



## *Primus Power Corporation* **Wind Firming EnergyFarm™**

### **Project Description**

Primus Power is deploying a 25 MW/75 MWh EnergyFarm™ in the Modesto Irrigation District substation in California that consists of a series of EnergyPods™; a plug-and-play zinc-flow battery combined with off-the-shelf components and power electronics housed inside a standard shipping container. The modular design and operation will be field tested at Pacific Gas & Electric with support from Sandia National Lab and the Electric Power Research Institute. The EnergyFarm™ will displace a planned \$78M fossil fuel plant. EnergyFarms™ can firm intermittent wind energy and mitigate energy price spikes. During a spike the Farm switches to full dispatch power, reducing energy purchases during costly periods, capturing multiple revenue streams, and shortening return on investment. EnergyFarms™ are scalable from 330 kW/1 MWh up to systems larger than 100 MW/300 MWh.

### **Goals/Objectives**

- *Develop a distributed, mobile energy storage module based on a zinc-flow battery technology that can be mass produced*
- *Reduce system capital costs and footprint*
- *Enhance application flexibility*
- *Validate module performance and functionality (greater than 75 percent efficiency)*

### **Key Milestones**

- EnergyPod™ testing (October 2011)
- Production facility construction complete (November 2011)
- Build 42 EnergyPods™ (July 2012)
- Commission EnergyFarm™ (February 2013)

### **Benefits**

- Power costs reduced
- Renewable energy resource adoption accelerated
- Greenhouse gas emissions reduced
- Advanced battery manufacturing established in the U.S.



### **CONTACTS**

#### **Ronald Staubly**

Project Manager  
National Energy Technology Laboratory  
3610 Collins Ferry Road  
Morgantown, WV 26507-0880  
304-285-4828  
Ronald.Staubly@netl.doe.gov

#### **Rick Winter**

Principal Investigator  
Primus Power Corporation  
2450 Mariner Square Loop  
Alameda, CA 94501-1010  
(925) 360-8444  
rick.winter@primuspower.net

### **PARTNERS**

Modesto Irrigation District  
**California Energy Commission**  
**Pacific Gas & Electric**  
**Sandia National Laboratory**  
**Electric Power Research Institute**

### **PROJECT DURATION**

01/1/10–01/31/15

### **BUDGET**

#### **Total Project Value**

\$46,700,000

#### **DOE/Non-DOE Share**

\$14,000,000/\$32,700,000

### **EQUIPMENT**

Energy Pod™ Flow Battery Cells  
Power Electronics/Inverter  
Transformers

### **DEMONSTRATION STATES**

California  
CID: OE0000228

*Managed by the National Energy Technology  
Laboratory for the Office of Electricity Delivery and  
Energy Reliability*



U.S. DEPARTMENT OF  
**ENERGY**

Office of Electricity Delivery and Energy Reliability



American Recovery and Reinvestment Act  
.....  
Smart Grid Demonstration Program

