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# HYDROGEN GENERATION COSTS VIA WIND POWER IN ARGENTINA



L-B-Systemtechnik GmbH  
Ottobrunn/Germany



**Argentina / Patagonia = cheap electricity via wind power**



# Hydrogen production via wind power in Argentina ?





### "CGH<sub>2</sub> onsite electrolysis"



Electricity



Power transmission via HVDC



Buenos Aires

Electrolyzer onsite filling station



Large filling stations



Wind farms in Patagonia

Scenarios for ARGENTINA



### "CGH<sub>2</sub> central electrolysis"



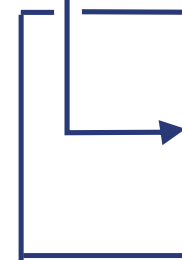
CGH<sub>2</sub>



H<sub>2</sub> pipeline



Buenos Aires



Small filling stations

Electrolyzer central in Patagonia



### H<sub>2</sub> EXPORT



**LH<sub>2</sub> transport:**  
~ 15,000 km  
(~8,100 nautical miles)



Wind power



Electrolysis



LH<sub>2</sub> production

Large filling stations



Small filling stations



LH<sub>2</sub>  
LCGH<sub>2</sub>



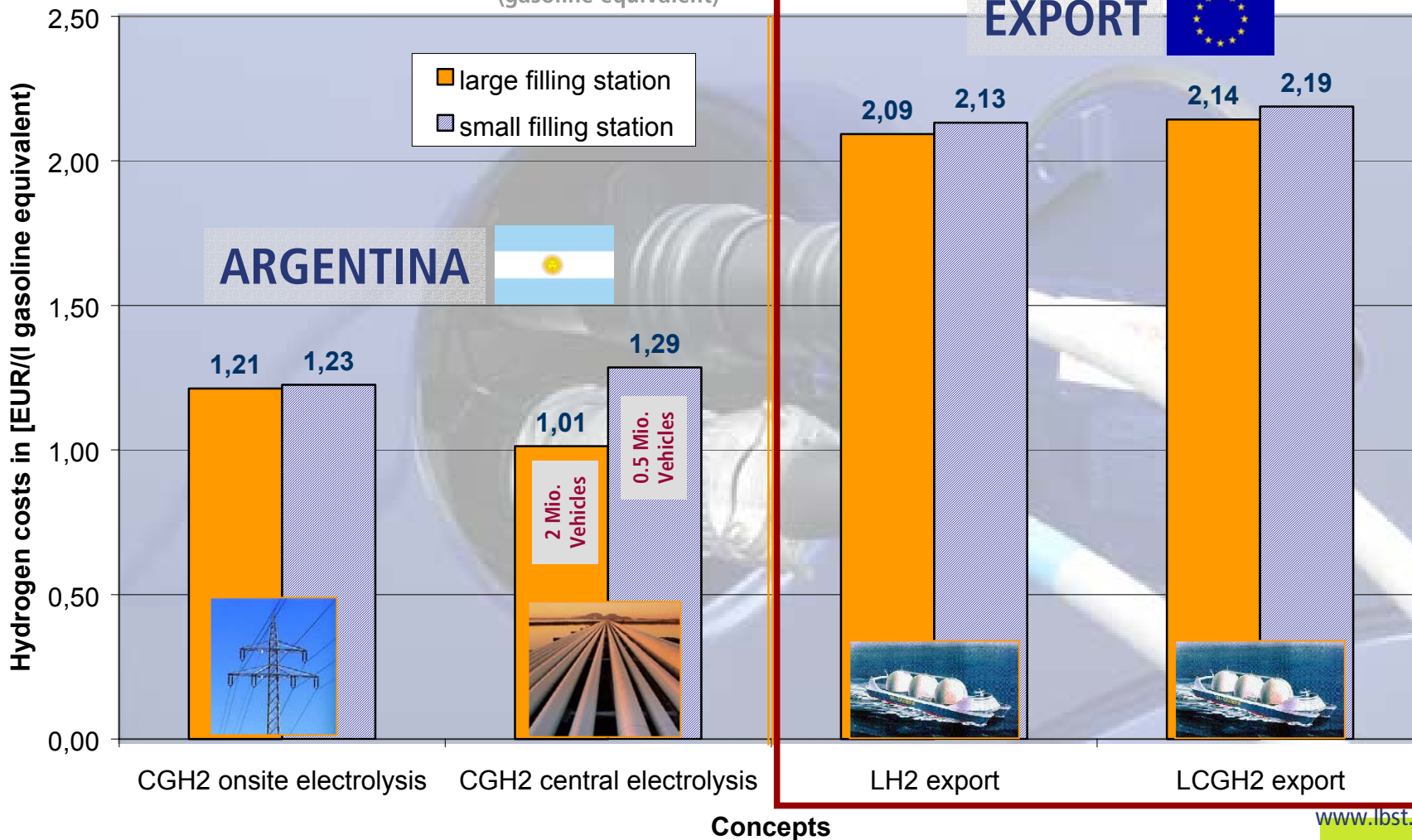
# Seminario International - Tecnologías del Hidrógeno



