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Clean Energy: The Top Companies in Small Nuclear Power Plants

BY DR. KENT MOORS, EDITOR, *OIL & ENERGY INVESTOR*

Dear Reader,

Some 550 miles northwest of Anchorage, a tiny Alaskan settlement may hold the key to solving electricity shortages for small communities all over the world.

Galena has barely 700 residents. It sits on the Yukon River. And for energy, it relies on diesel shipped up when ice-free passage allows. That is both an expensive and uncertain way to generate power. Therefore, the local council has decided to move in a different direction, one that will cut the settlement's electricity prices from 28 cents a kilowatt-hour to less than 10 cents, in a matter of months.

They have unanimously voted to go nuclear.

What is about to happen in Galena is reflecting developments in other parts of the world. And it may just bring nuclear power back into fashion as a significant focus for investors.

To be sure, these mini reactors come with huge profit potential... And I'll tell you all you need to know about them below.

The Rapidly Emerging World of "Nuclear Batteries"

The Galena settlement has accepted an offer from **Toshiba Corp.** (OTC:TOSBF) to install one of the company's new 4S ("Super Safe, Small and Simple") mini nuclear reactors. The plant could begin operations in less than one year.

The 4S is a sodium-cooled fast spectrum reactor – that is, a low-pressure, self-cooling power plant – that will provide 10 megawatts (MW) of electricity annually for three decades before it needs refueling.

The 4S is actually referred to as a "nuclear battery" because it has no moving parts. Upon completion, it looks much like a water tower. Once installed, it does not need to be maintained or even opened

during its 30-year operating life.

Cool.

The Obama Administration has decided to emphasize nuclear power as one alternative to dependence on foreign oil. Given this newfound nuclear support, we are once again talking about reactors as a legitimate alternative source for at least some of our energy needs.

Yet the decade-long (and often more) delay in getting a traditional new reactor online, along with the exorbitant cost, would seem to make any prospects for more immediate help in meeting rising energy demand remote at best.

But not so fast. Technological developments like the Toshiba 4S promise to bring nuclear power to smaller communities in an inexpensive and manageable way.

The Advantages of Smaller, Locally Focused Power Plants

The real key to increasing short-term impact is to *decrease* unit size. Investors need to think small, because mini reactors are where the money will be made in the nuclear power sector.

Mini reactors have been in service for decades in the military, especially on naval vessels. Yet the commercial application of minimized size is a much newer development. We are witnessing a quickly developing, inexpensive alternative to conventional power plants.

The recognition is setting in everywhere. In a market dominated by French and Japanese companies building the latest versions of large reactors, new players are emerging – both in response to concerns over the cost and to the increasing reluctance of government agencies to supply loan guarantees for their construction.

The “downsizing” has affected the entire nuclear power spectrum.

Daewoo Engineering & Construction Co. Ltd. (047040:Korea Stock Exchange [Koscom]), **Hyundai Engineering & Construction** (000720:Koscom), and **Korea Electric Power Corp.** (NYSE:KEP) have recently surprised many by wrestling Middle Eastern reactor contracts from better-known global leaders, such as the French-Japanese **AREVA** (OTC:ARVCY), **Siemens** (NYSE:SI), and **Mitsubishi Corp.** (OTC:MSBHY).

The South Korean companies are positioning for a major global move to meet increasing demand for medium-sized reactors. These plants can be built and licensed in much less time than larger competitors.

However, your primary investment moves will come more from developments closer to home. The mini reactors coming on the scene will transform the industry. There will still be the need for larger plants, but the mini revolution is likely to make nuclear power available to many localities in a more flexible application.

They also solve two major concerns – waste storage and loan guarantees. These versions would be able to store on-site and, with likely energy and climate legislation on the horizon, along with the proposed clean energy banks, funding would be less of an issue.

Three approaches are already here, with more certain to follow.

The Big Three in Mini Reactors

First is the Toshiba 4S going into Galena, a result of engineering work at both the Japanese major and a U.S.-based Westinghouse subsidiary recently acquired by Toshiba. The 4S is already before the Nuclear Regulatory Commission (NRC) for licensing.

But the 4S is hardly the only American option coming on-market.

Another is the Babcock & Wilcox Co. “B&W mPower” mini reactor. This model can store waste for up to 60 years on-site and produce between five and 10 MW a year. It’s also self-contained, but it is entirely underground. That allows for a greater waste-storage potential than the 4S and a much less-apparent physical footprint.

McDermott International Inc. (NYSE:MDR) recently decided to separate B&W, one of its subsidiaries, from the company’s other engineering interests. The Tennessee Valley Authority (TVA) has designated 760 acres near the Oak Ridge National Laboratory in eastern Tennessee as a site for a future power plant. This will probably become a main testing location for the mini reactor.

But I find a third development the most interesting...

It is Santa Fe-based Hyperion Power Generation Inc., a spin-off company from the Los Alamos National Laboratory. Hyperion is barely out of an incubator stage, yet already has 120 orders for its Hyperion Power Module (HPM). Shipments should begin by 2016. It is privately held now, but it needs more capital to expand activities. That will require it to go public. The company should file engineering specs with the NRC this year.

The Hyperion units are the smallest yet – about the size of a hot tub. Each HPM can provide electricity for eight to 10 years before refueling... power 20,000 homes... and generate as much as 25 to 100 MW in serialized installation. They are sealed at the factory, making accidents virtually impossible, and can be either above or below ground.

With a price tag of \$35 to \$50 million, the HPM is also inexpensive enough to revolutionize village life in most areas of Africa and Asia by providing both power and the ability to purify water - readily available technology exists to clean dirty water. What undeveloped areas *lack* is the ability to power that technology cheaply. It is little wonder, then, that both continents are directing considerable interest in Santa Fe these days.

Of course, the advances coming from Toshiba, B&W, Hyperion, and other competitors certain to enter this market, have direct applications here at home. We are witnessing the miniaturization familiar to computer users. If we could liken a conventional nuclear plant to a mainframe, the minis seem the nuclear industry’s version of a laptop: Almost anyone can afford one, and you can take it anywhere.

Action to Take

Look for an IPO from Hyperion Power Generation. This company and its technology have a lot of potential. And an investment in its future may be the best way to buy into the promising mini-reactor industry.

In the meantime, watch for news on the Toshiba 4S and be prepared for a possible stock offering from Babcock & Wilcox separate from its parent company.

Besides being interesting investment ideas in their own right, public offers from Hyperion and B&W are a good signal that the mini-reactor industry has begun to grow in earnest and is large enough for serious investment consideration.

Sincerely,



Dr. Kent Moors

Dr. Kent Moors has been advising the world's largest and most active energy producers and buyers for 31 years, including six of the world's top 10 oil companies and high-level government officials from the U.S., Russia, Kazakhstan, the Bahamas, Iraq, and Kurdistan. Business clients include the Bank of England, Citicorp, AT&T, Deutsche Bank, the European Bank for Reconstruction and Development, the Russian Central Bank, and Westinghouse.

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