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## Beyond De-Regulation And Energy Crises: Creating Agile Sustainable Communities

■ By Woodrow Clark

Climate change and global warming are two concepts that evidence has proved to be scientifically correct. Now, U.S. policymakers are getting the message, in part due to the new documentary, "An Inconvenient Truth," but also to world pressure and actual global disasters. Globally, the business community gets it. Check out the ads from GE (eco-imagination) or BP ("beyond petroleum").

What do we do about energy and its impact on global warming?

One key to global and local clean and healthy futures is the development of clean, sustainable energy sources. But such energy-based solutions must also contemplate the way various energy sources interface with essential infrastructure, such as water, waste and transportation systems.

Moreover, society must focus its attention on the emerging commercial technologies (such as hybrid cars and, soon, hydrogen fuel cell vehicles) that are available regionally within the next five to 10 years. Planning and investing now for that future will prove to be prudent and cost-effective. Critical policy strategy is to form public-private partnerships, known as "civic markets," that can establish policies and then create and provide "bond funds" on the regional, state and national levels for the public to support and promote funding for agile, sustainable communities. Californians will be seriously considering this strategy in November this year.

"Agile energy systems" is a concept from my book, which talks about flexible and adaptive energy programs that effectively and efficiently implement economic, environmental and social benefits, the triple bottom line. The Economist has talked about this idea as parallel to an "energy Internet." However, there needs to be a collaboration between the public and private sectors in creating them. Such civic markets can form new associations of communities, cities and nation-states that might be useful to plan public policies and create the "government market" in terms of procurement and coordination of public resources for renewable energy on-site and central grid power generation.

The California energy crisis and similar situations globally make it clear that extremes – such as regulation versus de-regulation or public ownership versus

privatization/liberalization – are not the answers. These simplistic and misleading policy approaches miss the economic needs of communities and environmental concerns of society.

Events such as ENRON company corruption and global warming have made it apparent that infrastructure systems must be a combination of both public and private concern and even ownership. The Chinese call it “social capitalism.” Such approaches are known as creating a “civic core” and need to be agile systems that thus encourage and meet public standards for goals such as a renewable energy portfolio standard for the good of society. This approach also establishes new business ventures and creates new jobs.

If the government offers incentives or mandated requirements, such as with Renewable Energy Credits, Green Tags or Carbon Credits, these must all be predictable in terms of length and scope if they are to have value in enticing private sector investors. For example, tax credits that have to be “renewed” every two years are severely limiting to equity investors; though they do have significant value to project investors that can get in under the time constraint but then are viewed with uncertainty in the eyes of new entrepreneurial ventures and corporations. Business markets need certainty in terms of rates, tariffs and contracts in order to be partners with the public sectors.

The end of the fossil fuel era, which is within 20–30 years by almost all predictors, can be readily seen with the reduction of dependence upon the central power grid. In an earlier issue of *The Economist* (March 23, 2004), the future was mapped out as an analogy to the Internet. There is much more that can be said about this but most of that is covered in my book, “Agile Energy Systems” and elsewhere. However, agile energy systems demonstrate the future will be a combination of onsite and central power generation. The future is here NOW today. We talk about that in some detail below. But first, let's discuss finance.

Where is the money for all this?

Consider the bond measures and what they will do. For example, take just the transportation sector. Waste, water and the environment are all impacted by this sector. At another time, further discussion can be given to them. However, the transportation sector is in the middle of a “paradigm change.” As with any new technological innovation, the commercialization for the mass-market debate has begun in earnest about hydrogen fuel cell vehicles. What is critical in this debate is not to lose sight of either the end goal (a clean, green plant) or the historical reality about any new technology. The key is that government be the market driver. The critical path is forming public-private partnerships and figure out how best to achieve the common endgame goals.

The future is here now. And shortly (within five–eight years), hydrogen fuel cell cars will be commercial and in the mass market. The State of California is in the middle of this paradigm change. Under the leadership of Gov. Arnold Schwarzenegger, a Hydrogen Highway RoadMap Report was completed.

However, renewable energy generation positively impacts fuel diversity needs through the time-sensitive sequenced portfolio approach. The bipartisan EndGame or societal goal should be a non-fossil-fuel-based, renewable energy conversion to hydrogen.

Such a move would advance California's nation-state vision to be "energy independent." California, for example, has plentiful supplies of renewable power sources for generation and given the energy crisis and recent experiences since then in the energy sector, the state and various regions certainly want to be energy independent.

The time frame is critical as natural gas reforming for hydrogen should be seen as a near-term solution (three-five years) until the electrolyzing costs (from wind, solar, water, etc.) for hydrogen will be at parity with today's natural gas prices. Natural gas and its related area of LNG are transitional. Hence there must not be long-term or stranded capital costs for this fuel supply. Wind is already competitively 'there' and solar systems are close behind natural gas. And these sources are natural without global security concerns. The transition to renewables is vital because future fossil fuel costs will remain difficult to control and their supply limited or located in politically sensitive regions.

Nation-states, such as California, must start with creating government-driven markets. State and local governments need to set specifications and issue competitive contracts for procurement of clean and green vehicles (defined as anything that moves from fork lifts to golf carts to mass transit buses, planes and trains). For hydrogen, these may initially be H<sub>2</sub> internal combustion engine vehicles, but soon to transition to non-fossil-fuel-produced hydrogen fuel cell vehicles as these advanced technologies mature and become more commercially competitive.

One critical approach would be for government "matched risk." This could be accomplished in part through insurance, credit enhancement and back-up mechanisms. Another would be support for the education and training of people in hydrogen (e.g. an academic "Hydrogen Center" or Institute) for fire and safety staff, which would make California the world leader in "intellectual capital" and lead to research, technologies, innovations and entrepreneurial new business ventures.

California must make regulatory definitions of renewable and alternative energy public policy while emphasizing fuel diversity to benefit from state tax and renewable energy credit programs. That is, provide private sector incentives such as tax breaks, tax shifts, grants and rebates and focus on financial leverage mechanisms as in the 1990s, when federal funds were offered as matching funds for new technologies to be commercialized.

National facilities throughout California, such as the proposed base closures in 2006, are perfect public resources for implementing green and clean hydrogen stations for on-site peak load power. Regional, city and nationally owned or controlled properties, such as facilities from departments and agencies for transportation, environment, natural resources and energy can be used as hydrogen power stations now (the next three-five years) and thereafter converted to hydrogen refueling stations within five to 10 years.

Public-private partnerships can create and provide “bond funds” on the regional level and much like the similar bonds in California and elsewhere for the public to support and promote funding for hydrogen. Perhaps there needs to be a “Hydrogen Finance Authority.” Consider also the possible use of “Intellectual Property” rights gained by the national, regional or local bond or government grant financing as an economic development incentive mechanism.

Technology also must be advanced through matching goals and appropriate public-private collaborations from national, state and regional departments and agencies such as Energy, Defense, Education, Labor and EPA for research and development focusing on systematic analysis, demonstration projects and prototypes to determine where the greatest impact can be achieved for near-term medium- to high-risk research. New technologies must have more demonstration and prototype system models that can be turned into commercial and retail operations. Examples of near-term commercial applications are fuel cell forklifts, buses as in the European Union program or fleet vehicles as in Japan.

Finally, societal benefits need to include not only quantitative health and social costs, but also focus on job creation and new business ventures for this exciting next generation of energy technologies.

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