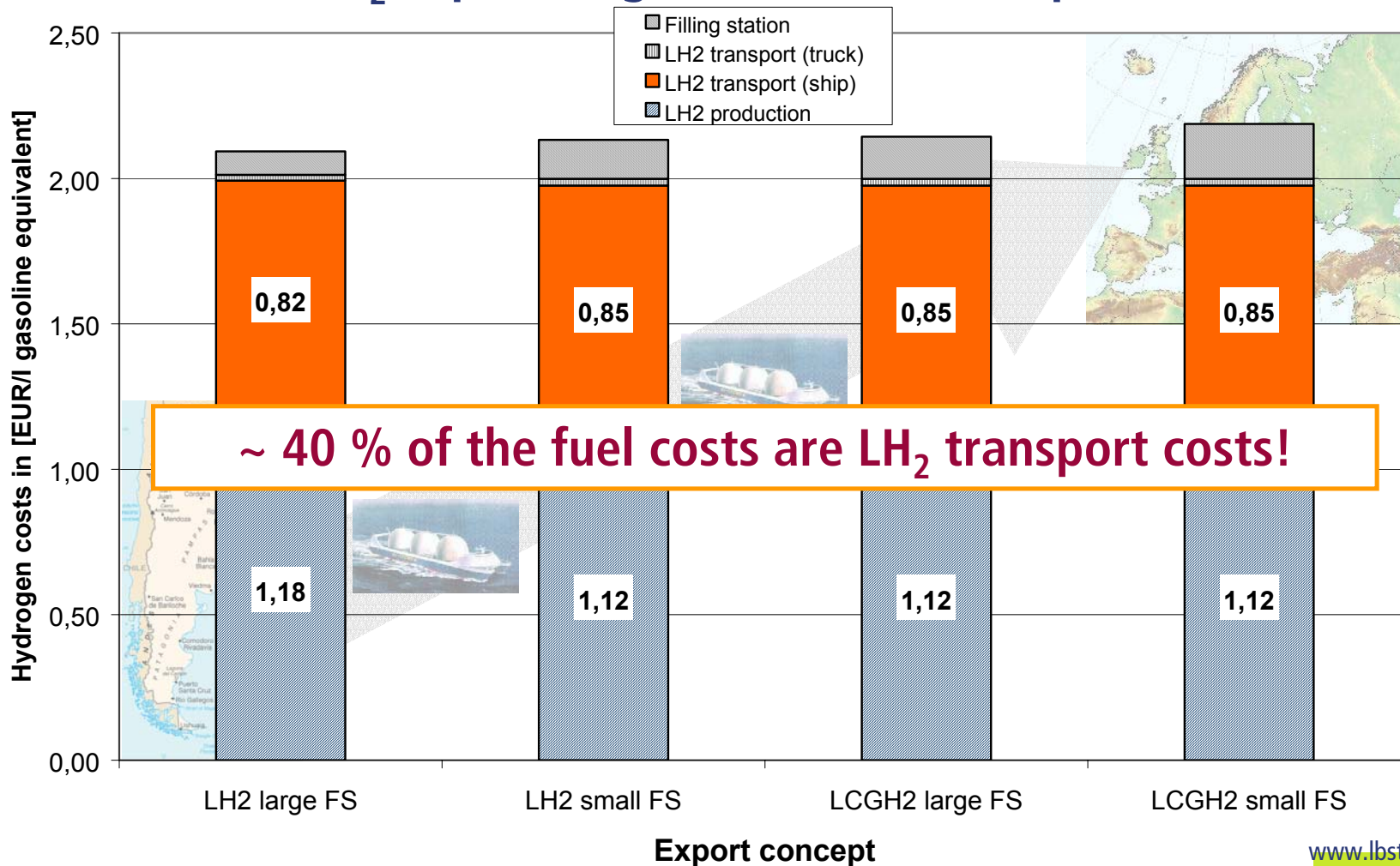
## Potential hydrogen fuel supply costs in 2020

