Solar Thermal

Market & support schemes in Germany

German Solar Industry Association (BSW-Solar)

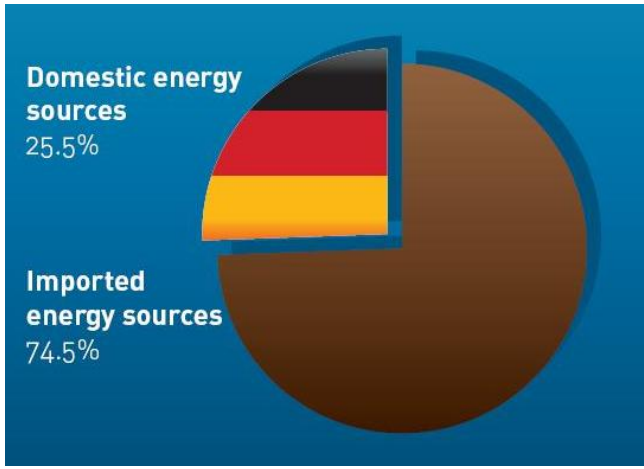
German Solar Industry Association

TASK	To represent the German solar industry in the solar thermal and photovoltaic sector
VISION	A global sustainable energy supply provided by solar (renewable) energy
ACTIVITIES	Lobbying, political advice, public relations, market observation, standardization
EXPERIENCE	Active in the solar energy sector since more than 25 years
MEMBERS	More than 850 solar producers, suppliers, wholesalers, installers and other companies active in the solar business
HEADQUARTERS	Berlin

Our energy system must change…

…since:

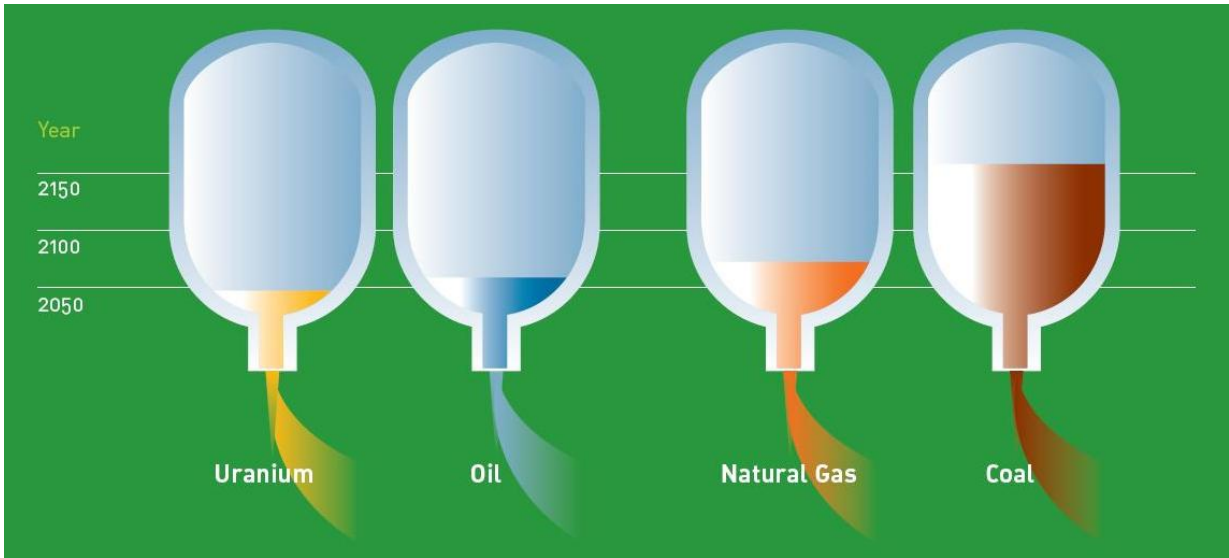
- We are highly dependent on energy imports (security of supply)
- Fossil & nuclear resources are finite (but demand is growing)
- Climate change requires us to act urgently



