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The EU PV Market - Update and Outlook

Frank Haugwitz

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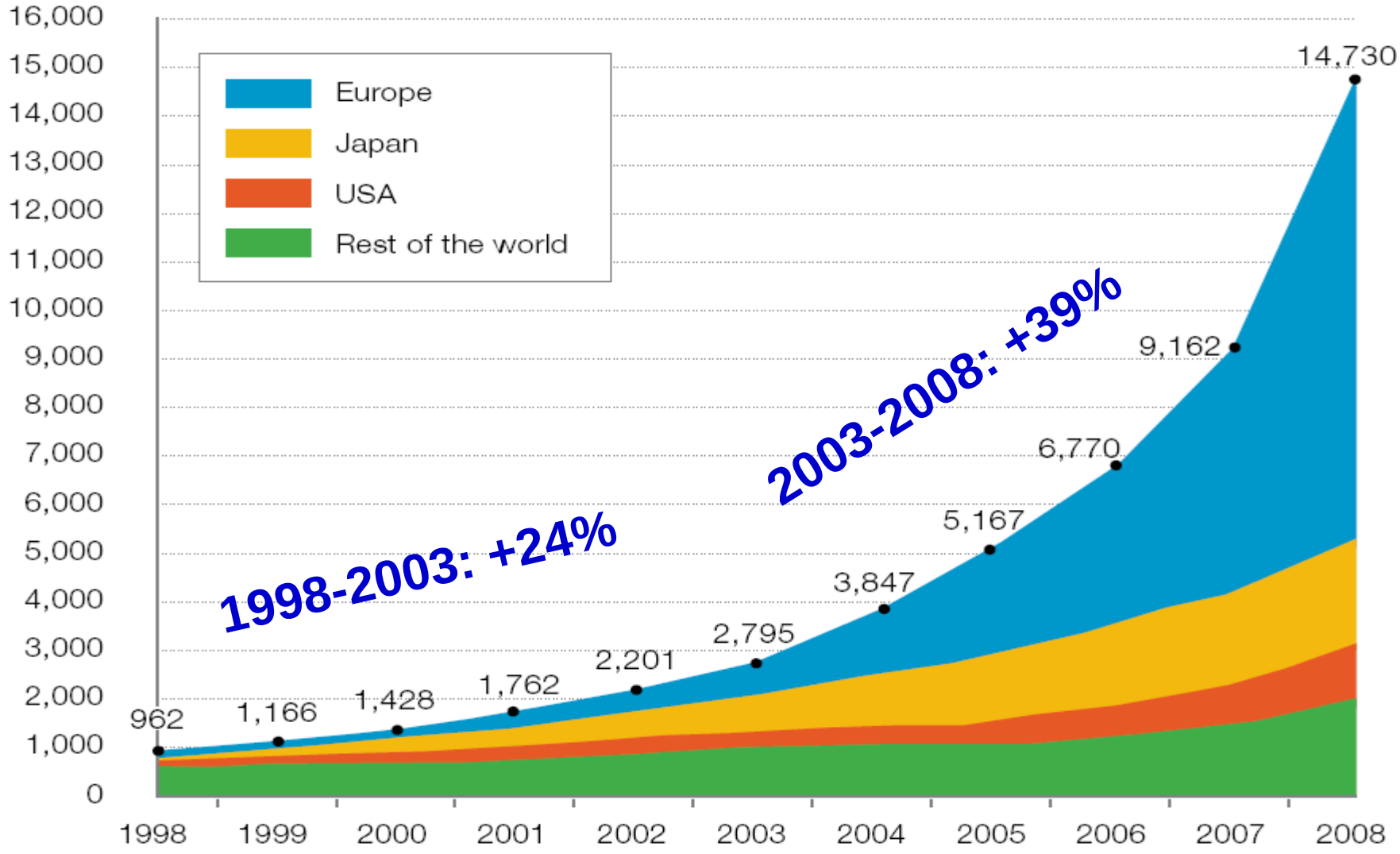
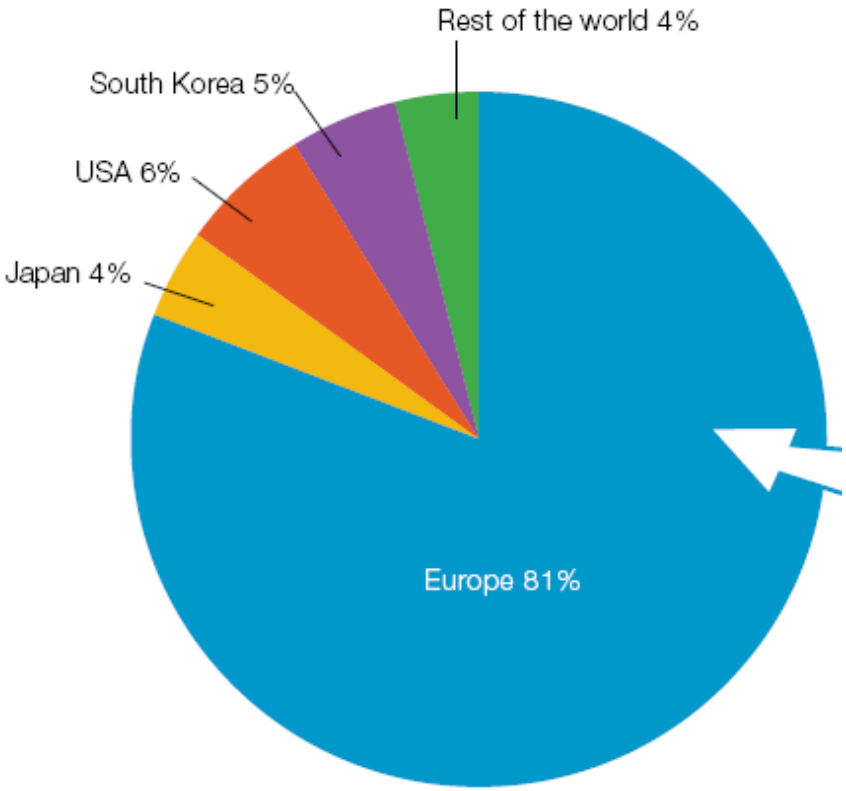
Global Cumulative MWp PV Installations per Region 1998-2008



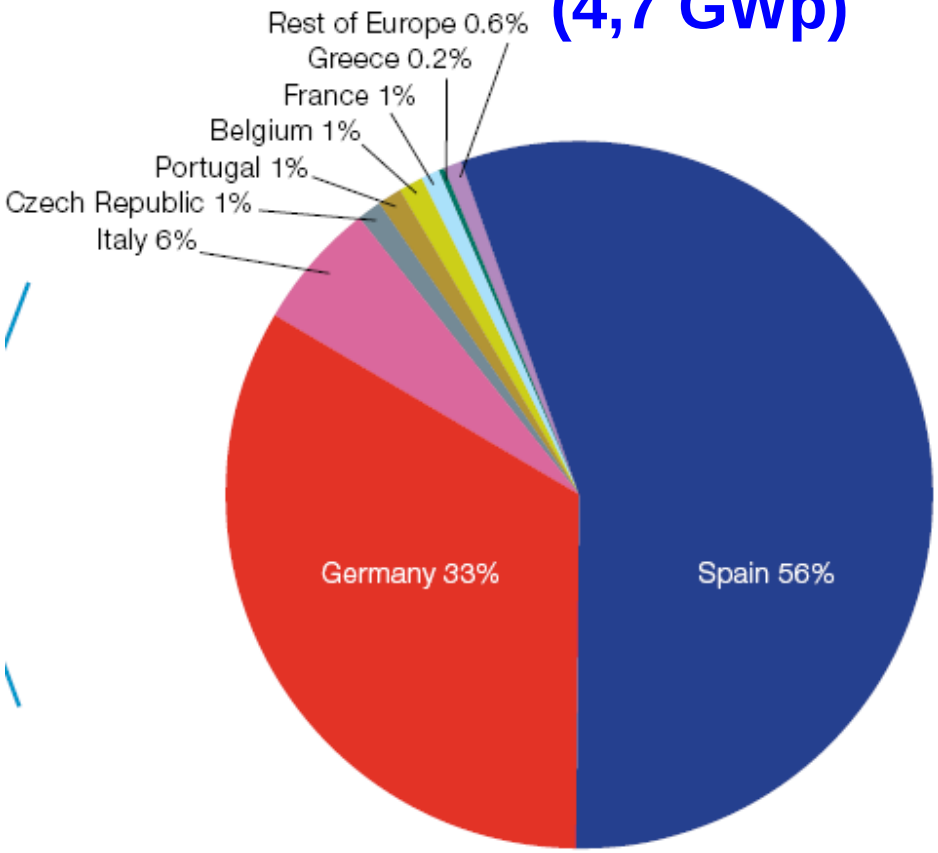
Source: EPIA Global Market Outlook March 2009

