

California Energy Commission 2015 Microgrid Workshop

Military Microgrids: Initiatives, Perspectives & Challenges

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DoN

“Changing the way we get and use energy is a priority for the Department because energy security is critical to our national security.”

- Ray Mabus, Secretary of Navy
January 2012

SECNAV Energy Goals



Five Major Energy Goals

Reduce Energy Consumption & Intensity

By 2020, USN will reduce energy consumption & intensity by 50% from a 2003 baseline.

Power from Renewable Sources

By 2020, 50% of total ashore energy will come from renewable sources.

Net-zero installations

By 2020, 50% of installations will be net-zero consumers.

Reduce Non-Tactical Petroleum Use

By 2015, reduce petroleum used in commercial vehicle fleet by 50% from a 2009 baseline.

Increase Energy Security

Provide reliable, resilient and redundant power to increase the energy security of mission critical assets.

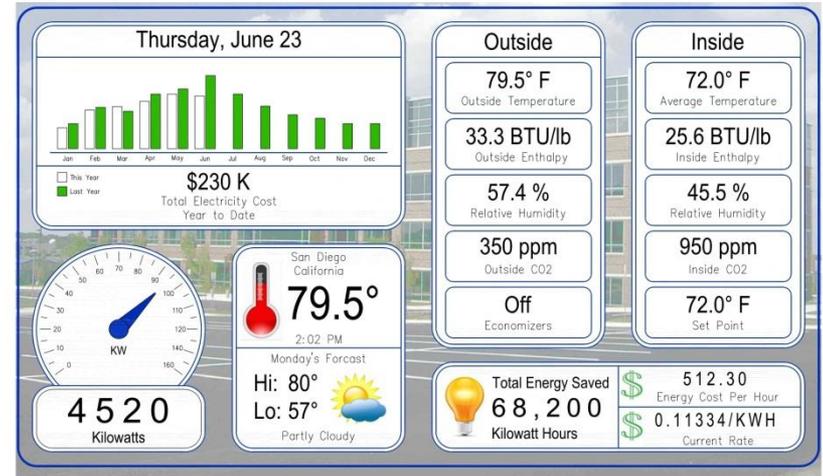
Policy, guidance and directives shape the Navy's Smart/Microgrid Strategy:

- National Defense Authorization Acts 2010-2012
- Energy Independence and Security Act of 2007

