



EU PV Market Overview

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Policy Director

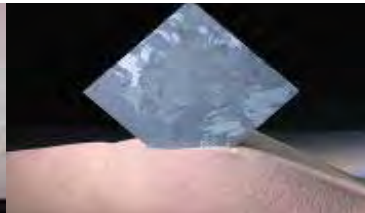


EPIA and its members

EPIA represents **95% of the European Photovoltaic Industry**
and 80% of the Global Photovoltaic Industry

Total Turnover of EPIA members (2007): **~14.000 M€**

- ❑ Silicon feedstock: **Wacker, REC, DC Chemical ...**
- ❑ Equipment and services: **Applied Materials, Centrotherm, Oerlikon, Stangl, IB Vogt, M+W Zander, Meyer Burger, Vesuvius ...**
- ❑ Wafers and Ingots: **Crystalox, Scanwafer, Pillar, Podolsky, PV Silicon ...**
- ❑ Cells: **Q-Cells, BP Solar, Isofoton, Shell Solar, SolarWorld, Sharp,**
- ❑ Modules: **Aleo, Solon, Schott Solar, Photowatt, Suntech Power, First Solar, Atersa...**
- ❑ Systems: **Tenesol, Naps Systems, Conergy, Phoenix Solar, ...**
- ❑ Inverters: **KACO, SMA, Sputnik, Sunways, Fronius...**
- ❑ Cabling: **Multi-contact...**



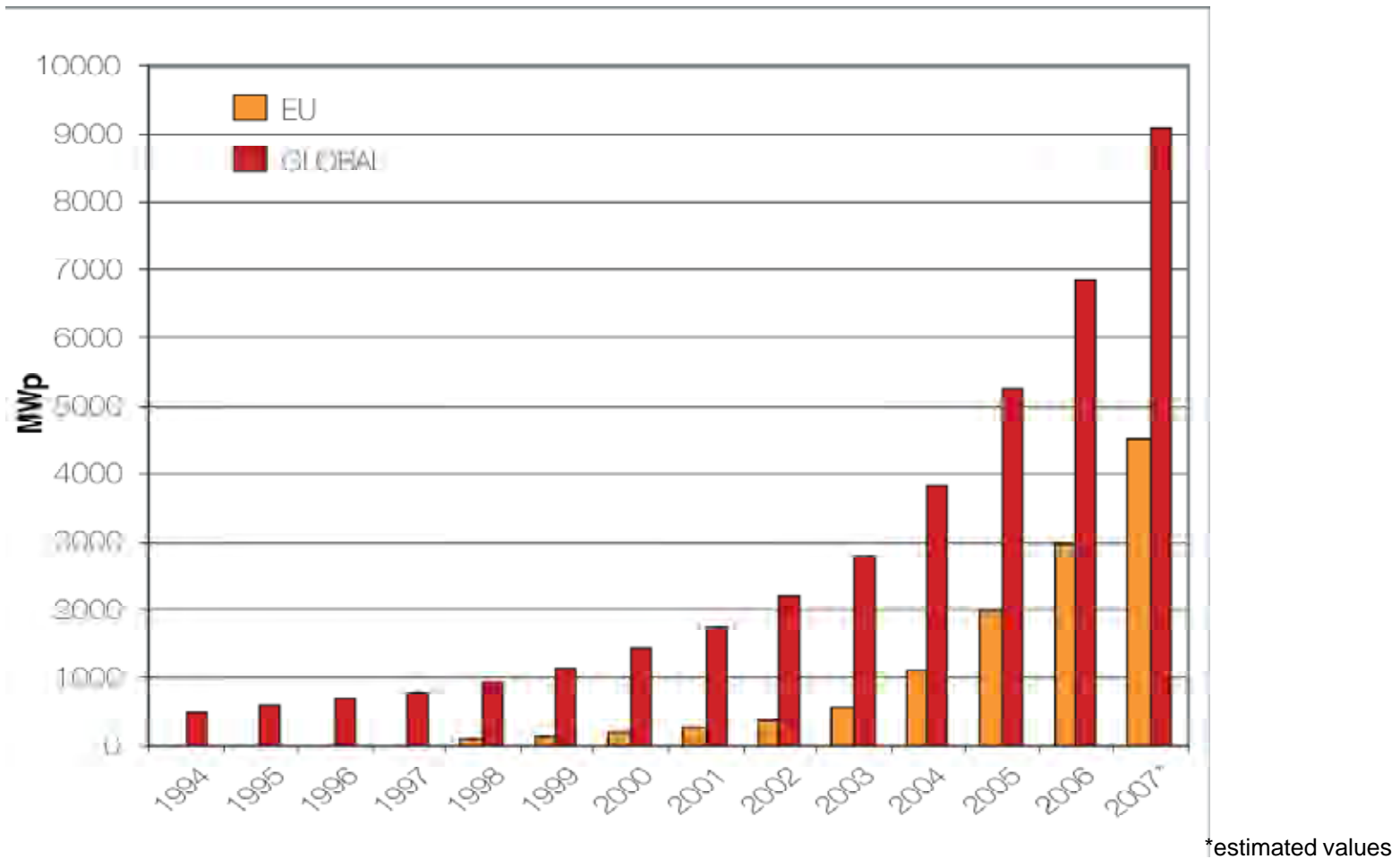


What does EPIA do?

1. **EPIA advocates its members interests at national and EU level**
2. **EPIA is a key information provider about market, legislation and technology developments**
3. **EPIA provides an excellent Networking Platform through international Conferences, Workshops and working group meetings**



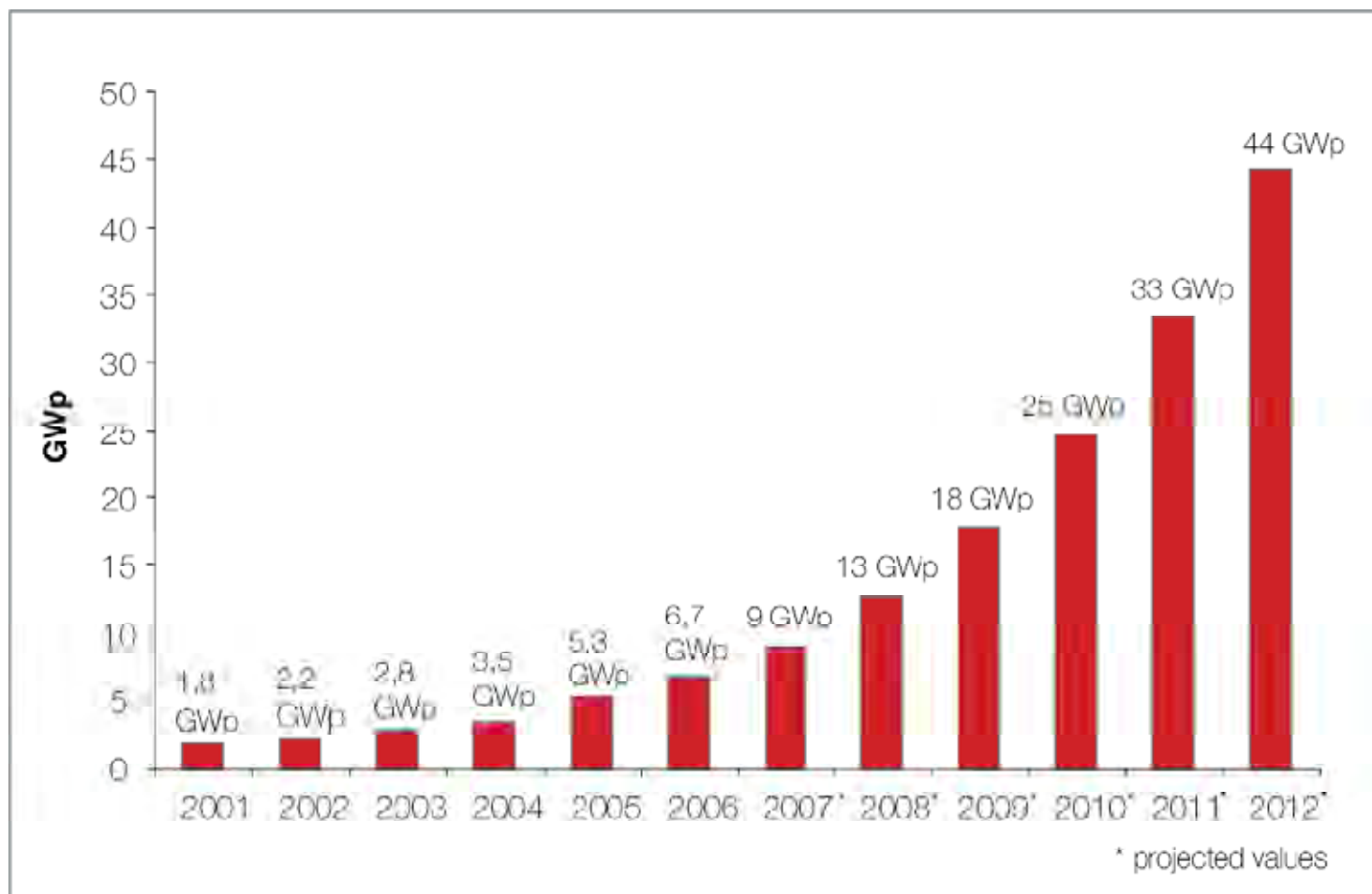
Market historical development of cumulative PV installed capacity





