

**Global Market Outlook for Photovoltaics until 2012**  
**Facing a sunny future**

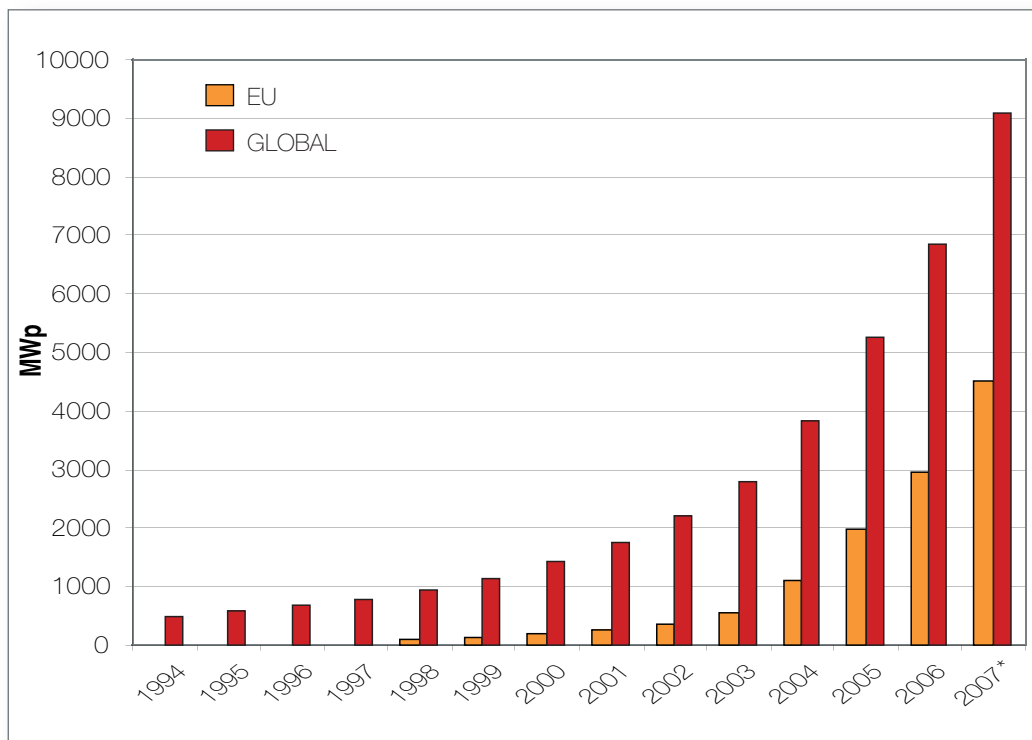
## Global Market Outlook for Photovoltaics until 2012

### Facing a sunny future

#### Demand side

The solar PV market has been booming over the last years and is forecasted to confirm this trend in the coming years. By the end of 2007 the global cumulative capacity exceeded 9 GWp. The European Union contributes to around 50 % of the global cumulative capacity.

**Figure 1:**  
Historical development of cumulative installed global and EU PV capacity



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007*
EU					90	128	188	266	373	543	1089	1981	2971	4500
GLOBAL	502	580	669	795	948	1150	1428	1762	2201	2795	3847	5253	6851	9100

All figures in MWp \* projected values from December 2007

PV market deployment is to a large extent dependent on the political framework of any given country. Support mechanisms are defined in national laws. The introduction, modification or fading out of such support schemes can have profound consequences on PV industries. PV Market forecasts therefore depend on a deep understanding of the political framework. EPIA puts a great deal of effort into analyzing PV markets. Due to its close contact with key players in the industry and its deep knowledge of PV policy and support schemes, EPIA market scenarios are a credible and well known source for short term market forecasts.

