Unleash the Power of Sunlight

Advanced Materials & Chemicals

Dow Corning Solar Solutions
Eric Peeters, Business Vice President
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DOW CORNING

We help you invent the future.™

Dow Corning ...

A Leader in Si-based Chemistry

- A joint venture of The Dow Chemical Company and Corning Incorporated
- Organized to explore the potential of the silicon atom in 1943
- A global leader in silicones and high purity silicon
  - More than 7,000 products/services
  - Approx 25,000 customers
  - Approx 10,000 employees
  - Strong and healthy financially: $6.0 billion sales 2010
- Investing in our future and our customers' futures: *geographic, manufacturing, innovation*
- Focused on sustainability and Responsible Care®

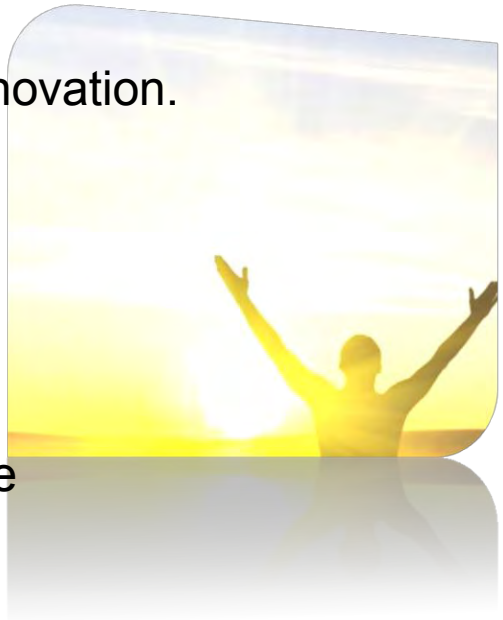
Ongoing Global Investments

2006	❑ First commercially viable metallurgical feedstock produced using large-scale manufacturing processes
2007	❑ US $1 billion investment in Hemlock Semiconductor
2008	❑ US $3 billion investment in Hemlock Semiconductor ❑ New manufacturing process lowers cost per watt of solar power ❑ Solar Solutions Application Center opened in Freeland, MI ❑ Investment in monosilane gas facility for thin films in Hemlock, MI
2009	❑ Launch of new encapsulant and processing solution ❑ Solar Solutions Application & Business Center opened in Newark, California
2010	❑ Announcement of investment in Solar Solutions Application Center in Korea ❑ Unveils Plans for new Solar Energy Exploration & Development Center in Europe ❑ Dow Corning and REIS Robotics announce alliance
2011	❑ Unveiled plans for Solar Solutions Application Center in China ❑ Solar Solutions Application Center opened in Korea ❑ Construction of European Solar Energy Exploration & Development Center complete

Materials Innovation increases Efficiency

The Fundamental Solar PV Challenge: Reduce cost per kWh!

- **Technology Innovation** to improve solar panel efficiency
  - mainstream c-Si PV entire value chain
  - Diversification in other types of PV technology … unlimited
- **Operational Excellence and Economy of Scale**
  - High throughput/yield through automation, process innovation.
  - Less capital investment through process optimization and innovation
  - Labor efficiency
- **Raw Material Conversion Efficiency**
  - Less raw material/Wp consumption
  - Enlarge material supply to ease the high material price pressure
  - Replacement by lower cost materials
- **Better Durability** for solar panels leading towards increased power output over a life-time of the module



Materials can help in the equation…

- **Use less materials**
  - Supply challenges
    - Speed of industry development
    - Materials availability
    - Think ‘smaller’, ‘thinner’, ‘lighter’
- **Use lower cost materials**
- **Use materials that increase durability**
- **Use materials that increase efficiency**
  - Output of kWh
  - Manufacturing efficiency
- **Use materials that enable novel & more efficient designs**

Intrinsic Benefits of Silicon-based Materials

Where conditions are extreme, silicone has the upper hand

Proven performance in Construction, Electronics and Solar Industries

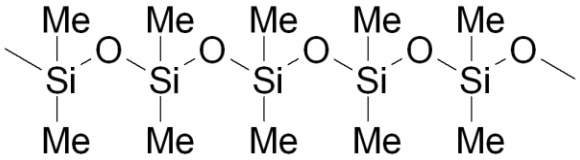
General Silicone Property Advantages

- Durability to UV exposure
- Wide temperature use range
- Corrosion resistant
- Ultra transparency
- Electrically insulating
- Low Moisture pick-up

Supply Chain Advantages

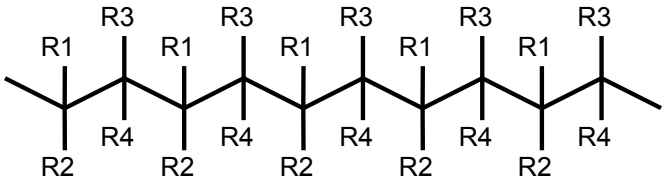
- Global availability
- Ease of delivery
- Not leveraged on petrochemicals
- Flexible chemistry/mass production