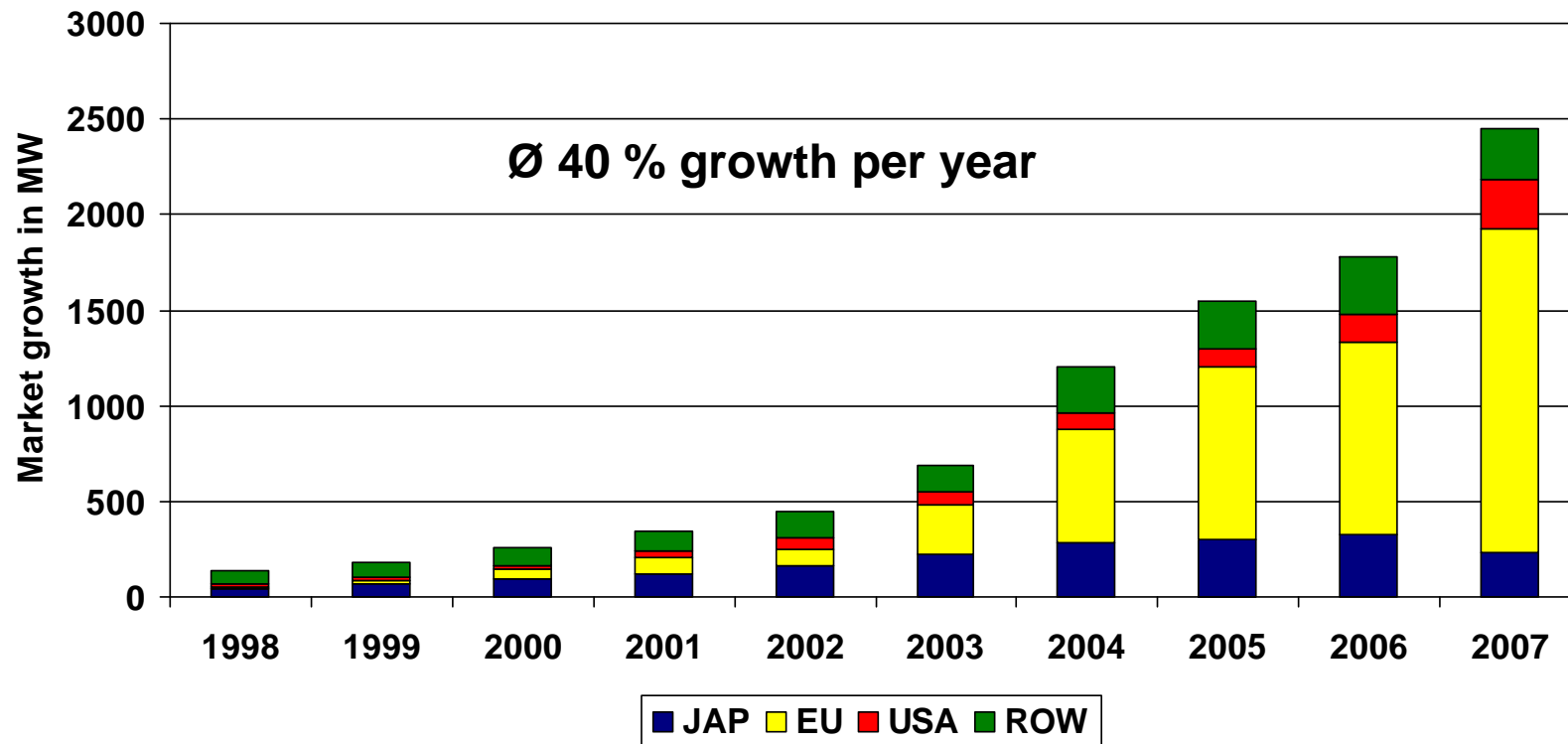
Future outlook of the PV market

Global cumulative PV capacity





Historical market development by regions

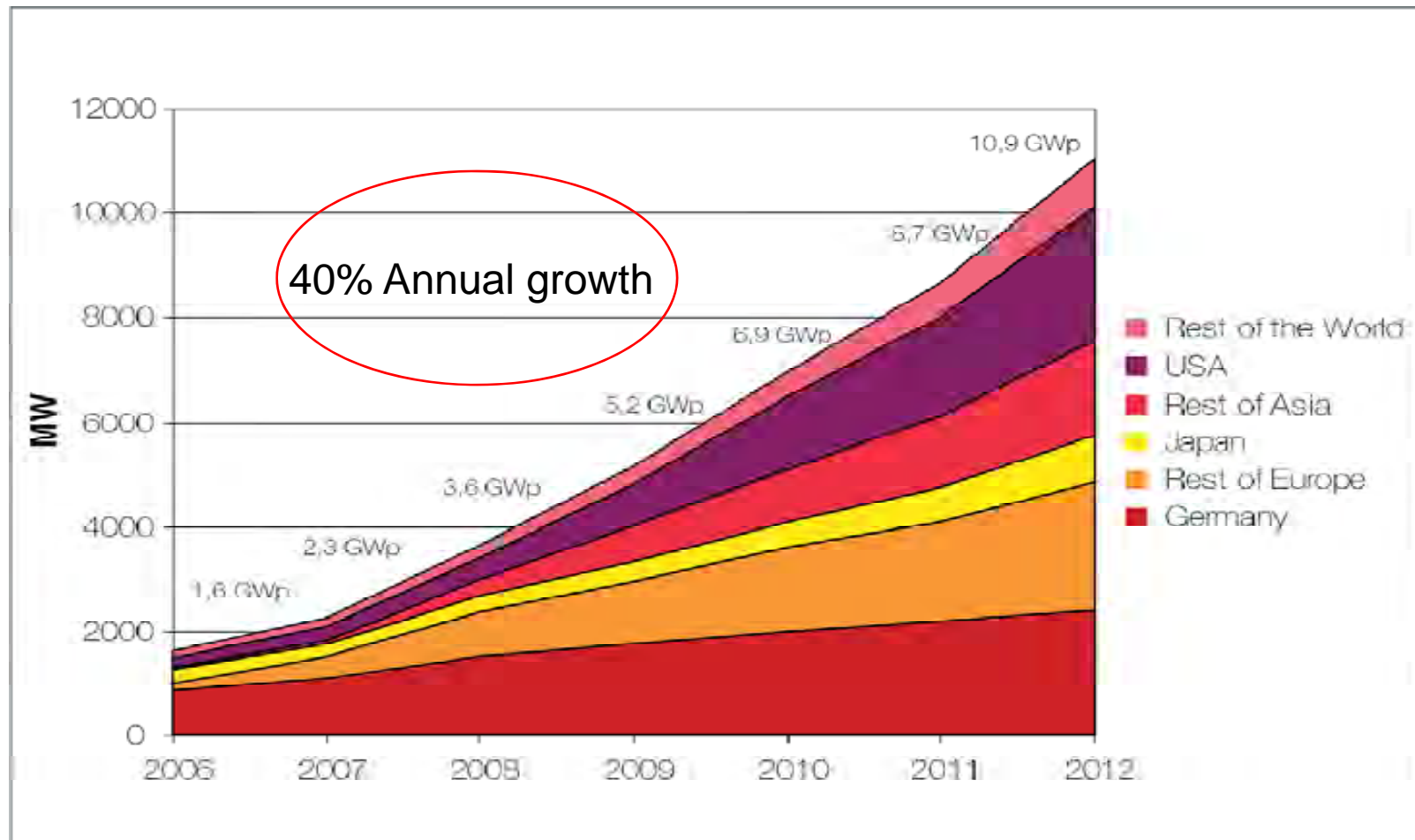


ref: European Photovoltaic Industries Association (EPIA) & Navigant Consulting



Future outlook of the PV market

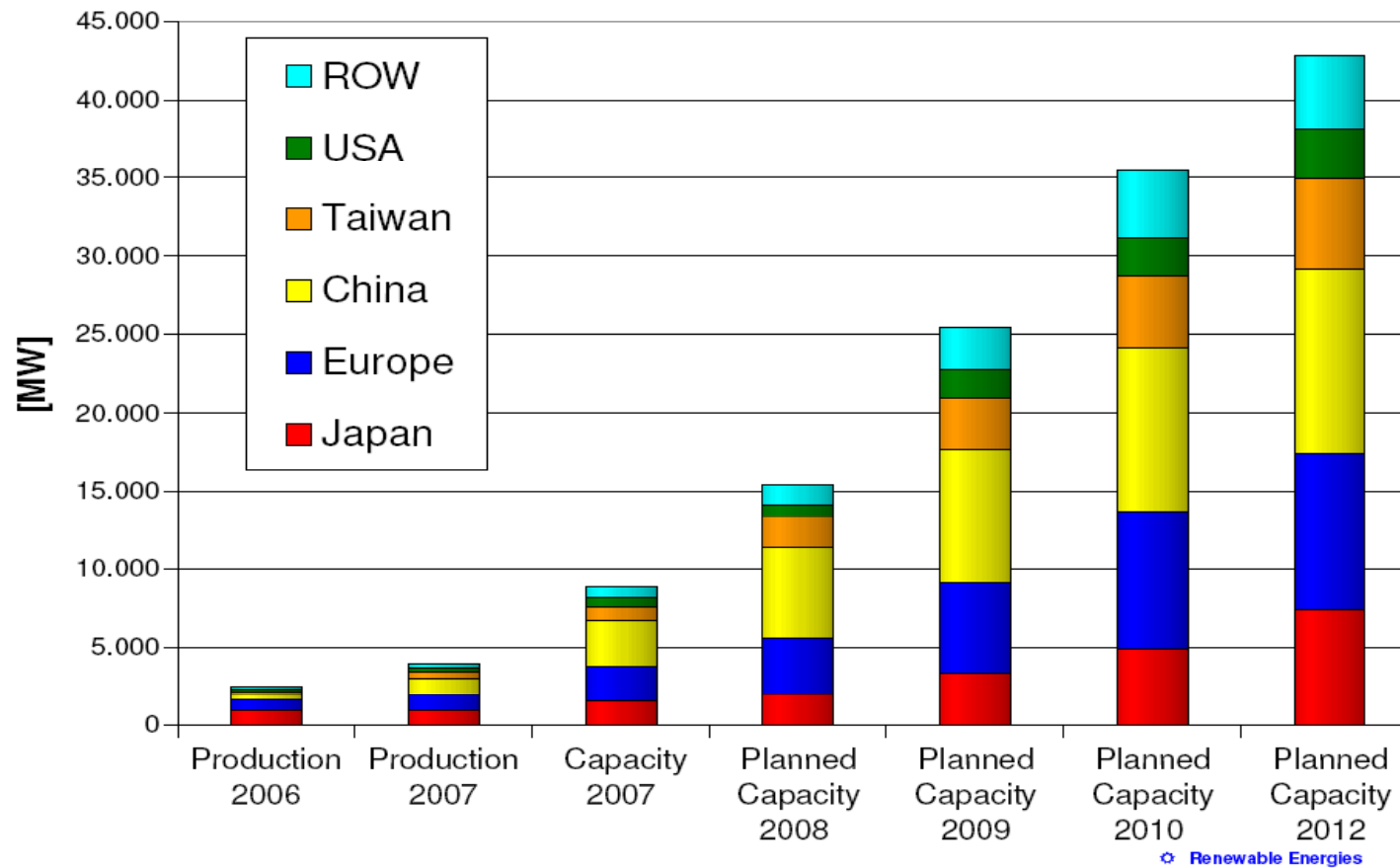
Regional distribution of global PV markets





Future outlook of the PV market

Planned Production Capacity

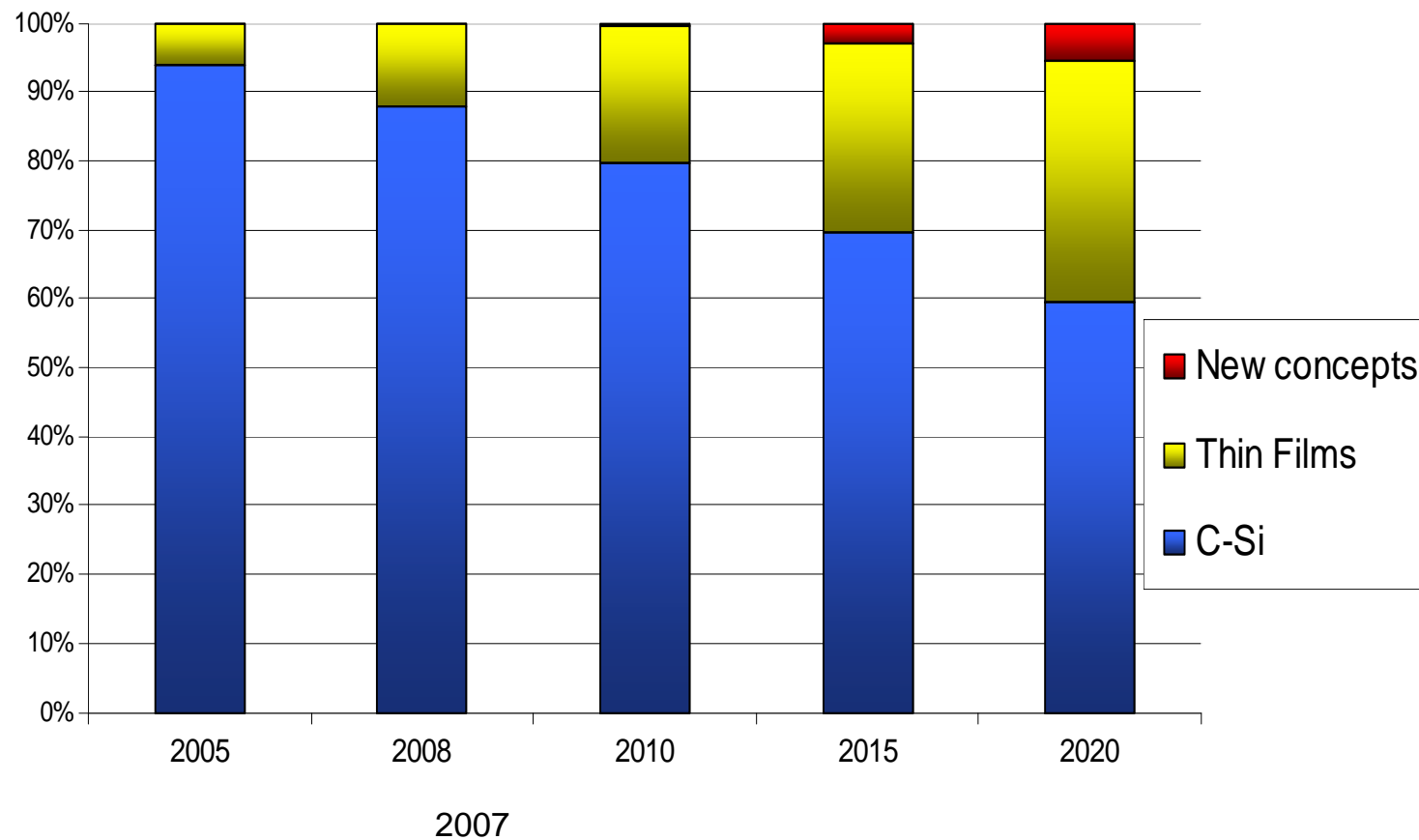