Regional Distribution of PV Markets in 2008

Global Markets in 2008 (5,6 GWp)



EU Markets in 2008 (4,7 GWp)



Source: EPIA Global Market Outlook March 2009

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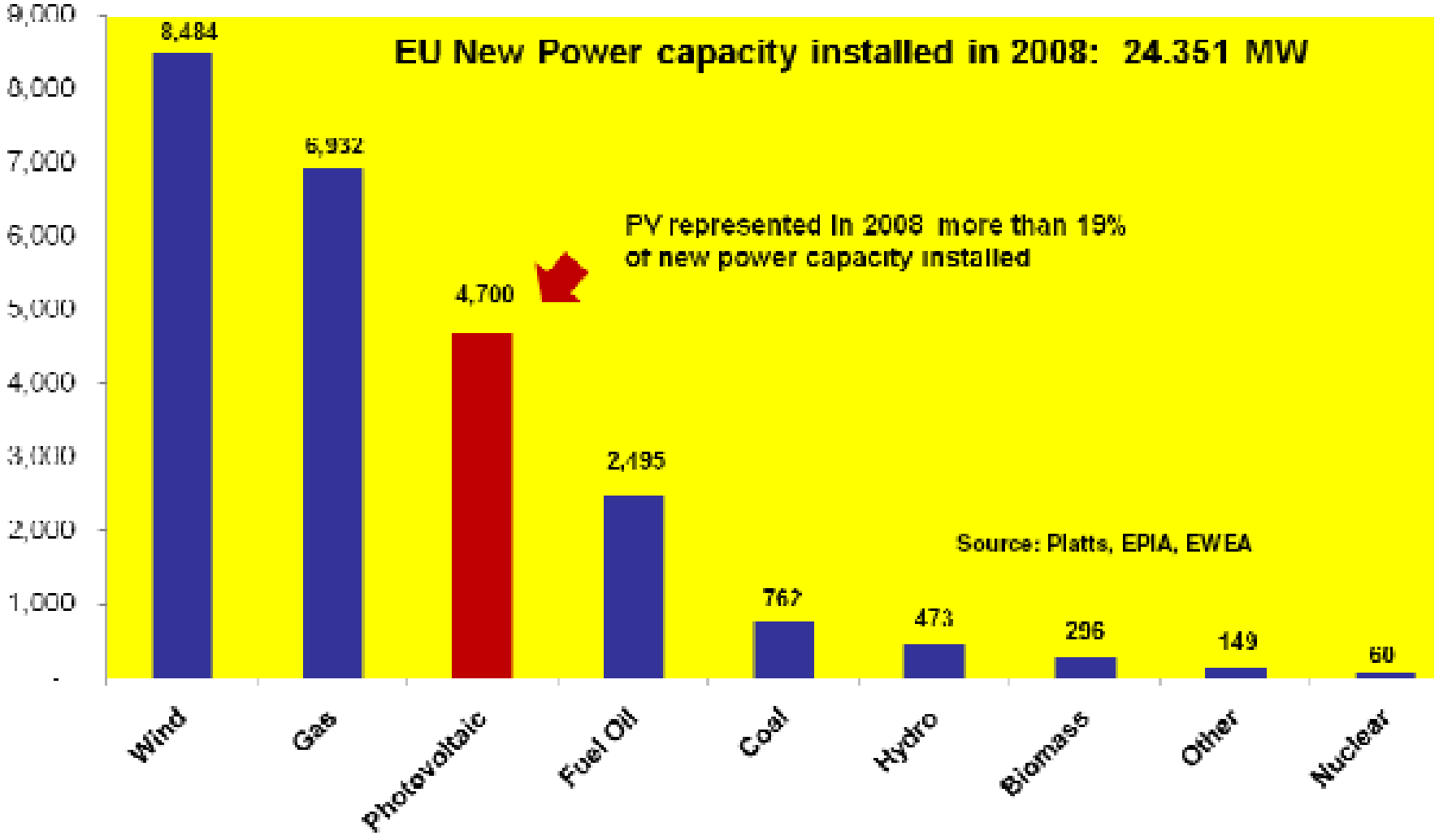
PV represented 19% of new EU power capacity installed in 2008



Overview Natl. Support Scheme of EU Member States

Country	Main support scheme	Ground mounted	BIPV	BAPV	Duration	Cap	Cumulative PV Power installed (end 2008)
France	FiT	0.32 - 0.43	0.60	0.32 - 0.43	20	-	87 MW
Germany	FiT	0.32	0.33 – 0.43		20	-	5,308 MW
Italy	FiT	0.35 – 0.39	0.43 – 0.48	0.39 - 0.43	20	1200 MW	430 MW
Switzerland	FiT	0.30 - 0.40	0.38 - 0.56	0.37 - 0.46	25	16 Mio CHF	46 MW
Austria	FiT	0.30 - 0.46			10+1+1	3.3 MW/year	30 MW
Belgium	GC	Brussels: 0.15 - 0.65 Wallonia: 0.15 - 0.63 Flanders: 0.45			Brussels 10 Wallonia 15 Flanders : 20	-	71 MW
Bulgaria	FiT	0.38 - 0.42			25	-	1.4 MW
Czeck Republic	FiT	0.48 - 0.49			20	-	54 MW
Greece	FiT	0.40 - 0.50			20	-	20 MW
Luxembourg	FiT	0.36 - 0.39			15	5MW	24 MW
Netherlands	FiT	0.29			15	15 MW (2009)	59 MW
Portugal	FiT	0.62			5+10	12 MW	68 MW
Romania	GC	0.11 – 0.22			10		0.45 MW
Slovenia	FiT	0.33 - 0.37			5+5+10	-	2.1 MW
Spain	FiT	0.32 – 0.34			25	500 MW (2009)	3,137 MW
UK	GC	0.03-0.06			lifetime		24.1 MW

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Status EU New Member States

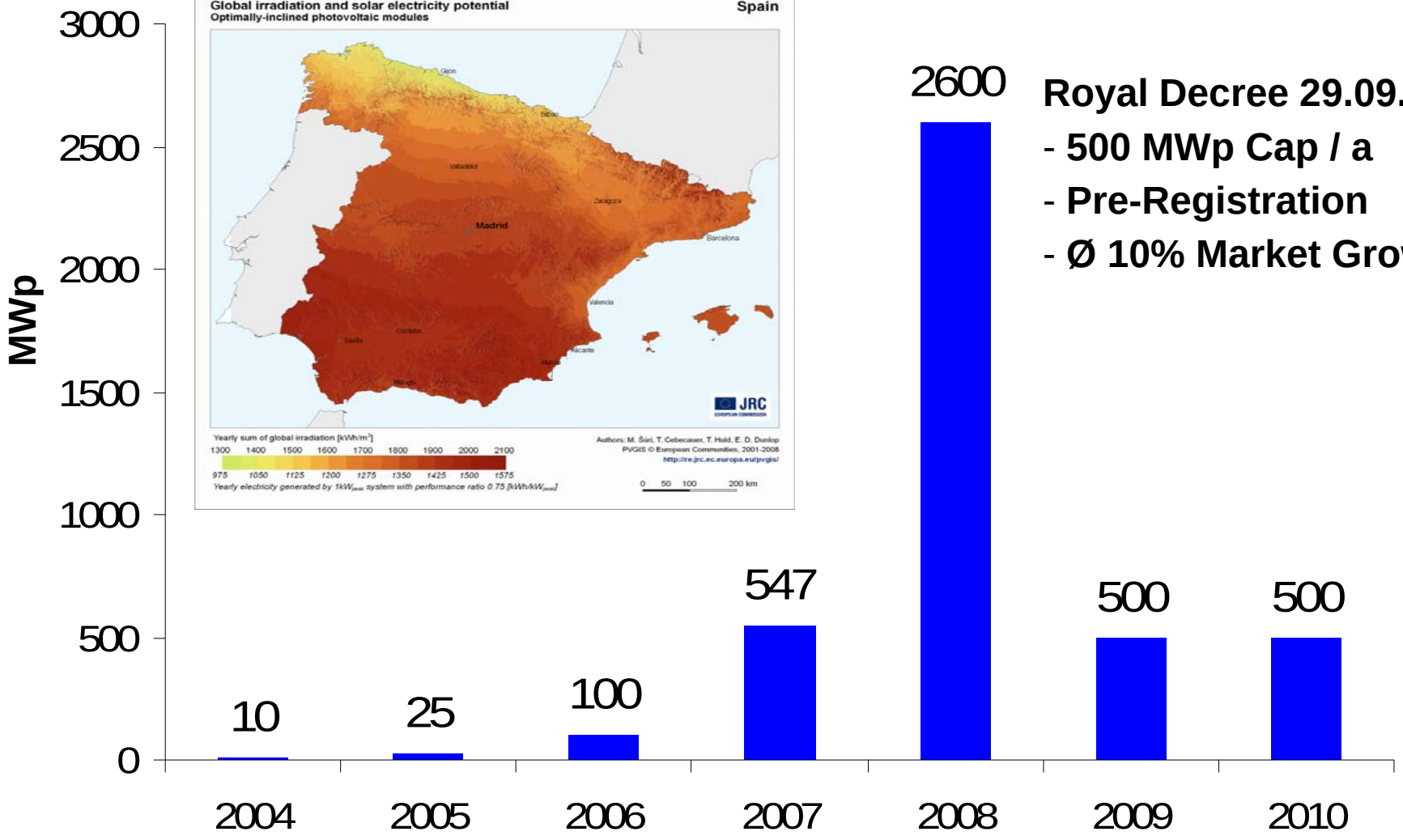
	Feed-in tariff	Quota system	Green certificates	Tax incentives	Preferential loans	Net-metering
Bulgaria	✓				✓	
Cyprus	✓	✓				
Czech Republic	✓			✓		
Estonia	✓			✓		
Hungary	✓	✓			✓	✓
Latvia	✓					
Lithuania	✓			✓	✓	
Malta				✓	✓	✓
Poland		✓	✓	✓	✓	
Romania		✓	✓	✓	✓	✓
Slovakia	✓				✓	
Slovenia	✓			✓	✓	

