

# The Amazingly Green Forbes House



Ivan Forbes (center) and his son, Glenn (right), answer the questions of Club CEO John Hawkins before they give him a tour of their house (below).

## ■ Join *Alive!* on a tour of the energy-saving Sylmar house of Glenn, Elke and Ivan Forbes, City Retiree.

**PUBLIC WORKS** — The obsession of Ivan Forbes started in the early 1970s.

"When the oil embargo hit in the 1970s, we had to stand in line every other day to get gas," Ivan recalls during a tour of his energy-efficient house in Sylmar. "I said, 'There has to be something the little guy can do, and I'm going to do it.'"

"The '71 earthquake started it all," added Ivan's son, Glenn, who played a large part in the conversion of the house. "That's when [Ivan] said, 'Let's put in some solar panels and get a solar credit.' That started it all."

"We're going to be as independent as we can," Ivan says. And how.

The Forbes' house in Sylmar, which suffered through earthquakes in 1971 and 1994 and a devastating fire in 1996, only to come back better each time, is seriously energy efficient. Through its hot water panels, its photovoltaic panels and its wind turbine, on a good day it produces most of the power they need. And if the wind is strong enough, the house actually produces more than they need, and they're able to put power back into the City's power grid.

So this is free energy?

"Basically, yes," Glenn says.

How much does the system save the Forbes family?

"Before the fire, we had one big air conditioning system in the house," Glenn explains. "My electric bill in the summer would run between \$200 and \$400 per pay period, or a couple hundred per month."

"Now, it's about \$15." Generally, that's for taxes, the rental of the power equipment, the hookup fee, and other administrative fees, he says. (The water bill is "normal," Glenn says. "You can't save on water.")

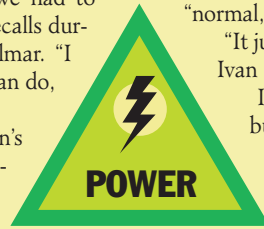
"It just hurts me to have to pay that electric bill," Ivan says.

Ivan Forbes points out that he and Glenn built the system in pieces, or modules. "It started off slow, and we built it up," Glenn adds.

And how much did this system cost?

"Let's just say between \$20,000 and \$30,000 for the turbine, photovoltaic panels and the inverters and battery system, or the price of a new car," Glenn says. "We expect to reach the break-even point sometime this summer."

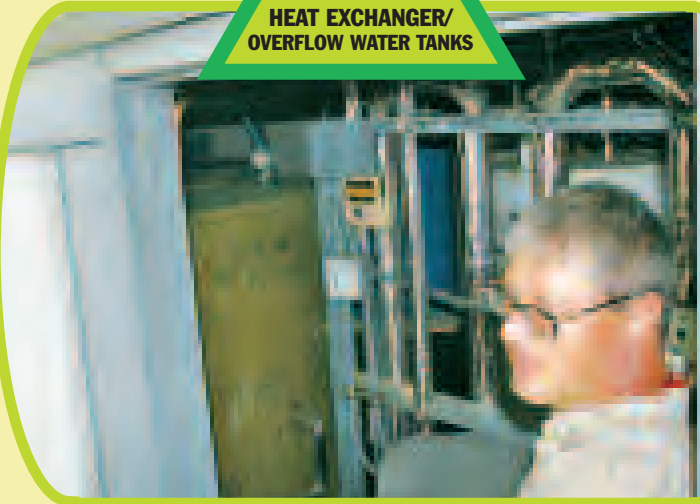
**Come along as Ivan and Glenn Forbes take Club CEO John Hawkins and *Alive!* editor John Burnes for a tour of their amazing house. Just turn the page for all the details.**



**See the full tour on the following pages.**

# Touring the house that can give energy back

**HEAT EXCHANGER/  
OVERFLOW WATER TANKS**



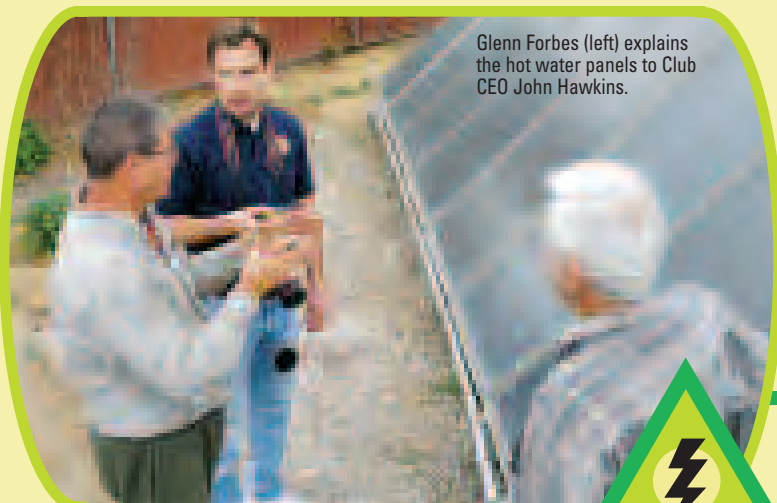
**PURPOSE:** To hold hot water for household use, and maintain its temperature. The hot water comes from the domestic hot water panels. During daylight, the water is in constant recirculation: the hot water is in a closed loop and transfers its heat to other water for drinking, washing, etc., through the heat exchanger.

