

The US DOE Regional Test Center Program

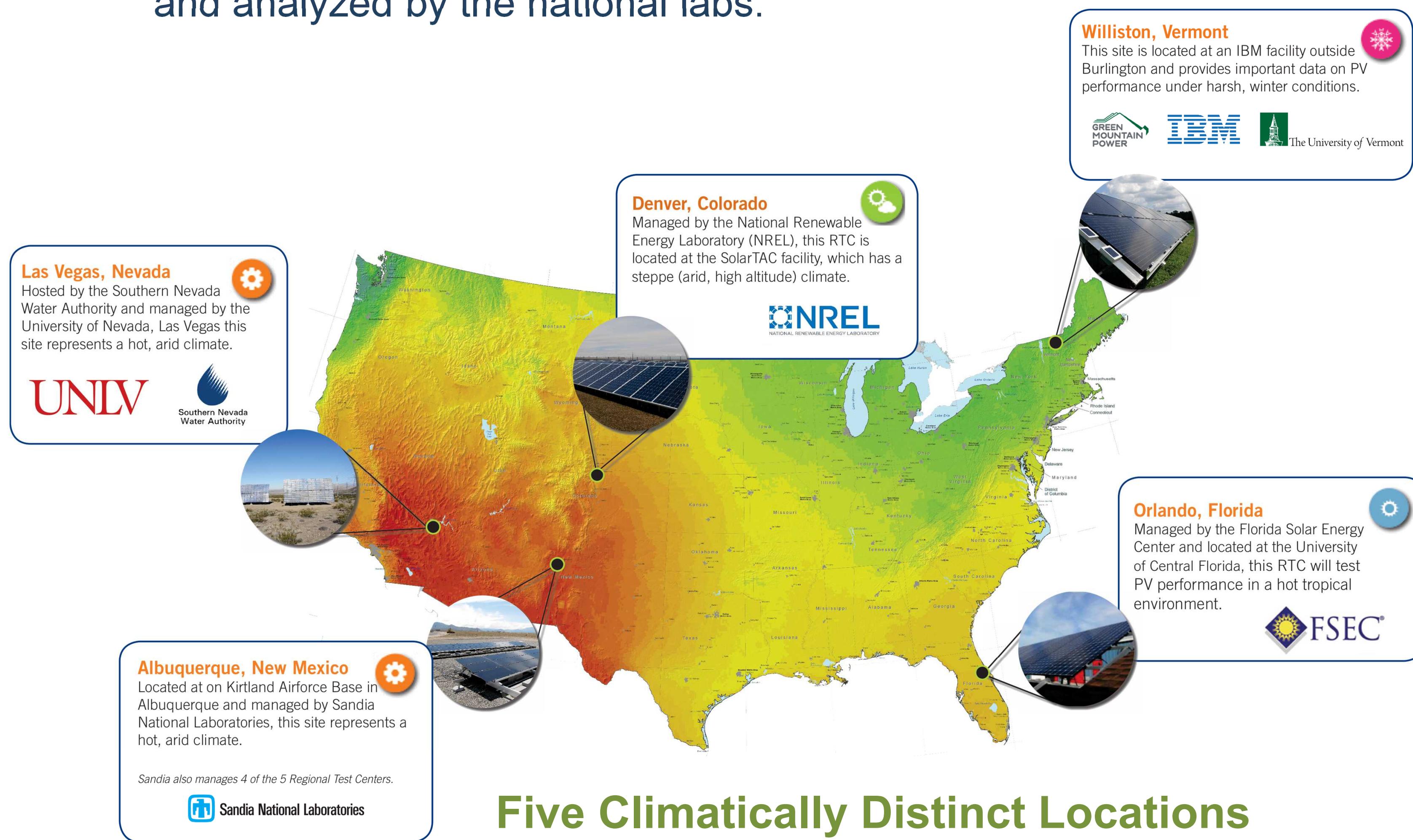
Driving Innovation, Quality and Reliability

Laurie Burnham¹, Bruce King¹, Chris Deline², Stephen Barkasz³, Aaron Sahm⁴ and Josh Stein¹

