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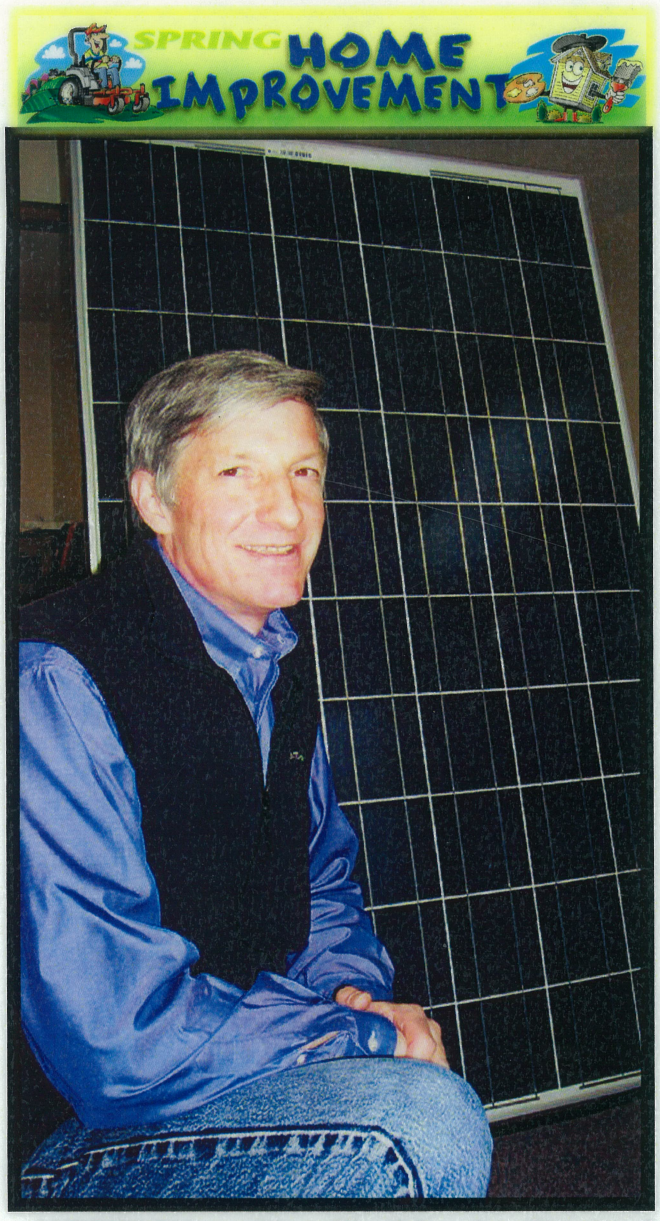
RENEWABLE ENERGY SOLUTIONS

Customized To Fit Your Budget And Your Business Or Home



ANDREW CAY, president of Brattleboro-based Integrated Solar Applications, says that solar thermal systems for hot water and space heating needs are one of the best renewable energy investments you can make. Cay is shown with a solar panel. (Photo by Dorianne Almann)

By Dorianne Almann

Brattleboro, Vermont-based Integrated Solar Applications Corporation combines renewable, sustainable energy technologies to achieve the most effective heating and cooling solutions for residential and commercial settings in Massachusetts, Vermont, and New Hampshire. ISA's focus is on solar thermal, solar photovoltaic, small wind, geothermal, biomass, and hybrid systems by combining these technologies for new construction and retrofits. President Andrew Cay's background in engineering, building methods and technologies, energy modeling, and integration of renewable energy systems complements the skills of ISA's employees who are experienced, licensed, and certified in renewable energy systems.

Buderus, Fronius, Velux, and Xantrex are among the manufacturers of renewable products that have certified ISA. The company favors American made products but offers customers an array of products made in countries around the world.

"We are partners in the renewable revolution, offering net zero energy solutions," Cay said. Buildings that produce energy equal to or greater than the energy they consume over a year are said to be net zero energy buildings. Cay went on to explain that ISA advocates for energy conservation, sustainable building design and practices, and the use of green materials.

"It is our goal to find the right combination of conservation and renewable energy solutions for each of our customers," Cay said.

According to Cay, now is an excellent time to make an investment in a renewable energy system. Such systems create energy independence. They lessen dependence on foreign oil and highly polluting coal. Federal tax credits and grants for renewable energy systems are now set at 30 percent of project cost and when combined with state incentive rebates, homeowners and businesses can save more than 45 percent on a renewable energy system. Rates of return routinely exceed 10 percent per year and can be as high as 20 percent or more.

"The return on renewables' investment makes for a wise investment today that is genius tomorrow," Cay said.

