

Oerlikon Solar

Thin Film Technology Driving Global Energy Solutions

Hamburg, 24 September, 2009

Chris O'Brien

Head of Market Development, North America



Oerlikon is a provider of clean-technology solutions

100 year history, 2008 sales of CHF 4.8 billion

Oerlikon Solar



- Leading provider of silicon based thin film solar technology

Oerlikon Coating



- Leading coatings in the automotive sector:
 - 10x durability
 - 4% less energy consumption

Oerlikon Graziano



- Transmissions for hybrid cars

- Vacuum solutions for the solar industry

Oerlikon Vacuum



Oerlikon Fairfield



- Loose gears for wind turbines

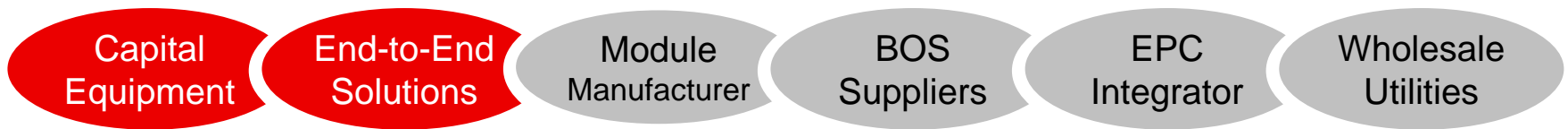
Oerlikon Systems



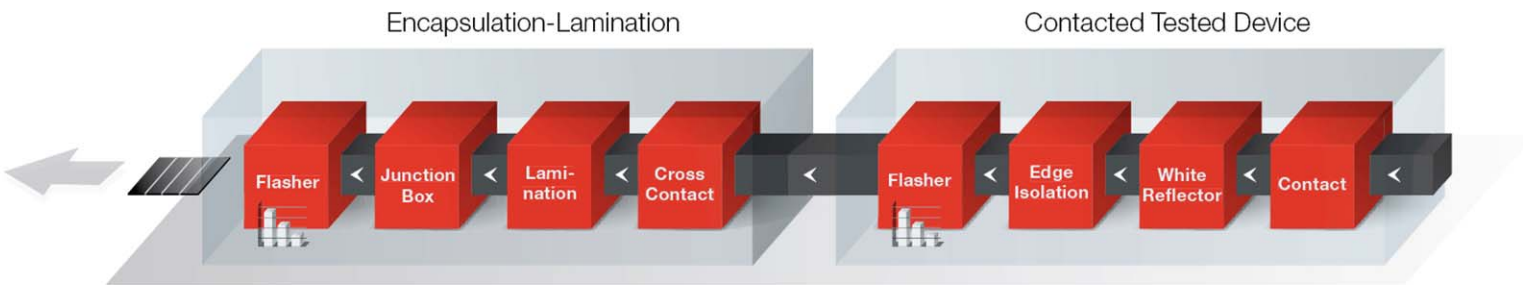
- Advanced Nanotechnology for solar cells, thermo-electric generators and batteries

