Disclaimer

This presentation is based on information currently available to management. The forward-looking statements contained herein could be substantially impacted by risks and influences that are not foreseeable at present, so that actual results may vary materially from those anticipated, expected or projected.
Oerlikon At a Glance

- 19,750 Employees worldwide – and growing
  - 2500 Global Support
  - 1500 Scientist and Engineers
- 35 Countries
  - 170 Global locations
- >250 Million CHF R&D investment in 2007
  - 6700 Living patents
Oerlikon group - leading platform for key business levers

1. Innovation + Cross Segment R&D
   Close to core and beyond

2. Operational Excellence
   - Continuous Improvement
   - Quality Circles
   - Integrated Supply Chain & Lean Manufacturing
   - Safety & Certifications
   - Operational Excellence
   - Controlled Processes
   - Business Process Management
   Customer focus and competitiveness

3. Regional Presence
   Global competence with customer proximity

4. Our Employees
   Training and development
Key Member of Oerlikon Group
Oerlikon Solar Footprint

**North America**
- Sales
- Customer Support
- Operations *est. 2009*

**Europe**
- Solar HQ
- Operations
- Pilot Line
- Advanced R&D
- Product Development
- Customer Support & Training

**Asia**
- Sales
- Operations
- Pilot Line
- Technology Center
- Customer Support
- & Training
Solutions for a Solar Powered World

- Market Opportunity
- Achieving grid parity
- Oerlikon Solutions
Global Energy Demand

China and US/Canada have the greatest growth in demand.

Over 2/3rds of electricity generated today is from fossil fuels today.

Source: Credit Suisse and McKinsle & Co.

*Quadrillion British Thermal Units

**for 2005
Drivers for New Energy Sources

- Increased Energy Demand
- Rising Costs
- Diminishing Fossil Fuel Resources
- Environmental Concern and Regulations
- National Security

![Graph showing Renewable Primary Energy Supply with CAGR and Total Market 78%](image_url)
### Renewable Energy Options

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Potential (TW)</th>
</tr>
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<tbody>
<tr>
<td>Sun</td>
<td>120,000.0</td>
</tr>
<tr>
<td>Geothermal</td>
<td>12.0</td>
</tr>
<tr>
<td>Wind</td>
<td>3.0</td>
</tr>
<tr>
<td>Tides and Ocean Currents</td>
<td>2.0</td>
</tr>
<tr>
<td>Hydroelectric</td>
<td>0.5</td>
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</tbody>
</table>

Solar has greatest potential to meet world’s growing electricity needs compared to other renewable energy sources.

Source: Engineering and Science No. 2 2007
Solar Market Segments and Applications

<table>
<thead>
<tr>
<th>Segment</th>
<th>Sample Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Industrial/ Habitation</td>
<td>Communications, Signals, Security, Water, Power, Outdoor Lighting</td>
</tr>
<tr>
<td>Consumer Power/ Indoor</td>
<td>Recreational, Automotive, Consumer, Novelty, etc</td>
</tr>
<tr>
<td>Grid Connected</td>
<td>Residential, Commercial, Utility</td>
</tr>
</tbody>
</table>

**Key PV industry drivers**

- Grid connected systems are the engine of the industry, with highest year-on-year growth approaching 50% since 2000
- Large scale ground ground-based GW system need to be established

**Grid-Connected Applications are >85% of the PV market**
Solutions for a Solar Powered World

- Market Opportunity
  - Achieving grid parity
- Oerlikon Solutions
Achieving Grid Parity → Lowering the Cost per Watt

\[
\frac{\$}{W_p} = \frac{\text{Total Cost}}{\text{Throughput} \times \text{Power}}
\]

- Oerlikon Advantage
- Turnkey Advanced Manufacturing Lines
- Micromorph High Efficiency Tandem Solar Cells
Grid Parity for PV in California and Spain ~2011-2015

Cost of PV electricity generation California ($/kWh)

- Grid price increasing by 2-3.5% p.a.
- PV generation cost downside
- PV generation cost upside

Cost of PV electricity generation Spain ($/kWh)

- Grid price increasing by 2-3.5% p.a.
- PV generation cost downside
- PV generation cost upside

Forecast for global Grid Parity is 2011 to 2014

*~6kW/m² per day solar irradiance assumed
Source: Oerlikon analyst reports
Cost of Ownership Development to Grid Parity

Thin Film Si Roadmap

- **Equipment cost decrease**
- **Material cost decrease**
- **Other cost decrease**
- **Tact time decrease**
- **Cell efficiency increase**
- **Economies of scale**

