

Introduction to renewable energy trends

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The UE strategy: 20% renewable by 2020

- The renewable energy commitment of EU is showing first results in terms of:
 - Market deployment
 - Industrial competitiveness
 - Technological development
 - Cost reduction
- Policy of national incentives to renewables is working very well at least in 15 out of 27 Member States

The regions and local Authorities' role in the renewable energies development

MEDENER - Mediterranean Association of National Agencies for Energy Conservation

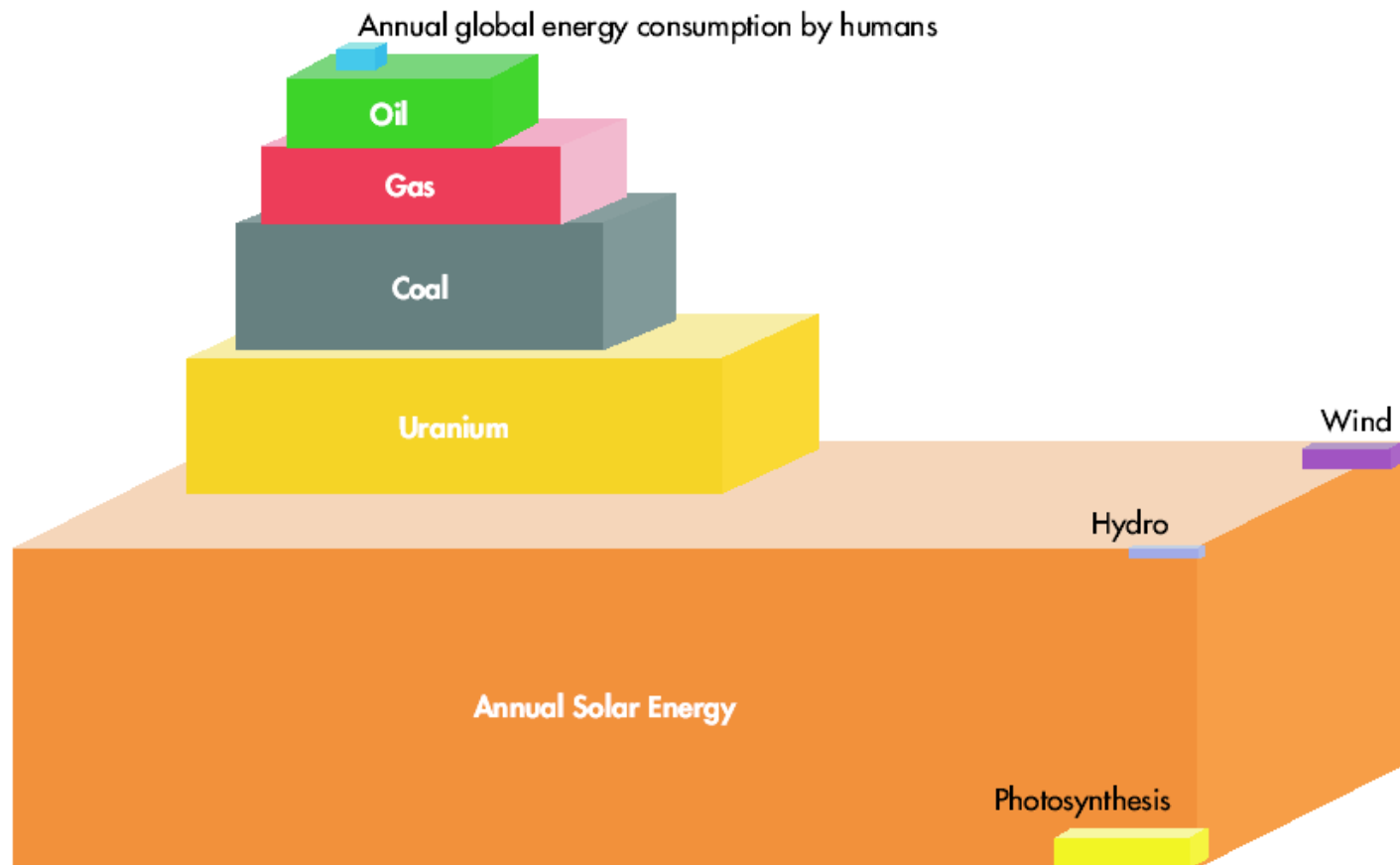
A nonprofit making International Association set up to contribute to the development of regional partnership by exchange of experiences and share of knowhow in the rational use of energy, the development of renewable energy sources and the protection of the environment in connection with the energy sector.

The regions and local Authorities' role in the renewable energies development

Common aspects of MEDENER countries

- Continuous growth of energy demand
- High external energy dependency
- High potential of renewable resources (RES) and energy efficiency (EE)
- EE and RES promotion responds to economic, social and environmental strategy
- to support and cooperate with **regions and local authorities** for energy efficiency improvements and renewable energies development.

Total energy resources



Source: National Petroleum Council, 2007 after Craig, Cunningham and Saigo.

The Microbial fuel cells and possible applications

Microbial fuel cells (MFCs) are devices that use bacteria as the catalysts to oxidize organic and inorganic matter and generate current.

Applications:

- Electricity generation;
- Biohydrogen production.
- Wastewater treatment;
- Biosensor;

A look ahead

Given the scientific and technological knowledge reached so far, there is the need to strongly encourage to keep the momentum and to proceed, both a EU and MS levels,

- strengthening the research;
- developing prototypes.

