

# The Power of Energy Efficiency: Plug the Holes in the Ship

By R. Christopher Mathis

SMART AS WE ARE, we are failing to plug the holes in our ship.

Buildings (homes and commercial buildings) consume over 40 percent of our nation's energy—more than any other sector of our economy. Reducing their energy consumption is easy. Most of these lessons we learned during the post-embargo days of the mid- to late-seventies. And most of the technologies needed are BORING. Insulation. Air sealing. Better windows. Duct sealing. Water heater blankets. More efficient appliances, furnaces and air conditioners. BORING.

Not sexy like windmills. Not cool like hydrogen vehicles. Not trendy like methane recovery, ethanol and solar. We want to put all these new, cool technologies on the deck of our energy planning “ship” while we ignore the holes beneath the waterline.

Energy efficiency is boring by comparison. Hard to get excited about old, proven technologies. But is it? I think we have failed to deliver the truth about the Power of Energy Efficiency. If we fully knew this power, I suspect that we would behave differently.

## RESIDENTIAL EXAMPLE #1

We have about 120 million existing single family homes in the US (US Census data).

We build about one to two million per year (NAHB Annual Construction Statistics). That is about one percent new each year.

So 99 percent of the “holes” in our ship are existing buildings. About half of these homes have single or double clear glass (EIA data and Ducker data overlay).

That makes about 60 million homes.

*What if we just changed the windows with current code minimum windows? Not the best windows we have available. Not the coolest technology. Just the boring stuff that has been available for 20 years and is now the code minimum.*

Windows drive the air conditioning loads in homes and buildings (DOE and LBNL data).

Replacing the average home with new windows would save about one ton of peak air conditioning per home (REMDesign and Energy Gauge modeling).

Some would save more. Some less. But on average—about one ton.

- 1 ton is 12,000 Btu/hr.
- 1 ton of AC requires about 1 kW of peak electricity.
- Simple math:  $60,000,000 \times 1 \text{ ton} \times 1 \text{ kW} = 60,000,000,000 \text{ Watts} = 60,000 \text{ MegaWatts}$ .
- That is 300 – 200 MW coal fired power plants.
- Or 100 – 600 MW super coal plants.
- Or 30 new 2000MW nukes.
- Permanently.

Just by changing the windows.

## THE REST OF THE STORY

What if we also did the other boring stuff? Insulate, air seal, water heater jackets, improved HVAC? How much more might we save?

Oh, and where do we GET these boring energy efficiency technologies? Answer: from US companies that have been making this stuff for decades. Familiar names like Andersen, Marvin, Pella, and just about every other window company in America.

They all have it. It is required by code. American companies. Home-grown solutions. Employing people now. Neighbors.

Who is going to install these windows? Answer: people in your neighborhood. Contractors, builders, window installers. Local people. Jobs we cannot “out-source”. Putting people to work.

Oh, and these companies and people will pay taxes on the products and for the work, for the raw materials, for the installation labor. Contributing back to our economy.

And the utilities? They should invest in this plan now. It provides immediate and better peak power management than any peaking power plant they could build. Oh, they will still build power plants, but why not plug the holes in the ship first?

Fixing people's homes is a permanent solution. The heating, cooling and peak loads are permanently reduced.

Yes, there will be further derivative benefits. Air quality will improve. Our nation's energy security will improve. People will have reliable jobs and new skills. Tax revenues will go up. US factories will be kept busier longer.

Let's plug the holes in the ship with these boring, proven, home grown energy efficient technologies. Let's do it now. For everyone's benefit.

---

*Christopher Mathis is the President of Mathis Consulting Co., located in Asheville, NC. He can be reached at [chris.mathis@charter.net](mailto:chris.mathis@charter.net) or at [www.thesciencebehind.com](http://www.thesciencebehind.com). Please note, this piece is the opinion of the writer and does not necessarily reflect that of the NIBS or BETEC.*

What if we just changed the windows with current code minimum windows? Not the best windows we have available. Not the coolest technology. Just the boring stuff that has been available for 20 years and is now the code minimum.