**WOOD-BURNING  
STOVE**



**PURPOSE:** To burn wood and radiate heat throughout the house, minimizing the need for electrical heating.

Glenn Forbes (left) explains the hot water panels to Club CEO John Hawkins.



**PURPOSE:** To heat water for the house's hot water needs. By using the rays of the sun, water is heated inside these panels. When the water reaches a certain temperature, the panels release the water into holding tanks for later use. These hot water panels are powered by the solar photovoltaic panels.

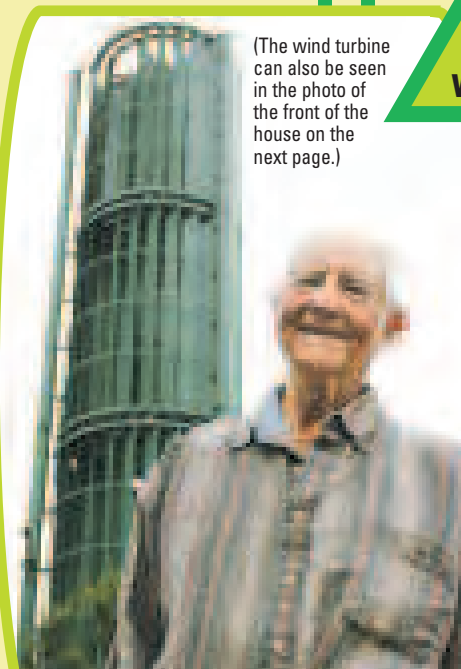
**DOMESTIC  
(SOLAR) HOT  
WATER PANELS**

**POWER  
SIGN**



**PURPOSE:** This sign alerts DWP crews that this house is wired to dump electricity back into the grid.

**VERTICAL  
ACCESS  
WIND TURBINE**

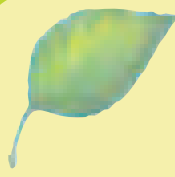


(The wind turbine can also be seen in the photo of the front of the house on the next page.)

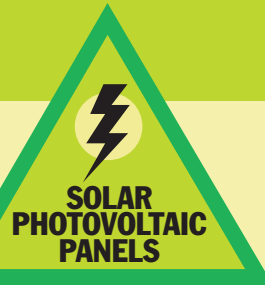
**PURPOSE:** Harness the power of the wind to turn a gearbox (with a gear ratio of 20 generator turns for each one turn of the blades), and create electricity. The energy is put directly into the City's power grid. If there is any excess power, the Forbes family receives a credit on their bill.

- Height:** 42 feet
- Total weight of base:** 42 tons
- Blades:** Six at 180 feet each, total length
- Minimum wind speed required to return electricity to the grid:** 3 miles per hour
- Power produced at 33 mph wind speed:** 12 kilowatts (12,000 watts)



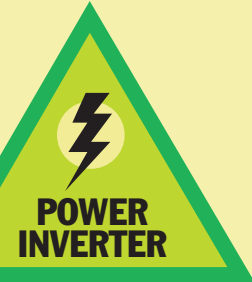


# The Amazingly Green Forbes House



**SOLAR PHOTOVOLTAIC PANELS**

**PURPOSE:** To generate electricity for household use, and to power the solar hot water panels. Powered by the sun. The panels transfer their energy to the batteries (DC). At maximum generation, the system is designed to produce twice as much power as the house generally requires. Number of panels: 16. Angle: 35 degrees, facing south.



**POWER INVERTER**



Ivan Forbes, Retiree, explains his house to *Alive!* editor John Burnes.



**PURPOSE:** Accepts power from the batteries (which hold the power from the photovoltaic solar panels) and inverts it to AC power for the house, in both 120 and 220 volts.

