

Pyrotek Graphitization Facility Expansion Project



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PYROTEK, INCORPORATED

June 7, 2010

Project ID
#ARRAVT016

Expansion Project Overview

Pyrotek, Incorporated (“Pyrotek”) is a privately owned US based company that was founded in 1956, in Spokane, WA. Metallurgical Systems, a Division of Pyrotek, utilizes proprietary furnaces within our Sanborn, NY plant to heat treat materials to extremely high temperatures. This process is known as graphitization. Due to the high demand for electricity required by our graphitization process, the plant utilizes low cost, Niagara Falls hydro-power available through the New York State Power Authority.

Our graphitization process is a proven technology. The DOE Award under Funding Opportunity DE-FOA-0000026 has provided grants to support the construction of USA based manufacturers of batteries and electric drive components. The grant awarded to Pyrotek enables us to expedite the expansion of our production capacity, and bring a high performance anode material, to the market in volumes that correspond with the demand from the automotive industry.



Expansion Project Overview

Timeline

- Start – March 2010
- Finish – January 2013
- 3% Complete as of Apr 2010

Budget

- Total project funding \$22.6M
 - DOE share - \$11.3M
 - Pyrotek share - \$11.3M
 - Funding as of Apr 2010 - \$479K
 - Funding budget thru CY2010 - \$15M

Barriers

- Barriers and Risks
 - Long lead time purchases

Partners

- Pyrotek is a strategic partner with ConocoPhillips in the production of a high performance anode material, which is marketed and sold by ConocoPhillips as CPreme®*.
- Pyrotek is a key member of a USA lithium-ion battery supply chain, as our graphitization technology, coupled with ConocoPhillips' precursor material, has proven to provide superior anode properties.

* Trade name use authorized by ConocoPhillips.



Expansion Project Relevance

Pyrotek Project Objectives

1. Increase anode material production capacity at the Sanborn plant to meet higher projected EV, PHEV and HEV demands.
2. Decrease processing costs to ultimately provide a lower priced material to the lithium-ion battery manufacturers.
3. Meet the objectives of ARRA2009 by creating and preserving construction and manufacturing jobs within the United States.

Expansion Project Objective No. 1

The Recovery Act objective is to stimulate the economy and to create and retain jobs. Specifically our grant was awarded and will be used in support of the construction of a U.S. based manufacturing plant to produce anode materials for lithium-ion batteries.

The first objective of our expansion project is to increase the production capacity of our proven technology to produce a superior anode material within our Sanborn, NY plant. This capacity is needed to meet the higher projected EV, PHEV and HEV forecasts. 100% of the anode material processed within the Sanborn plant will be used for lithium-ion batteries, and 90% will be used for batteries in automotive applications.

Expansion Project Objective No. 2

The second objective of our expansion project is to reduce the costs to produce the anode materials. Lower processing costs will ultimately reduce the costs to the end customers of the anode material, the battery manufacturers, which will also lower the cost of domestically produced lithium-ion batteries.

Pyrotek is a key member of a USA lithium-ion battery supply chain, as our graphitization technology, coupled with ConocoPhillips' precursor material, has proven to provide superior anode properties. Several other DOE Award winners are also customers of ConocoPhillips, and will be receiving the anode material produced at our expanded plant.

Cost reductions will be achieved through increased volume and continuous production. In addition, pre and post graphitization processes will be added into our new plant, which will provide for a more lean manufacturing process flow, as well as reduce freight costs and the other inherent costly delays found in bulk material shipments.



Expansion Project Objective No. 3

As noted earlier, the Recovery Act objective is to stimulate the economy and to create and retain jobs. Pyrotek's expansion project utilizes only USA contractors for the plant expansion/construction work. All of the specialty equipment and components will be fabricated and procured from North America vendors – estimated at 99% within the USA.

In addition to all of the domestic labor associated with the capacity expansion project, Pyrotek will hire (48) production and administrative employees while ramping up production to the full capabilities of the plant.

Lastly, all members of the USA supply chain for lithium-ion batteries will benefit each other with regard to growth and employment.

Expansion Project Approach (pg1)

Originally planned as a multi-phased project, as a result of the DOE Award, Pyrotek has implemented a single phased project to include:

- adding 93,000 sq feet of manufacturing space to our existing plant,
- installing and commissioning, (12) new high volume furnaces (with space for (6) additional furnaces when warranted by demand),
- installing and commissioning specialty material handling equipment,
- utilizing a hydro power allocation from the New York Power Authority, needed for the low cost processing, and
- hands-on training of new employees along side of our experienced graphitization department staff, to ensure a qualified staff is in place when the new equipment is brought online.

Expansion Project Approach (pg2)

All NEPA work has been completed, and our project has been cleared to move forward.

Data collection, bar code system will track all material by lot numbers, keeping track of inventory and processing status. Material quality testing will be performed after completing each processing step to ensure the desired anode material properties are achieved and provided to the battery manufacturers.

The project period has been set to run from March 11, 2010 through January 31, 2013. Initial project plans and engineering started in October 2009. Facility engineering drawings are completed, and RFQs have been provided to three contractors, with quote responses to be submitted by April 30, 2010.

Expansion Project Approach (pg3)

Electrical and plumbing engineering drawings are due to be completed by April 20, 2010, and will be submitted via RFQs to three electrical and three plumbing contractors, with quote responses to be submitted by May 7, 2010.

Preliminary facility occupancy expected by early December, 2010.