Source: JRC, European Commission, Valencia, Sept 2008



Future outlook of the PV market

Segmentation of Market by Technology





National Policy situation: *Support Programs for PV*

❑ Feed-In-Tariff

➤ Europe:

- Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Hungary, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxemburg, Netherlands, Portugal, Slovakia, Slovenia, Spain, Switzerland, UK

➤ ROW:

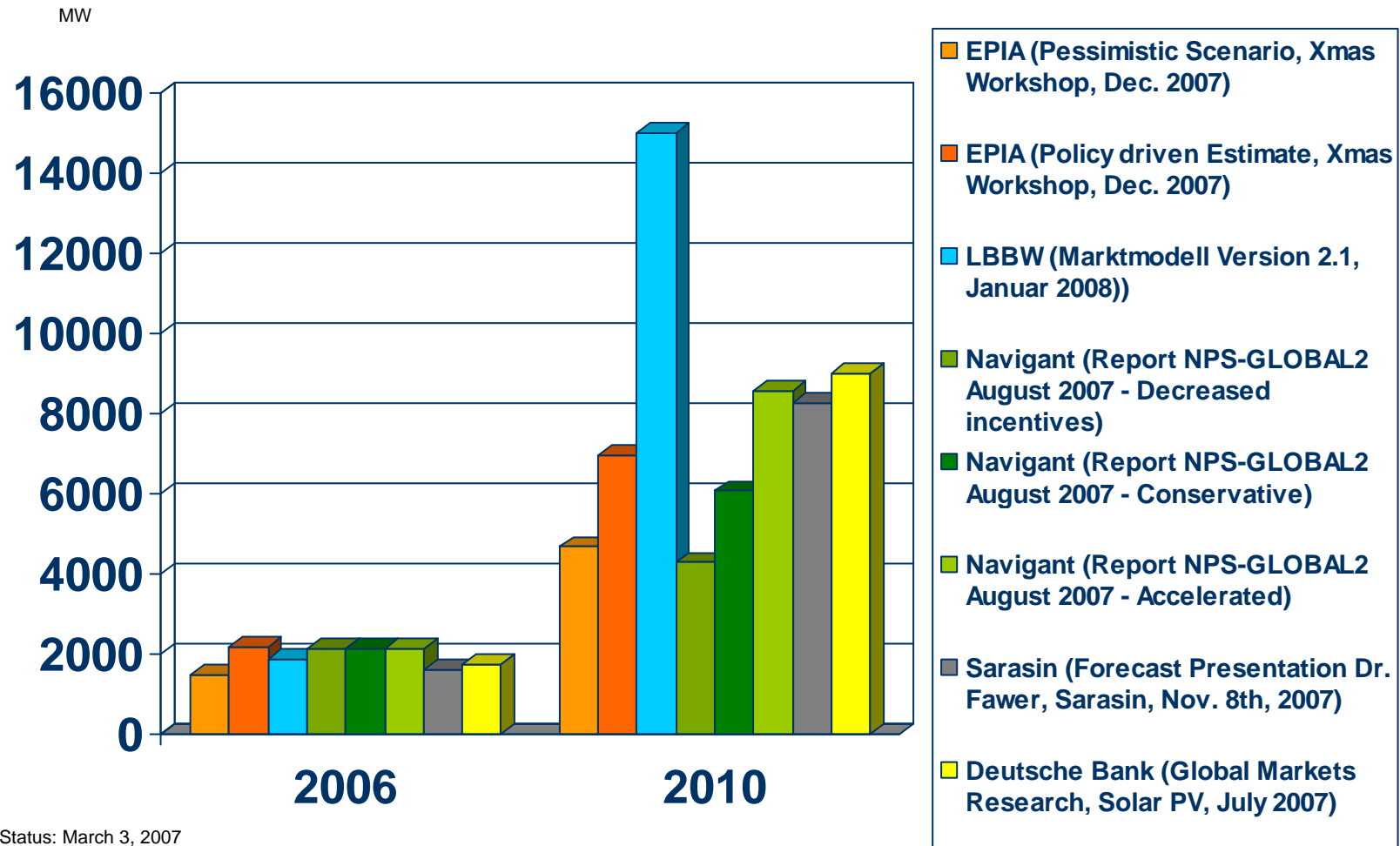
- Australia, South Korea, India, Canada, Israel, Malaysia ...

