



GovEnergy

www.govenergy.gov

The Premier Energy Training Workshop
and Trade Show for Federal Agencies

A River of Energy Solutions

**A holistic approach to
Energy Security**

μgrid ready concepts

Topics

- Holistic approach to Energy Security
- μ Grid concepts
- Managing peaks
- Technologies and strategies
- What can we be working on now

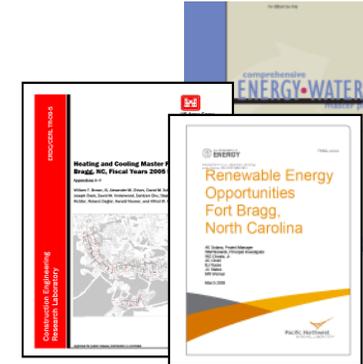
Holistic approach to Energy Security

Energy Requirements

- Energy Security
- Energy Conservation
- Net Zero Energy
- Renewable Requirements
- Lower Emissions
- Reduce Fossil Fuel

Energy Plans

- Comprehensive Energy and Water Master Plan
- Utility Monitoring and Control System (UMCS) Plan
- Central Energy Plants Master Plan
- Energy Implementation Plan
- Renewable Energy Master Plan
- Energy Master Plan (TBD)
- Energy Technology Templates
- Commissioning Action Plan
- Energy Awareness Plan
- Energy Security Plan



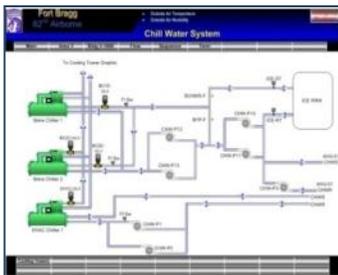
Identifying Problems



Meters- Energy Usage



Energy Awareness - Changing Behavior



Central Energy Plants



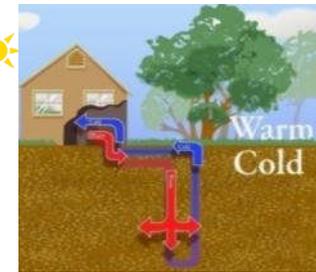
Incorporating Technologies



Solar Walls



Solar Domestic Hot Water



Group Source Heat Pumps



Fuel Cells



Thermal Energy Storage (TES)



