

Planting a tree will significantly reduce summer energy bills and improve environment, study finds

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Now that spring is in full swing, many people are sprucing up their yards with perennials, annuals and shrubs. However a new study led by Ryerson University may convince residents to plant a tree close to their home, not only because trees can lead to reducing utility bills, but they have environmental benefits as well.

"Our [urban environment](#) has many structures made of concrete and asphalt, which absorb a great deal of the sun's energy, creating a 'heat-island' effect," says Andrew Millward, co-author of the study and a geography professor at Ryerson University. "To mitigate the rise in city temperatures during the summer, we need to protect and expand urban vegetation cover, such as large trees, which provides shade and cooling in the areas that we live and work."

Millward and his research team used an online tool to measure the [energy savings](#) generated by 577 trees planted by Torontonians on their property between 1997 and 2000.

The study found that these trees saved homeowners 77,000 kWh in energy over a 10-year period. On a per-tree basis, these savings are equivalent to the amount of electricity needed to run an average Canadian home for about a week (assuming household use is approximately 25 kWh per day).

As trees grow larger, their energy conservation benefits increase significantly; after 25 years, Millward estimates each tree will save between 435 and 483 kWh per household—equal to running a dishwasher once every day for an entire year. This can translate into a saving of upwards of \$40 annually.

The researchers also found that in Toronto's densely built urban neighbourhoods, more than half of the energy conserved was from shading provided by trees planted in neighbouring lots.

Trees also provide environmental benefits such as reducing [air pollution](#), providing a [natural habitat](#) for wildlife, sequestering carbon dioxide from the air and mitigating [storm water runoff](#).

Toronto's urban forest covers 20 per cent of the land, with 60 per cent of trees located on homeowners' property.

Thinking about where to plant a tree? Professor Millward says residents who don't have any trees on their property should plant a native tree species either west or south-west of their home. This provides the most shade during the afternoon, typically the hottest time of day. For those with existing trees, he suggests they find a place for a new tree that will give it enough space to grow.

The online tool used in the study to measure the [energy conservation](#) benefits of trees was created by Millward for [Local Enhancement and Appreciation of Forests](#) (LEAF), a Toronto-based non-profit organization. Using the [Ontario Residential Tree Benefits Estimator](#), homeowners can select their city, tree species and location to plant. The tool then provides an estimate of the energy savings, reduction in air pollution and other conservation benefits.

"I would strongly encourage homeowners to explore all of the benefits

that [trees](#) can provide, not just the energy cost-saving measures," says Millward. "This really is a win-win for not only residents, but for our environment because we are helping to mitigate rise in urban temperatures and buffer the impacts of global warming."

The study's research team comprises Ryerson graduate student Michelle Sawka, lead author of the study, Environmental Applied Science and Management, Ryerson University; Janet Mckay, LEAF; and Misha Sarkovich, Sacramento Municipal Utility District. Programming of the online tree benefits estimator was done by student Nikesh Bhagat of Ryerson's spatial analysis graduate program .

The study, "Growing Summer [Energy](#) Conservation through Residential Tree Planting," was published in the May issue of the journal *Landscape and Urban Planning*.

Provided by Ryerson University

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