

2010

MARKET OUTLOOK



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The European Photovoltaic Industry Association is the World's largest industry association devoted to the solar electricity market. The association aims to promote photovoltaics at the national, European and world-wide levels and to assist its Members in the development of their businesses in both the European and in export markets.

DISCLAIMER: Please note that all historical figures provided in this brochure are valid at the time of publication and will be revised when new and proven figures will be available. All forecast figures are based on EPIA knowledge at the time of publication (20 December 2010).

1 - INTRODUCTION

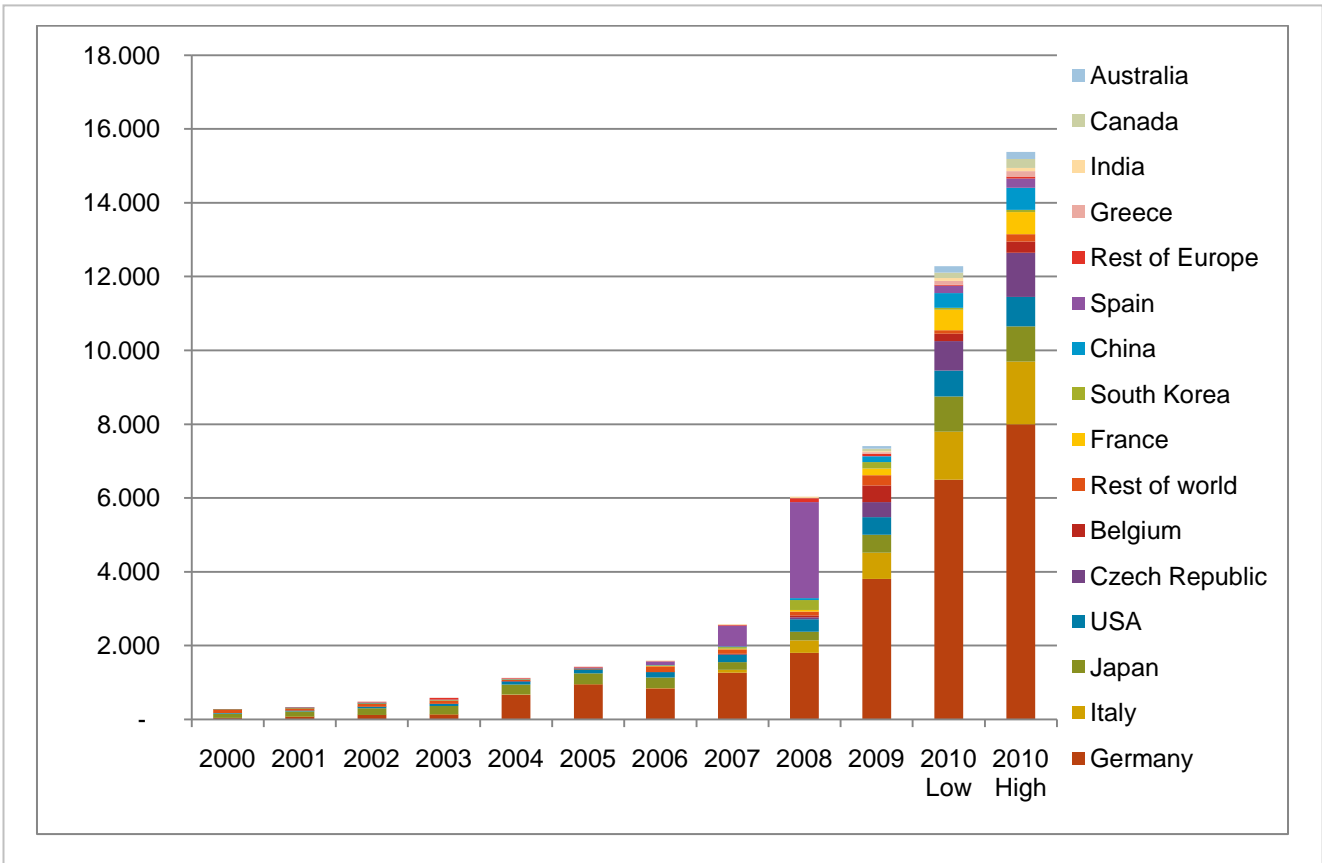
PV markets have never performed so well in their entire history. While the awareness of PV's capabilities grows in many public opinions, it now appears on the energy map of several countries with penetrations of up to 4% in electricity production for Spain during the summer. In 2010, prices for large systems decreased as low as 2.5 Eur/Wp in some countries. The total newly installed capacity added in 2010 represents in average the electricity production of 2 nuclear reactors. In several countries, grid parity for residential systems is reachable in the coming years and in some specific cases in countries or regions with very high electricity prices, PV could already become competitive soon with net-metering only.

Adequate support policies that have been driving the markets so far must continue and be further encouraged. The PV Industry also supports well-designed support schemes that limit the cost of FIT for electricity consumers, while ensuring the development of the markets and industry.

2 - MARKET OUTLOOK 2010

The global PV market in 2010: approximately 15 GW.

