



Naval District Washington *SmartEnergy CONOPS*

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3/31/11

SmartEnergy CONOPS

Tying it all together

1. NDW Energy Vision
2. NDW AMI Project
3. NDW DDC/SCADA Initiative
4. ARRA PV Project
5. NFESC Energy Audit Contract
6. Demand Response Program
7. FY10 ESPC/UESC Projects (Planned Awards)
8. FY10/11 ESPC/UESC Projects (Preliminary Audits)
9. Revised UEM Core Organization
10. Energy Manager/REM Plan
11. Utility Energy Project Rebates

NDW SmartEnergy CONOPS



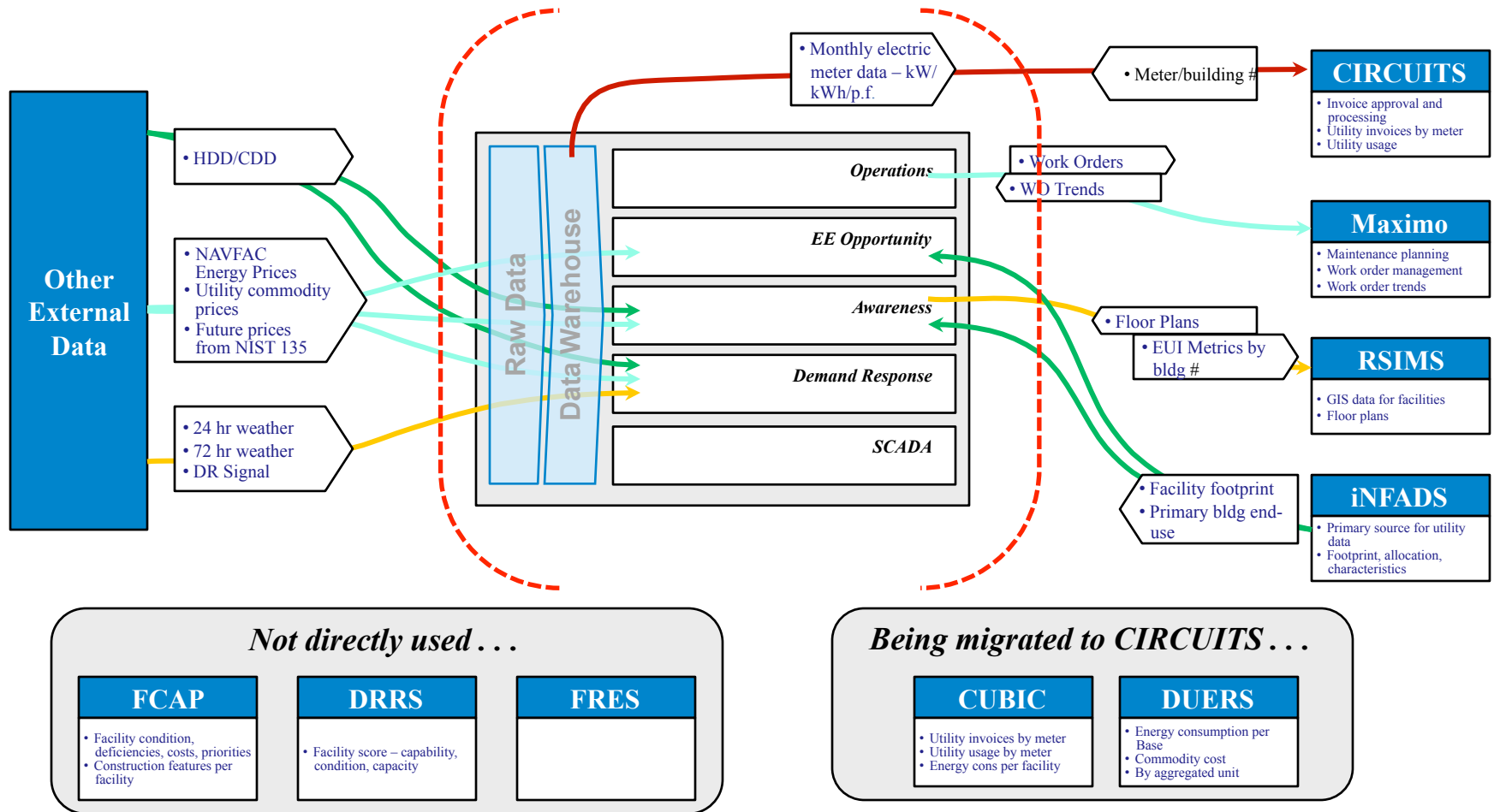
