Development and Perspectives of Photovoltaic in Selected European Markets

3rd China New Energy International Forum

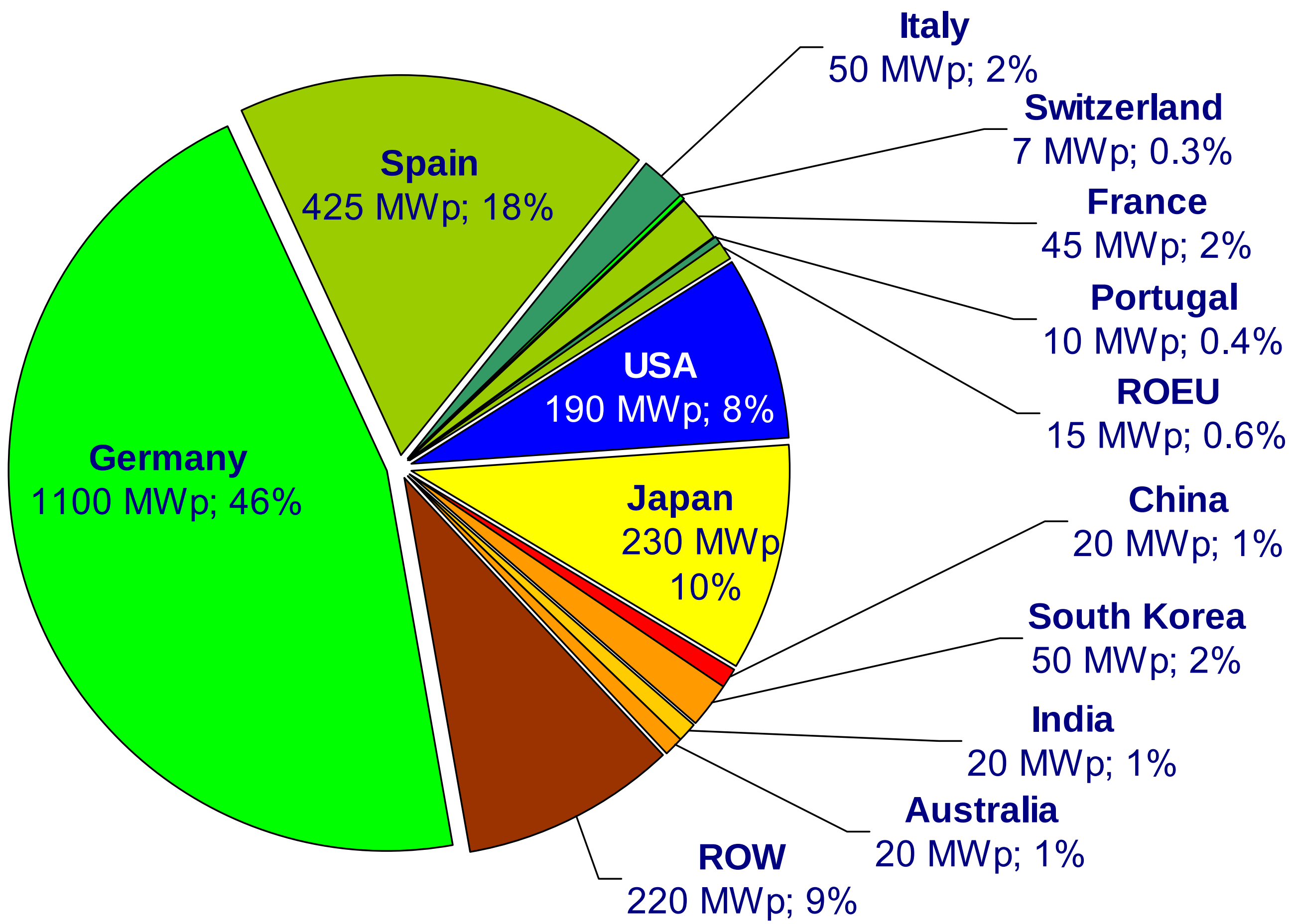
Beijing, November 27-28, 2008

EU-China Energy & Environment Programme
Frank Haugwitz (韩飞)

Global PV Market Perspectives

EU-CHINA

Newly installed PV Power in 2007: 2.4 GWp



Source: EPIA, BSW, ASIF, SEIA
Updated 15 July 2008

Forecast for 2008:

3.6-4 GWp (+50%)

Source: BSW

GREECE – Legislative Framework

The Law: 3468 / 2006

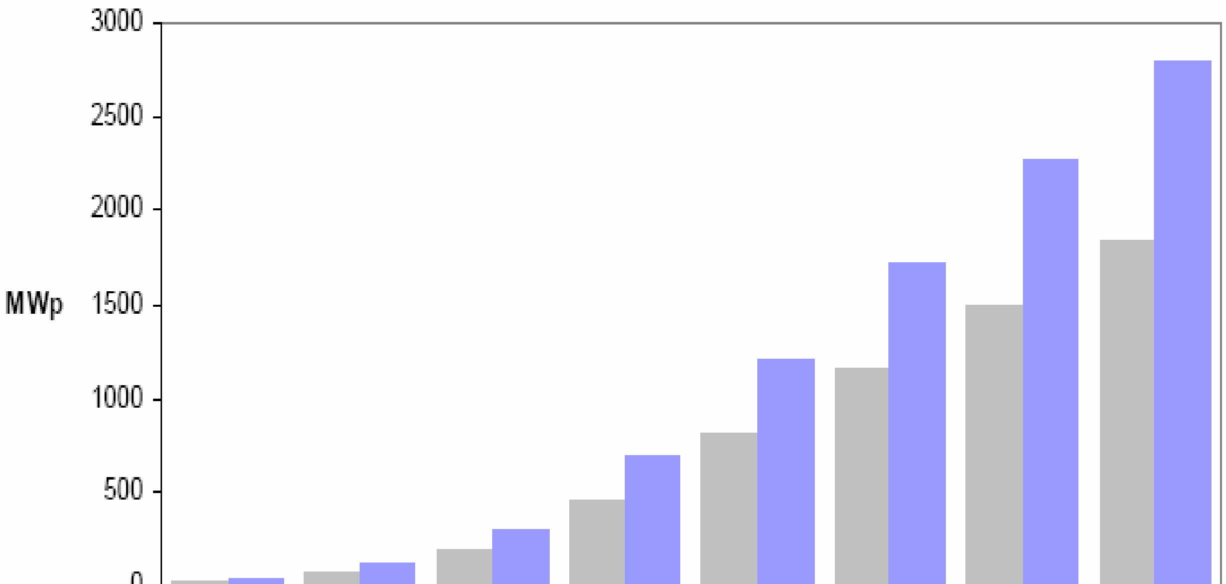
- No cap, but reference is made that by 2020 a minimum of 500 MWp mainland and 200 MWp islands will be installed