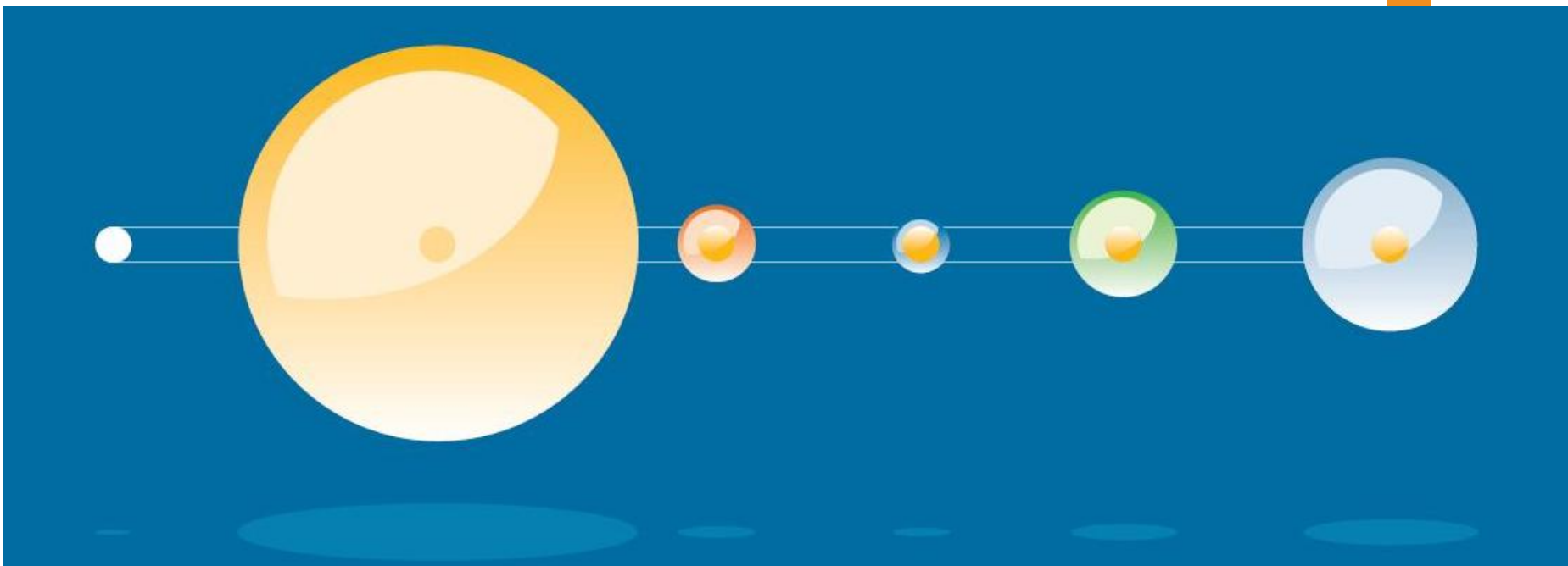
Diagrams: AEE / Sources: BMU, BMWI

„We should leave oil before it leaves us“

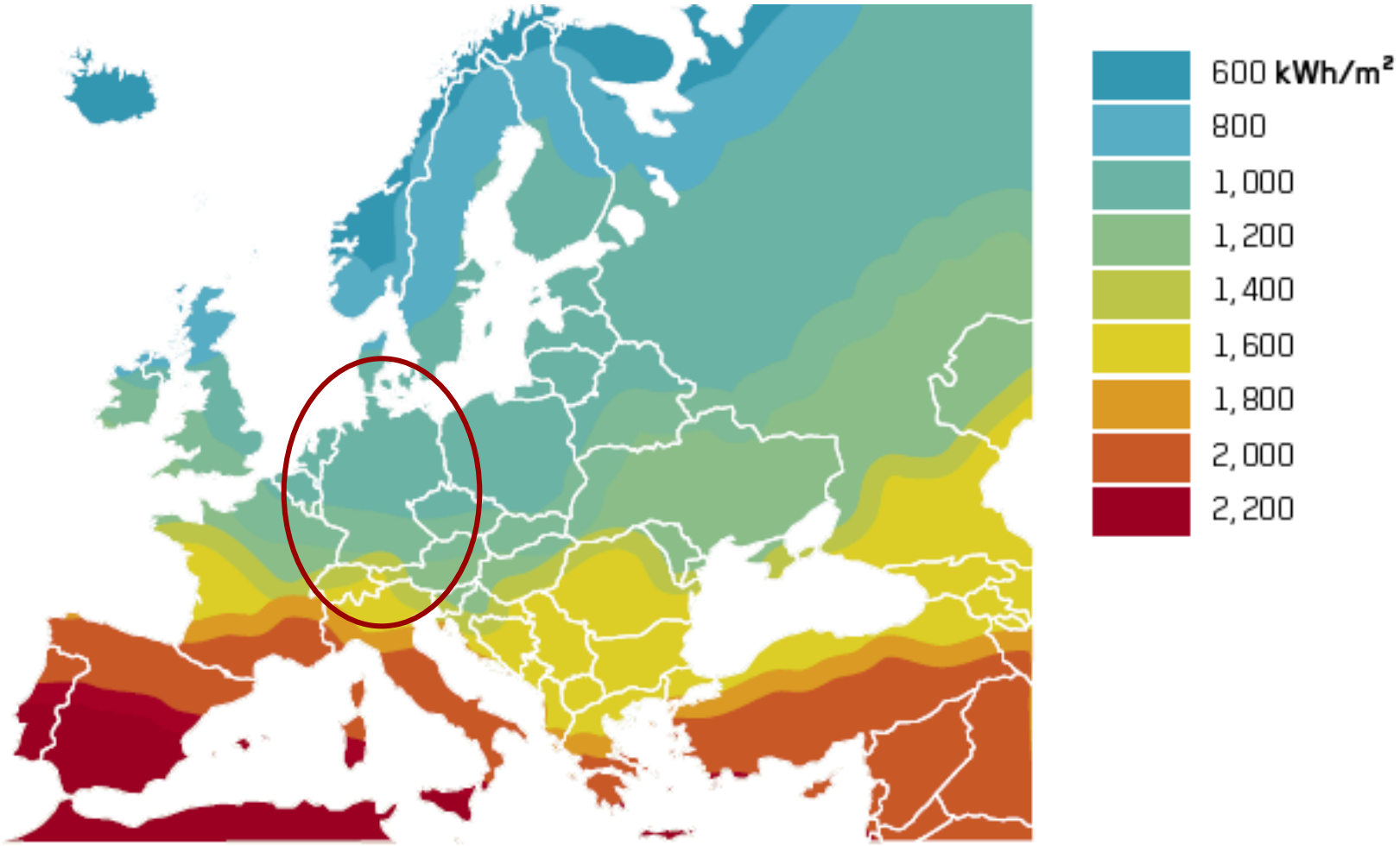
Fatih Birol, Chief Economist
IEA, March 2008



Why solar? Well...



