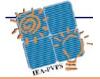


Assigning a fair price to PV electricity



Gaëtan Masson EPIA, Head of Business Intelligence









1

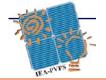


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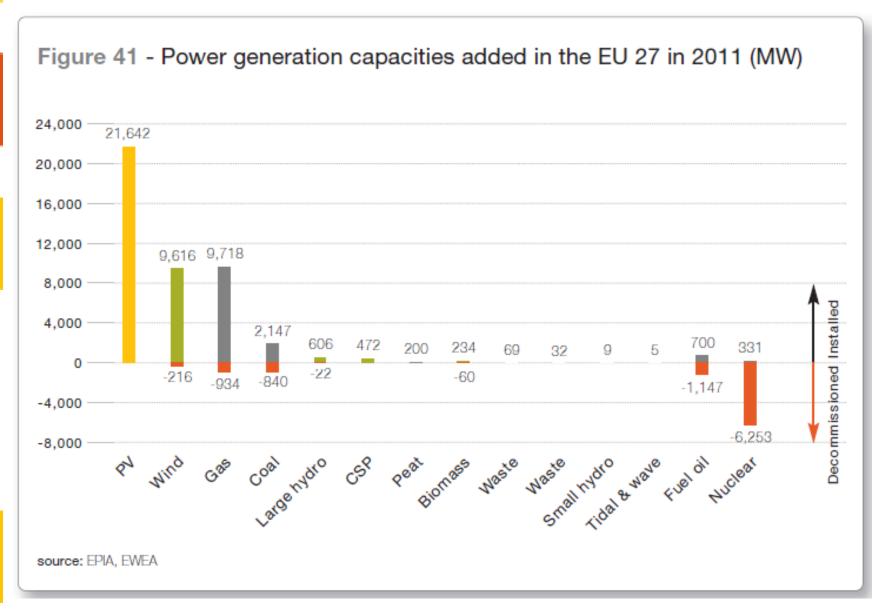
3

1st source of electricity installed in Europe in 2011

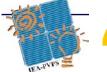
PV a the 1st source of electricity in 2011