Feed-in-Tariff kWh	On-Grid	Off-Grid
Sys. ≤ 100 kWp	€c 45	€c 50
Sys. > 100 kWp	€c 40	€c 45

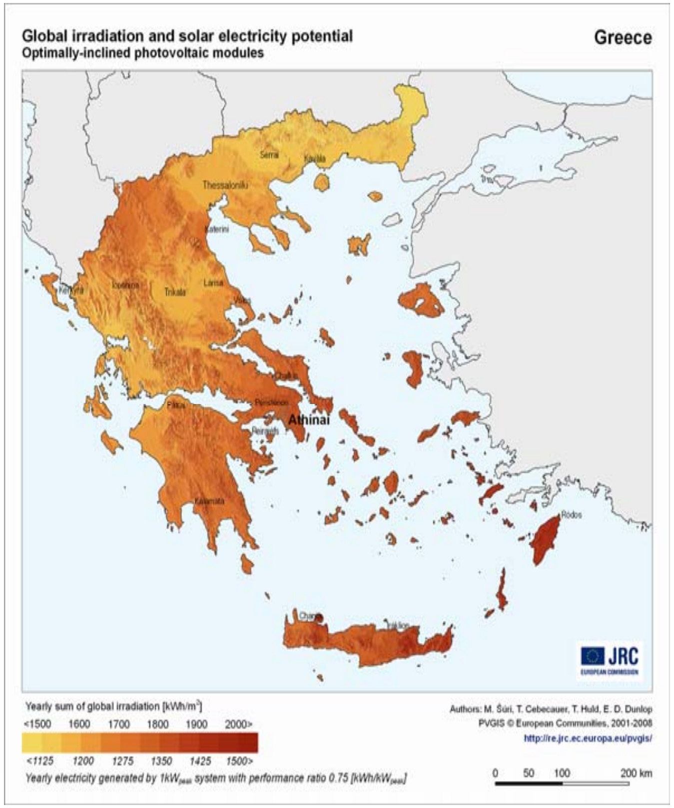
- 40% subsidy for systems costs
- 2010-13: FiT annual degression of 1% ; 2014: 0,5%
- Rooftop Programme from 2009 (750 MWp) higher FiT

Source: EPIA Workshop Frankfurt, Solar Hellas Group, February 2008, NNPVA Meeting June 2008

GREECE – Market Perspectives



	2008	2009	2010	2011	2012	2013	2014	2015
Low	20	75	195	460	800	1150	1500	1850
High	25	110	290	690	1200	1730	2265	2800



- End of 2008: 15 MWp installed capacity
- Next 3-5 years, medium and large size systems expected
- Submitted applications requesting permission amount to 3.7 GWp with 2.5 GWp to be finalized until 2012

Source: Hellenic Association of Photovoltaic Companies, Sept. 2008 (Cumulative Figures)

FRANCE – Legislative Framework

Tax Incentives

- Tax credit for income tax payers : 50 % reimbursement of the equipment cost
- Specific tax incentives on investment in overseas departments (French Territories)

Feed-In-Tariffs

- Continental France : 31,19 €c/kWh + 26 €c/kWh, if BIPV
- Overseas Dept. : 41,19 €c/kWh + 16 €c/kWh, if BIPV
- Duration 20 years

New Regulations as of Nov 18, 2008

- Roof-Top Prog. initiated (supermarkets, factories, schools)
- 30 €c/kWh + 15 €c/kWh
- Govt. tender for a 300 MWp project to be released 4Q 2008

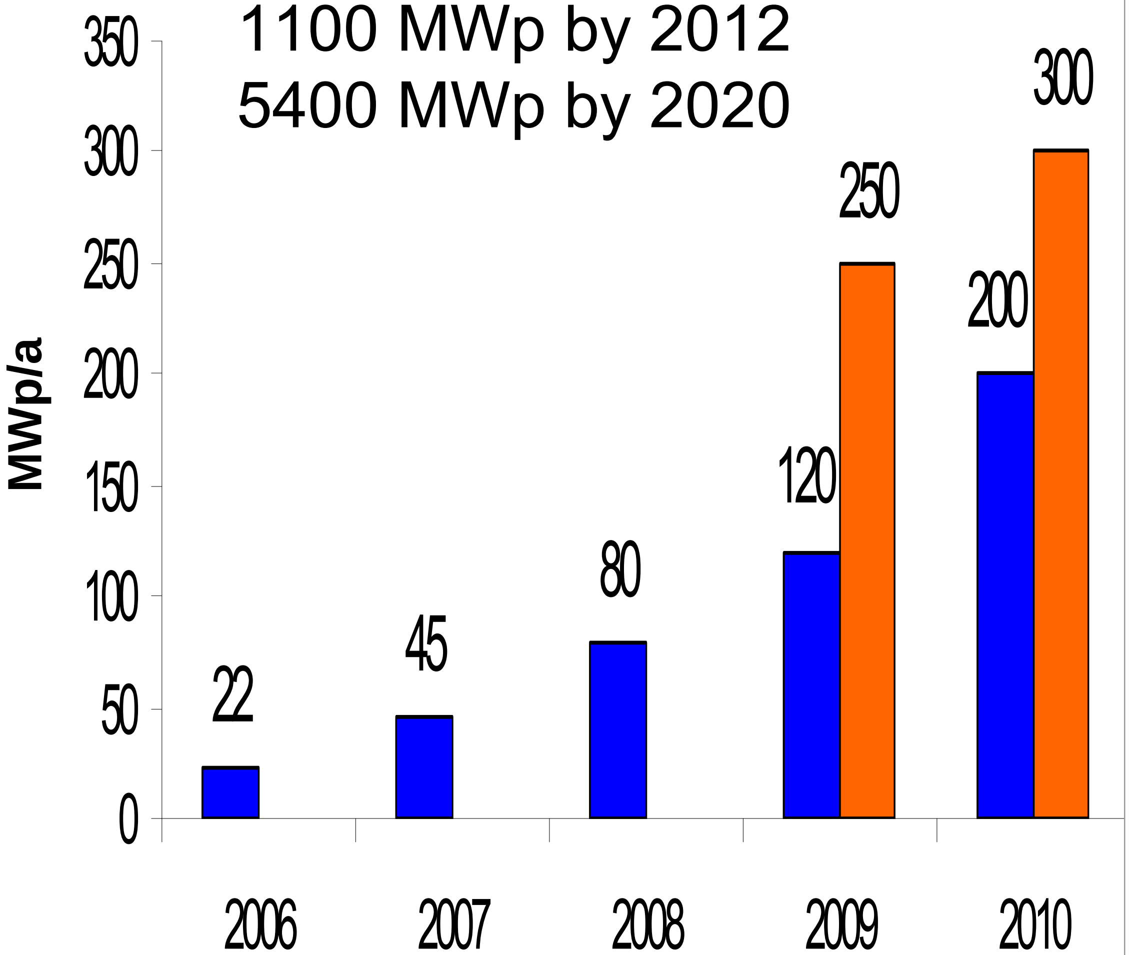
Source: EPIA Workshop Frankfurt, February 2008, Enerplan Sept. 2008