Country	Feed-in tariff rate for PV (EUR/kWh)	Granting period (years)	Degression	Price of electricity (EUR)
Bulgaria	<5KW – 0,428 >5KW – 0,380	25	no	
Cyprus	0,383 for houses and non-profit entities 0,36 for companies 20,5–22,5 with subsidy	15 or 20	no	0.12-0.16
Czech Republic	0.4603-0.4634 or bonus	20	5%	
Estonia	0,073	12		
Hungary	0,093	investment payback	no	0,156€/kWh for households
Latvia	0,427 since 02.2009	10	no	0,106
Lithuania	to be set by National Control Commission for Prices and Energy		no	
Malta	No			
Poland	GC = 250 PLN (57 EUR)			0,09
Romania	CG = 4 x (27 – 55) EUR	15	no	0,144 – 0,256
Slovakia	0,280 0,45 since 2009	1	yes (from 2009) 10%	
Slovenia	0,399 or bonus	15	7%	

Market Development in EU New Member States 2003 - 2008

Country NMS	2003	2004	2005	2006			2007			2008		
	Total	Total	Total	Off-grid	On-grid	Total	Off-grid	On-grid	Total	Off-grid	On-grid	Total
	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
Czech Rep.	330	363	470	194	546	740	209	5252	5361	380	54 294	54 674
Slovenia	51	96	200	95	310	405	100	925	1025	100	2 046	2 146
Cyprus	254	340	518	450	578	1028	560	843	1403	600	1586	2186
Bulgaria	20	33	43	13	53	66	20	55	75	32	1 375	1 407
Poland	107	234	291	337	101	438	488	152	640	832	179	1011
Hungary	100	138	155	100	150	250	130	220	350	180	270	450
Romania	50	86	101	95	95	190	175	125	300	205	245	450
Malta	4	9	15	0	48	48	0	97	97	0	238	238
Lithuania	17	17	19	40	0	40	55	0	55	55	0	55
Slovakia	10	15	20	20	0	20	20	26	46	20	46	66
Estonia	2	2	2	5	0	5	12	0	12	12	0	12
Latvia	3	3	3	3	0	3	4	0	4	4	0	4
TOTAL	948	1336	1837	1352	1881	3233	1773	7695	9368	2 420	60279	62 699

Spanish PV Market Development



Royal Decree 29.09.2008

- **500 MWp Cap / a**
- **Pre-Registration**
- **Ø 10% Market Growth**

German PV Market Development

PV Market Data 2008

Newly installed power	**1 500 MWp**
Total installed power	**5 334 MWp**
No. of total systems installedca.	**500 000**
Turnover 2008	**6 Bln €**
Employees	**45 000**

Milestones

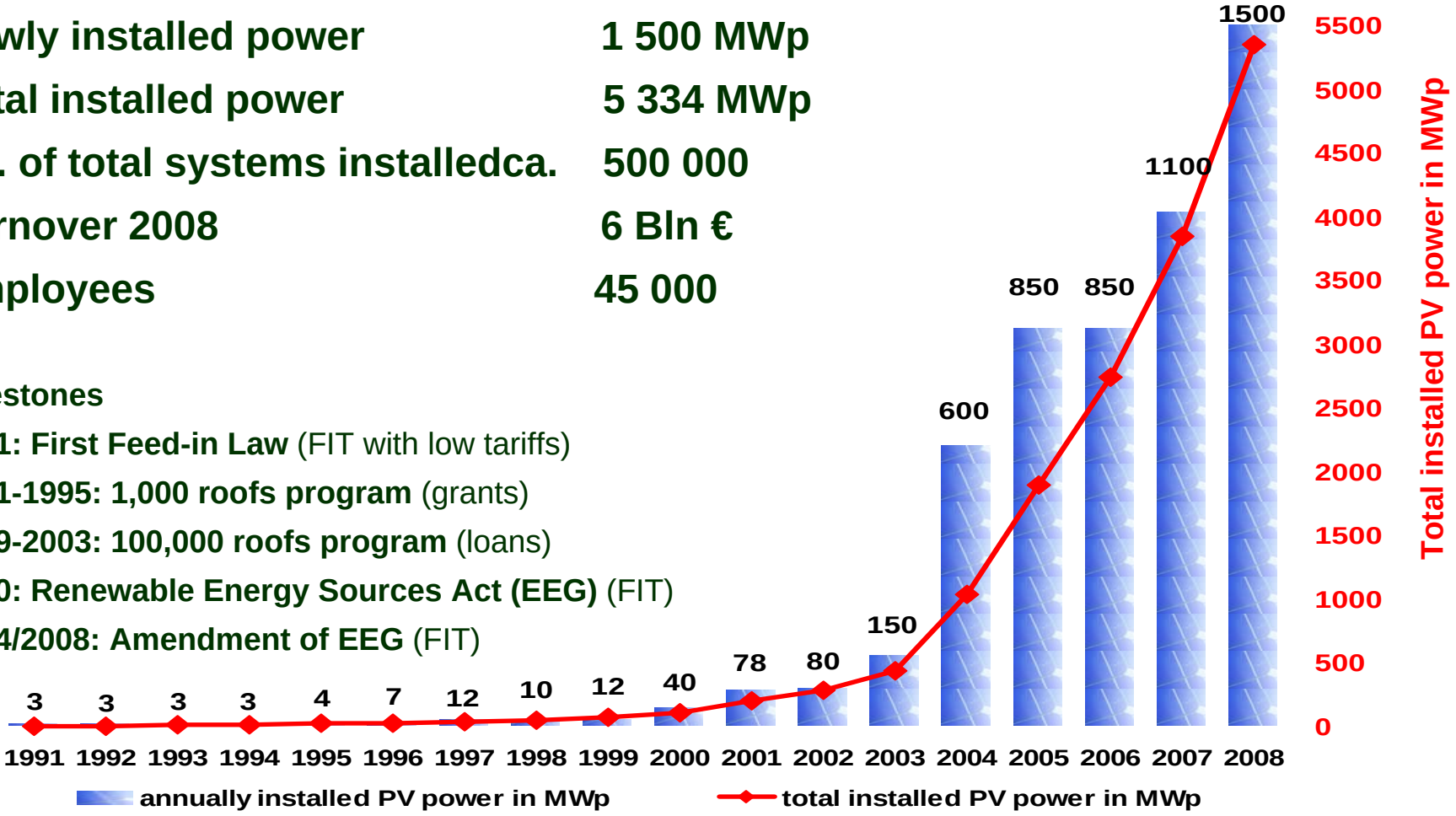
1991: First Feed-in Law (FIT with low tariffs)

1991-1995: 1,000 roofs program (grants)

1999-2003: 100,000 roofs program (loans)

