NOVOLYTE technologies

Sustainable technologies powering solutions

Expansion of Novolyte Capacity for Lithium Ion Electrolyte Production

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Project ID: ARRAVT015

Overview

Timeline

- Phase I Start: April 30th, 2010
- Phase I Complete: June 30th, 2013
- Phase II Start: January 1st, 2013
- Phase II Complete: April 29th, 2015

- Phase I is 16 % complete as of 3/2012

Barriers and Risks

- Adoption rates and acceptance of xEVs
- Overcapacity due to delayed demand
- Undercapacity due to rapid xEV adoption
- Capital opportunity cost

Budget

- Total project funding: $41,236,094
  - DOE Share: $20,618,047
  - Novolyte share: $20,618,047

Partners

- None. Collaborators and partners will be evaluated as specific project requirements dictate.

Objectives / Relevance

- Objectives:
  - Phase I: Expand Novolyte lithium ion electrolyte manufacturing capacity to 4,500 metric tons (MT) by 2013
  - Phase II: Expand Novolyte lithium ion electrolyte manufacturing capacity to 10,000 MT by 2015
- Relevance to Vehicle Technologies and the American Recovery and Reinvestment Act (ARRA) of 2009:
  - Provide an adequate domestic supply of high quality lithium ion electrolyte for the local xEV battery market
  - Maintain and grow jobs: An estimated 18 jobs will be created and 18 will be retained by project completion

Technical Approach

- 2010 – 2013: Completion of Phase 1. Total Cost: $6,700,000

- Expansion Projects include:
  - Install new large scale raw material storage tank and associated equipment
  - Build new motor control center (MCC) building
  - Upgrade solvents distillation and expand production building
  - Build new control room center and upgrade high voltage transformer
  - Install new steam boiler and new vessel cleaning station
  - Upgrade lab and flammable storage building

Technical Accomplishments and Progress
Phase I

- Installed and qualified analytical testing equipment for higher raw material and production volumes
- Upgraded Sample Reactor Material Handling
- Expanded and outfitted containment vessel fleet
- Upgraded Electrolyte Pumping System and transfer lines
- Preliminary Engineering Completed for Process Controls

Technical Approach

- 2013-2015: Completion of Phase 2. Total Cost: $34,536,095
- Planned Projects include:
  - Evaluation of alternative US sites, if necessary
  - Installation of approximately 60,000 square feet of new buildings, bulk chemical storage, materials purification, mixing and reactors
  - Installation of packaging and quality control/quality assurance capabilities consistent with current and expected product and market requirements

Collaborations and Partnerships

- Project Collaborators:
  - None at present. Will be evaluated as project pace continues.

Future Work: 2012

- Incremental Capacity Expansion Project:
  - Temperature and pressure monitoring upgrades, warehouse/storage upgrades, install additional reactor capacity, building expansion and upgrades, concrete upgrades, storage tanks and product loading system
- Installation of second larger sample reactor and temperature moderation equipment
- Infrastructure upgrades to material handling, warehouse, storage, concrete and HVAC
- Site survey and selection for Phase 2. Complete EA for new site, if required
- Engineering for reactor expansion
- Attain go / no-go decision point on reactor expansion and go / no-go decision point on Phase 2 . Complete reactor expansion if required.

Future Work: 2012-2015

• Begin site selection for Phase 2, if required	6/1/2012
• Begin engineering for reactor expansion	4/1/2012
• Go/No Go Decision Point on reactor expansion	5/1/2012
• Completion of EA for new site, if required	12/31/2012
• Go/No Go Decision Point on Phase 2	12/1/2012
• Completion of reactor expansion	3/31/2013
• Kick off Phase 2	1/1/2013
• Completion of Phase 1	6/28/2013
• Phase 2 construction completed	12/31/2014
• Phase 2 startup and commissioning completed	1/31/2015
• All spending, re-billing, and reimbursement completed	4/29/2015

Summary

- Novolyte's electrolyte plant capacity expansion is a two phase project, timed to intersect with future market demand.
- Project risk is carefully managed by working closely with domestic customers to forecast and foresee project delays or to accelerate the completion of key tasks, if necessary.
- Phase I is approximately 16% complete and is focused on upgrading and expanding the existing Baton Rouge facility to 4,500 MT.
- Phase II, the expansion of 4,500 MT to 10,000 MT will commence on January 1st, 2013. Site selection activities will begin in Q1 of 2012.

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