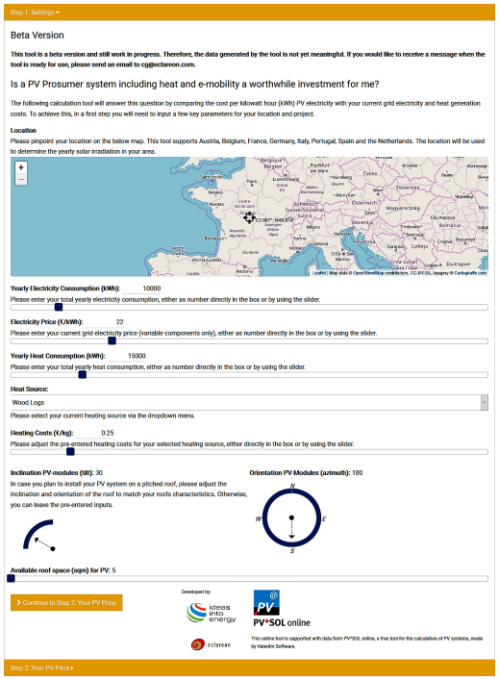




Features of Online PV Calculator

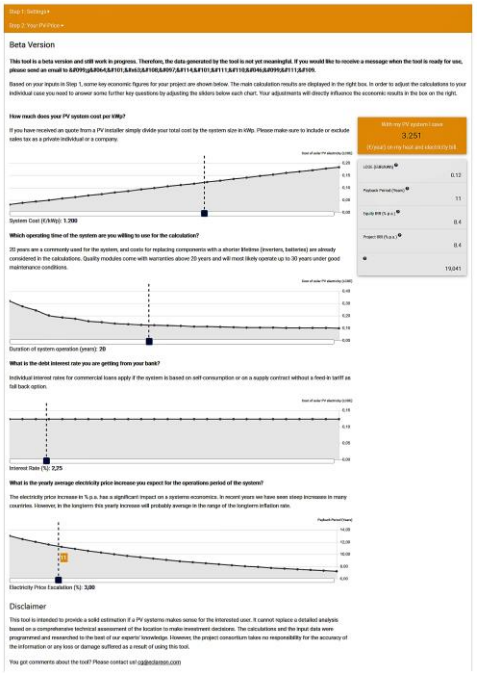
Step 1: PV System Planning

- Simple system dimensioning
- Performance calculation
- Selection of consumption profiles
- User inputs for total consumption
- User selects application segments



Step 2: Financial Analysis

- Profitability assessment with LCOE, Payback Period, Equity IRR, Project IRR, Net Present Value
- Results will adjust dynamically



Step 1: PV System Planning

Step 1: Settings

Beta Version

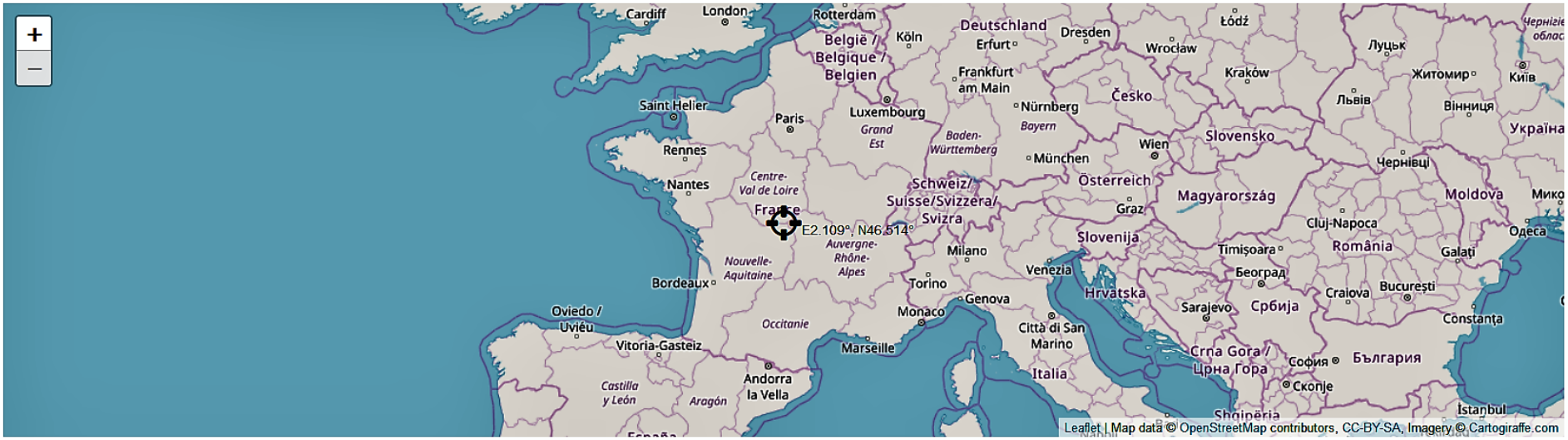
This tool is a beta version and still work in progress. Therefore, the data generated by the tool is not yet meaningful. If you would like to receive a message when the tool is ready for use, please send an email to cg@eclareon.com.

