



**RDECOM**

PAO:U11-644



**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**

## Flexible Photovoltaics: An Update

*Brant Lagoon  
Physical Scientist  
NSRDEC  
Presented to JOCOTAS  
3 November 2011*

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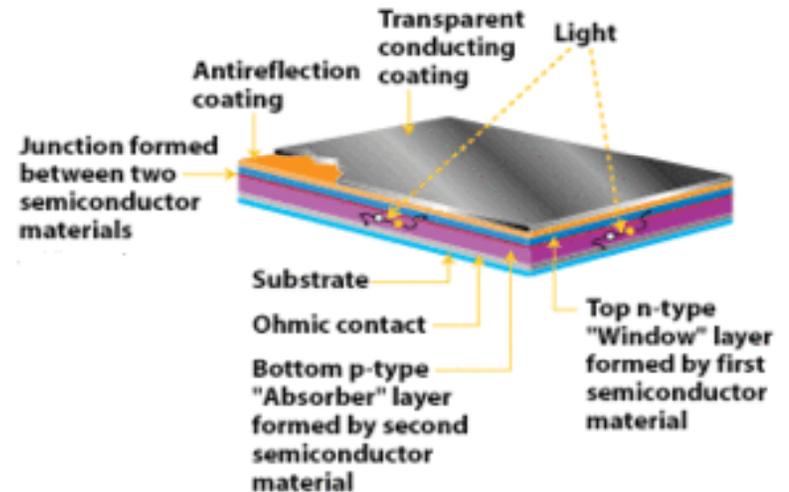
- **Convert the sun's light energy into electricity**
  - **No Noise**
  - **No Moving Parts**
  - **No Fuel Consumption**
  - **No Pollutants**
- **Flexible Materials**
  - **Amorphous silicon**
  - **Small Units are Lightweight**
  - **Packable**
  - **Redeployment**
- **Additional Benefits**
  - **Solar Shading**
  - **Passive Collection**



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- **Developments**

- Research into increasing efficiency of panels
- Research into textured substrates
- Balance of systems development
- Micro grid integration



- **Evaluations**

- Net-Zero Plus JCTD

- **Deployments**

- AFRICOM
- Afghanistan



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# Net-Zero Plus Joint Capability Technology Demonstration



- *Saves up to 1.52 kW/hr over the baseline tent*
- *Generates and stores enough power to sustain billeting mission overnight*
  - *Mission loads were <1 kW/hr*



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# AFRICOM Deployment



- *Camp Lemonnier, Djibouti*
- *Natick conducted two day training*
- *Year-long, limited military user assessment*
  - *Very positive feedback from users*
  - *Added to HOA property book*
  - *Request for additional units*
- *24/7 exposure, including harsh wind, high temps, extreme dust*
  - *Minor de-lamination in corners*
  - *Current plan to investigate and resolve in upcoming funded effort*



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# Current Challenges/ Industry Opportunities



- **Cost**
  - Initial price could be prohibitive for short term deployment
    - Mission based decision
  - ROI could be months or years depending on location
- **Efficiency**
  - Less efficient compared to mono- and poly-crystalline silicon
- **Durability**
  - De-lamination
- **Footprint**
  - Currently designed for most shelters
  - Different configurations based on mission, location, shelters, etc.
- **Requirements Document is Undefined**

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# Questions?



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