Solar Potential



Source: Sapa Building Systems

Our future is a mix of all renewables

Renewable Energies

- are everlasting
- are „domestic“ energy sources
- are the only sustainable solution
- mitigate climate change
- become increasingly competitive
- increase the domestic and regional added value
- create thousands of new jobs

Source: BMU, Daten EE, Juni 2007

Challenges for RES are

- **the financing of investments** as long as RES are more expensive than fossil and nuclear energy
- **the reconstruction of the energy supply system** to a distributed generation system

Source: Solarwatt

Solar thermal technology – heating & cooling with the sun

Image: Sun-Pro

Status of the Use of Solar Thermal Energy

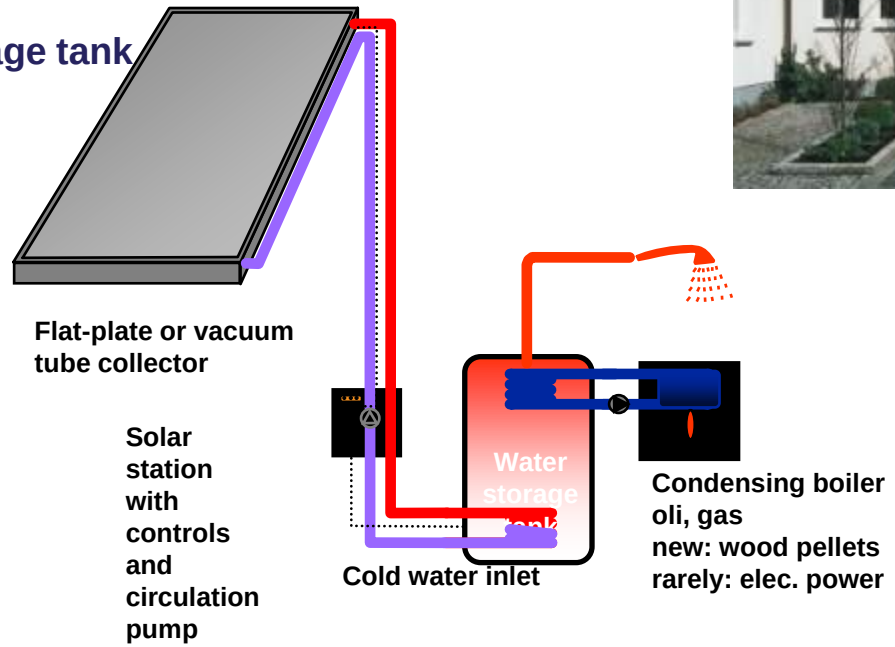
- Mainly in use in Europe:
solar domestic hot water systems
- Growing share of **combined systems** for DHW and room heating support in Central Europe
(Austria, Germany, France)
- The number of **collective systems** for multi family houses, hotels, hospitals etc. is growing
- Plastic absorber for **swimming pools** are in use in Central Europe
- Several **solar district heating** systems with and without seasonal storage are used in Central and Northern Europe
- Some pilot plants for **process heating**
- Some pilot plants for **solar thermal assisted cooling** are installed in Europe

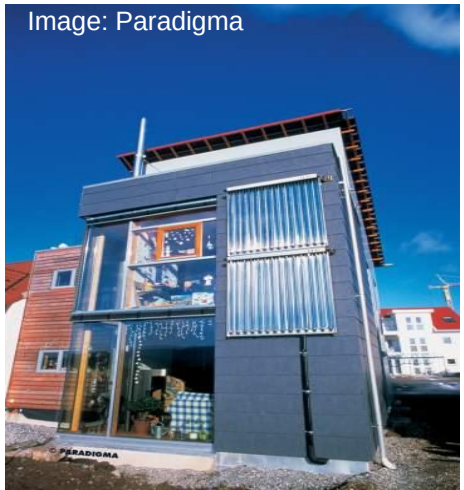
Domestic Hot Water Production

Market share in Germany: 35%

Typical data for Germany (4-person household)