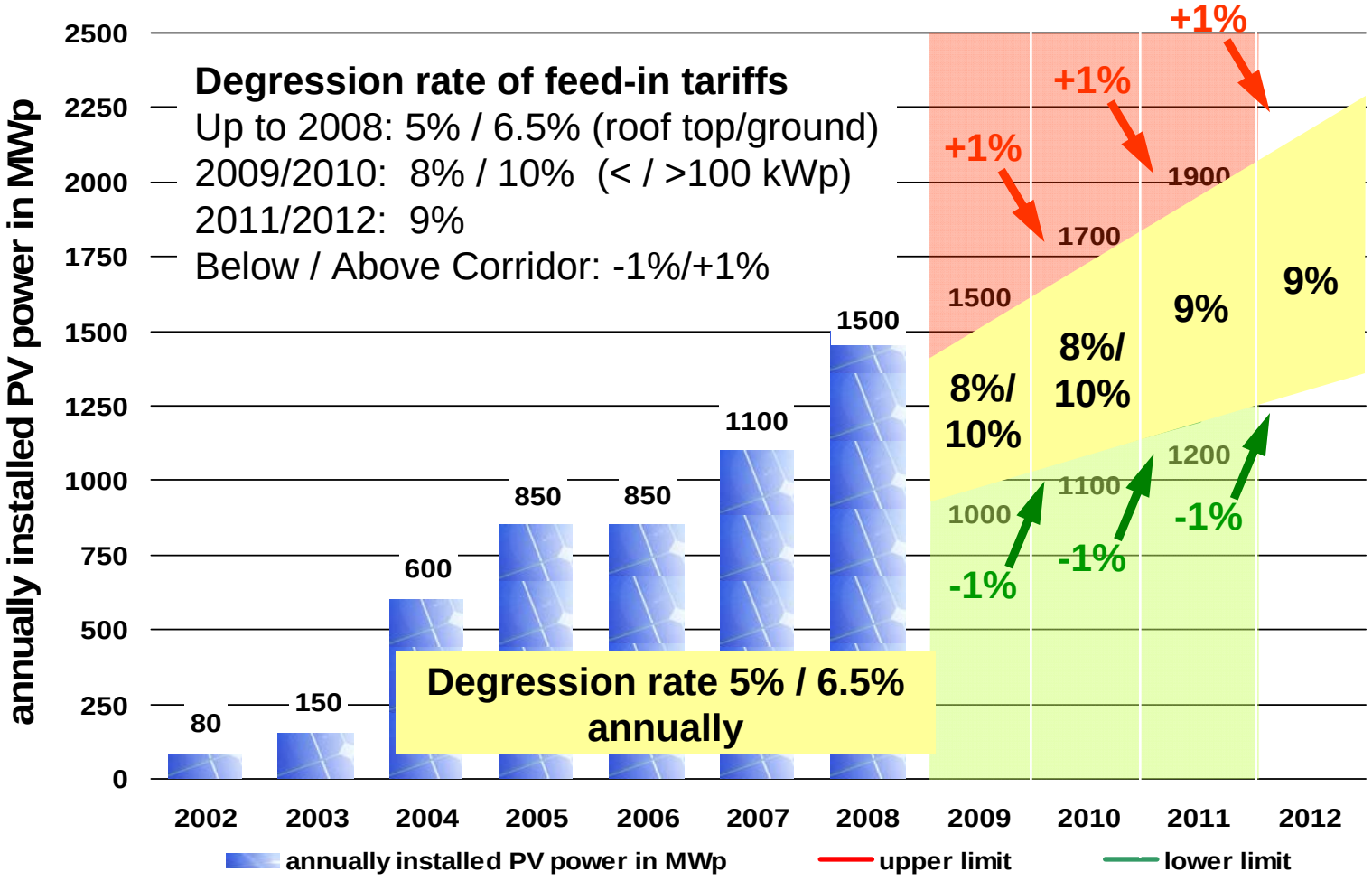
2000: Renewable Energy Sources Act (EEG) (FIT)

2004/2008: Amendment of EEG (FIT)



Source: BSW

Germany
FIT-Amendment 06/2008



Source: BSW

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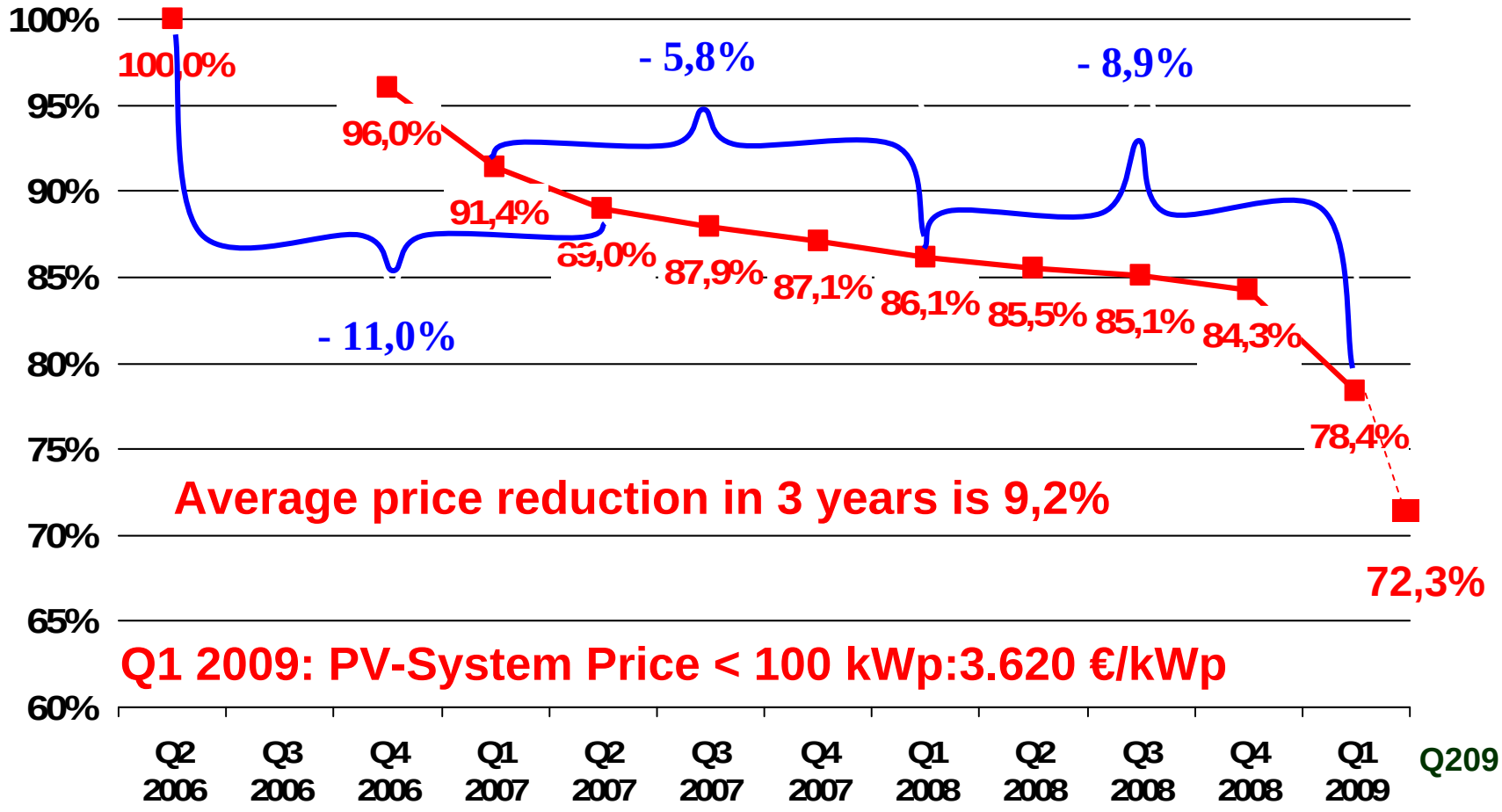
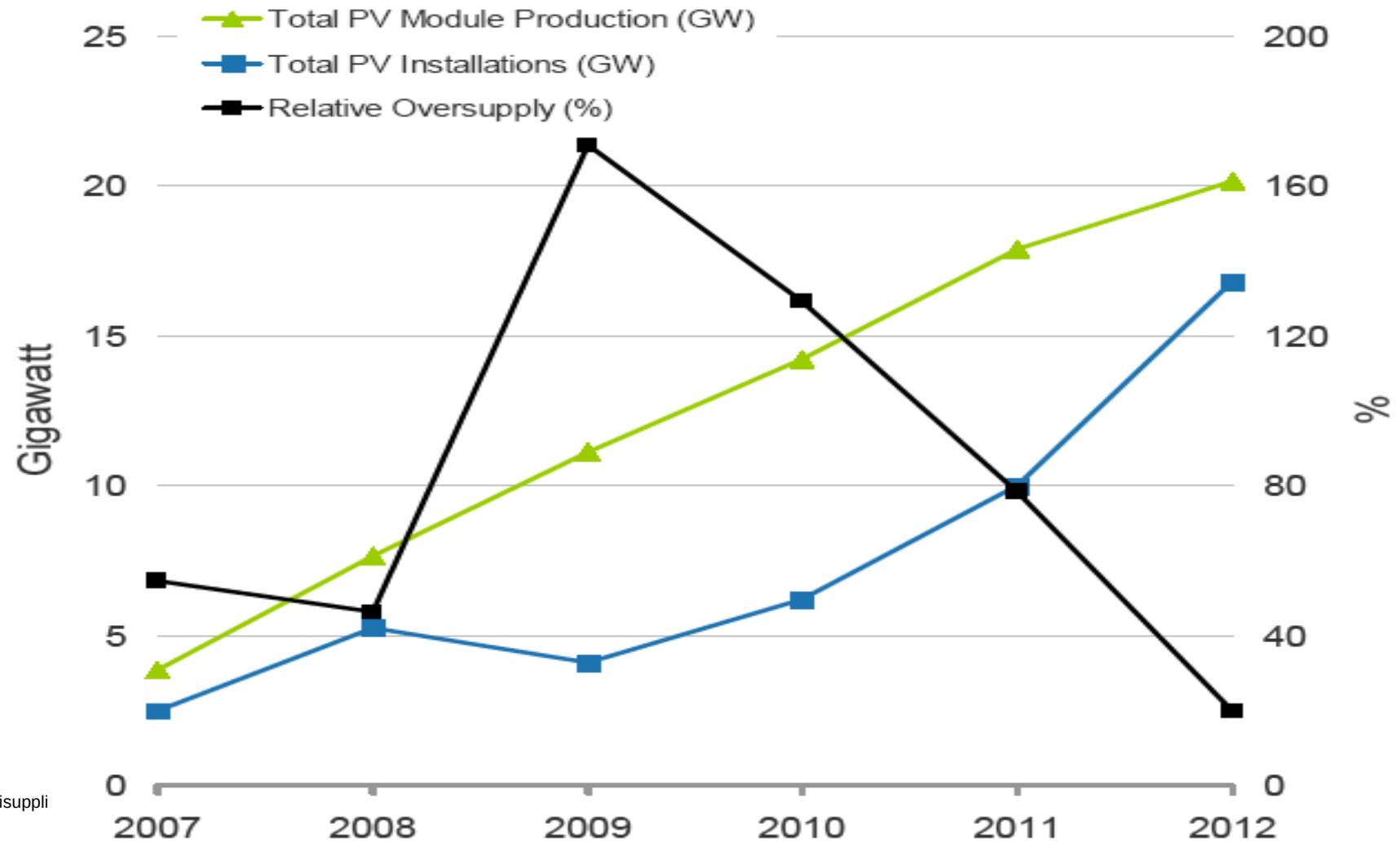
German System Price Decrease