Leading upstream position in thin film PV

Oerlikon Solar providing end-to-end production solutions



Line Automation



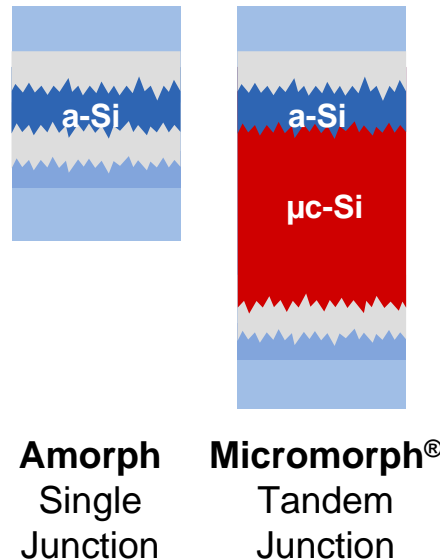
Oerlikon Solar Micromorph[®] Technology

Delivering up to 50% more power

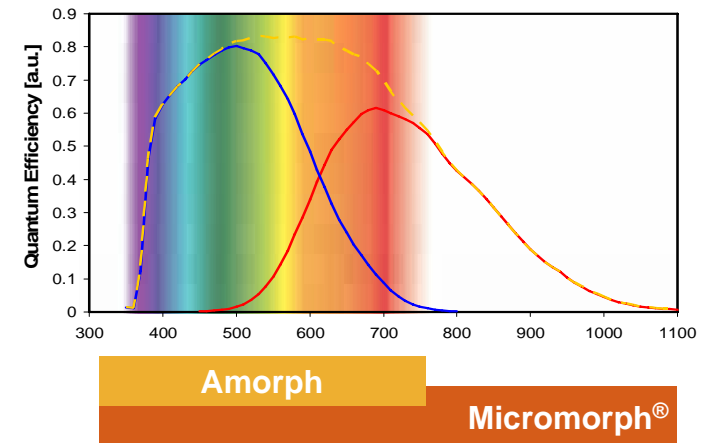
Cell Structure



Cell Cross Sections



Spectral Cell Sensitivity



Micromorph[®] is key enabler for lowest cost solar energy.

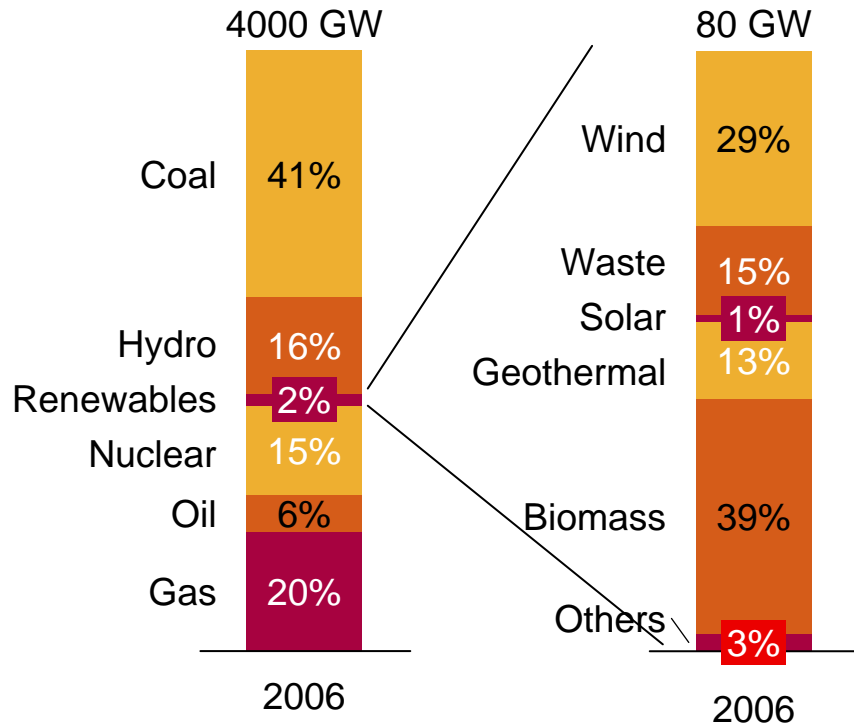
Recent technical highlights

- Oerlikon Solar Receives Micromorph® Master Certificate
- TÜV IEC master certification for Amorph and Micromorph®
- Announced record cell efficiency with over 10 % stabilized on amorphous silicon
- New record Micromorph® module with 151 Watt performance and over 11% efficiency (initial)
- VLSI Research Inc announced the ranking of the top 5 turnkey line suppliers to the PV manufacturing industry for 2008
- Oerlikon Solar KAI 1200 PECVD system wins the Cell Award 2009
- Oerlikon Solar TCO 1200 systems wins the Solar Award 2009



