Living roofs produce food, clean the air and conserve energy

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It may not feel like it now, but Ottawa will get hot. Scorchingly hot. Fry-an-egg-on-the-top-of-your-head hot. And when it does, our fair city will become what scientists are known to refer to as an "urban heat island." Hard, reflective surfaces and a lack of vegetation - nature's air conditioners - will heat it up, while gas-powered vehicles pollute the already stagnant air.

But it need not be that way.

By replacing the standard black and white urban shingles with plant material such as green grass, goldengrass, wildflowers and even small trees city dwellers can, and in many places are, altering local climate. Since plants absorb rather than reflect heat municipalities, businesses and homeowners are slowly beginning to tap into an concept that the Vikings had when they built shelters with tovtaks (turf roofs).

Toronto's Monica E. Kuhn, Architect Inc. (www.mekarch.ca) specializes in residential, sustainable and green roof design. Ms. Kuhn is a permaculture instructor and lecturer, and is a founding member of Toronto's Rooftop Gardens Resource Group, and a board member for The Green Roofs for Healthy Cities Coalition.

"Rooftops are a city's greatest untapped resource," says architect Monica Kuhn. "Sloped or flat, large or small, industrial or residential, the possibilities for urban greening, air cleaning, community building, and food production are limitless." According to Ms. Kuhn, covering a roof with plants increases a city's biomass, thereby increasing oxygen levels. Since plants are natural filters a rooftop living landscape helps cut down on dust and airborne particulates.

Green Roofs also have the potential, because roots hold and absorb water when it rains, to reduce storm water runoff. This in turn decreases the load on the city's already overflowing storm sewage systems.

Ben Polley, owner of Harvest Homes (www.haresthomes.ca), says that his company has been installing three to five green roofs annually, for residential and light commercial projects.

Originally launched in Kemptville, Polley moved Harvest Homes to Guelph in 2003. This summer he will launch a new division "Torus Ecosystems" in response to growing interest in environmentally sustainable building options. This will separate their straw bale construction business from their living roof installations, alternative waste water installations, and rainwater harvesting installations.

Mr. Polley points to the insulating effect of green roofing as a major advantage to the building's owner/ operator.

"Typically R-30 is considered to be good," says Mr. Polley. "But a living roof can provide an R-50 value or better. It is an insulating blanket against the winter cold." Vancouver's Fairmont Waterfront Hotel has a green roof, as does Toronto's Mountain Equipment Co-op. Imagine a golf course atop a corporate headquarters or a natural retreat above a nursing home.

Karen Moyer, Environmental Coordinator with the environmental services department at the City of Waterloo won the Green Roof Civic Award of Excellence in 2004 for the development of the green roof industry.

But one of the largest green roofs in North America is right here in Ottawa.

The Canadian War Museum on LeBreton Flats boasts 10,684 square metres of green roof. It is a self-sustaining ecosystem that requires minimal maintenance, and holds 300 millimetres of mixed soil and retention board. Significantly, the museum roof can hold up to 720,000 litres of storm water.

"It is performing marvellously. It has met all of our expectations," says Guy Larocque, Facility Management and Security Services, Canadian Museum of Civilization Corp. "It's holding well. It doesn't leak. And in three seasons the grass is at its full height." Still, green roofing in general has been slow to receive government legislative and financial support. In Europe there are many examples of its benefits. Indeed, green roofing has created a vibrant, multi-million dollar market for products and services in Germany, France, Austria and Switzerland.

Before commencing with a plan for a green roof you will need to know the slope, the structural loading capacity, and existing materials of the roof, as well as the nature of any drainage systems, waterproofing, and electrical and water supply in place. You should also consider who would have access to it, who will do the maintenance, and what kind of sun and wind exposure the roof gets.

Mr. Polley does caution that each green roof installation is unique, so technical performance will vary. He also points to a few limitations.

"The weight of water saturated soil is such that the roof framing will often have to be heavier than typically used, which may add to the cost," explains Mr. Polley. "Also, while systems exist for pitches from 30 degrees to a full 90 degree vertical face, these tend to be more expensive and have more limitations in plant selections." The 6th Annual International Greening Rooftops for Sustainable Living Conference, Awards and Trade Show (www.greenroofs.org) is being held in Baltimore, Maryland April 30-May 2, 2008.

Locally, green roof training courses are being offered in Montreal. The next workshop is Green Roof Infrastructure: Design and Installation on Friday, June 20.