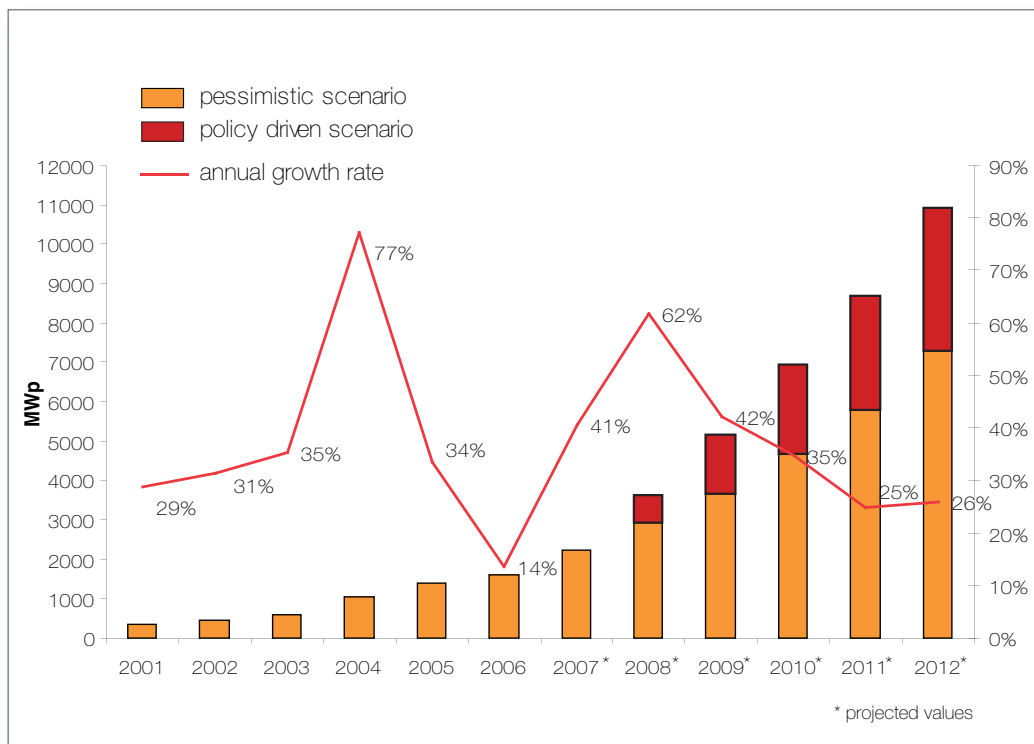
In December 2007, EPIA went through an extensive data gathering exercise among a highly representative sample of the PV industry, national associations and energy agencies. Based on cross checking of data and consolidation of complementary market projection methods, EPIA has derived 2 representative scenarios for the future development of the PV industry.

**The Pessimistic scenario:** This scenario is based on the assumptions of a 'business as usual' scenario which does not assume any major enforcement of support mechanisms.

**The Policy driven scenario:** In this scenario, EPIA expects the follow up and/or introduction of support mechanisms, namely feed-in tariffs, in a large number of countries.

### EPIA PV market scenarios until 2012

Figure 2: Annual market (MW) and annual growth rate (%)

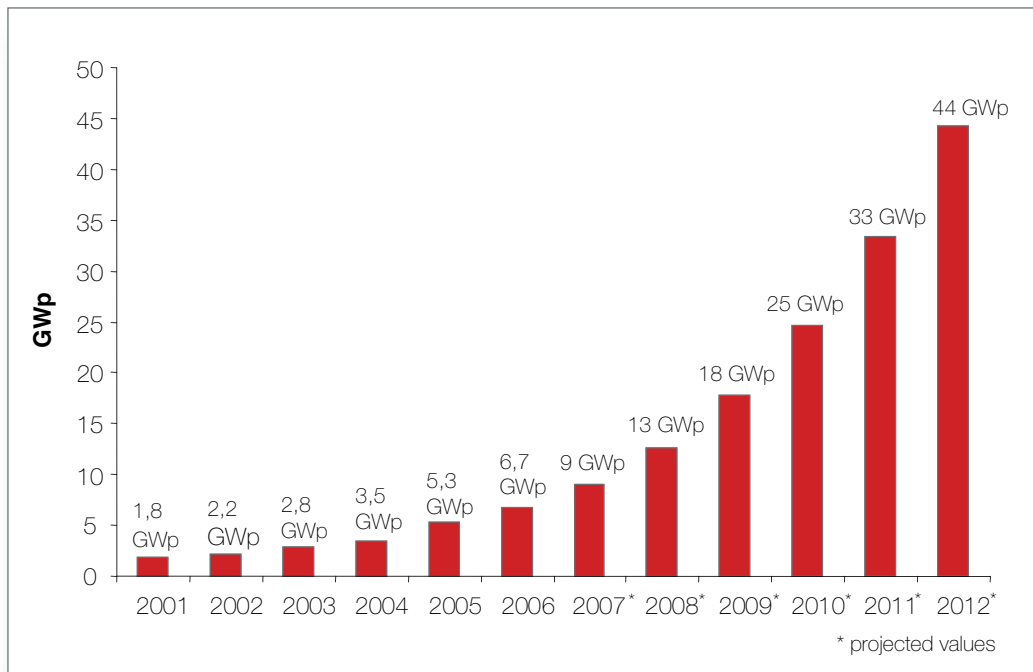


	2006	2007*	2008*	2009*	2010*	2011*	2012*
Policy driven scenario	1598	2246	3630	5160	6950	8673	10927
Pessimistic scenario	1598	2246	2940	3655	4680	5803	7282
All figures in MWp							* projected values