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in Euro per liter (gasoline equivalent)

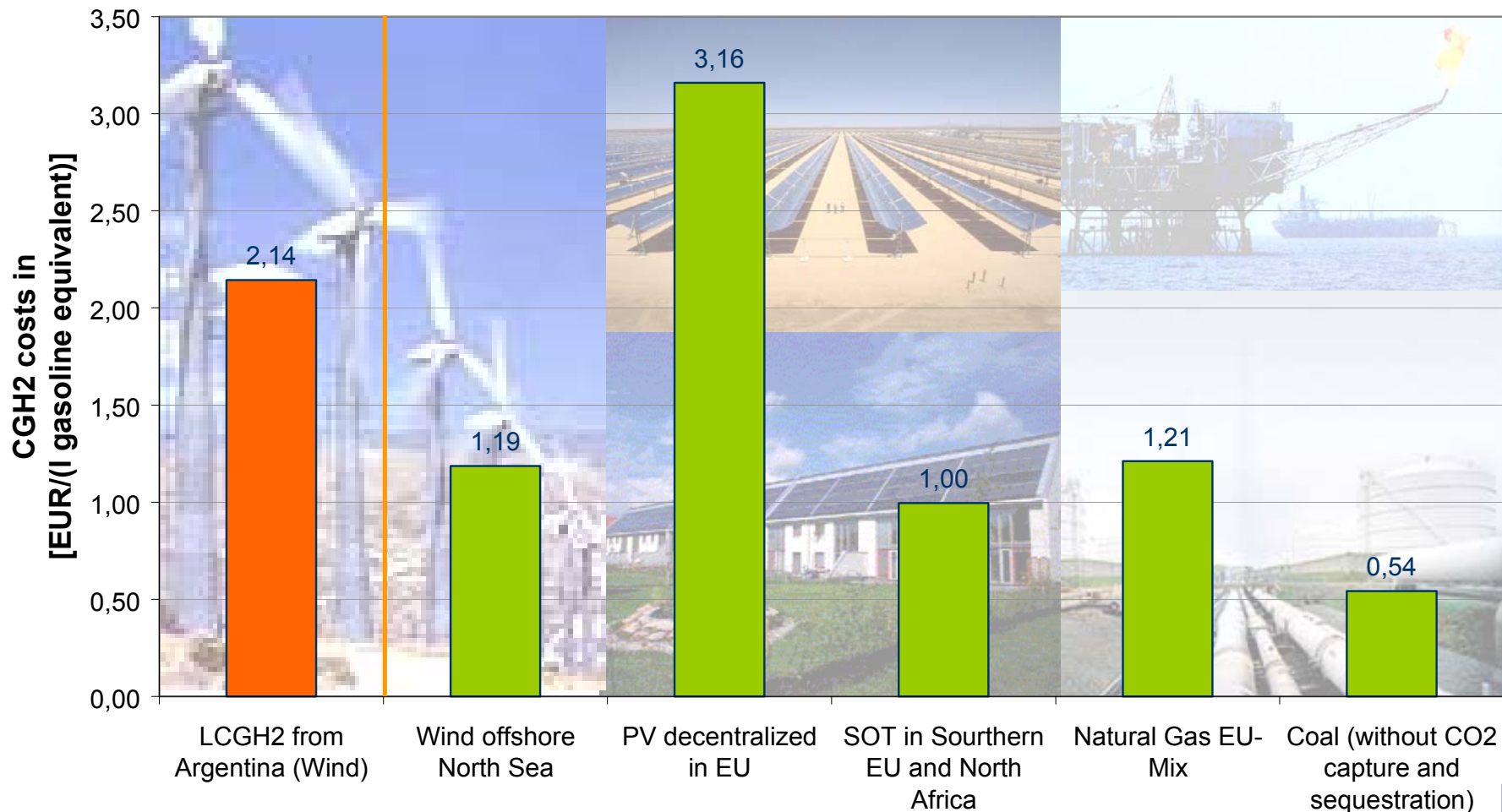


### LH<sub>2</sub> Export: Argentina → Europe





**Comparison with  
potential hydrogen production costs  
in Europe 2020**





### Wind power generation / hydrogen production for Argentina/South American market:



- ▶ Power transmission via HVDC to 'demand centers' (e.g. Buenos Aires)
- ▶ remote locations
- ▶ transportation fuel