❑ Other support programs

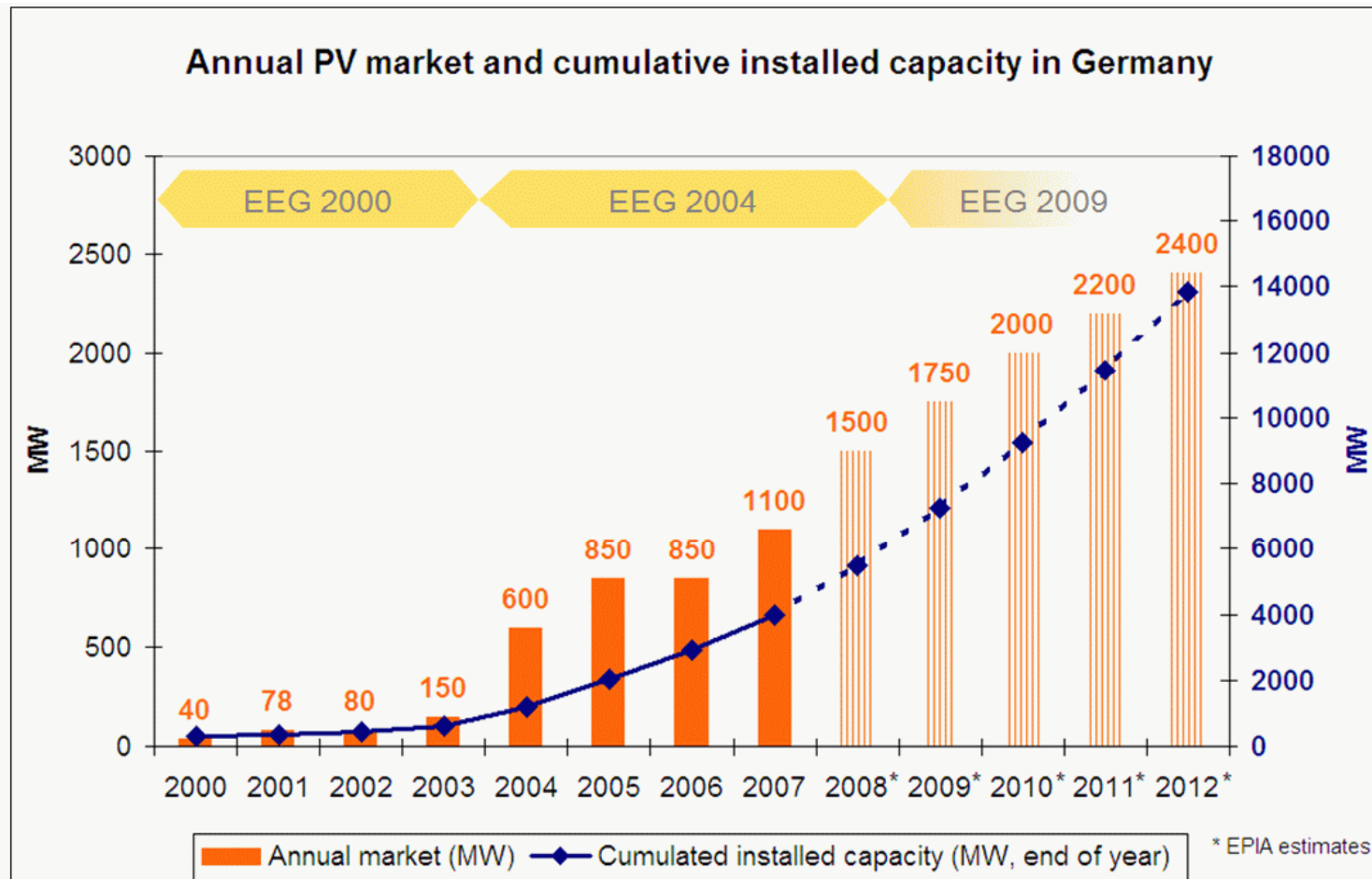
- US (Federal Investment Tax Credit (ITC), Renewable Portfolio Standards (RPS), Purchase Power Agreements (PPA),
- Investment reduction: Japan, Malta, Finland, Poland , Sweden, ...



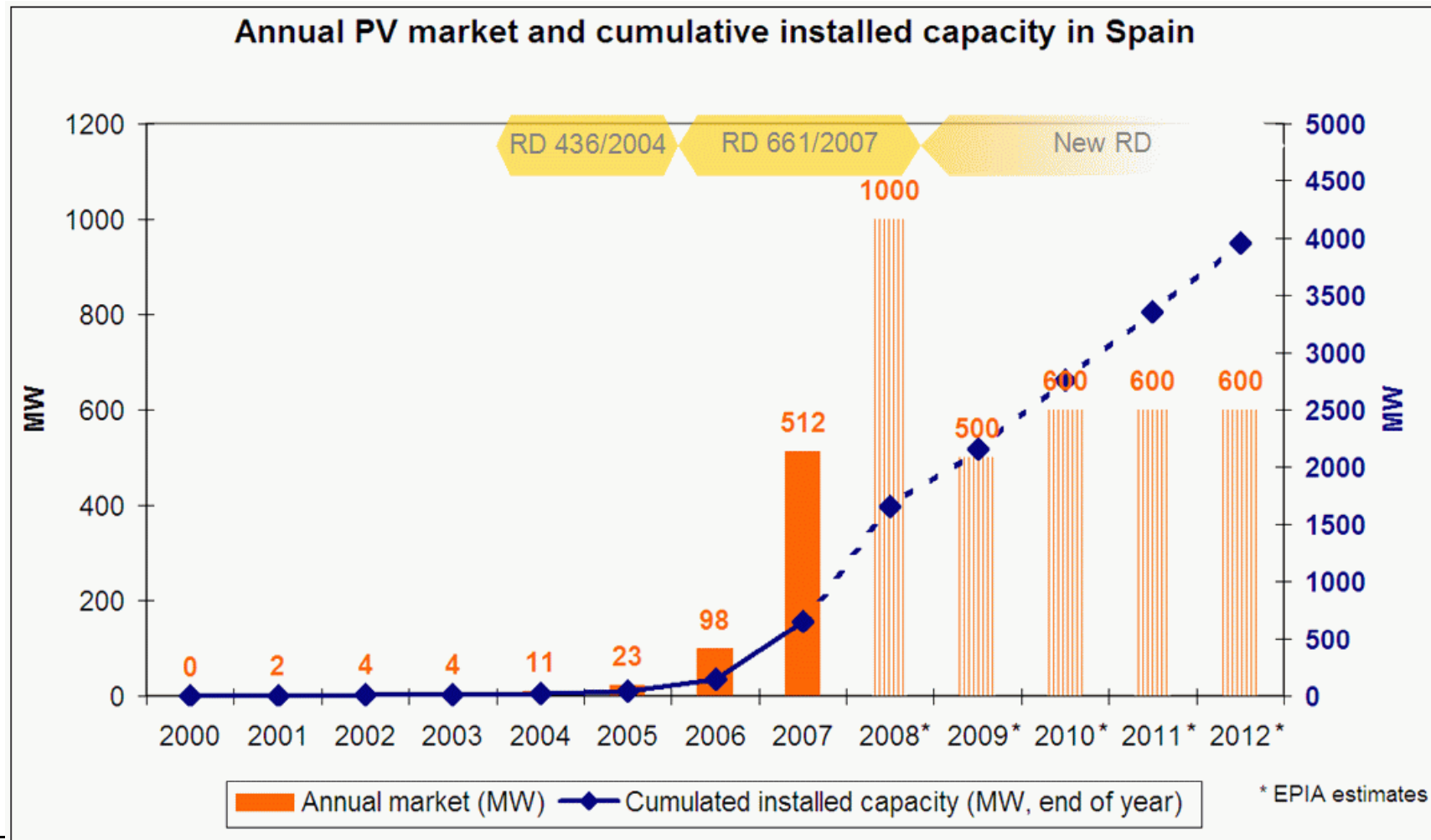
Different world PV market projections until 2010