In the Policy Driven Scenario EPIA expects 7 GWp of annual installations by the year 2010 and 10.9 GWp by 2012. According to this scenario, within the next 5 years the global PV market will be 5 times bigger than it was in 2007. Annual market growth rates differed considerably in the past. Due to the take-off of the German PV market in 2004 the growth rate for annually installed capacity peaked at 71 % in the same year. A temporary shortage of silicon and a demand supply imbalance led to lower growth rates in the following 2 years. In 2007 the Spanish market took-off which again resulted in a bullish growth rate. Over the coming years European countries and the USA are expected to be the main contributors to continuous growth in the PV sector.

In the following section, we will concentrate on the policy-driven scenario, which is believed to be the most representative projection, given current policy trends. Under this scenario, annual growth rates well above 25 % can therefore be expected.

**Figure 3: Global cumulative PV capacity (Policy Driven Scenario)**



By the end of 2012 a global cumulative capacity of 44 GWp could be achieved. This is equivalent to the power capacity of 44 nuclear reactors. Under the Policy Driven Scenario, PV is clearly on the way to becoming a major global energy source.



**Detailed market forecast for the major global annual PV markets in MW**

**Table 1a: Pessimistic Scenario**

**Table 1b: Policy Driven Scenario**

	2006	2007*	2008*	2009*	2010*	2011*	2012*		2006	2007*	2008*	2009*	2010*	2011*	2012*
Germany	850	1100	1500	1500	1500	1650	1800	Germany	850	1100	1500	1750	2000	2200	2400
Spain	97	300	300	300	400	400	400	Spain	97	300	500	500	600	600	600
Italy	12	40	80	130	200	270	360	Italy	12	40	150	300	400	540	730
Greece	1,2	2	10	50	100	130	180	Greece	1,2	2	20	100	200	270	360
France	14	45	60	120	200	270	360	France	14	45	150	250	300	400	540
Portugal	2	10	15	20	30	40	50	Portugal	2	10	20	40	50	70	90
USA	141	259	350	600	1000	1350	1800	USA	141	259	400	800	1400	1900	2550
China	12	20	25	35	50	70	90	China	12	20	35	70	100	140	180
Japan	286	230	200	200	200	270	360	Japan	286	230	300	400	500	680	910
South Korea	21	50	100	250	400	540	730	South Korea	21	50	150	300	500	680	910
India	12	20	100	200	300	410	545	India	12	20	150	300	400	540	730
Rest of the World	150	170	200	250	300	410	545	Rest of the World	150	170	250	350	500	680	910
<b>TOTAL</b>	<b>1598</b>	<b>2246</b>	<b>2940</b>	<b>3655</b>	<b>4680</b>	<b>5810</b>	<b>7220</b>	<b>TOTAL</b>	<b>1598</b>	<b>2246</b>	<b>3625</b>	<b>5160</b>	<b>6950</b>	<b>8700</b>	<b>10910</b>