CHP

μ Grid Concepts



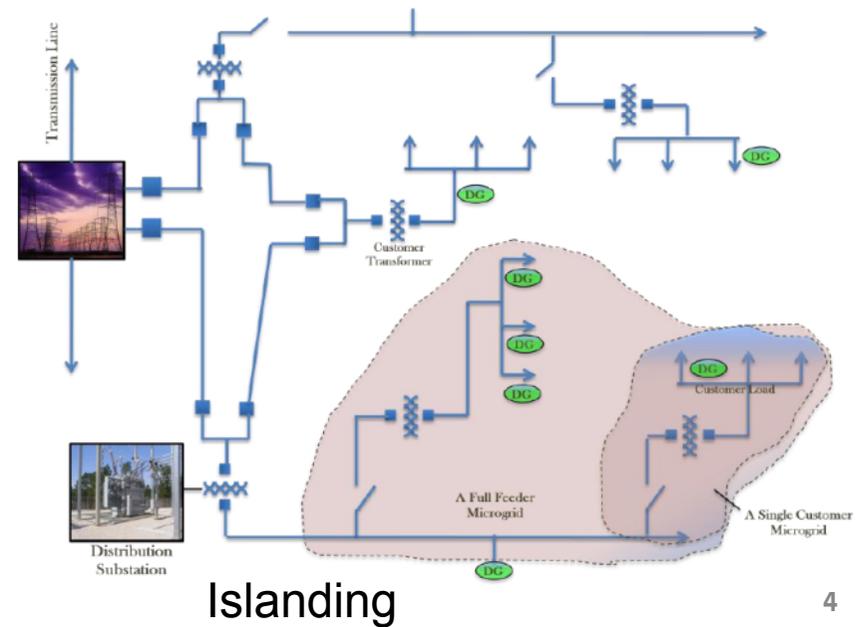
Single Feeder



Building



Complex

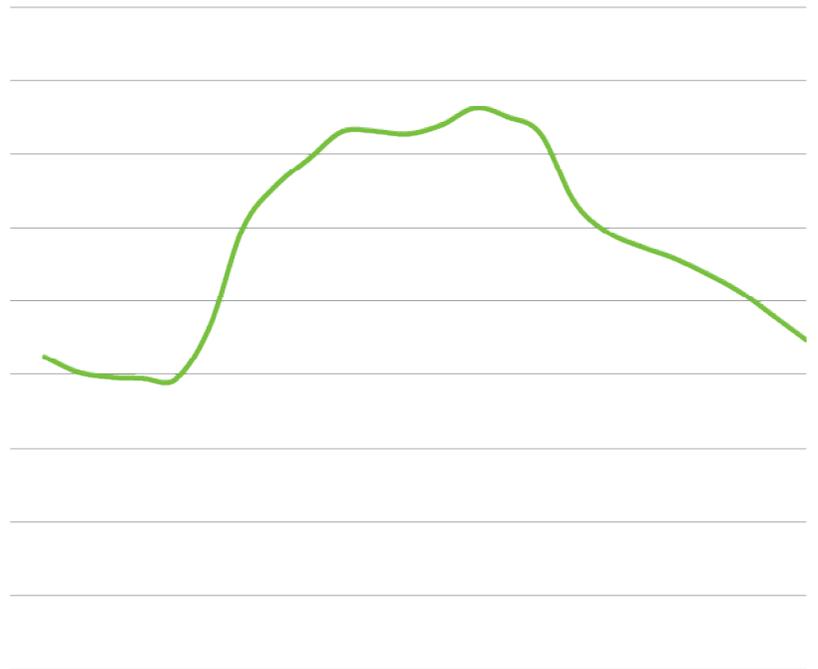


Managing Peaks

- Energy Conservation Measures
- Load Control
- Energy Awareness
- Renewable Energy
- Thermal Energy Storage
- Electrical Energy Storage