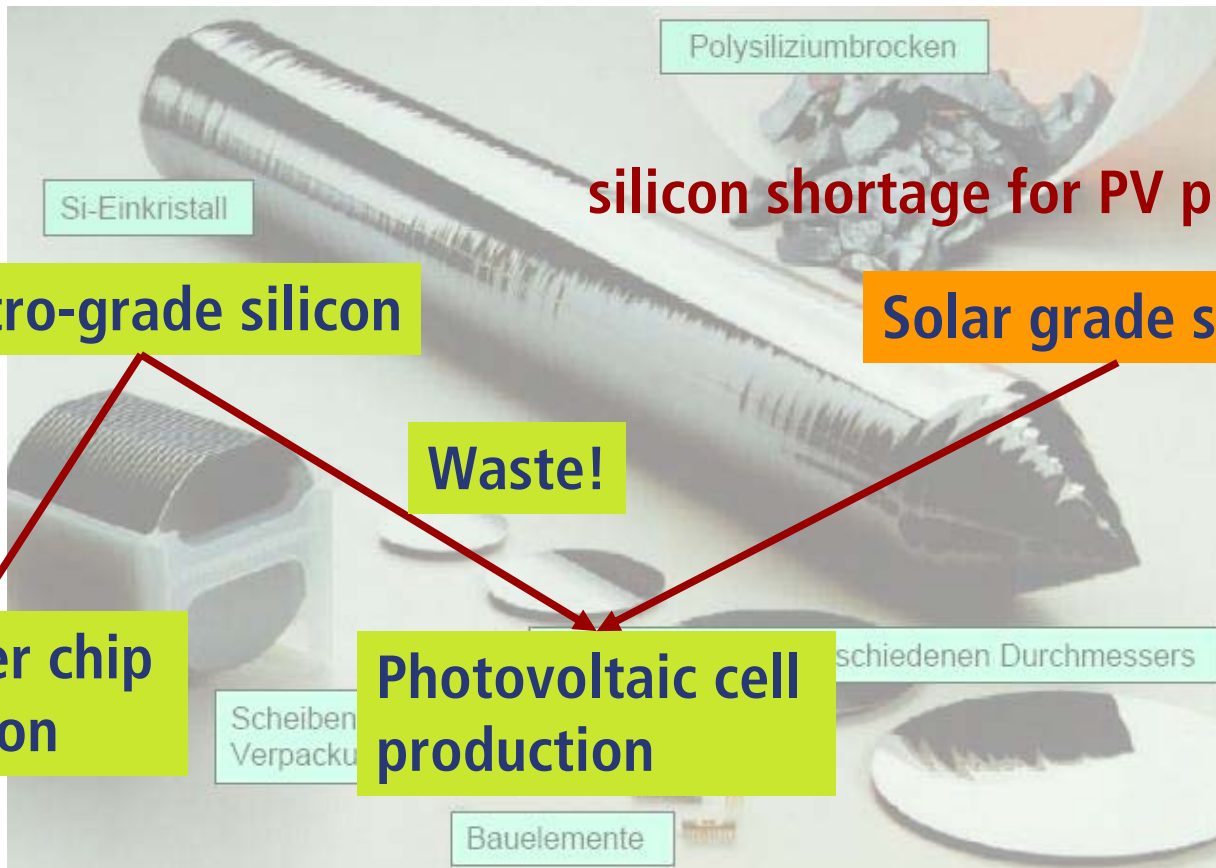
# EXPORT

**'Cheap and green electricity'  
via wind power for industry**

**→ energy-intensive products**

**e.g. silicon (Si)**

# Silicon production!



silicon shortage for PV production

electro-grade silicon

Solar grade silicon

Waste!