Defining a Smart/Microgrid



VS



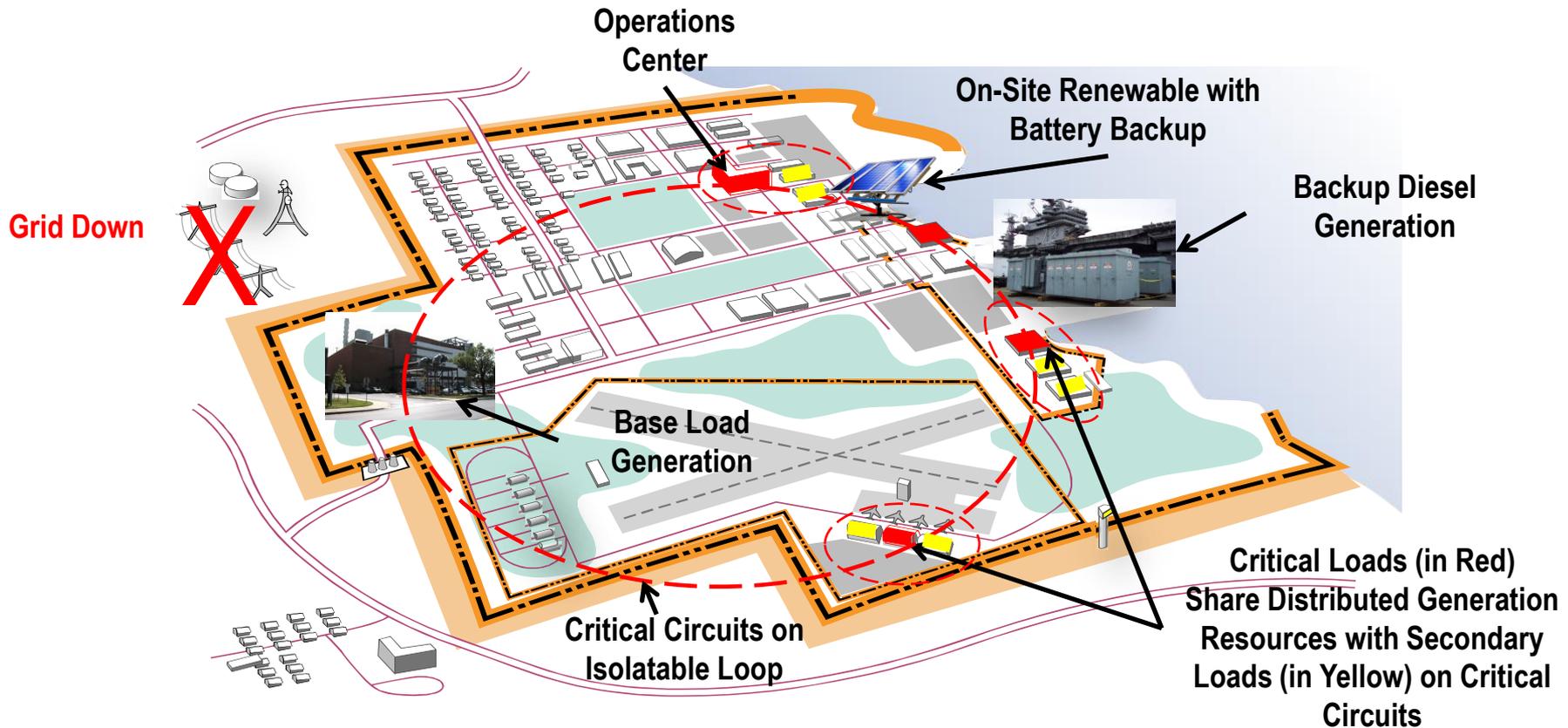
Microgrid: Ability to Island from the Grid
Subset capability of Smart Grid Program

Smart Grid: A Level of Grid Intelligence

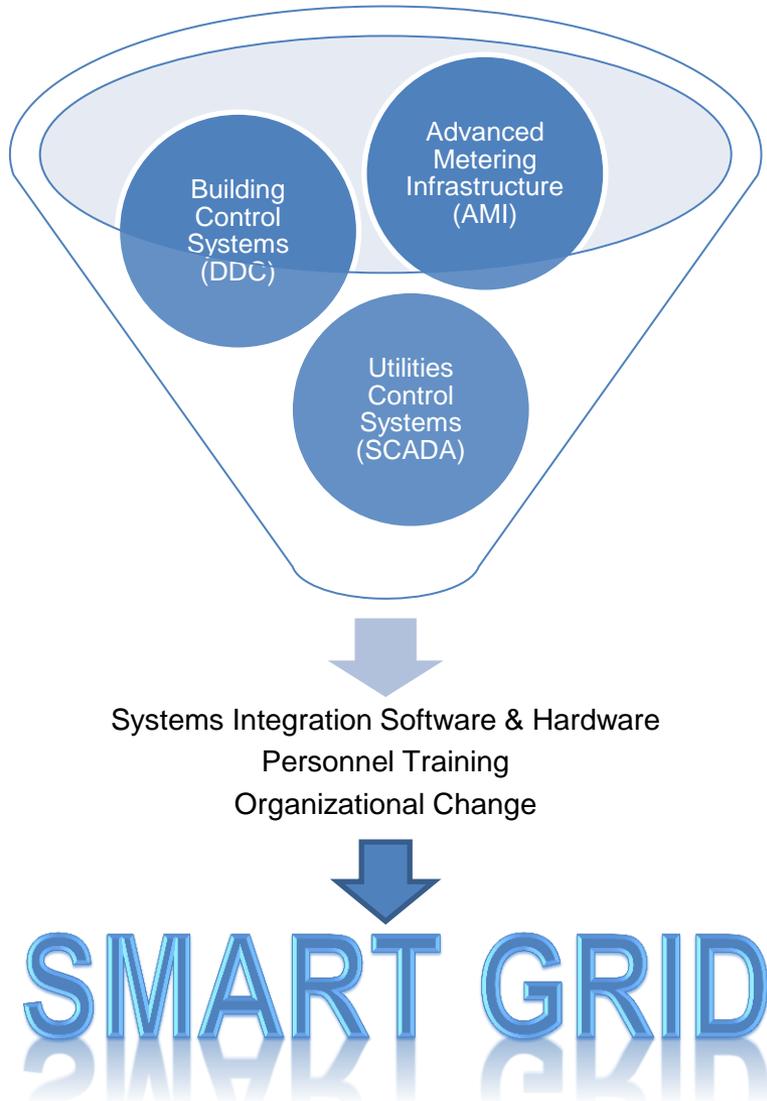
The conversation is shifting...

