

CASE STUDY

# What if you could see how your roofing insulation choices impact carbon savings?

New energy modeling tool and commercial roofing insulation help to improve decision-making beyond code



**Project Name:** New material and energy modeling tool for better roofing insulation

**Project Description:** This project demonstrates collaboration with a leading commercial building solutions manufacturer, working together to advance built environment industry adoption of high-performance materials that assist in maximizing energy and emissions saving potential.

**Project Start:** 2018

**Crediting Period:** 7 years (2018-2026)

**Project Participants:** Firestone, USA; Oak Ridge National Laboratory



**Location:** North America

**Why Beyond Business as Usual?** Improved decision-making capabilities unlocked by a new energy modeling tool that helps architects, designers and building owners gain the necessary insights for harnessing the opportunities of innovative insulation material.

(<https://www.firestonebpc.com/us-en/roofing/insulation/isogard>), which will measure reductions in cost, energy and greenhouse gas (GHG) emissions of commercial structures using innovative insulation solutions. The tool helps enable architects, designers, property owners and construction companies to compare the performance of commonly available roofing insulation materials in temperate to colder climates of the United States and Canada where energy usage can contribute to increased carbon dioxide emissions.

This collaboration marks the first carbon agreement in North America under the Official Carbon Partnership between Dow and the International Olympic Committee (IOC).

## Insulation science

With excellent performance properties, polyurethane technology is one of the world's best insulators. Material scientists are creating polyurethane building solutions to help meet the most demanding industry requirements and increase energy efficiency.

Learn more: <https://www.dow.com/en-us/product-technology/pt-polyurethanes.html>

## Harnessing the power of energy-saving potential

Imagine a city the size of Paris added to our planet every single week. According to a recent report coordinated by the United Nations Environment Programme, the world is expected to build 230 billion square meters in new construction over the next 40 years, which equates to the addition of a large city each week.<sup>1</sup> With such significant anticipated infrastructure growth, it is critical that architects and property developers design and construct new buildings with high-performance materials that maximize energy and emissions saving potential beyond code.

Moving the built environment sector to this lower-carbon path requires industry collaboration. Complex market barriers, such as affordable and easy access to resource-efficient building options, must be broken down. In collaboration with Firestone Building Products (Firestone)—a subsidiary of fellow Worldwide Olympic Partner, Bridgestone—Dow is funding the creation of an energy modeling tool

## Going beyond code with improved decision-making

Business-as-usual building planning is often done according to standard building codes. Unlike leading voluntary energy programs with more stringent requirements, standard North American building codes are only just starting to incentivize energy efficiency measures and holistic energy modeling. Currently, this translates to the underutilization of high-performance solutions. Providing access to performance data is one of the first steps to educate industry professionals on the significance of long-term cost savings and reduction in GHG emissions.

<sup>1</sup>[https://www.worldgbc.org/sites/default/files/UNEP%20188\\_GABC\\_en%20%28web%29.pdf](https://www.worldgbc.org/sites/default/files/UNEP%20188_GABC_en%20%28web%29.pdf)

The new energy modeling tool, being developed by Oak Ridge National Laboratory (ORNL) for free access on Firestone's website, helps empower architects, contractors and building owners to better identify energy saving solutions and improve decision-making. Use-phase building energy consumption is compared within the modeling tool to alternative roofing technologies, allowing for informed selection of material and amount of insulation.

## A value chain collaboration for the built environment

Taking the collaboration one step further, through a newly formulated commercial roofing insulation, Dow, Firestone Building Products and ORNL are collaborating to help accelerate

the adoption of solutions that mitigate GHG emissions beyond code. Firestone's ISOGARD™ roofing insulation is the next generation in polyiso insulation for commercial structures, such as office buildings, hotels, hospitals, warehouses, schools and airports. When compared to a business-as-usual scenario, the first two years of full-scale sales and installation of the new ISOGARD™ insulation on commercial buildings in northern climate zones are expected to help prevent emissions of up to 381,311 metric tons of carbon dioxide equivalent (CO<sub>2</sub>e) by the end of 2026. The carbon emissions mitigated from this innovative, beyond business-as-usual collaboration is equal to the GHG emissions from 80,958 vehicles driven for one year,<sup>2</sup> showcasing Dow and Firestone's contribution and commitment to delivering a positive climate legacy.

### Dow-IOC official carbon partnership: combining the power of sport and science for a more sustainable future

Dow is a Worldwide Partner and the Official Chemistry Company of the Olympic Movement. In 2017, Dow was appointed the Official Carbon Partner of the International Olympic Committee (IOC) to develop carbon mitigation programs using science to create carbon savings that are applied to balance the operational carbon footprint of the IOC. Dow is collaborating with customers, value chain partners and industry leaders to work together to introduce innovative low-carbon technologies in the sectors of Buildings & Infrastructure, Food & Packaging and Manufacturing & Energy. These mitigation projects are tailored to the technology needs of the various geographic regions and help to accelerate the adoption of more sustainable technologies across different sectors and value chains. The program and carbon reductions are verified by a third party, Environmental Resources Management.

### Be part of the program

As part of the Dow-IOC Carbon Partnership, we seek to deploy better technologies that reduce costs and promote resource-efficient processes. We invite industry leaders who would like to gain competitive differentiation, enhance sustainability expertise and be climate leaders to work with Dow and other technical specialists to improve the economic and environmental profile of their operations and solutions.

Learn more at <https://www.dow.com/en-us/sports/sustainability/ioc-carbon-partner>.



OFFICIAL CARBON PARTNER

<sup>2</sup><https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

### About Dow

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