How

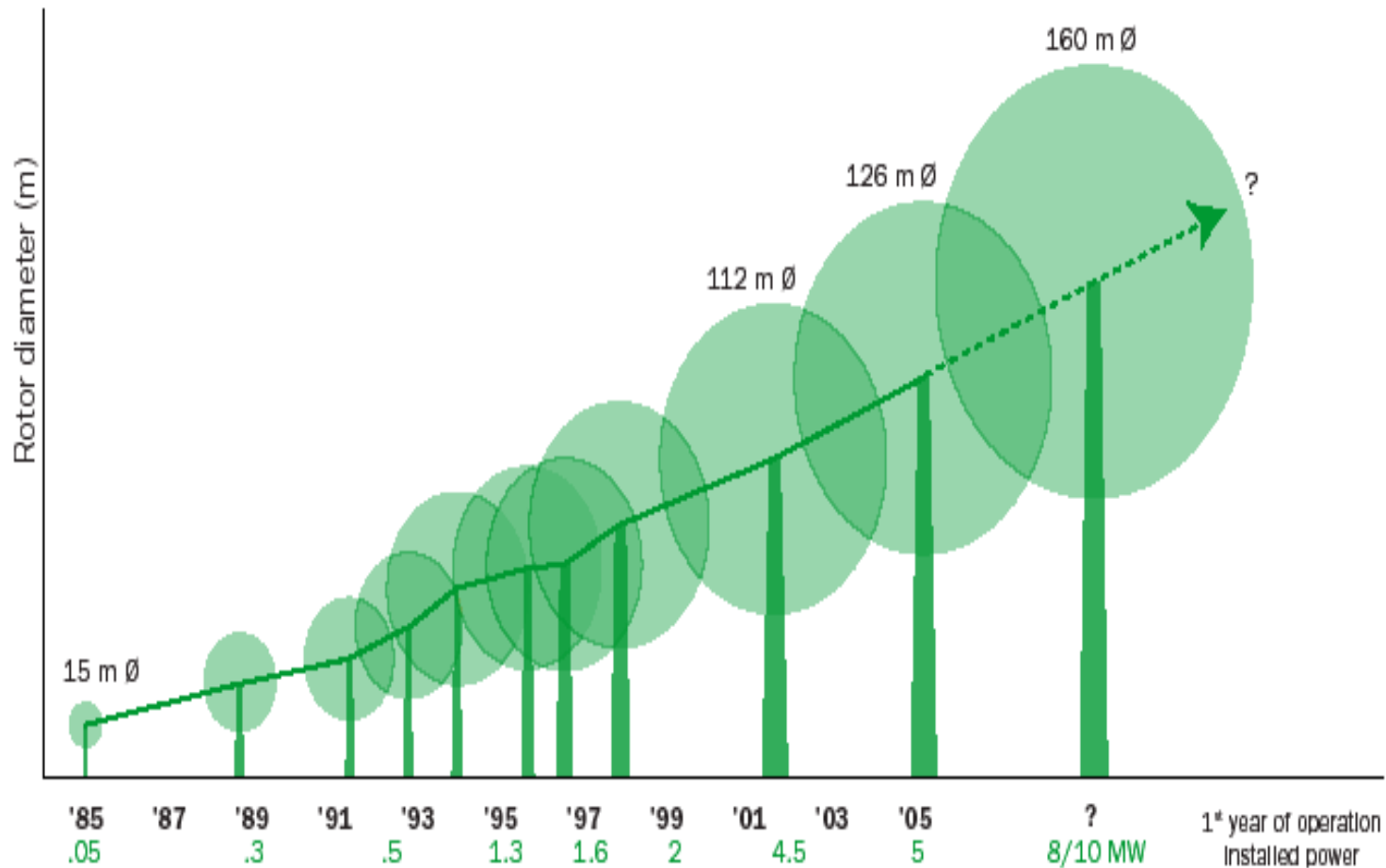
- sensitizing the national stakeholders, either public and private ones;
- devoting ad-hoc funds in the frame of the EU financial instruments.

A lesson learned from the recent past

Two impressing and winning challenges from the technological point of view:

- Wind energy
- Photovoltaics

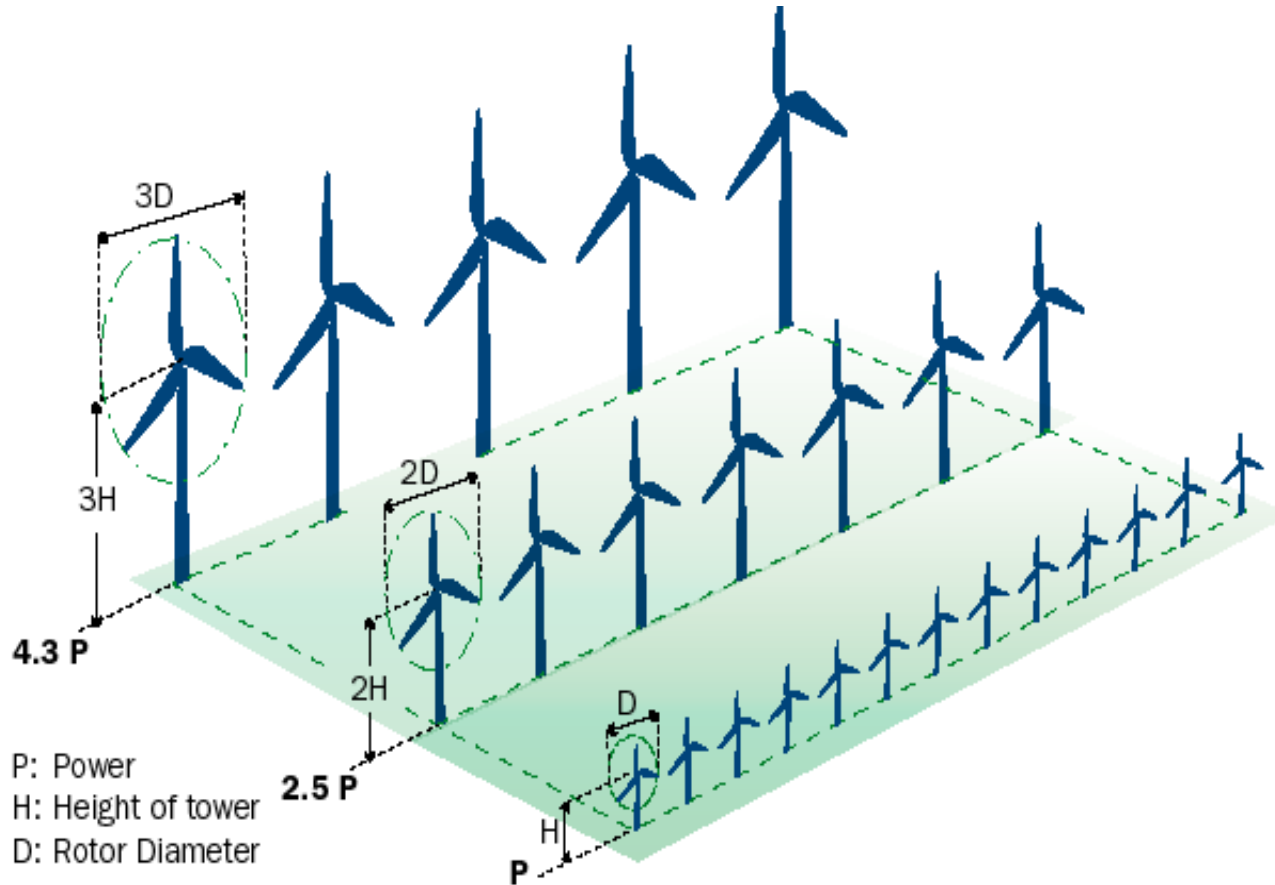
Technological improvements



Source: Jos Beuskens, ECN

The size of wind turbines at market introduction

Technological improvements

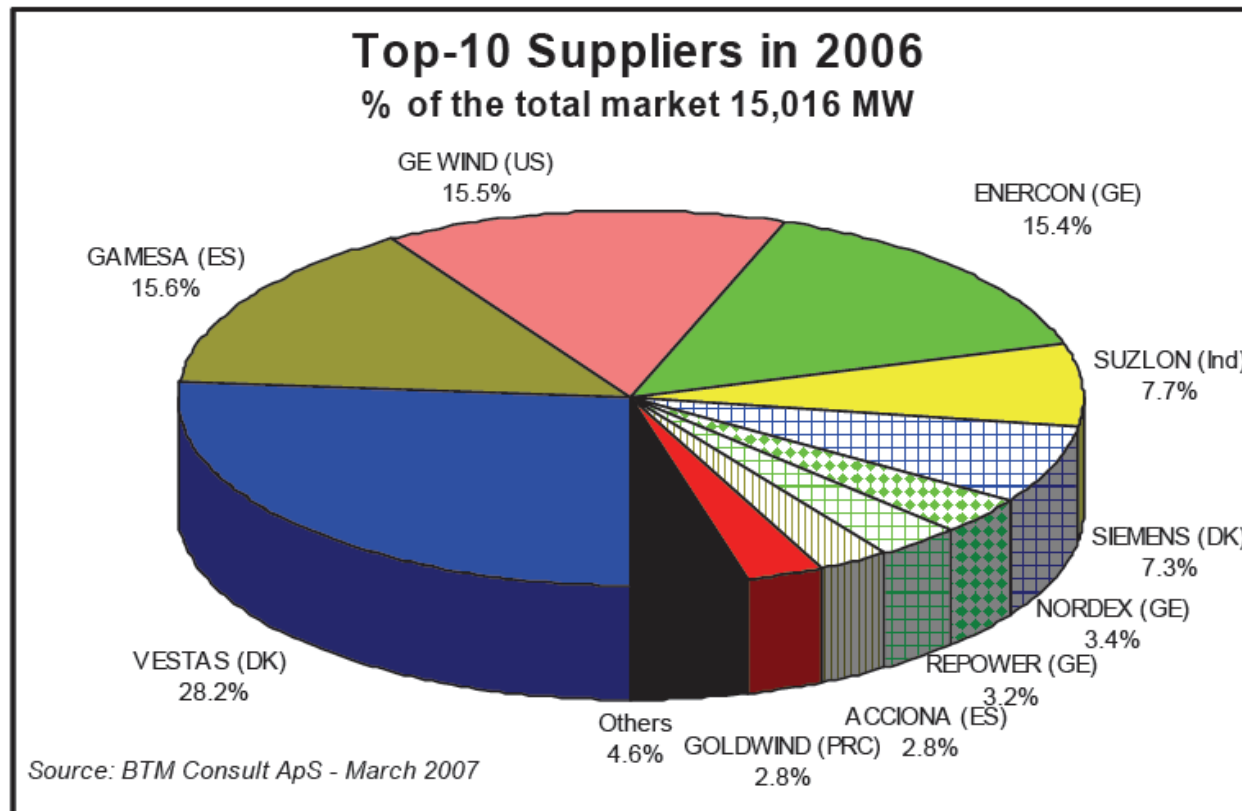


Source Wind Platform

Depending on the roughness of the terrain, the total capacity of a line cluster is more than proportional to the size of the rotor.