Equipment procurement planning is underway, that takes into consideration long lead time procurements, and the ability for vendors to handle significant order quantities. The approach is first to match initial pieces of equipment with the facility availability, and then to match subsequent receipts of equipment with installation capabilities, while staying ahead of the advancing levels of material demand.

Project Accomplishments

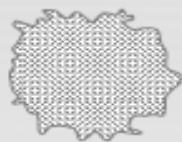
Milestone Title	Milestone Description	Planned Start Date	Planned End Date
Final Facility Design Complete	Facility drawings for RFQ process	10/1/2009	4/20/2010 completed
NEPA/FONSI Approved	All testing & research completed, & project management requirements established	11/10/2009	4/1/2010 completed
Site Groundbreaking	All site work - to include bldg demolition, grading, water retention, preliminary road work, foundations, etc	6/1/2010	8/13/2010
Building & Concrete Complete	Steel structure erected & concrete pad completed	9/5/2010	12/5/2010
Initial Equipment Order – Installation	Install and setup of material handling equipment, as well as initial bank of 3 furnaces	5/10/2010	2/15/2011
Initial Equipment Commissioning	Starting, testing, calibrating of high technology equipment - to include initial test runs of material for certification	1/15/2011	2/28/2011
Project Complete	Facility through landscaping is completed, and all equipment (including 12 furnaces) are installed and commissioned	10/1/2009	6/30/2012

Project Technology (pg1)

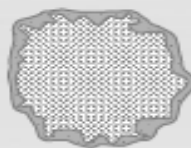
The anode material is presently being produced and has already been qualified as a high performance anode material for the lithium-ion battery market, and the domestic automotive industry.

ConocoPhillips Technology Platform

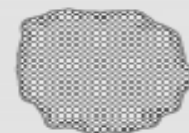
**Selection of
graphitizable cokes
and sizing of particles**



**Surface coating to
achieve the desirable
functionality**



**Graphitization to
achieve high specific
capacity**



**High rate-capable and
thermally stable
graphite particles**

Provided by
Pyrotek's Proven
Graphitization
Technology.

Project Technology (pg2)

Technological advantages of CPreme®* include:

- a longer battery life due to a more stable anode material,
- a higher discharge rate, resulting in a smaller battery for HEVs, higher thermal stability for a safer battery, and
- the ability to develop ultra high power anodes for other challenging applications.

Project Technology (pg3)

Expanded CPreme[®] Product Line

<u>Product</u>	<u>Application</u>	<u>Advantages</u>
G Series	Power & Energy Automotive HEV, PHEV	Excellent 1 st cycle eff., low heat release, high rate capacity, long life
A Series	Energy Automotive EV, PHEV	High capacity, excellent 1 st cycle eff., low heat release, high anode density, long cycle life, good power capacity,
M Series	Power Automotive HEV	Excellent compatibility with Mn-spinel cathode, high rate capacity, low cost, long life
P Series	Power Automotive HEV	High rate capacity, good 1 st cycle eff., low cost, good cycle life

Project Partnerships (pg1)

The anode material that Pyrotek processes belongs to our customer, ConocoPhillips, the leading domestic manufacturer of high performance anode materials for lithium-ion batteries. Their product, CPreme®*, has been adopted for use in power tool, defense, automotive and utility load management applications. It is based on patented technology and proprietary processing developed by ConocoPhillips, and has been shown to provide superior performance over the industry benchmark.

As stated earlier, one of the objectives of this project is to increase the production volume of this superior anode material through expanded facilities; however, increasing production is also tied to efforts to increase the throughput of each graphite furnace. Pyrotek and ConocoPhillips have worked closely over the past two years to develop processes that maximize our furnace throughput, while maintaining the superior material properties that make CPreme®* the leading anode material in the market.

* Trade name use authorized
by ConocoPhillips.



Project Partnerships (pg2)

ConocoPhillips continues to work with their strategic partners, including Pyrotek, to further improve the product and the process to manufacture CPreme®*. A potential risk or by-product of changes to improve the quality of the product could be the addition of time to the production process. As noted, improved product quality may simply have an acceptable cost of a lengthier production process.

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Project Future Plans

In response to forecasted demand for anode material that far exceeds the full capacity of our Sanborn plant expansion, Pyrotek plans on:

- adding (6) more furnaces in the storage area within the expanded plant,
- initiating a 2nd expansion phase on (12) acres of adjacent land, and/or
- continuing discussions on expansion options with Tennessee and Washington where comparable low cost hydro power is available.

Concurrently, the ConocoPhillips future plans for CPreme®* include:

- expanding the product line to target a wide spectrum of automotive Lithium-ion battery chemistry,
- scaling up production to meet demand and drive costs lower, and
- continuing to optimize processes and develop new products to lower costs further, while also growing Lithium-ion battery adaptation.

Project Summary

The benefits of this project include:

- developing a global leadership position within the USA for providing high performance anode graphites for automotive and other demanding applications, since all R&D, production and marketing for CPreme®* is based in the USA.
- employment associated with the facility construction, equipment manufacturing, (48) production & administrative positions at Pyrotek, over (40) high quality positions at ConocoPhillips, and employment throughout the full domestic supply chain.
- Employment opportunities are expected to grow beyond Pyrotek, ConocoPhillips and the supply chain, as the business continues to scale up.

More Information on Pyrotek

Website: www.pyrotek-inc.com

Key anode material project personnel:

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- John Sage, SVP & GM USA/Mexico Region
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More Info on CPreme®* Anode

Contacts to get more information on CPreme®*
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