



Renewable Energies in the Electricity Sector:

Solar Photovoltaic Electricity

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President of the European Photovoltaic Industry Association (EPIA),

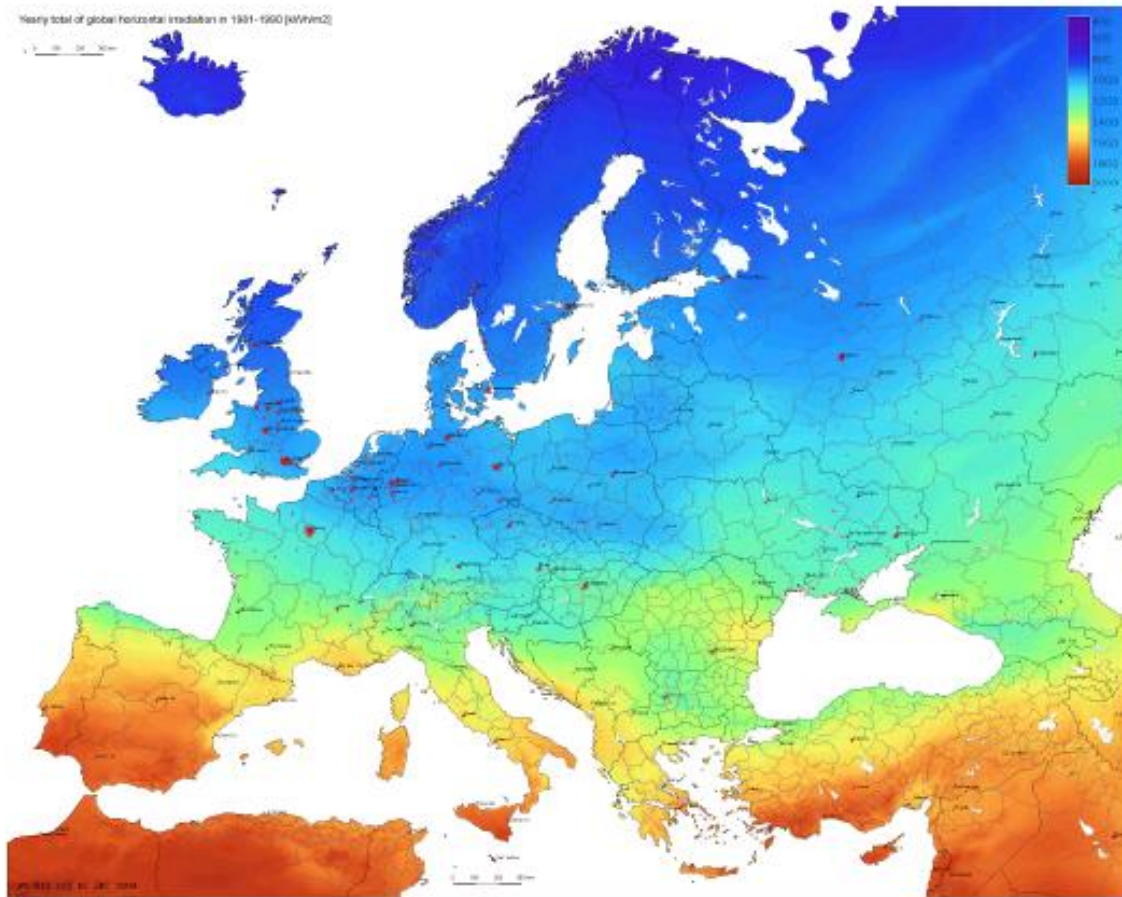
President of the German Solar Economy Association (BSW) and member of the Scientific Board of FhG-ISE and ISFH

Grid parity in Europe – 2007

(lines to guide the eye)



Yearly total of global horizontal irradiation in 1981-1990 (kWh/m²)