Source: Representative independent poll of 100 installers by EuPD-Research on behalf of BSW-Solar
PV-System Price means final customer price

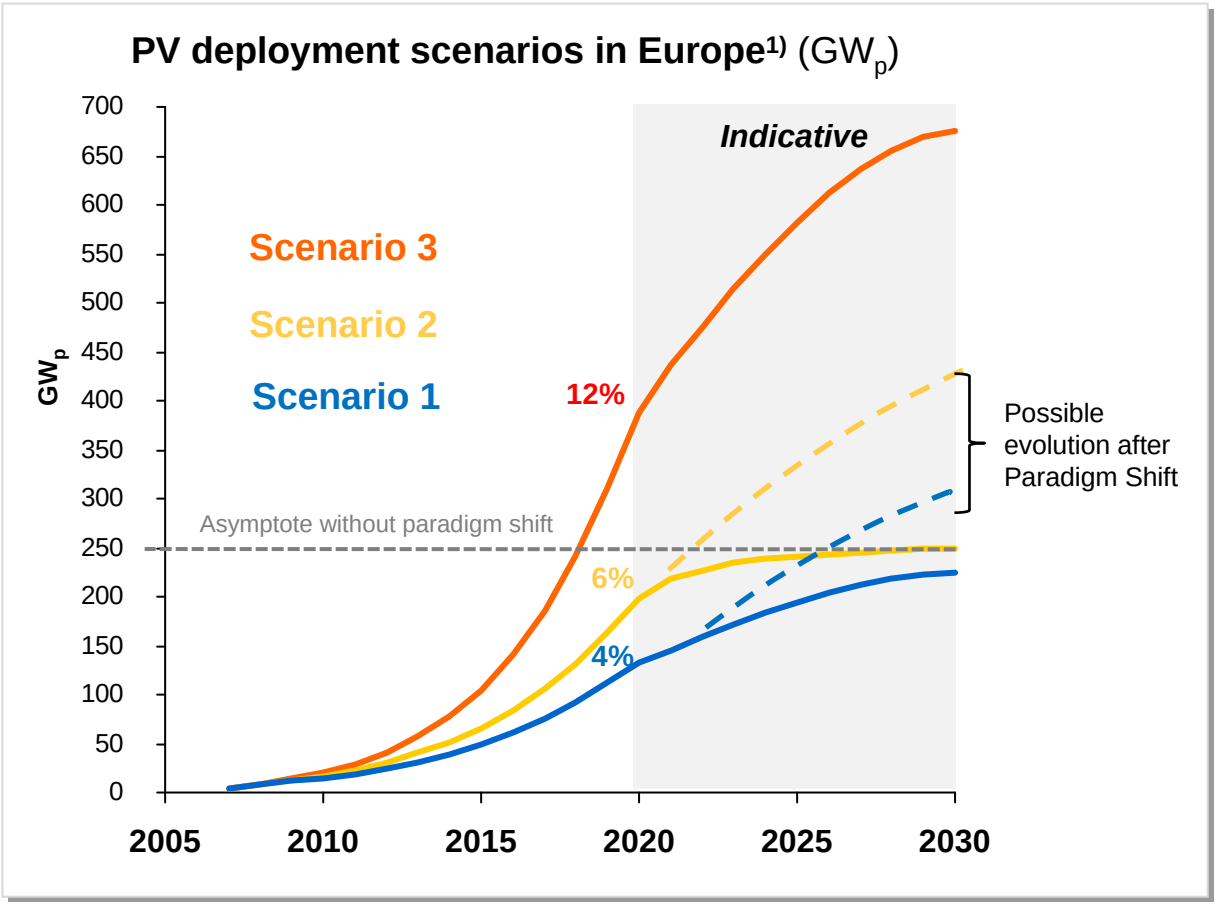
Global Market Demand vs Module Production Capacity



Source: isuppli

3 PV deployment scenarios in Europe[1]

The Paradigm Shift requires significant changes in the existing electricity system and at market and regulatory level, together with a strong collaboration with other players in the energy sector



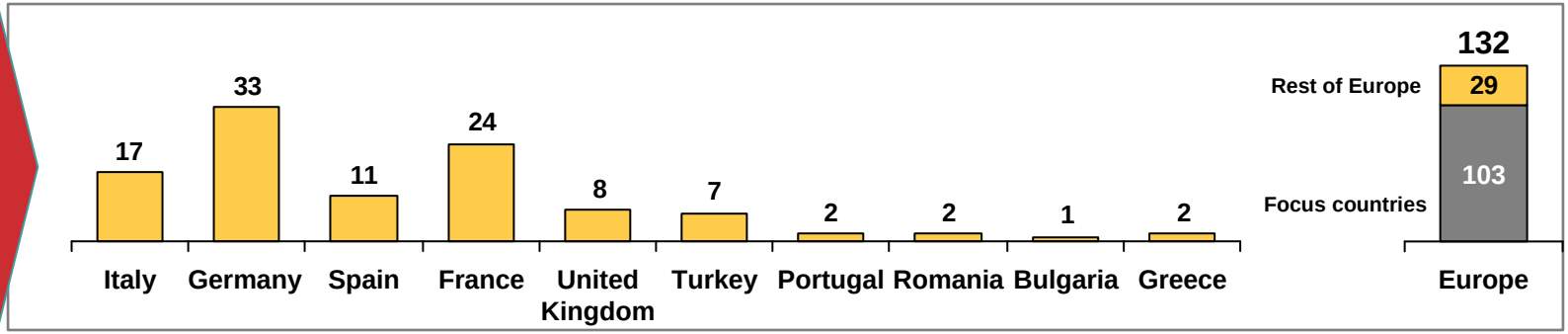
1) Europe 27, Croatia, Norway and Turkey