Vast addressable market for low-cost solar PV

Electricity world market size



Source: EIA

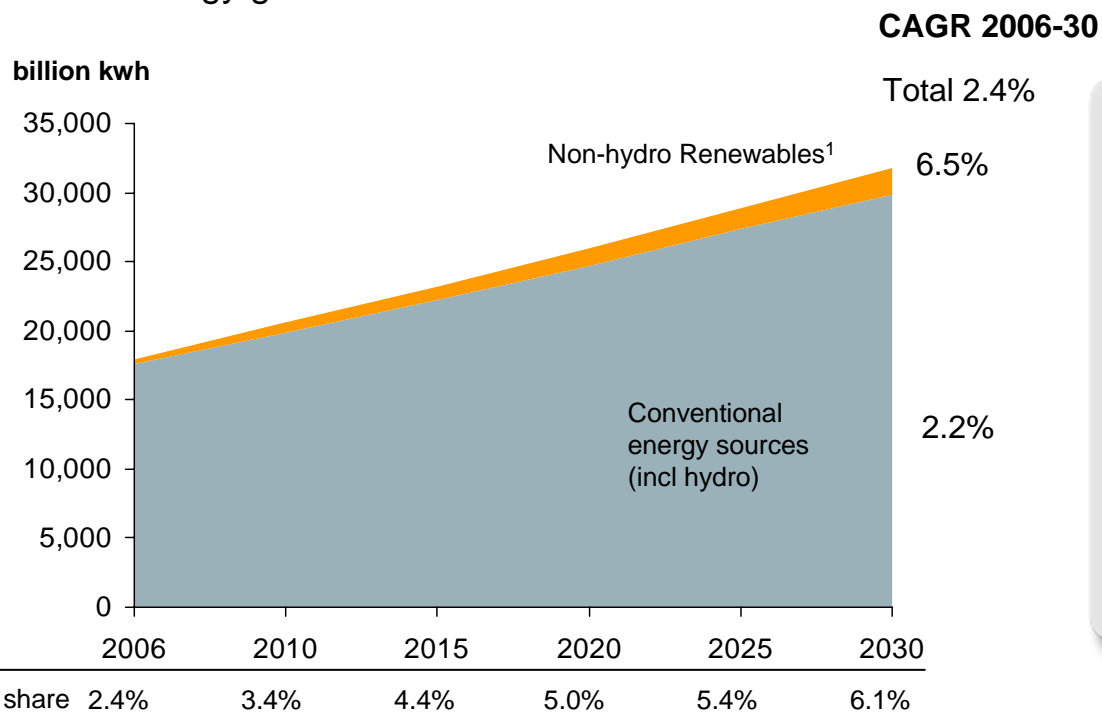


Solar power still holds less than 0.02% share of total world electricity production worldwide and bears strong growth potential

Electricity market update

Fundamentals: global electricity generation market growth

Global energy generation mix forecast



- Renewables grow with a CAGR of 6.5% whereas conventional energy grows with 2.2%
- Due to higher market share of renewables, the market share in the total energy generation mix is increasing to 6% in 2030.
- EIA is usually very conservative with renewable forecasts, especially solar.
- Additional demand for capacity from decommissioning (~2%/ p.a.)

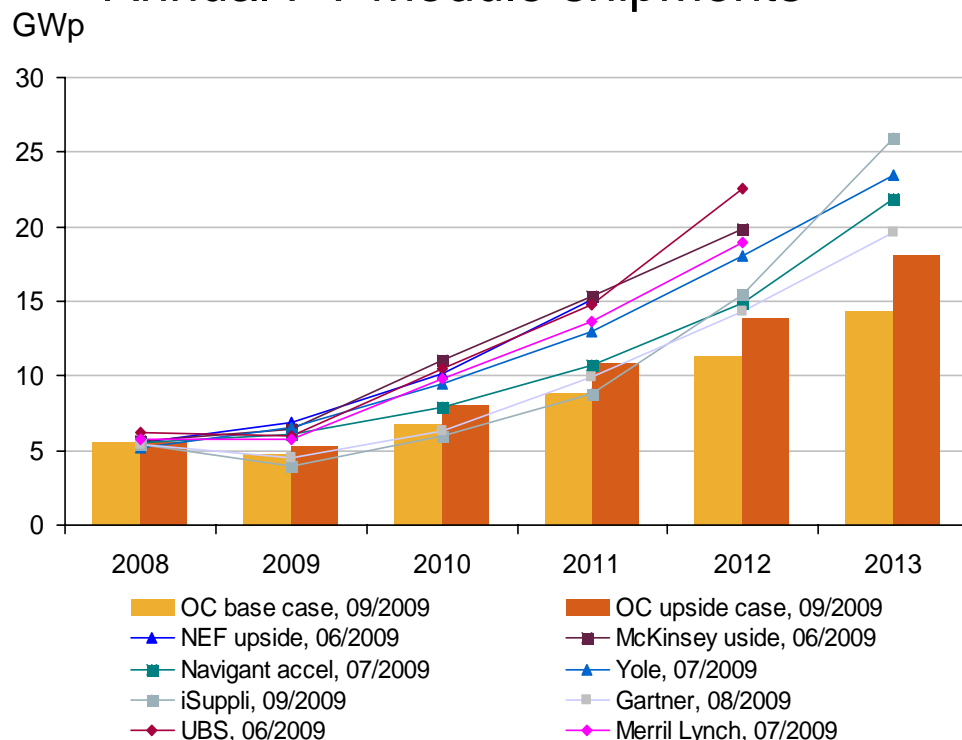
¹ Renewables include wind, geothermal, and other renewables

