



The experience of Germany on photovoltaic incentives

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Introduction

Solar electricity is a success story in Germany:

- The rate of market growth has been 50% in 2003!
- Ten-fold increase in market volume in the PV sector from 1998 to 2003!
- It was the effect of the combination of the 100,000 roofs solar energy programme and the Renewable Energy Sources Act!





Content

- Key elements of energy policy in Germany – national goals in the development of renewable energies
- Policy instruments for promoting solar electricity:
 - Renewable Energy Sources Act
 - 100,000 roofs solar power programme
 - research and development
- Achievements in market launch of PV
- Prospects for PV in Germany

Key elements of energy policy in Germany

Germany has launched a successful new direction in energy policy towards a sustainable energy supply. It aims on

- conservation of the environment and resources, esp. climate protection
- economic efficiency for producers and consumers and securing the energy supply

Key elements are:

Massive expansion of renewable energies,

Improvements in energy efficiency and phasing out nuclear technology





Policy targets for renewable energies

A market development towards increased use of renewable energies is not a matter of course – it requires suitable energy-policy framework conditions and quantified goals:

- Short-term targets: increase the share of renewable energies in electricity generation to **12,5% in 2010 and at least 20% in 2020**
- Long-term target: renewable energies are to account for **at least 50% of total energy supplies in Germany and globally by 2050**
- Renewable energies must also **prove their competitiveness on the energy market**





Renewable Energy Sources Act

Into the foreseen future, renewable energies will only be truly competitive if they continue to receive the targeted support by the Renewable Energy Sources Act.

The Act deals with the purchase of, and the compensation to be paid for, electricity generated exclusively from Renewable energies by grid operators.



Renewable Energy Sources Act

The Act imposes three obligations on network operators:

- They are **obliged to connect** to their grids installations generating electricity from renewable energies
- They must first purchase all of the electricity produced from these installations **as a priority**
- They must pay **fixed rates** for the electricity



The fees are fixed for a period of 20 years. This brings investment security for the renewable energy industry.

Tariffs vary by energy sources (wind power, biomass, solar power, geothermal power, hydropower), locations, and installation rate.



Interim Act on Photovoltaic Energy

Due to avoid the threat of a slump

In the PV market following the end of the 100,000 roofs solar energy programme the Interim Act came into force on 1st January 2004.

New increased payments for solar power:

- For roof areas: 57,4 cent/kWh up to 30 kilowatt capacity
54,6 cent/kWh between 30 and 100 kilowatt
54,0 cent/kWh for 100 kilowatts and over
- For parts of buildings: increased fees by 5 cent/kWh
- For free-standing installations: 45,7 cent/kWh





100,000 roofs solar power programme

- **By using grants and low-interest loans (at first 0%, later 1,91%) this programme promoted the investment of solar power installations**
- **Goal was to achieve an additional PV capacity of 300 MW by the end of 2003**

Strengthening of demand side

- **new manufacturing technologies**
- **mass production**
- **significant price reduction**



