Let the Sun Shine In

The ancient technology of passive solar design is resurfacing as homeowners, builders and designers turn to the sun for its free, sustainable, eco-friendly energy. TEXT **BRIONY SMITH**

Our ancestors were definitely on to something.

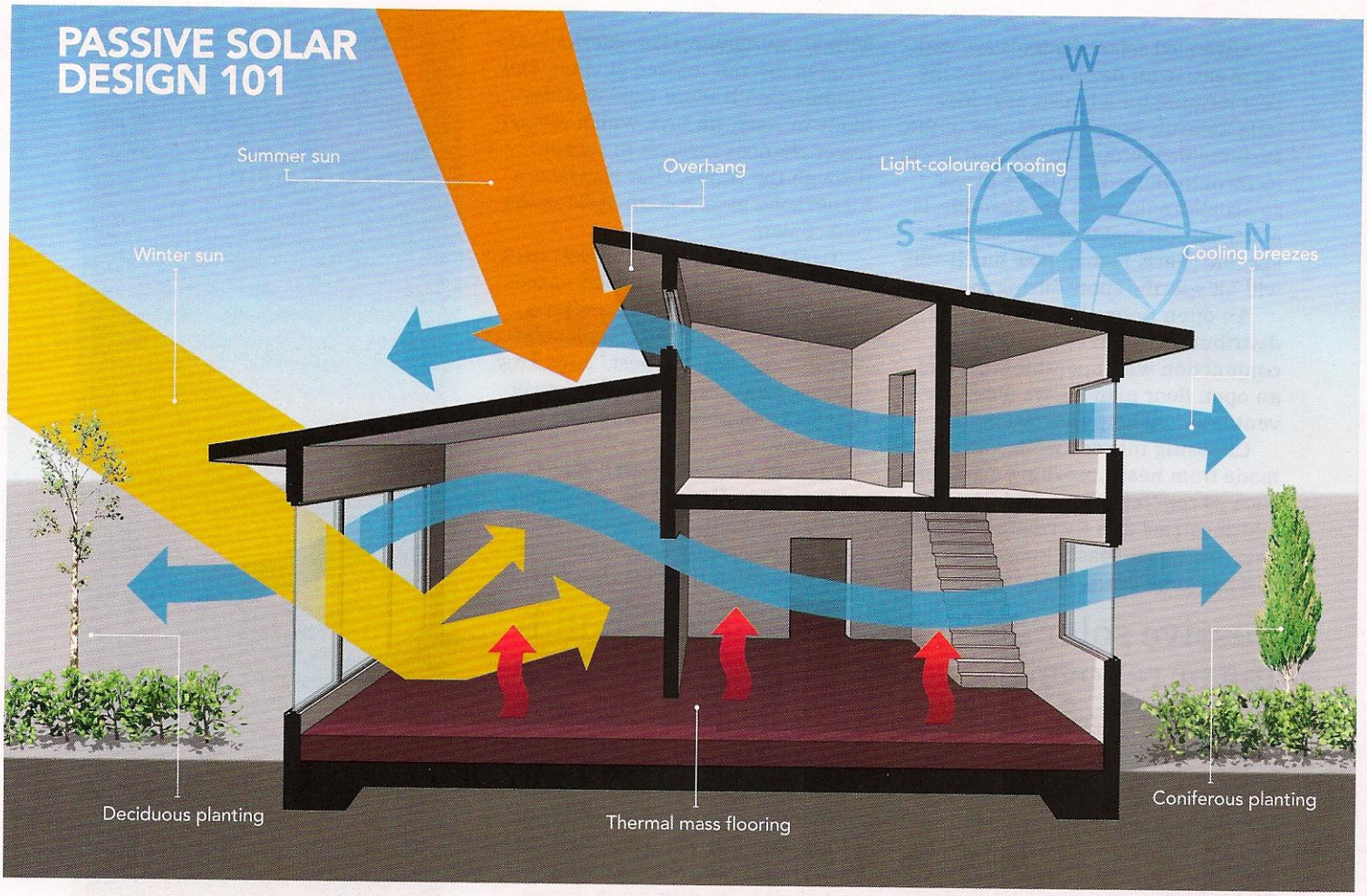
For centuries, humans designed, oriented and built their mountainside cabins and prairie huts with the sun in mind, making the most of its heat and light.

But with advances in technology, our reliance on oil, natural gas and electricity increased, and we forgot about the sun. Now that energy prices are skyrocketing—the cost of crude oil tripled between 2001 and 2006, and natural gas and electricity prices are rising at rates that far outpace inflation—homeowners, builders and designers are turning back to our old collaborator and to passive solar design principles for some of that free energy.

Passive solar design means, simply, building or renovating your home to take advantage of the energy provided by the sun, says Alexander Maurer, director of the Vancouver-based Marken Projects Inc., a green home design and project consulting firm. You end up with a warmer, brighter home and reduced electricity bills as a result.

Passive solar design 101 Our ancestors sought the perfect sunny spot for their homes, and so should you. If you're building new, orientation is key in passive solar design.

Ideally, a home should face south on an east-west axis. This allows more sun into the house, lighting it and heating it naturally—and free of charge—to reduce the dependence on power-guzzling HVAC systems.



of the windows to shade them and reduce the amount of heat coming in from the sun, preventing your home from overheating in the summer.

Overhangs are an easy, cost-effective way to add a passive solar design element during an energy-efficient retrofit, says Zytaruk. And, since the sun sits lower in the sky during winter, the overhang won't block any of the sun's rays from streaming in to your home during these colder months when you need the warmth.

Your roof can also help keep the summer sun at bay. Zytaruk recommends looking for light colours when choosing your roofing material, since dark colours will absorb sunlight, heating up your home.

Even landscaping can be a part of your passive solar design plans. Deciduous trees have barren branches in the winter, letting in as much light as possible during these colder months, yet providing shade in summer once they've leafed out.

Coniferous trees, which don't lose their leaves, can be planted on the north side of the property to create a barrier that can help block cold winter winds from cooling the home.

South-facing windows allow in the perfect amount of light—they are the cornerstone of passive solar design.

Fine points Knocking out new windows and building overhangs are major renovation projects however, requiring expert help from an architect, designer or structural engineer and a skilled contractor. Permits are required if you're changing the size of a window opening or making changes to a load-bearing wall.

Codes and bylaws will also dictate the minimum and maximum size for overhangs, so consult a structural engineer or an architect and your local building authority to make sure that any changes are up to code.

"How much is this all going to cost me?" you're probably wondering. Not as much as you might expect. Passive solar design only adds about five to 15 percent more to the cost of a standard new build or renovation. The cost comes from the extra material to build overhangs, high quality windows and better insulation. But these costs can be offset over time through lower heating and cooling bills.

Although passive solar design isn't that common in Canada yet, experts predict that it will become much more widespread over the next few years, especially as oil, natural gas and electricity prices continue to rise, and time-of-use hydro billing starts to add up for homeowners.

One thing is certain: Whether it's situating your custom home so it faces south, or cutting in a new south-facing window during a renovation, there are many ways to make the sun a part of your energy plan—and savings. ◻

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