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# Energy Source: Make energy-saving changes, and get paid for it

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High-efficiency windows have been added for extra energy savings.

I grew up in Dearborn, Mich., world headquarters of the Ford Motor Co., and a favorite family pastime was a visit to the Ford Rotunda to learn about the car of the future. Many of the futuristic predictions that dazzled us decades ago — from cars that talk to vehicles that park themselves — are now commonplace.

Today I live in North Kingstown, far from the Motor City but a community with no less of an eye on the future. Here in this seaside town, local builder Dave Caldwell is transforming a condemned 1960s ranch house into a futuristic building — a comfortable and attractive home that will stay warm in the winter and cool in the summer with minimal use of gas, oil or electricity.

According to Dave, the key to the house of the future is smart construction, or more specifically, a well designed building envelope. Dave calls the building envelope the building “exoskeleton,” the shell that separates the heated or cooled space from the outdoors. By creating a super-tight exterior, the overall heating and cooling demand will be dramatically lowered and energy costs for homeowners will drop by 50 percent or more.

The good news is that much of the technology needed to create the home of the future is readily available — it just needs to be put to use. As Dave points out, builders and homeowners didn’t think much about energy when supplies were cheap and plentiful. But as energy costs rise and supplies dwindle there are now incentives to implement efficiency-best practices.

Dave’s project, the first of its kind in Rhode Island, is part of the “Deep Energy Retrofit” program sponsored

by National Grid. The goal of the program is to achieve significant energy reductions through major insulation upgrades, window replacements, heating and efficiency improvements, and other measures.

The residential retrofit project in North Kingstown started with the construction of a new roof and new walls over the existing roof and walls to provide space for insulation. A combination of insulation products (open cell foam, closed cell foam and rigid exterior insulation) were added to create a super-insulated structure: R-60 roof and R-40 walls, versus R-13 in the standard home.

Triple-paned R-5 windows provide light but minimize heat loss in the winter and heat gain in the summertime. Small, highly efficient air source heat pumps are used to heat and cool the house.

A major challenge in super-tight homes is air ventilation. In this model home, air will be exchanged through a Heat Recovery Ventilator, which refreshes the interior air with fresh outside air, but keeps the heat or cooling in the house.

What about renewable energy? Dave hasn't included it in the North Kingstown project: the need for supplemental energy generation is minimal and a proposed 10 kilowatt photovoltaic system would have required removal of several mature trees on the property. However, in some energy retrofits, once a super-tight building envelope is constructed, a solar photovoltaic or other renewable energy system is added. The renewable system provides the remaining electricity required for heating and cooling, air ventilation and all other electrical requirements. These "net zero" homes will effectively have no heating or monthly electric utility bill.

For Dave, green building is good business. "Ultimately, energy efficient buildings are a win-win," he explains. "The homeowner wins with significantly lower energy bills and the community wins because we are keeping energy dollars in-state — creating local construction jobs to build efficient structures versus sending money out-of-state to buy oil and gas."

Interested in turning your home into a house of the future? Through the Deep Energy Retrofit pilot program, National Grid will cover as much as 75 percent of the costs of the energy upgrades up to a total of \$42,000. Candidates must be able to secure their own financing to cover nonreimbursable portions of the project and must agree to team up with a contractor experienced in green building construction.

For more information or to determine if you may be eligible for a Deep Energy Retrofit, visit: [www.powerofaction.com/ri](http://www.powerofaction.com/ri). For information on a no-cost energy audit available to any National Grid customer, visit: [www.powerofaction.com/rienergywise](http://www.powerofaction.com/rienergywise).

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