

Vermont Regional Test Center for Solar Technologies

Overview

The Vermont Regional Test Center (RTC) is situated in the town of Williston, Vermont (outside of Burlington), adjacent to IBM's semiconductor facility.

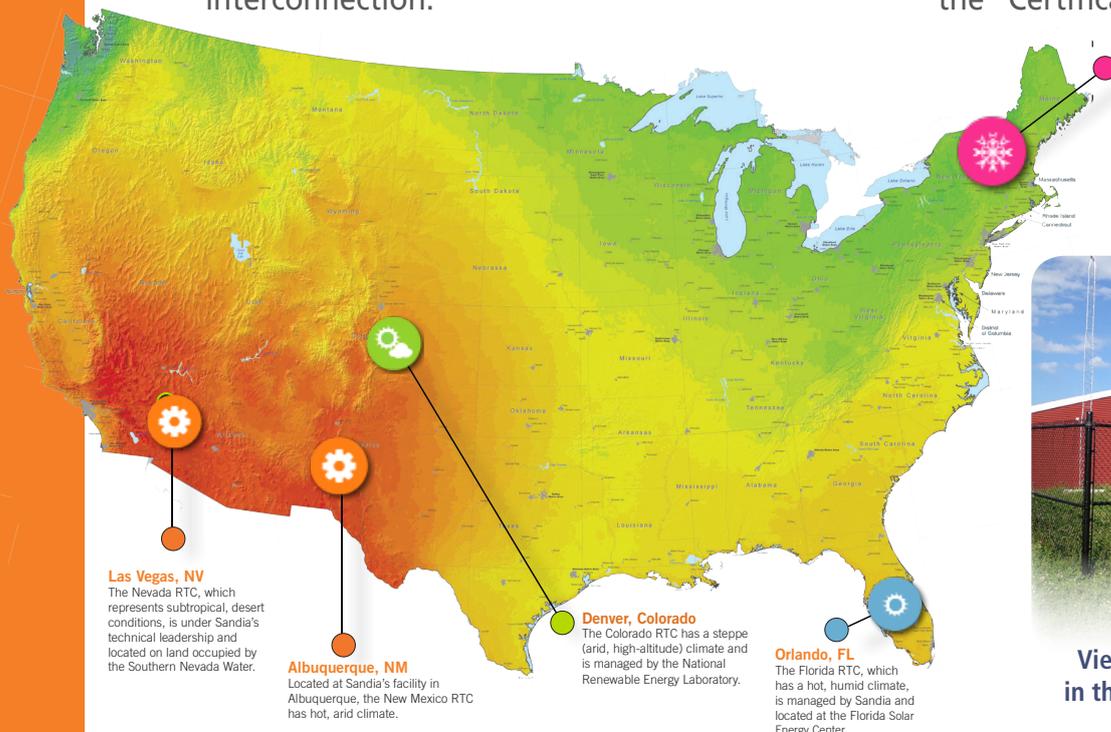
Located on flat, unshaded land, the VT RTC adds a unique climate to the RTC portfolio, providing validation studies for photovoltaic (PV) components and systems in a northern location, where harsh winters, abrupt variability in weather, and moderate to high precipitation prevail.

The VT RTC reflects a collaborative effort between Sandia National Laboratories, IBM, and Green Mountain Power:

- Sandia manages the RTC and designs and conducts the validation work being done on site;
- IBM designed and constructed the site and now oversees site operations and maintenance; and
- Green Mountain Power assisted with the grid interconnection.

Site Description

- The VT RTC, which can accommodate 300 kW of installed PV, occupies seven acres, four of which are enclosed by a security fence. The remaining three acres are available for future expansion.
- The site is grid-tied, with a 300 kVa pad-mounted transformer, three-phase wiring and installed conduit, and junction boxes to allow for the easy installation of PV systems.
- The site has world-class meteorological and monitoring systems.
- The site has a 6kW crystalline silicon array that is generating baseline performance data that is publicly available and against which the performance of other systems can be compared.
- The VT RTC can accommodate multiple technologies, including fixed-array, tracker systems, and installations ranging from a few kilowatts to several hundred kW.
- Non-UL equipment is permissible per terms of the "Certificate of Public Good" permit issued



Williston, VT

The Vermont RTC, managed by Sandia and located on IBM property provides data on PV performance in harsh, winter conditions.



