

# 2<sup>nd</sup> Annual renewable energy finance forum – China

## **China's Solar Market**

German Technical Cooperation  
Frank Haugwitz

The Kerry Centre, Beijing March 29-30, 2007

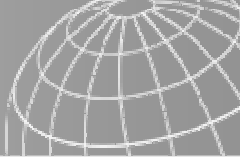


# Key Power Sector Data 2004-2006

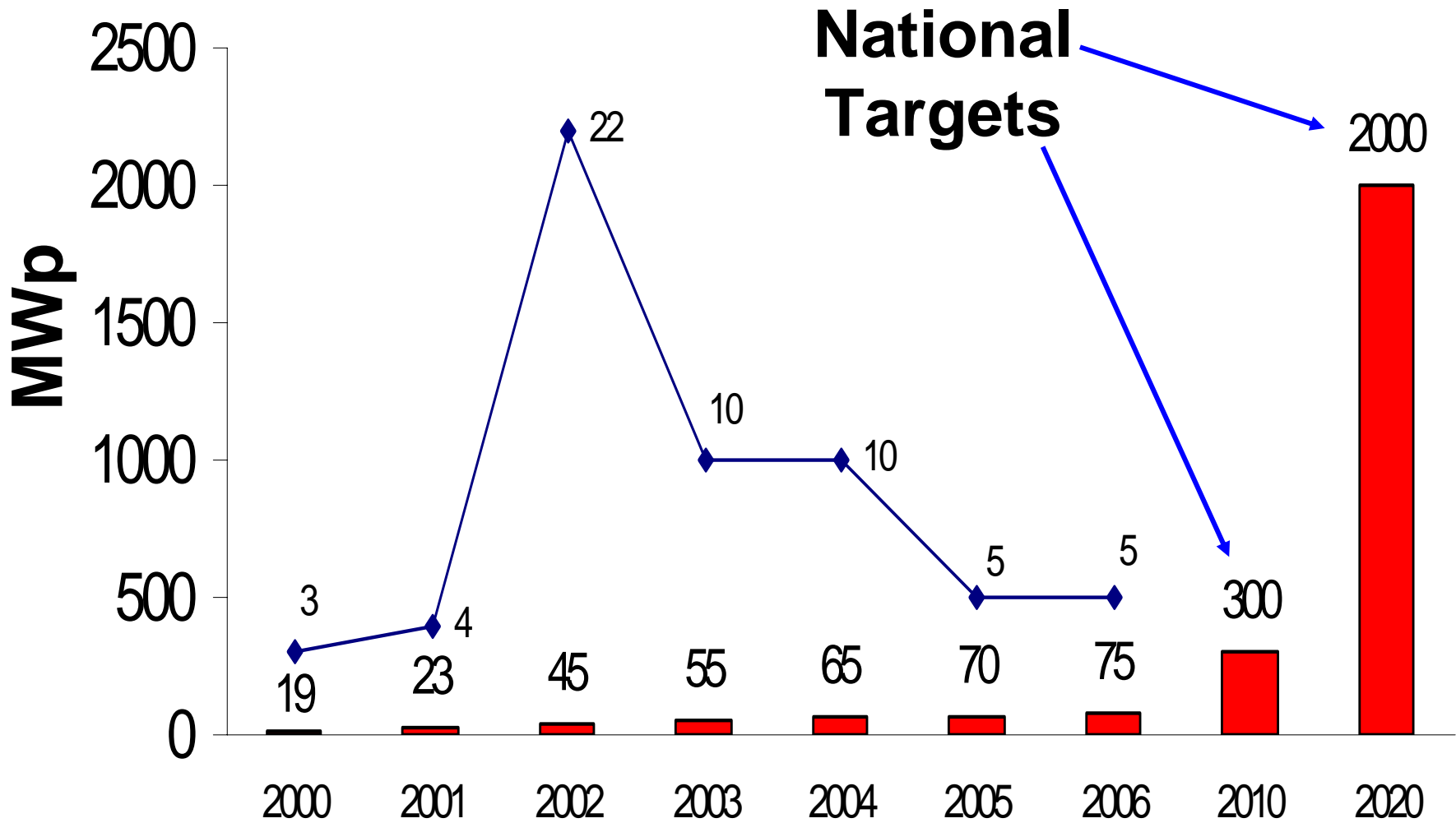
|                   | <b>2004</b> | <b>2005</b> | <b>2006</b> |             |
|-------------------|-------------|-------------|-------------|-------------|
| Thermal           | 332         | 383         | 484         | 77,8%       |
| Hydro             | 104         | 116         | 128         | 20,5%       |
| Nuclear           | 6           | 7           | 7           | 1,1%        |
| Renewables        | 1           | 2           | 3           | 0,5%        |
| <b>Total (GW)</b> | <b>442</b>  | <b>508</b>  | <b>622</b>  | <b>100%</b> |

In 2006:

- Electricity Consumption: +14%
- Coal Consumption: +8%
- Oil Consumption: +14,5%
- GDP Growth: +10,7%

