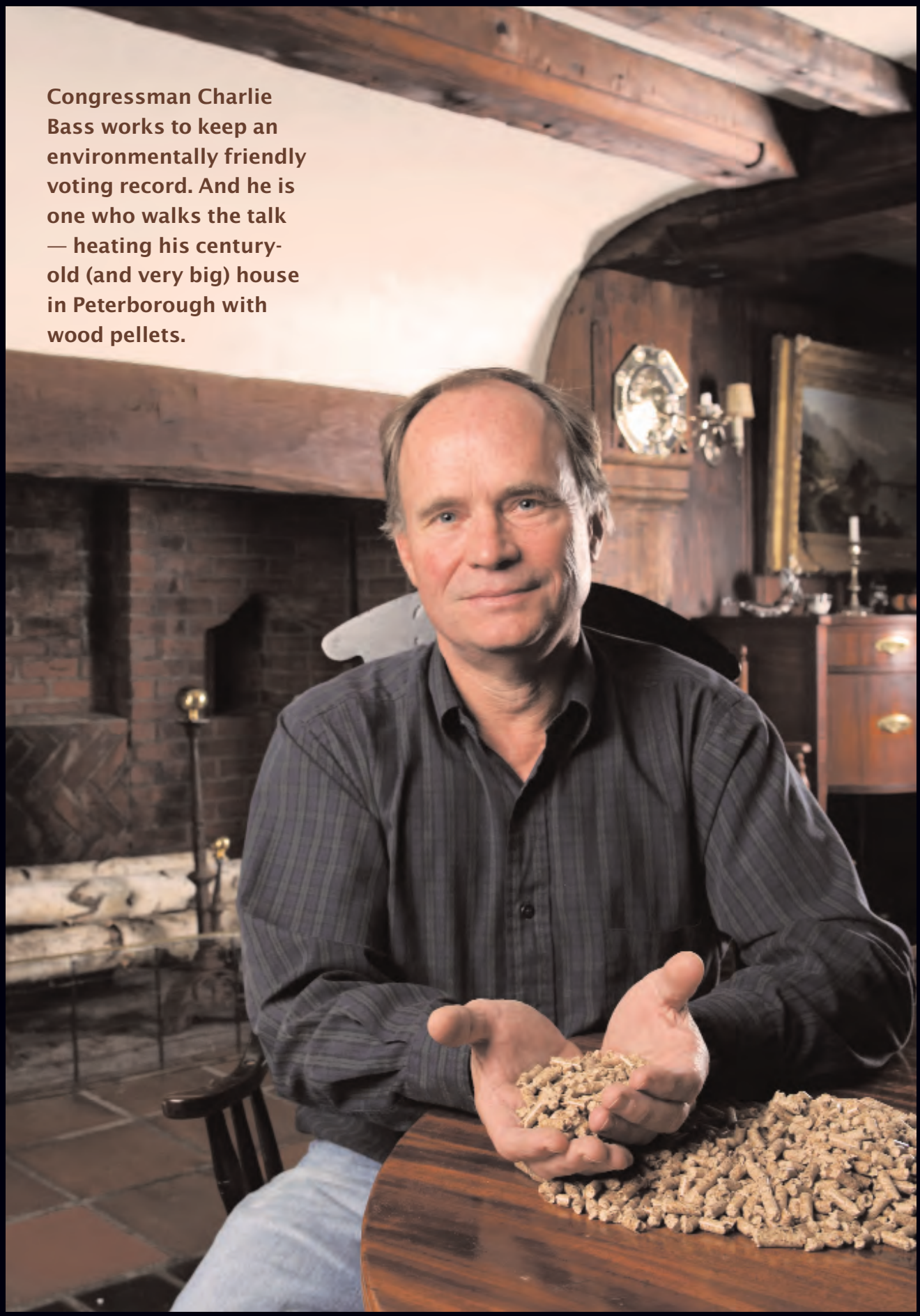

Congressman Charlie Bass works to keep an environmentally friendly voting record. And he is one who walks the talk — heating his century-old (and very big) house in Peterborough with wood pellets.

