

RESEARCH & DEVELOPMENT NEEDS FOR SOLAR HEATING & COOLING

Catching Up: Priorities for Augmented
Renewable Energy R&D

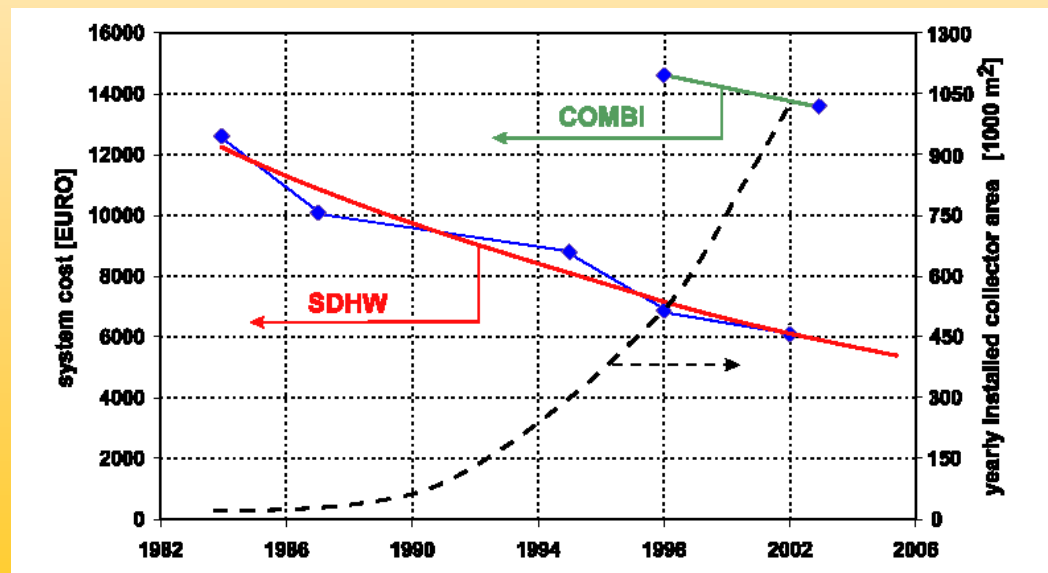
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Technology	Current Cost	Performance Indicator
Solar water heating	2,500 - 6,000 euro/system	60-70% solar fraction
Solar Combisystem	14,000 euro/system	20-40% solar fraction
Solar Cooling	1.5 – 3 times conventional cooling system cost	30-50% primary energy savings
Passive Heating	No additional cost	50% of the building heating load is typical