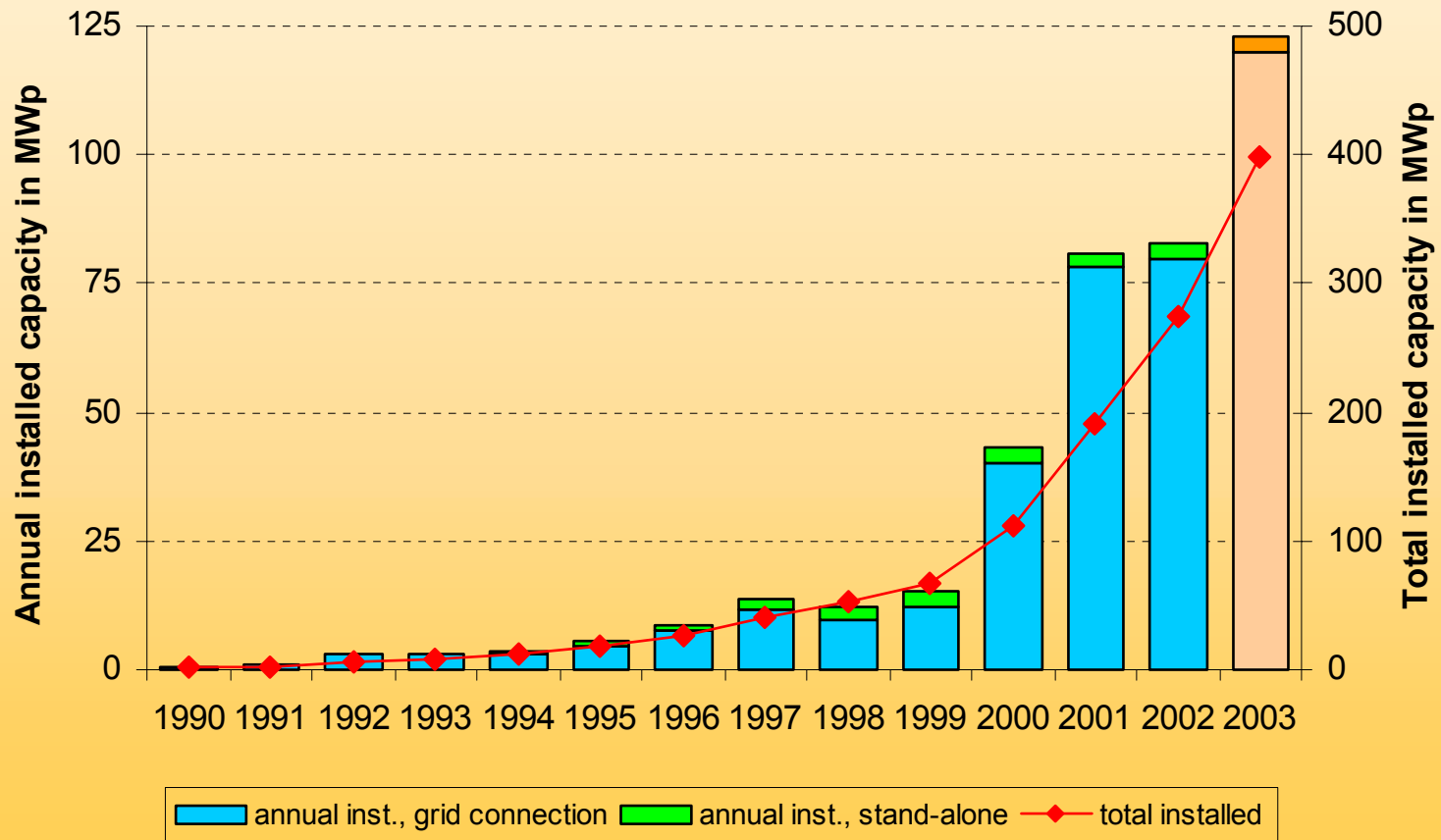


100,000 roofs solar power programme

- Under the programme a total of **350 MWp PV capacity** was installed on more than **60,000 solar roofs**.
- The **total volume of loan commitments** comes to **1.7 billion euro** – this initiated a **total investment volume of 2.4 billion euro**
- The programme helped **reduce the cost** of solar energy systems by some **24% between 1999 and 2003**
- The Programme was open for combination with the system of fees established under the **Renewable Energy Sources Act**



Successful development of the PV market





Successful development of the PV market

- By the end of 2003 the **total installed PV capacity in Germany reached around 400 MW.**
- As a result of the market growth, the improved efficiency of the modules and the increasing automation of large-scale production facilities, the **cost of photovoltaic solar power systems has fallen by about 25% since 1999 and about 60% since 1991.**
- On an international scale, **Germany ranks second behind Japan** and before the USA in terms of installed solar power capacity.



Research and development

- The volume of research and development **funds for renewable energies** was 67 million euro in 2003 and is **around 66 million euro in 2004.**
- The picture specifically for the **PV sector is around 27 million euro.**
- The Federal Government will present **a new energy research programme by the end of 2004.** Central elements will be energy savings, improvements in energy efficiency, and the expansion of renewable energies.





Outlook

- Photovoltaic has some of the greatest expansion potential of all renewable energies.
- The long-term scenarios for Germany indicate the share of electricity consumption accounted for PV will reach 0,3% by 2010 and 6% by 2050.
- A worldwide share of 23% is forecast for PV.