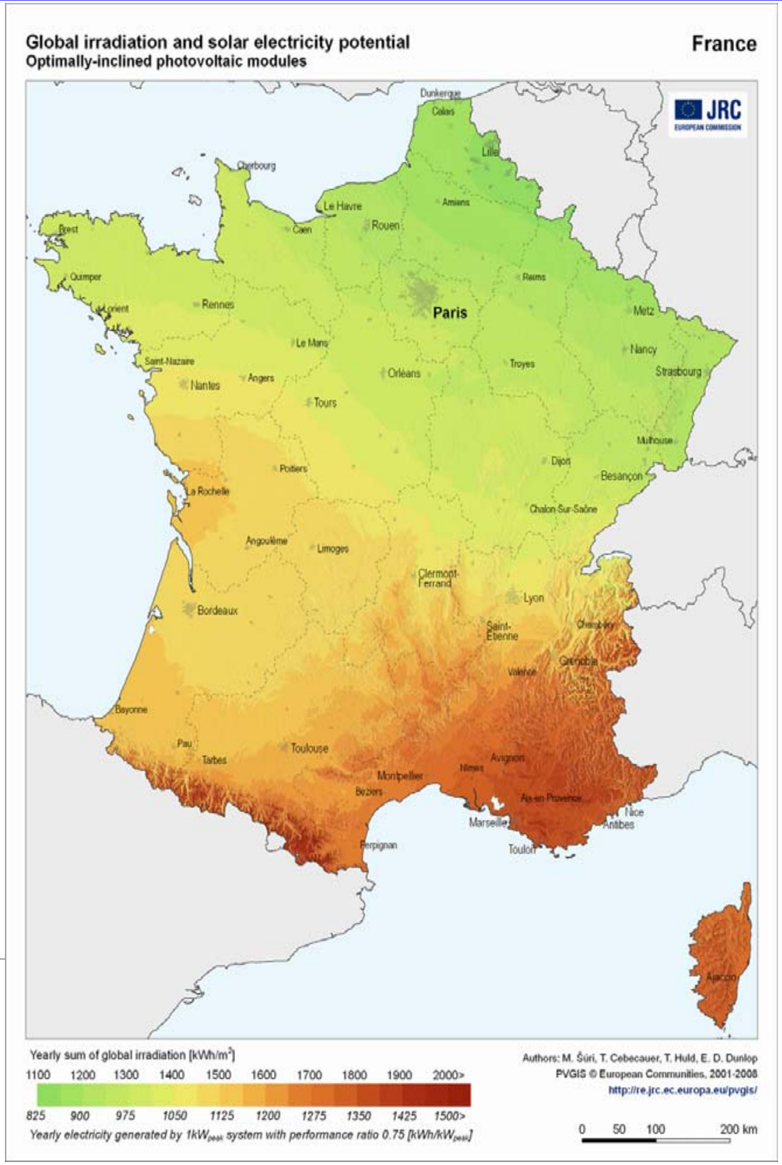
FRANCE – Market Perspectives

National Targets

1100 MWp by 2012

5400 MWp by 2020





Source: EPIA, Enerplan Sept. 2008 (annual figures)

FRANCE – Outlook

Market Development Estimations for 2008/2009

- 60% market share in continental France; 40% in overseas dept.
- Lead by private (< 3kW) BIPV systems
- Ground-mounted sys. mainly in overseas dept. and S-France
- France favors BIPV, consequently the development depends on strategies related to building sector.

Year	Annually Installed Capacity	Total Installed Capacity
2013	0,5 GWp	1,6 GWp
2018/19	1 GWp	7-8 GWp (in 2020)

Source: EPIA Workshop Frankfurt, February 2008, Enerplan Sept. 2008

ITALY – Legislative Framework

Ministerial Decree 19/02/2007

System Size in (kW)	Non-Integrated	Partially Integrated	Integrated Systems
1 < 3	€c 40	€c 44	€c 49
3 < 20	€c 38	€c 42	€c 46
> 20	€c 36	€c 40	€c 44

