FY08 DOE Energy Storage and Power Electronics Program (ESPE) PEER Review

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Sandia National Laboratories

Sandia is a multi-program laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration, under contract DE-AC04-94AL85000

Mission

Develop advanced electricity storage and PE technologies, in partnership with industry, for modernizing and expanding the electric supply. This will improve the quality, reliability, flexibility and cost effectiveness of the existing system.

Help create an energy storage industry

Develop advanced power electronics for the grid of the future

Significant Events in FY08

Power Electronics Sub-Program

Vision – Enable highly integrated, cost-competitive, reliable power electronic systems to increase performance, security and flexibility of the electric utility system.

Scope – All utility level systems which can benefit from advanced power electronics; power conversion systems, fault current limiters, circuit breakers, transformers, HVDC, FACTS, SVC, etc.

DOE Program Managers –
Dr. Imre Gyuk
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Power Electronics Sub-Program Benefits

- Increase system reliability and security
- Increase T&D efficiency
- Increase load factor on T&D system
- Added power flow control
- Improve voltage and frequency regulation
- Improve transient and dynamic stability
- Added flexibility
- Deferral of new or upgraded infrastructure

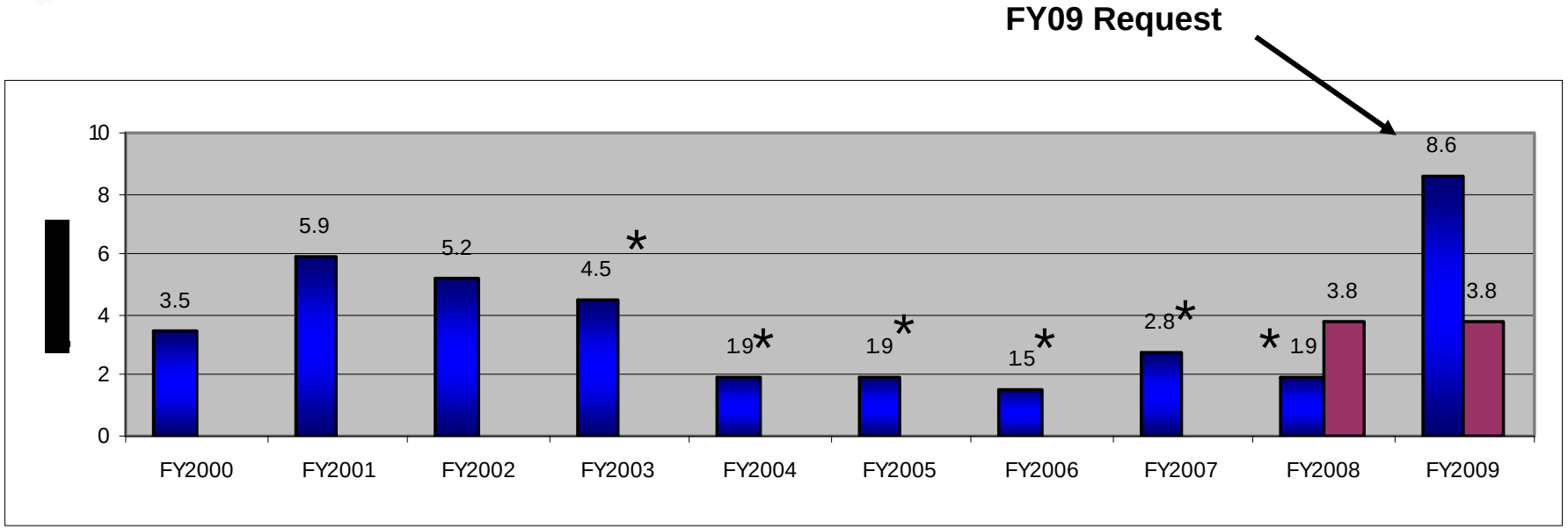
Power Electronics Sub-Program Approach

- Leverage existing efforts in DoD and Industry to utility scale (higher voltage and current, power, lower cost)
- Partnerships
  - National Laboratories – ORNL, SNL
  - Universities
  - Industry Research Organizations – EPRI
  - State Energy Agencies
  - Federal Agencies – DHS, DoC, DoD

ESPE Program Highlights

- Ionic liquid electrolyte research project completed, one possible candidate for further investigation
- Testing of carbon enhanced lead acid batteries shows significant improvement in lifetime
- CEC Palmdale 450kw Supercap project commissioned
- CEC SMUD SPRINT POP site project contracted VRB 20 kW, 9 hr backup system
- NYSERDA Long Island bus terminal system operational with NAS battery
- Beacon 20 MW flywheel plant design completed
  - Beacon purchased land in Eastern NY
  - Permitting in process

Energy Storage and Power Electronic Systems Program Funding



* Earmarks removed

Summary

- Power Electronics work expanded and split into separate sub-program
- Energy Storage continues to draw increasing attention and new interest
  - 2008 saw 3 investment workshops focusing on energy storage
- FY09 budget picture is unclear
  - Continuing Resolution for full year likely
  - Good news is request has healthy increase for Energy Storage sub-program