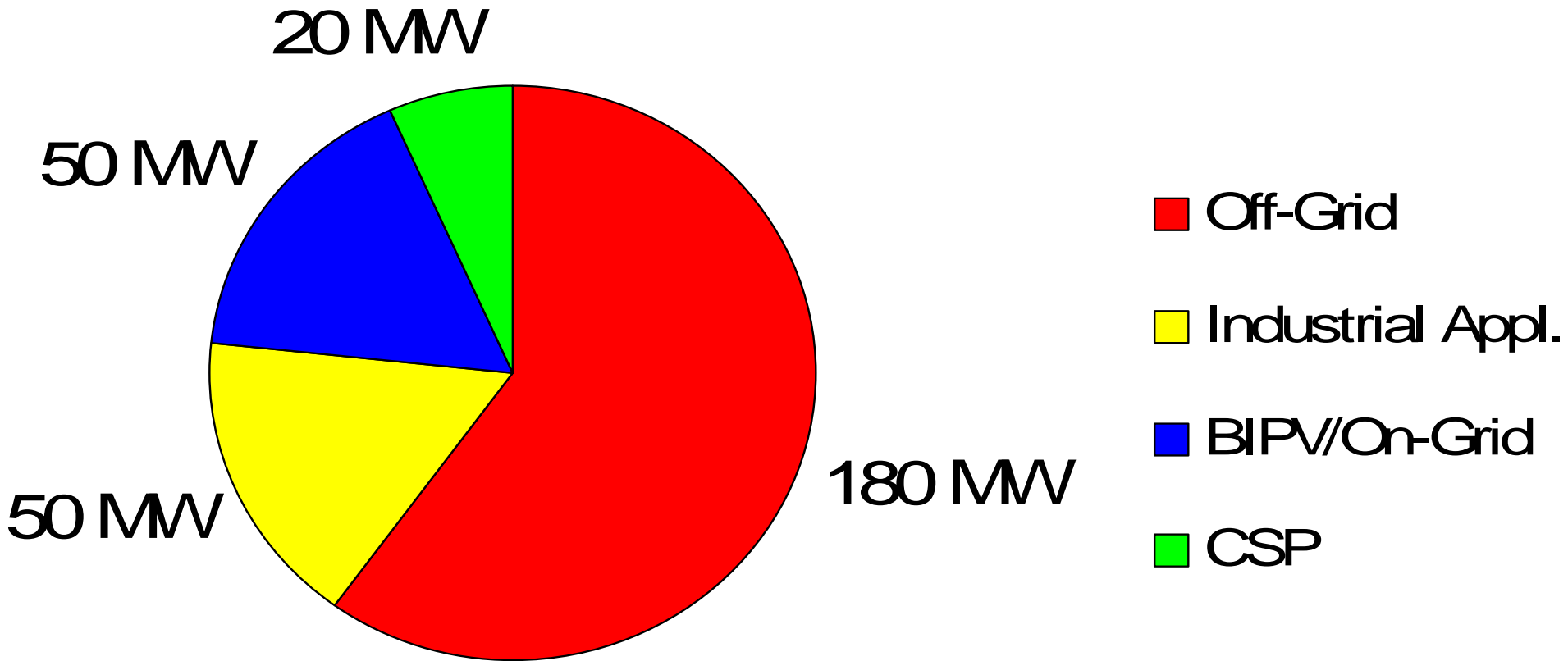


# Installed PV-Capacity 2000-2020





# PV-Market by 2010 (Est.)





# Energy from the Desert



# Additional Future Drivers

## Legislative Framework Conditions

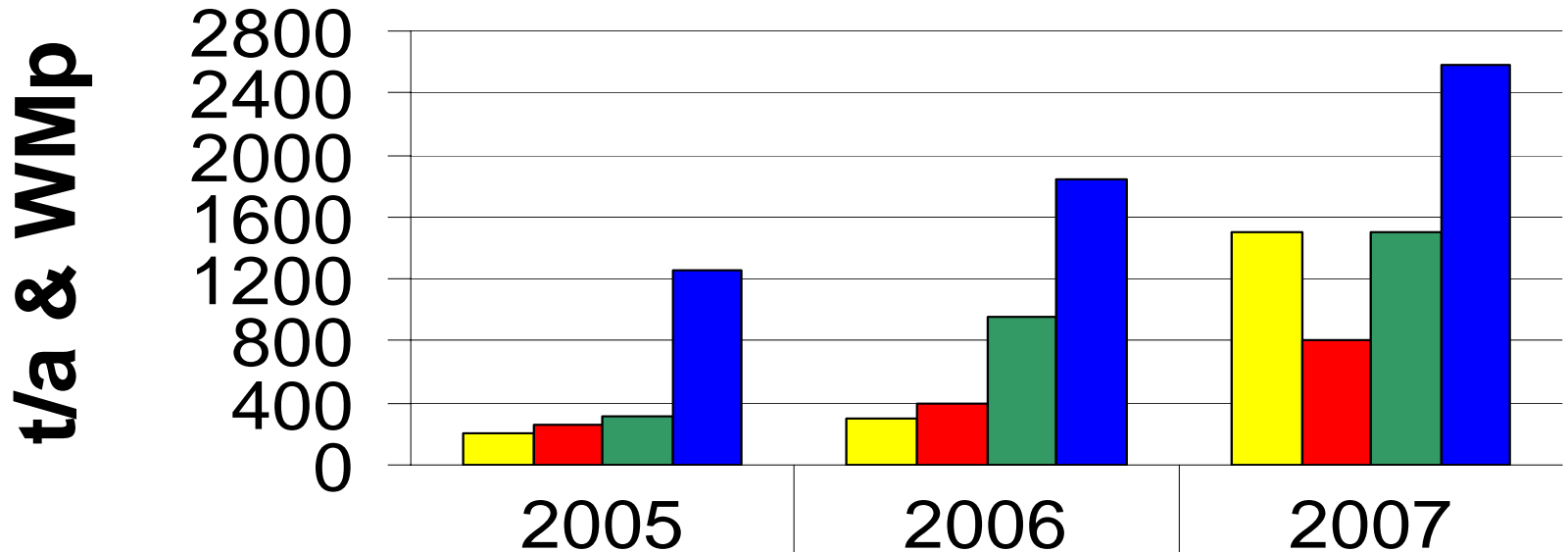
- January 2006 RE-Promotion Law came into effect
- State Council established RE Development Fund
- National Energy Law under preparation
- Long-term Scientific & Technological Dev. Plan