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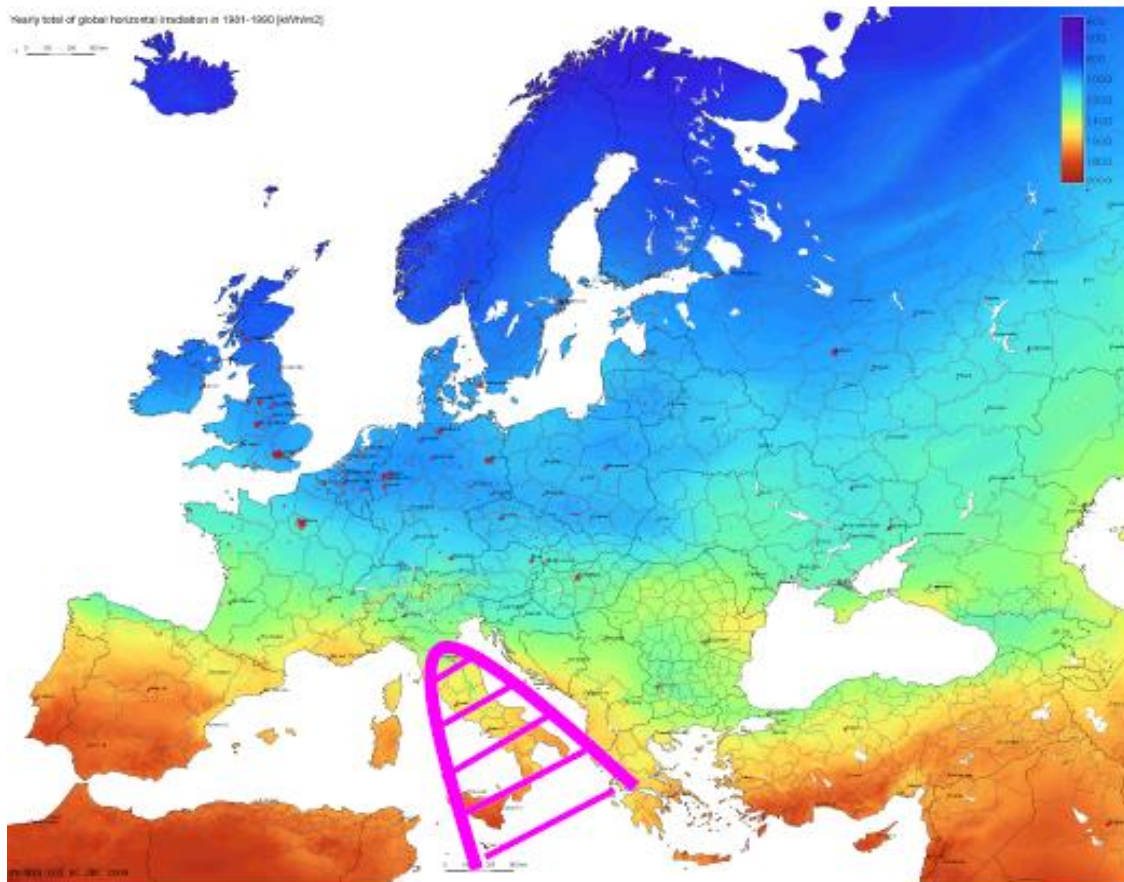
insolation map: Šúri M., Huld T.A., Dunlop E.D. Ossenbrink H.A., 2007. Potential of solar electricity generation in the European Union member states and candidate countries. [Solar Energy](http://re.jrc.ec.europa.eu/pvgis/), <http://re.jrc.ec.europa.eu/pvgis/>

Grid parity in Europe – 2010

(lines to guide the eye)



Yearly total of global horizontal irradiation in 1951–1990 (kWh/m²)