Is a PV Prosumer system including heat and e-mobility a worthwhile investment for me?

The following calculation tool will answer this question by comparing the cost per kilowatt hour (kWh) PV electricity with your current grid electricity and heat generation costs. To achieve this, in a first step you will need to input a few key parameters for your location and project.

Location

Please pinpoint your location on the below map. This tool supports Austria, Belgium, France, Germany, Italy, Portugal, Spain and the Netherlands. The location will be used to determine the yearly solar irradiation in your area.



Step 1: PV System Planning

Yearly Electricity Consumption (kWh): 10000

Please enter your total yearly electricity consumption, either as number directly in the box or by using the slider.

Electricity Price (€/kWh): 22

Please enter your current grid electricity price (variable components only), either as number directly in the box or by using the slider.

Yearly Heat Consumption (kWh): 15000

Please enter your total yearly heat consumption, either as number directly in the box or by using the slider.

Heat Source:

Wood Logs

Please select your current heating source via the dropdown menu.

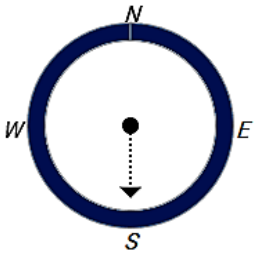
Heating Costs (€/kg): 0.25

Please adjust the pre-entered heating costs for your selected heating source, either directly in the box or by using the slider.

Inclination PV-modules (tilt): 30

In case you plan to install your PV system on a pitched roof, please adjust the inclination and orientation of the roof to match your roofs characteristics. Otherwise, you can leave the pre-entered inputs.

Orientation PV-Modules (azimuth): 180



Available roof space (sqm) for PV: 5

Step 2: Financial Analysis

Step 1: Settings ▸

Step 2: Your PV-Price ▾

Beta Version

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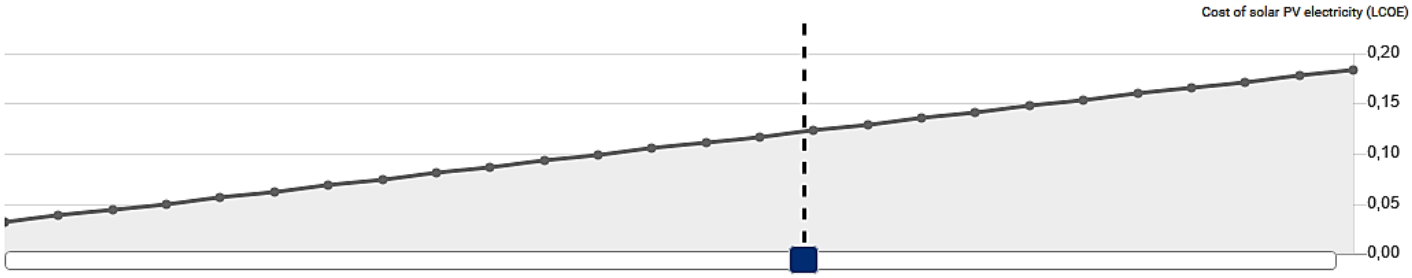
Based on your inputs in Step 1, some key economic figures for your project are shown below. The main calculation results are displayed in the right box. In order to adjust the calculations to your individual case you need to answer some further key questions by adjusting the sliders below each chart. Your adjustments will directly influence the economic results in the box on the right.

