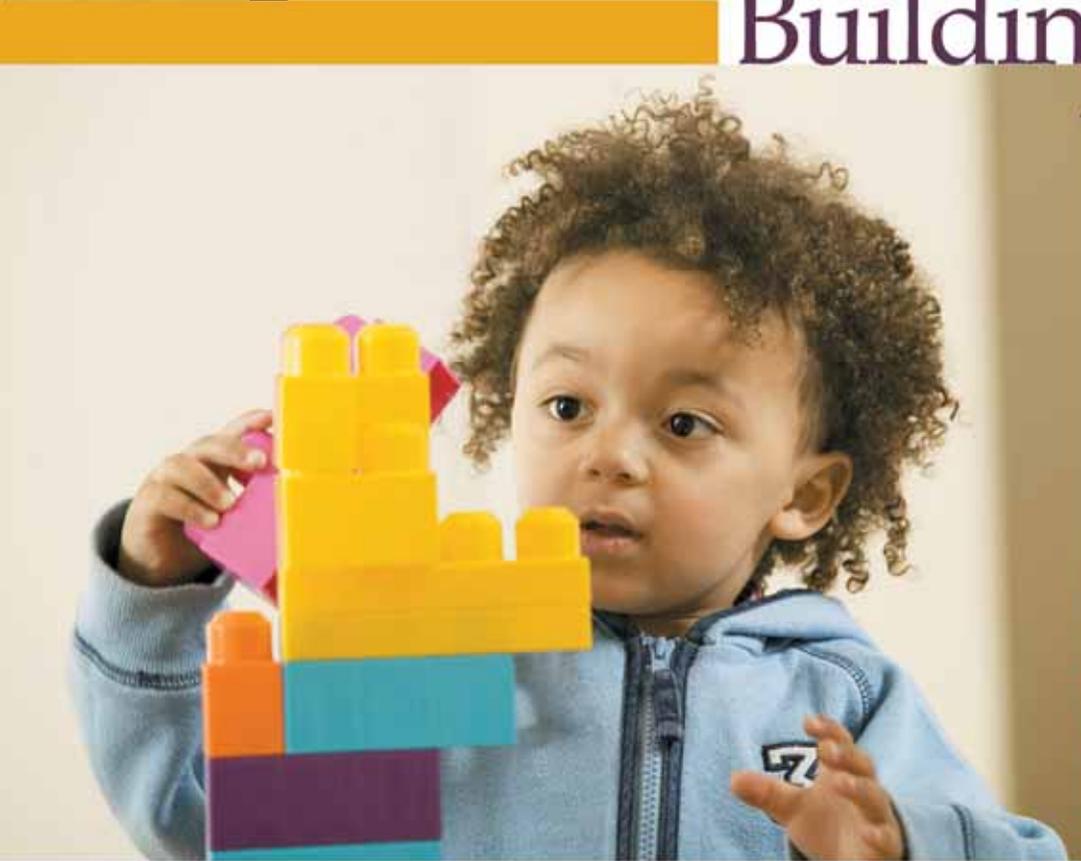




Plastics: Building Better



Contributing to a sustainable future



 Canadian Plastics
Industry Association



Effecting change

The use of plastics in building and construction continues to make a positive contribution to the greening of buildings. From the use of housewrap to pipes to insulation, plastic products are doing their part to help build a sustainable future.

Just four percent of Canada's total oil and gas stream is used to make all plastic products, which is a very efficient use of our natural resources. All of the applications for plastics within the building and construction sector represent a mere one percent of the total amount of oil and gas used in the country. Experience has shown that most plastic products can be recycled after their useful life.

Plastics reduce greenhouse gas emissions

Plastics also play a role in reducing greenhouse gas (GHG) emissions. Did you know that it takes only 35 litres of fuel to make enough housewrap for one 1,800 square foot house? Or, that the use of this housewrap can save 1,250 litres of heating fuel per year, which in turn, reduces GHG emissions by 1,793 kilograms of carbon dioxide per year.