Figure 1: Annual worldwide installed PV capacity from 2000 to 2010 in the World (in MW)



Once again in 2010, the growth of the PV markets worldwide has been impressive. With an estimated installed capacity between 12.4 and 15.7 GW for this year only, PV could have experienced a 100% growth compared to the previous year. The range between both estimates reflects the uncertainties on the market evolution at the end of the year in several key markets.

Considering the shipments that were reported throughout 2010¹ the maximum today seems to be 16 GW. Inverter shipments seem to confirm that maximum as well. But with a high number of shipments in Q4 2010, a market boom could be expected once again during December - before the cut of FiT in Germany. However,

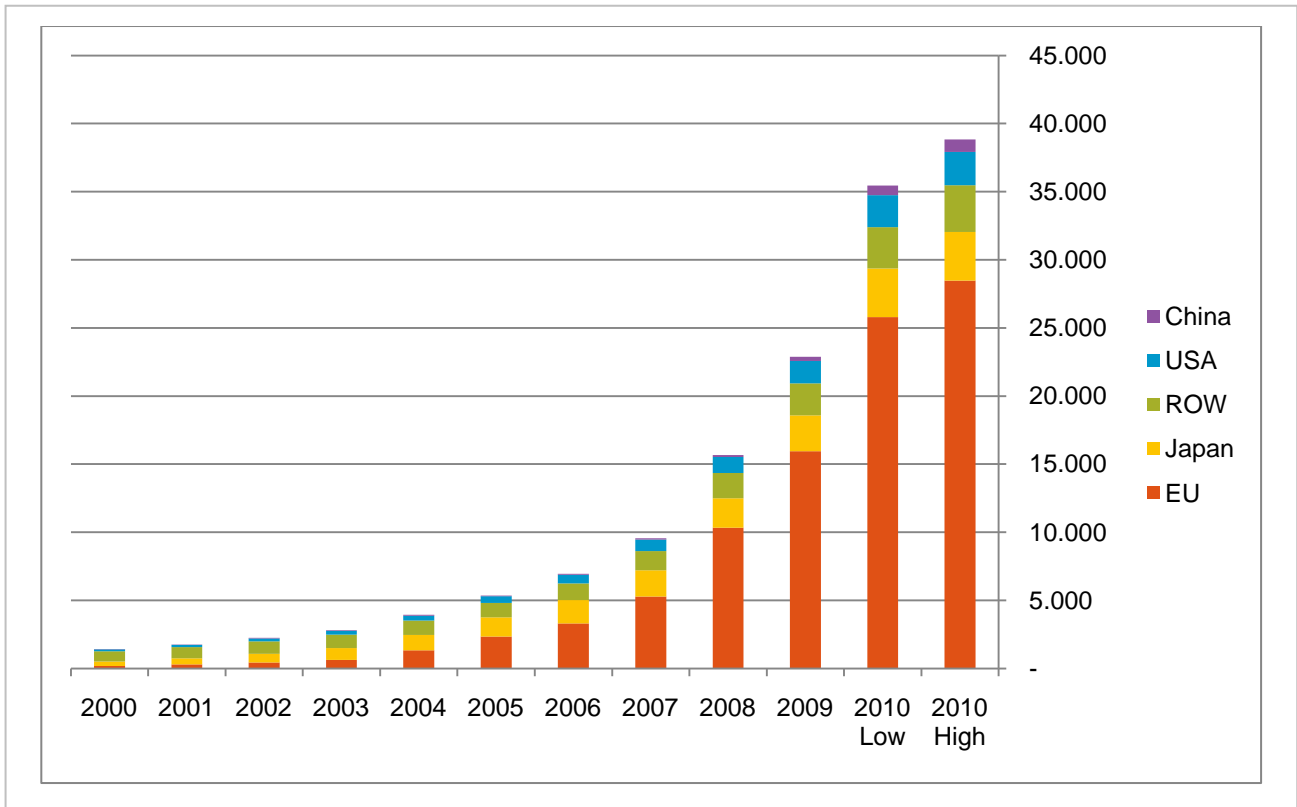
¹ Provisionary data from Navigant Consulting, courtesy of Ms. Paula Mints.

part of these shipments could also end up in inventories in case the market would fail to reach the expected summits.

In addition, the delay to report new installations can vary from one country to another, complicating forecasts even further. The last reports from Germany have shown that the market is not performing as well as in December 2009 or June 2010 before significant cuts in FiTs. This could limit the overall market to around 14.5 GW. In Italy and Belgium, a number of installations from 2010 will be reported during the first months of 2011 only.

All those elements tend to estimate the global market to be most likely between 12.4 and 15.7 GW in 2010, with a reasonable probability of a market size around 14-15 GW based on recent mid-December information.

Figure 2: Evolution of global cumulative installed capacity worldwide (in MW)



The total installed capacity has therefore reached at least the 36 GW mark and can be possibly up to 39 GW.

The increase of the capacity from 2009 to 2010 is the most impressively represented in absolute values.

European markets: At least 2 “GW markets” in 2010

In 2010, Europe alone added between 9.8 and 12.5 GW. Even though 11 GW seems at this time a good assumption that will have to be refined with updated information coming during the first months of 2011.

While Germany retains its leadership for the second year in a row, the evolution of the main markets shows notable discrepancies.