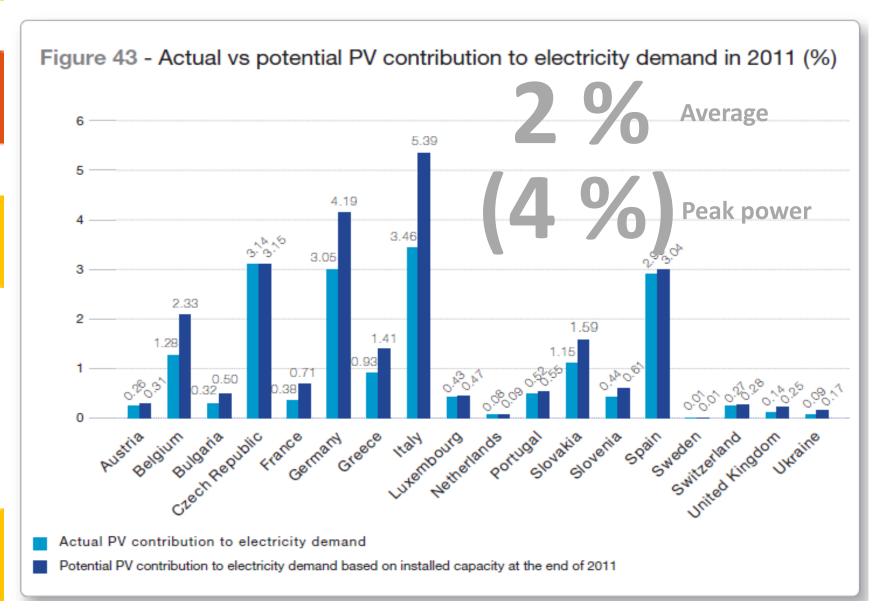




% of electricity demand covered by PV



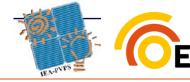


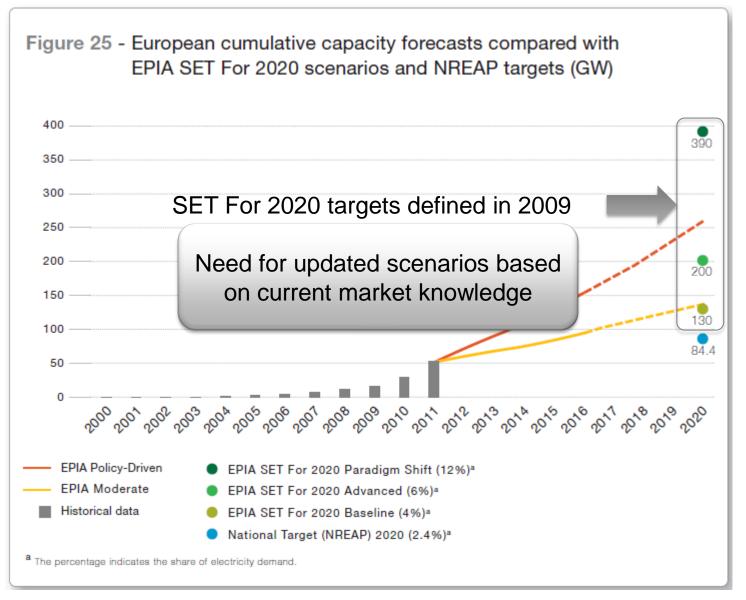




Scenarios until 2020 & 2030

2020 PV scenarios in EU

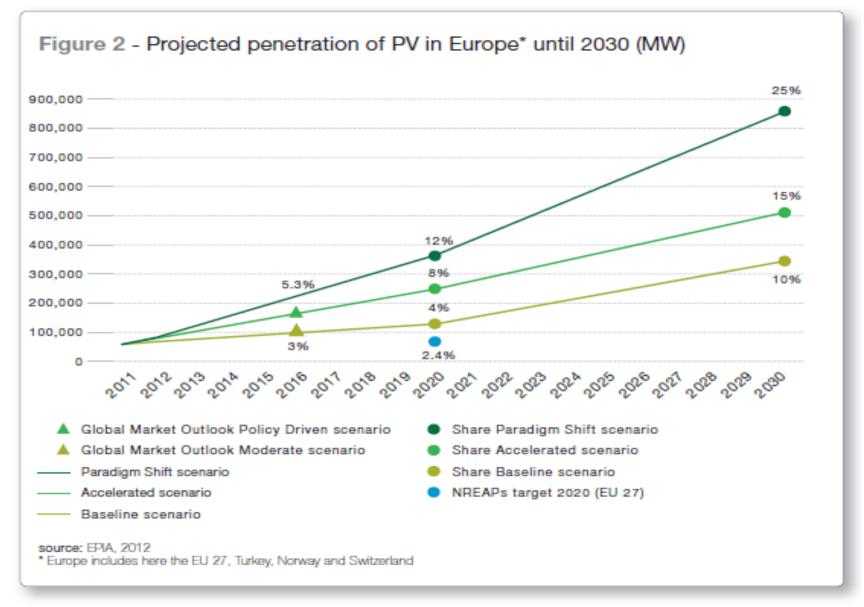




New EPIA scenarios until 2020 and 2030









An history of the price of PV electricity

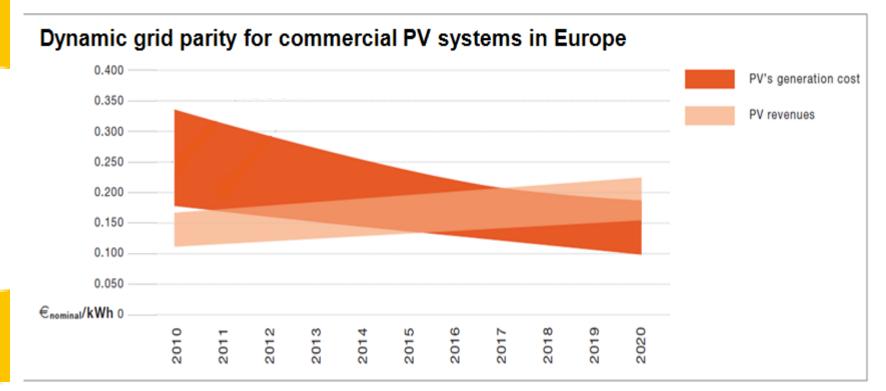
Price of PV electricity



3 periods

PV is not competitive

Transition period, PV close to competitiveness



Pre-competitive phase



PV is not competitive

Transition period, PV close to competitiveness

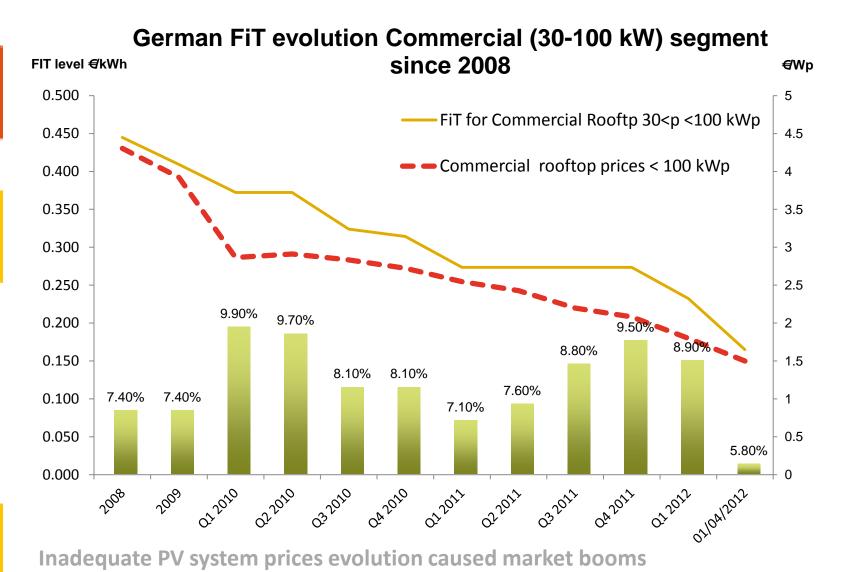
- Price paid for PV electricity has to cover the costs and the risks.
- FiT and similar schemes define the price of the PV electricity
- Profitability should define the price level
- The fair price is the one that guarantees a fair IRR
 - Equivalent risk
 - Reasonable return
 - Or face the boom...



