

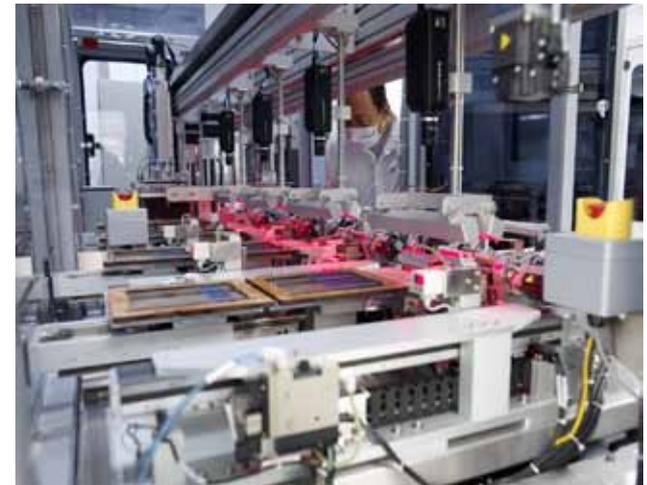
# Tyroan Hardy & Raphael Varieras CSI RD&D Program Presentation

February 10, 2011



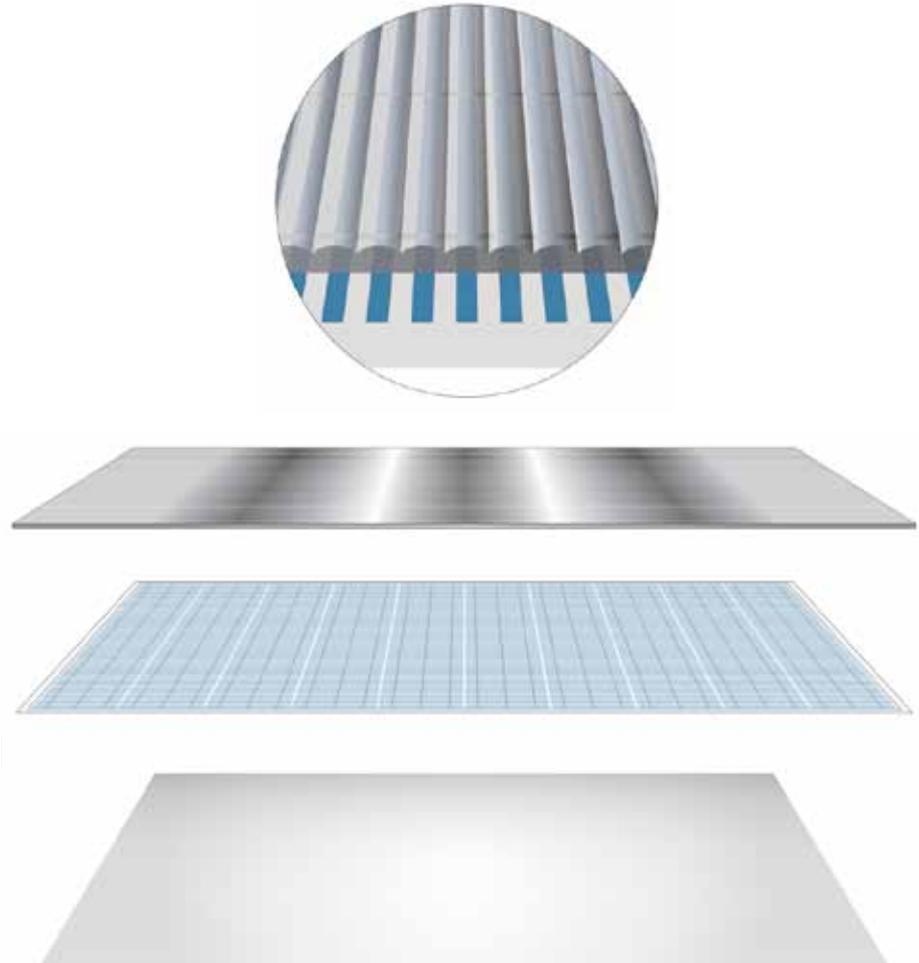
# Solaria

- Global manufacturer of competitive, low-cost silicon PV modules
- Breakthrough, low risk technology
- Proprietary manufacturing process
- Well-capitalized, backed by leading institutional investors
- Run by industry veterans and seasoned management team
- Worldwide operations in USA, Europe and India