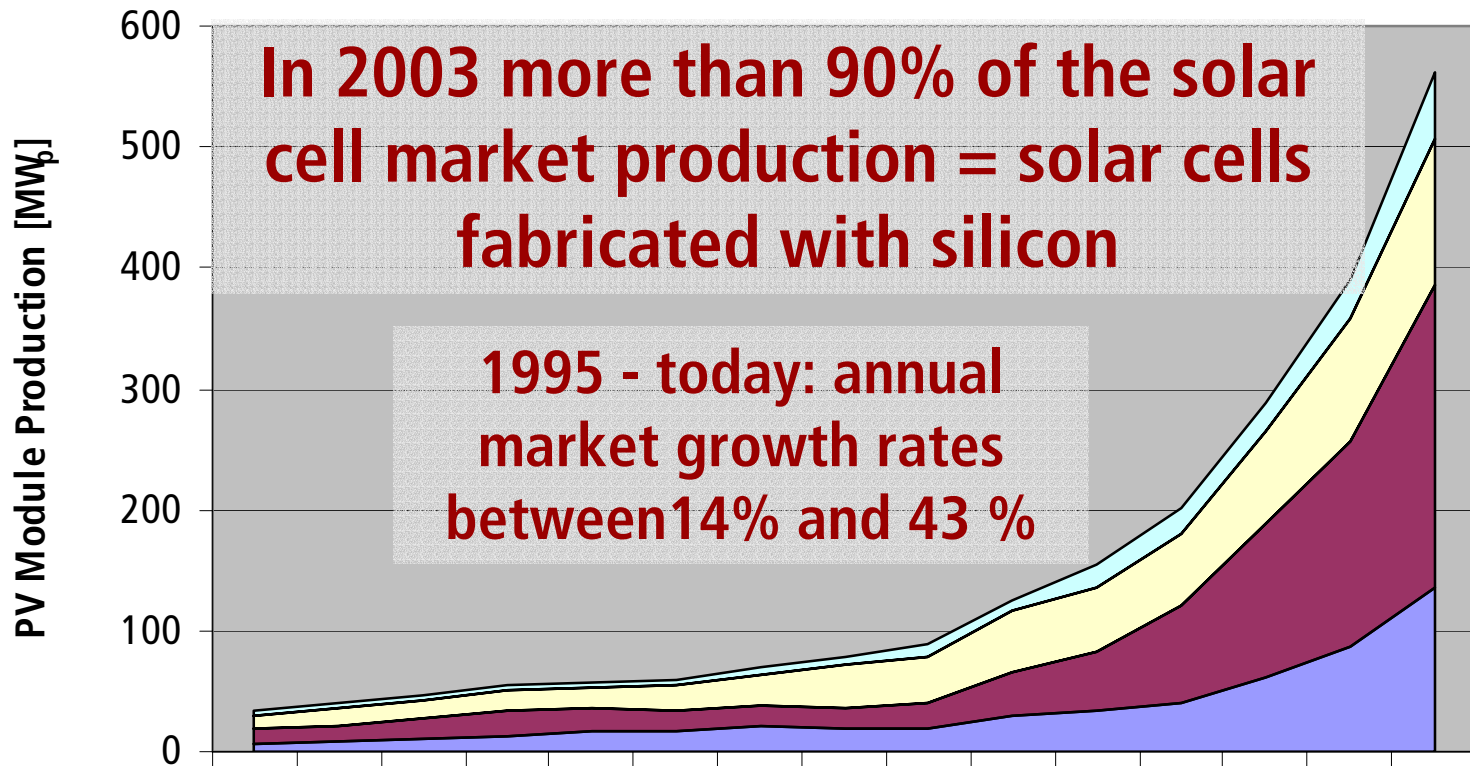
Computer chip production

Photovoltaic cell production



## PV production - market data

L-B-Systemtechnik

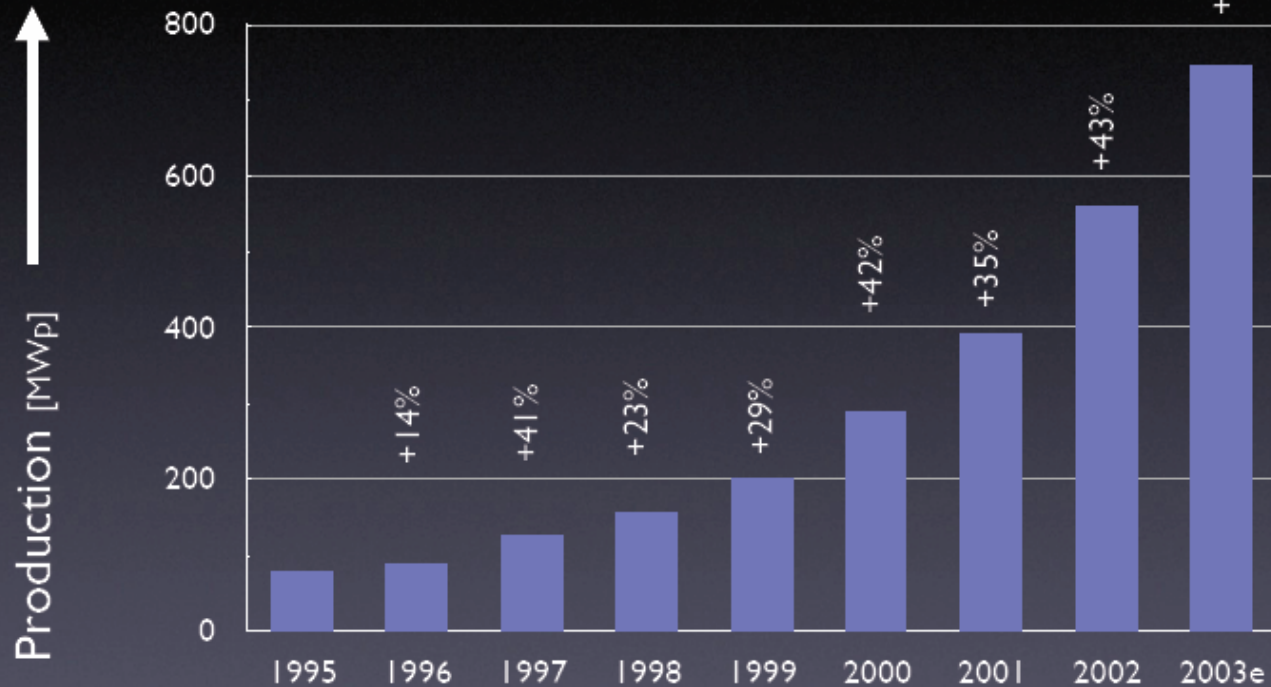


	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Rest	3,00	4,00	4,70	5,00	4,60	4,40	5,60	6,35	9,75	9,40	18,70	20,50	23,42	32,62	55,50
USA	11,1	14,1	14,8	17,1	18,1	22,44	25,64	34,75	38,85	51	53,7	60,8	74,97	100,3	120,6
Japan	12,8	14,2	16,8	19,9	18,8	16,7	16,5	16,4	21,2	35	49	80	128,6	171,2	251,1
Europe	6,7	7,9	10,2	13,4	16,4	16,55	21,7	20,1	18,8	30,4	33,5	40	60,66	86,38	135,1