Behind Germany, Italy’s PV market grew above 1 GW for the first time, scoring the second rank. In Europe, Czech Republic underwent a tremendous market surge that will most likely affect the PV development in this country in the worst possible way in the coming months and years. But while Spain failed to reach the 500 MW of the CAP, in France finally around 500 MW have been installed, Greece reached 150 MW, and in the meanwhile, the UK appeared on the map while the Belgian market scored once again to more than 200 MW. In other EU countries, PV remains at the crossroads. Several small but existing markets progressed in 2010

(such as Austria, the Netherlands, Slovakia and Slovenia), while most other east-European markets did not make any significant progress; such as in the case of Bulgaria.

Figure 3: Annual worldwide installed PV capacity from 2000 to 2010 in the World (in MW)

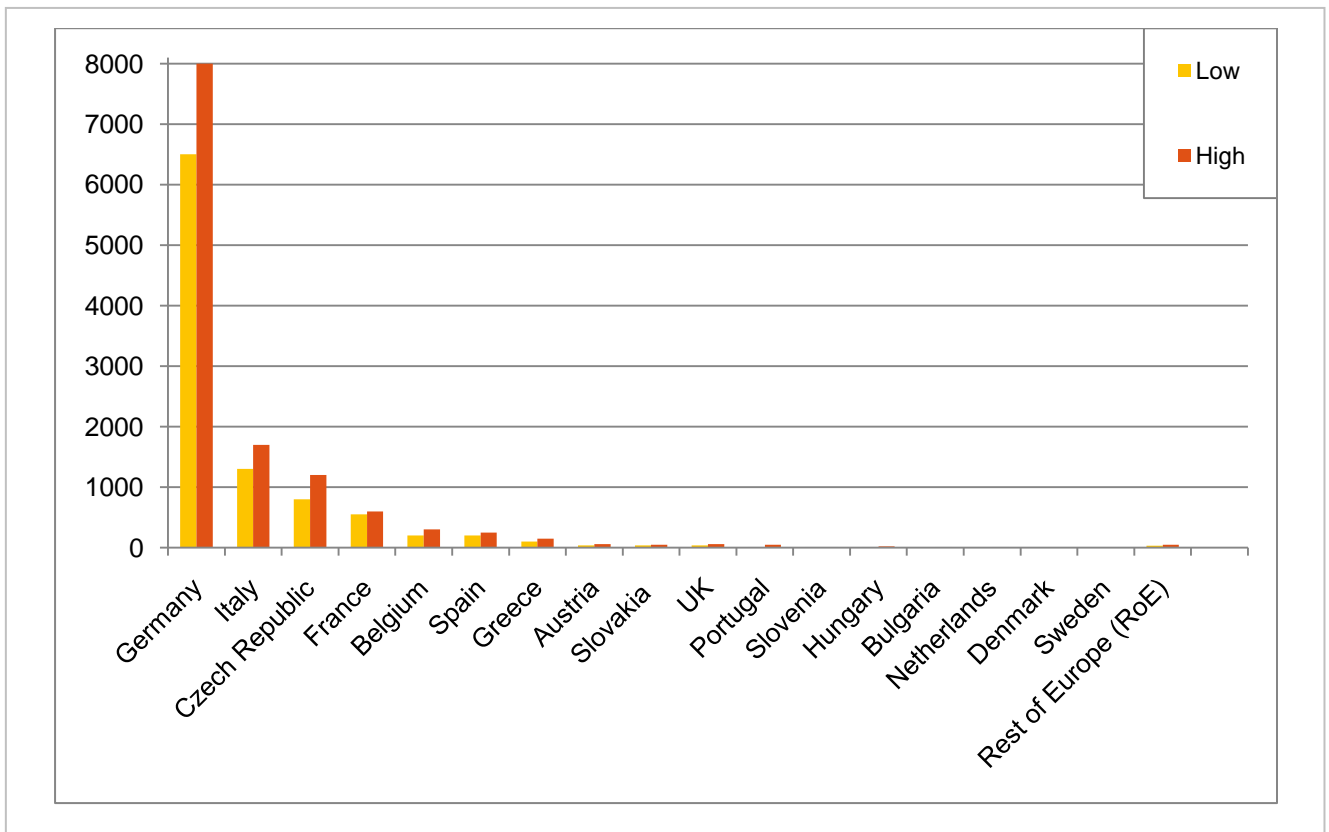
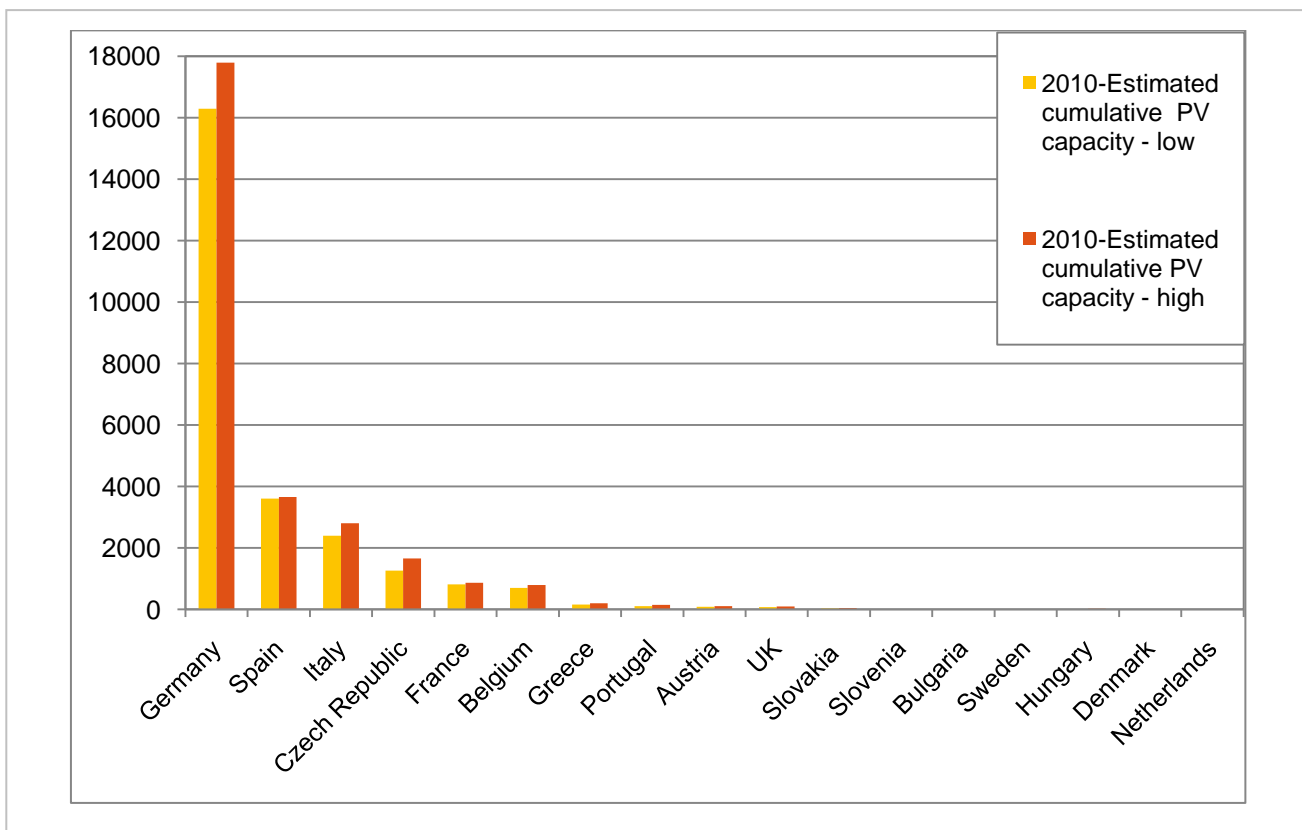


