

Overview of NREL & PV-related Research at NREL



**Meeting with ASU
Feb. 16, 2017**

Greg Wilson and Sarah Kurtz

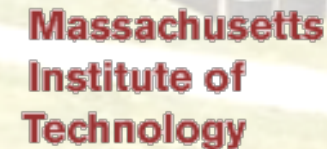
National Renewable Energy Laboratory

Dedicated Solely to Advancing Energy Efficiency and Clean Energy Research toward Enabling Deployment onto a Modernized Grid

- Physical Assets Owned by the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy
- Operated by the Alliance for Sustainable Energy under Contract to DOE
- 2400 staff and world-class facilities
- More than 350 active partnerships annually
- Campus is a living model of sustainable energy



Alliance for Sustainable Energy—Partnering with Excellence



NREL's Program Portfolio

Strategic Analysis



Efficient Energy Use

- Buildings Technologies
- Vehicle Technologies

Delivery & Storage

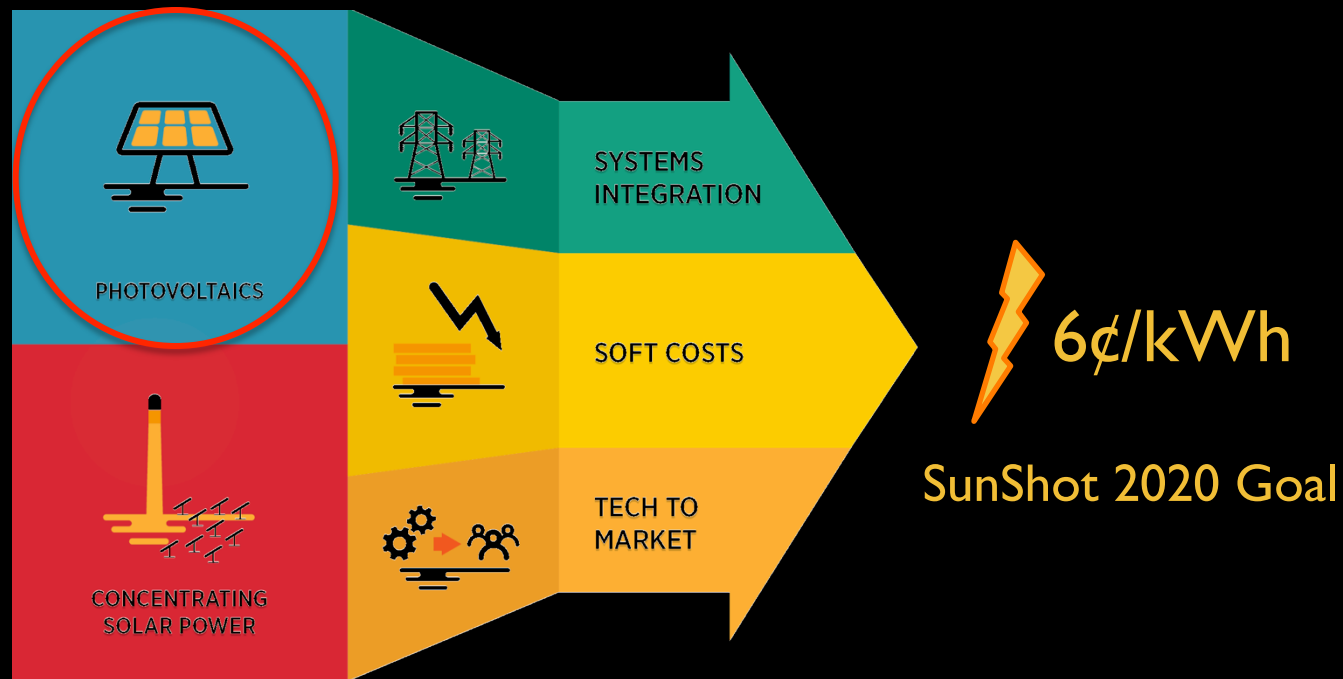
- Battery and Thermal Storage
- Hydrogen
- Smart Grid and Grid Integration