The Regional Test Center Program

Overview

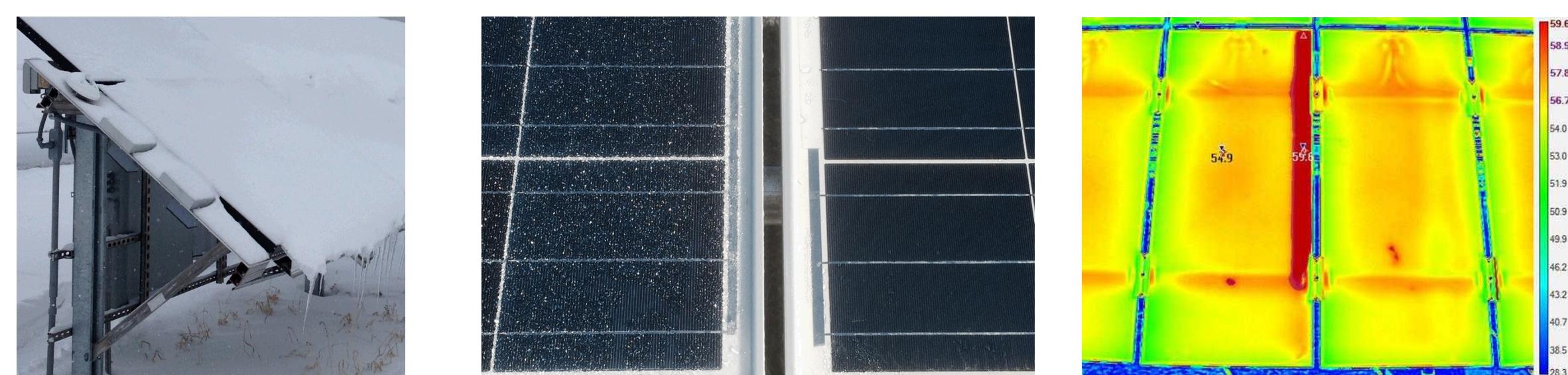
Supported by the US DOE SunShot Initiative, the Regional Test Center (RTC) Program is a five-site, multi-climate project intended to accelerate innovation and strengthen the competitiveness of the domestic solar industry. Led by Sandia and the National Renewable Energy Laboratory (NREL), the RTC program directly supports the roll-out and adoption of new solar technologies, thus indirectly supporting the expansion and overall reliability of the US solar sector. The RTC approach, which is customized for each industry partner, typically involves a three- to five-year field study at multiple sites. At the end of the study, participating companies not only have confidential, high-fidelity performance data for PV products but have data that was collected from a range of climates, and produced and analyzed by the national labs.



Five Climatically Distinct Locations

Addressing the Impact of Climate

The RTC program provides high-fidelity monitoring of fielded arrays and helps troubleshoot issues that arise throughout the validation study. In addition to monitoring the daily performance of a system, the RTC team studies the impact of climate on solar arrays, tracking and analyzing such variables as snow build-up and rates of evaporation. Each RTC site has tools, such as infrared cameras and IV curve tracers, to aid in their evaluation of module performance.



Left to right: PV array under snow at the VT RTC; adjacent modules showing different amounts of condensation at the FL RTC; an IR image of a cracked module in NM

Crucible for Innovation



Driving Innovation



As a company committed to ...the U.S.'s ability to compete globally through innovative technology and streamlined processes, Stion is excited to work with Sandia and the DOE to monitor performance of its U.S. made high-efficiency framed and frameless CIGS thin-film PV modules in a variety of climates."

- Chet Farris, President and CEO of Stion



"Very few programs like the RTC exist, which allow manufacturers to test their product and models under such a wide variety of climate and location conditions, and at the same time provide access to an institution that has literally written many of the world's most adopted solar models."

- Randy Stewart, CEO of Prism Solar



"We value the federally-funded Regional Test Center Program for its support of manufacturers as they strive to provide exactly the renewable-energy products that consumers want."

- Mukesh Dulani, President SolarWorld Americas

Support for Emerging Technologies

The RTC model, which is based on collaboration between industry and the national labs, is helping US companies carve out an advantage in an increasingly aggressive PV marketplace. Engagement with the national labs gives companies an opportunity to improve the technical performance of their products, leading to increased efficiencies and lower costs.

- Research Support for Trending Technologies**
PV experts at the national labs are introduced to prototype products and make recommendations for improvement, provide research support for promising industry trends and refine performance models.
- Access to National Laboratory Capabilities**
Participating companies have access to Sandia and NREL capabilities and expertise in such areas as systems reliability, accelerated testing, material science, and performance modeling.
- Multiple Partner Synergies**
The RTCs play the role of industry catalyst, bringing together multiple manufacturers for a single validation study and allowing those companies to exchange ideas and technical knowledge, which can lead to further innovation.
- Identification and Mitigation of Climate-Induced Challenges**
The five-site program enables RTC researchers to identify climate-specific challenges, do diagnostic testing on fielded arrays and provide recommendations for improvement, helping increase consumer confidence in new PV technologies in some of the fastest-growing solar markets in the US

Advancing the US Solar Industry

The RTC program provides technical support and performance validation for cutting-edge and prototype technologies including:

- High-efficiency PV and CPV solar cells
- Bifacial modules
- Frameless module construction
- Thin-film technologies
- Advanced power electronics
- Advanced tracker designs



¹Sandia National Laboratories; ²National Renewable Energy Laboratory; ³Florida Solar Energy Center; ⁴University of Nevada, Las Vegas