

RGGI Programs NYSERDA

Subject: Passive Solar Greenhouse Gas Reduction

I have done R&D on solar concentrators since 1974 (with NYSERDA funding in the '70s and '80s) and I teach Solar Energy Engineering at RPI (since 1983).

However, I am writing about Passive Solar Heating as a way for New York to easily and cost-effectively save annually 10s of millions of tons of CO<sub>2</sub> and billions of dollars.

I have personal experience in my passive solar house and many other passive houses in this climate. Our house was built in 1982 before several window technology improvements. Even so our house in Troy NY gets 66% of its heating, over 50% of its total energy from passive solar windows.

**Heating is the largest use of residential energy use in New York**, ~41 million tons CO<sub>2</sub> (NYSERDA Trends.) **Solar energy is the largest resource available in NYS**, ~500 quads. ( $3 \text{ kWh/m}^2/\text{d} * 365\text{d} * 140,000 \text{ km}^2 * 3412 \text{ BTU/kWh} = 500 \text{ Q}$ )

A new passive solar house is simple, easily zero net carbon and zero net energy annually, LEED Platinum level energy performance. For existing buildings, Conservation First and then passive solar retrofits are straight-forward, but so far almost unknown.

For example, if 50% of houses save 50% with conservation and 50% of remaining heating with passive solar the savings is 33 million barrels annually, ( $3/8 * (34\text{Mbbl oil} + 57 \text{ M boe gas})$ )

Tools to do this include:

- Building codes

- Require energy audits for all real estate transactions

- A carbon tax

Note that passive solar and residents have no lobby. No large corporation makes money off passive solar and so doesn't organize political pressure for passive solar.

Also note that architects, builders, all construction trades, homeowners, renters, bankers and politicians all benefit from local solar energy security. And I am not yet including solar electricity, wind, or hydro, (or commercial-industrial applications of solar energy).

Please accept this short note, instead of a semester long lecture, as an indication of the secure, carbon-free, passive solar energy gold mine available to New York.

Sincerely,

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