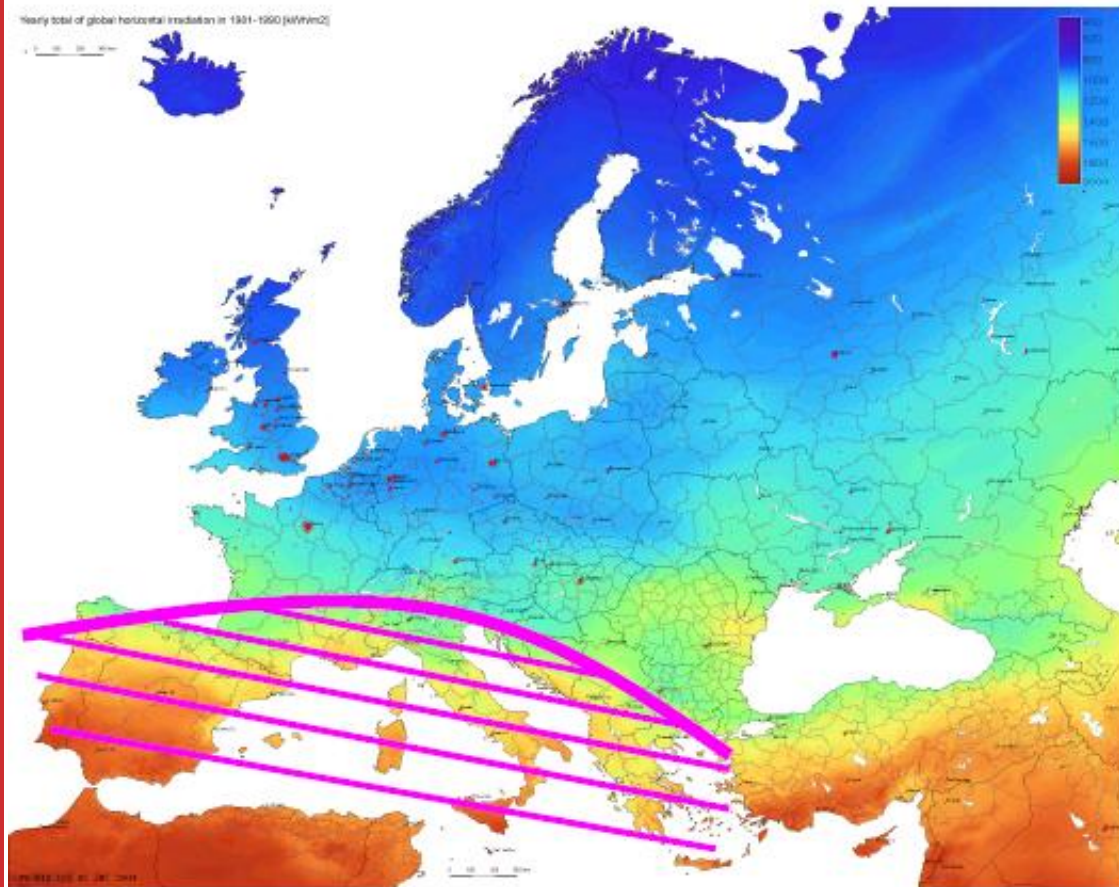
irradiation (kWh/m ² ·yr)	PV generation cost (€/kWh)
600	0.50
1000	0.30
1400	0.21
1800	0.17

Grid parity in Europe – 2015

(lines to guide the eye)



Yearly total of global horizontal irradiation in 1981-1990 (kWh/m²)



irradiation (kWh/m².yr) PV generation cost (€/kWh)