View of the VT RTC, with weather station in the foreground and 66kW of installed PV systems in the background.

by the Vermont Public Service Board.

- The building roof, which is pitched at 18.4°, can support rooftop PV installations

Meteorological Instrumentation

The VT RTC weather station, which has the same instrumentation as the other RTCs, collects the following data at one-second intervals:

- Global horizontal irradiance
- Direct normal irradiance
- Diffuse horizontal irradiance
- Precipitation and wind
- Temperature
- Relative humidity

Monitoring Capabilities

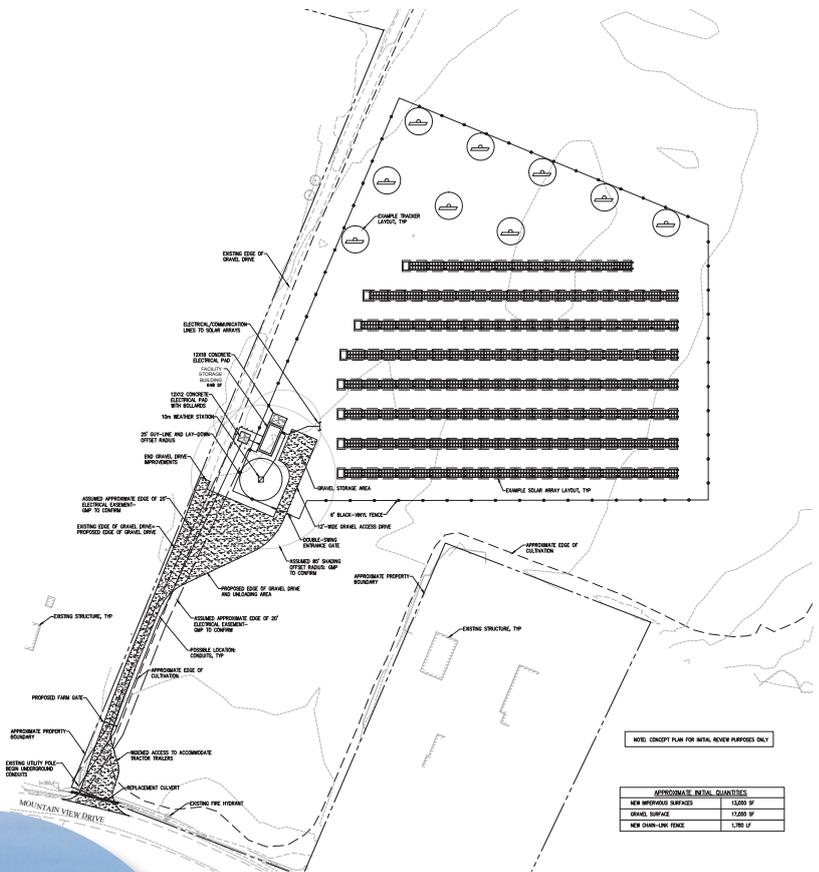
PV systems installed at the RTC can be monitored for:

- DC /AC voltage,
- string-level current, and
- module temperatures.

Solar tracking instrumentation.



Six kilowatt (kW) baseline system at VT RTC is generating baseline performance data. Irradiance sensor and two reference cells are measuring solar irradiation (located to the left of the array); other data being monitored include voltage, current and temperature.



Schematic of the VT RTC.

About IBM

IBM is a global company with 40 years of leadership in addressing environmental challenges including research on solar cells. With a semiconductor facility in Vermont, IBM has played a pivotal role in the success of the VT RTC, giving the land, overseeing the design and construction phases, and providing strategic direction, as needed. IBM brings deep technical expertise to the partnership, both on the facilities/construction side and on the electrical side.

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