The Impact of Anti-Dumping and / or Countervailing Duties on Imports of Solar Panels, Cells and Wafers from China on EU Employment and Value Added

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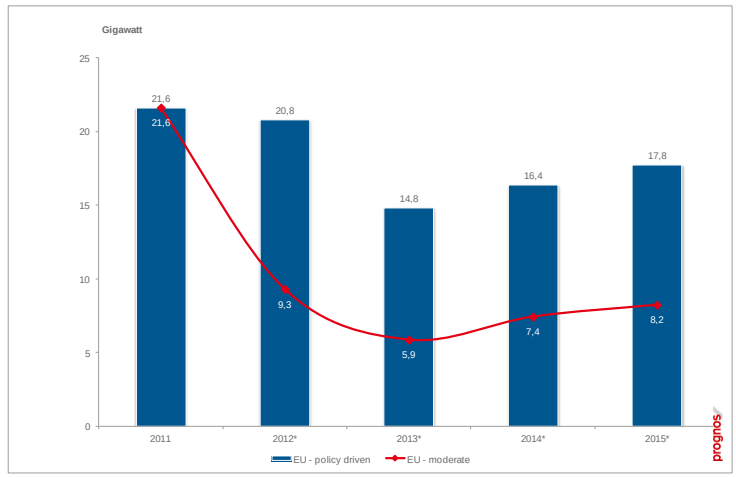
EU PV Market

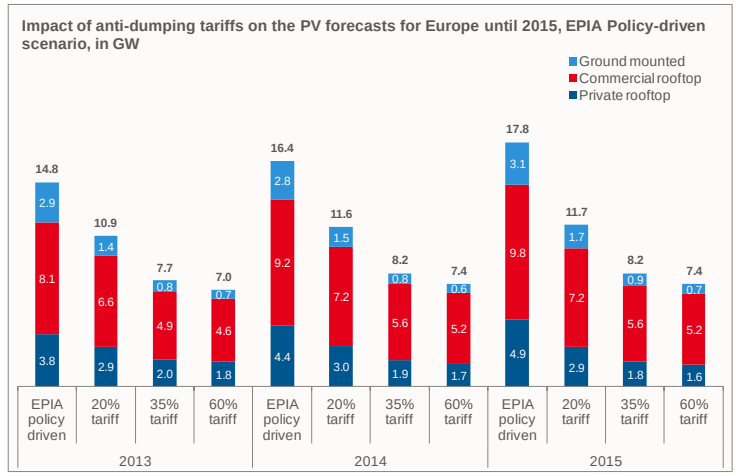
New PV installations 2011-2015 (GW) – EU (Development without duties)



Source: EPIA (2012): Global Market Outlook for Photovoltaics until 2016, May 2012

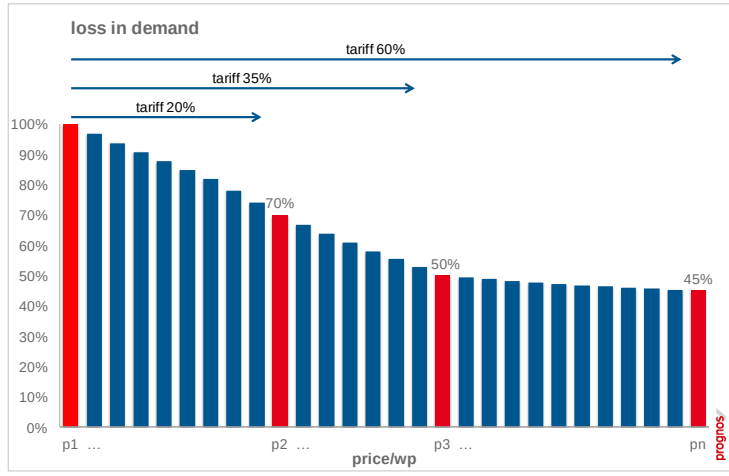
EU PV Market shrinks significantly due to AD and / or CVD

The overall market impact for the EU shown below reflects the aggregate of the calculations for every single segment in every key market.