Table 1 - Internal Rate of Return levels

Pre-competitive phase





Transition phase

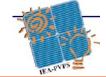


PV is not competitive

Transition period, PV close to competitiveness

- Forget « grid parity » definition Think « competitiveness »
- 2 main questions:
 - When will PV reach competitiveness ? (country / segment)
 - How to manage the transition?
- Rooftops (local consumption) vs Utility-scale (electricity production),
 - On rooftops: « prosumers » will compare PV with their electricity bill.
 - For utility-scale, investment perspective (comparison with similar asset gas CCGT) or wholesale price competitiveness.

Transition phase: PV on rooftops





T O D A Y

- Profitability depends on support schemes
- FiTs guarantee 15-20 years of cash flows
- Risks: reduced, mesurable
- Electricity producer selling at FiT



- Profitability will depend on electricity savings / possible resale of excess electricity: variable, less predictable cash flows
- Savings: self-consumption / net-metering schemes
 - Electricity compensation ?
 - Grid operators financing?
 - Taxes losses ?
- Sale of excess electricity: need of adequate regulatory framework (aggregators, innovative business models for LV area netting)
- Risks: less regulatory risk, more operational risks
- Main drivers: cost of capital, cost of insurance
- Prosumer, producing for <u>local</u> (own+neighb.) consumption

Transition phase: utility-scale PV





T O D A Y

- Profitability depends on support schemes
- FiT + other guarantee 15-20 years of cash flows
- Risks: reduced, mesurable
- Electricity producer selling at FiT



Electricity producer selling where it can

- Profitability will depend on the ability to guarantee cash flows
 - PPA (with electricity suppliers, or with large consumers peer-to-peer)
 - Selling on wholesale electricity market (midday prices ?)
 - Cost of capital becomes essential to reach competitiveness
 - Quality becomes essential to remain competitive
- Risks: less regulatory risk, more operational risks, market risk, counterparty risk...
- Transition from FiT ? Should we go for RPS/Quotas/GC ?

Transition phase



- The fair price for PV electricity will then depend on:
 - Whether or not the PV system can be competitive
 - Depending on the segment
 - Depending on irradiation
 - Depending on local regulations
- At the end, the fair price for PV electricity is still the one covering the costs and risks.
- Competitiveness of PV will be ensured when investors will accept to start investing with an equal level of risk return with or without support schemes.

Competitive phase



PV is not competitive

Transition period, PV close to competitiveness

- Competitiveness implies that PV can play its role on electricity markets.
- Fair price is not only a result of costs and risks to be covered: it is mainly a market question;
- Retail electricity prices will define the fair price for self-consumed electricity
- Wholesale electricity prices will define the fair price for electricity injected into the grid
- Imports of electricity from MENA could become competitive with wholesale prices in Europe

Three major points of attention



Will distribution networks be capable of hosting future PV installations?

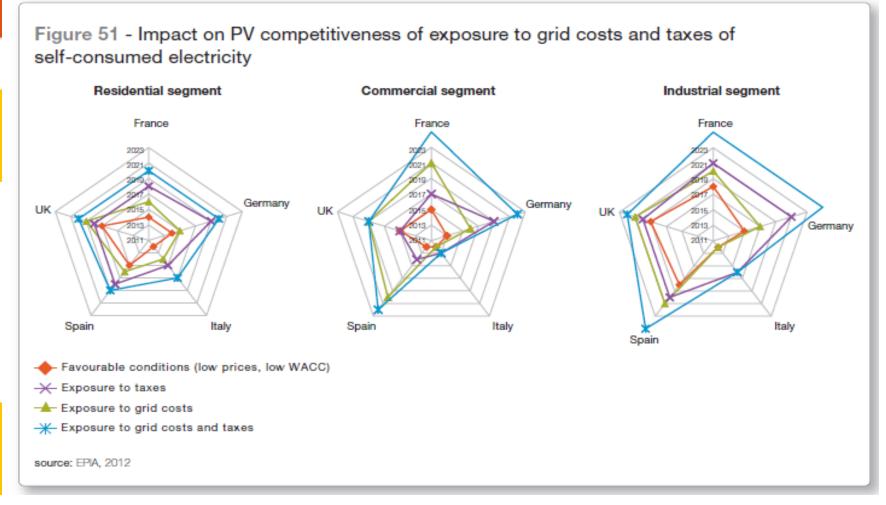
Will transmission system operators be able to manage system operations safely with high shares of PV and Wind?

Will system costs delay significantly the competitiveness of PV?

Impact of grid integration on competitiven



- Exposure to grid costs and taxes (today compensated)
- What is a fair price for PV electricity then?





Session 1: PV in the electricity sector

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- Ruggero Schleicher-Tappeser
- Jochen Hauff, AT Kearney