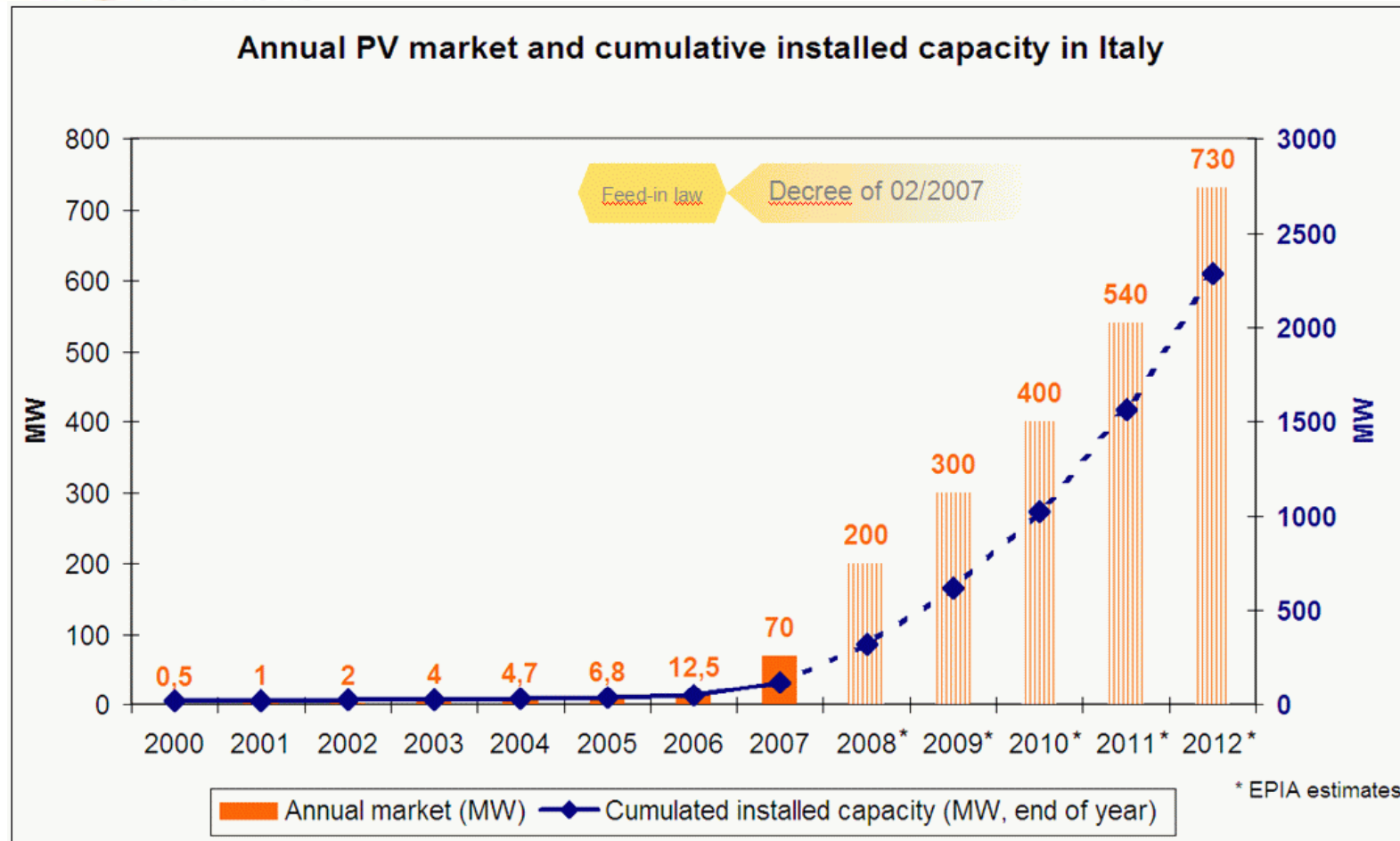
Success story: Germany



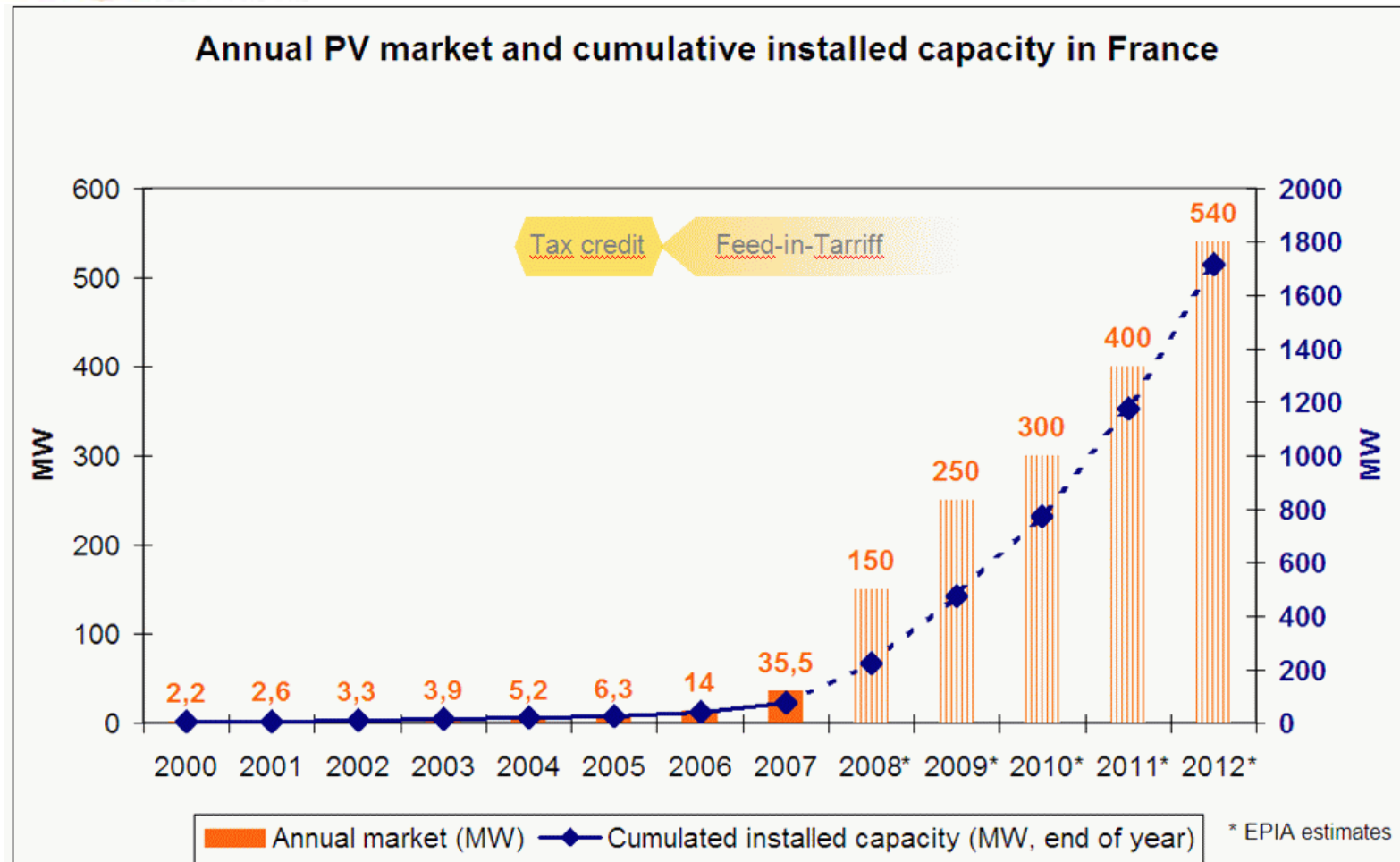
Spain



Italy



France





PV market expectations [MWp]

Country	2007	2008	2010
Austria	2.7	4	?
Sweden		1	
France	45	150	500
Germany	1100	1350	2000
Greece	2	10	180
Italy	50	150	500
Luxembourg			
Netherlands			
Portugal	14	42	50
Slovenia			
Spain	518	1000-1500	400
Switzerland	6.5	10 - 15	4
UK	3	3	3 – 30
Belgium	10	20	?

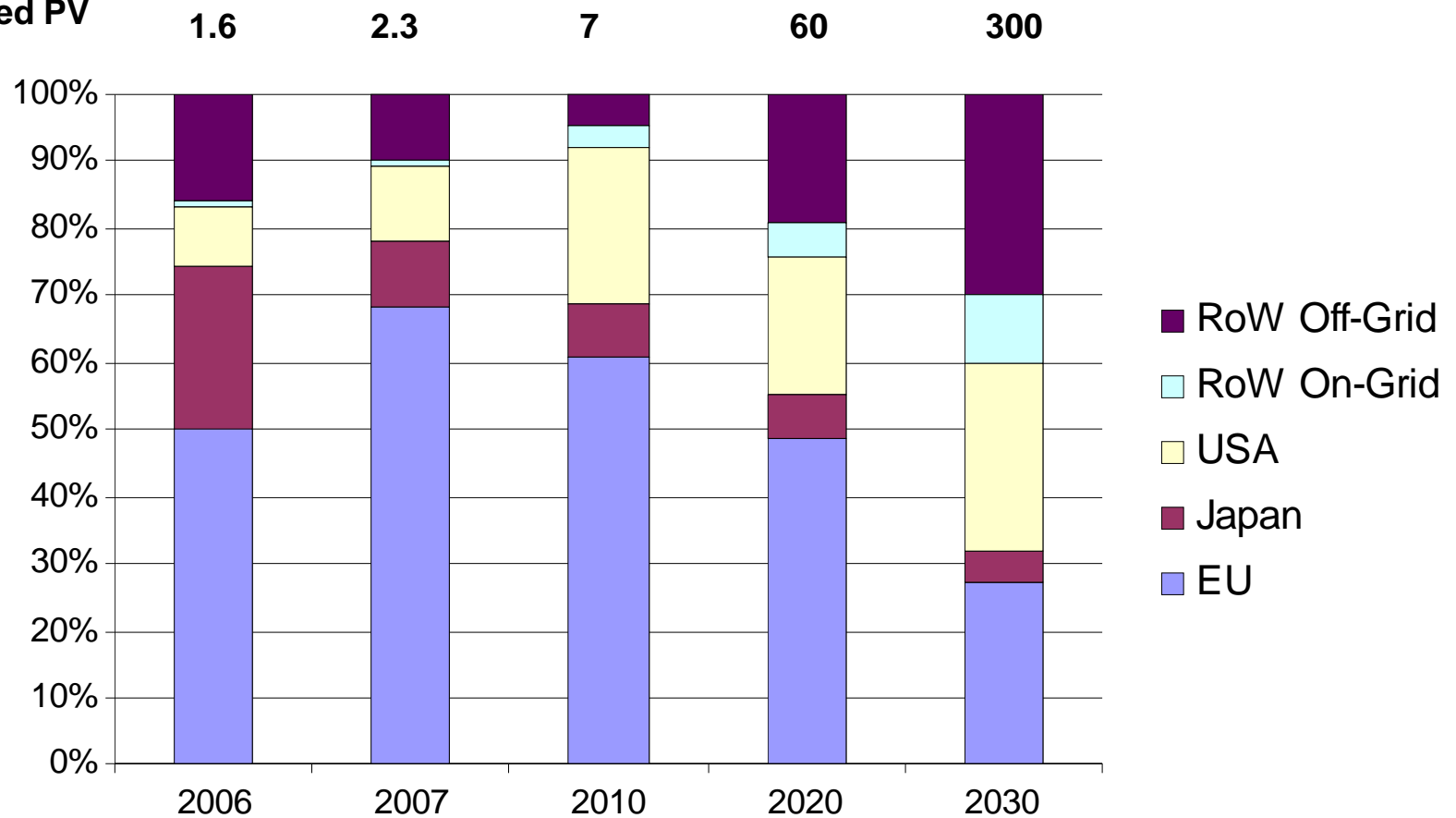
Country	2007	2008	2010
USA	305	400	600 - 1200
Canada	13.3	20	100 - 300
Australia	20	40	
China	20	20	
India	20	70	
Japan	230		
Malaysia			
South Korea	50		
Taiwan	1	3	10
Israel			
Near East			
Africa			
RO World	230		