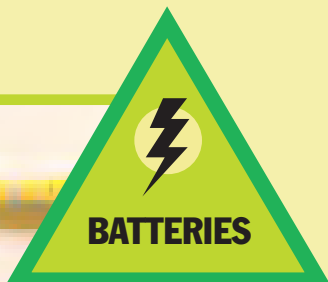
## Forbes House Back View



## Forbes House Front View



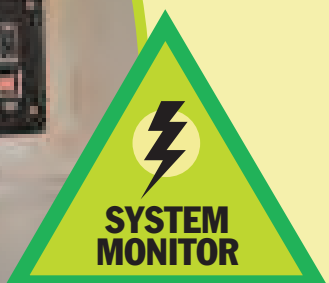
From the front (above), the Forbes home in Sylmar appears normal. But in the back (left), the house becomes an amazing exercise in energy efficiency.



**BATTERIES**



**PURPOSE:** Power is sent from the solar photovoltaic panels to the batteries, for storage and eventual use when the house requires it.



**SYSTEM MONITOR**



**PURPOSE:** To monitor the power system's performance, including energy collected, volts in, amps, watts and accumulated amp hours of savings.



## The Amazingly Green Forbes House

# To Help Save the Environment, Start Simply

What Ivan Forbes did is extraordinary, and many of you can follow his guide to start your own energy-saving project.

But if that grand scale intimidates you, don't worry – the DWP offers these tips on how to save energy and water every day, simply.

## SAVING ENERGY



- Turn off lights when not in use.
- Adjust thermostat to 78 degrees to reduce energy usage.
- Limit the use of appliances during peak hours of the day—use washing machines, dishwashers, vacuum cleaners and other heavy appliances during evening hours.
- Try to avoid cooking during peak hours of the day since cooking will add to the heat inside the home.
- Ventilate your home at night by opening windows and doors to clear out the heat and allow cooler air to circulate.
- Replace incandescent light bulbs with compact fluorescent lamps (CFLs) wherever appropriate.
- During the heat of day, close your draperies, shades or blinds to reduce the extra heat from direct sunlight and check your home for adequate insulation.
- Plant shade trees, to reduce heat gain to the house.
- Install/use ceiling fans or whole house fans for comfort cooling.
- Install a programmable thermostat to adjust the temperature automatically and maximize your energy savings.
- Clean or replace your air conditioner's filter(s) every month to keep your air conditioner running more efficiently.
- Regularly brush or vacuum the condenser coils at the bottom or rear of your refrigerator and check door gasket for tight fit and adjust if necessary.
- Buy energy-saving "Energy Star" labeled appliances.

### Some other suggestions for businesses include:

- Turning off your desk and overhead lights, and meeting room lights, if they are not needed.
- Keep personal appliance use to a minimum.
- Turn off all computer equipment when you leave the office or when they are not being used.
- Be sure your computer equipment goes into the sleep mode when not in use. (80 percent savings in energy use)
- Go paperless when possible. Reduced printing and copying translates into reduced energy use.
- Promote "casual Friday dress" as a means of raising the cooling settings on thermostats.
- Turn off lights and equipment when they are not in use.
- Replace incandescent light bulbs with compact fluorescent lamps (CFLs) wherever appropriate.
- During the heat of day, close your draperies, shades, or blinds to reduce the extra heat from direct sunlight and check your home for adequate insulation.

## SAVING WATER



- Use only as much water on your lawn as you need to. Step on your grass. If it springs back when you lift your foot, it doesn't need water. Use the watering calculator and watering index found at [www.bewaterwise.com](http://www.bewaterwise.com) to learn just how much you should water. Saves 750 to 1,500 gallons a month.
- Fix leaky faucets, plumbing joints and your sprinkler system. Saves 20 gallons a day for every leak stopped.
- Install a new "smart" sprinkler controller that figures out the right amount of water for your landscape based on information about your plants and garden environment. In one study, these new controllers saved 40 gallons a day
- Replace a portion of your lawn with beautiful native and California Friendly plants. Saves 1,000 to 1,800 gallons a month depending on your climate.
- Replace your old washing machine with a new, high-efficiency model. Saves 20 to 30 gallons per load.
- Run only full loads in the washing machine and dishwasher. Saves 300 to 800 gallons a month.
- Use a broom instead of a hose to clean driveways and sidewalks. Saves 150 gallons or more each time.
- Shorten your showers. Even a one- or two-minute reduction can save up to 375 gallons per month.
- Don't water the sidewalks, driveway or gutter. Adjust your sprinklers so that water lands on your lawn or garden where it belongs – and only there. Saves 500 gallons a month.
- Don't use the toilet as a wastebasket. Saves up to 200 gallons a month.