Figure 4: Newly installed capacity in Europe in 2010

<i>in MWp</i>	<i>Low</i>	<i>High</i>
Austria	40	60
Belgium	200	300
Bulgaria	5	10
Czech Republic	800	1200
Denmark	2	2
France	550	600
Germany	6500	8000
Greece	100	150
Hungary	10	20
Italy	1300	1700
Netherlands	5	10
Portugal	12	50
Slovakia	40	50
Slovenia	11	11
Spain	200	250
Sweden	1	1
UK	40	60
Rest of Europe (RoE)	30	50
Total	9846	12524

Figure 5: Estimated cumulative PV capacity in Europe in 2010 (in MW)



PV markets outside Europe: Japan approaching the GW mark, US progressing

With 20% of the global PV market, non-European countries represent a massive potential in the coming years. In 2010, the major markets progressed to reach in total between 2.6 and 3.2 GW.

Japan has been a vigorous market this year and approached the 1 GW mark, while the US progressed as well to around 700 and 800 MW. Despite the insufficient support, the Chinese market could reach around 400 to 600 MW in 2010. While this number could be considered as a major leap towards a real PV market, it doesn't imply the giant has awakened yet.

Canada and Australia confirmed to be promising markets that could reach 180 MW and between 150 and 250 MW respectively. The case of South-Korea has been disappointing for the second year in a row but a solid growth is expected for 2011. We expect some additional MW from markets such as Taiwan, India, Malaysia and Thailand but exact numbers were not known yet.

Figure 6: Newly installed capacity outside Europe in 2010 (MWp)

