

## GLOBAL WARMING: REQUIRE NET-ZERO-ENERGY HOMES

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Sometimes we cross a line in what we're doing, where things suddenly feel very different. We've actually cut energy use in homes in half since the 1970s. That felt good, but we're now building homes that are twice as big, so the net effect is small.

But in the last few years people have drawn a line, and said, "Let's require ALL new homes to stop using ANY fossil fuels – to *produce* as much energy as they consume. Period." That's a line that feels incredibly different when we cross it. Producing, not consuming. We can feel proud. We can feel we're really doing something differently and better. And we can do it.

It's also interesting how unaware we are of the institutional patterns that shape our lives. Federal "depletion allowances" for the oil industry made energy seem cheap, so we've built poorly insulated homes, consumed most of our fossil fuels, and pay more over our lifetimes for energy to operate our homes than for the homes themselves.

Our homes are responsible for a huge hunk of our energy use. Oregon proposes to upgrade building codes to reduce energy use by 15 percent by 2015. That's old politics, old science, old thinking. We can do way better than that, and do it now.

*Premier ZEH development, Sacramento CA.*



Are zero-energy homes really possible? They're not only possible but becoming affordable.

Remember – we pay our energy bills out of the same pocket as our mortgage payments. And putting our dollars up front into zero-energy homes means real security against rising energy costs. Real

security also when the power goes out and other people have no heat. And real security in not pushing us into more global wars to grab other people's energy. Side benefit - our dollars support local builders rather than depleting remaining fossil fuel energy supplies.

It makes enough sense that the Lopez Island Community Land Trust in Washington State, which builds homes for the island's hard-working low-income families, is now building all its homes as zero-energy. Building homes that put as much energy back in the grid as they take out. Homes on very tight budgets.

Habitat for Humanity has built zero-energy homes in Denver, Tennessee, and elsewhere. Great Britain and France have already mandated that all new building construction be zero-energy – not just homes, but ALL buildings. Canada is working on similar programs. Germany is retrofitting existing homes for major reduction in energy use. Portland, Oregon, is developing a “fee-bate” program to “rebate” the front-end costs of efficient buildings by charging a fee for buildings that are energy hogs.

So, how do we perform the magic, and how fast can we get there? We can change the building code insulation levels immediately, and get to the electric “net-zero” part within 2 years. The tax credits to pay for the added front-end costs are already there, and future savings more than pay that cost – global warming or not.

First step is super-insulated walls, roof, and windows. Insulated well enough to often *totally eliminate* the need for a heating system. The savings from not having a heating system helps pay for the extra insulation. This is the principle made popular with the European “Passivhaus” homes. More than 6,000 Passivhaus buildings have been constructed in Europe, with others in various countries world-wide. Super-insulation homes also don't have to be high-tech. Architect Kelly Lerner has built whole communities of straw-bale homes in Siberia and China which dramatically improve both comfort and energy efficiency. And they don't have to be ugly. These homes can warm the heart as well as the body.

There are variations from just a lot of insulation. The Ouroboros House we pioneered in Minnesota in 1973 started by berming the north walls, to get the house down where the ground temperature is warmer than air temperatures in the winter and cooler in summer. Traditional desert housing in the southwest uses thick adobe walls. Because of their big daily temperature swings, the daytime heat slowly moves through the walls, keeping the inside warm at night, and the night-time “cold” coming through the walls in the hot days keep the insides cool.

Adding passive solar heating, with big south windows, lessens the need for insulation or heating systems, as in the Rose House in Portland, OR. The third step is good daylighting and efficient lighting and appliances. And turning them *really* off, using a power strip, not just “dark screen”.

Zero-energy homes can heat water with a solar water heater, even on the coast. Super-efficient heat-pump water heaters, soon to be imported, will do even better. The final step is roof-top solar-electric panels - either now or orienting the roof to install them as prices drop. These export excess electricity to the grid when not needed. Together, these actions can totally, or almost totally, eliminate the need for fossil fuel energy for a home - in almost any climate.

And we can go further. The Farallones Integral Urban House project in Berkeley, CA, way back in 1976, took an old existing urban house, and demonstrated how it could become virtually self-sustaining in terms of food as well - on a standard urban lot.

Requiring zero-energy houses in our building codes can happen, and happen quickly, at local, state, or national levels. It helps homeowners. It helps the building industry, transferring investment from oil to building. It helps the future. Oregon pioneered energy efficiency in building codes in the 1970s, with huge benefits. Lets do it again. Then we can focus on improving what we've already got.

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