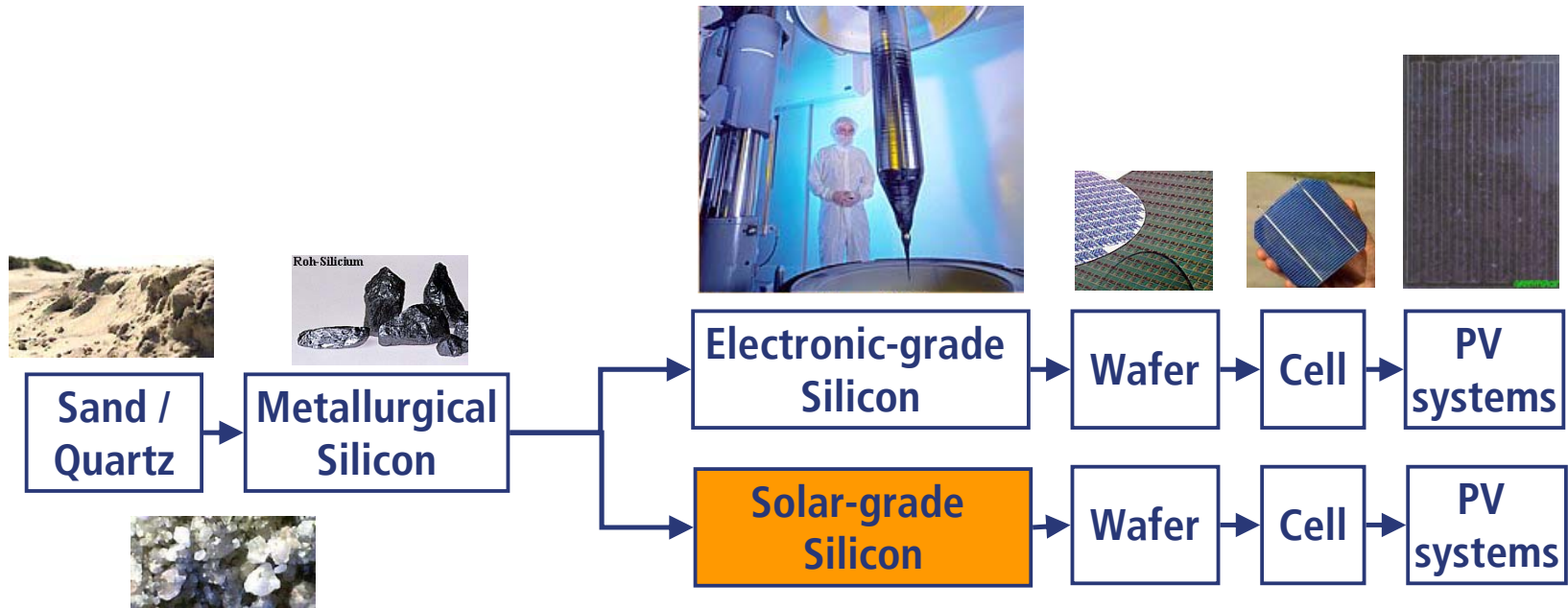


### PV World Production Development (1995-2003)

**PV production 2003: ~ 3 GW**



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## Production Value Chain

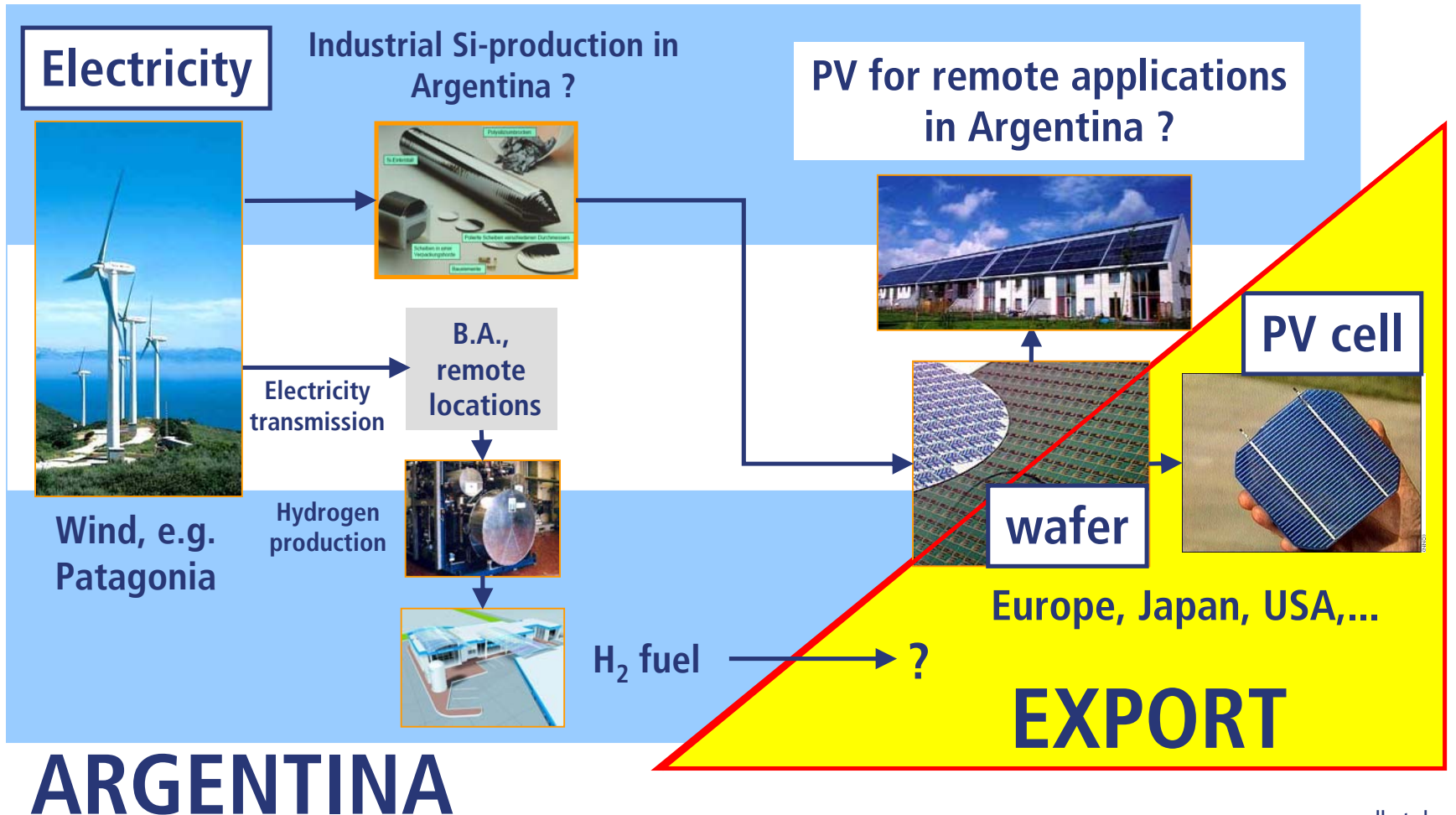


## Renewable Energy Sources Act (EEG) for Argentina!

▶ **Wind energy!**

▶ **Photovoltaic** ▶ market for PV systems in Argentina

- ▶ **Private households: remote, decentralized power production**
- ▶ **Industry: PV cells production for Argentina**





# Thank you!

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