Spectrafy™
solar spectral sensors

Case Study: The CanSIM Network

Enabling the world's first real-time, solar spectral measurement network

In 2017, Canada's Natural Resources Ministry (NRCan) launched the world's first, real-time, solar spectral measurement network. Powered by Spectrafy's innovative spectral sensors, the CanSIM Network is designed to enable state-of-the-art environmental and photovoltaic analysis today, while also being future proofed for the needs of tomorrow.

From the outset, NRCan wanted the CanSIM Network to be spectral - a requirement necessary to enable the most accurate analysis of photovoltaic performance.

Historically, a high-quality solar spectral and environmental measurement network would have been financially impractical – requiring multiple expensive, high-maintenance sensors that would push the per-station cost into the hundreds of thousands of dollars, while also burdening the Ministry with significant ongoing operating costs.

Figure 1: CanSIM Station

NRCan turned to Spectrafy to provide a state-of-the-art spectral network solution within the fiscal constraints of modern government. Thankfully, Spectrafy was up to the task. By combining elegantly simple hardware with advanced software, Spectrafy's sensors combine multiple measurement functions into a single, compact, rugged sensor. As a result, the cost and operating expense of advanced solar spectral and environmental monitoring has been drastically reduced.

Over a period of twelve months, Spectrafy collaborated with NRCan personnel to design, deploy and commission the first seven CanSIM stations throughout Canada. Each station is equipped with a SolarSIM-D2 and a SolarSIM-G that enable measurement of a comprehensive suite of spectral, broadband, and environmental parameters (see "CanSIM Measurands").

The CanSIM network represents a step-change in measurement capability. Previously, only a handful of locations worldwide maintained the measurement capabilities enabled by a single CanSIM station. With the SolarSIM technology, Spectrafy has now made these advanced capabilities routinely deployable.

CanSIM *Measurands*

- *Spectral & broadband GHI (280-4000nm)*
- *Spectral & broadband DNI (280-4000nm)*
- *Spectral & broadband DHI (280-4000nm)*
- *Aerosol optical depth (280-4000nm)*
- *Spectral and total column ozone*
- *UVA-UV-B, UV-T, UV-E irradiances*
- *Photosynthetically active radiation*
- *Spectral and total column PWAT*
- *PV spectral correction factors*
- *Ambient temperature*
- *Atmospheric pressure*
- *Relative humidity*

Spectrafy™
solar spectral sensors

"The data that will be derived from the CanSIM network is important in helping Canada optimize its solar energy generation potential"

Yves Poissant – Research Project Manager, NRCan

Spectrafy Cloud

In addition to employing Spectrafy's innovative sensors, each station is connected over the cellular network to the Spectrafy Cloud - a turn-key data management and visualization platform. Data is accessible over the internet, in real-time, via a clean, intuitive, graphical dashboard, thereby maximizing NRCan's ability to disseminate CanSIM data to all relevant stakeholders in industry, government and academia.

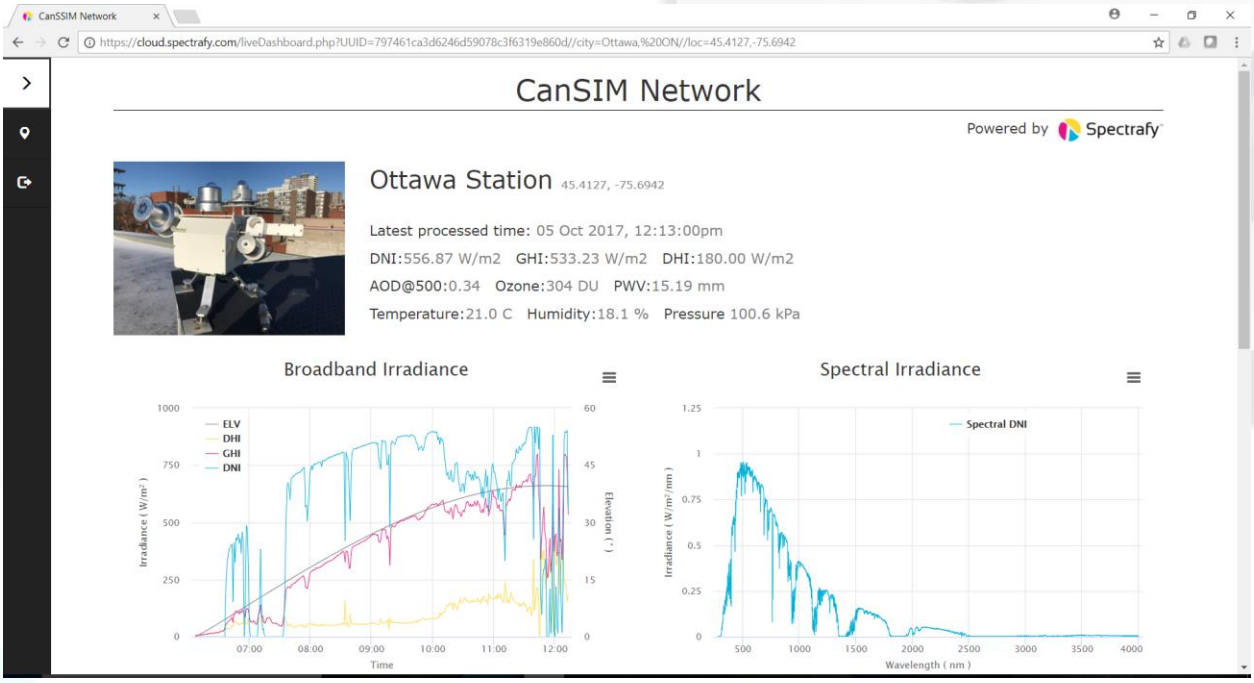

Figure 2. Screenshot of the CanSIM data visualization platform

The CanSIM network sets a new standard for highly advanced, yet affordable and sustainable solar and atmospheric monitoring. In an era of climate change, advanced environmental monitoring is arguably more important than ever, and the CanSIM network is already providing new insights that will be vital in responding to the decades of climate change ahead. Moreover, CanSIM data will help underpin the financing and deployment of solar power plants for years to come, reinforcing Canada's leadership in renewable energy, and her international commitments to a low-carbon future.