Wind Industry

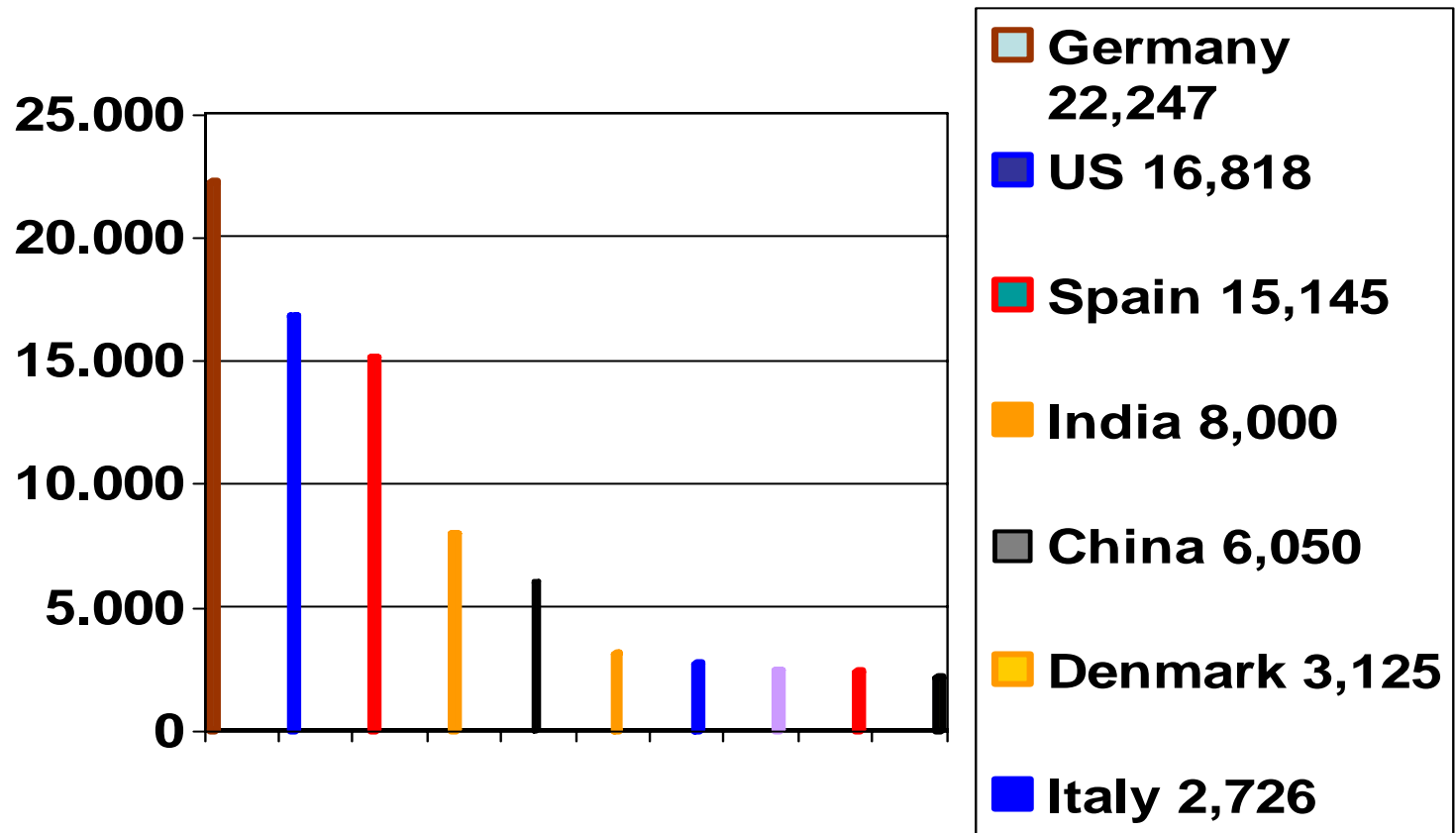
Industry



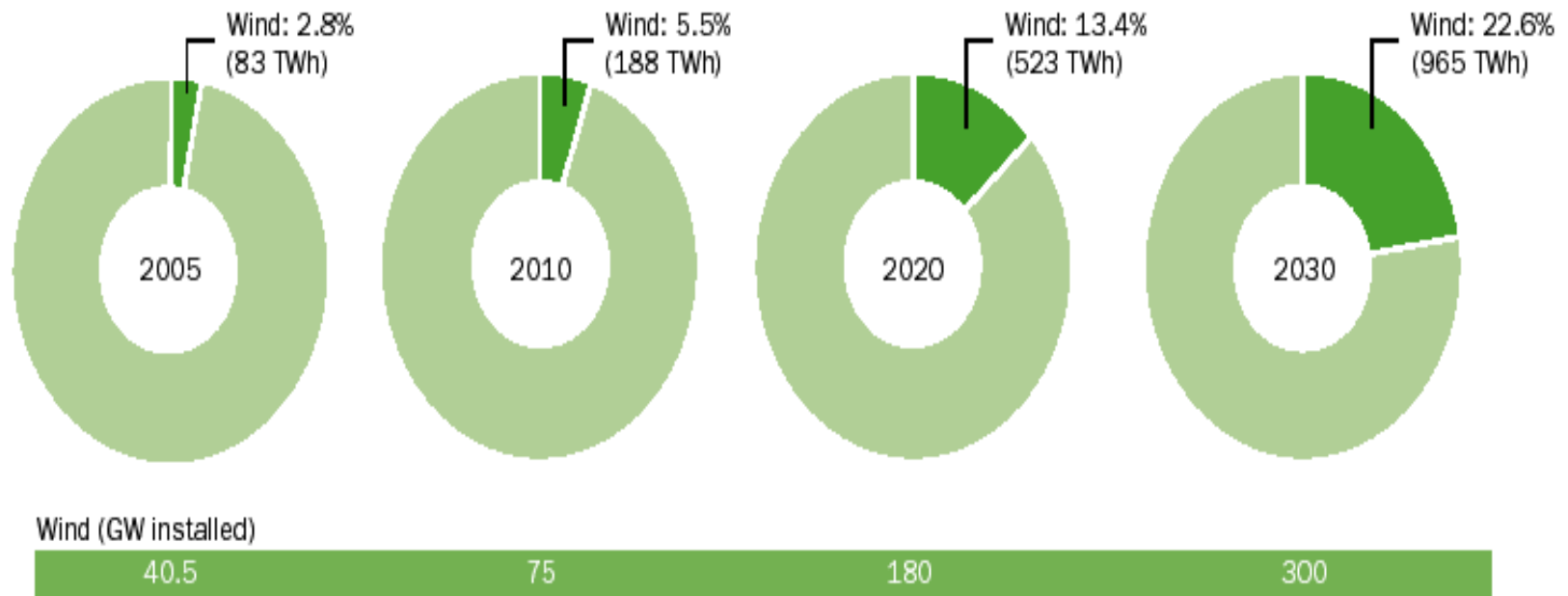
European firms represent the largest part of world wind industry