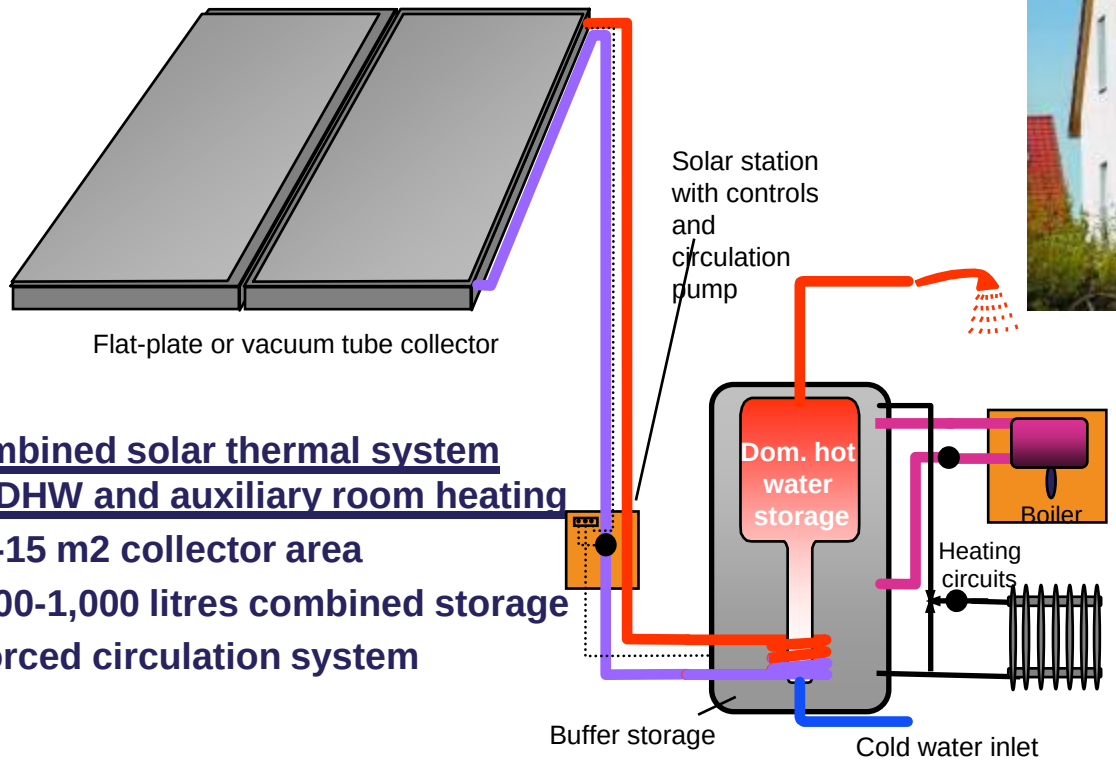
- **Forced circulation**
- **5-6m2 collector area**
- **300-400 l. solar storage tank**





Solar Thermal Combined System

Market share in Germany: 65%



Combined solar thermal system for DHW and auxiliary room heating

- **8-15 m2 collector area**
- **500-1,000 litres combined storage**
- **Forced circulation system**

New business fields: Large scale solar thermal systems

Large solar thermal systems for multi family houses, hotels, hospitals, nursing homes etc.

German companies have a lot of experience and offer matured systems.