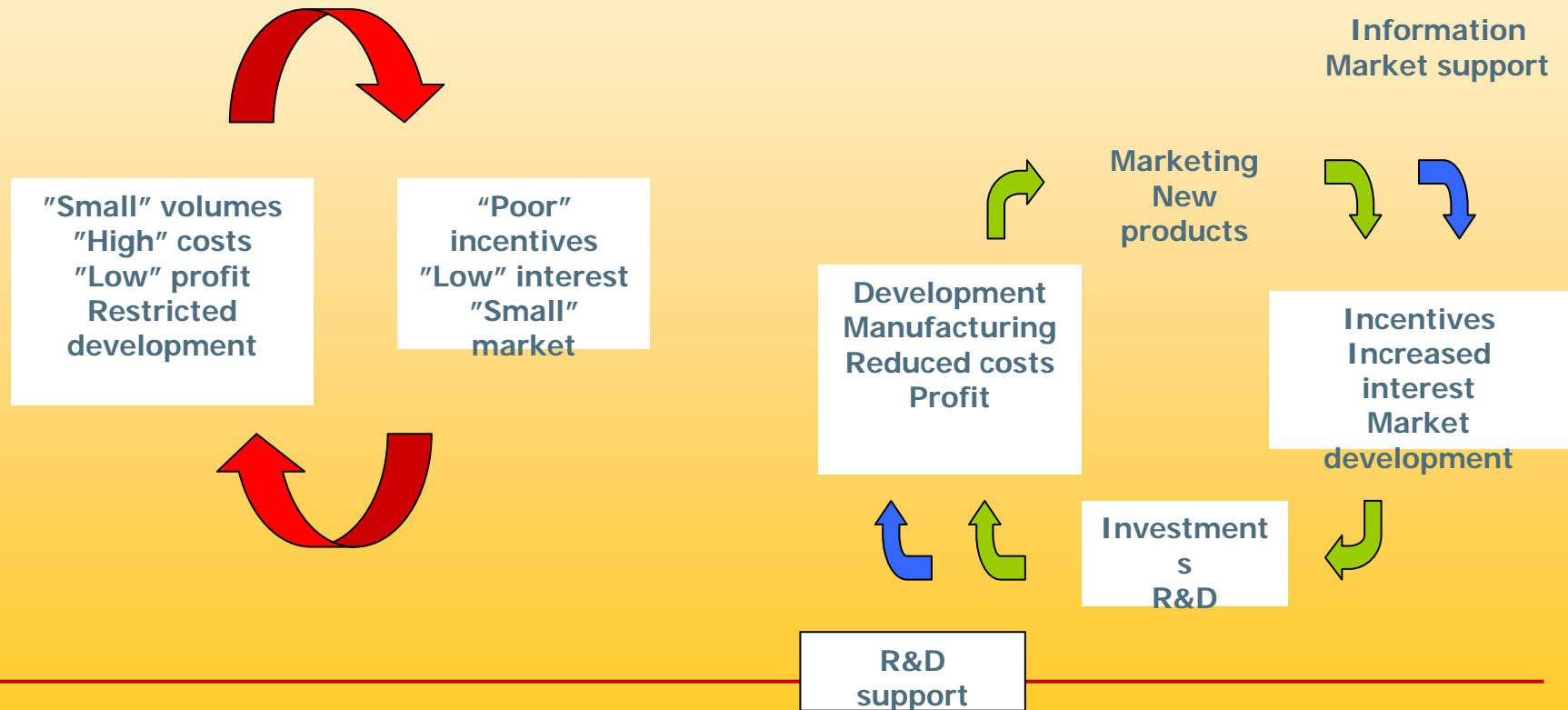
Development of average costs for thermal solar systems in Germany (including VAT and installation)

Source: Stiftung Warentest



SHC INDUSTRY & MARKET SCENARIO

WHY R&D IS CRITICAL FOR TECHNOLOGY & MARKET DEVELOPMENT



SHC R&D FUNDING LEVELS

- In 2000, US\$ 75 million
- In 2001, US\$ 69 million
- Industry funded R&D during 2000-2001 is estimated to be at least 50% as much as that provided by governments. Reason being that most R&D projects that are not pre-competitive require industry cost sharing or 50% or higher

CONCLUSION: R&D FUNDING IS DECREASING

*Figures from the IEA SHC Programme report, *Solar Energy Activities in IEA Countries 2002*

REASONS FOR CONTINUED R&D FUNDING

- Solar is the logical successor of oil and gas heating. More than one third of our energy use is for heating
- It is a cost effective investment as many applications are close to market entry
- Solar energy, as with other renewable energy sources:
 - Provides significant local and global environmental benefits
 - Contributes to energy security and energy services at point of end use
 - Promotes employment
 - Contributes to sustainable economic development of nations

LEVEL OF R&D FUNDING NEEDED

AREA	10 YEAR R&D BUDGET (million euros)
Advanced materials	50
Advanced solar thermal collectors	60
Advanced thermal energy storage	120
Large-scale solar heating systems	70
Solar industrial processes systems	150
Solar cooling systems	80
Combined solar heating and cooling systems	150
Building integration and passive solar	100
Standards, regulations and test procedures	115
TOTAL 10 YEAR R&D PROGRAM	815