



Sustainable Homes: A Guide to Retrofitting and Building Toward Net Zero

Our homes can have a major impact on the environment and can also be impacted by the effects of climate change. There are many ways to reduce the impact of a home on the environment and make it more resilient to a changing climate. Whether that's retrofitting an existing home, or building an eco-friendly home from the ground up, each choice makes a difference.



Before undertaking construction of a new home, or beginning any addition or alteration to an existing home, you will want to **ensure you have obtained the required building permit to proceed safely and legally with your construction.**

To understand what is required for a building permit for your project, visit the resources page for Building Services online, contact the Building Services main line at 705.674.4455 ext. 4278, or visit the Development Desk in the One-Stop Services Centre located in Tom Davies Square.



Goal 3 of the Community Energy and Emissions Plan: The existing building stock is retrofit for 50% increased energy efficiency by 2040 and large buildings are routinely recommissioned.

What is retrofitting?

Retrofitting refers to upgrading an existing home to be more energy efficient and even an energy efficient home can still take a few steps towards becoming a net-zero energy home. Home energy improvements can reduce your home's carbon footprint.

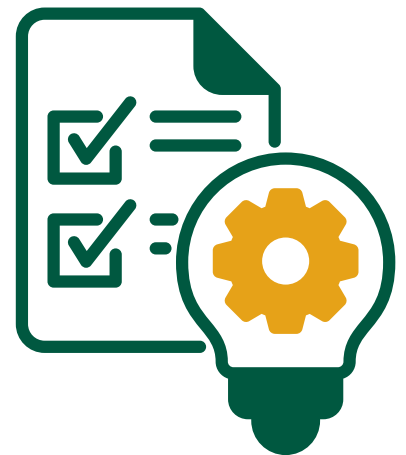


What are some retrofit project ideas?

Energy efficient and smart technologies can make your home more comfortable and save you money. Upgrades can be done in small steps over time or as part of a larger project.

Typical home energy improvements include:

- Seal cracks in walls, doors and windows
- Increase insulation in the attic, basement and exterior walls
- Install high-efficiency ENERGY STAR® heating and cooling systems (e.g., furnace or boiler, air conditioner)
- Replace conventional heating and cooling systems with an air or ground source heat pump
- Install high-efficiency water heater such as instantaneous or tankless water heater or hybrid tank hot water heat pump
- Install ENERGY STAR® windows and doors
- Install smart controls (e.g. smart thermostat)
- Upgrade lighting to ENERGY STAR® LEDs
- Replace appliances with ENERGY STAR® and WaterSense products
- Examine roof options for solar photovoltaics or cool roof technology
- Install ENERGY STAR® heat recovery ventilator and energy recovery ventilator
- Install drain water heat recovery systems
- Develop an energy efficient landscape that can reduce your heating, cooling and lighting costs through shade, windbreak and stormwater management
- Install energy battery storage
- Install electric vehicle charger



Why should I retrofit?



Make your home more comfortable

Retrofits can make your home more comfortable by reducing drafts and dampness and improving indoor air temperature in the winter and summer.

Energy efficient and especially net-zero homes are also very quiet as they are more isolated from outside noise.

Help you age in place

With lower heating and cooling bills and increased comfort, seniors are able to age in place easier in energy efficient homes.

Save money

Retrofitting results in less energy being used to maintain temperatures and heat water. In turn, this can result in up to 40% savings on home energy and heating bills. Energy efficient homes also see a resale value of 3% more than comparable homes.

Reduce your carbon footprint

In 2016, space and water heating (largely with natural gas) accounted for 68% of buildings emissions in Greater Sudbury. Retrofitting can help reduce these emissions by requiring less energy or switching energy sources.

Addressing energy efficiency issues can result in up to a 30% reduction of home energy use.

I'm a tenant. What can I do?



Tenants who cannot control the temperature, windows or large appliances can still decrease their ecological footprint and energy costs by purchasing energy and water efficient small appliances (fans, dehumidifiers) and electronics (televisions, monitors). Tenants also qualify for some retrofit rebates and incentives. Choosing the right window covers and using them to maximize light, heat or cooling effects also reduces costs. Accessible and low-cost upgrades may include:



- insulated light switch plate sealers
- weather stripping for windows and doors
- window insulation film
- rain barrels
- energy-efficient lighting

Tenants can also talk to the landlord about the benefits of retrofitting the building through less maintenance, lower costs, improved image and making the rental property more attractive and comfortable for tenants.