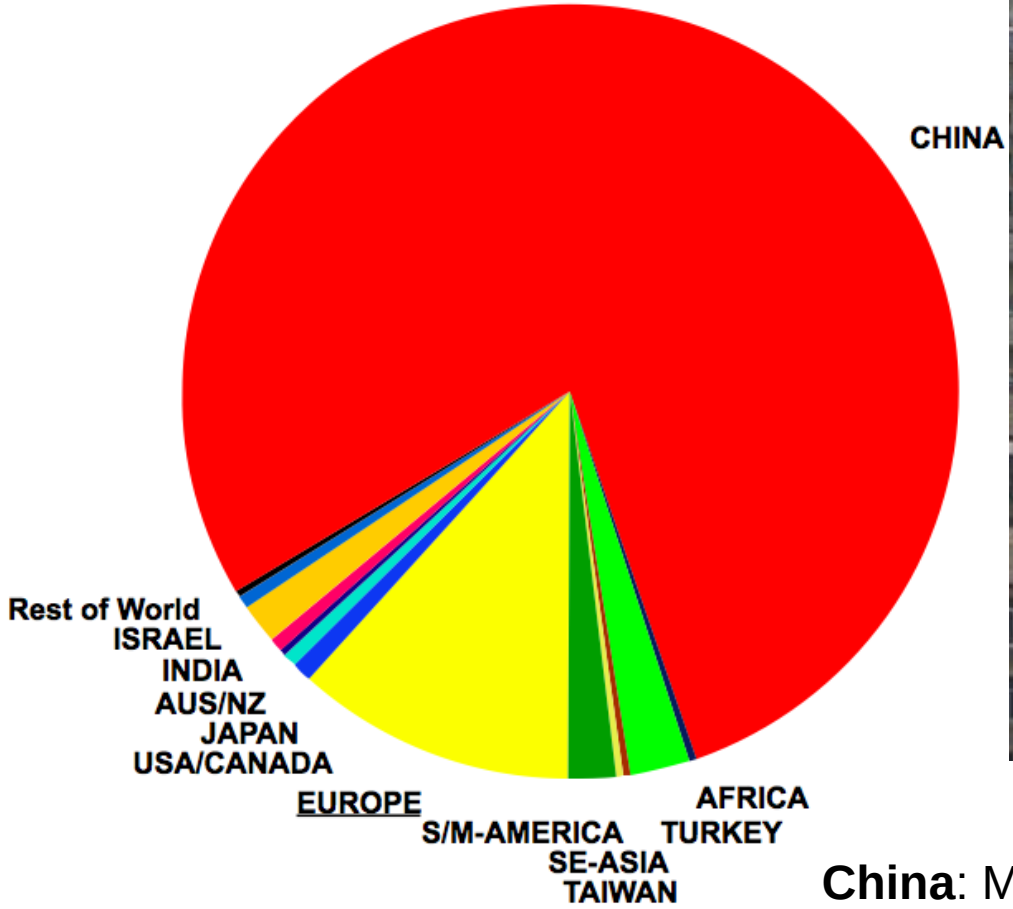
Image: Solvis

Image: Wagner & Co

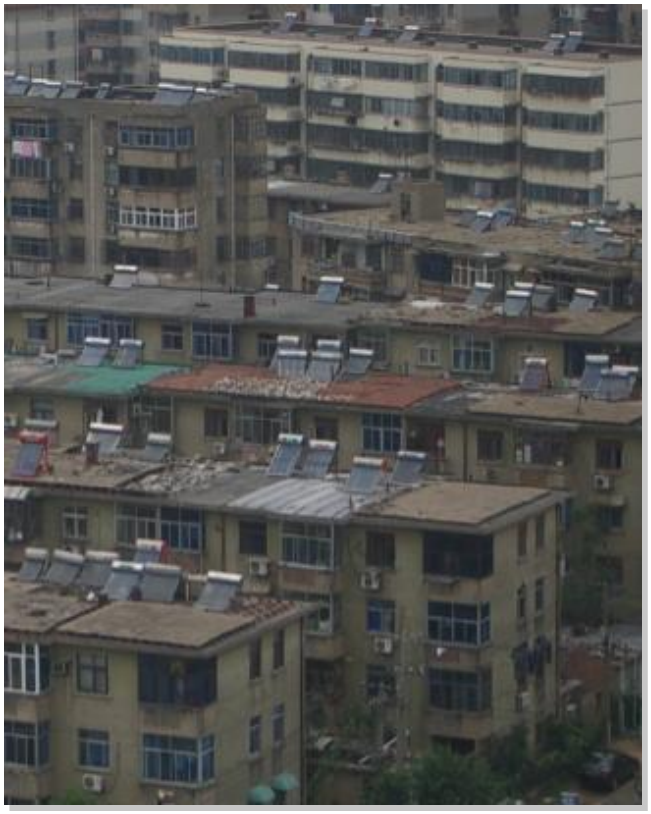
Solar Thermal Markets

German Solar Industry Association (BSW-Solar)