Wind Market

World: 94.112 MW **Europe: 57.136 MW**



Contribution of wind energy to the European electricity consumption (2005 - 2030)

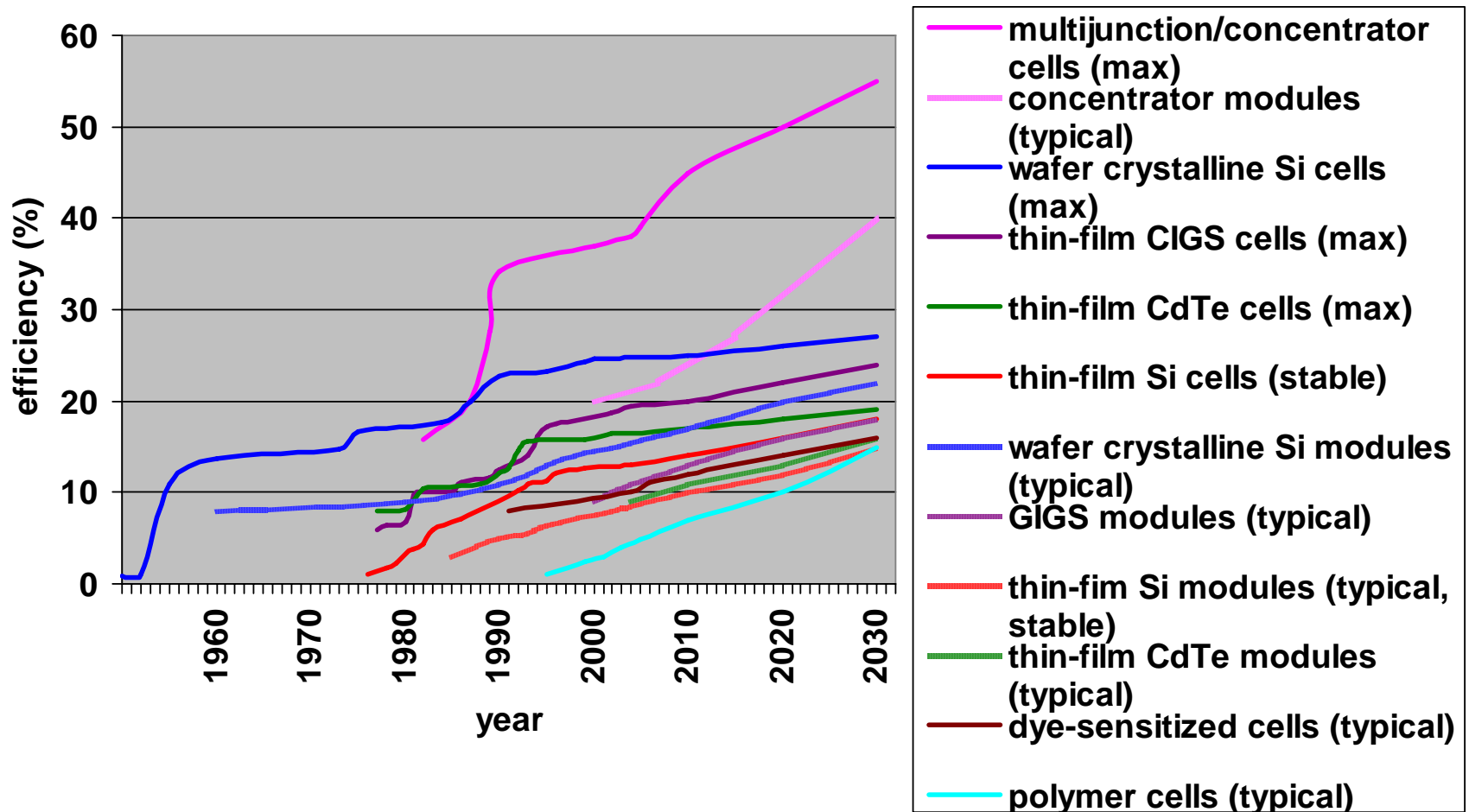


Present module efficiencies for different PV technologies

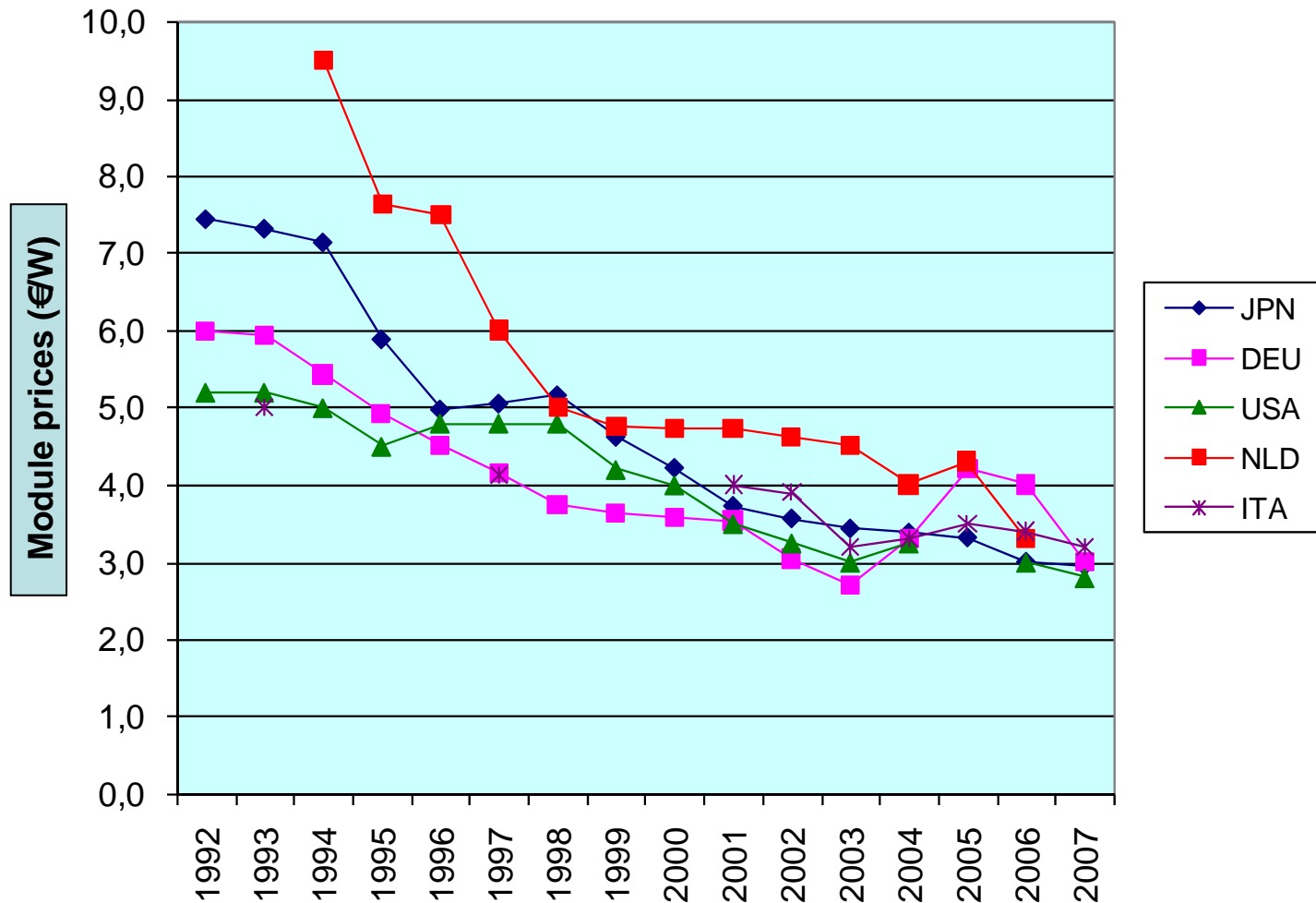
	Wafer-based c-Si		Thin films		
	sc-Si	mc-Si	α -Si α -Si/mc-Si	CdTe	CIS/CIGS
Commercial module efficiency (%)	13-15%	12-14%	6-8%	8-10%	10-11%
Maximum recorded module efficiency (%)	22.7%	15.3%	–	10.5%	12.1%
Maximum recorded laboratory efficiency (%)	24.7%	19.8%	12.7%	16.0%	18.2%

Sources: Adapted from Frankl, Menichetti and Raugei, 2008 and EPIA and Greenpeace, 2007.