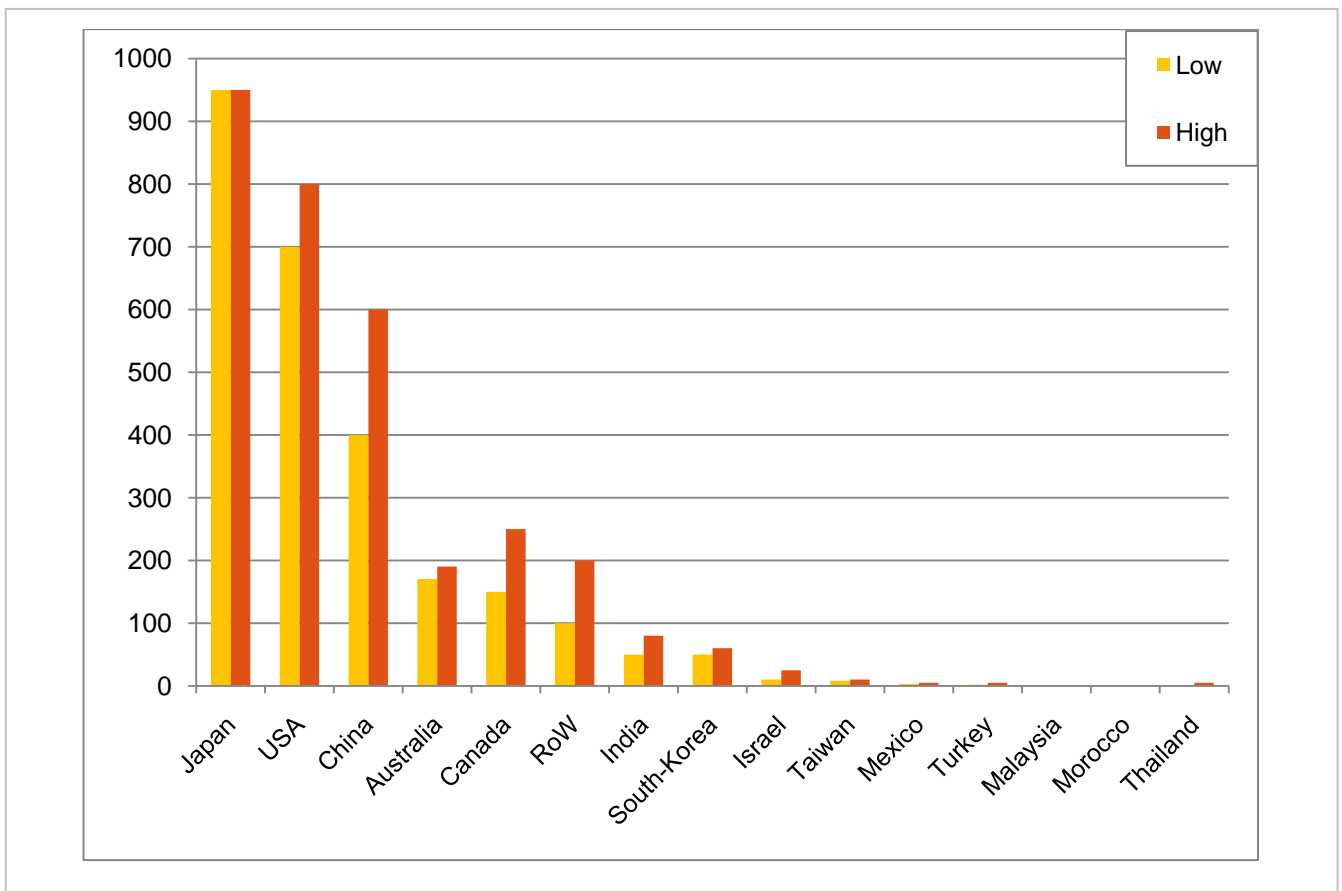


Figure 7: Newly installed capacity outside Europe in 2010

in MWp	Low	High
Australia	170	190
Canada	150	250
China	400	600
India	50	80
Israel	10	25
Japan	950	950
South-Korea	50	60
Malaysia	1	1
Mexico	3	5
Morocco	1	1
Taiwan	8	10
Thailand	1	5
Turkey	2	5
USA	700	800
RoW	100	200
Total	2596	3182

3 - MAIN EU MARKETS ANALYSIS

The six countries that shaped the European PV market in 2010 are analyzed below.

Germany: entering a new phase of PV deployment.