World market for solar thermal systems 2008: 39.5 Mio m^2 newly installed



Source: Werner B. Koldehoff

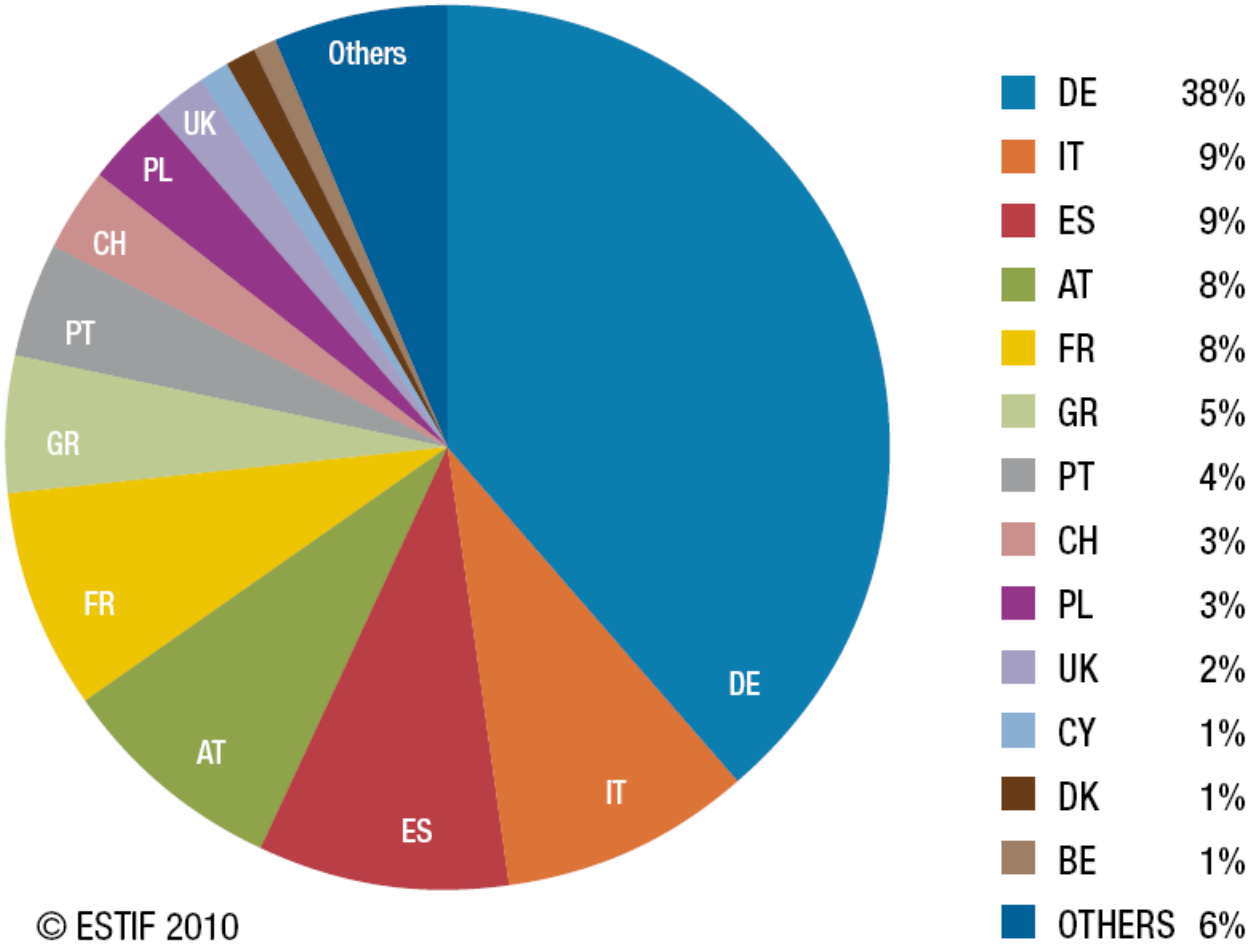


China: Market leader
(simple, cheap systems)
Europa: Technology leader

European Solar Thermal Market 2009

Market size: 4000 000 sqm

Shares of the European Solar Thermal Market (Newly Installed Capacity)



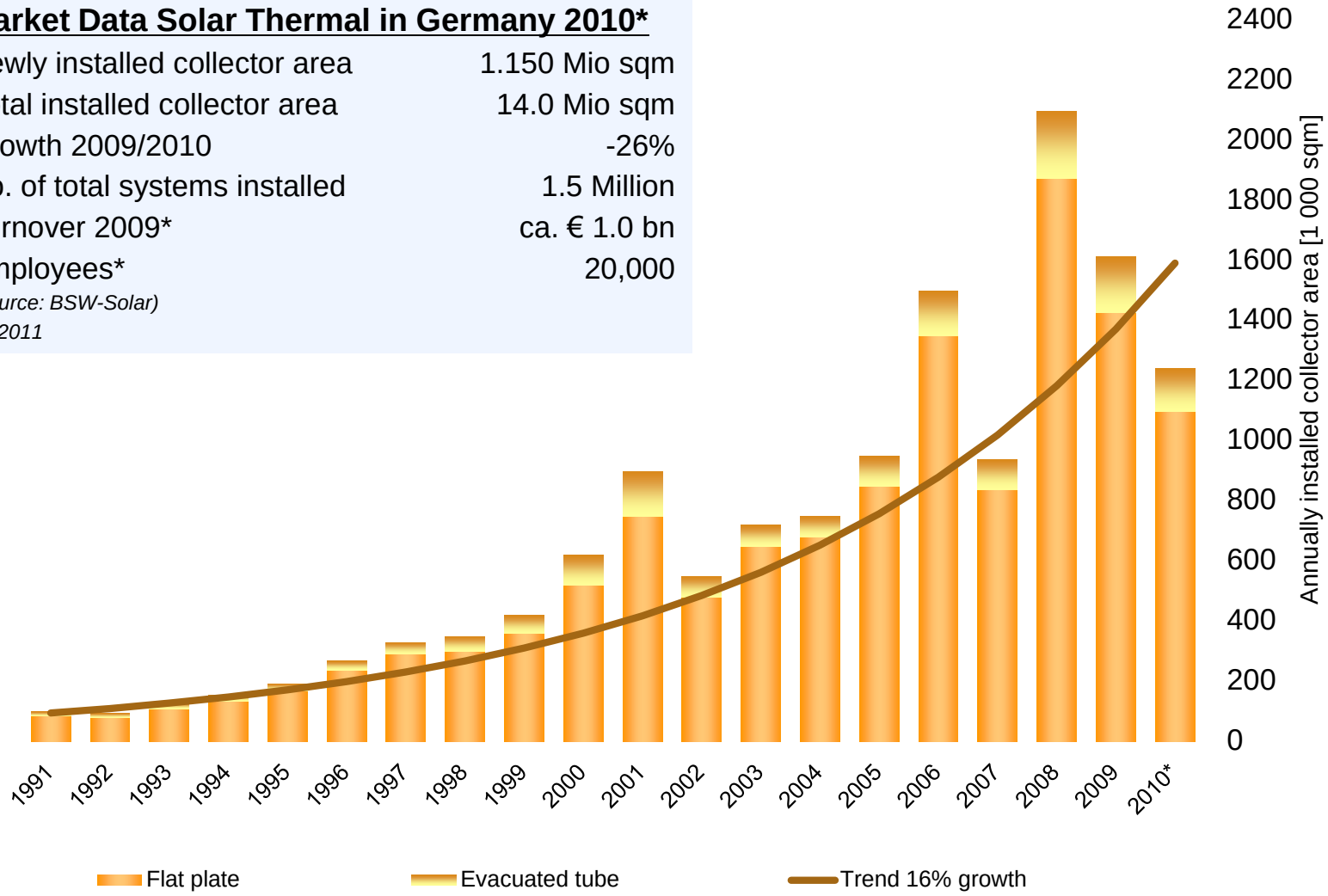
© ESTIF 2010

Development of the German ST market

Market Data Solar Thermal in Germany 2010*

Newly installed collector area	1.150 Mio sqm
Total installed collector area	14.0 Mio sqm
Growth 2009/2010	-26%
No. of total systems installed	1.5 Million
Turnover 2009*	ca. € 1.0 bn
Employees*	20,000