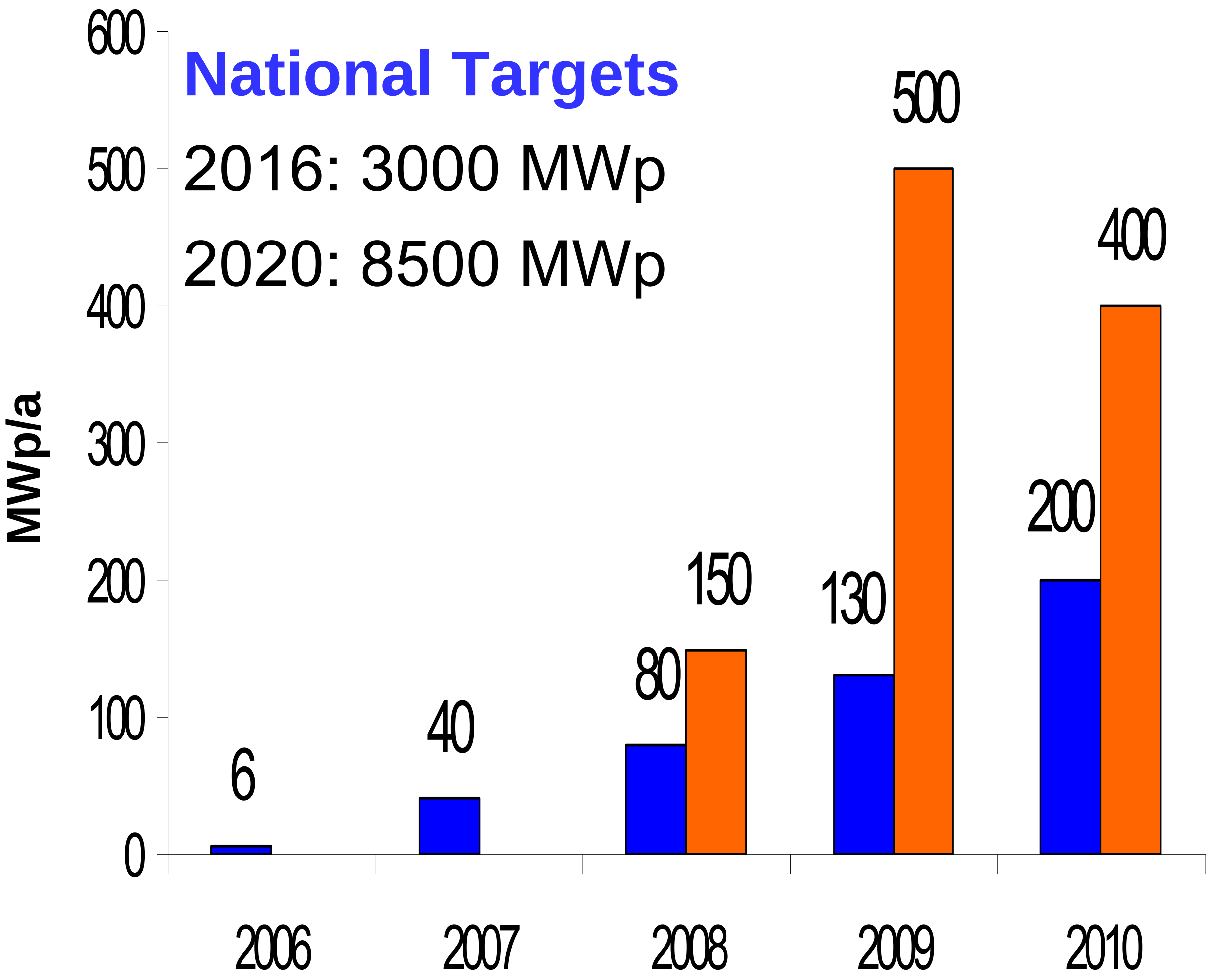
Non-Integrated	Open space plants ground-mounted, on tracking systems or similar
Partially Integrated (3 types)	Modules installed on roofs, covers, facades or railings, coplanar with support surface
Architecturally Integrated (10 types)	Roofs, roofing or facades of buildings consisting of PV systems

- FiT valid for up to 1200 MWp installed & annual 2% reduction by 1.1.2009

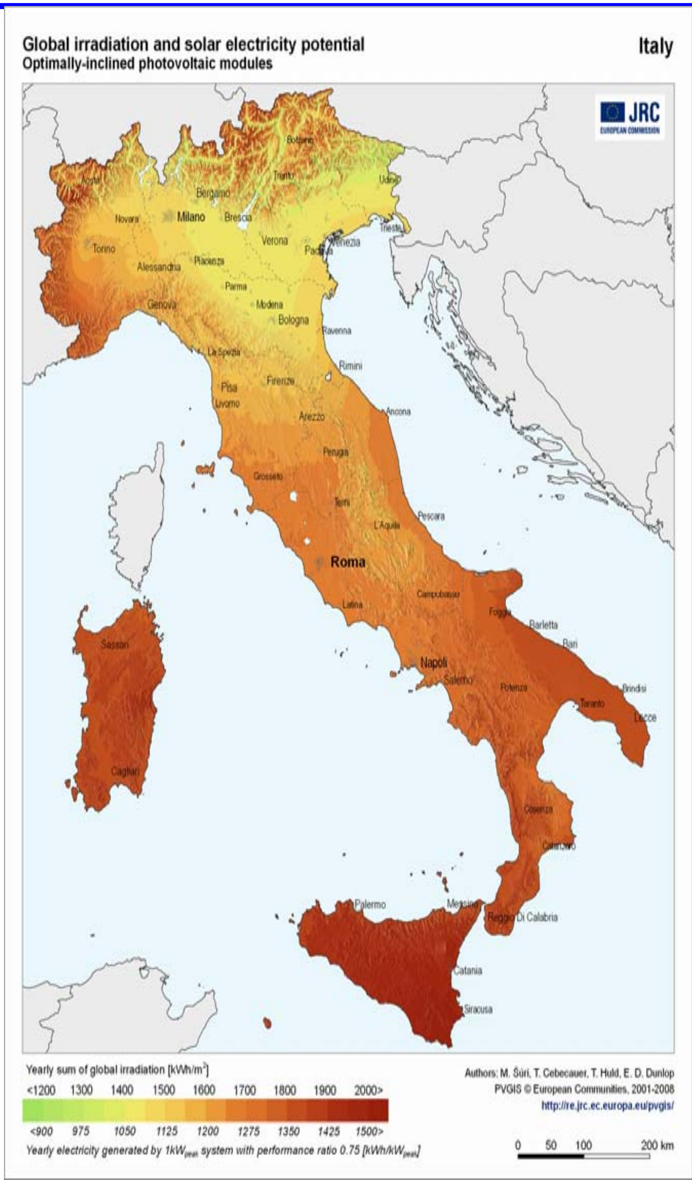
Source: EPIA Workshop Frankfurt, Assosolare, February 2008