Source: EIA International Energy Outlook 2009

PV Market forecast

Thin Film share will increase in the next 5 years

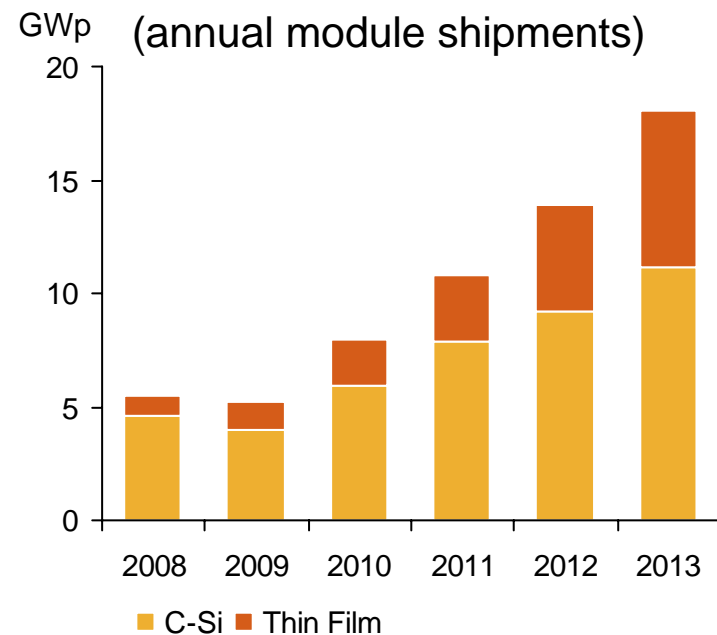
Annual PV module shipments



Source: Oerlikon Solar

Growth will return in 2010.

Growing share for TF



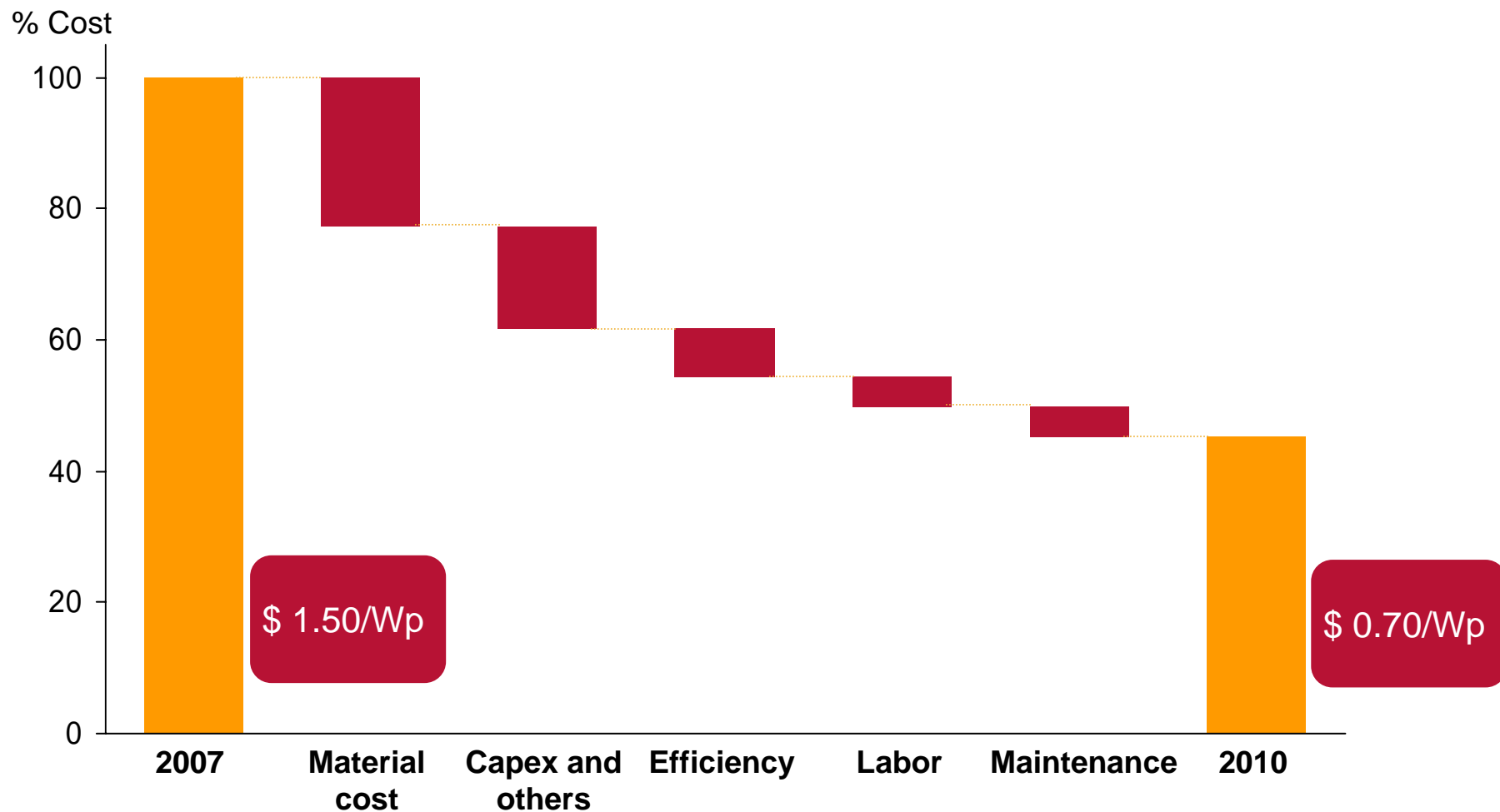
Source: Oerlikon Solar (upside case)