Stylized Demand Curve for the EU PV Market

The demand curve along the increasing line of imposition of anti-dumping duties shows the growing decrease of demand. Any duty rate will immediately translate in decreased demand.

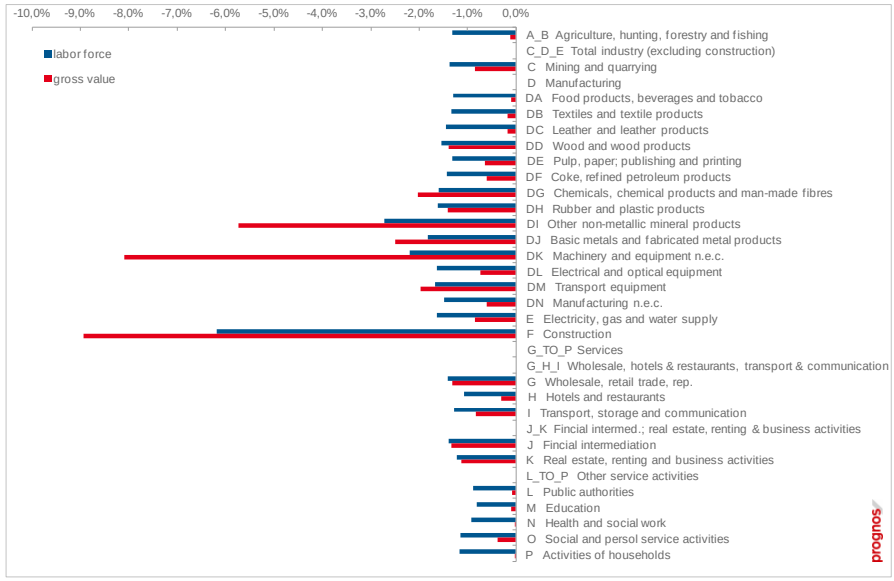


PV Value Chain

Not only the producers of cells and modules have to be taken into account…

Source: Prognos based on European project "PV employment" 2009

Input-Output-Table showing effects for EU-5

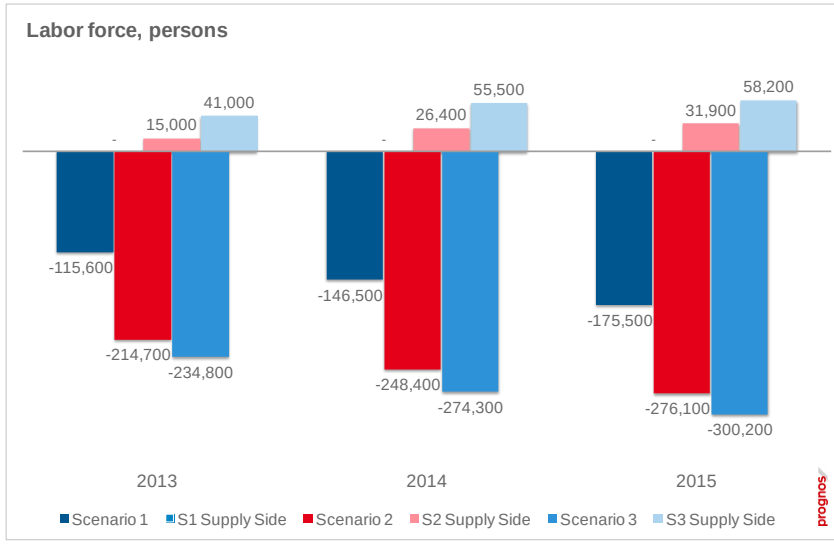


The impact of decreased demand on employment and value added: four main findings

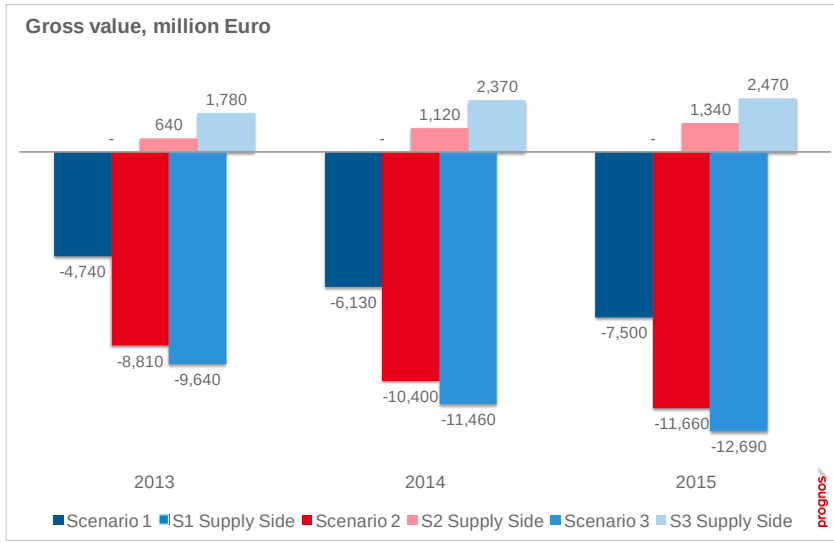
Impact on Demand leads to important economic effects

1. Employment in the solar sector in Europe decreases because the **demand for PV products decreases** + less value added, i.e. less solar installations and less demand of BOS components.
2. Employment and value added are also affected by the **decrease of exports of raw materials and machinery** from EU Member States to China.
3. Moreover, **all other segments of the EU economy** such as the supply of engineering or other services are suffering from the decrease in demand for solar products.
4. Employment and value added in the EU may be positively affected by a **limited increase of production of solar products in the EU**.

EU-27 reduction in labor force (tariffs of 20, 35 and 60%)



EU-27 reduction in value added (tariffs of 20, 35 and 60%)



Summary and Conclusion

AD and / or CVD duties harm the EU economy as a whole

- With *any* increase in the price level and thus at any level of duties, demand will decrease.
- At the level of duties taken for illustration purposes (20% to 60%) for 2013-2015:
  - On average over the 3 years 145,900 to 269,800 jobs lost;
  - on aggregate € 18.4 to 33.8 billion lost in value added.
- The above job losses and the shortfall in value added is after offset of the potential increased employment and value added by the EU solar producers that the study also calculates. In particular:

  (i) EU Producers might gain a higher market share but in a significantly smaller market.
  (ii) The plus in EU production cannot compensate the losses.
- Germany suffers the highest losses, followed by Italy and the UK.

