



LEFT: Richard Trethewey explains how the copper heat exchanger in a tankless water heater transfers the heat from a gas flame to the water flowing through the tubing.

Energy Efficiency

The oil-price shocks of the 1970s spurred the fight to control our profligate energy use. Nearly 50 years later, we have 98-percent-efficient boilers, furnaces, and tankless water heaters; Energy Star programs that push for more-efficient appliances, fixtures, and heating-and-cooling equipment; certification programs for window performance; and many new energy-saving products. And with the advent of affordable solar panels, houses can produce as much power as they consume.

Heat pumps In most conditions, this type of heating-and-cooling equipment captures and concentrates about 3kw of thermal energy for every 1kw of power it consumes. However, many heat pumps suffer a steep decline in heating capacity when outside temperatures drop below freezing. Mitsubishi's inverter-driven, cold-climate heat pumps are an exception to that rule; they maintain 100 percent capacity down to 23 degrees F. **H2i Heat Pump**; mitsubishicomfort.com

Thermal imagers These handheld devices convert infrared radiation into colors on a screen, allowing you to see otherwise hidden problems such as uninsulated stud bays, wet wood, soggy insulation, leaky windows and ducts, overheating switches and outlets, even termite infestations. **FLIR One Gen 3**; flir.com

"In just 20 years, there's been a quantum leap in the amount of heat we get out of every dollar we spend."

—RICHARD TRETHEWEY

LEDs Solid-state bulbs, including those from Cree, produce the same amount of light as old-style, 60-watt incandescents, while using just 1/3 the energy. That makes LEDs the easiest, most cost-effective way to minimize utility costs. **Cree 60-watt replacement bulb**; creebulb.com

Condensing technology When excess heat is extracted from the exhaust of fuel-burning furnaces, boilers, and tankless water heaters like Rinnai's, efficiencies that once topped out at 85 percent are able to reach 98 percent. **Sensei Series**; rinnai.us