**2007**
- for 20 MWp fabs
- $< 1.5 $/Wp (<1.12€*/Wp)

**2010**
- for GWp fabs
- $< 0.7 $/Wp (<0.52€*/Wp)

(Calculated with an exchange rate of €1.00 =$1.34)
Achieving Grid Parity

**Fab nominal capacity**

- **CapEx per Watt**
- **Cost of ownership**

![Graphs showing the cost of ownership, module efficiency, and fab nominal capacity over time.](image)

(Calculated with an exchange rate of €1.00 = $1.34)
Solutions for a Solar Powered World

- Market Opportunity
- Achieving grid parity
- Oerlikon Solutions
# 2 Primary Production Technologies for Solar Cells

<table>
<thead>
<tr>
<th>Technology</th>
<th>Substrate</th>
<th>Cell</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline Silicon</td>
<td><img src="crystalline%E7%A1%85%E5%9B%BE%E6%A0%87.png" alt="Image" /></td>
<td><img src="solar-cell.png" alt="Image" /></td>
<td>Cost Silicon Supply</td>
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<tr>
<td>Thin Films</td>
<td><img src="thin-films.png" alt="Image" /></td>
<td><img src="thin-films-cell.png" alt="Image" /></td>
<td>Large Scale Mfg. Efficiency</td>
</tr>
</tbody>
</table>
Thin Film Solar Cell Basics

Thin Film Solar Panels

Thin Film Solar Cell Structure

Manufacturing Order

- Glass
- Front Contact
- PV Material
- Back Contact
- Lamination
- Glass

Thin Films
Key process elements needed for scalable Thin Film PV Manufacturing

- **LPCVD**
  - Deposit Contacts

- **PECVD**
  - Deposit PV Material

- **Laser Scribers**
  - Define Cells
Thin Film is Fastest Growing PV Technology

![Graph showing installed solar cell manufacturing capacity from 2006 to 2015]

**2006-2015 CAGR**
- **Thin Film**: 74.8%
- **C-Si**: 49.4%
- **Total Market**: 54.0%

**Thin Film Drivers**
- **Cost advantage**: Thin Film reduces the amount of light absorbing material, leading to a reduction of CoO while technology increases efficiency.
- **Shorter energy payback period**: Production of thin film modules is less energy intensive.
- **Temperature coefficient**: The performance of modules remain more stable with increasing temperature.

Source: Commerzbank and Oerlikon estimates
Our Mission

To be the leading supplier of product and fab solutions for the PV manufacturing industry

- Equipment and Processes
- Building and Infrastructure
- Guaranteed Performance
Micromorph Process Technology—up to 50% more Efficiency

The principle of light trapping

• Integral to Micromorph process
  - High transmission in visible and near IR light spectrums

Jeannine P. Sargent * Piper Jaffray Clean Tech * February 20, 2008 * aew
Oerlikon Technology

- Turnkey Advanced Manufacturing Lines
  - Advanced process integration
  - Systems and support

Advanced process solutions plus high performance cell technology deliver lowest cost per watt

Turnkey Advanced Manufacturing Lines:
- Clean
- TCO
- Laser
- PECVD a-Si/μ-Si
- Laser
- TCO
- Laser
- Assembly
Oerlikon Turnkey Services

- Equipment Move-In
- System Installation
- Testing & Syst. Qualification
- Process Integration
- Production Ramp-up
- Coordinated Maintenance
- Uptime Improvement
- Quarterly Preventative Maintenance
- Equipment top condition
- PM adapt to the production

Delivering fastest time to money
Growing Solar Customer Base
Industry Announced GW Thin Film Fabs
Significant capacity ramp up following explosive demand

2007 Highlights

- Strong sales and order momentum – important global customer wins
- Introduction and first contracts signed for Micromorph technology
- Development of internal and external supply chain
- Formation of solar segment within Oerlikon and strengthening of management team

Outlook

- Ramp-up of global operations and supply chain to match substantial demand growth
- Continuous improvement/innovation of key components
- Focused completion of offering along the value chain

Order Intake 2007 > CHF 600M

*(Solar Sales 06-07 in Coating, 08- Solar will be reported as separate segment*
Solutions for a Solar Powered World

- Thin Film is Solar’s fastest growing segment contributing to a $134B (€100B) total Solar Market opportunity by 2015

- Oerlikon is on track to achieve grid parity by 2010

- Proven thin film solutions for high volume solar module production

(Calculated with an exchange rate of €1.00 =$1.34)
Oerlikon Solar offers cost-effective, proven solutions for the mass production of Thin Film Silicon Solar Modules.