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Methodology and Premises

The study aimed at determining whether anti-dumping and / or countervailing duties would have an impact on employment and value added and, if so, what that impact would be

- To determine whether and what that impact would be, the study proceeded in two steps:

(i) determine what, if any, **impact** the duties would have **on the PV market volume** and

(ii) based on the impact on demand, determine whether and how there would be an **impact on employment and value added** along the entire PV value chain and in connecting branches of the EU economy.

Methodology and Premises

Analysis of the impact on demand (1/2)

- The market forecasted by the European Photovoltaic Industry Association for 2013, 2014 and 2015 without anti-dumping and countervailing duties was taken as basis, i.e., the impact of the duties on this demand was assessed.

- To do so, the following factors were taken into account:

  (i) the cost of solar systems for 2013, 2014 and 2015 for systems including Chinese modules versus systems including EU-made modules – costs were based on the forecasts published by different specialized surveyors as compared with Prognos' own market analysis;

  (ii) the contribution to revenue from solar systems of public support schemes and, in particular, revenue generated from the feed-in-tariffs;

  (iii) the revenue generated from solar installations by self-consumption of the solar energy generated;

  (iv) the average return on investment anticipated by investors;

  (v) for illustration purposes, the impact of three levels of anti-dumping and / or countervailing duties (20%, 35% and 60%) was determined on the cost of systems and compared against revenue from FiTs and self-consumption and anticipated ROI (Return on Investment).

Methodology and Premises

Analysis of the impact on demand (2/2)

➔ This allowed to determine whether a private or business investor would consider the investment in a solar installation to be financially rewarding if anti-dumping and / or countervailing duties were imposed. This was then the basis for assessing the impact on demand with reference to the impact that cost increases / revenue decreases had in the past on demand.