Sources: EPIA, EU DG TREN "European Energy and Transport: trends to 2030, update 2007", Eurostat Data Portal, EU JRC Photovoltaic Geographical Information System, A.T. Kearney analysis

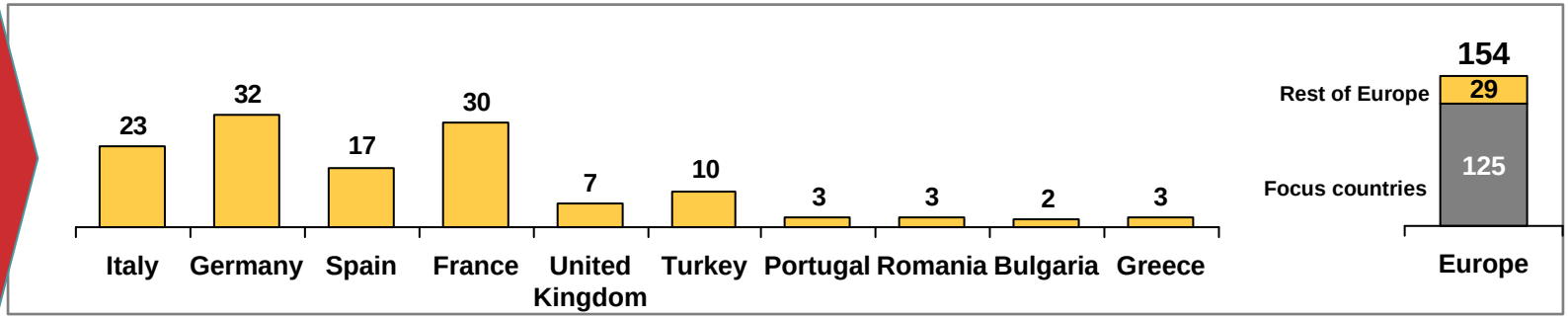
For the Baseline scenario, PV penetration in the 10 countries is expected to reach ~100 GW_p out of the total 130 GW_p

PV baseline scenario

2020 PV Installed Capacity GW_p



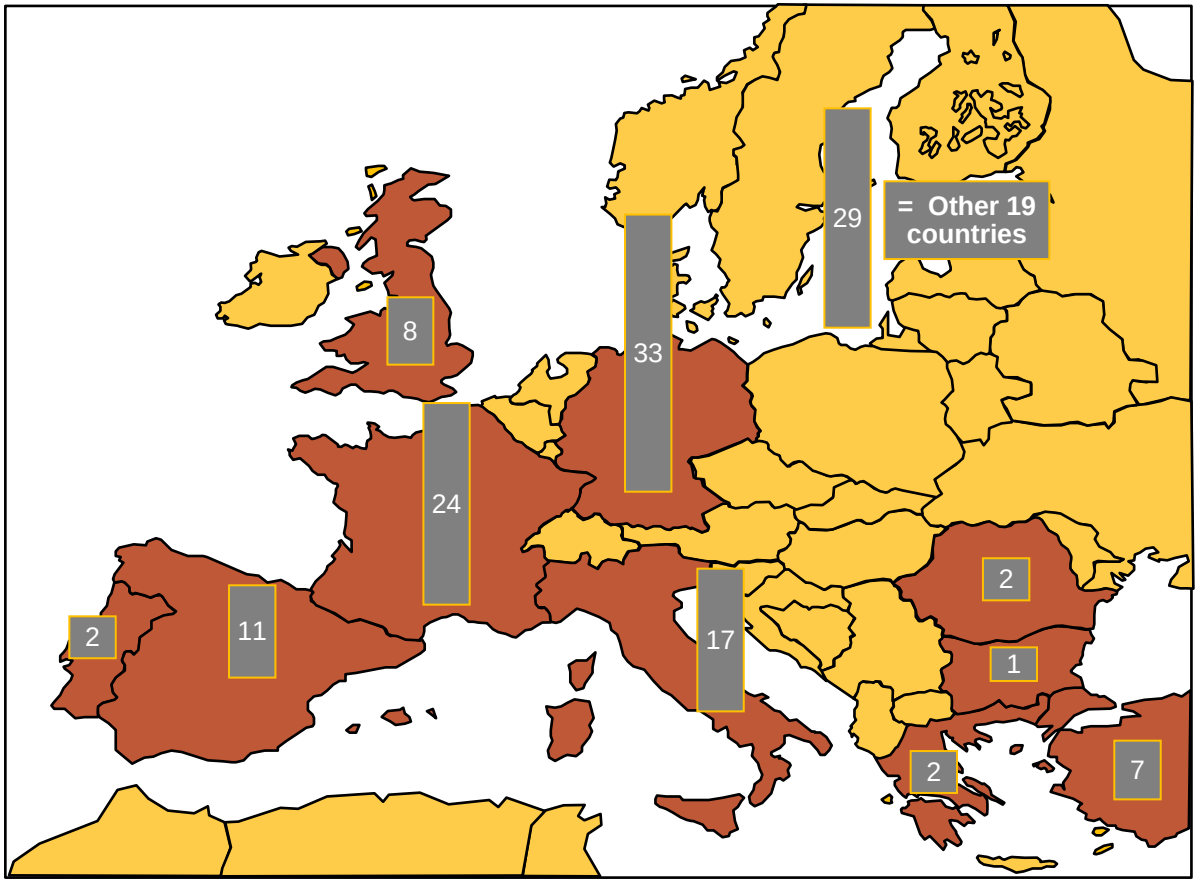
2020 PV Electricity Production TWh



PV Penetration on total electricity consumption in 2020

The geographical deployment scenario is based on the key drivers of PV penetration

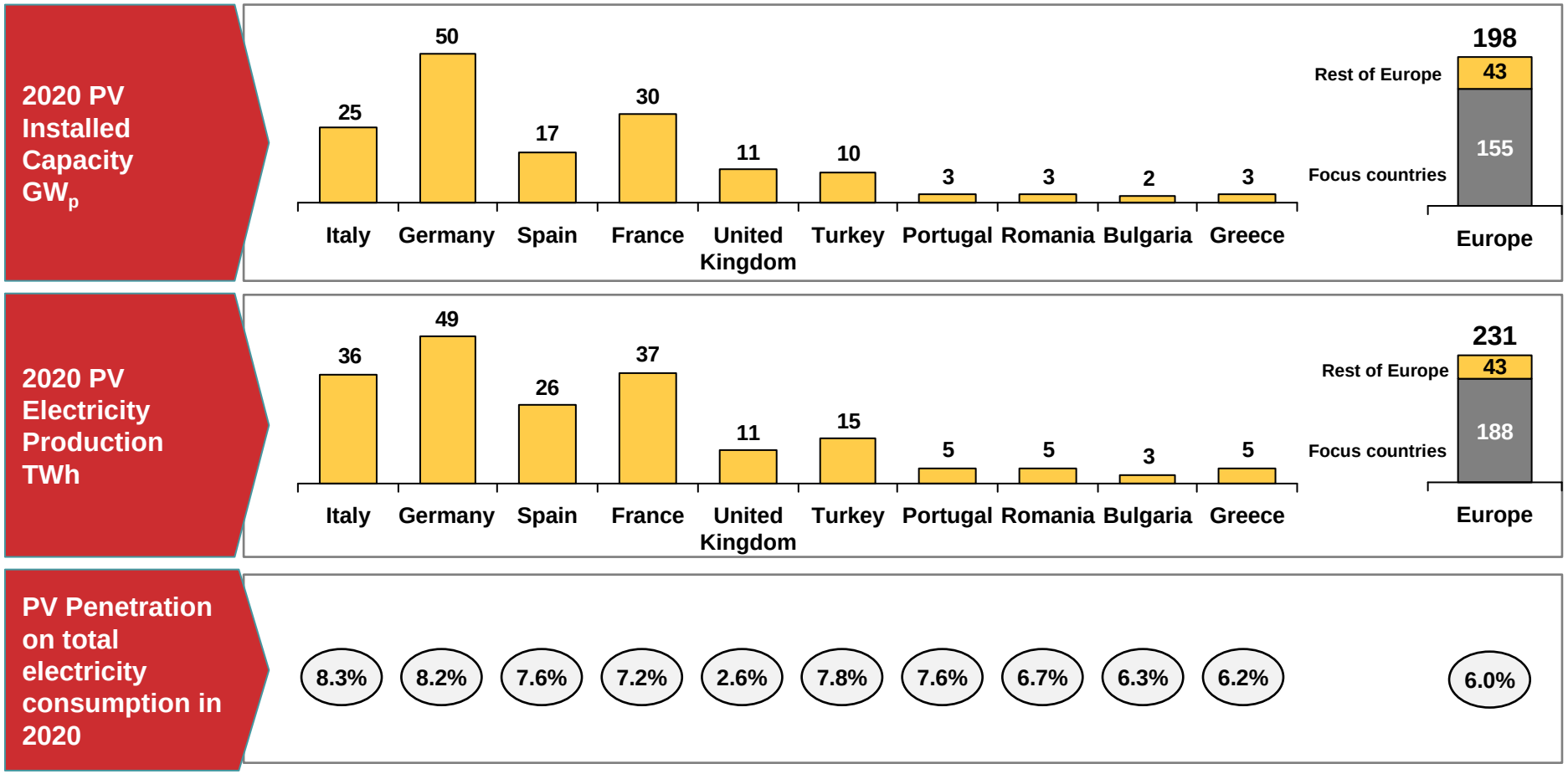
Example – Baseline scenario cumulative installation by 2020 (GW_p)



