Low-Cost, Advanced Metallization to Mitigate Cell-Crack-Induced Degradation

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Cost Drivers

A Pathway To 3 Cents per kWh
100 MW.oc One-Axis Tracking Systems With 1800 kWh/oc/MWoc. First-Year Performance. Includes 5 Year MRCRS. Horizontal Lines Indicate Low, Median, and High U.S. Solar Resources

Capability Development

Outcomes and Impact

1. Data Management & Analytics, DuraMAT Data Hub
2. Predictive Simulation
3. Advanced Characterization & Forensics
4. Module Testing
5. Field Deployment
6. Techno-Economic Analysis

DuraMAT Capabilities

Industry Goals

Accomplishments

• Demonstrate increased module reliability against stress-induced cell fractures.
• Make specialized paste products available for integration on commercial Si PV modules.
• Target future partnerships with cell production companies.
• Provide new materials and integration solutions for terrestrial PV.

Outcomes and Impact

Project Timeline

• Demonstrate increased module reliability against stress-induced cell fractures.
• Make specialized paste products available for integration on commercial Si PV modules.
• Target future partnerships with cell production companies.
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Goal 1: Commercial MMC Paste Formulation

Goal 2: Proprietary Metallic Performance & Degradation

Goal 3: Si Solar Cell Performance

1. Demonstrate MMC-enhanced cell under performance to baseline
2. Present 3 posters Complex accelerated thermal cycling of Si module
3. Present 4 poster Demo MMC-integrated cell sample
4. Present 5 poster Demo MMC-integrated cell

Materials Charaterization

In Situ Scanning Electron Microscopy During Strain Test

Screen Printing & Light IV

Dynamic Mechanical Analysis (DMA)

Three-Point Bending Test

Resistance Across Cleaves and cracks (RACK)

Summary

Durability by Deliberate Design; Perfecting a Process that is Engineered to Last

Osazda Energy, LLC, provides materials engineering solutions to improve solar cell and solar module reliability. Our specialized metal matrix composites have been proven to electrically bridge stress-induced cracks that appear in solar cells; the composites also self-heal to regain electrical continuity. As the solar market is rapidly shifting towards thinner platforms for lower costs and making its way into wearable power systems and unmanned aerial vehicle market, our materials engineering solutions promise substantially improved reliability for solar power systems.