Renewable Resources

- Solar
- Wind and Water
- Biomass
- Geothermal

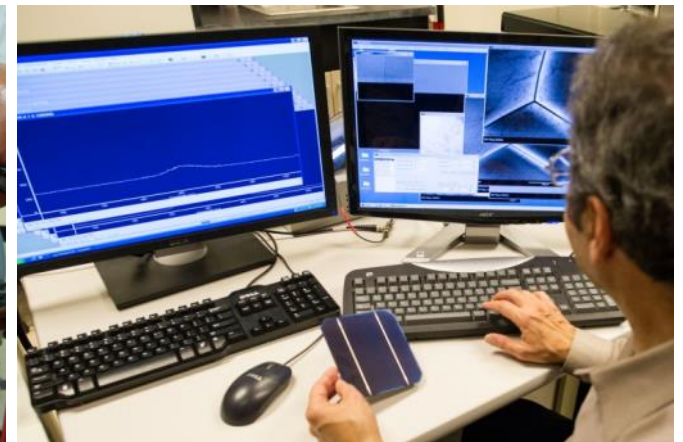
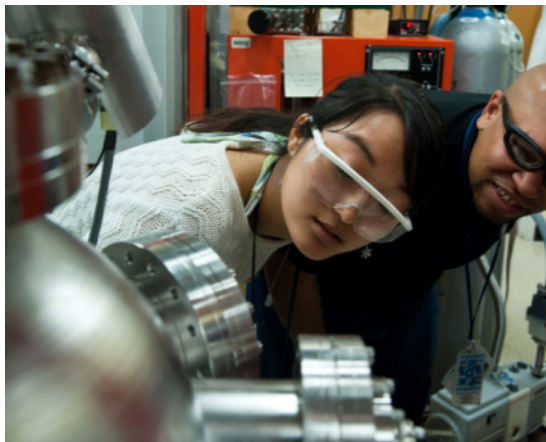
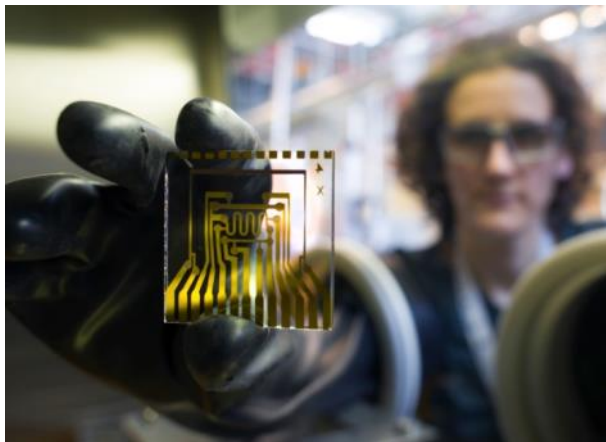
Foundational Science

NREL's PV Program: Originating as SERI in 1977, today a key component of the U.S. DOE SunShot Initiative, funded primarily through SUNLAMP.



PV R&D is NREL's single largest R&D program (~\$30M out of ~\$300M per year, mainly through SUNLAMP).

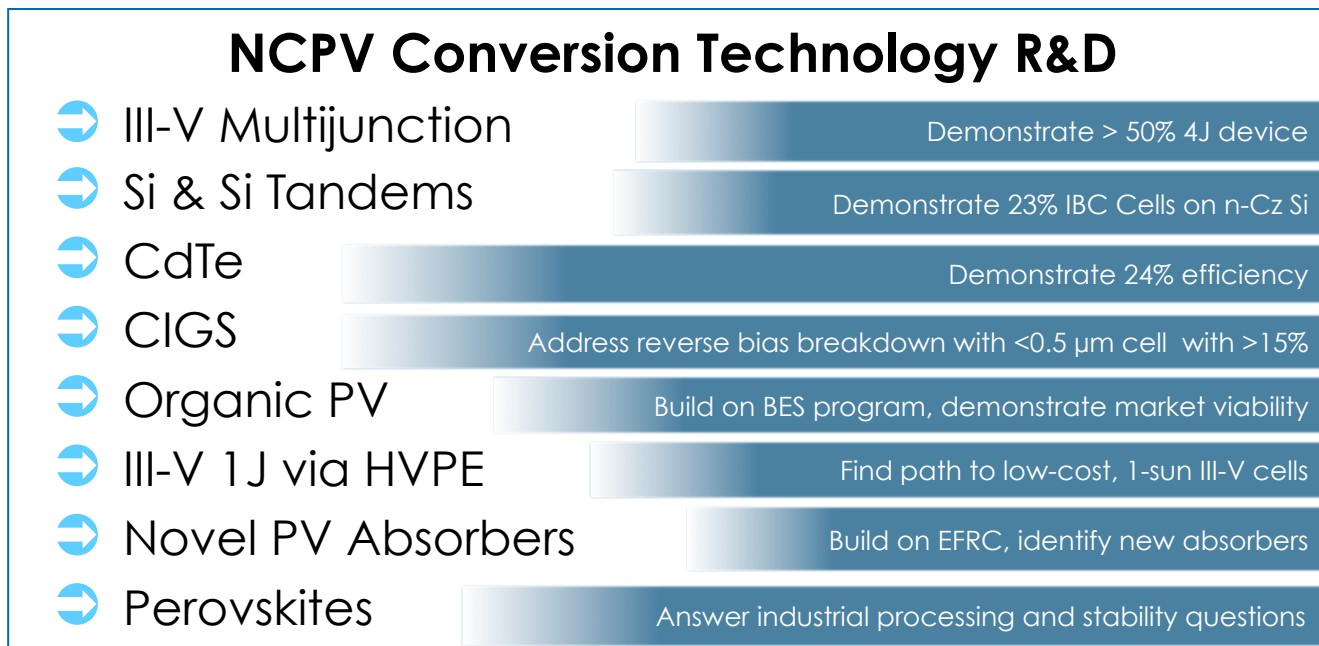
NREL receives additional funding from EERE's SunShot Initiative, including for grid integration, CSP, cost analysis, and soft-cost reduction.