OBJECTIVES

- Reduce energy costs without impacting mission (also reduces energy consumption)
- Reduce O&M costs without impacting mission
- Change operational behavior regarding energy to allow transparent decisions regarding energy-saving opportunities

ACTION AREAS

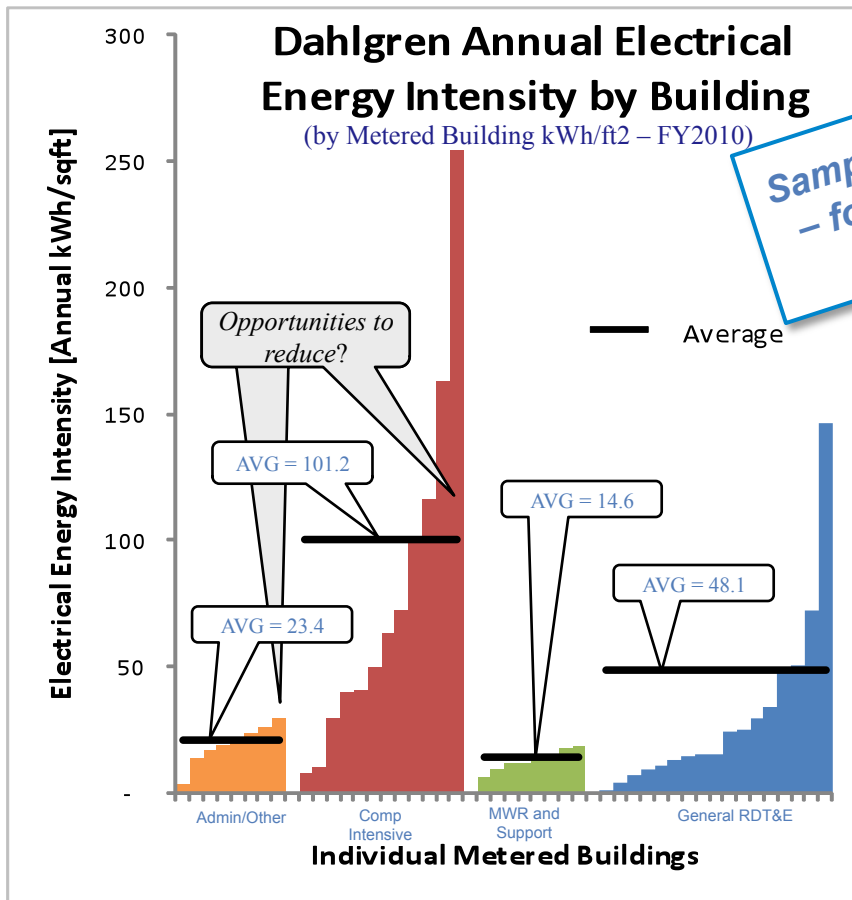
1. Manage Facilities to as-Designed Condition
2. Identify Energy Efficiency Upgrades
3. Generate Stakeholder Metrics that Change Behavior
4. Enhanced Demand Response
5. Networked SCADA (Supervisor Control and Data Acquisition)