EU-CHINA

ITALY – Market Perspectives



Source: EPIA (annual figures)



SPAIN – Legislative Framework

- Since 1999 the govt. follows a clear strategy to promote PV
- Royal Decree 436/2004 (based on FiT)

  < 100 kWp - 41 €c/kWh // > 100 kWp - 22 €c/kWh
- Royal Decree 661/2007

  Tariff until 09/2008: 45 €c/kWh
- **Royal Decree 1578/2008 (September 29, 2008)**

  2009: 500 MWp Caps / reduced FiT / Pre-Registration

  Caps: Ground-mounted Sys: 2009: 100 MWp & 2010: 60 MWp

  FiT: max. 10 MWp – 32 €c/kWh (ground-mounted)

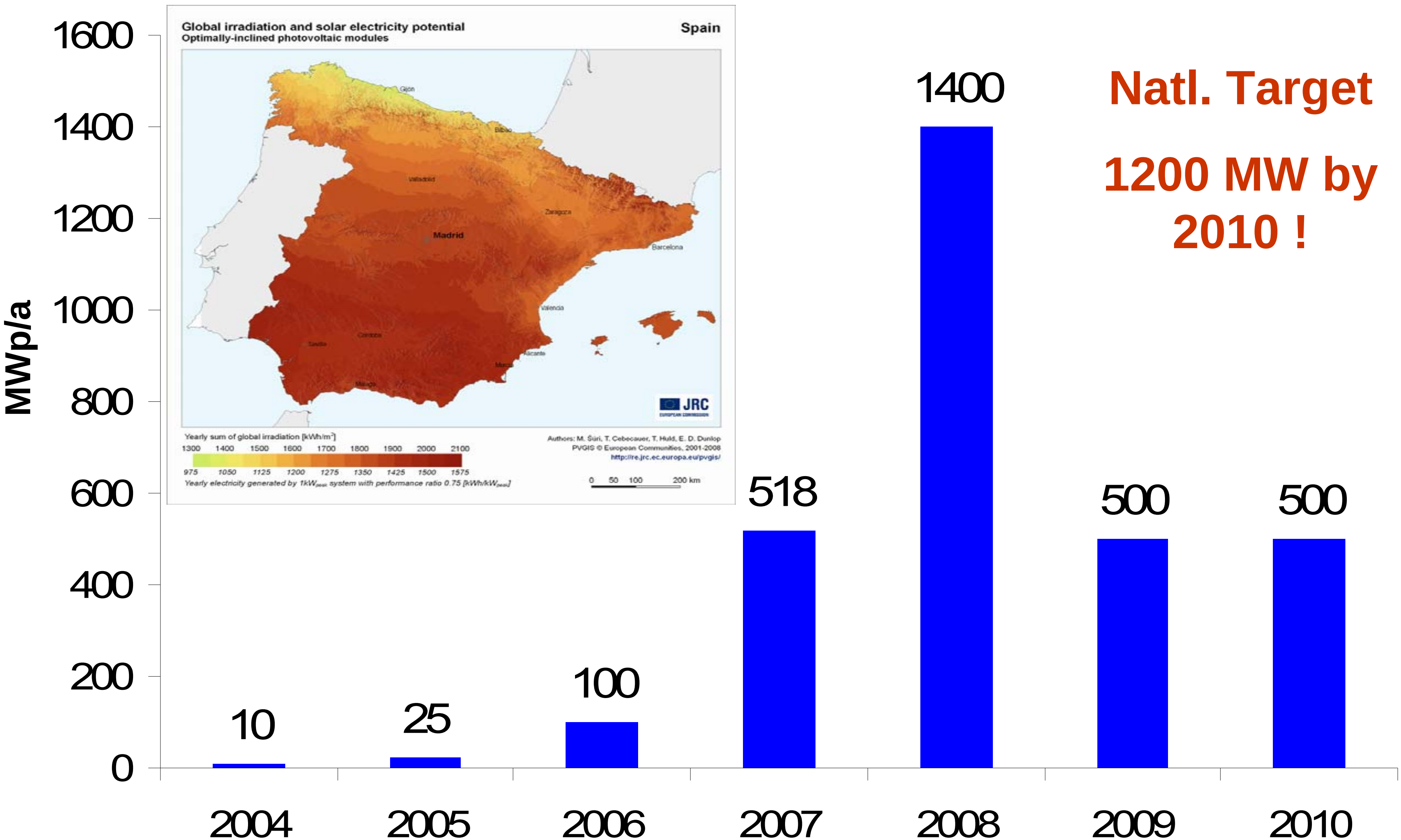
  FiT: max. 2 MWp – 32-34 €c/kWh (roof-top)

  Pre-Registration (every quarter 75 MWp)

  Nov 1, 2008 – Jan 31, 2009 – announced by March 16, 2009

  Possibility to reduce the FiT by 10%/a

SPAIN – Market Perspectives



Natl. Target

1200 MW by 2010 !

Sources: ASIF Oct. 2008 (annual figures)