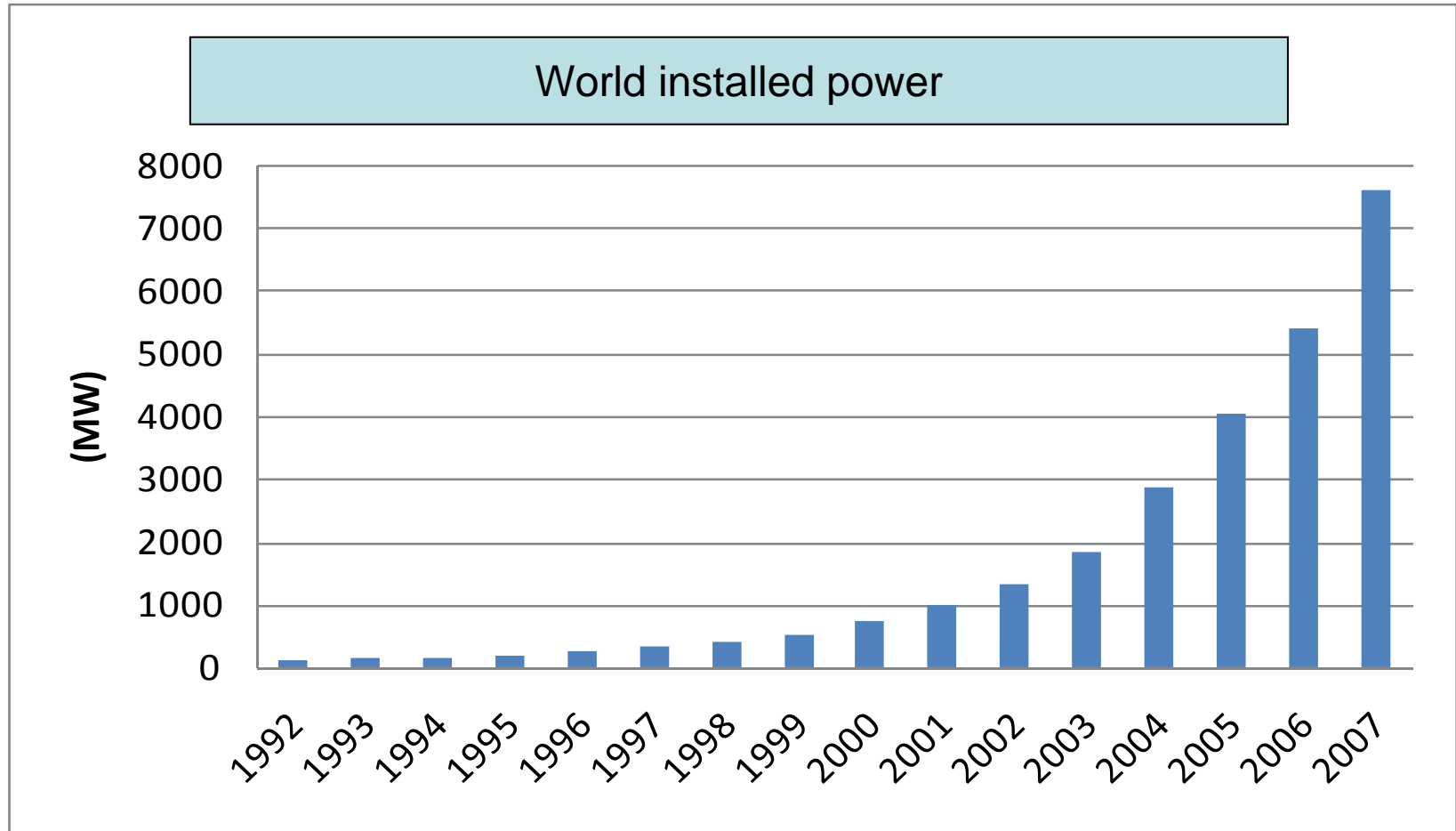
Historic trends and expert expectations on future efficiency development (averaged)