The use of plastic exterior foam insulation also results in dramatic GHG reductions. Within Canada alone, plastic exterior foam insulation reduces GHG emissions by three million tonnes per year. That's equivalent to the annual emissions of 700,000 vehicles.

And there are GHG savings in something as simple as replacing old water pipes with plastic pipes. A recent University of Toronto discussion paper suggests that Canada could achieve 10 percent of its Kyoto targets by simply replacing all of the old water pipes with plastic pipes. More energy is required to pump water through leaking and partially blocked old iron pipes, thereby contributing to greenhouse gas emissions. The use of more hydraulically efficient plastic pipes would eliminate this.

The role of plastics in reducing GHG emissions is just one example of how plastics contribute positively to the greening of buildings.





Infinite solutions

The environmental benefits of plastics are diverse, thus providing solutions to many green building challenges. Here are some of the more prevalent applications.

- **Vinyl Roofing Membranes** are energy efficient, durable and watertight; they are also inherently fire-resistant. (Photo 10)
- **Foam Plastic Roof Insulation** (in the form of expanded polystyrene, extruded polystyrene foam sheathing and polyisocyanurate foam) delivers a high R-value, resists water absorption and extends the life of low-slope roofs. (Photo 9)
- **Spray Polyurethane Foam Insulation** delivers high R-value and provides an airtight, gap-free, monolithic building envelope with low permeability and adheres to virtually all surfaces, whether smooth or irregular. (Photo 14)
- **Structural Insulated Panels** provide high R-value, add exceptional strength to the building, reduce the use of lumber harvested from mature trees and provide increased sound insulation. (Photo 18)
- **Polycarbonate Plastic Windows** offer high-strength shatter resistance, provide lower thermal conductivity than glass and minimize condensation.
- **Insulating Foam Sheathing and Housewrap** reduce the penetration of dust, pollen and other airborne pollutants, reduce moisture infiltration and can reduce heating and cooling costs by between 10 and 50 percent. (Photos 5, 11, 12)
- **Vinyl Siding** is a highly durable material that will not dent or rot, is virtually maintenance free and never needs painting. (Photos 3, 19)
- **Insulating Concrete Forms (ICFs)** allow walls to withstand forces that could destroy normal stud-wall buildings. ICFs also act as air barriers and a high thermal-mass buffer against extreme outdoor temperatures. These products are rated above R-17. (Photos 7, 13)
- **Plastic Sealants**, such as spray foam, expand and fill energy-wasting gaps around windows, pipe and electrical outlets.
- **Plastic Piping** does not corrode, provides superior flow capacity and has a life expectancy measured in centuries. It delivers the highest possible quality of water to the tap for the least cost. These products also enhance the efficiency of central vacuum and air-filtration systems. (Photos 2, 20)
- **Plastic Tubing** has revolutionized the industrial and agricultural sectors due to its high performance and reasonable cost.
- **Vinyl Window Frames** offer high thermal efficiency, weather resistance, durability, do not crack, peel or chalk and never need painting. (Photos 3, 16)





Infinite solutions

- **Exterior Insulation Finish Systems/Exterior Cladding** require no painting and resist mould and mildew growth. These products are also impact resistant and are rated at a high R-value.
- **Plastic Electrical Products**, such as conduit, have increased the safety of buildings due to their non-metallic nature, thereby eliminating shorts in electrical systems. In addition, all electrical wiring is insulated with plastics and meets all electrical and fire-safety requirements. (Photo 17)
- **Plastic Decks, Docks, Fences, Railings, Boardwalks and Doors** require little maintenance or repairs, and can also withstand diverse and extreme weather conditions. Plastic doors also help lower heating and cooling costs. (Photos 1, 3)
- **Plastic Fire Sprinklers** may soon be mandatory in new home construction. They are an economical life-saving measure, easy to install due to their light-weight and easy connecting system.
- **Plastic Wall Coverings** are easily cleaned, ridding building interiors of dust, dirt and pet dander. The use of easy-to-clean surfaces in healthcare settings is a way to control germs and promote a sterile environment. (Photo 8)
- **Plastic Floor Coverings** are impervious to moisture so spills will not penetrate surfaces. Plastic-backed carpet dries measurably faster than carpet backed with porous materials. (Photo 4)
- **Polyethylene Air/Vapour Barrier** is an excellent way to prevent air leakage and control moisture. (Photo 15)

Plastics of the future

Plastics have been - and continue to be - instrumental in making a positive contribution to green building. Already, the use of plastic air barriers in building and construction applications has become an integral part of the energy conservation efforts of the Government of Canada in R-2000 homes.

