

A Private Enterprise Approach to Renewable Energy

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A private enterprise strategy is feasible for forging a clean renewable energy economy. Unless alternative energy sources develop, like fusion, the principle sources for such an economy are solar and wind energy. Nuclear energy at present is not cost competitive.

One of the problems with developing and selling wind and solar energy is the variability of these sources. Typically, alternative energy companies are small and horizontally organized. Many solar and wind companies have failed, in part due to the inability to market power that is not dependably deliverable, and in part due to variability in government support.

The variability in delivery problem may in part be solved by use of improved energy storage and transportation means. See:

<http://www.mtaonline.net/~hheffner/HotCold.pdf>
<http://www.mtaonline.net/~hheffner/BigPicture.pdf>

However, much of the reliable delivery problem can be immediately solved simply through effective business strategy and business synergies. The solution is a vertical integration approach. By diversifying energy sources, the reliability of delivery is increased, and great technical synergy is possible. By owning energy transmission systems, the delivery strategy can be optimized with reduced exposure to external manipulative schemes.

Wind companies should, during buildup of capacity, also acquire or build conventional generating capacity for the purpose of smoothing energy deliveries. Small methane fueled jet engine powered electric plants might be a viable way to build this capacity. Energy delivery reliability for a wind based producer can also be improved by buying or building alternative power sources, like solar, or biofuel generating plants. Merger with existing power generating utilities may make sense, and should be facilitated and expedited by regulatory commissions when application is made by all the merging parties. This nominal approach can be greatly enhanced with technological improvements and a more integrated approach.

Wind farms can readily be used to store energy in the form of liquified air. This capacity, combined with use of heat storage plus waste heat from a nearby peak load generating facility, can dramatically increase the efficiency of that facility, as well as

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the energy storage capability of the overall plant. There are many synergies that can exploit existing technology through vertical integration.

A large new source of reliable power, deliverable in the form electricity, can readily be absorbed. Home heating can easily and cheaply be upgraded and augmented by electric heaters. Radio network based, home heating control systems can be implemented that optimize use of the generating, transmission and distribution systems by timing the use of auxiliary electric heat according to codes broadcast by utility management systems. Electric vehicle technology is close to being deliverable in a big way, so home charging can be managed in a similar fashion. The utility control systems could broadcast demand area designation codes and desired demand percentage values. The home systems would respond by attempting to meet auxiliary home demand with the designated amount of auxiliary electricity.

The remaining problem, variability in government support, can only be attacked by reaching the critical mass required to support adequate lobbying.

A solid business plan and big financing may be the key to quickly cracking the energy nut. Alternatively, a mutually formed business consortium or even merger of alternative energy producers and manufacturers might be achieved to take advantage of the dramatic and obvious economies of scale and synergies available to alternative energy producers. A vertically integrated renewable energy industry strategy is superior to most if not all other US business opportunities in profit magnitude, reliability, and feasibility.

The capital sufficient to fully execute a large scale vertical integration strategy unfortunately lies principally in the existing carbon based energy industry. Some companies doubtlessly do not have the leadership ability or motivation to adapt to, much less to rapidly forge, a renewable energy future. Yet the business opportunity lies there for the taking. Some entity will sooner or later, by evolution or by design, take advantage of it. It is hopeful the foresight and energy to do so will come from US companies.

Update March, 2007

The problem of direct load management is being solved by use of "Smart Meters".
See:

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<http://www.sciencedaily.com/videos/2007-01-04/>

The problem of direct storage of electric energy in bulk has been solved by VRB Power Systems (VRB.CA), which is delivering commercial systems. See:
<http://www.vrbpower.com/>

In areas with appropriate geologies, ait compression is viable. See:

http://news.com.com/2300-11392_3-6170568.html?tag=ne.gall.latest

The \$1/watt barrier has been cracked by First Solar (FSLR), which is also delivering commercial systems. See:

<http://www.firstsolar.com/>

It takes little imagination to see the potential to buy VRB and FSLR, a lot of cheap land, possibly some power utilities, and possibly a wind turbine manufacturer and then dedicate their future output to commercial renewable energy production rather than commercial sales of equipment.

Similarly, the potential for cheap desert land to produce biodiesel, even with only salt water, is profound. See:

http://www.unh.edu/p2/biodiesel/article_alge.html

Concurrently, the transportation energy problem, powering cars and trucks, can be greatly facilitated by development of a diesel engine that is acceptable for running on bio oils directly, without purification and esterification. While diesel engines (e.g. Volkswagen diesel) can run using vegetable oil, this is not permitted by EPA standards.

Using present methods, ethanol required to accomplish the esterification of bio-oil to make bio-diesel is immoral to produce. Aside from the fact farm land is consumed, more energy is debatably spent making ethanol than it contains, and grain prices are rising out of sight, the use of ethanol is immoral because each gas tank equivalent of ethanol removes from the earth enough resources to feed a person for a year.

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Ethanol from corn is not the answer. Neither is bio-diesel that requires such ethanol for its production.

Cellulosic ethanol from sources like elephant grass has similar problems, especially with regard to soil depletion, which can take as little as 3 years. Hydroponically produced oil from algae will neither deplete soil nor require consumption of fertile farm land or fresh water.