Lockheed Martin and Energy

Efficiency/Sustainability

Commercial Energy Efficiency

Utility Efficiency Programs

City Efficiency Programs

FEMP

Alternative Generation

Wind

Solar

Biomass

Ocean thermal

Storage Nuclear

Wave

Demand Response

Advanced Tools and Systems

SEEsuite

Cyber Security

Operational Optimization

Microgrids
DoD Land Forces Power Issues

**Challenges & Impact of Power are Significant**

- War Fighter unnecessarily exposed to convoy and infrastructure hazards
- High O&M costs (fuel, batteries, repairs) due to inefficient use of resources
- Power gaps exist away from generators, vehicles, and wall plugs
- War Fighter burdened with weight in carrying batteries

**Inefficient Architecture**

**Fuel Convoys**

**Route Clearance**

**Hazardous Infrastructure**

**Vehicle Power System Growth**

**War Fighter Burden**
LM Power Generation & Management

- Ocean Thermal Energy Conversion (OTEC)
- Fuel Cells
- Microgrid
- Mobile Waste to Energy Conversion (MWEC)
Innovation is Key to the Long Term Success of LM
Microgrids R&D Pipeline

Univ, Small Business
- University (Texas A&M, UT Austin, Drexel, etc.)
- Small Business Partnerships (Ideal Power Converters, Skybuilt Power, others)

IR&D
- Microgrid Architecture and algorithm IRAD
- Cohesive LM Energy Systems via MFC Microgrid Architecture
- Hardware/software in the loop intelligent Microgrid Development Center

CR&D
- Hi-Power - AC/DC Trade Study 2008
- Army CERDEC HI-Power 2009/2010 – Demo microgrid for Army TOC/FOB
- Air Force Integrated Smart BEAR Power Systems 2010
- ESTCP Ft. Bliss microgrid demo

Leveraging University and Small Businesses to Fill Key Gaps
Partnership with Lockheed Martin

• **Mechanisms**
  – Direct Research and Development Contracts (IRAD)
  – Subcontracts from Customer Research and Development (CRAD)
  – Subcontracts from Programs
  – Small Business Innovation Research (SBIR)
  – Direct Response to Broad Area Announcements (BAA)
  – University Research Contract
  – Mentor-Protégé

• **Hot Topics**
  – Intellectual Property
  – Publications
LM Vision and Values

Powered by Innovation, Guided by Integrity, We Help Our Customers Achieve Their Most Challenging Goals

- Do What’s Right
- Respect Others
- Perform With Excellence