Integration of SmartEnergy System with NAVFAC Databases

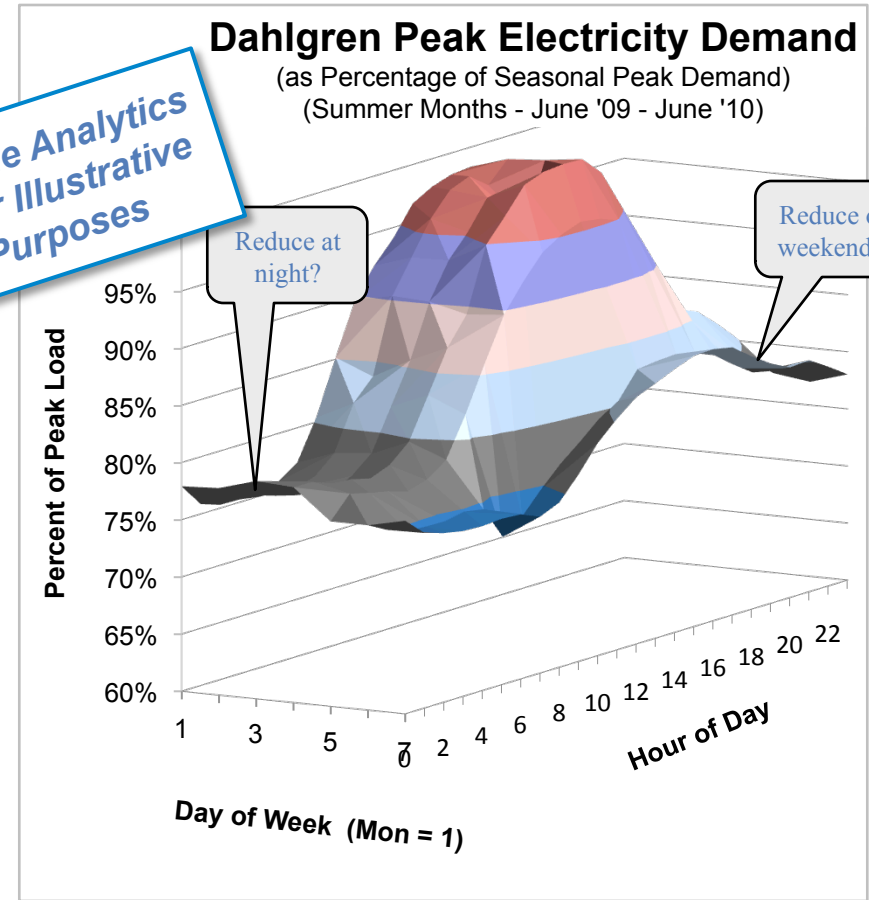


Note: See additional database detail in Appendix
Data warehouse may be housed within CIRCUIITS

Example: SmartEnergy Data Analytics



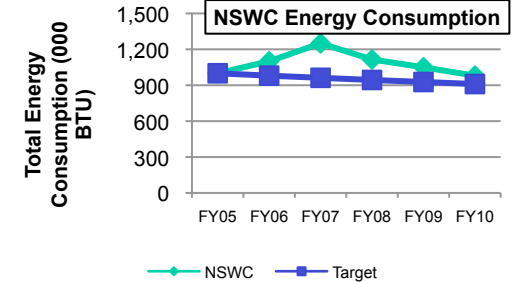
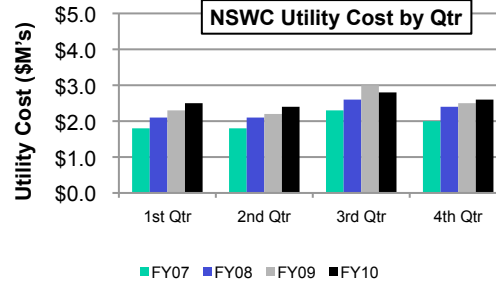
Sample Analytics
– for Illustrative
Purposes



Example: SmartEnergy Metrics Scorecard



| | |
|----------------|-----------|
| Base: | "Example" |
| Tenant: | NSWC |
| Date: | Nov 2010 |



| Tenant: | NSWC |
|--------------------------------------|---------------|
| Total Building Count | 75 |
| Total Square Footage | 500,000 |
| Actual Rolling 12-month Utility Cost | \$5.0M |
| Total FY10 Utility Budget | \$5.5M |
| Monthly Electric Consumption | 3,000,000 kWh |
| Monthly Electric Cost | \$300,000 |
| Monthly Thermal Consumption | 5,000 mmBTU |
| Monthly Thermal Cost | \$40,000 |
| HDD/CDD | 21/NA |

| IPL- Energy Related | Start | Funding |
|--------------------------------------|-------|---------|
| P160- Geothermal Heat Pumps | FY10 | SP |
| P188- Lighting Retrofit | FY11 | NWCF |
| P120- Bldg 165- 1,000 more employees | FY11 | MILCON |
| P190- Solar Panel Parking lot | FY13 | SP |