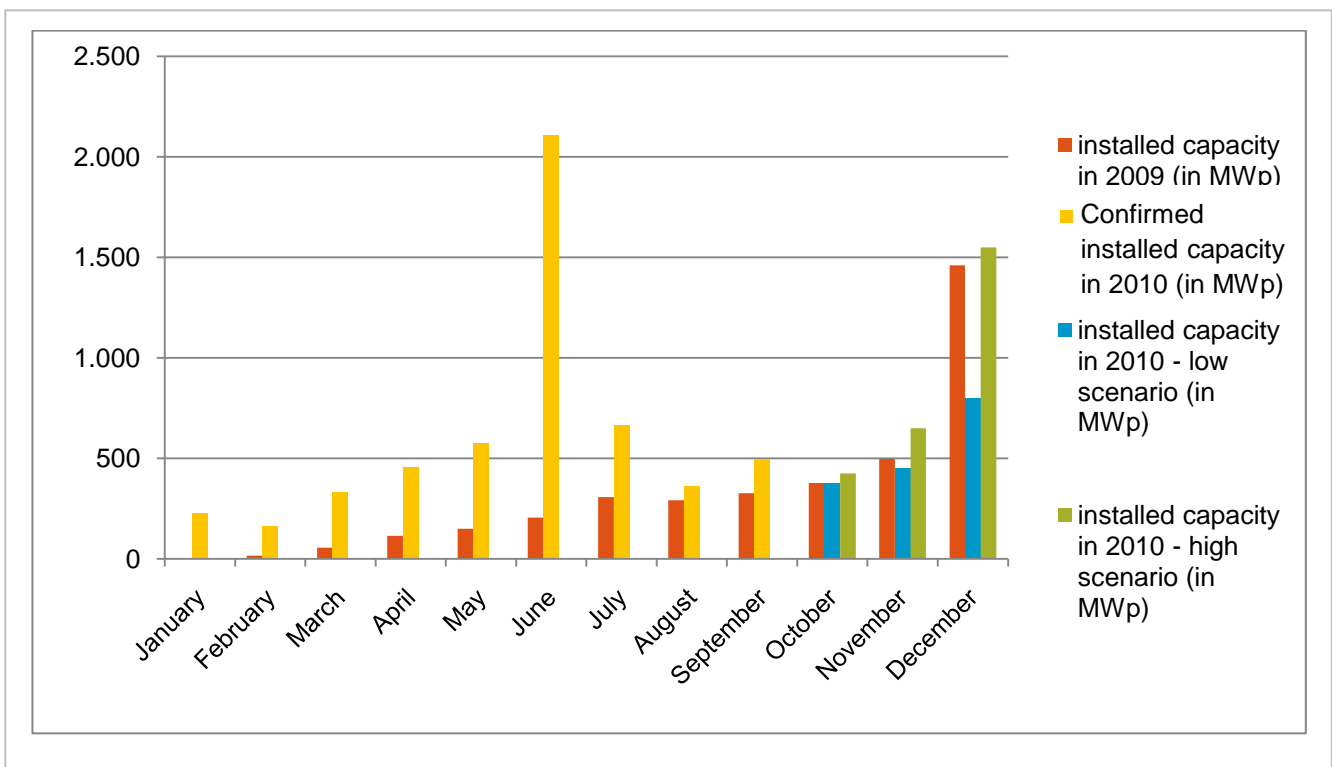
For yet another year, the German market has proven to be the most significant one of all. With between 6.5 and 8 GW installed in 2010 only, this might bring the cumulative installed capacity to as high as between 16.4 GW to 17.9 GW. During the first 5 months, the installed capacity reached more than 5 times the capacity that was installed during the same period of 2009. In June, the total number of installations reached more than 2 GW in a single month. The months after the cut did not show any major slowdown in the market, with monthly installations well above 300 MW. During the last three months of 2010 some sources claim that the market has slowed down compared to the last three months of 2009, while others foresee a massive growth. We expect that with roughly 5.4 GW installed by the end of September, total figures for 2010 could hardly reach more than 8 GW by the end of the year.

Hardly comparable years in the PV business in Germany

In the beginning of 2009 very few PV systems were installed, in spite of the existence of interesting FiTs. This can be explained with the unfavourable economic situation at that time. The industry was pushed to realize massive price reductions that allowed the market to take up again. The system price in Germany was pushed down with 17% over the entire year. Most of this price decrease (approximately 15%) was realized during the first three quarters of 2009. The combination of the existing tariff and low PV system prices triggered PV growth at the end of 2009 continuing throughout the first half of 2010. Reaching sufficient volumes, there was however no longer any motive for further price decrease.

PV system prices stagnated from the second quarter of 2010 and even increased due to other factors amongst which are the effects of a strong Euro compared to the USD and Chinese RMB, and the shortage of certain system components (inverters). In total, over the first three quarters of 2010, only a very marginal price decrease of 2% has been realized, far behind the 15% that had been realized during the first three quarters of 2009.

Figure 8: Evolution of installed capacity in Germany in 2009 and 2010 (in MW)



Sustainability

Scenarios for 2020 range from 52 GW (National Renewable Energy Action Plan) to 70 GW (BSW's PV roadmap) or 80 GW (EPIA's paradigm shift scenario from SETFor2020). This represents from 3.5 to 6.3 GW installed each year during the coming decade.

Challenges that the PV industry is facing in Germany

1. The cost of FiT and the public acceptance of those overhead electricity costs. Current initiatives such as the PhoenixSolar/A.T.Kearney study and the BSW/Roland Berger roadmap to 2050 could help to ensure continuous support.
2. Grid integration: with local bottlenecks on the distribution grid and the question of PV balancing power slowly appearing on the map for the transmission operators, grid integration is the major technical subject of the coming years.
3. Ensuring the competitiveness of the European / German industry in a context for rapid price decline as well as increased competition with non-European low cost players.
4. While some are proposing a cap on market development in Germany in 2011, EPIA is clearly against the introduction of such market restricting measures. Instead we advocate for a sustainable market development based on sustainable support mechanisms.

Italy: Fast development despite administrative barriers

It is somehow odd that Italy is the only large PV market in southern Europe, a region where high irradiation levels allow for a lower levelised cost of electricity (LCOE) compared to other northern regions. However, as prices for PV systems in Italy are still high compared to other mature markets, the LCOE remains higher than what could be potentially reached. For small rooftop installations, the average system price in Italy is about up to 30% higher than in Germany. Despite such high prices, profitability remains highly attractive, thanks to the current high levels for FiTs.

The government's decision to maintain registration under the current *Conto Energia* program open until June 2011 (for installations that have not yet been connected but were installed before the end of 2010) indicates the strong political commitment to safeguard investor's confidence in PV.

