

## TESTIMONY

### HOUSE PUBLIC UTILITIES COMMITTEE

REP. JOHN P. HAGAN – CHAIRMAN

Date: Wednesday, February 13, 2008

Time: 10:00 am

Room: Statehouse Room 313

### HEARINGS FOR SENATE BILL 221

#### State Energy Policy Revisions

By

William Mook, CEO

The Mök Companies

Human industry uses energy at a rate of 15 trillion watts today. That power level doubles every 17 years as people throughout the world grow richer. Today this power is generated primarily by burning of the following fossil fuels;

- 28,3 billion barrels of crude oil
- 5.5 billion tons of coal
- 2.2 billion tons of natural gas

Burning these fuels produce 40 billion tons of carbon-dioxide each year, These fuels also cost humanity \$4 trillion per year. The ongoing industrial growth in Asia, principally in China and India increases demand for energy every day. Energy prices rise as suppliers struggle to meet rising demand with fixed reserves. Growth will continue since human industry produces \$66 trillion each year with that \$4 trillion worth of energy products. Increasing demand, increasing prices and shortage of conventional supply create a long term trend favorable to alternative energy development. Any nation, any state, any community, that supports the development of alternative energy and helps reduce its costs relative to other communities, will reap the rewards of this long-term growth trend, even if higher fuel prices mean slow downs in more traditional economic sectors. .

To be sure, I am not proposing that alternative energy be subsidized for that creates economic weakness. What I am proposing is that conditions be made ripe for the development of alternative energy supply at prices competitive with conventional energy and that conventional and alternative energy both play on a level playing field.

Alternative energy systems provide the only means for our industry to survive the eventual depletion of conventional fuels. All today's fuel could be replaced by burning 3.34 billion tons of hydrogen gas each year. This hydrogen is easily made by the electrolytic decomposition of 30 billion tons of water. By the application of 167 billion mega-watt hours of DC electricity which requires 98.2 trillion watts of solar panels covering 210,000 sq miles of desert lands

Can we afford to do this?

Certainly, with my patented technology! I have developed break-through technology to make solar panels, and variable load electrolyzers which make hydrogen, at a total cost of \$200 per ton using solar panels that cost only \$0.07 per peak watt including all balance of system costs. This cost is 1% the cost of

conventional panels and makes the visionary hydrogen economy just described competitive with oil today. You may learn more at my web site

**<http://www.usoal.com>**

Other companies will obviously arise to meet or better my prices. Creating conditions in Ohio that support innovations like mine that dramatically reduce the cost of alternative energy benefits everyone by promoting rapid growth in an important and growing sector of the world economy.

What might this be worth? Well, the planet wide installation of solar panels I just described would cost only \$7 trillion to build using my approach and would generate \$4 trillion per year in profits. That's a 40% annualized rate of return on capital. Certainly that capital will be found once the process is proven.

How do we get started? By demonstrating the technology outside the laboratory on a scale large enough to stay in business and grow in direct competition with conventional energy suppliers.

My company's low cost solar panels achieve their price because they are made on a massive scale. I have completed preliminary work for a 1.2 million square foot factory that employs 690 workers and produces 100,000 MW of solar panels a year. That's 4 square miles of solar panels a week. Despite this factory's unprecedented size, the world could use 14 of them to meet the shortfall in energy and get prices under control. You may get a copy of the 88 page document describing this installation by e-mail at [admin@usoal.com](mailto:admin@usoal.com).

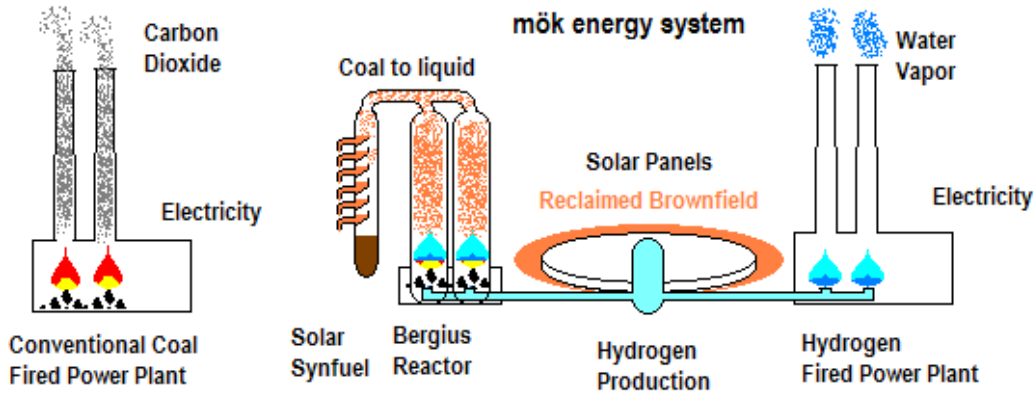
One important fact is that a significant energy market does not exist for hydrogen fuel. How do we create one?. Well, one thing to notice is that hydrogen can be used to upgrade low grade sources of carbon into higher quality hydro-carbon fuels. Markets do exist for those.