Pellet Power

Yankee ingenuity is the blending of tradition and innovation to create new classics. When you want to warm an heirloom home in the age of nuclear energy, leave it to ingenious Yankees to figure out how to do it better — with wood.

Stories by Meg Cadoux Hirshberg
Photography by John Hession

The Bass home is redolent of an earlier age — one that was not as concerned with heat loss, solar gain or the cost of energy.

Congressman Charlie Bass checks out the storage tank for his wood pellets.

Most people don't find their central heating system very exciting, but New Hampshire Republican Congressman Charlie Bass practically scampers around his cavernous basement as he explains all the cool features of his wood pellet boiler. Bass is a classic Yankee tinkerer, and his talk is peppered with technical terms like BTU's, watts, amps, and maximum loads. He pauses for a few minutes to mop up some pooled water that had seeped in from a recent storm, and wrings out the cold dirty water by hand into a bucket. Clearly, Charlie Bass is not someone who's afraid to get his hands dirty.

Which is a good thing, because Bass's boiler was imported from Denmark without all the bells and whistles that can make the system easy to use and maintain. Bass had to rig a pellet delivery device to move the wood pellets from their storage place into the boiler itself, and he has personally crafted several other refinements to his system. While Europe has a highly developed manufacturing, distribution, and service system for its hundreds of thousands of pellet boilers, this is not the case in the U.S., where pellet stoves for space heat are commonly used, but not pellet boilers for central heating. There are currently no American manufacturers of high quality "biomass" boilers, which burn wood, wood pellets, and/or pellet corn. (Not yet, anyway—but given the recent interest in renewable energy, which has spiked along with the cost of oil, some entrepreneur is bound to fill that vacuum soon.)

The century-old Bass home, in Peterborough, is redolent of an earlier age, one that was not as concerned with heat loss, solar gain, or the cost of energy. It is low-ceilinged, poorly insulated, and has a fairly dark interior. Recently Bass installed triple glaze thermal windows, and replaced every incandescent bulb with

Laura and Gil Richardson practice what they preach. A cordwood boiler heats the house and the domestic hot water. They built their house very tight to minimize air leakage. An air-to-air heat exchanger heats incoming fresh air. All the Richardsons' appliances are energy-efficient, and they use compact fluorescent light bulbs. Two arrays of photovoltaic cells (each with 10 panels) provide all the electricity, and the home itself is oriented south to maximize solar gain.

full spectrum compact fluorescent light bulbs, which has greatly reduced his energy use. He keeps his heat down to 60 or 62 degrees ("I like it, my wife Lisa tolerates it.")

Bass's 9000 square foot brick Tudor home is a stylistic copy of the Paul Revere House in Boston, though it's much larger. The living room has an enormous old fireplace with logs as long as a man ("We light it once, on Easter"). It is an informal and cozy home, with scattered evidence, in the form of baubles and yarn, of Lisa's hobbies — jewelry making and knitting. A large gray cat and a friendly old mixed breed dog follow their master from room to room. The view spilling out from the large kitchen window is classic New Hampshire—a small orchard, and hundreds of unspoiled acres of forest and field (owned by Bass and his brother), approximately ten of which are cultivated as an organic vegetable truck farm maintained by Bass's stepmother, Rosaly, who has been married to Bass's father for over 30 years. It is an idyllic setting for the Basses to raise their two children, Jonathan, age 11, and fourteen-year-old Lucy.

Outside Bass's stately home stands, incongruently, a huge, shiny 5-ton galvanized steel feed silo that Bass uses to store his wood pellets. A 4-inch PVC pipe runs underground from the bottom of the silo to the basement boiler; the pellets are propelled by an internal auger down through the pipe and into the boiler. Inside the basement, Bass flips a switch to start the auger, a job he must do about 4 times a week in winter. (Bass usually spends Tuesday through Thursday each week in Washington—son Jonathan is responsible for the switch-flipping in his dad's absence) The boiler heats water to about 165 degrees F and pumps the hot water through the house radiators.