(Source: BSW-Solar)
** 1/2011*



Solar Thermal Support Schemes in Germany

Main Instrument: Market Incentive Programme (MAP)

Market Incentive Programme (MAP) – Grants and Loans:

- Federal support for solar heat (< 40 m2 + some exceptions), bio mass, heat pumps
- Aims at heating systems
- Support only for combined systems in **existing buildings** under the condition
  - High efficiency pump grade „A“
  - Hydraulic balance of system compulsory from 1. Sept. 2011
- Budget is approx. 310 Million € in 2011 + up to 40 Mio. € from climate fund
- Annual adaption of support programme
  - Main problem: „Stop-and-Go“

MAP-Programme for refurbishments in the building stock

Basic support per m2 collecor surface (CS) for combined systems DHW & space heating

- 120€/m (90€ /m2*)
- 4800 € + 45 € / m2 for syst. > 40 m2 1 & 2 family houses
- 45 € / m2 for extension of exist. Systems
- 180 € / m2 for multi family houses (20 – 40 m2)

Efficiency boni

- 60 € / m2 for well insulated € 1 & 2 family buildings **(45 / m2*)
- 2400 € (1800 €*) + 22,5 € / m2 > 40 m2 for well insulated multi fam. / others
- 50 € / pumps

Boni for repalcements of old oil and gas boilers by renewable technologies or modern condensing boilers in combination with solar thermal 600 Euro (500 €*).

*1. Jan. 2012 ** 30 % above 2009 EnEV (Energy efficiency regulation)

Renewable energy heat obligation (since 2009)

- Obligation for the use of renewable energies to cover a certain share of heat demand in building
- Concerns only new buildings
- National aim: Provide 14% of renewable heat by 2020 (from: 6% in 2008)
- **Problem**: Implementation of the law is not effectively regulated

Details concerning the renewable energy heat obligation

Provision of heat demand in new buildings by alternatively:

- At least 15% by solarthermal systems,
- At least 50% biomass (e.g. wood pellets), liquid biomass or natural heat (heat pump) or
- At least 30% by biogas with combines heat and power systems

Fulfillment of obligation for solar thermal:

- One / two family buildings: min.: 0.04 m2 collector surface per square metre used space
- Multifamily buildings: min 0.03 m2 collector surface per square metre used space

Combinations of different technologies are possible

Other support instruments

- KfW programme for solar systems > 40 m2 providing a grant that covers 30 % of system costs
- Additional programmes in several federal states (e.g. Hamburg, Saxony, etc.)

Solar Thermal strategies to enhance technology and market penetration

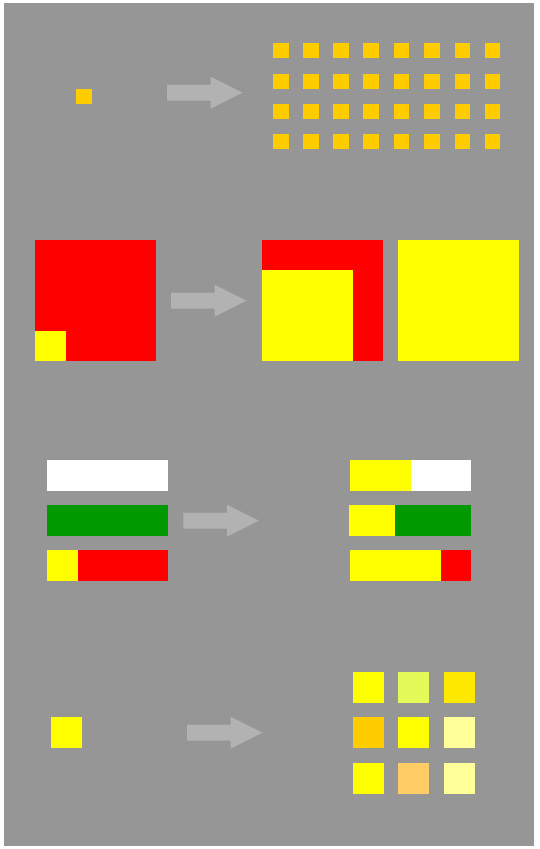
4 strategies needed to develop the full potential of ST

1. The **number of solar thermal systems** has to be sharply increased

2. The **share of solar thermal energy per buil-ding** has to be increased step-by-step up to 100%

3. ST has to be introduced in **new market segments** like public buildings and the commercial sector

4. **New ST applications** have to be developed like solar assisted cooling, district and process heating