Silicones



Si – O bond: ~110 kcal/mol

Organics



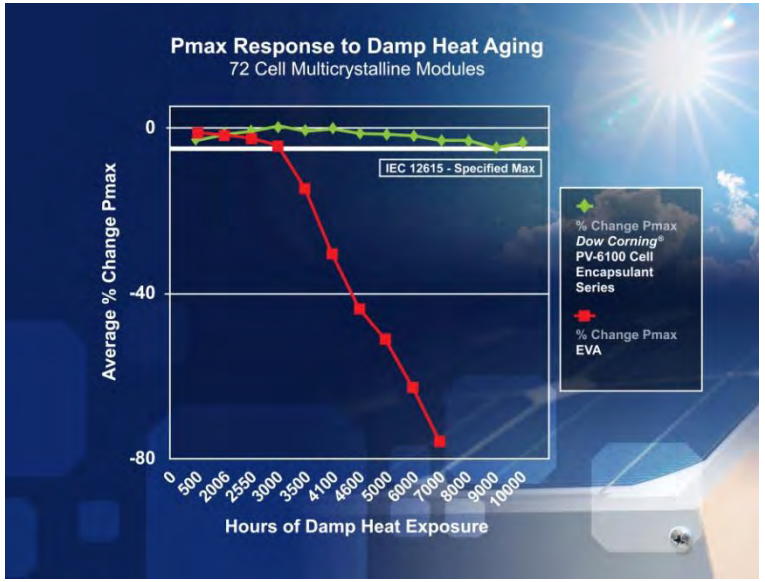
C – C bond: ~80 kcal/mol

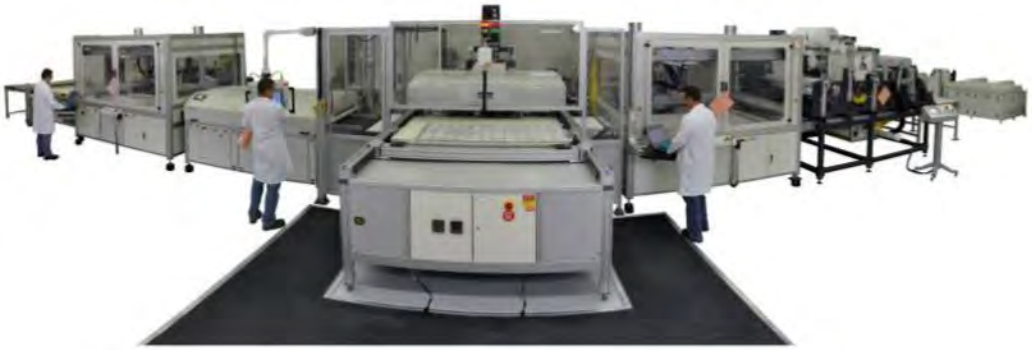
Materials Innovation increases Efficiency

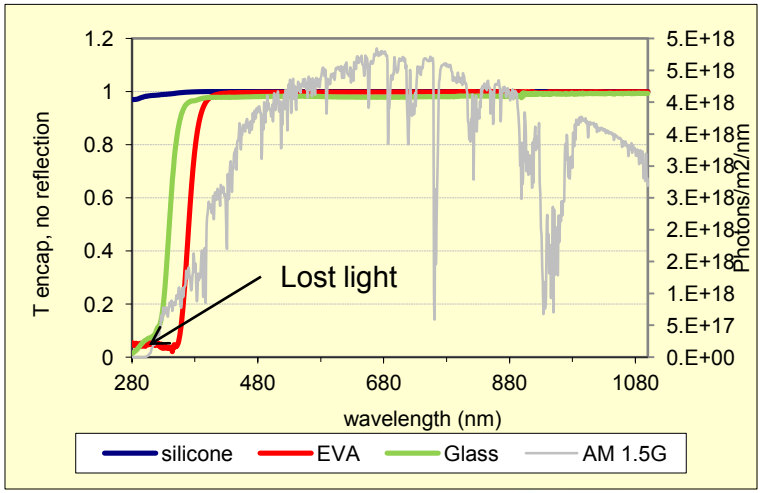
Examples

Silicone Encapsulation

- **Higher Manufacturing Output** - faster than traditional EVA method by 4 to 7 times
- **Improved Durability** and Power Output Stability
- **Improved Module Efficiency** - due to increased blue light transparency







Critical success factors for PV

- **Manufacturing** needs to be backed up with **world-class innovation**
  - Applied research in academia
  - Collaboration between academia and industry
- **Industry** needs to collaborate to align roadmaps
- **Investment** is needed to achieve world-class manufacturing standards with a high degree of automation. Consistent and stringent quality standards are needed for fabrication and installation
- **Technical talent** needs to be educated and developed to work throughout the solar industry value chain - from feedstock to installation
- **Global demand** needs to be stimulated in various ways, from research to manufacturing to installation

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www.dowcorning.com/solar

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