



Company Backgrounder

Fall 2011

Overview

Prudent Energy is the leading technology developer, manufacturer and systems integrator of advanced “flow battery” or reversible fuel cell energy storage systems. Using the element Vanadium in a proprietary electrochemical mixture, Prudent’s VRB energy storage system (VRB-ESS®) delivers and stores electricity in exact amounts on-demand, allowing power companies to sell and use electricity more economically, reliably and safely. Founded in 2006, the Prudent Energy group of companies maintains corporate offices in Bethesda, Maryland and Beijing, China, with research, development, and assembly facilities in the United States, Canada and Asia.

Evolution

Prudent Energy’s now third-generation Vanadium Redox Battery (VRB®) is the product of over 20 years of research and development in North America and around the world. Initially deployed as an efficient, virtually zero-emission alternative to diesel engines or lead-acid batteries in remote areas off or on weak parts of the power grid, Prudent’s VRB® systems have become the technology of choice to discharge and store electricity not only in kilowatt-sized applications (such as at wireless telecom tower locations), but they are also being used in megawatt-scale quantities to support an entire generation, transmission and distribution network.

In January 2009, VRB Power, Inc., then a publicly traded company in Vancouver, Canada, sold all its patents, trademarks, know-how, equipment, and the bulk of material it owned or controlled to Prudent Energy. As a result, Prudent acquired the world-wide rights to Vanadium-only flow batteries, with over 40 far-reaching patents encompassing core cell stack designs; electrolyte composition; systems designs; and several application patents involving the use of VRB® and VRB-ESS® with wind farms, off-grid applications, and smart grids. Using *only* Vanadium in the electrolyte – as opposed to a blend of electrochemical elements – gives Prudent significant competitive advantages in terms of operating cost, system life, maintenance, and safety.

In March 2010, the company’s primary investors – including Draper Fisher Jurvetson (DFJ), DT Capital – joined other private investment firms from the United States, Europe and Asia to close an over-subscribed Series C round of funding at \$32 million. Backed by this support, Prudent has made important new additions to its executive leadership team, while combining product development innovation with low-cost manufacturing and supply chain efficiencies. Meanwhile, Prudent’s highly respected research and development team continues to improve upon is the company’s technology while collaborating with leading scientists to produce further innovation.

Over the course of the last 12 months, the company has seen significant cost reductions in all aspects of its technology and has entered into a number of preferred vendor and contractor agreements. Together these initiatives have given Prudent Energy the ability to rapidly deploy advanced VRB® technology for the benefit of electric power producers and the customers and communities they serve around the world.

Recognition

The Prudent team's work to revolutionize VRB® energy storage technologies is recognized as a leading commercial effort to develop clean and efficient sources of energy. Accepted into the Guardian Group's Global Cleantech 100, Prudent Energy ranks among the top cleantech innovators who are delivering products on-site.

VRB® systems have proven themselves in more than 20 small-scale applications. Installed on a grid scale, they will have enormous influence on global economic and energy security, while accelerating performance of renewable energy production and smart grid operation worldwide.

Prudent's ability to sell utility and industrial customers energy storage systems in modular fashion – tailored to their precise energy and power needs – means that expensive new capital expenditures can be deferred, which in turn keeps customer rates affordable. Vital electricity and telecommunications services will expand into more remote and off-grid areas. Local jobs will be created and preserved through local sourcing of labor and materials for project installations.

Products

Prudent sells two lines of products – both based on a mature and proven standard 5 kW-rated cell stack – for kilowatt-class and megawatt-class applications. Kilowatt-class systems are sold in “plug and play” fashion, primarily for wireless telecom base stations and remote area power supply needs. Megawatt-class systems use a 200kW module currently to provide up to 10 MW for wind farms, photovoltaics, and grid stability.

The modularity of the 5 kW rated cell stacks allow them to be assembled like pieces of Lego®, while the amount of energy stored in tanks holding the liquid electrolyte can be easily adjusted. Both small and large VRB® systems require very little end-user maintenance, with Prudent and its partners typically handling all management, maintenance, and service support.

Projects

Prudent generally does not comment on projects until they are at an advanced stage of completion. However, given the importance of its VRB[®] reversible fuel cell systems to the energy storage community, we have announced the signing of an energy storage services contract with Gills Onions, a major food processing company in Oxnard, California. Prudent expects to reduce this customer's electricity bills by as much as 30%, with the savings going immediately to improving the company's bottom line. Prudent also will expand the company's commitment to sustainability, since the VRB[®] system produces virtually zero emissions and no noise. Finally, Prudent will provide the Gills Onions facility with the peace of mind in the form of back-up power and high power quality whenever the customer needs it.

Growth

Prudent Energy is one of the few advanced battery companies to have successfully begun low-cost unit mass production. In October 2009, the company achieved a critical milestone by producing its first set of cell stacks with 100% yields. With Prudent's growth comes a firm commitment to build profitable company operations – by growing its sales channels, optimizing its supply chain and distribution networks, and creating alliances with global manufacturers. As the company's utility-scale solutions are sold commercially, Prudent may also pursue plans to develop and manufacture key components and materials at one or more U.S. facilities.

For more information, please visit Prudent Energy's website at www.pdenenergy.com.