Challenges for the industry research

Technology for collectors

- New materials, lower costs
- Integration into the building envelope
- Process heat collectors, Photovoltaic-Thermal (PVT) and
- air collectors

Storage technologies

- Seasonal storage (big and very huge)
- High energy density (Latent- and chemical storage)

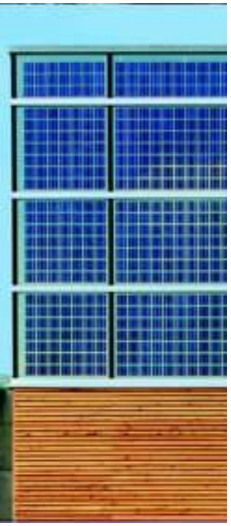
Active solar house

- System technology, Cost reduction

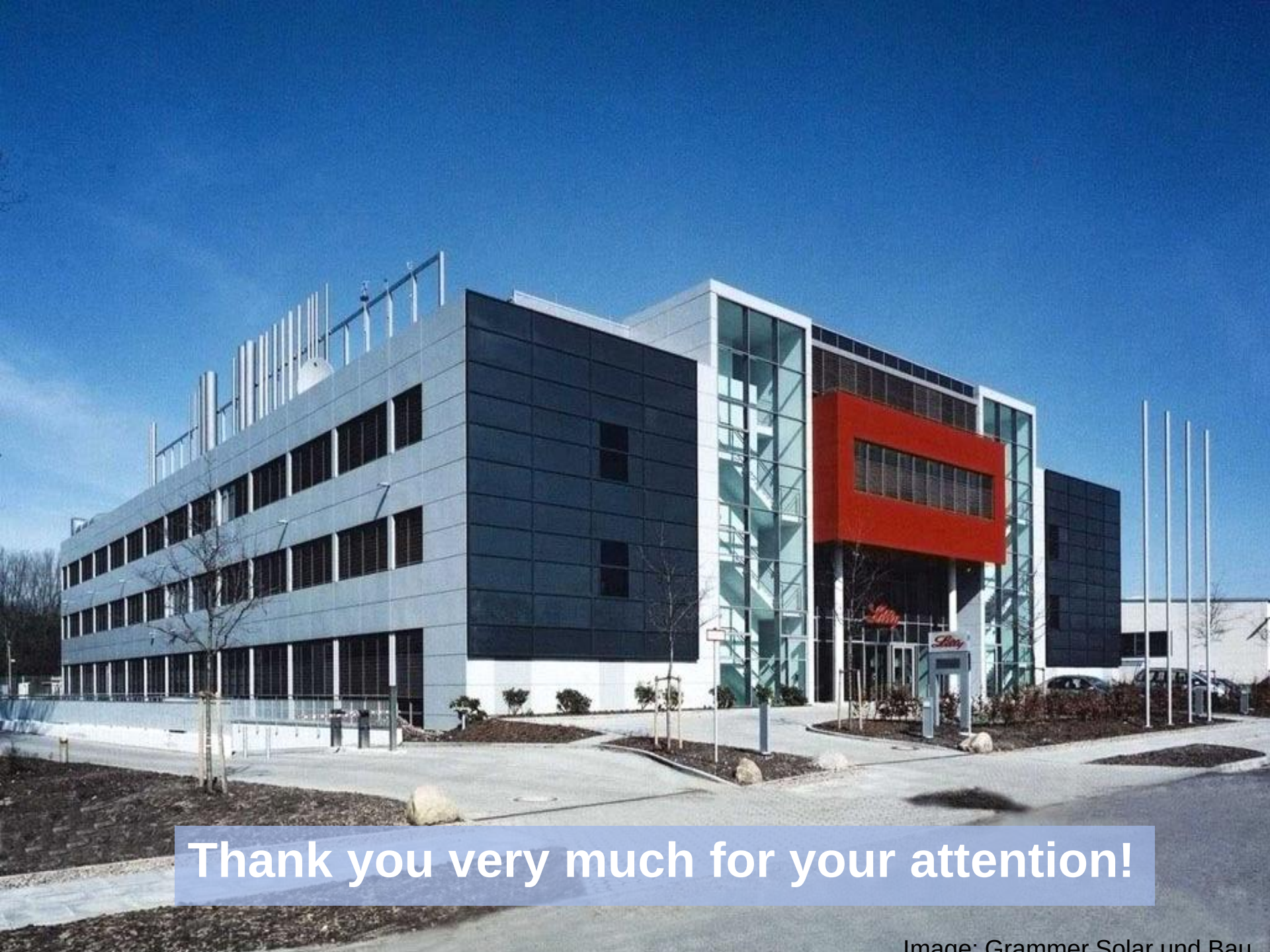
Process heat

- Solar Cooling
- Industrial Processes

Conclusions



- German companies have more than 30 years of experience in developing and producing Solar Thermal technologies
- Industry & Research closely work together to enhance technology, to create cheaper and more efficient solutions
- The industries are mature, therefore solar energy can play a leading role in the provision of clean and renewable energy
- German companies can provide clients around the world with technological solutions.



Thank you very much for your attention!

Image: Grammer Solar und Bau