# Solaria Low Concentration Photovoltaic Module

- 2x-3x concentration using low cost optics
- 50-67% less PV cell material
- Rapidly scalable – 4 months lead time
- Aligned with solar industry trends toward higher efficiency and lower cost



# Solaria Modules

- § **230 Watt** modules shipping
- § **270 Watt** modules available Q3/Q4 2011
- § Designed and optimized for tracker applications
- § Reliable and cost effective
- § First certified low concentration PV module





- Install 350 kWp on Multiple Tracker Applications
  - 1-Axis Horizontal Tracker
  - Azimuth Tracker
  - 2-Axis Tracker
- Demonstrate of Solaria Low Concentration Modules
- Data Collection
  - Performance
  - Reliability
- Increase PV Installations in California



Bankability



# Project Funding

Co-sponsored through California Public Utility Commission (CPUC) grant funding from California Solar Initiative (CSI) Research, Development, Demonstration, and Deployment (RD&D) Program with Itron, Inc. as the program manager.



# Solaria Manufacturing Facility Fremont, CA 110 kWp Tracker Installation

- Solaria Managing Installation
- 58 kWp 1-Axis Horizontal Tracker
- 52 kWp Azimuth Tracker
- Permits Approved
- Under Construction
- 1-Axis Horizontal Tracker Installed
- System Expected to be Fully Energized Mid April



## Alameda County Santa Rita Jail, Dublin CA 240kWp Tracker Installation

- Alameda County Managing Installation
- 220 kWp - Azimuth Tracker
- 20 kWp 2-Axis Tracker
- Alameda County over 3 MW of solar PV systems installed on multiple County sites
- Energy generated will support operation of Santa Rita Jail



# Evaluation, Measurement and Reporting of Results

- Energy Production
  - Module evaluation
  - Diffuse light performance
  - Operating temperatures
  - DC Power and Energy Production
  - AC Power and Energy Production
  - Correlate actual energy production with simulations
  - Examine effective backtracking strategies
  - Power, Energy, Weather summary
  - System availability



# Evaluation, Measurement and Reporting of Results

- Operating Results
  - Installation costs
  - Operation and Maintenance Costs
- Financial Performance
  - Performance and reliability
  - Correlate actual energy production with simulations
  - Investor grade due diligence memoranda
- Module Degradation
  - Degradation measurement
  - Module cleaning studies
  - Perform IV curve measurements



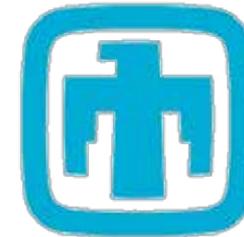
# Evaluation, Measurement and Reporting of Results

- Soiling Studies
  - Soiled Module testing
  - Clean Module testing
  - Module degradation and soiling
- Soiling
  - Indoor IV curve measurements
  - Electroluminescence pictures
- Long Term Reliability
  - Results of visual inspection of all modules on the test systems
  - Description of any reliability issues or concerns
  - Any maintenance, repairs, cleaning, or system abnormalities during the month

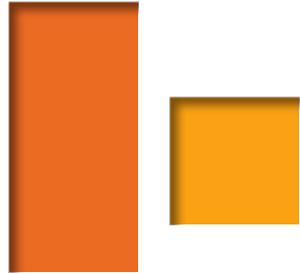


# Reports

- Monthly
  - Solaria produced, automated
- Quarterly
  - Third Party Consultant from Sandia National Laboratories
- Yearly Report
  - Same as quarterly report with additions:
    - Corrective actions (if any)
    - Correlation with simulation models
    - Correlation with other California systems
    - Suggest improvement for future monitoring
    - Assessment of tracking algorithms
    - Detailed analysis of module degradation
    - Detail analysis of soiling rates and cleaning
    - Operations and maintenance cost
    - Total cost of ownership and LCOE calculations



**Sandia  
National  
Laboratories**



**END PRESENTATION**

**SOLARIA™**