Source. NNPVA



Development of the Various Market Segments (relative)

Yearly installed PV power (GWp)



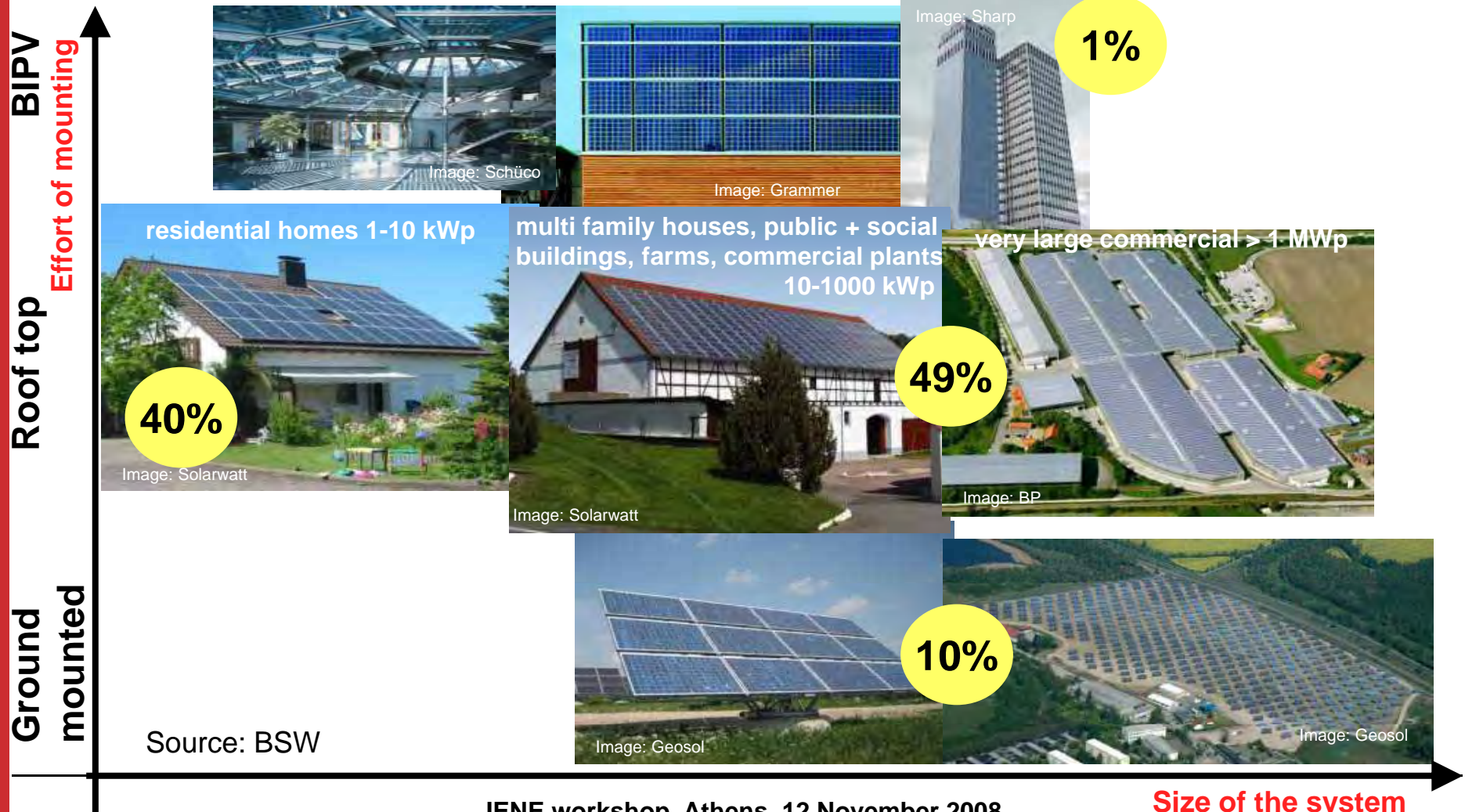
Ref: W. Hoffmann personal estimates



EU Market Situation

Market segments of on-grid PV Systems.