BEYOND THE GRID

Living off the power grid, Laura Richardson practices what she preaches. The volunteer president of New Hampshire's Sustainable Energy Association (NHSEA), Richardson is passionate about renewable energy and sustainable living. She spends about 50 hours a week spreading the gospel about sustainability. Two years ago Laura founded NHSEA (www.nhsea.org), the New Hampshire state chapter of the Northeast Sustainable Energy Association (www.nesea.org).

The goal of NHSEA is to provide resources to homeowners interested in renewable energy and to act as a clearinghouse for information. By e-mail and phone, Richardson personally fields endless questions: How do I get an energy audit? Where can I buy solar panels? Which appliances are most energy-efficient? She also makes referrals to installers and suppliers. To increase awareness, NHSEA holds about five workshops a year, for both homeowners and contractors to learn more about energy-efficient design. NHSEA also organizes an annual free "Green Homes Tour," in which several dozen "green" homeowners throughout the state open their doors to the public to display what they've done to both conserve energy and produce it sustainably.

Richardson and her husband Gil were themselves first inspired by a Green Homes tour in 1998. "I had never before thought about the impact of building materials or the cost of energy — energy was always just there. I saw that you could build with conservation and the environment in mind, and still have a beautiful home. Those homeowners gave me a gift, and now I want to give that gift to others."

Living "off the grid" means that the Richardsons must provide all the energy needs for their home themselves. A cordwood boiler heats the house and the domestic hot water — and the Richardsons cut most of the wood themselves. Since, as Laura Richardson says, "the cheapest energy is the energy that you don't use," they built their house very tight, to minimize air leakage. An air-to-air heat exchanger heats incoming fresh air. All the Richardson's appliances are energy-efficient, and they use compact fluorescent light bulbs. Two arrays of photovoltaic cells (each with 10 panels) provide all the electricity, and the home itself is oriented south to maximize solar gain. "We sleep well at night," says Laura. "We believe we're doing good things in the world."

The Richardsons' home represents an extreme model of low-impact living that most people would neither want nor be able to imitate. But their home serves as a showcase for what is possible, which was part of the Richardsons' intent when they built it. After all, if countries like Austria, Sweden and Denmark can each generate more than 20 percent of their energy from renewable sources — compared to a measly 4 percent in the U.S. — why can't we?

Steve Walker, left, founder of New England Wood Pellet

GOLDDUST

Though he's easily over six feet tall, Steve Walker is dwarfed by the dark mountains of sawdust behind him. Color that brown dust gold: It is the humble raw material that built Walker's $10 million business, New England Wood Pellet. Walker's business is growing fast — about 40 percent this year — and, with the spike in oil prices, it's getting media attention from the likes of CBS News and *The New York Times*.

Only 38 years old, Walker is already an old-timer in the wood pellet business. In 1992, Walker, then living in Acton, Mass., learned that the wood pellets a friend used for his stove came from Montana. Figuring that there was no reason pellets couldn't be manufactured locally, Walker went over to a local Blue Seal to see how they made animal feed pellets. Soon after that, Walker started manufacturing pellets, one at a time, in the basement of his home. "I learned slowly and painfully that the production process is not the same for wood pellets as for feed," Walker says. In 1995, Walker moved his growing business to Jaffrey, N.H. The former basement business now produces over 75,000 tons of pellets a year and is one of the largest wood pellet manufacturers in the country.

Walker is buoyantly optimistic about the future of renewable energy. "Everyone, from homeowner to CEO, should spend time looking at ways to cut their energy use," he says. "People need to realize that energy conservation doesn't mean compromise. You don't have to freeze or drive slowly. Between wind, solar, geothermal and biomass, we don't need to use fossil fuels in this country." Then, proudly gesturing to his enormous production facility, Walker says, "Fossil fuels are always trying to hide — their pollution, their damage to the environment and to human health. We want to be seen!"

For more information, visit www.pelletheat.com.

In Europe, most pellet boilers are completely automated and require no more attention than a standard home heating system, except for the occasional need to empty the ash. But the less-advanced technology currently available in the U.S. requires a bit more homeowner participation than a standard boiler or furnace does. In the absence of an automated pellet feed system, homeowners need to physically pour in the 40 pound bags of pellets. But even without the refinements usually present in European systems, pellet boilers are not hard to use. Says Cindy Cadot, business manager of the Harris Center for Conservation Education in Hancock, of the Center's recently-installed pellet boiler: "We don't have a maintenance staff here, so if a bunch of nature nuts can run this thing, anyone can."