Plastics continue to offer new and innovative solutions, such as wheat straw mixed with plastic to make fibre-composite panels for flooring, roofing and furniture applications. Similarly, renewable resources such as soybean oil are used to replace chemicals used to manufacture polyurethanes for carpet backing. And corn is being used to manufacture a number of plastics used in fibres and packaging.

These, and other future products, are evidence of the Canadian plastics industry's commitment to green building and to finding better environmental, economic and social solutions for building and construction.





Contributing to a sustainable future

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Plastics are essential to the environmental, economic and social aspects of sustainable building. In terms of the environment, plastics contribute to 4Rs: reduce, reuse, recycle and recovery of energy.

ENVIRONMENTAL: Plastic building products by their nature conserve natural resources. Doing more with less through the full product life-cycle saves energy and reduces GHG emissions. Plastics are:

- Successful in reducing GHG emissions through thermal insulation;
- Light in weight, which means less energy and lower costs in transport;
- Easy to install, conserving resources and manpower; and
- Recyclable, for example, vinyl siding off cuts from new construction and demolition projects can be recycled. Plastics may contain recycled content, i.e. plastic lumber may be made with 100 percent post-consumer plastics or it can be made with a mixture of wood and virgin or recycled plastics. Other products containing recycled content include the centre core of plastic pipe and the back surface of vinyl siding.

ECONOMIC: Since plastics are durable, they help to reduce a building's operating/life-cycle costs. This contributes to a positive building valuation, to lower occupancy maintenance and improved retail sales, as well as reduced liability. Plastics are:

- Durable, and offer decades of enjoyable use without the possibility of corrosion or rotting;
- Low maintenance, no painting is required, which saves time, labour and emissions of volatile organic compounds or VOCs; and
- Easy to install, which reduces injuries and manpower.

SOCIAL: Plastics used as building and construction materials also contribute to the social aspect of green building. The use of plastics enhances occupants' comfort and provides improved quality of life. Plastics provide:

- Energy-efficient insulation which saves on heating costs and provides a quiet and comfortable environment for occupants;
- Air and moisture barriers that prevent air leakage and control moisture; and
- Safety in the form of protecting its occupants against wind, vibration, seismic and sound transmission.

Plastics are resource efficient

A European peer-reviewed study indicated that over their life-cycle plastic building products, when compared to competing materials, provided savings in energy consumption and GHG emissions.

Plastics can contribute to credits in green building rating systems.



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About CPIA

Plastics have a significant role to play when it comes to green building. The Canadian Plastics Industry Association (CPIA), a not-for-profit organization with over 460 members who represent 60 percent of the economic activity in the sector, firmly believes that the plastics industry has a responsibility to both the environment and social fabric of the country. This commitment is evident in some of the organization's work that has been done to date.

CPIA's Vinyl Council of Canada launched an Environmental Management Program (EMP) in 1999 designed to get members to voluntarily implement this environmental stewardship system and report on progress. A Sustainability Management Program (SMP) has been developed subsequently for the entire plastics industry.

CPIA also supports any and all green standards and rating systems that practice the following three principles:

- Full consideration is given to the environmental impact and energy efficiency, product safety, cost, performance and availability of a product;
- Evaluation using a life-cycle systems approach that focuses on how individual components interact within the building system, and reduce overall environmental impacts during the entire life of a building; and
- Establishes sustainable building/product criteria that consider a full range of factors, including best available scientific information, consensus-based decision making, transparency, openness to all stakeholders, and consideration of new information.

For more information on how plastics can make a positive contribution to your project, contact:

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*Canadian Plastics
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