



TORONTO

Eco-Roof Incentive Program

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Source: City of Toronto

THE SCIENCE

There's a growing movement in North America to improve the environmental performance of rooftops by installing cool or green roofs. Cool roofs are made from materials that reflect the sun's rays. Flat roofs that use cool materials are typically made from a white or light coloured membrane that is highly reflective, while sloped cool roofs can use shingles with regular colours (e.g. red, brown or beige) but that have a higher reflectivity rating. Cool roofs can help reduce urban heat islands, minimize indoor overheating and reduce electricity consumption through lower air conditioning usage.

Green roofs refer to a layer of vegetation that partially or fully covers a roof. Extensive green roofs, which are lower cost and require less maintenance, have a shallow soil base and simple landscaping with drought-resistance species such as grasses and plants. Intensive green roofs, which have complex landscaping features such as shrubs and trees, have a deeper soil layer, higher costs and require more maintenance. While green roofs are generally more expensive than regular roofing materials, they can provide multiple environmental benefits including lower peak storm water volumes, increased biodiversity and habitat, reduced urban heat islands, increased energy conservation, and lower greenhouse gas emissions. Importantly, green roofs can provide valuable green space within dense urban environments where it otherwise would be limited.

THE TRIGGER

The Eco-Roof Incentive Program emerged out of a green roof movement in Toronto in the early 2000s. Between 2000 and 2003, the City of Toronto collaborated with various governmental organizations, local research groups and non-profits to initiate three pilot green roof projects; one on Toronto City Hall and others at the Computer Science Building at York University and the Eastview Neighbourhood Community Centre. The pilot projects experimented with different plant species and planting techniques. Data on energy efficiency, storm water retention volumes, plant survival, unit cooling benefits and other variables were collected and analyzed. Based on the success of these pilot projects, in 2005, the city commissioned a team at Ryerson University to undertake an analysis of the various environmental, social, and economic costs and benefits of green roofs. The findings from the Ryerson report, along with extensive stakeholder consultations, resulted in the city adopting a Green Roof Strategy in February 2006. The strategy included recommendations to encourage widespread adoption of green roofs through the city's development approvals process, education and outreach efforts, and, importantly, a financial incentive program.

THE APPROACH

The development of an Eco-Roof Incentive Program had two main phases:



Figure 16: One of the many roofs built under the Eco-Roof Incentive Program in Toronto (Source: City of Toronto)

1. Pilot Green Roof Incentive Program (2006 – 2008)

Toronto Water – the City Division responsible for drinking water, waste water, and storm water – established a two-year \$200,000 pilot Green Roofs Incentive Program between 2006 and 2008. The overall goal of the pilot program was to “encourage green roof construction in the city, resulting in a number of highly visible projects.” Eligible green roofs received a grant of \$10 per square metre up to a maximum of \$20,000. The program was open to all owners of private property in the City of Toronto.

2. Eco-Roof Incentive Program (2009 – present)

Due to the success of the Pilot Green Roof Incentive Program, the city in 2009 made the pilot program permanent and expanded it to incentivize both green and cool roofs. The purpose of the expanded Eco-Roof Incentive Program is to provide support to owners and operators of industrial, commercial, institutional and residential buildings to make roof spaces more environmentally friendly by cooling the air, reducing energy use, increasing habitat and biodiversity and managing storm water. Property owners with eligible green roofs in Toronto can apply to receive \$75 per square metre up to a maximum of \$100,000. Eligible cool roofs can receive \$2 to \$5 per square metre up to a maximum of \$50,000.

An important component of the Eco-Roof Incentive Program is the supportive policy and regulatory context. The Green Roof By-law, which was approved by City

Council in 2009, is at the heart of the Incentive Program's success. The Green Roof By-law requires that green roofs be installed on all new commercial, institutional, and residential development with a roof space larger than 2,000 square metres; requirements range from 20% to 60% of available roof spaces being covered with green roofs. Developers can opt to make a financial contribution to the city in lieu of meeting the above requirements. The payment in lieu from the Green Roof By-law is used to provide sustainable ongoing funding for the Eco-Roof Incentive Program.

As part of the by-law, the city implemented a Green Roof Construction Standard in 2009 which sets out minimum design and engineering requirements that meet the city's objectives and Ontario Building Code requirements. To be eligible for the Eco-Roof incentive Program grants, the design and maintenance of the roof must abide by the Green Roof Construction Standard. Furthermore, at the application stage, the city requires a five-year maintenance plan for both cool and green roofs to ensure their continued environmental performance.

THE OUTCOME

Since 2009, the Eco-Roof Incentive Program has supported 176 projects (44 green roofs and 132 cool roofs) with a total combined area of 375,000 square metres of roof space; an area equal to about 63 football fields. In addition, these eco-roof installations are estimated by the city to have diverted over nine million litres of storm water; reduced energy consumption by over 1,000 megawatt hours annually, and avoided over 120 tonnes of greenhouse gas emissions.

A WORD FROM TORONTO

When asked what advice she would give to other communities that would like to develop a similar incentive program, Annemarie Baynton, a Senior Environmental Planner at the City of Toronto mentioned the importance of engaging the roofing sector in the design and implementation of the Eco-Roof Incentive Program. When the program was launched in 2009, city staff provided program information and brochures to the roofing industry, helping them speak with their clients about the benefits of different eco-roofing options and the range of incentives available. "Recognizing the important role roofing professionals play in increasing program uptake, the program was designed with flexibility in the application process, allowing contractors to submit applications on behalf of their clients. This approach has led to an increased number of applications. In 2013, after further consultation with roofing professionals and property owners, the incentive program was expanded to include residential buildings." One lesson learned from this expansion is that while there has been great interest from homeowners in the program, there has been a learning curve regarding the technical aspects of installing green roofs and reflective shingles on sloping roofs, showing the need for continued engagement with the residential roofing sector.