CAGR 2009-13

Thin-Film	53%
c-Si	29%
Total Market	36%

Cost Roadmap for Oerlikon Solar Micromorph®

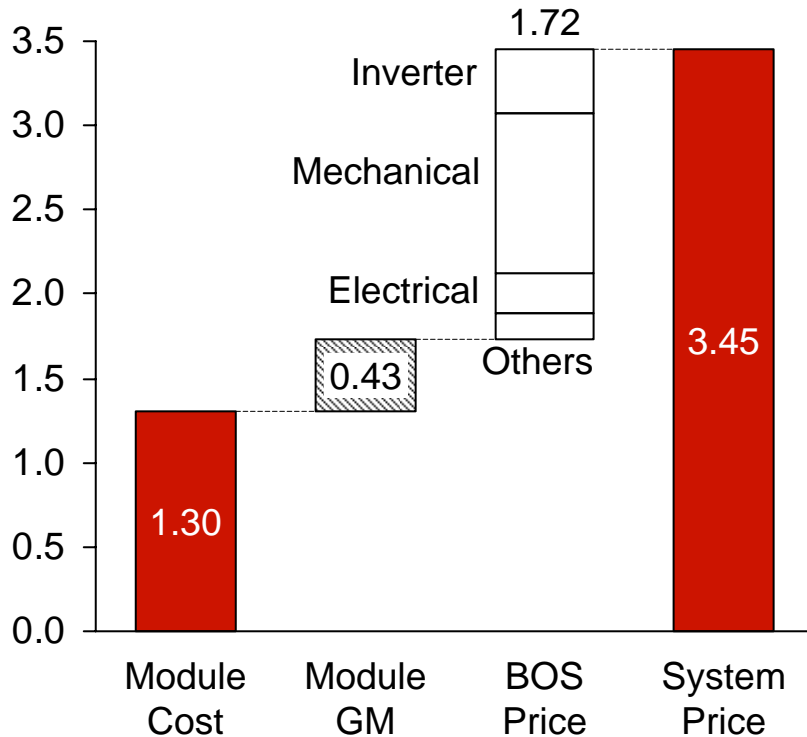
On track to deliver \$ 0.70/W by 2010



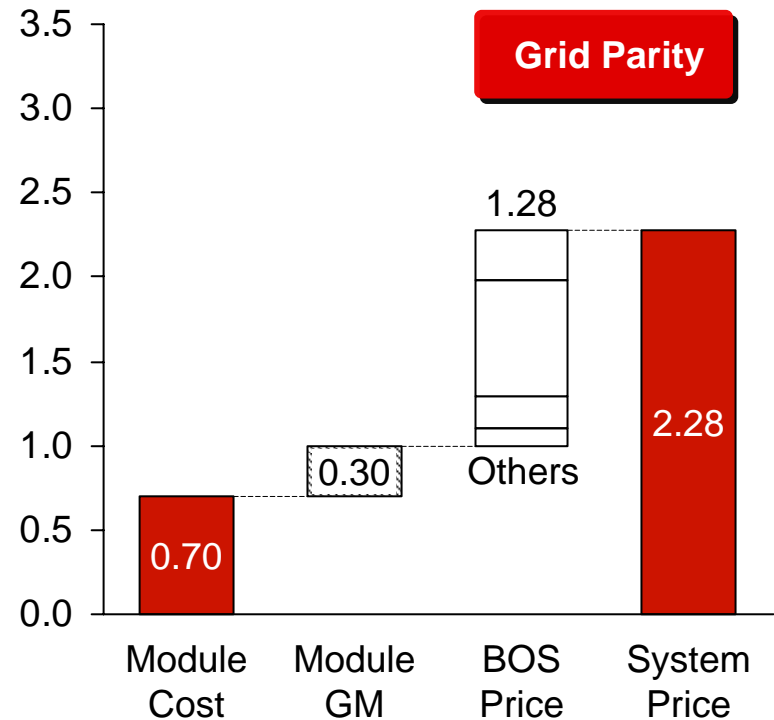
Driving to deliver least cost energy

Panel price is not the whole story

Oerlikon Solar Micromorph today
Cost of Electricity: \$ 0.14/KWh ¹⁾



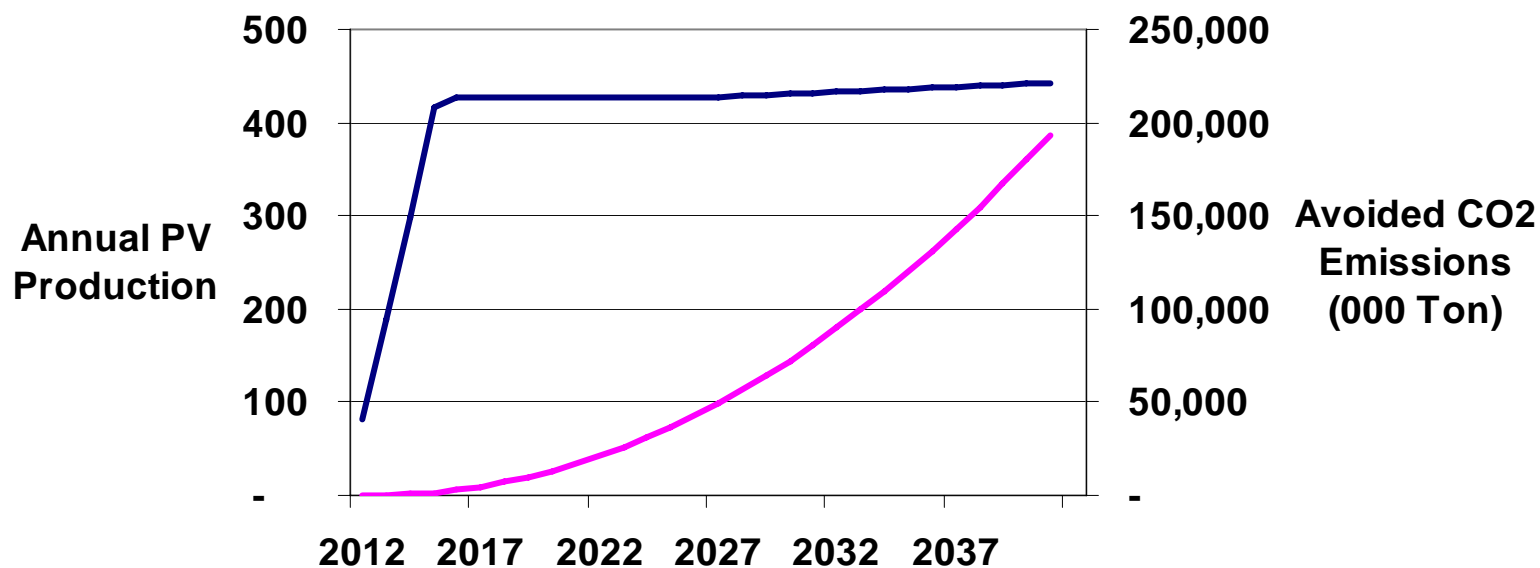
Oerlikon Solar Roadmap to end 2010 ²⁾
Cost of Electricity : \$ 0.09/KWh ¹⁾



1) Electricity Calculations for a 10 MW Project in California incl. ITC and Debt/Equity Cap. Structure
 2) Equipment Shipment (Module production ramped in 2012)

Substantial Contribution to Sustainable Energy

Avoided CO2 Emissions from Oerlikon Solar Mfg Plant



Oerlikon process includes abatement equipment for over 99.9% removal of residual cleaning gases

Thank you
for your attention.