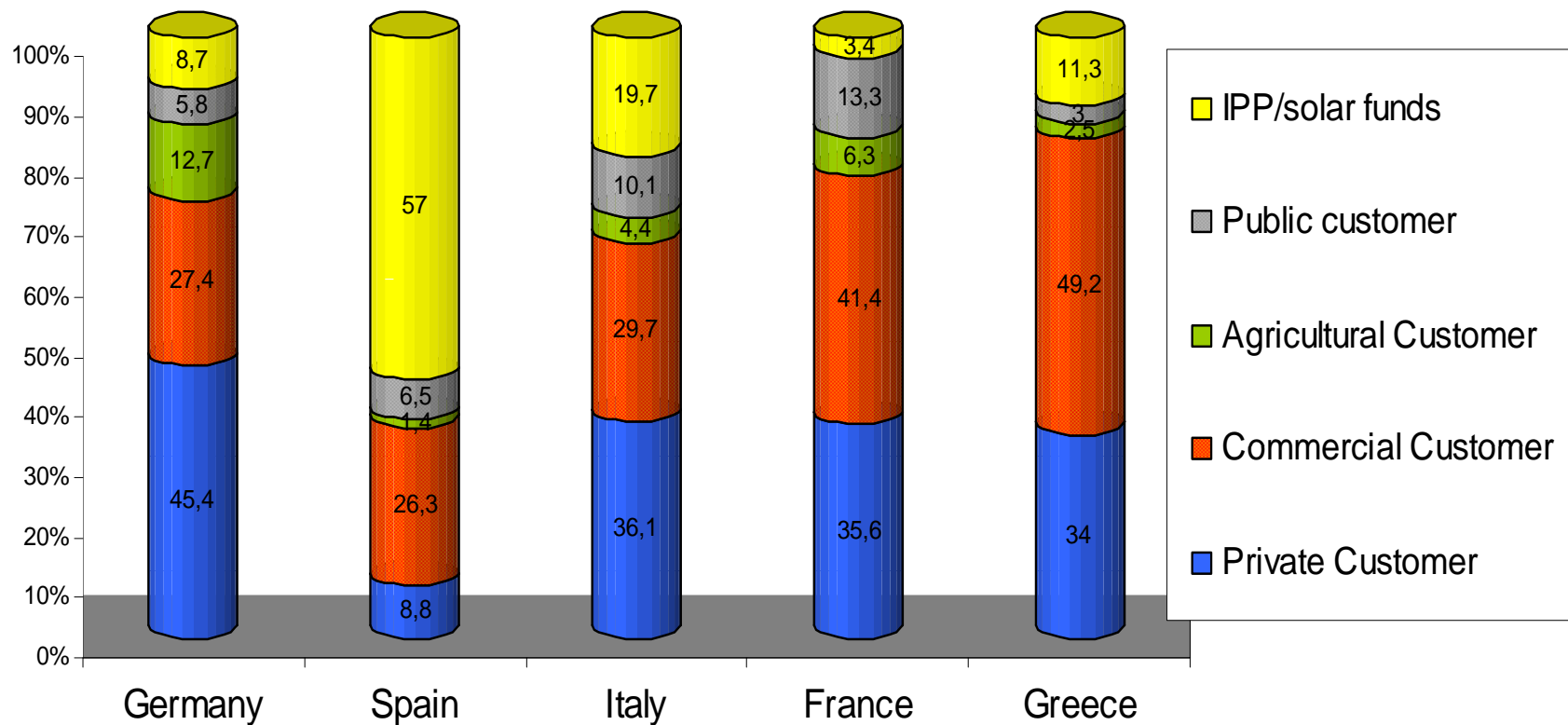
e.g.: Germany





EU Market Situation

Segmentation by customers of some EU market, 2007



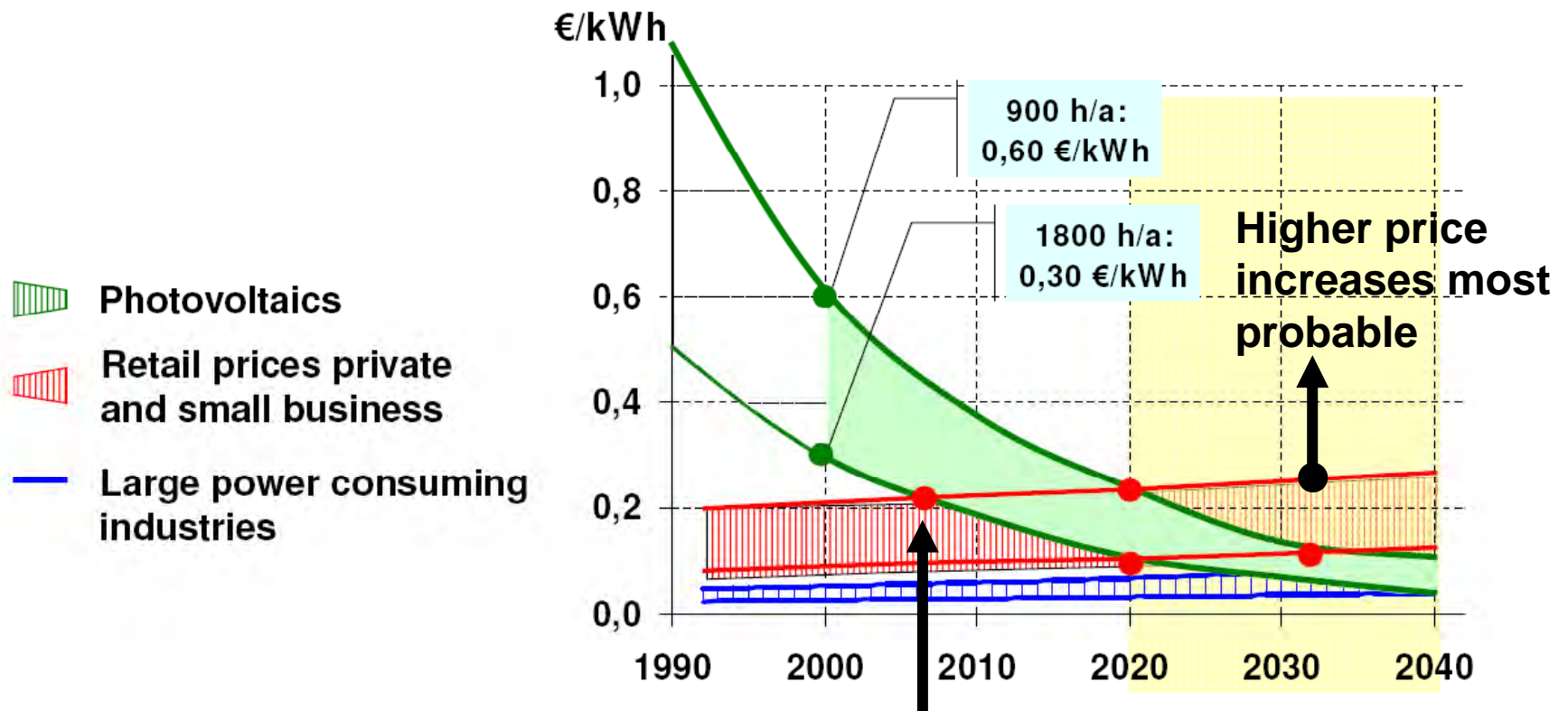


New target by 2020

- ❑ SET plan (Strategic Energy Technology Plan)**
- ❑ 12% of electricity demand by 2020 provided that the appropriate political framework is ensured.**
- ❑ Solar industry initiative (CSP and PV)**



Competitiveness between Electricity Generation Cost PV and Electricity Price



Ref: W. Hoffmann personal estimates (1999 and 2008)

**Grid parity already reached in Southern
regions ... even more in liberalized
electricity markets for peak power prices**

IENE workshop, Athens, 12 November 2008

Grid parity in Europe – 2007

(lines to guide the eye)



irradiation (kWh/m ² .yr)	PV generation cost (€/kWh)
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600	0.83
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1000	0.50
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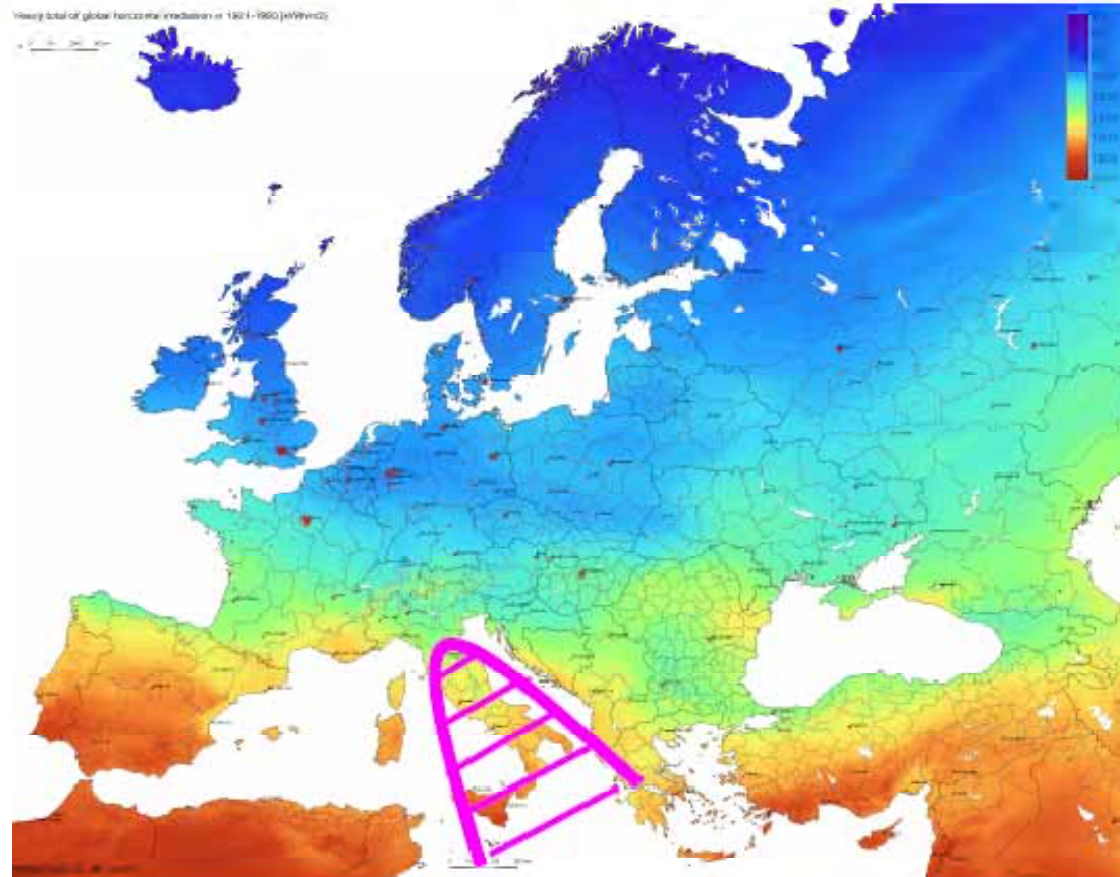
1400	0.36
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1800	0.28
------	------

insolation map: Šúri M., Huld T.A.,
Dunlop E.D. Ossenbrink H.A., 2007.
Potential of solar electricity
generation in the European Union
member states and candidate
countries. [Solar Energy](http://re.jrc.ec.europa.eu/pvgis/),
<http://re.jrc.ec.europa.eu/pvgis/>

Grid parity in Europe – 2010

(lines to guide the eye)



irradiation (kWh/m ² ·yr)	PV generation cost (€/kWh)
---	-------------------------------