- This analysis was made for

  - the three segments of PV installations generally distinguished in Europe, i.e., **private rooftop, commercial rooftop and ground-mounted** installations;

  - for the five EU Member States with the largest volume of installations, i.e., **Germany, Italy, Spain, France and the UK**, which represent about 80% of the market volume;

- The analysis includes a rough estimation for the rest of the European market.

Market Evaluation - Step by step approach

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Analysis of LCOE and the revenues of PV systems

By way of example, the premises and calculations for commercial rooftop installations in Germany are shown in the table below.

Germany - Commercial rooftop (10-100 kW)	Unit	2013	2014	2015
Premises				
System costs Germany/EU	Euro/Wp	1.30	1.33	1.25
System costs China	Euro/Wp	1.10	1.15	1.10
Fixed operation costs (based on investment costs)	%	1%	1%	1%
Interest/ROI (pre tax)	%	8%	8%	8%
Average annual full load hours (over lifetime)	h	925	925	925
FiT	Cent/kWh	14.5	11.5	9.2
Electricity prices commercial consumer (excl. VAT)	Cent/kWh	21.1	21.8	22.4
Potential own consumption rate	%	50%	50%	50%

LCOE calculation → **Revenue calculation**

Market expectation

German Commercial Rooftop LCOE vs. Revenue incl. FiT

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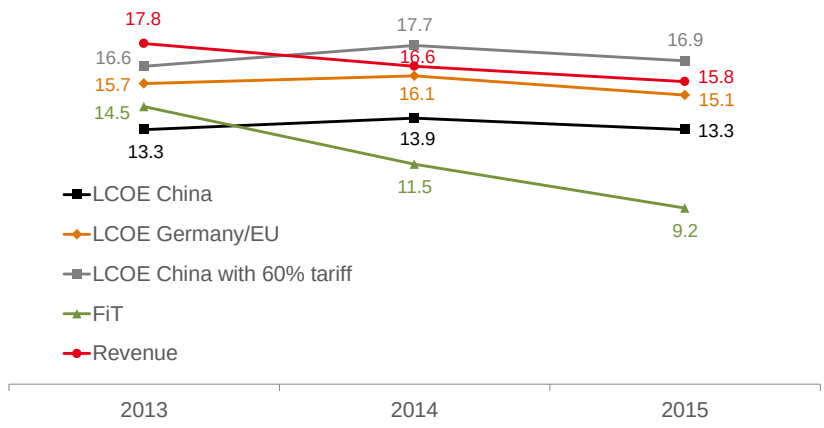
Development of LCOEs with 925 full load hours, FiT for commercial PV systems and the revenues with an own consumption rate of 50% in Germany, in Cent/kWh



Results of the market evaluation

Market impact: Example - Germany commercial rooftop

- The FiT for PV are expected to decrease faster than the cost for PV systems in the next years.
- Therefore self-consumption will become more important for investors to gain sufficient profit margins. But the legal framework for self-consumption is not certain yet and the risk for investors will rise with an increase of self-consumption.
- Anti dumping measures lead to a significant increase of system costs.
- The average LCOE increases above the average expected revenue.
- The commercial rooftop market segment is expected to shrink by 20% to 50%.
- The decrease in demand for the whole German PV market is between 28% (2013, tariff of 20%) and up to 55% (2013, tariff 60%).

Methodology and Premises

Analysis of economic effects

- For the calculation of the impact on employment and value added, we used the 2005 **OECD input/output tables** for all sectors of economy as updated by more recent data stemming from **Prognos' macroeconomic forecast VIEW** (own monitoring of economic interaction among regions and sectors of industry).

- IO-Tables contain branch-specific productivities. Thus, changes in the employment level can be determined by taking into account the value added lost because of the shrinking demand for PV products and installations. The analysis also takes into account that less **intermediate inputs are exported from the EU to China**. The share of value added produced in the EU e.g. in Chinese PV modules is about 36 %.