Getting started with installing a renewable energy system involves three steps, Cay explained. You inventory your resources, understand your objectives, and understand the incentives.

Assess the resources you have on your property in terms of sun exposure, water resources, wind opportunities, availability of wood, and the like. Once you detail your resources, identify your reasons for moving to renewable energy, think about your lifestyle, philosophical commitment, financial objectives, and budgetary constraints. Finally, understand incentives available to you in order to make the most of your financial investment. Federal tax credits are available and Vermont, Massachusetts, and New Hampshire are among the states offering renewable energy incentive programs.

Solar thermal systems for hot water and space heating needs are one of the best renewable energy investments you can make, Cay said. Typically, these systems pay for themselves within 10 years or less and can last at least 25 years. Few moving parts in solar thermal systems translate into minimal maintenance and service and owners see few operational costs once their system is installed.

"When properly designed and installed, solar thermal systems are efficient, even when outdoor temperatures are well below freezing," Cay noted.

Cay said that for a family of three people who are interested in moving to renewables, a solar hot water system is logical. The total system cost is typically between $9,000 and $13,000; state and federal incentives reduce the system's cost to $5,000 to $8,000.

Where solar thermal systems heat up a liquid that moves through the panels and use a heat exchanger to transfer the heat to your domestic hot water or to your heat delivery system, solar photovoltaic (PV) systems result in electricity. Made primarily of light sensitive silicon, photovoltaic systems convert sunlight into usable electric energy when paired with an appropriately sized inverter. Having no major moving parts, PV systems can reliably produce power for more than 25 years and are virtually maintenance free.

The most popular PV systems let you sell power back to your electric company through "net metering," Cay explained. The system is connected to your electric meter and you see credits on your electric bill.

Geothermal systems take naturally occurring heat from the ground, making usable heat for your house via a heat pump.

Geothermal systems rely upon an unlimited quantity of a constant temperature source. The ground is an excellent source as it maintains a constant temperature of approximately 50 degrees Fahrenheit year-round. A heat pump extracts energy from a source and transfers that energy to the heating system in your home. Geothermal system sources are typically drilled wells (vertical), field buried pipes (horizontal), or lake or pond submerged pipes (open source).

Similar to the solar-based systems, geothermal systems can be retrofitted in homes having radiant or forced hot air systems. Cay said, "Geothermal systems see very attratcive rates of return, saving you 60 percent to 70 percent on your heating bill." He said the systems are also reliable and require little maintenance. Geothermal's drawback is that New Hampshire, Vermont, and Massachusetts offer no state incentives for installation.

Unlike the solar-based systems, geothermal systems offer you the flexibility to heat your home in the winter and cool it in the summer simply by turning a reversing valve. According to the Environmental Protection Agency, geothermal systems are the most energy-efficient, environmentally safe, and cost effective conditioning system available.

As Cay said, "For every kilowatt hour spent to run the heat pump of a geothermal system, you get 3-1/2 kilowatt hours of return."

Given the area's forested nature, wood and pellet boilers are a good choice in our region for home heating. Cay explained that the wood boilers Integrated Solar sells are gasification units from Tarm Biomass. Reaching temperatures of 2,400 degrees Fahrenheit, these units have an efficiency rate of 85 percent or higher. Pellet systems offer a lower maintenance alternative to conventional wood boilers. The nature of the pellet fuel with bulk storage and delivery requires less homeowner involvement compared to cordwood—there's no splitting, stacking, and hauling of wood. You buy pellets in bags or store them in a silo.

Cay said the state of New Hampshire offers a $6,000 incentive for installing a high efficiency bulk storage pellet boiler. "The state is encouraging installation of these systems as a way to revitalize the state's wood harvest and pulp businesses."

Integrated Solar also supplies small wind systems having capacity less than 100 kilowatts. "The wind industry represents a great opportunity and it's an important arrow in the renewables' quiver, but it is not regulated and not certified. The wind industry is where solar was 30 years ago."

Cay said that an initial consultation to help you figure out how a renewable energy system could be incorporated into your home or business is free. While the technology has changed radically since ISA started, the company's commitment to quality products, service, and design remains unchanged. ISA is still servicing systems of clients who had their solar systems installed in the 1970s and 1980s. There is a five-year warranty on very system ISA installs.

Founded in 1975, Integrated Solar employs 10 full-time employees and two sub-contractors. In 2008, Cay bought the company from its founder Alain Ratheau who remains with the company today, acting as its lead engineer.

Integrated Solar is located at 121 Spring Tree Road in Brattleboro, VT; for more details, call 802-257-7493, fax 802-257-7447, or visit www.isasolar.com.

GROUND MOUNTED panels for solar hot water (left) and photovoltaic systems.
(Photo by Integrated Solar Applications