Executive Summary

The Department of Energy expects electrical energy consumption internationally to almost double by 2030. The world as we know it in the 21st Century will not be the same as what we, particularly in the U.S., have experienced in the 20th Century. The combinations of climate change, urbanization, and materials/energy demand make this a dangerous century for humanity. Population and resource demand worldwide will drive up electrical generation prices faster then are currently being expressed in the public sector.

Renewable energy companies invest in countries and states that are committed to the development of renewable energy for the long haul. The traditional argument of letting "market forces" operate is not a reliable approach in the energy market for several reasons. Establishing energy policy by government to guide the future of electricity is at this time extremely important to the utilities and related industries. Since China and Middle Eastern nations are the largest holders of U.S. dollars, and they are aggressive investors, as a result they may have the power to supplant or redirect the path of the energy technology world. Energy sources generally require large sums of capital over longer time horizons with relatively high technology risk, which calls for more government involvement to support that research and development. The United States needs to provide a stable regulatory structure to foster renewable energy research and development (or centralized generation). Energy technology, developing at a prodigious rate, requires a stable ten- year policy and investment environment to be implemented.

The 2008 summer combined peak demand for electricity in Detroit Edison and Consumers Energy service areas is projected to be 21,136 mW. Edison and Consumers have and will purchase additional power to assure a reserve of nearly 14 percent above the projected peak demand. The cost of new plant construction has been found by several studies to be very costly. For new plants an anticipated a cost of 30 cents per kWh over 12-13 years of construction with a long – term operating cost of 18 cents per kWh is expected. The utility and renewable energy industries are facing a major labor problem as the baby boomers approach retirement age. The industry is growing so rapidly that enough trained workers are not being supplied by the traditional community college system.

The "smart grid" is a precursor to the implementation and restructuring of electrical future with demand management and distributed generation. The primary interface to the consumer is an electrical meter that is capable of communicating and controlling electrical usage within the consumer's home or business. When AMI is implemented, each consumer will have usage interval data which provides them with a clear presentation of how they are using electricity and gives consumers the opportunity to make better choices. Utilities can then offer to the consumer

a variety of time-based pricing which can further enhance consumer demand choices. The two most important immediate returns should be fewer problems with flow, and quality of electricity. Hybrid machinery connected to a smart grid is potentially a powerful adaptation. If the grid is smart enough, the electrons could be generated any place and delivered efficiently

Currently, the United States obtains just under 1% of electricity from wind, but massive growth is possible because of the much superior wind resources of the U.S. when compared to the generating capacity of Europe. Compared to centralized generation, wind and solar power can be built for 14 cents per kWh. States with a Renewable Portfolio Standard (RPS) tend to have markedly higher wind installation rates than states without an RPS.

Deep and shallow geothermal power is available throughout the U.S. for residential and business use. Solar thermal and photovoltaic systems can provide hot water and electrons and contribute to developing business and job growth. In-stream electrical generators can also provide electrons in a distributed generation system without many of the aquatic ecosystem impacts of dams. Technology is now available which provides electron storage and can therefore overcome the intermittency or variability making them dispatchable or useful as base load generation.

Efficiency continues to be the most cost effective energy management investment. Efficiency models that allow utilities to profit from demand/load management of electrical consumption are now available. Studies continue to reiterate that efficiency grows the economy and fosters job growth. Many states are moving aggressively to foster improved efficiency with diverse strategies.

None of the traditional “certificate” pathways in vocational training centers, return-from-prison work centers or community colleges are oriented toward an energy efficient renewable or green economy. Yet, these arenas and the utility industry offer a tremendous opportunity for post-high school education and the high paying jobs that are available. Tapping the “green economy” will require a renewed educational/job training structure that provides guidance and training beginning in high school and continuing on to community college .

For the immediate future an RPS or feed-in-tariffs seem necessary to foster renewable energy investment in Michigan. However, it is imprudent at this time to invest in centralized generation, given the unpredictability of cost and federal climate change requirement. But the future is extremely positive because of the rapidly developing new technologies that will very likely revolutionize the energy/electrical world as we know it.