- **The deployment takes into account all the drivers identified to drive PV penetration:**
  - Evolution of electricity prices by country and customer segment
  - Irradiation data
  - Size and pattern of electricity consumption
  - Support schemes available
  - The likely results of the implementations of the recommendations for the SET plan

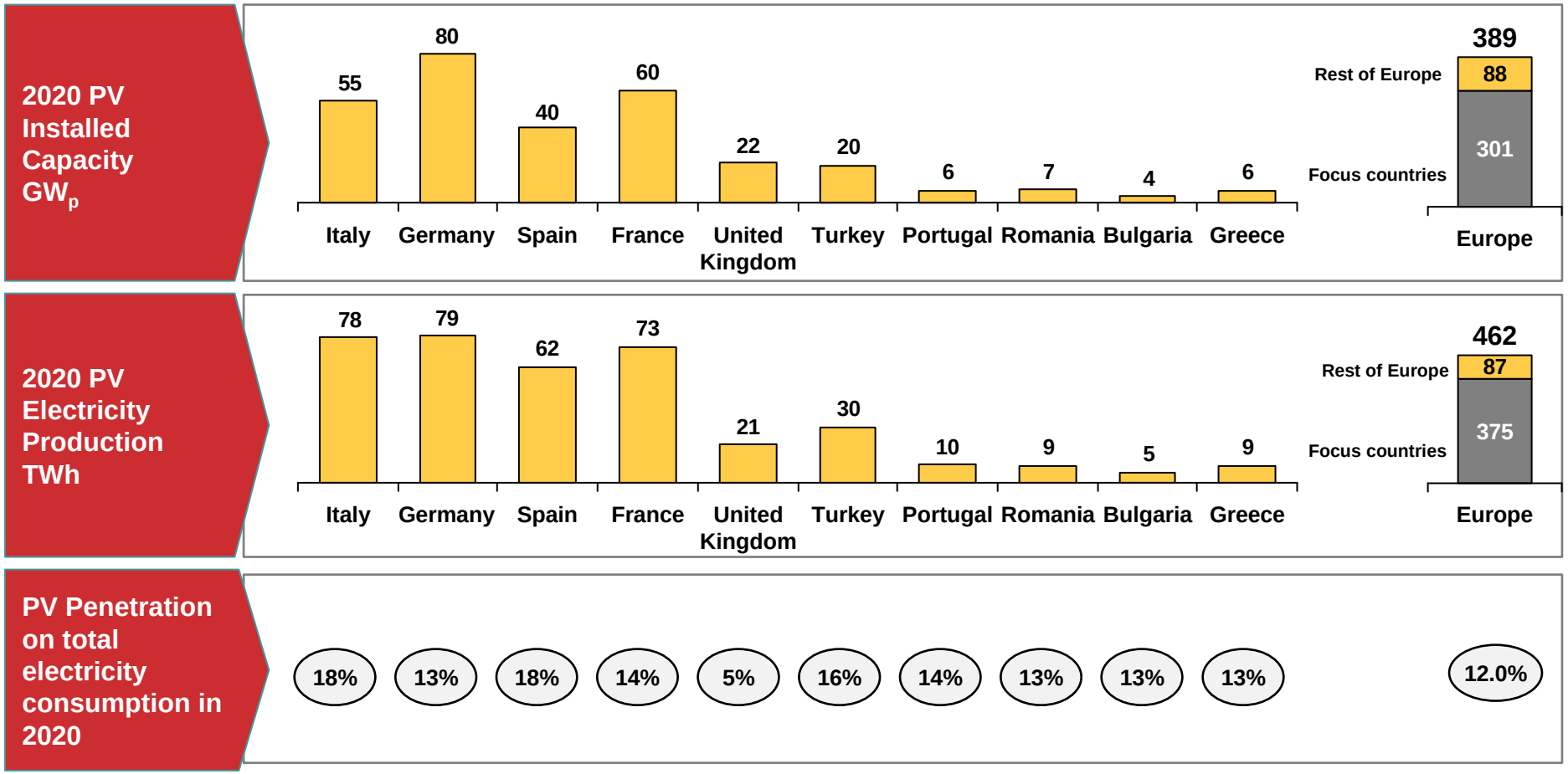
In the Accelerated Growth Scenario, PV penetration in the 10 countries will amount to ~155 GW_p

PV Accelerated Growth Scenario

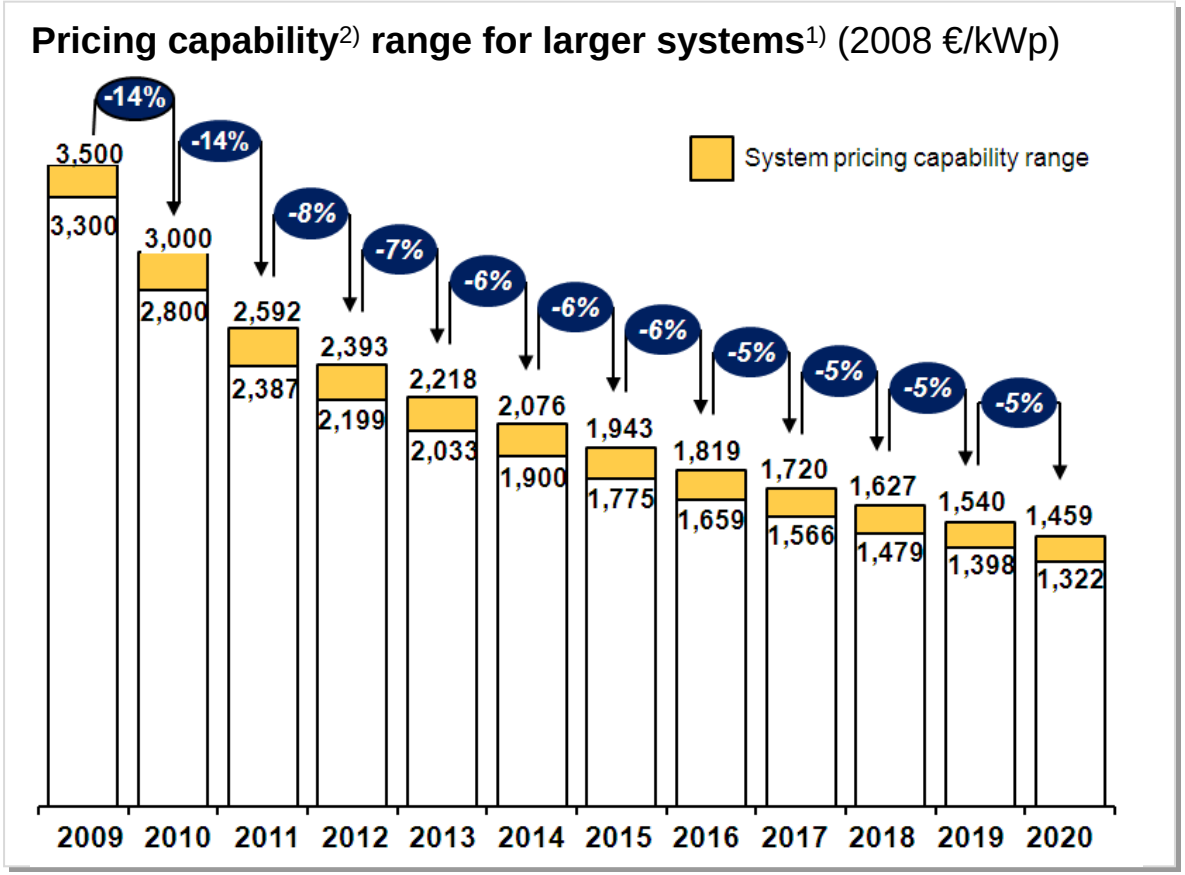


In the Paradigm Shift scenario, total PV installation in the 10 countries will reach ~300 GW_p