Bass, now in his sixth term in Congress, recently supported a bill to provide rebates to consumers who buy renewable energy systems for their homes — though it is unclear if funding will actually be appropriated for the bill. (Although Bass is generally popular with New Hampshire's environmental community, they sharply disagree with the Congressman's refusal to support either the Kyoto global warming treaty or recent attempts to raise the mileage standards on cars.) "We are too dependent on oil," Bass says. "My interest and concern is in reducing the amount of carbon we put into the atmosphere."

Even without the refinements usually present in European systems, pellet boilers are not hard to use.

Bass installed his pellet boiler two years ago. "My home and the land around it are ancestral property. My grandfather [former New Hampshire governor Robert Perkins Bass] built this house in 1910, and gave it to my father [Perkins Bass, a four-term Congressman from Bass's district], who gave it to me. I grew up in this house. In the late 1990s my father replaced our old oil boiler with a modern one. Even the newer boiler used over 4,000 gallons of oil a year to heat this house. Now that oil is over $2.50 a gallon, I'd be spending at least $10,000 a year just to heat this place. Currently my heating bill, using only wood pellets, with rare occasional backup from the oil heat system, is about $3,000 a year." Bass has not had an oil delivery in more than a year — during which time he's only used 165 gallons of oil — and his oil tank is still half full.

Bass is both passionate and knowledgeable about the subject of renewable energy. "Ideally I don't want to burn one gallon of oil," he says animatedly, his blue eyes blazing. "The wood pellets in my boiler are extremely efficient at extracting energy. In Europe, one-third of their energy comes from renewable sources. A couple of years ago I decided to look for alternatives to heat my own home." Bass's nephew by marriage, Steve Walker, is the president and founder of New England Wood Pellet in nearby Jaffrey, one of the nation's largest wood pellet manufacturers (see sidebar). Walker got Bass excited about heating with wood pellets.

Bass bought his pellet boiler from Lloyd Nichols, owner of Tarm USA in

Lyme, N.H. Nichols has imported Danish biomass boilers since 1975. Nichols' biomass boilers range in price from about $5,000 to a bit over $10,000, which is far more expensive than an average oil furnace. But, as Nichols points out, people spend several times that amount on a car, which they replace in a few years, while the boilers last practically forever and save you money in the process. Bass had at first estimated that the pellet boiler would pay for itself in six years, due to the cost-savings achieved by using pellets instead of oil for fuel. When the price of oil went up recently, that payback period got reduced to three years.

Lloyd Nichols himself has a more typically sized home, at 2,400 square feet. It has standard windows and is not particularly well-insulated. Nichols uses about four tons of wood pellets a year to provide heat and hot water for his home. The pellets retail for around $220 a ton, bringing his heating bill to less than $900. In terms of BTU output, one ton of pellets — at $220 — is equivalent to 125 gallons of heating oil, about $325. So if Nichols had heated with oil, his heating bill would have been around $1,300 instead.

Wood pellets also compare favorably with propane and natural gas, in terms of cost, fuel efficiency and emissions. And because of the near total combustion (around 98.5 percent), pellet stoves produce little creosote, so they can be installed by direct vent, without a chimney.

Nichols says that selling biomass boilers is more than the way he makes his living: "It's missionary work, evangelistic." More and more of his customers are making the decision to heat with biomass not for cost reasons, but for personal ones. Wood, wood pellets and pellet corn are not only renewable energy sources, but they produce very little in the way of polluting particulates and are "carbon neutral," meaning that they do not contribute to global warming any more than if the wood decayed naturally in the forest. "When I see my pile of wood pellets," says Nichols, "I'm looking at independence and security. I don't have to worry about the politics of oil controlling the way I heat my home. It's a personal statement and a personal commitment."

Charlie Bass heartily agrees: "The 'greenness' of this way of heating is comforting," he says, "because it means I'm closer to living in balance with the world around me." **NH**