

NYSP2I Performs Greenhouse Gas Evaluation of SunThru's Aerogel Insert



Challenge

SunThru sought to estimate greenhouse gas (GHG) impact of their aerogel insert used in a double pane insulating glazing unit (IGU) compared to a triple pane IGU.

Solution

NYSP2I compared the GHG impact of SunThru's aerogel and double pane IGU assembly with a triple pane IGU to estimate the GHG emission reduction potential (ERP) for the raw material extraction, manufacturing, and use lifecycle phases.

Results

Based on SunThru's projected sales volumes, it is estimated that SunThru's aerogel insert technology may reduce GHG emissions by 4,006 metric tons of CO₂e per year.

SunThru LLC

SunThru LLC, based in Scotia, NY, is a manufacturer of an aerogel monolith insert for insulating glazing units (IGUs) for residential window applications. Their aerogel insert can be directly integrated by window manufacturers into double pane IGU assemblies, enhancing insulation performance without any significant increase in weight, thickness, or light transmission properties of the unit.

"NYSP2I was wonderful to work with. During the project they not only demonstrated their great technical abilities but also were extremely respectful, responsive, and reliable. The Greenhouse Gas Emissions Reduction Potential Analysis that they completed for SunThru has already proven useful as we have been able to share it with our customers and investors. Our customers and investors are pleased with the results and have greater belief in the claims of the product we are developing. As SunThru progresses we hope to rely once again on NYSP2I to complete a measurement and verification project." John Costa, CEO

Challenge

SunThru believes that their aerogel insert for double pane IGUs results in fewer greenhouse gas (GHG) emissions compared to triple pane IGUs and sought to estimate the potential reduction in GHGs resulting from the use of their technology at scale.

Solutions

SunThru requested assistance from the New York State Pollution Prevention Institute (NYSP2I) to determine the GHG emission reduction potential (ERP) associated with their aerogel monolith and spacer insert (aerogel insert) for double pane IGUs as compared to triple pane IGUs. NYSP2I conducted a high level comparative analysis of the GHG impact of the raw material extraction, manufacturing, and the product use phases of both SunThru's technology used in a double-pane IGU and a triple pane IGU.

NYSP2I referenced publicly available environmental product declarations (EPD) for standard IGUs for the material and manufacturing impacts of double pane and triple pane IGUs. Material and manufacturing impacts for SunThru's aerogel were estimated based on material and manufacturing energy data provided by SunThru, combined with emissions factors obtained from the US EPA eGRID Summary tables, US EPA Inventory of US Greenhouse Gas Emissions and Sinks, and ecoinvent V 3.9.1 database. Impacts for the use phase were based on SunThru's energy savings claims and historic window sales volume data from Energy Star.

Results

The analysis resulted in an estimated per-unit GHG ERP of 1.2 -2.0 kg CO₂e/m² window compared to triple pane new construction and replacement window, respectively. Incorporating SunThru's projected sales volume, NYSP2I estimated a total GHG ERP of 4,006 metric tons of CO₂e per year.

The estimated GHG ERP calculated by NYSP2I is an order of magnitude estimate based on information and claims provided to NYSP2I by SunThru relative to their product and the baseline technology. It should be noted that this analysis considered the main aspects of the raw material extraction, manufacturing, and use life cycle phases. The end-of-life life cycle was not considered. Moving forward, SunThru may consider a more comprehensive life cycle assessment to validate energy, GHG, and other environmental impacts.

Partners



☎ 845-642-7675
@ johncosta@sunthru.biz
🌐 www.sunthru.biz
🏠 4051 Ridge Road
Scotia, NY 12302

For more information please contact us:

☎ 585-475-2512
@ nyssp2i@rit.edu
🌐 rit.edu/nyssp2i
🏠 111 Lomb Memorial Drive, Bldg 78
Rochester, NY 14623