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.



System Cost (€/kWp): **1.200**

Which operating time of the system are you willing to use for the calculation?

20 years are a commonly used for the system, and costs for replacing components with a shorter lifetime (inverters, batteries) are already considered in the calculations. Quality modules come with warranties above 20 years and will most likely operate up to 30 years under good maintenance conditions.

With my PV system I save

3.251

(€/year) on my heat and electricity bill.

LCOE (EUR/kWh)	0.12
Payback Period (Years)	11
Equity IRR (% p.a.)	8.4
Project IRR (% p.a.)	8.4
	19,041

Step 2: Financial Analysis

System Cost (€/kWp): **1.200**

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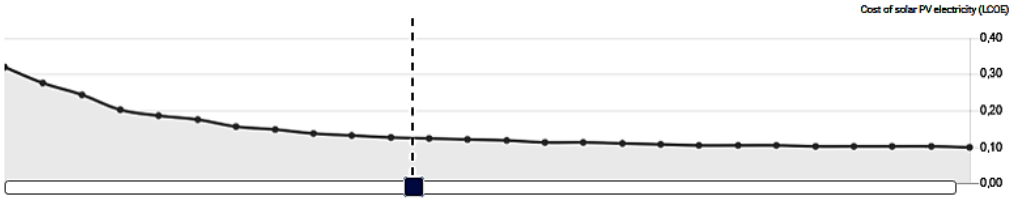
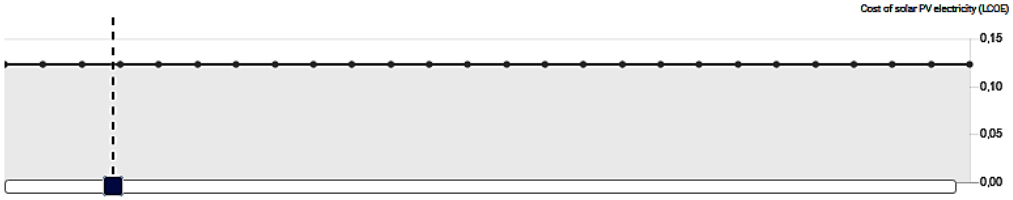


Duration of system operation (years): **20**

What is the debt interest rate you are getting from your bank?

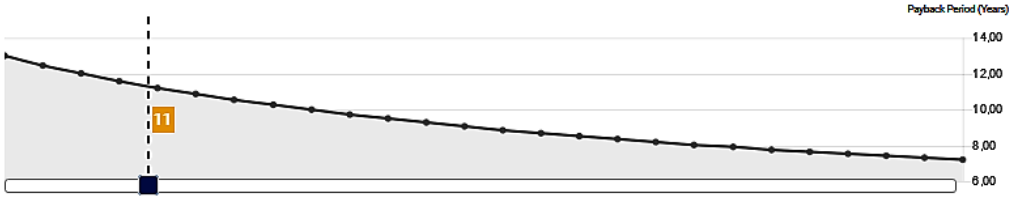
Individual interest rates for commercial loans apply if the system is based on self-consumption or on a supply contract without a feed-in tariff as fall back option.



Interest Rate (%): **2,25**

What is the yearly average electricity price increase you expect for the operations period of the system?

The electricity price increase in % p.a. has a significant impact on a systems economics. In recent years we have seen steep increases in many countries. However, in the longterm this yearly increase will probably average in the range of the longterm inflation rate.



Electricity Price Escalation (%): **3,00**

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Equity IRR (% p.a.)	8.4
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	19,041

Contacts

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Becquerel Institute – ICARES Consulting (BI) Belgium
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Eclareon (ECL) Germany
www.eclareon.com
European Renewable Energies Federation (EREF) Belgium
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Fronius International (FRO) Austria
www.fronius.com/en
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