A record year

With some monthly market figures rising clearly above those in 2009 and some even doubled or tripled compared to those in 2009, the market is expected to have grown significantly in 2010. It is most likely that the total installed capacity this year will reach 1.3 GW and it might even be as high as 1.7 GW.

The data report for a PV system can be delayed by a couple of months before being taken into consideration by the regulator and published. A large part of the 2009 PV market was only registered during the 3 first months of 2010, making the market outlook in Italy less straightforward to estimate. However, two statistics should be considered:

- The total installed capacity mid December reached almost 2 GW. This indicates that at least 830 MW were already installed in 2010. If we consider the market evolution in 2009, with only 495 MW registered in 2009 compared to 720 MW installed that year, the market for 2010 could reach easily more than 1.3 GW.
- Moreover the market was obviously higher from April 2010 than it was in 2009. From June, the monthly registered capacity reached in between the double and the triple of 2009. This could indicate that the market is higher than 1.3 GW and could even reach up to 1.7 GW in 2010.

The level of the FiT, combined with a possible decrease in Germany and the room for price reduction could help the Italian market to maintain or grow even more in 2011.

France: slow growth or a CAP?

Representing the fourth largest market in Europe in 2010, with around 550 MW installed, France has not yet solved its long waiting times for PV system connection.

The market could reach around 550-600 MW in 2010, with more MW installed but not connected yet. This is the consequence of the inability of the French DSO, ERDF to connect more PV systems in due time. The year 2010 was marked by numerous changes in PV policies in France, sometimes announced without notice of the government. The release of the so-called "Rapport Charpin" on the future of PV in the country triggered a new set of public consultations that had not been finished yet in the beginning of December. Now the government imposed a 3 months moratorium on medium and large scale installations (above 3kWp). This is the consequence of the success of PV that outpaces the government targets for 2020. With a queue of already delivered permits that almost amounts to as much as 5.4 GW, the pipeline is equal to the target set in the National Renewable Energy Action Plan. But while the market level remains low in comparison to other more mature markets, many signs show that all conventional stakeholders seem in favour of putting PV development on hold:

- Claims about the limitation of the French distribution grid were made public in 2010 although the total installed capacity is 95% lower than in Germany.
- The French DSO (ERDF) is blocking new permits even before the moratorium decision has been taken officially by the government.
- Government communication about FiT remains chaotic and lacks transparency and vision.
- Costs of FiT for the community are exaggerated, without taking the price of electricity sold on the market into account, or the impact of PV on peak-load prices neither the net present value of future PV electricity after the 20 year period during which FiTs are granted.

As long as nuclear electricity dominates the country's electricity supply it seems that everything is being done to ensure that PV's development will remain constrained to low levels, below 1 GW installed each year, despite the country's significant potential.

Spain: slowly recovering in a difficult political context

While the official numbers for 2009 showed that the Spanish market progressed only by 9 MW (while they indicated initially 69 MW), 2010 figures indicate the country's return to become a small market. Around 200 MW could be installed in Spain this year, far from the 500 MW cap and very far from the 2.5 GW installed in 2008. With many political discussions about a possible retroactivity on already existing power plants, the uncertainties led to a slow market development.

The expected FiT decrease for 2011 will probably alter the market: ground mounted installations will become less profitable, while the residential segment could represent a large boom. The question however remains whether the existing cap will allow to move the allowed quotas for ground mounted systems to the residential segment.

In addition, the economic crisis in Spain has decreased the demand for electricity. Every new installation has therefore to compete directly with existing peak load generators, such as gas power plants. In that respect, a market take-up in Spain implies clear political choices towards renewables in general and PV in particular. Also the need for more electricity interconnections with neighboring countries will be one of the key drivers of the future PV development in Spain.

Czech Republic: sustainability at the cornerstone of market development

The recent measures imposing a retroactive tax of 26% on PV electricity represents the major negative factor for the Czech market this year. After two years of strong, uncontrolled growth, the Czech Republic passed the GW mark early this year and could reach 1.2 GW at the end of the year.

While the PV system prices experienced a major decrease in the 2 last years, the FiT remained stable, leading to high profitability levels for PV investments. The consequences of this unsustainable growth have now become clear: there is little chance to see the Czech market stabilizing in the coming years and levels higher than a few dozen MW each year are not to be expected.

According to official data of the ERU (Czech Regulator), the total installed capacity reached 463 MW at the end of 2009 and climbed to 1 GW in November 2010. Given the usual delay in collecting the data and the concentration of projects at the end of the year, it is likely to see the Czech market installing between 800 and 1200 MW of PV this year. The impact of the retroactive tax on PV power plants could hardly lead to project cancellation this year in a market dominated by large ground mounted installations.

To complete the picture, the image of PV in Czech Republic has severely deteriorated during the last couple of months. The local utilities and grid managers argued that FiTs were representing an incredible cost for the electricity consumers, just before announcing a 16% electricity price decrease after the retroactive law was enforced. In addition, it seems now that the utility CEZ is candidate for buying PV power plants from PV developers that the retroactive law will push to bankruptcy.