600 0.42

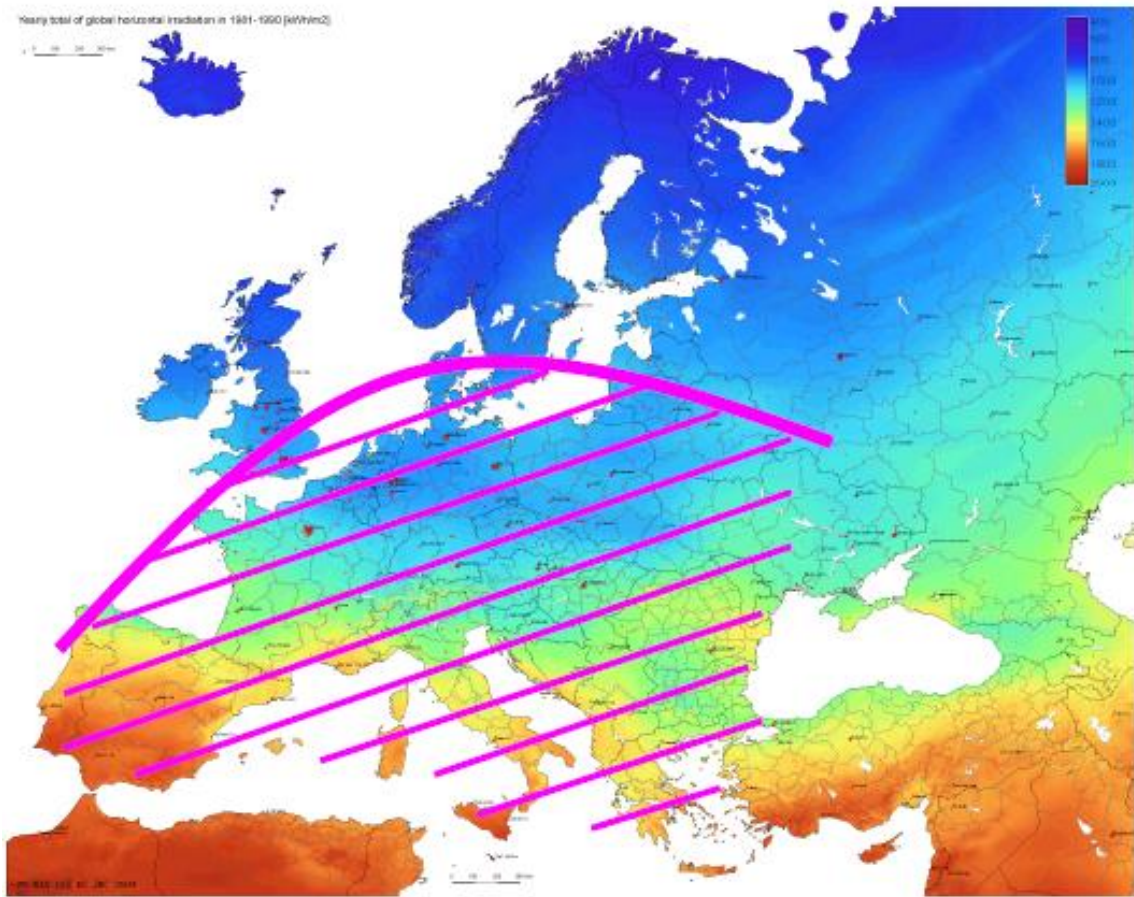
1000 0.25

1400 0.18

1800 0.14

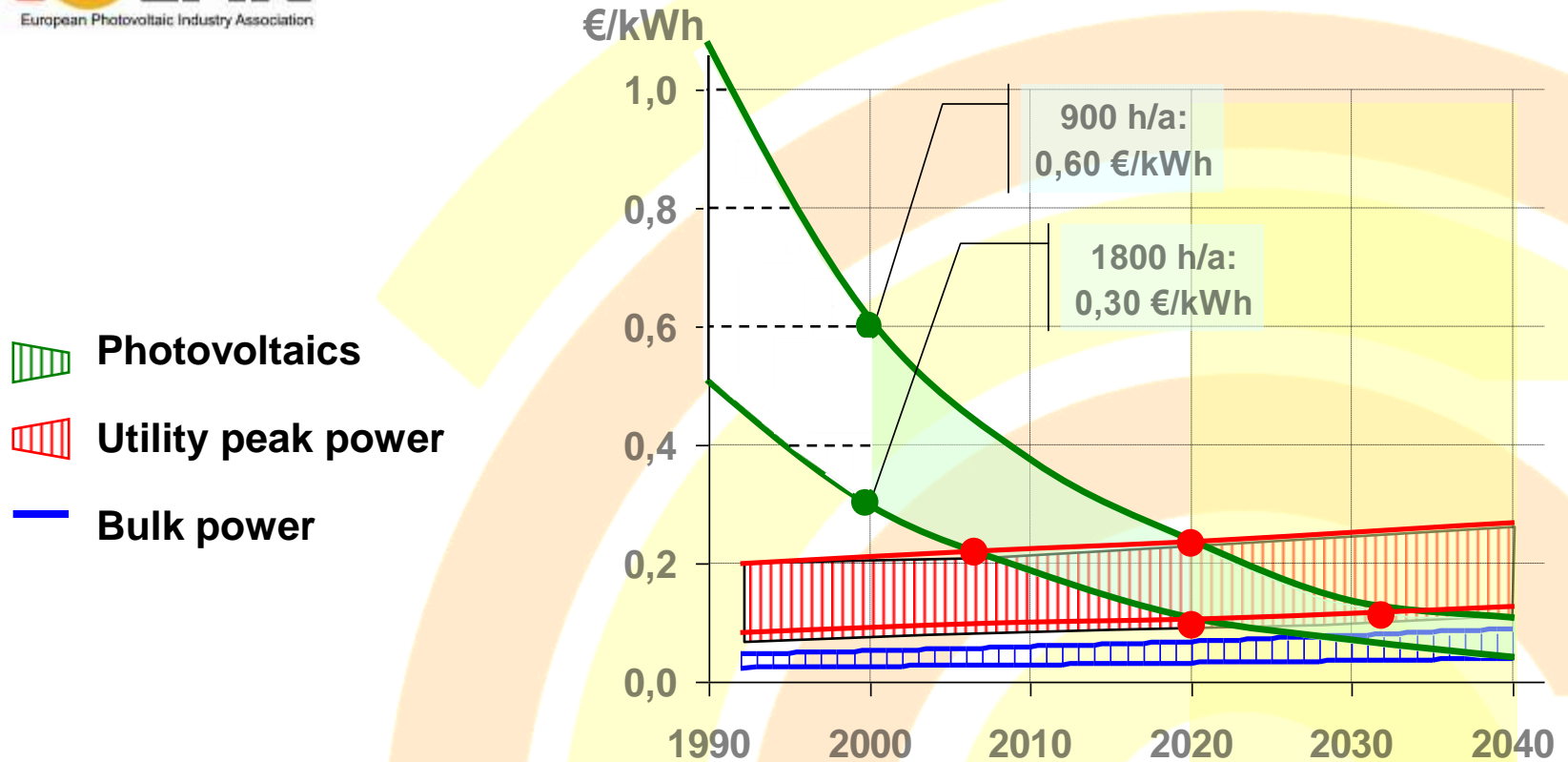
Grid parity in Europe – 2020

(lines to guide the eye)



irradiation (kWh/m ² .yr)	PV generation cost (€/kWh)
600	0.33
1000	0.20
1400	0.14
1800	0.11

Competitiveness between Electricity Generating Costs for PV and Utility Prices



market support programs necessary:



= own estimates

Electricity generating cost [€/kWh] Eurelectric / VGB Power Tech	Today		Tomorrow		Day after tomorrow	
	2005		2030		2050	
Fossile (coal, gas)	4 - 4.5		6-7		6.5 - 9	
Nuclear (PWR, HTR, FBR)	4 - 6		3.5 - 7		3.5 - 6	
Wind (off-/on shore)	9/7.5		8/7.5	6/5	8/7.5	3/4
Solar thermal	17		8	6	8	3
PV solar electricity (south/north)	62	20/40		5/10		3/6



Thank you for your attention!