Where should I start?



If you decide that retrofitting your home is the best option for you, here are some next steps you can take.

- 1.** Contact the City's CHIRP Home Improvement Navigator to explore possible rebates or incentives. Visit [greaterudbury.ca/CHIRP](https://greater Sudbury.ca/CHIRP) to learn more.  
- 2.** Consult a local energy advisor for a home evaluation. They can help identify issues in your home, give you an energy efficiency report and inform you of possible upgrades.
- 3.** Obtain a building permit if needed. Many retrofits associated with changes to the energy efficiency of a home including insulation and roof repairs, may require a building permit. Find guides for your project on our website and before you apply, meet with Building Services Staff in the One-Stop Services Centre to ensure you have what you need. You can apply for one either in person or online with Building Services. Visit greaterudbury.ca/buildingpermits to learn more.
- 4.** Explore ways to make your renovation greener and healthier (e.g. request the use of non-toxic, low-VOC products, sustainably harvested wood products, etc.)
- 5.** Hire a licensed contractor. A contractor will be able to do the required work and help you navigate the retrofit and permit processes. Look for recommendations from trusted friends and family and aim for a minimum of two quotes.
- 6.** Ask for references from potential contractors and get contracts in writing.
- 7.** Ask contractors for their licence number and verify it at the Business Licence Lookup website.
- 8.** Call 311 for more details.

Interested in Building a Net-Zero Home?

Many people are looking for ways to save on energy costs within their homes. More home builders are now asking what they must do to build a net-zero home since the City of Greater Sudbury has released a Community Energy and Emissions Plan (CEEP) with a goal of becoming a net-zero emissions community by 2050.



Goal 2 in the Community Energy and Emissions Plan: Periodically increase the energy efficiency of new buildings until all new buildings in 2030 onward are Passive House energy efficiency compliant.

What is a Net-Zero Home?

A net-zero home uses very little energy and has very low greenhouse gas (GHG) emissions. To compensate for any energy used or GHG emitted, the property would have a method to produce its own energy. If any GHG are emitted, there are ways to sequester (capture) carbon by having trees and other vegetation.



What Does a Net-Zero House Include?

- Stormwater management – rain barrels and rain gardens
- Grey water systems – requires permission from PHSD
- Orientation of the home to make the best of exposures
- Thermally efficient windows and doors and the best location for them
- Increased insulation in attics, basement floors, and walls
- Airtight building envelope
- Water saving appliances and plumbing fixtures – like toilets and showerheads
- ENERGY STAR® appliances
- Strategic landscaping to provide passive cooling and heating with shade
- Solar collection systems
- Cool roofs
- High efficiency ventilation, cooling and heating systems
- Innovative energy sources such as heat pumps (ground or air source)
- High efficiency or tankless hot water systems
- Home automation systems
- LED lighting systems

Why Should I Go Net Zero?

- Enjoy a healthier, more comfortable and quieter home
- Reduce your home's greenhouse gas emissions and environmental impact
- Lower noise levels
- Reduce heating and cooling costs
- Increase the value of your home
- Increase indoor air quality levels
- Distribute temperature evenly
- Higher quality construction methods and materials
- Embraces modern design and technology

Decrease your ecological footprint

Behavioural changes to conserve energy and water can also play an important role. Try:

- Turning off the tap while brushing your teeth
- Taking shorter showers
- Watering your garden in the morning or evening to limit evaporation losses
- Air-drying your clothes
- Biking or taking transit
- Buying an electric vehicle
- Driving and flying less
- Eating less meat
- Bundling up instead of turning up the heat in the winter



Hire a Contractor

Many home upgrades that involve complex parts of your home, like furnaces, heat pumps or water heaters must be done by a specifically licensed contractor. Be sure to ask for credentials, get two to three quotes and check reviews when choosing a contractor.



Contact Us

earthcare@greatersudbury.ca

Greater Sudbury Resources

City of Greater Sudbury Building Services

greatersudbury.ca/live/building-and-renovating

City of Greater Sudbury CHIRP Home Retrofit Support

greatersudbury.ca/CHIRP

Northern Ontario Home Builders' Association

1 877-858-0468

sudburyhomebuilders.com

Public Health

705-522-9200

phsd.ca/health-topics-programs/sewage-systems

Conservation Sudbury

705-674-5249

conservationsudbury.ca/en