SUNLAMP PV Projects



Extensive Capabilities and PV Experience Under One Roof

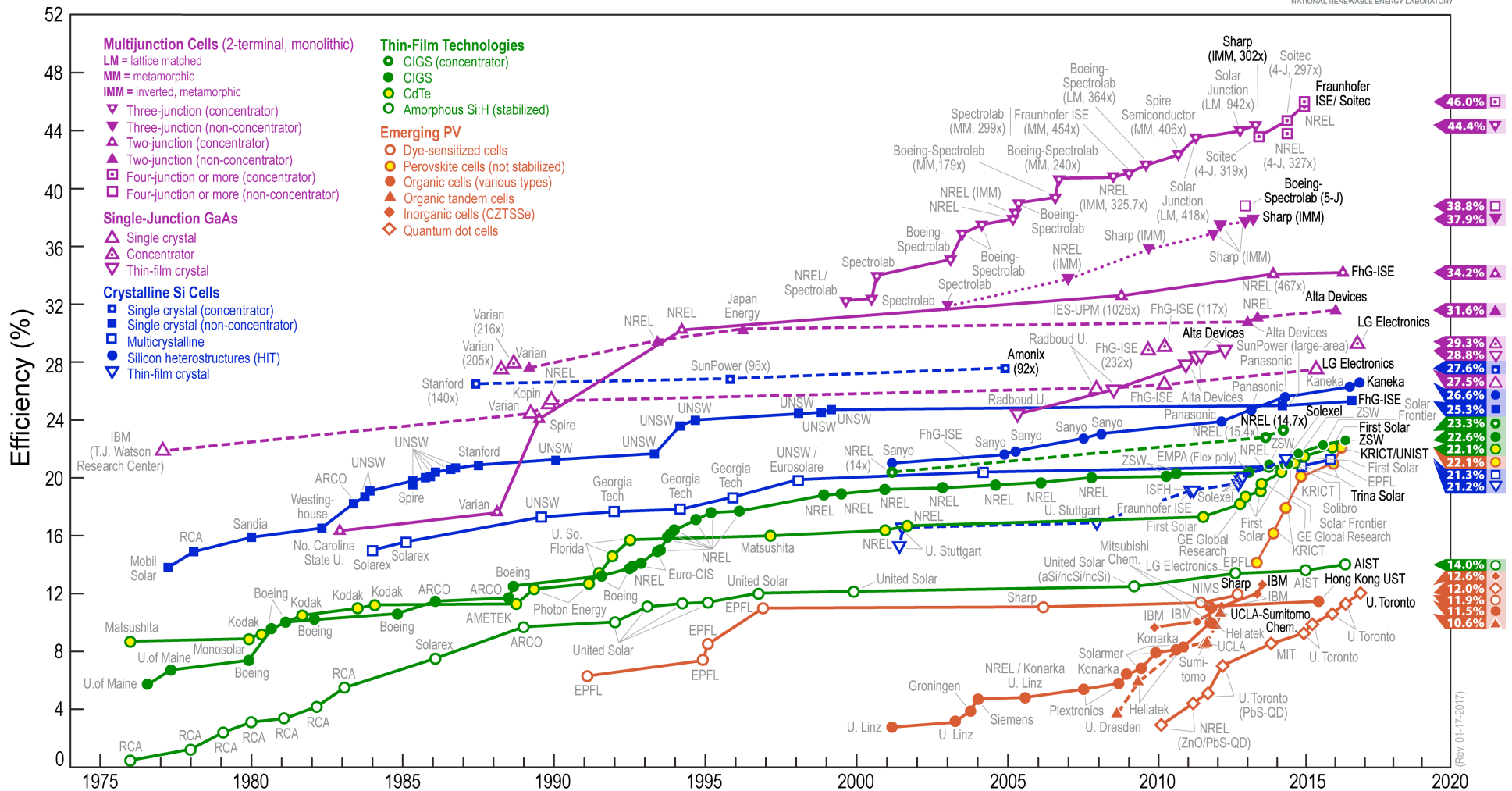


PV Materials research covers every mainstream PV material system

PV Research – Sustained Progress



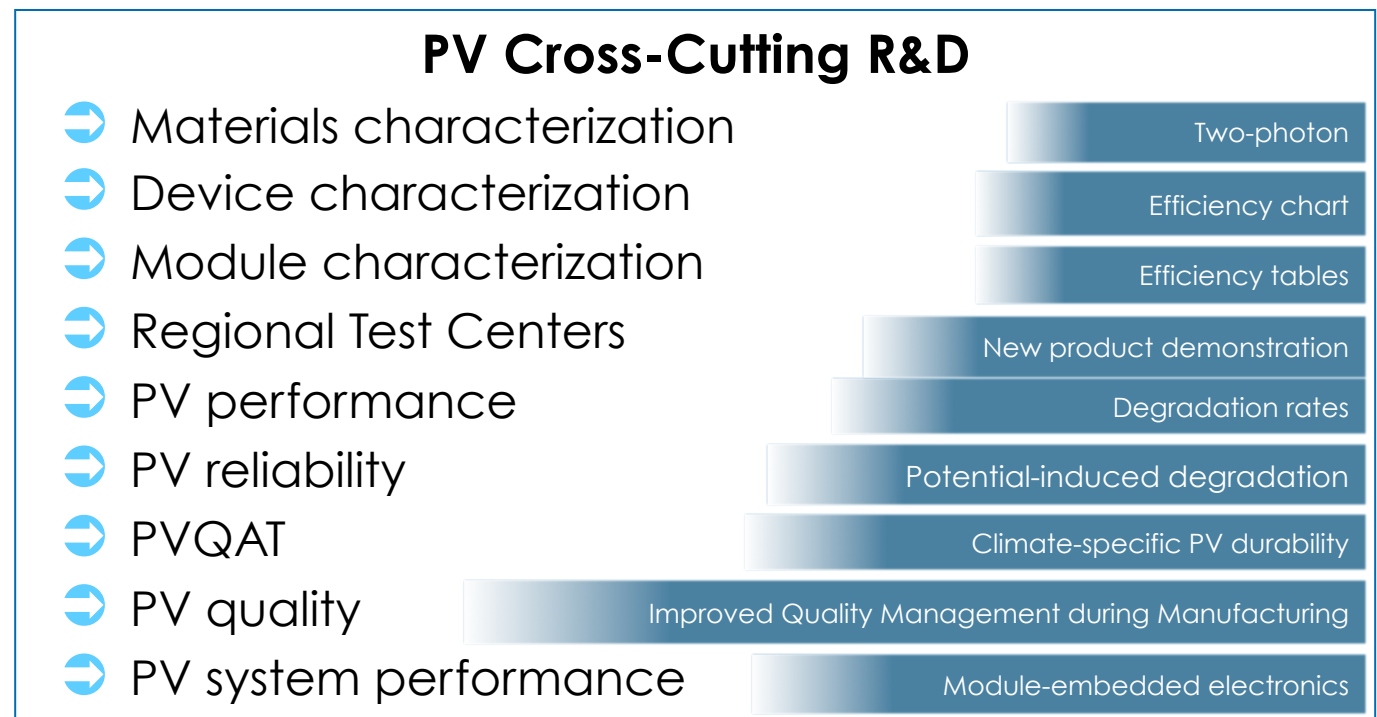
Best Research-Cell Efficiencies



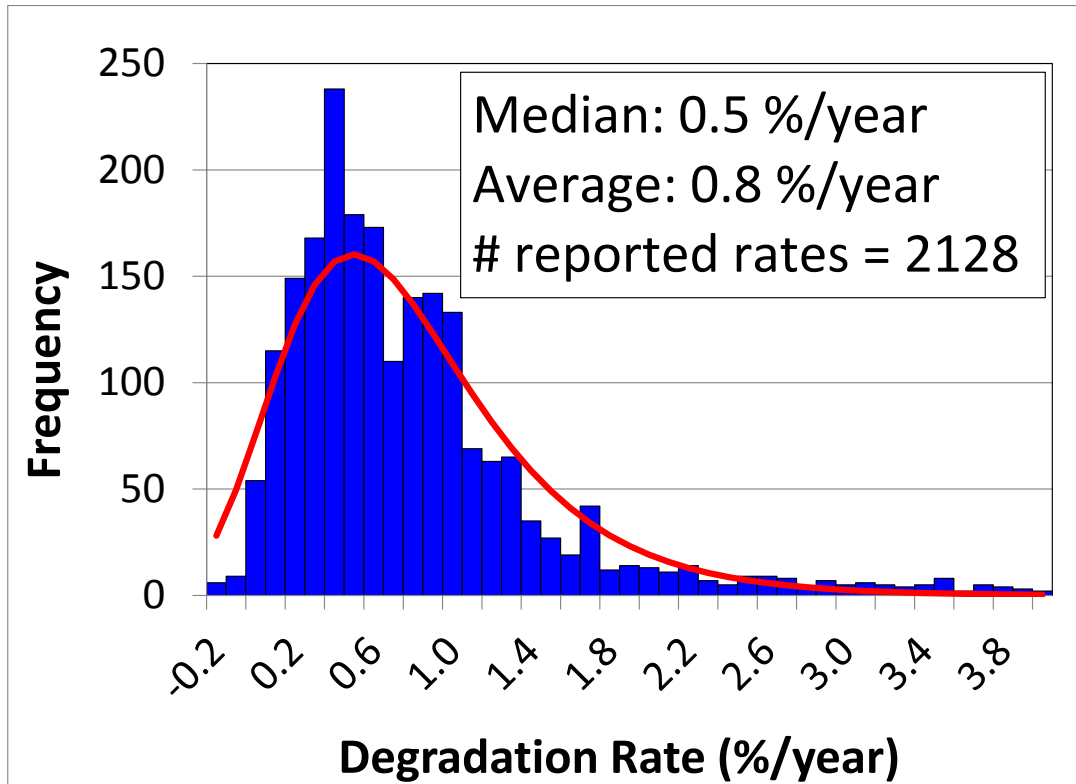
National Center for Photovoltaics



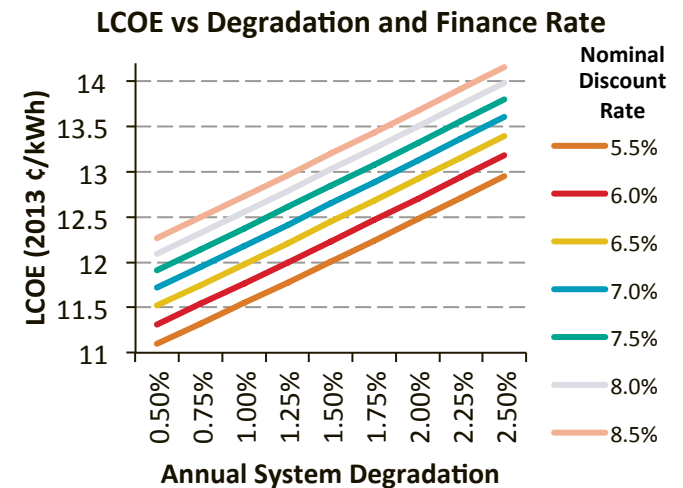
Extensive Capabilities and PV Experience Under One Roof



PV Degradation rates



Degradation over the life of a PV system has significant effect on LCOE



⇒ NREL's analysis of reported degradation rates is widely referenced as the basis for financial analysis of new projects.

Opportunities to come to NREL

- HOPE – Hands-On PV Experience, one week at NREL, applications due March 1
 - <https://www.nrel.gov/pv/hands-on-photovoltaic-experience.html>
- Graduate Student Research Internships, applications due April 15, U.S. Citizens only
 - <https://www.nrel.gov/solar/internships.html>
- SUN UP – receive some help in being matched with an NREL researcher; student needs to bring the funding
 - <https://www.nrel.gov/pv/sunup.html>
 - There are presentations about NREL research at this site



NREL

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Thank You

