



## The Outlook for Alternative Renewable Energy for the Green Industry

### Wind, Photovoltaic, Micro-Hydroelectric

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Most environmental horticulture agribusinesses, such as greenhouse operations and container or field production nurseries, are faced with many externalities that influence their bottom line. Examples include an increase in the federal minimum wage and rising competitive wages, increased cost for raw products or inputs, increased federal and state regulation, higher property taxes, wavering availability of labor, increasing competition along with new acquisitions and mergers, and increasing fuel and energy costs.

Unlike many other businesses, these firms rely more heavily on electricity than they do for liquid, petroleum-based fuels. So instead of looking at bio-fuels, bio-energy, biomass, and other bio-products to generate alternatives to fossil fuels, these agribusinesses are scrutinizing and evaluating alternative renewable energy sources of electricity to beat the meter.

Alternative renewable energy – what is it, and why is it important to the green industry? The concept of renewable energy means sources of energy that are replenished, replaced or renewed on a short, active timeframe. Sun, wind, and flowing water are perpetually renewed on an active basis. Biomass from trees and grasses have an annual or longer cycle but are still renewable energy sources within the perception of an active timeframe, as would be the use of manure and other wastes for anaerobic digesters. Oil is being made under the earth's crust somewhere, but the timeframe is measured in millions of years, and the current cost of extracted crude oil exceeds \$100 a barrel, while the economics of the renewable energy sources is quite positive.

Mini-hydroelectric, photovoltaic (solar panel), and small-wind turbines have proved successful in generating electricity on-site to escape the electricity grid by environmental horticulture firms, as well as other agribusinesses (including confinement livestock and poultry producers, fruit and vegetable grading, packing, and cooling sheds, cotton gins, and food processors). Solar panels can be placed on existing structures or similar surfaces, while the small wind machines have a small footprint with conduit placed underground. The success of mini-hydroelectric, of course, is location dependent; hence, firms must have direct access to the flowing water source. Seasonality does influence the quantity of electricity generated: water pressure and flow increases during the winter, while sun (solar) energy and wind velocities increase during the summer – yet all three alternative renewable energy sources are capable of generating electricity year-round.

Using agribusinesses that installed either mini-hydroelectric, photovoltaic, or small wind turbines to generate electricity, the following financial information reflects a very favorable investment opportunity for the green industry, assuming net metering with the utility provider:

Renewable Energy Source	Financial Determinant			
	Payback Period (years)	Simple Rate of Return (percent)	Net Present Value (at 10% interest)	Internal Rate of Return (percent)
Small Wind	4 – 5	20 – 25	\$ 59,000	16 – 23

Photovoltaic	3 – 5	22 – 28	\$ 42,500	11 – 14
Hydroelectric	5 – 8	15 – 20	\$ 23,500	9 – 13