GERMANY – Market Development

EU-CHINA

Market Data 2007

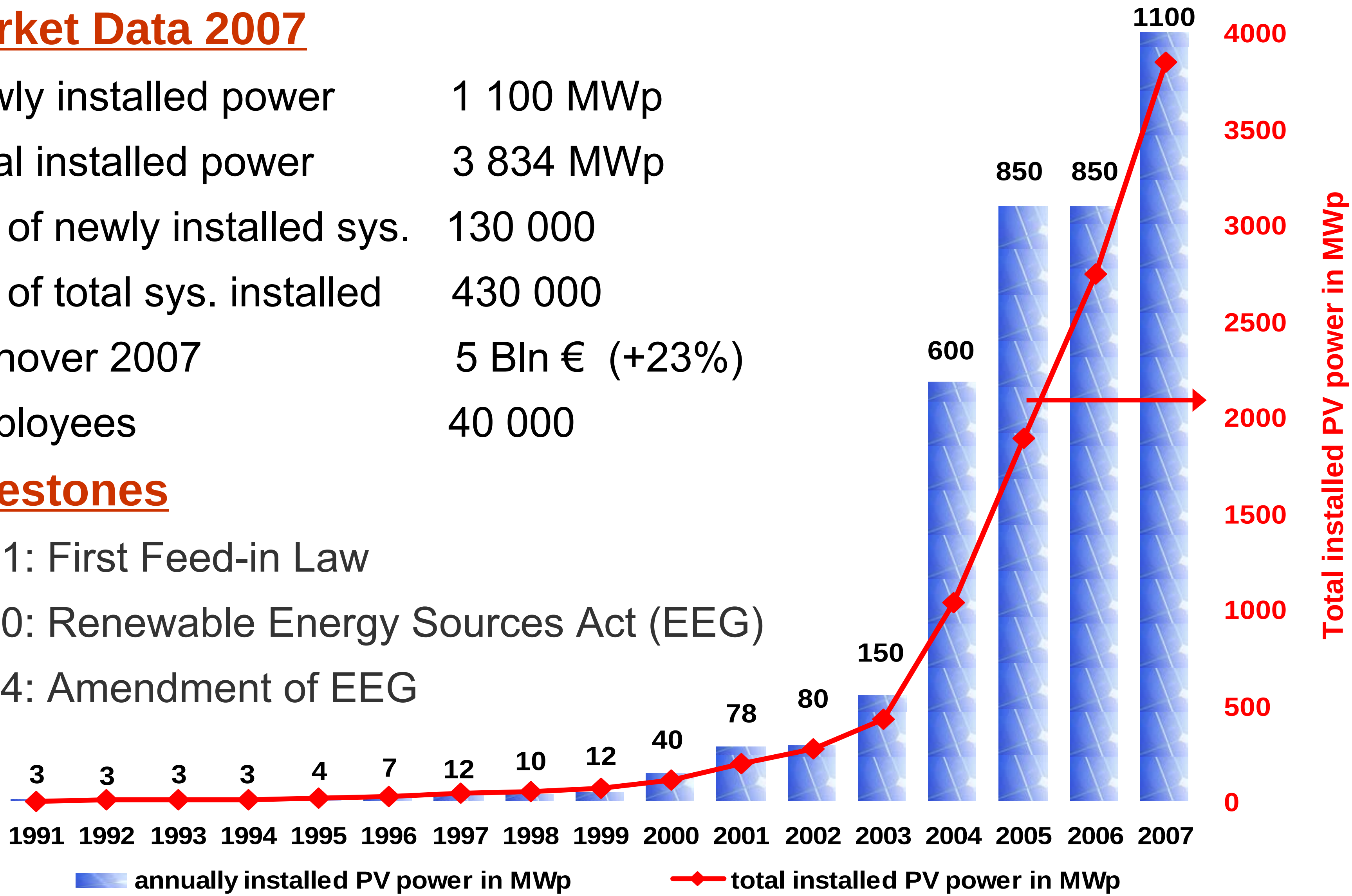
Newly installed power	1 100 MWp
Total installed power	3 834 MWp
No. of newly installed sys.	130 000
No. of total sys. installed	430 000
Turnover 2007	5 Bln € (+23%)
Employees	40 000