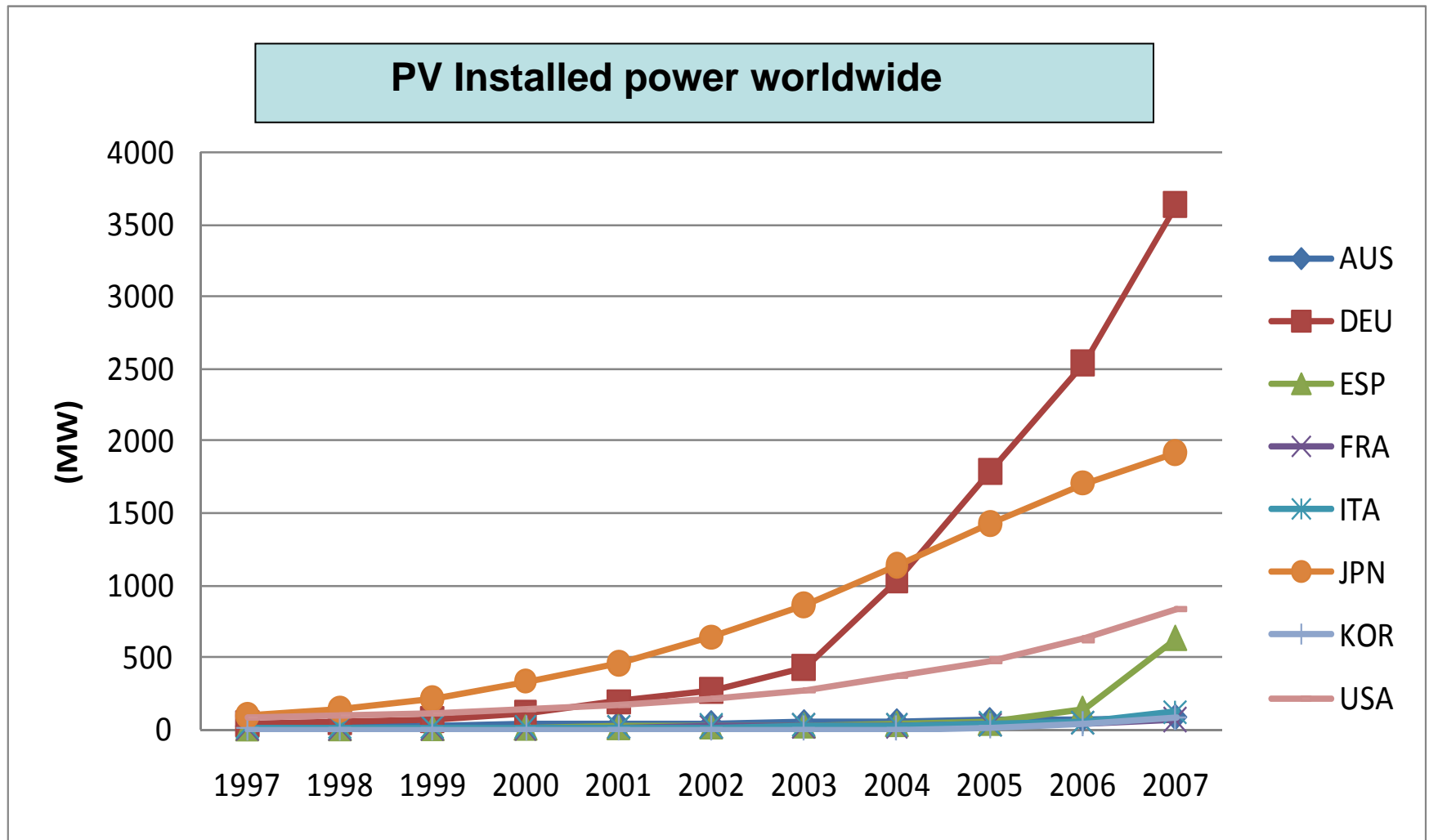
PV Module learning curves



PV Market



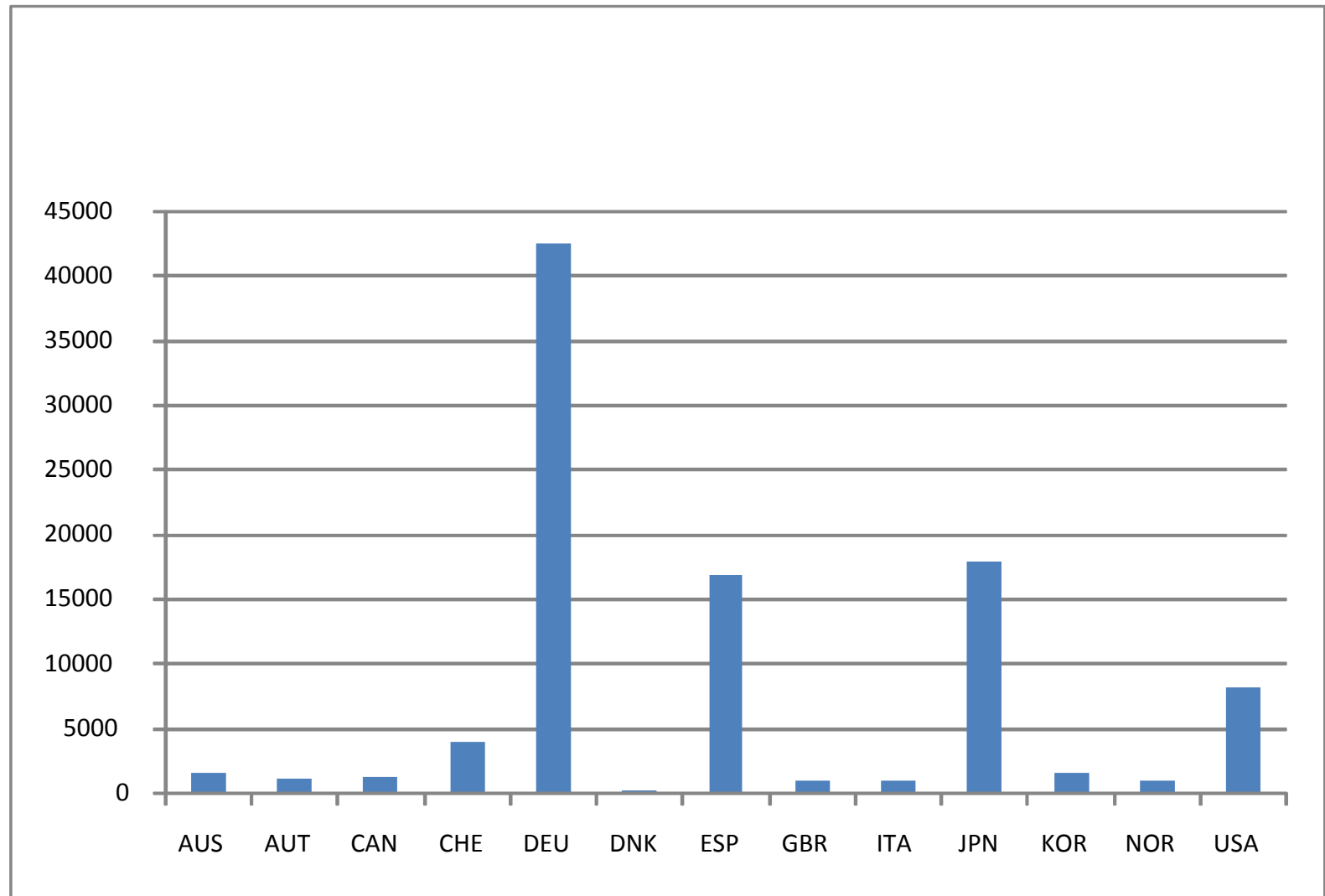
PV power worldwide



Industrial production in 2007

	feedstock (tonnes)	wafers (MW)	Cells (MW)	Module wafer based (MW)	Module thin film (MW)
AUS			50	9	
AUT				47	
CAN				7	1
CHE		120			1
DEU	8000	480	1 744	585	94
ESP				450	
FRA		6	70	50	1
GBR		190	2	129	2
ITA			12	72	
JPN	1391	670	1507	1333	89
KOR		11	36	53	
NOR		503			
PRT			8	19	
SWE				70	
USA	5800	142	318	89	177
Total	15191	2122	2057	2913	365

Level of employment in research, development, manufacturing and deployment



Future development

- PV will become competitive with electricity grid production by 2012 in the South of Europe
- PV will supply 12% of European electricity demand by 2020

Conclusions

The mentioned examples show as

- the joint effort between scientific and technological research and appropriate funding

as well as

- the public and private co-operation

could bring to an established successful technology, which is fundamental for the deployment of renewable energies