For example, carbon-dioxide is converted to methane by adding hydrogen. Methane is the principal component of natural gas. A ton of hydrogen is converted to two tons of methane and 4.5 tons of water by absorbing 5.5 tons of carbon-dioxide. The Natuna gas fields of Indonesia contain significant carbon dioxide. The value of those fields are multiplied by converting the carbon-dioxide that is produced with the natural gas there, to methane and selling it to buyers in South Korea. So, solar hydrogen may be used at gas wells that produce lots of carbon-dioxide, to increase natural gas value.

Carbon in coal is converted to liquid fuels by adding hydrogen to coal. Not by Fischer-Tropsch, which involves burning the coal. No, I'm talking about DIRECT hydrogenation using solar hydrogen made from sunlight and water. Here NO coal is burned. Coal is used as a carbon feedstock to make liquid fuels. This process, called the Bergius Process is an emission less process that has greater yield of liquid fuels, as well as producing higher quality liquid fuels than traditional coal-to-liquid, and made economic with my hydrogen.

With 110 kg of solar hydrogen I produce 7 barrels of liquid fuels from one ton of coal. That means that every coal field is a potential oil field. America has more coal than any other nation on Earth. Also, for large strip mines, converting a mine to a solar collector site, returns it to productive use. At \$0.07 per peak watt I only pay \$33 million per square mile of solar collectors. Getting land at zero cost, or getting paid to take land, is a significant issue for me. So, States with brownfields, and strong programs of using brownfields as solar collector sites, have a leg up over states that do not have such programs.

Coal mines are not the only source of coal for making liquid fuels. A power utility in Australia wants to cut carbon dioxide production at a 2,400 MW coal fired power plant. So, they convert from burning 6.2 million tons of coal each year to burning 1.0 million tons of my solar hydrogen per year made with low-cost solar panels from water. The utility avoids the production of 19 million tons of carbon dioxide, and saves \$390 million in new taxes on carbon.



### MAKING USE OF HYDROGEN TO MEET TODAY'S ENERGY NEEDS

I take the coal in trade for the hydrogen and add another 660,000 tons of hydrogen to that coal to make 43.4 million barrels of petrol each year. At \$85 per barrel value I earn a revenue for that plant of \$3.7 billion a year - so, from the 1.7 million tons of solar hydrogen I create a value of more than \$2,000 per ton! Since future production of petrol may be sold today in forward contracts, financing is possible that is not possible for hydrogen alone.

How far can we go in this direction? The world burns 5.5 billion tons of coal to generate electricity each year. By burning 887 million tons of hydrogen instead, 17 billion tons of carbon dioxide are eliminated - nearly half the total. The 5.5 billion tons of coal using my process produce 38.5 billion barrels of petrol each year by adding 600 million more tons of hydrogen to the coal.. This is more petrol than is consumed at current prices. So, we have just shown that my approach to using solar energy we can use today's methods of oil finance to reign in the rising price of crude oil, while reducing carbon emissions with zero change in use at the consumer level.

Yet the revenue and profits created by doing all of this pays for a substantial hydrogen infrastructure which forms the basis of our hydrogen economy well before 2020.

The production of 1,487 million tons of hydrogen for this revised program requires 74.35 billion megawatt hours of DC electricity from 43.7 trillion watts of solar panels covering 93,700 sq miles of land. This eliminates half our carbon and reduces our reliance on extracted oil while creating the basis of a hydrogen economy.

This is not only a technically workable program, but a workable business program as well. Well before 2020 - we can have a hydrogen economy. We'll get it by going after big oil and providing energy at a lower cost more conveniently than big oil. We won't get it by government programs that subsidize high priced solar energy. We will get it by supporting research and development in the alternative energy sector in ways that reward the development of low-cost alternative energy sources.

I've been working on this for 15 years - and major energy companies don't want to change, and in fact are opposed to any fundamental change that undermines the value of the sizeable investments they have made in present day energy supplies. This is to be expected. Their boards after all are paid to maximize the value of those assets to their shareholders. That means there is a role of responsible government to play. That means it falls to forward thinking legislators to level the playing field and create opportunities for alternative energy suppliers that can go it alone, go head to head with today's energy suppliers in ways that ultimately take market share from them, and ultimately put them out of business as their supplies diminish. Leaving it to the energy companies themselves, will delay development until their reserves decline in value despite the price rise those shortages cause.