Milestones

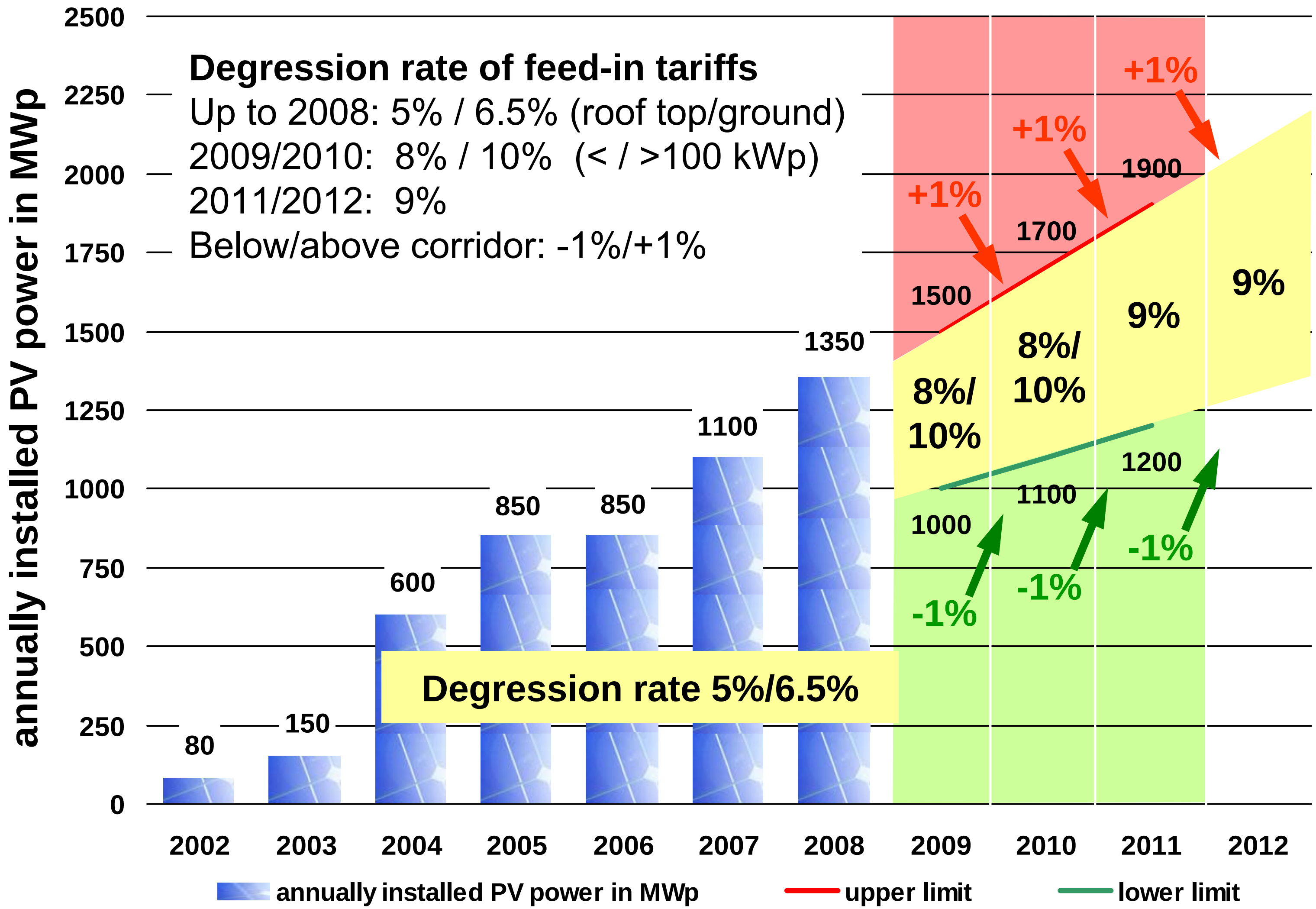
1991: First Feed-in Law

2000: Renewable Energy Sources Act (EEG)

2004: Amendment of EEG



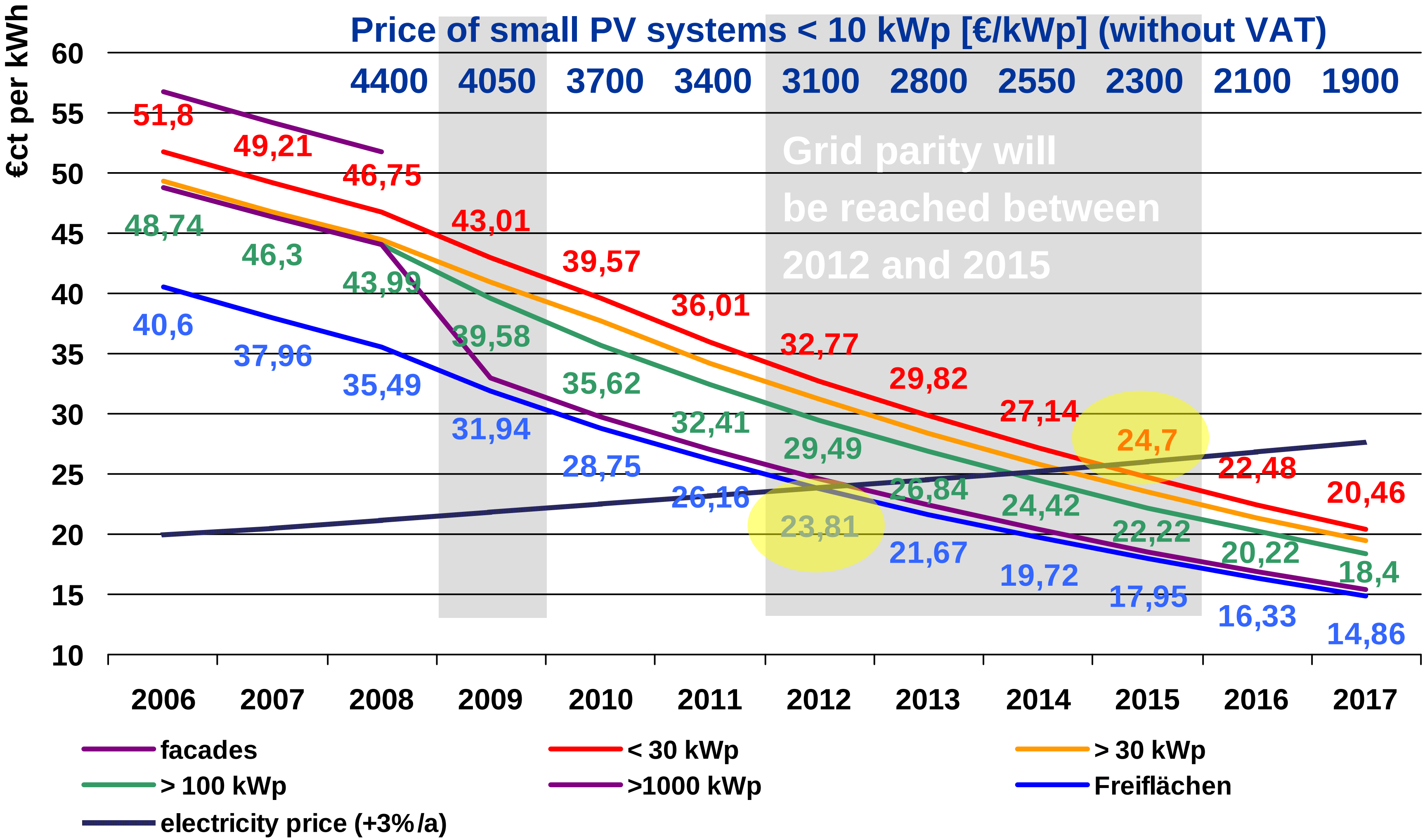
German PV Market up to 2008 and Feed-in Tariffs as of 2009