CNRSW Microgrid Approach

Leverage controls to shed non-critical loads and provide critical loads with secure energy

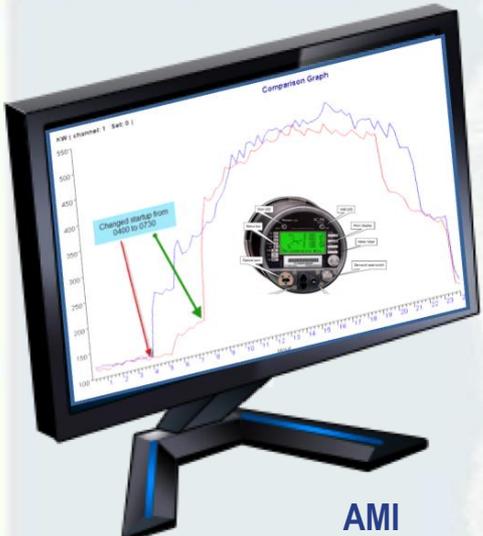


Navy and Marine Corps Smart Grid



- **Market Driven Near Real Time Energy Management**
- **Demand Response, Peak Shaving, Load Leveling**
- **Condition Based Targeted Maintenance and Repair**
- **Predictive maintenance, Remote Diagnostics**
- **Cyber secure utilities and energy systems**

Smart Grid Foundations



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Working Toward 



Smart/Microgrid Initiatives



- **SPPI**
 - S.A.M.E.S. RDT&E Metro Navy Microgrid
 - Expansion of current Systems
 - Demand Response
- **MCAS Miramar Microgrid Project**
- **29 Palms Microgrid ESTCP**
- **SNI Microgrid w/Battery Storage**
- **Enterprise Smart Grid Program**
- **SPIDERS & More!**

Challenges for the Future



- **Maintenance and Sustainment of both Controls and Dynamic Equipment**
- **Cyber Security**
- **Develop a value for Energy Security**
- **Energy storage solutions**
- **Integration of systems**
- **Fiscal realities**
- **Regulatory, Industry Standards, Industry Buy-in: Finding Capable Contractors**
- **Future Integration of other utilities?**

Potential Opportunities



- **FY15 ESTCP:**
 - Proposals due March
- **Smart Grid CIP Program**
 - FY16-20
- **CA SGIP**
- **TechVal**
- **ECIP**
- **Financed Energy Projects**

Questions?



How to engage the Navy:

Presenter's contact information

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- To submit energy ideas

➤ <http://greenfleet.dodlive.mil/energy/energy-efficiency-idea/>

Defining Energy Security



- **What is energy security? US Navy: *“having assured access to reliable and sustainable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs”***
- **2008 Defense Science Board Task Force on DoD Energy Strategy described vulnerability of the nation’s electric power grid**
- **The number of large blackouts at a national level is growing in number and severity**

Tangible Damages During Outage



- Training missions may be canceled and planes grounded
- Personnel is sent home – many man (\$) hours wasted
- The need to man electric gates, traffic lights and other facilities
- Food spoilage in mess halls and commercial outlets
- Impact to Fleet Readiness

Source: IEEE 1547.4