\* projected values

**Figure 4: Regional distribution of global PV markets (Policy Driven Scenario)**

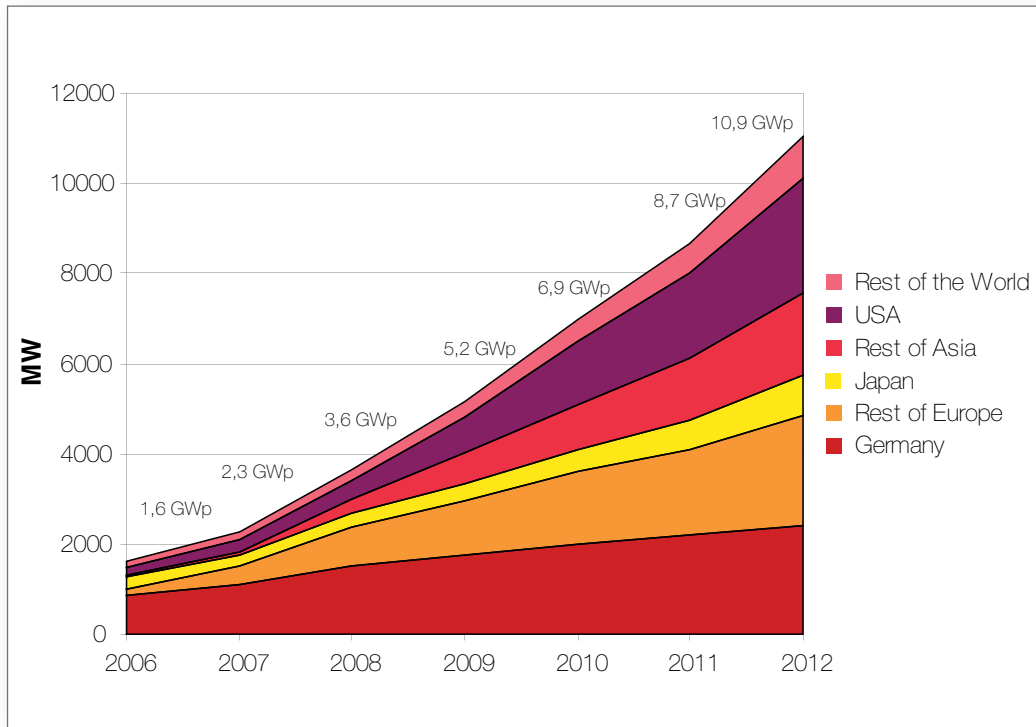


Figure 4 shows the geographical distribution of the EPIA policy driven scenario. Germany is expected to remain the market leader and even increase its market size considerably over the next years. The biggest growth is foreseen for the Rest Europe in particular in countries such as Spain, Italy, France and Greece. The USA will also be able to use its vast solar potential and will challenge Germany as the Number 1 PV country. PV development in Japan will, to a large extent, depend on the decision of the Japanese government to reintroduce, or not, a support program. Also the Rest of Asia, in particular India and South Korea, will face increasing demand for PV.

## Production side

### Production capacities by the end of 2010

Silicon	8-10 GWp
Wafer	10-12 GWp
Cells	11-14 GWp
c-Si Modules	14-16 GWp
Thin Film	4 GWp

Silicon is the second most abundant raw material on Earth. For some years silicon supply (processed silicon) was the bottleneck of the PV industry. Due to the vast expansion of production capacities of known players and the introduction of new capacities by new players, silicon capacities will reach 8-10 GWp by 2010. As silicon is a major raw material for c-Si technologies (93 % in 2006), silicon capacities predefine the upper production limit for the industry. However, "end of the year production capacities" along the value chain from wafer – cells – modules are larger than actual production. Why? Firstly, a considerable part of capacity is added during the year while capacities are always stated as end of year capacities. Secondly, capacities are often stated by assuming a 365 day 24 hour operation. Maintenance periods and periods of lower capacity usage have to be considered when comparing actual production and capacity figures.

In addition to the established c-Si capacity, approximately 4 GW of Thin Film capacity is expected to be available by the end of 2010. This would represent 20 % of the overall module production capacity. Although all technologies face high expansion rates, Thin Film capacities are currently expanding at a faster rate than capacities for other technologies.

## Towards a bright future

Global PV markets have been expanding rapidly over the last decade. EPIA expects a similar market development for the years to come. By 2010 a global annual PV market of 7 GWp can be expected in the privileged Policy Driven Scenario. However, it is evident that such a market growth will require continuous political support in some countries and expanding support in countries which have not been active supporters of PV so far. PV will reach competitiveness with peak power prices in southern Europe by 2015 and in most of Europe by 2020. This so called grid parity is expected to then trigger an extraordinary demand due to PV generated electricity becoming increasingly competitive as a result of a continuous decrease in PV technology prices and expected price increases of fossil energy sources.

PV solar electricity will not only become a major source of cheap electricity in the decades to come, it will do so by delivering clean, safe and reliable electricity that is needed to face the environmental challenges of our century!



PV Soundless in Freising, Germany. Isofotón

**Photo credit:**

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**About the European Photovoltaic Industry Association:**

With over 150 Members drawn from across the entire solar electricity sector, the European Photovoltaic Industry Association represents over 95% of the European photovoltaic industry. EPIA members are present throughout the whole value-chain of the photovoltaic industry: from silicon, cells and module production to systems development. EPIA's mission is to deliver a distinct and valuable service driven from the strength of a single European photovoltaic voice.

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