Top Energy Consumers

Electric

Top 5 Consumers (\$000's)

| Bldg # | FY10 | FY09 |
|--------|-------|-------|
| 6 | \$450 | \$400 |
| 78 | \$500 | \$450 |
| 43 | \$550 | \$500 |
| 200 | \$600 | \$550 |
| 12 | \$650 | \$600 |

Energy Intensity

Electric Intensity

RDT&E Buildings

| Bldg # | 3-Month Ave | Region Ave |
|--------|-------------|------------|
| 123 | 140 | 80 |
| 60 | 135 | 80 |
| 80 | 145 | 80 |
| 94 | 125 | 80 |
| 17 | 115 | 80 |

Top Energy Consumers

Thermal

Top 5 Consumers (\$000's)

| Bldg # | FY10 | FY09 |
|--------|-------|-------|
| 5 | \$450 | \$400 |
| 98 | \$500 | \$450 |
| 212 | \$550 | \$500 |
| 85 | \$600 | \$550 |
| 66 | \$650 | \$600 |

Energy Intensity

Thermal Intensity

RDT&E Buildings

| Bldg # | 3-Month Ave | Region Ave |
|--------|-------------|------------|
| 96 | 140 | 80 |
| 82 | 135 | 80 |
| 100 | 145 | 80 |
| 4 | 125 | 80 |
| 18 | 115 | 80 |

Example: SmartEnergy Facility Management



Facility Operations Centers: Proposed Sites

| <u>Location</u> | <u>Fenceline(s) Covered</u> |
|--------------------------------------|---|
| <i>WNY*</i> | WNY, NSF Suitland, NSF Naval Observatory, NSF Arlington |
| <i>NSF Naval Research Laboratory</i> | NSF Naval Research Laboratory, NSF Chesapeake Beach |
| <i>NSF Carderock</i> | NSF Carderock |
| <i>JBAB</i> | Joint Base Anacostia-Bolling |
| <i>NSF Annapolis</i> | NSF Annapolis, US Naval Academy, North Severn, NOSC Baltimore |
| <i>NSA Bethesda</i> | NSA Bethesda |
| <i>NAS Patuxent River</i> | NAS Pax (main base), NRC Solomons, OLF Webster Field |
| <i>NSF Indian Head*</i> | NSF Indian Head (main base), Stump Neck Annex |
| <i>NSF Dahlgren*</i> | NSF Dahlgren (main base), Pumpkin Neck Annex |

*Note: 1 of 3 locations for NDW SmartEnergy pilot

Five Elements of NDW Energy Vision 2035



Mission Efficient Comfortable Conditions

E: Cost-Effective Renewables

- *Self-supporting electrical and renewable thermal, where cost effective*

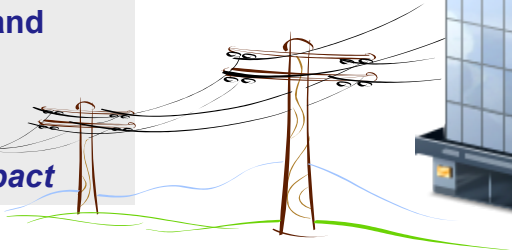


A: Efficient End-Use Technology

- *Tight building shell*
- *Efficient lighting*
- *Efficient mechanicals*
- *Efficient plug loads*

D: Aggressive Demand Response

- *Generator dispatch*
- *Building systems, with no comfort impact*



B: Cost-Efficient Energy Sources and Distribution Infrastructure

- *Low cost energy sources*
- *Efficient boiler/furnace*
- *Efficient on-base distribution*



C: Networked SmartEnergy Management Capabilities

- *Adequate metering and controls*
- *Well-tuned control system*
- *Controlled to match needs*
- *Regularly monitored performance*
- *Periodically diagnosed for improvement*

