

Clean energy efficiently powers the Wicked Joe coffee roasting facility in Topsham, Maine.

Solar Power and Energy Efficiency at Wicked Joe

Photovoltaic solar panels on the roof convert sunlight into electricity. An inverter inside the building synchronizes the solar electricity with electricity from the public grid. The brighter the sun shines, the more solar electricity the roof generates.

This solar electricity reduces or even reverses the flow of electricity from the public grid. Meters measure these electricity flows. Every kilowatt hour of solar electricity that is fed in to the public grid is credited on each month's power bill.

- Peak Power: 3.57 kW
- Annual Energy: 4,521 kWh
- Configuration: Grid Connected



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Solar Space Heating

Solar air collectors on the southern wall bring the sun's warmth into the building. When the sun shines, the panels warm up. A thermostat senses when the panels are warm enough to turn on a fan to draw heated air through the solar collectors and into the facility.

- Air Temperature Rise: 30-100°F above ambient
- Annual Energy: 1.5 to 3.5 GJ per square meter
- Configuration: Glazed Solar Air Collector



This solar heat reduces the amount of fuel used for space heating.

Electric Vehicles

An electric car charging station is available to charge the battery of a plug-in hybrid or a fully electric vehicle. When the sun is shining, sunlight provides much of the energy that flows into the battery of a vehicle being charged at Wicked Joe.

- Charging Standard: SAE J1772
- Voltage: 240 V
- Maximum Current: 32 A
- Power: 7.7 kW



The charging station at Wicked Joe's facility is available for the electric-car-driving public when not in use by a company vehicle.

Energy Efficiency

Spark Applied Efficiency helped owners Bob and Carmen Garver select super efficient LED lighting for many of the offices and enclosed areas. They also installed motion sensors on high bay fluorescent lights to ensure no energy is wasted on unnecessary lights. Skylights provide daylighting, which allows sunlight to reduce the amount of artificial light required.

Heat pump water heaters harvest energy from indoor air to provide hot water and cooler air around them. These units are more than twice as efficient as standard electric water heaters. Heat pump water heaters are especially smart in facilities such as coffee roasters, turning unavoidable waste heat into useful hot water.

When they moved from their older facility in Brunswick, Bob and Carmen brought with them their high-efficiency natural gas roaster units. These roasters have not only lived up to their efficiency claims, but exceeded them. As a result, Wicked Joe's roasting operation uses far less fuel and produces

much less pollution per bag of coffee bean compared to a conventional coffee roaster.

- Lighting Energy Savings: Up to 80%
- Heat Pump Water Heater Energy Savings: Up to 50%

Commitment to Sustainability

The investments in clean solar power and efficient equipment are in line with an overall commitment to sustainability at the core of the business Bob and Carmen have created. Starting with beans grown by farmers who follow strict organic growing principles that produce excellent flavor, then roasting them in a facility that efficiently harnesses Maine's abundant sunlight, the team at Wicked Joe's produces quality coffee that is wicked good!

CASE STUDY PREPARED BY

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