600	0.50
-----	------

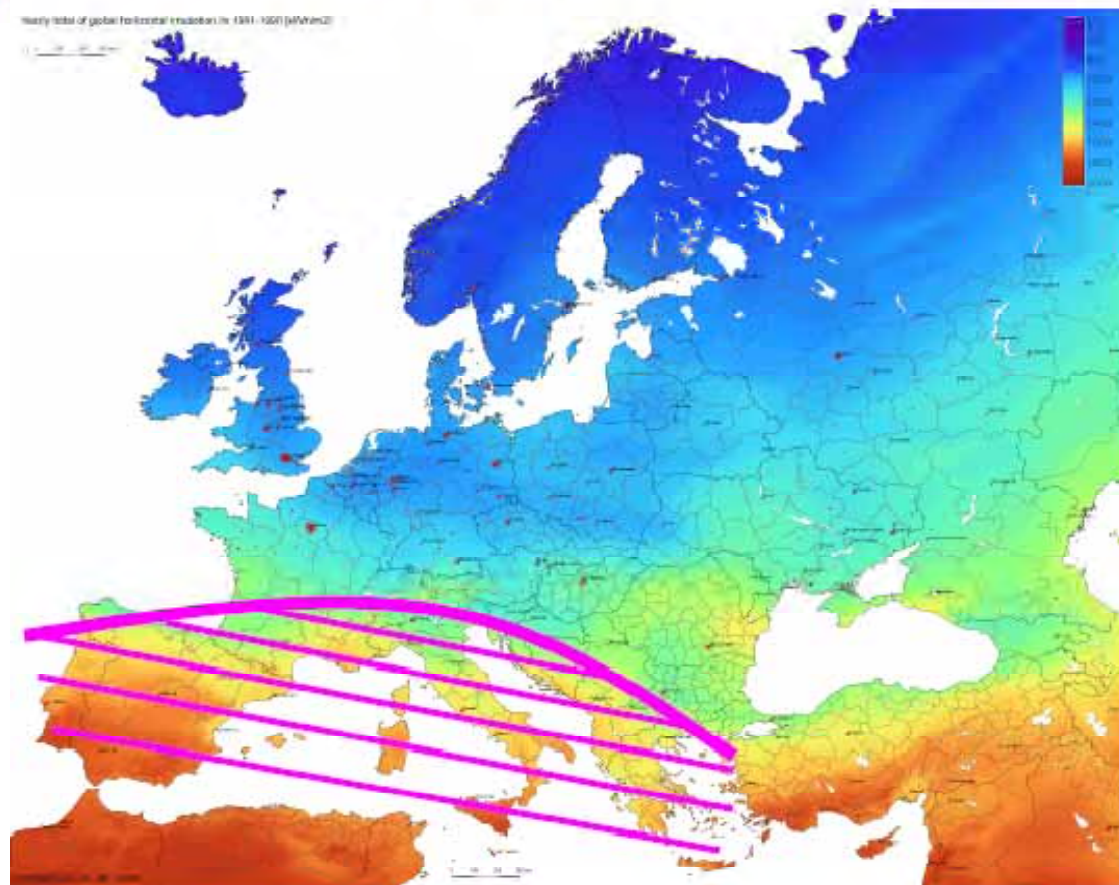
1000	0.30
------	------

1400	0.21
------	------

1800	0.17
------	------

Grid parity in Europe – 2015

(lines to guide the eye)



irradiation (kWh/m ² .yr)	PV generation cost (€/kWh)
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600	0.42
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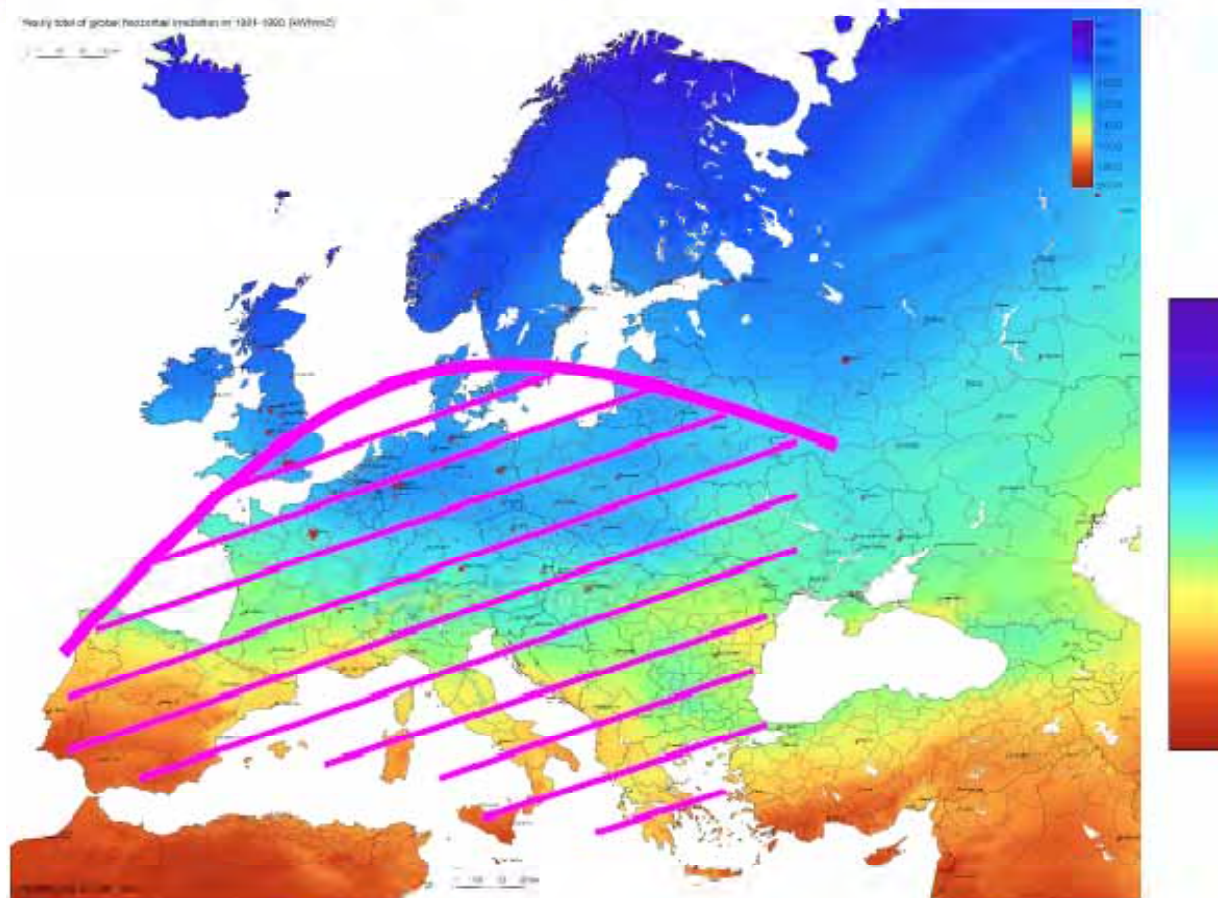
1000	0.25
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1400	0.18
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1800	0.14
------	------

Grid parity in Europe – 2020

(lines to guide the eye)



irradiation (kWh/m ² .yr)	PV generation cost (€/kWh)
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600	0.33
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1000	0.20
------	------

1400	0.14
------	------

1800	0.11
------	------




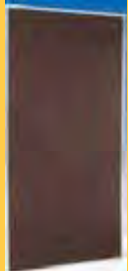

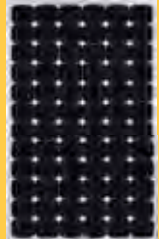



„Solar architecture is not about fashion,
it is about survival“ Sir Norman Foster

TüArena, Sport stadium, Tübingen, Germany

Image: Suntechnics, Sunways

Potential of BIPV

Module and Cell Efficiency							
Technology	Thin Film					Crystalline Silicon	
	(a-Si) 	(CdTe) 	Cl(G)S 	a-Si/ μ Si 	Dye s. cells 	Mono 	Multi 
Cell efficiency						16-22%	14-16%
Module efficiency	4-7%	8-10%	7-11%	6-8%	2-4%	13-19%	12-15%
Area Needed per KW (for modules)	~ 15 m ²	~ 11m ²	~ 10m ²	~12m ²		~7m ²	~8m ²



National Policy situation:

Countries with special *Feed-In-Tariff for BIPV*

Country	Installed Power	Feed-in-tariff (2008) c€/ KWh	Digression Rate	Duration	CAP / Target
France	All	57	No	20 years	1500KWh/KWp 1800KWh/Kwp (overseas)
Italy	<3	49	2% in 2009	20 years	Target 2012 - 1200MW Target 2016 - 3000MW
	< 20	46			
	>20	44			
Switzerland	<10	0,90 (55,7)*	8% yearly (from 2010)	25 years	
	<30	0,75 (46,4)*			
	<100	0,67 (41,2)*			
	>100	0,62 (38,4)*			

* Swiss franc (01/09/2008): 1franc= 0.62 €



National Policy situation:

Countries with special *Feed-In-Tariff for BAPV*

Country	Installed Power	Feed-in-tariff (2008) c€/ KWh	Digression Rate	Duration	CAP / Target		
France	All	32	No	20 years	1500KWh/KWp		
		42 (overseas)			1800KWh/Kwp (overseas)		
Italy	<3	44	2% in 2009	20 years	Target 2012 - 1200MW Target 2016 - 3000MW		
	< 20	42					
	>20	40					
Germany	<30	46,75	8% yearly Corridor	20 years	No cap		
	<100	44,48					
	<1000	43,99	10% yearly Corridor				
	>1000	43,99					
Spain	<20 Max 2MW	34	No	25 years	(2009) 27 MW	(2010) 33 MW	(2011) 40 MW
	>20 Max 2MW	32			240 MW	300 MW	360 MW



National Policy situation:

Some Countries with special *Feed-In-Tariff for ground base systems*

Country	Installed Power	Feed-in-tariff (2008) c€/ KWh		Digression Rate	Duration	CAP / Target		
Italy	<3	40		2% in 2009	20 years	Target 2012 - 1200MW Target 2016 - 3000MW		
	< 20	38						
	>20	36						
Germany	<100	35,5		8% yearly Corridor	20 years	No cap		
	>100			10% yearly Corridor				
Greece	<= 100	(Mainland) 50,28	(Islands) 45,28	No	10 + 10 possible			
	>100	(Mainland) 45,82	(Islands) 40,28					
Spain	<20 Max 10MW	32		No	25 years	(2009) 233 MW	(2010) 207 MW	(2011) 162 MW