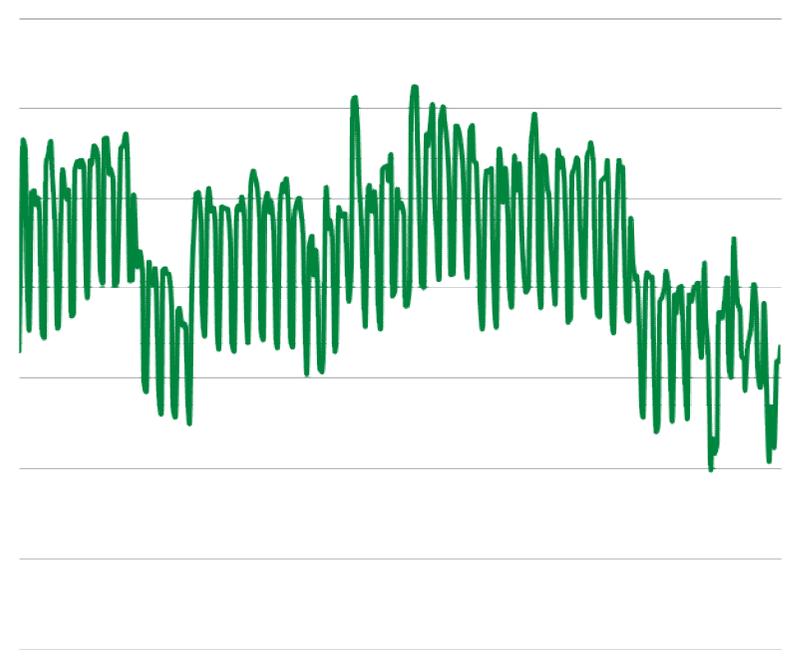


Typical Electric Utility



Diurnal - Summer

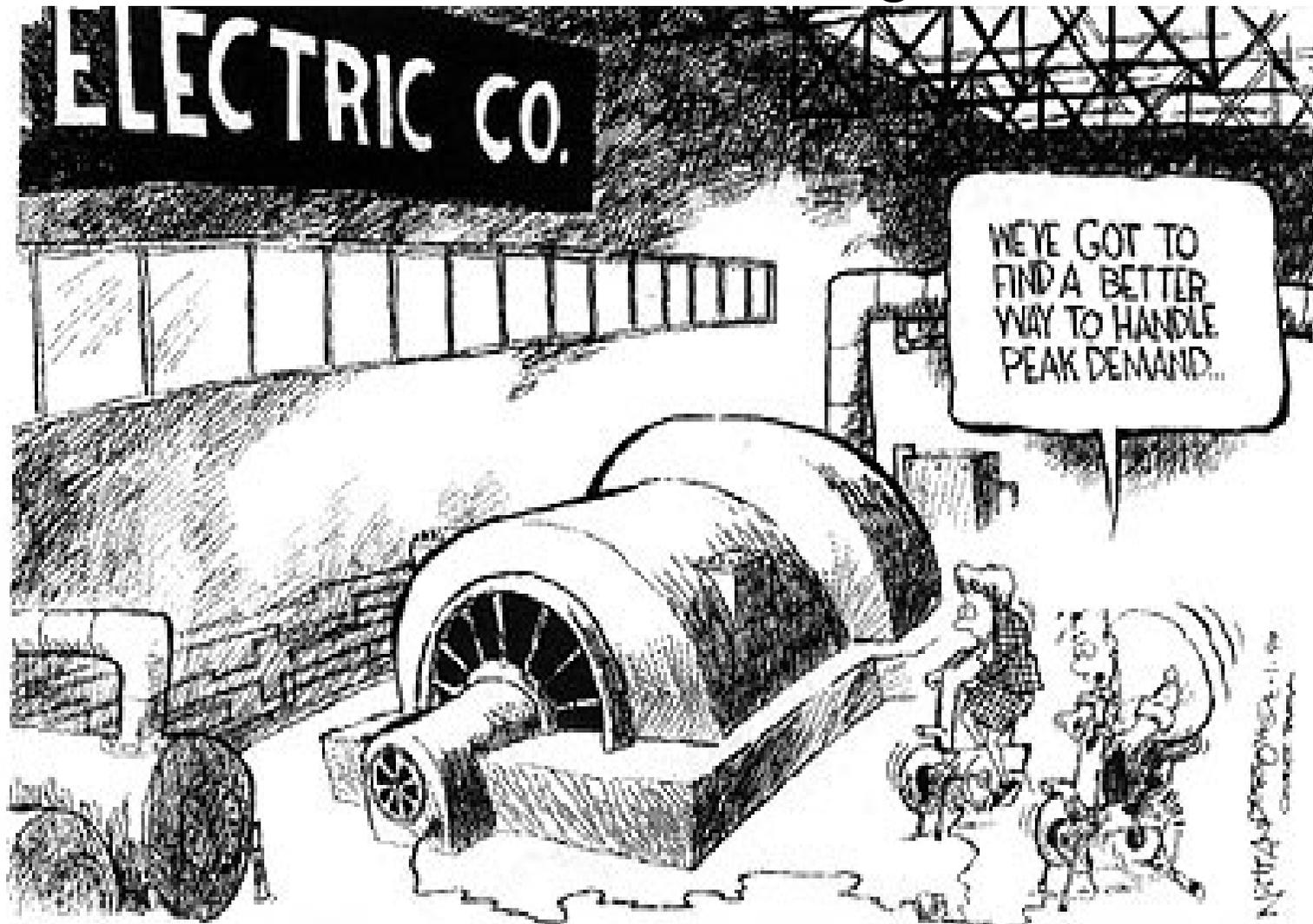
0 4 8 12 16 20 24



Annual

1/1 4/1 7/1 9/30 12/30

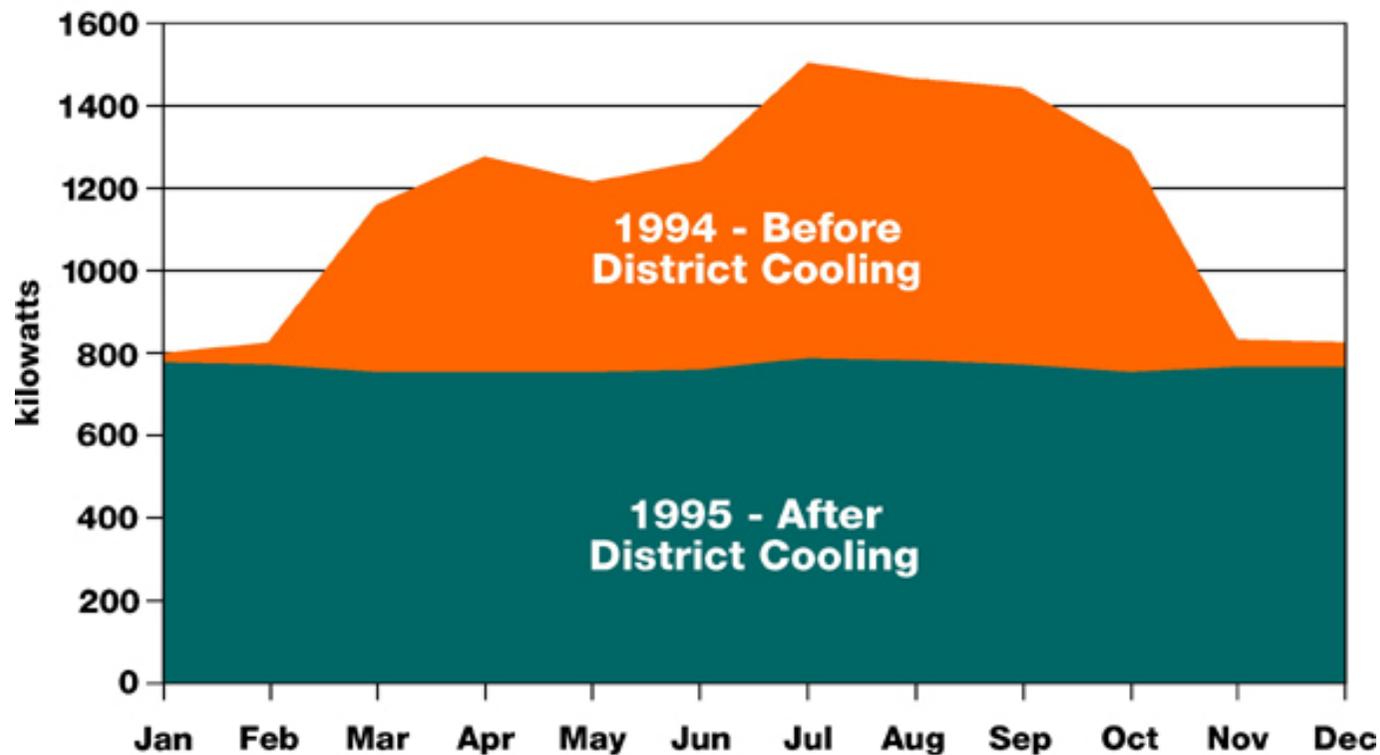
Peak Shaving?



Peak Shaving!



District Cooling Customer Electric Demand Profile



350,000 sf commercial office building built in 1965. Located in Cleveland. Two electric chillers displaced. Actual peak meter readings varied just 2% Jan-July.

Energy Awareness

Disconnect between building occupants and energy costs

- Transient populace
- Communication of roles and responsibilities
- Limited Resources
- Utility bills not received by individuals, no concept of operating costs



Challenge

Energy Awareness Programs

- Focuses on small changes integrated into daily activities



- Empowers personnel to make a positive impact

Solution

Growing program with increased ownership by building occupants

- Positive response from participants



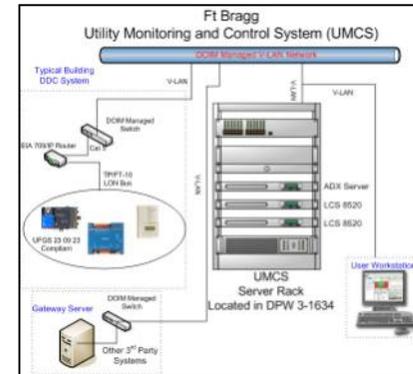
Way ahead

Increase number of Units involved in the program.

