Canadian Winter 2022 / 2023

A performance report of Nubo Sphere

SENSIRION
connected solutions

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Figure 1: Nubo Sphere covered by snow

Introduction

After Sensirion Connected Solutions launched its continuous methane emissions monitoring solution "Nubo Sphere" in 2022 a range of Nubo Sphere devices have been installed in Canada (northeastern British Columbia).

In northeastern British Columbia winter conditions can be harsh, characterized by continuous sub-zero temperatures and heavy snowfalls. Consequently, the sensor nodes were deployed under extreme and challenging weather conditions. **Figure 1** depicts a Nubo Sphere device deployed in British Columbia.

Performance of Nubo Sphere

Sensirion's solution has exhibited a resilient performance despite the severe weather conditions prevalent during the Canadian winter. Between 19th October 2022 and 1st April 2023 Nubo Sphere sensor nodes deployed in Canada maintained an average uptime of 84% across all devices. Depicted below in **Figure 2** is a comparison between the daily minimum temperature measured at the deployment sites and the percentage of the Nubo Sphere sensor nodes that were up and running each day.

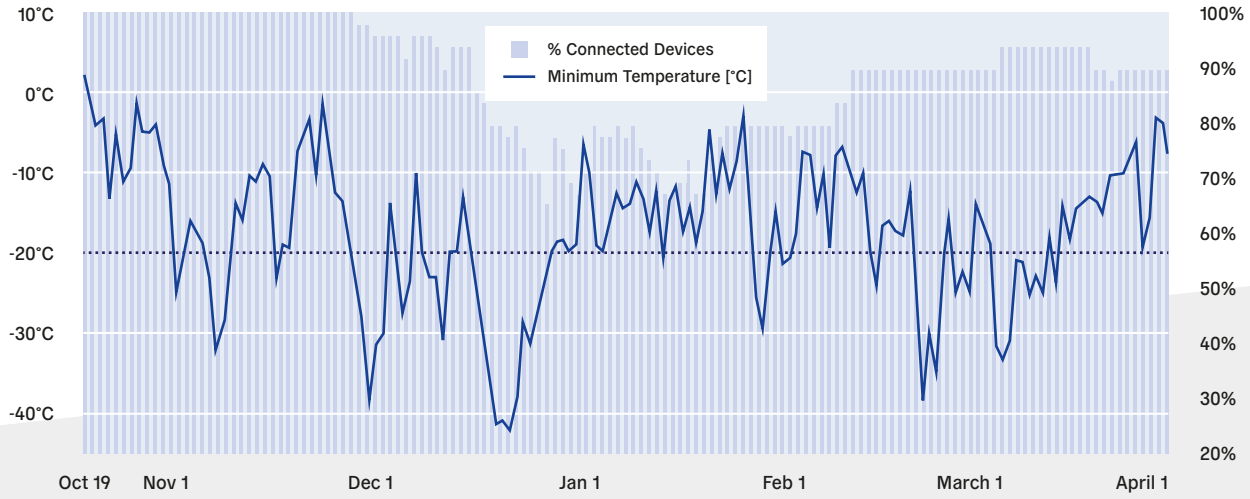

Figure 2: Nubo Sphere sensor nodes connected from October 19th to April 1st compared to the temperature.

The current generation of Nubo Sphere is only certified to operate in temperatures above -20°C. In practice, this means that when the temperatures fall below -20°C, the system will stop charging the integrated batteries, to prevent them from getting damaged. Considering the temperatures were below -20°C for a total of 56 days between October 19th and April 1st, the sensor nodes performed satisfactorily, and 39% of all sensor nodes ran throughout this entire period.

The performance of the sensor nodes was also affected by the solar panels getting covered with significant amounts of snow and ice (visible in **Figure 1**) and consequently not supplying sufficient energy to power the sensor nodes and charge the integrated batteries.

Summary and outlook

Considering it was the first winter of Nubo Sphere in Canada and our devices are not being designed to operate below -20°C, the sensor nodes performed very well, with a downtime of only 16% during the defined winter period. We are thoroughly analyzing the performance of our sensor nodes and are continuously improving Nubo Sphere's capabilities. An upgraded Nubo Sphere, certified up to -40°C and better equipped to withstand severe weather conditions, is currently being developed. We are committed to delivering a reliable, high-performing solution that can operate seamlessly under extreme environmental conditions.

Facts

-42.3 °C
minimum temperature measured

56 days
number of days below -20 degrees

59.4 km/h
maximum wind speed measured

64 days
number of days with snowfall

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