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Diversified Wins HydroMax Phase II DOE Grant

By: Alex Cornitius

The US DOE awarded Diversified Energy Corp. (DEC) a 24-month, $945,000 Small Business Innovation Research (SBIR) Phase II grant to continue development and commercialization of HydroMax® advanced-gasification technology.

The grant was awarded as a result of a competitive solicitation from the DOE's National Energy Technology Laboratory (NETL) and builds upon results achieved by DEC during Phase I. The award's objective is to develop technologies that can reduce and stabilize natural gas costs faced by the US industrial sector - represented by over 14,000 users spending roughly $50 billion/year.

The HydroMax gasifier uses a patented molten-metals approach to deliver critical industrial market benefits, including the capability to gasify a broad range of hydrocarbon inputs; syngas production that is relatively free of tars and oils and requiring less downstream cleanup equipment; and a design that is economical and reliable for industrial-scale, process-heating applications.

"The Phase II award from DOE-NETL serves to underscore the potential of HydroMax in the 10 - 80 MW (thermal) market for syngas production," explained Gary Stiegel, DOE-NETL Gasification Technology Manager. "The feedstock flexibility, cleanliness of syngas, and capability to economically and reliably scale to support industrial applications is being widely recognized. We're now firmly on a path to complete development and see this technology broadly adopted,"

Stiegel remarked that the HydroMax technology offers a unique and compelling approach to gasification and we look forward to the results from Phase II and the eventual commercial introduction of the technology."

Interview with DEC's President & CEO Phillip Brown

SGR: Can you discuss the latest developments with DEC's HydroMax gasification technology being awarded nearly $1 million in DOE funding?

DE: This is a contract award from NETL, it's a follow-on contract to a Phase I project that we were awarded last year and completed in Jan. 2008. What we did in Phase I was we built a small-scale HydroMax test reactor, and we tested the technology using PRB coal and Illinois #6 coal. The reactor size was about .1 meter in internal diameter (ID).

What we are going to do with this most recent award for the Phase II project from NETL is we are going to scale up the technology to a .5-meter, ID system. We will build it more or less like a commercially designed gasification technology. So we are looking at developing our first commercial-like design of HydroMax using refractory brick, long-life materials, a specially designed feedstock-injection system, slag management, and an exhaust port to capture the syngas coming out.

We will be doing the tests again on three different types of feedstocks. The first one will be PRB coal, the second Illinois #6, and the third test is going to be associated with a mixture of PRB coal and biomass.

SGR: So DE is going to team up with EERC on this?

DE: We are and we have been working with EERC for a long time now, and we are going to be doing the demonstration at their facility in North Dakota. There is a small amount of cost share that we will provide, but the DOE funding will cover most of it.

SGR: What are the first stages of development going to be at EERC's facility?

DE: What we are planning to do is we are going to do all of the design and analysis, procure the components with the ASPEN technology, and then EERC is going to integrate all of the components, build the gasifier for us, and then integrate it with its gas- handling systems that it already has on site.

SGR: So it's going to be a commercial-production unit?

DE: Well, it's not going to be a commercial-production unit, but it will be a commercial-like design. We are going to bring in all of the long-life materials, all of the structural components, all of the requisite feedstock-handling and slag-management systems will be demonstrated in the next phase.

SGR: What is the target application for this project?

DE: The target application is natural-gas replacement for industrial users. So any industries that are looking to reduce natural-gas consumption, and we are looking to provide them, instead of natural gas, a low-cost syngas that would replace the natural gas.

If the client has waste available we would gasify it, but we are looking at PRB coal as a feedstock to produce the syngas. The HydroMax technology can gasify just about any feedstock, so that opens a lot options.

One of the things I want to point about the potential for HydroMax is that this natural-gas replacement industry is enormous. Nearly 30% of natural gas consumed in the US is from industrial users. The DOE indicates that there are about 14,000 individual users in the industrial market for natural gas. So there is a huge market out there, and what we think we have found is a nice niche technology.

We are not going to have to have to scale-up to massive sizes and compete with some of the existing large-scale gasifiers. We think we will have a nice market niche and a relatively easy entry point from the demonstration activities that we have done to date.

SGR: How is the DOD contract with Velocys moving forward that will also utilize the HydroMax technology?

DE: We completed Phase I and we have the study's successful test results. We have a proposal into the DOD now for Phase II, and we have not received the award results yet.

We will leverage everything we learn in the DOE Phase II to the DOD's system and we would design it in such a way that it can be easily transported.

SGR: Do you have any potential clients lined up, or are you looking to demonstrate it first?

DE: Well for this second DOE project we are working with Certainty Gypsum, one of the world's largest gypsum wallboard manufacturers. They have a huge need to stabilize process-heating costs and are our Phase II DOE project team member.

We would use PRB coal to produce the syngas for Certainty Gypsum. So we have two companies lined up here, which could be our first users, and there are several other applications for this in the US.