PV paradigm shift scenario



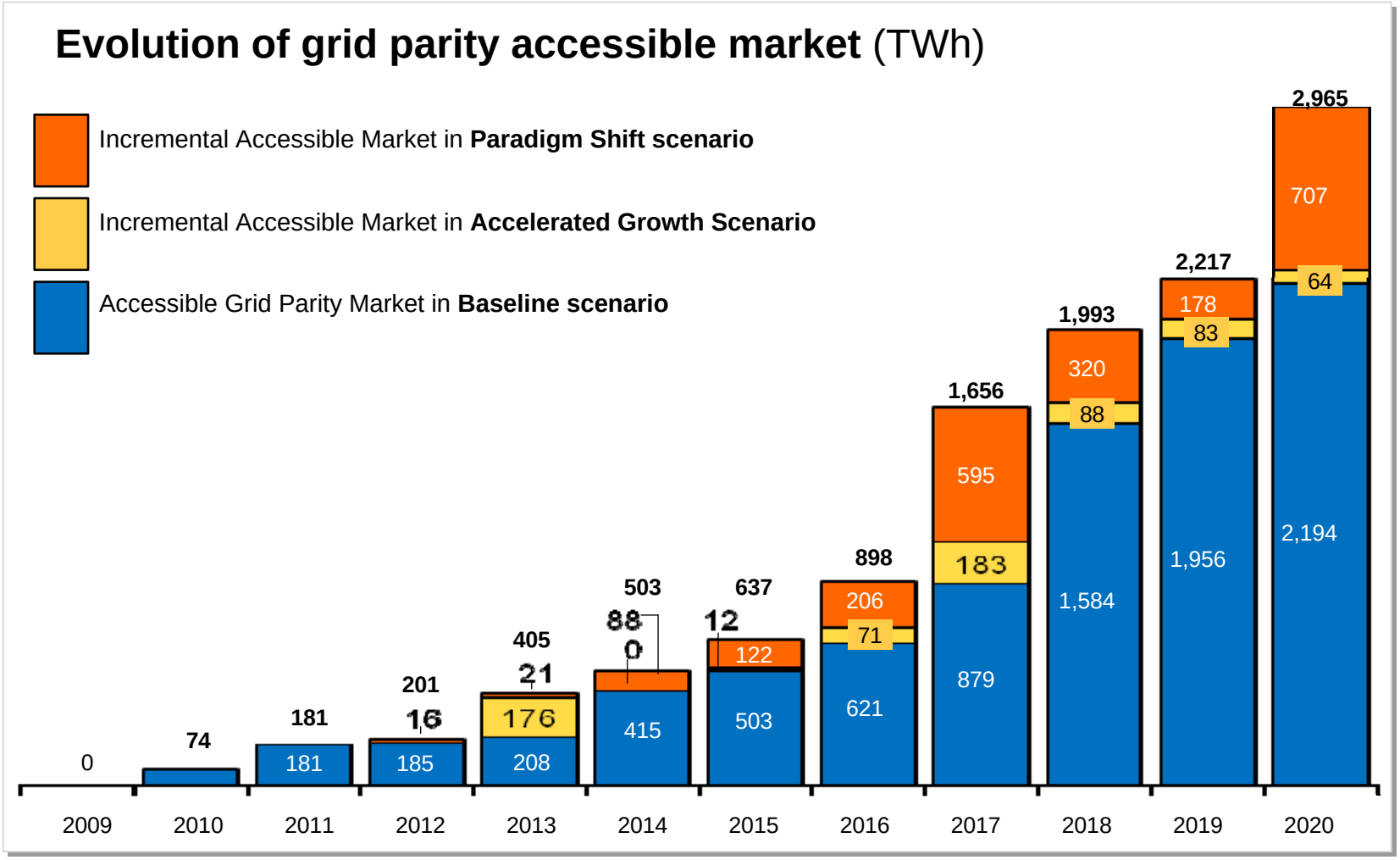
Potential for further cost reductions under the accelerated scenario



With the **accelerated deployment of PV** and the **required R&D efforts**, technologies will continue to rapidly improve, allowing a 50% price reduction at system level by 2020 with further future improvement potential

1) Industrial or IPP systems larger than 1 MW_p
2) In real terms 2008 €
Sources: EPIA, National Renewable Energy Laboratory;

... leads to large grid parity markets



Sources: EPIA, Eurostat Data Portal, EU JRC Photovoltaic Geographical Information System

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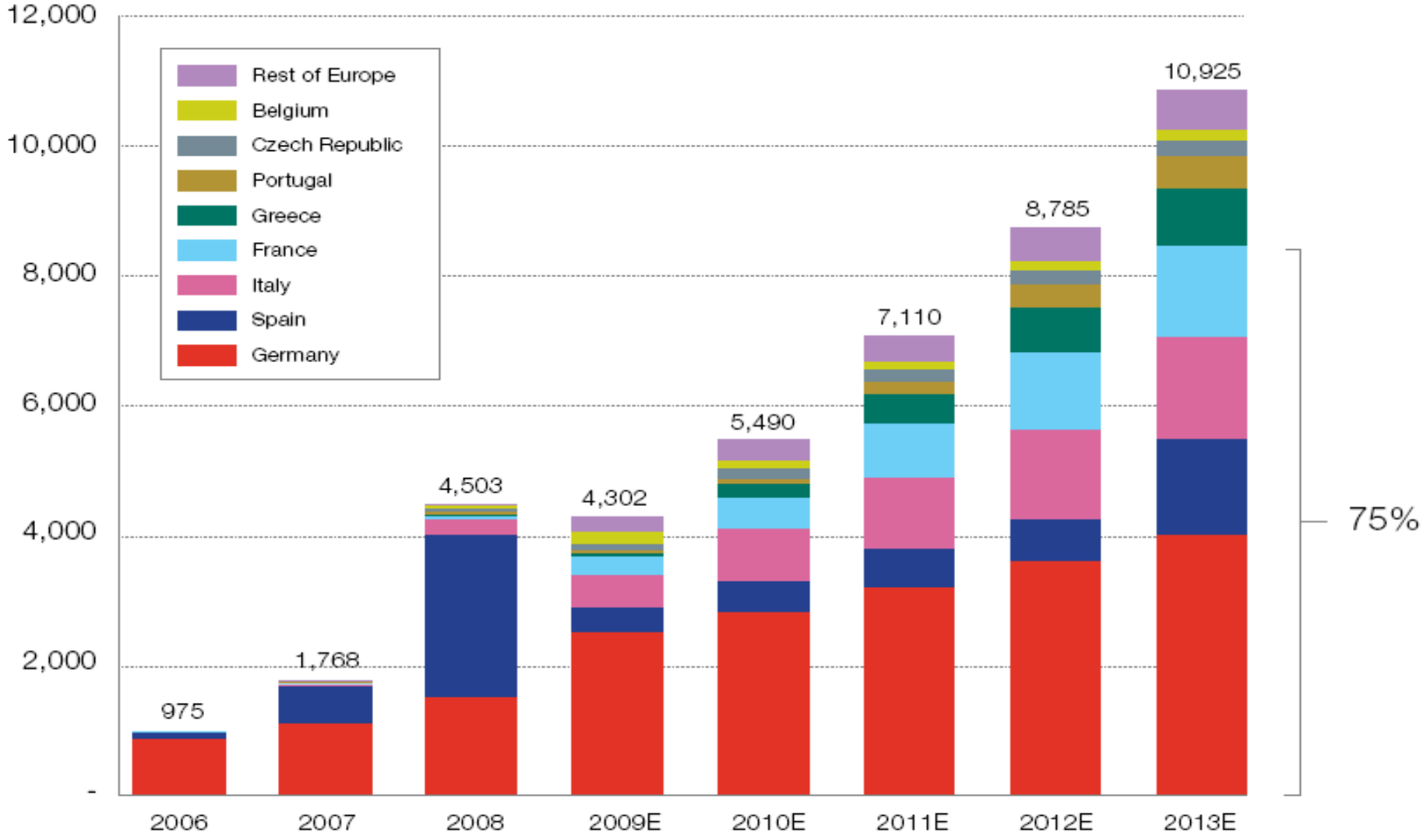
EU Annual Market until 2013
Policy Driven Scenario



Source: EPIA Global Market Outlook March 2009

Contact Details

EU China Energy & Environment Programme

Guohong Dasha B 1909 , Jia No. 11

Xicheng District, Muxidibeili , Beijing 100038

Tel: 0086 (10) 6390 89 88 Ext. 211

Fax: 0086 (10) 6390 89 89

Email: frank@eep.org.cn