While the foreseen decrease of FiTs for 2011 is finally in line with EPIA's recommendations to avoid unsustainable profitability for PV investments, it comes quite late to avoid a complete market shutdown (at worst) or massive decrease (at best) in 2011 and beyond.

Belgium: uncertainties in a reasonable market

With 10 million inhabitants and irradiation levels quite low, Belgium is performing well in the PV world. Because of stop-and-go policies in all regions, the market has slowed down slightly. Nevertheless, the total installations this year will most likely be higher than the initial expectations.

The figures for last year's (2009) installations were with 453MW higher than what was initially expected (292MW). This higher figure is related mainly to the Flemish market that exploded in 2009 with many installations only reported in 2010. With 412 MW installed in 2009, more than 90% of the total capacity was installed in the Flemish region.

With 100 MW registered to the Flemish regulator (VREG) and 40 MW in Wallonia, at the time of writing this document, the 2010 market will probably reach more than 200MW at the end of the year.

In Flanders, while small systems (below 10kWp) are automatically approved by the regulator, for larger systems (above 10kWp) the approval is not automatic and some installations might not be known to the regulator yet. Therefore, the current figure of 200MW is definitely not the final one and 300 MW could be possible.

In Wallonia, more than 95% of the market is built on residential installations. The same accounts for the Brussels region that targets around 3 MW for this year.

2011 will most likely see a decrease in the support schemes in all regions, with a possible market opening in Wallonia for medium sized systems.

4 - PV IN 2011: ANOTHER RECORD YEAR?

The supply of PV products will grow significantly in 2011 while any major growth of the global market would be surprising. The possible decrease of the German market in 2011 would hardly be compensated for by the growth of new markets. Indeed, only few markets in the world are at such a development phase where high levels of PV penetration would be reached. After one and a half year of strong growth, the demand will decrease in Europe during the first half of 2011, which will most likely trigger a further price decrease. Prices are even more pushed downwards because of the increased production capacities at the supply side. This could restart the market in Q2 2011 and help to reach similar levels as in 2010 or even higher.

Besides Germany, Italy should maintain its market level, possibly improving, followed at reasonable distance by medium sized markets in Europe, such as France, Spain, Greece, Belgium, the UK and possibly Portugal. Most eastern European markets will either stagnate or slowly grow. Outside Europe, Japan and the US could reach the GW mark, while China's growth will strongly depend on the support measures that the government might put in place. South-Korea will add more PV than in 2008 and India could start developing fast, possibly as large as 800 MW according to some national authorities. The addition of medium sized APEC markets could allow the total market in 2011 to equal or overtake the one from 2010.

In a policy-driven scenario, things could change even today. However, if taking the global policy situation towards PV into account, this seems less likely. The market could grow in several countries with a real potential such as France and Spain in Europe, the US (where the potential remains globally untapped), and of course, China and India. Other markets could start as well in 2011 if the political willingness to move forward is confirmed. **In a moderate scenario, the market in 2011 could stagnate around the 15 GW level.**

5 - EUROPEAN COUNTRIES PV POLICY OVERVIEW

Country	Political Support Environment	General Political support situation
Austria	Some lack of visibility on PV policies. Existing cap limits the market growth.	☹️
Belgium	Some lack of visibility on PV policies. Risk of political reaction if market surges again. Improving administrative process.	😊
Bulgaria	Complete lack of visibility on PV policies, combined with strong adverse lobbying from conventional stakeholders. Heavy and slow administrative process.	☹️
Czech Republic	Clear FiT evolution in 2011. Strong adverse lobbying from conventional stakeholders, including grid manager. Retroactive law passed in 2010. Grid operator is blocking any new permits.	☹️
Denmark	No FiT but net-metering and high electricity prices: grid parity for residential systems is virtually reached.	😊
France	Complete lack of visibility on PV policies, combined with strong adverse lobbying from conventional stakeholders. Multiple revisions of the FiT in 2010, complete uncertainty for 2011. Possible moratorium of 4 months on most installations. Heavy and slow administrative processes.	☹️
Germany	Clear FiT evolution in 2011. Risk of political reaction if market surges again. The simple and lean administrative framework can be bettered.	😊
Greece	Clear FiT evolution in 2011. Risk of late political reaction if market surges. Improving administrative process framework but long road to reduce costs and lead time.	😊
Italy	Clear FiT evolution in 2011. Risk of late political reaction if market surges. Improving administrative process but long road to reduce costs and lead time.	😊
Netherlands	FiT (paid by taxpayers) was cancelled.	☹️
Portugal	Clear FiT evolution in 2011 for small market segments. Improving administrative process.	😊
Slovakia	Some lack of visibility on PV policies, combined with adverse lobbying from conventional stakeholders, including grid manager. FiT could be restricted in 2011. Risk of late political reaction if market surges.	☹️
Slovenia	Clear FiT evolution in 2011. Improving administrative process.	😊
Spain	Clear FiT evolution in 2011. Issues to be solved regarding market segmentation within the cap. Unclear situation for existing power plants. Heavy and slow administrative process.	☹️
United Kingdom	Clear FiT evolution in 2011. Risk of political reaction if market surges.	😊



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