(While not directly about trains, we think this subject is closely related to them.)

5 April 2009

Renewably-generated electricity—-solar, wind, geothermal and the ocean tides—-is finally gaining acceptance and market share in America. Put all this together with a similar revolution in the storage and steady delivery of this energy and just maybe some of us will live to see the relegation of the expensive killers Coal and Nuclear (Fission) to their places in history alongside other once-useful artifacts like the buggy whip and the carbide lamp.

There's no denying that our lives are much easier and safer (and probably more fun) after over a century of reliable fossil-fueled electricity. But, as Olive Oyl once said to Popeye, "Too much is enough!". We've got cleaner choices now. Renewables have proven themselves. Which is why writing the following makes me feel a little like the Ebeneezer Scrooge of renewable energy.

Having fooled around with wind generators in the early '70's, and having long tried to promote "green" building (and re-building) as an old-house contractor, I'm naturally delighted with the rise of renewables. But; as with most Great Issue discussions, sizable gaps reveal themselves. With regard to renewable electricity, most of the everyday buzz centers on two extremes of generating capability: small installations serving one household and great big ones serving widespread millions.

These extremes are but two legs of what should be a three-legged electricity production stool. Let's gaze at these legs.

The Small Leg:

A power plant on every roof! How feel-good and self-sufficiently All-American can you get? But, like hybrid cars and political term limits, this attractive notion reveals significant flaws upon further reflection. These flaws include lack of efficiency in

labor, materials and invested energy per kilowatt realized; including the energy it takes to make, ship and deliver each set of components. There are other problems with this model:

—- These home-size systems cost more than most of us can afford, even with generous tax breaks;

—- They encourage rural sprawl;

—- Sooner or later (probably later), each and every householder will have to face significant repair and replacement of system parts—-a kind of energy balloon payment.

The Big Leg:

—- The bigger and more wide-serving any piece of infrastructure is, the more disruption and damage can be inflicted on its dependents by a single natural disaster or act of war;

—- Long-distance transmission of electricity is very expensive in materials and land (aluminum and easement acreage), subject to sabotage and theft (aluminum again) and easily interrupted by storms;

—- High-tension lines are being linked to radiation hazards;

—- A lot of power is lost in transmission, “falls off the wires”, as it were. This loss of course increases with distance from the generator.

A Third Leg

There is a third way that gets less attention amid all the trendy buzz; the middle of the scale or third leg: generation at the **town or community level.** I consider the

old power stations at Ratón and Algodónes to be excellent size examples. Use that model, only feed them renewables.

Besides optimizing the expenditure of money, materials, labor, transportation and acreage per kilowatt of delivered energy, there are other advantages to this mid-sized approach:

Environmental justice: Dirty but supposedly essential industries are disproportionally located in poor and non-white neighborhoods, and the resulting outcry is rightfully growing. *But what if a necessary industry is clean and non-polluting, like a modest-sized solar or wind power plant?* Far from being an environmental justice problem, these things would be a desirable asset to most neighborhoods; especially the mixed-use, live-work communities now coming into their own again.

Ugly? Hell, they look a lot prettier than most necessary structures we put up with all around us.

There's also a **neighborly** aspect to this distribution model; an aspect which promotes a sense of community and simplifies business transactions like billing problems and service calls. That billing manager or pole climber might be in your PTA or hang out at your favorite bar.

And to further turn "Not In My Back Yard" upside down, maybe our utility rates could be adjusted for distance from the plant, not unlike transit fare zones, and for analogous reasons. The further the power is sent, the more it should cost; subject of course to hardship, non-profit and essential-service exceptions.

I leave it to the many engineers among us to study and compare these various size-scale alternatives with respect to cost in labor and materials per kilowatt realized, efficient transmission, long-term maintenance and reliability, etc; and I hope somebody takes me up on this. I am no engineer, but my contractor's gut tells me that by adding this mid-sized mindset to the others, we can avoid many of the

dangers and expenses of operating primarily Real Big or Real Small.

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