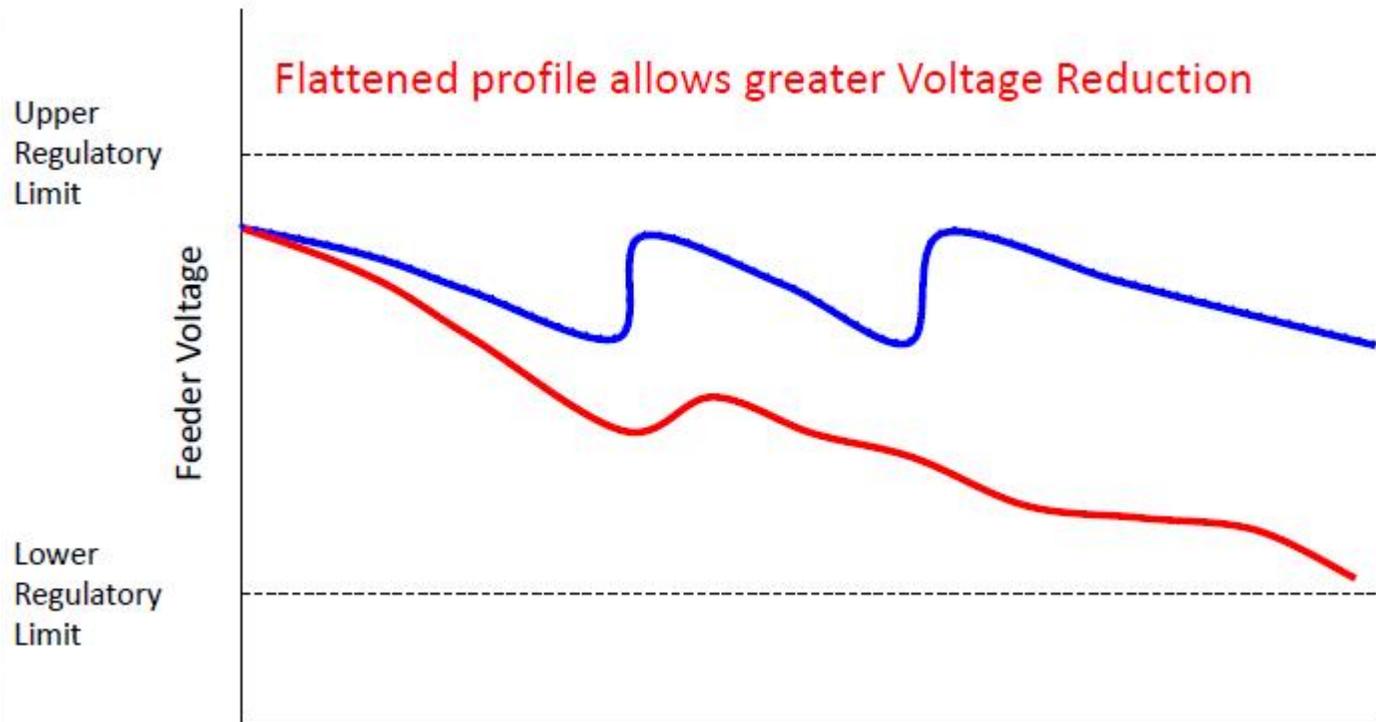
Results

Technologies & Strategies

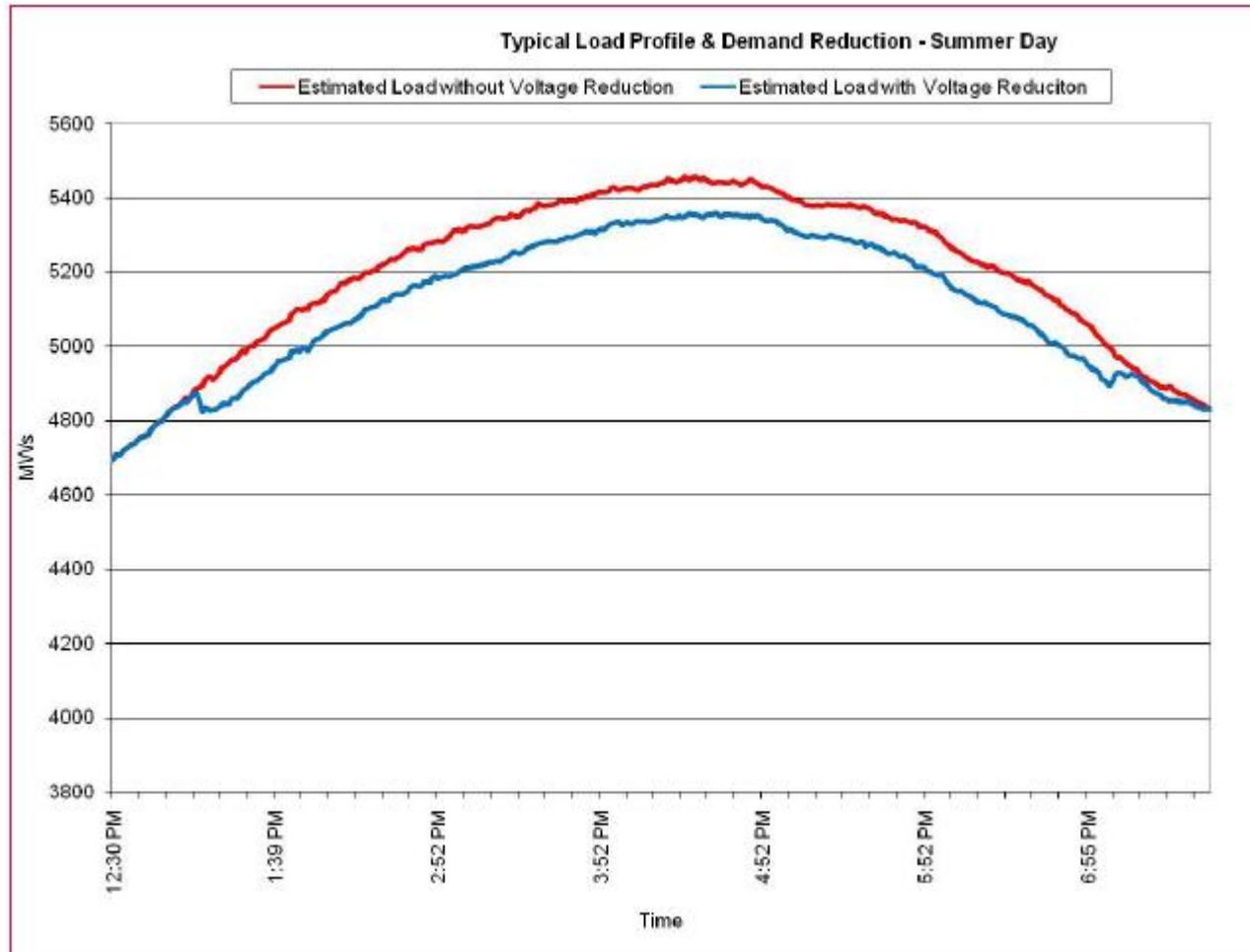
- Central Energy Plants
- Combine Heat & Power
- UMCS
- Voltage Reduction
- Power Electronics
- Distributed Generation



Voltage Reduction



Load Reduction



What can be done now

- μ Grid Ready Building Designs
- Value for energy security
- Generator Specifications
- Evaluate Inverters
- μ Grid Specifications
- Implement ECM's that are capable of interacting with μ Grids

Questions



Contact Info

Keith McAllister, PE, CEM, DCEP

(919)-656-8183

keith.mcallister.ctr@us.army.mil

keith@kestavaenergy.com