## Regional Initiatives & Major Events

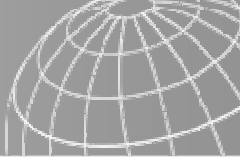
- By Law Shenzhen mandates SWH in 12Fl. Bldg.
- 2005-2015 Guangdong 100000 Roof-Program
- August 2008 Olympic Games - Beijing
- 2010 Expo - Shanghai



# PV-Industry Development 2005-2007



|              |      |      |      |
|--------------|------|------|------|
| Silicon t/a  | 200  | 300  | 1500 |
| Wafer (MW)   | 260  | 400  | 800  |
| Cells (MW)   | 320  | 960  | 1500 |
| Modules (MW) | 1250 | 1850 | 2580 |

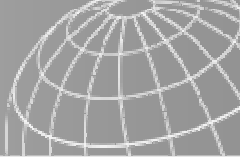


# Domestic Supply of Silicon

|                 | 2004         | 2005        | 2006 (Est.) |
|-----------------|--------------|-------------|-------------|
| Demand          | 585          | 1596        | 3080        |
| Supply          | 57.5         | 80          | 340         |
| <b>Shortage</b> | <b>527.5</b> | <b>1516</b> | <b>2740</b> |

| Manufacturer     | Capacity t/a    | Investment in Mio. € | Schedule      |
|------------------|-----------------|----------------------|---------------|
| Sichuan Emei     | 300             | --                   | 2006/8        |
| Luoyang Zhonggui | 300             | --                   | 2005/12       |
| Luoyang Zhonggui | 700 / 1260      | -- / 140             | 2007/3 / 2008 |
| Sichuan Xinguang | 2000            | 110                  | 2007/6        |
| CSG Holding Co.  | 1500 / (5000?)  | 600 ?                | 2008/12 ?     |
| Qujing Aixingui  | 3000 / (10000?) | 250                  | 2008 ?        |
| <b>Total</b>     | <b>9060</b>     |                      |               |





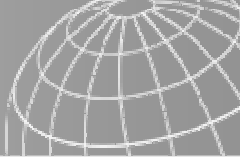
# Strengths vs. Weaknesses

|   |  |
|---|--|
| Unskilled labour 1 €/hrs                                    | Limited skilled labour                                 |
| Willingness to constantly improve production process        | Lack of Quality Consciousness                          |
| Domestic production technology could reduce costs           | 80% of all production technology imported              |
| OEM Manufacturer Ambitions                                  | Lack of Transparency<br>Market Stakeholder             |
| Income Tax Grace Period /<br>VAT Refund                     | International Business Code –<br>Lack of Understanding |
| Lower Costs for Construction,<br>Lease Land and Electricity |  |



# Resümee and Perspectives

- Targets, Programmes & Investments confirms the political commitment to promote the utilization of PV
- 2005: Industry Turnover 1,53 Bio. € before Tax / with share of Modules approx. 870 Mio. € - by 2010 est. 1,5 - 2 Bio. €
- Present Focus on Rural Electrification will in the mid-term be replaced by grid-connected applications
- RE-Law (Feed-in-Tariff/Quotas) could trigger a greater domestic market demand
- Extreme growth of domestic industry lead to cut-throat competition – long term supply contracts signed
- Capacity Factor 30-40% - more IPO in the pipeline



# Resümee and Perspectives

- Future domestic silicon supply could make them more independent
- Expansion plans of PV-Industry are based on strong export orientation - recent acquisition of MSK Japan
- Establishment of Regional Sales Offices e.g. EU/USA
- Concern that main export markets face saturation too soon and intl. M&A activities of foreign competitors could become a problem for less intl. experienced Chinese companies



# Thank you for your attention !

## Contact

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