

## PV 3.0

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### **Abstract/Summary:**

The present change of paradigms provides considerable difficulties to large parts of the PV industry which grew up with comfortable feed-in tariffs. The step into the new era will open new business models such as auto-consumption, energy contracting or sales of PV electricity on a public marketplace. Also, combination of PV power supply with other measures such as energy saving and load curve adaptation will be emerge. The article gives an overview of the historical development of PV, its application and business models and gives perspectives for PV electricity, such as an “Ebay”-type trading model and diminution of storage necessities via a global grid set-up.

**For more Information on the topic please contact the R&D Team of PI Berlin.**

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# PV 3.0

## Photovoltaics matures and reaches competitiveness

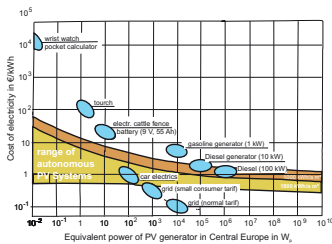
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The present change of paradigms provides considerable difficulties to large parts of the PV industry which grew up with feed-in tariffs in power. The step into the new area will open new business models such as energy contracting or B2B direct-sales of PV electricity. Also, combination of PV power supply with other measures such as energy saving and load curve adaptation will be demanded.

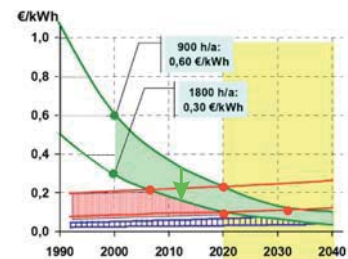


1a. The first stage of PV has been used in space (since 1960). Price of a PV generator has been  $\geq 100 \text{ €/W}_p$



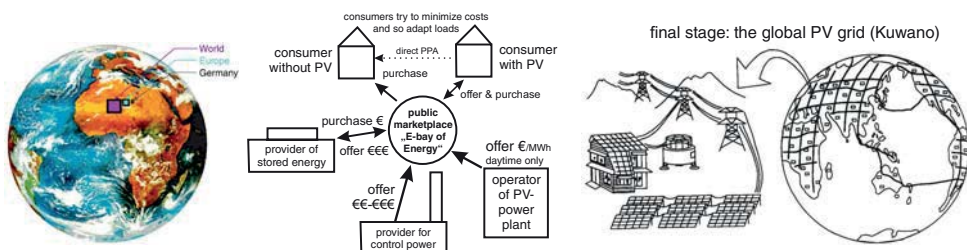
1.0

1b. Use of terrestrial PV has been for autonomous remote power supply (since 1980). System size has been in kW-ranges, PV system prices at  $5\text{-}20 \text{ €/W}_p$ . PV electricity costs have been  $1\text{-}2 \text{ €/kWh}$  and competed with battery power supply or diesel gen-sets.



2.0

2. Due to grid-feed tariffs (FiT) in some countries, PV boomed during 2000-2010, production increased, prices went down. System size reached the MW-range and system prices at  $2 \text{ to } 4 \text{ €/W}_p$ . PV electricity costs went down from  $0.6 \text{ to } 0.2 \text{ €/kWh}$ .



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3. Since 2012, PV electricity is cheaper than consumer tariffs from the utilities, thus opening abundant markets in most countries. Now, system size may reach the multi MW-range, system prices are down to  $1 \text{ €/W}_p$ . PV electricity costs are  $0.6\text{-}0.15 \text{ €/kWh}$ : PV is often the cheapest option for electricity during daytime, accordingly loads shall be adapted, control power or stored energy be purchased.

**PV is now able to go for power supply on a global scale !**

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