Source: BSW

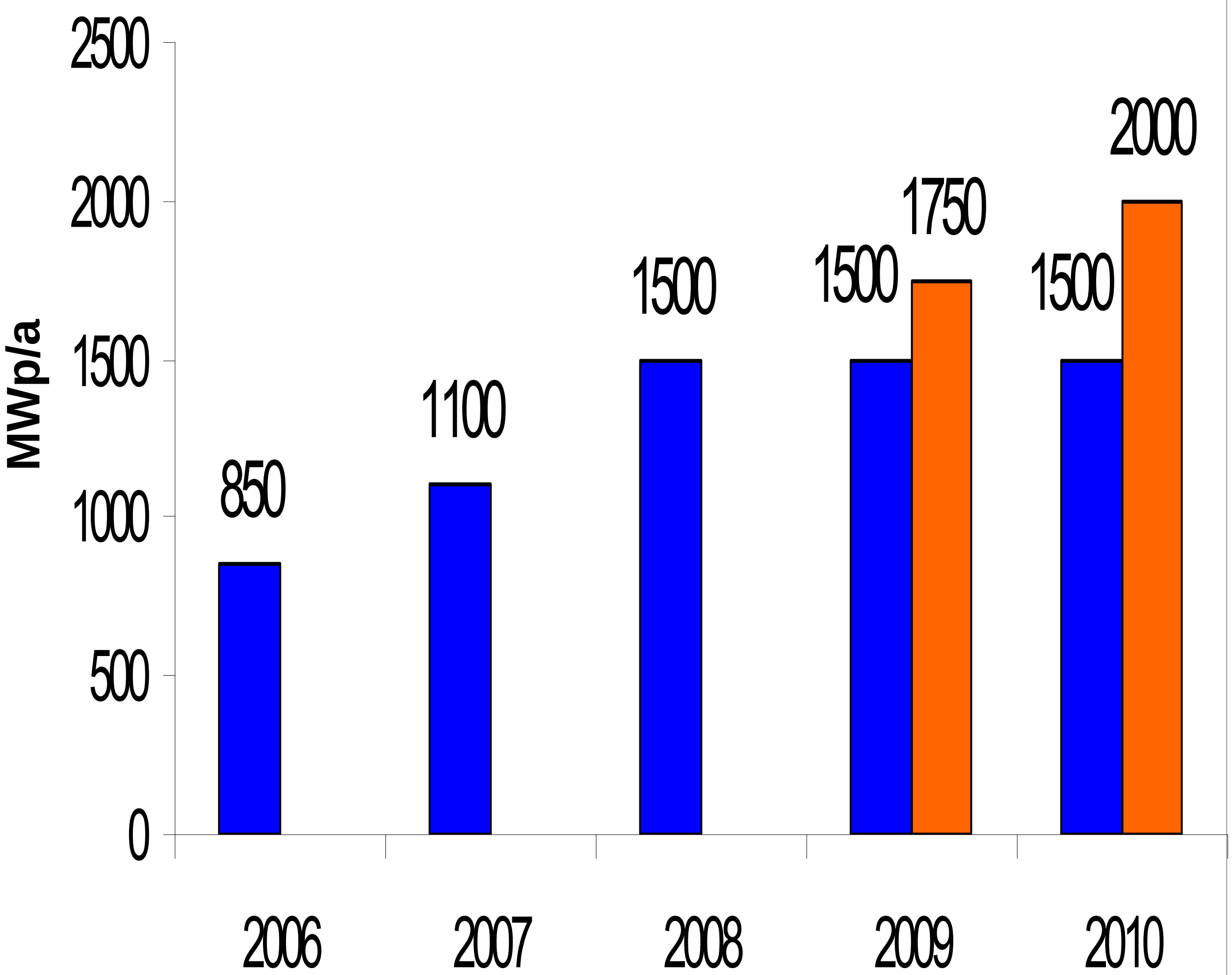
Feed-in Tariffs for PV within the German EEG

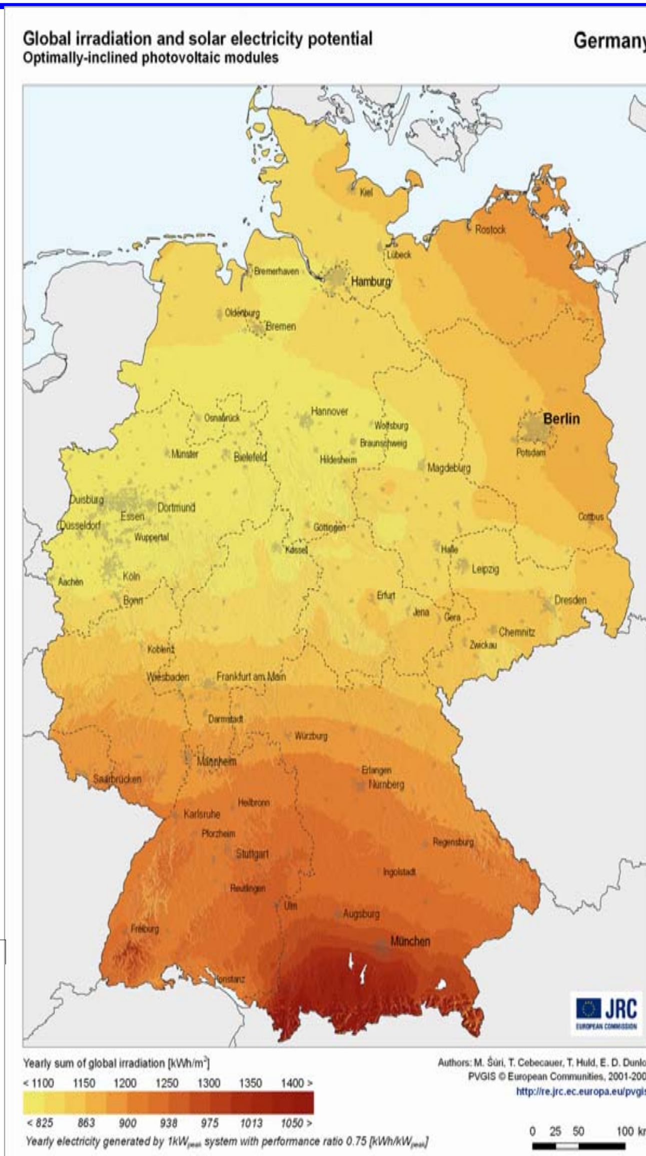
Based on higher degression rates as of 2009, decided on June 6, 2008



Source: BSW

GERMANY – Market Perspectives





Source: BSW, EPIA (annual figures)

European Perspectives

- Targets by 2020 (Sept. 08: EPIA Announcement)
  - 12% of electricity supply from PV by 2020
  - 350 GW by 2020 (2010: 15 GW → 35 GW/a for 10 years)

- Grid Parity Targets (EPIA)
  - 2010-12: Spain & Italy
  - 2015: Germany
  - 2020: 60-90% of whole Europe

- Global Demand: approx. 4 GWp by 2008 // 7-13 GWp by 2010
- Prod.-Capacity (Module & Cells): 2007: 4GW // 2010: 20 to 35 GW !
- Polysilicon supply constraint will ease by 2009/2010
- Number of Eastern EU Countries have introduced support schemes
- Global financial crises … govt. support could diminish, potential that natl. govt. favours natl. companies …

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