



*An Energy-Efficiency Workshop
and Exposition
Orlando, Florida*

**Distributed Generation/
Combined Heat and Power (DG/CHP)
Resources for Federal Facilities**

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August 18, 2003

FEMP – “ADD CHP”

- Accelerated Development and Deployment of Combined Heat and Power (ADD CHP)
- Goal: Make proven DG/CHP technology more easily accessible to federal agency sites who want to “lead by example” with DG/CHP
 - Enhance energy security & reliability
 - Reduce costs
 - Reduce GHG emissions



Energy Security

Mandates:

- Executive Order on Critical Infrastructure Protection (10/2001)
- E.O. 12656 Emergency Preparedness Responsibilities (11/1988)

Bottom Line:

- *Installations* must ensure energy is available for all critical mission operations

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**DG/CHP Is Key to
Security Solutions**

- DG can provide dependable, on-site power when and where needed - independent of external influences
- Doing DG efficiently means doing CHP
- More reliable if base-loaded or peak-shaving daily

“You know it’s ready for an emergency if it operates every day.”

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Why ADD CHP?

- ✓ 1600 MW w/avg. simple payback <8 years
- ✓ 50 trillion Btu/yr of source energy savings
- ✓ \$170 million/year in energy cost savings
- ✓ 4 million metric tons/yr of avoided CO₂ emissions
- ✓ Increased reliability/security for 13% of federal power purchased (buildings, FY2000)
- ✓ Diversified fuels reduce vulnerability to price volatility in a single market

CHP offers significant potential benefits

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FEMP’s Strategy

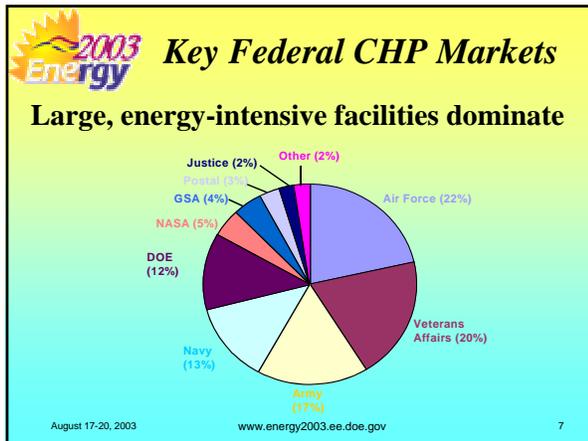
- Focus on key markets
 - Veterans Affairs
 - Army
 - Navy
 - Air Force
- Target assistance to address hurdles
 - Technical
 - Financial
- Help sites make informed decisions



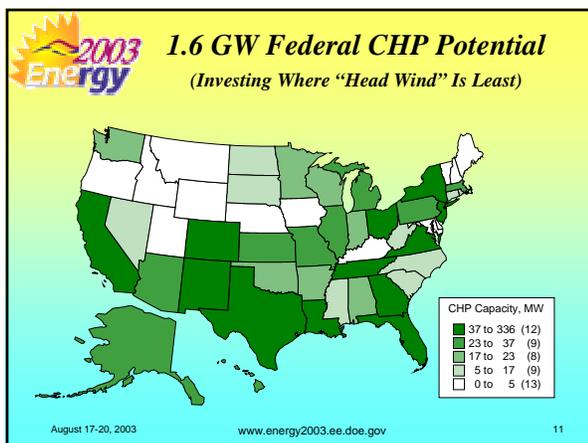
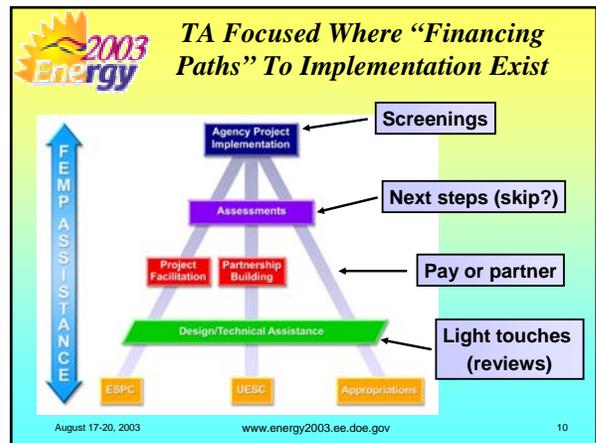
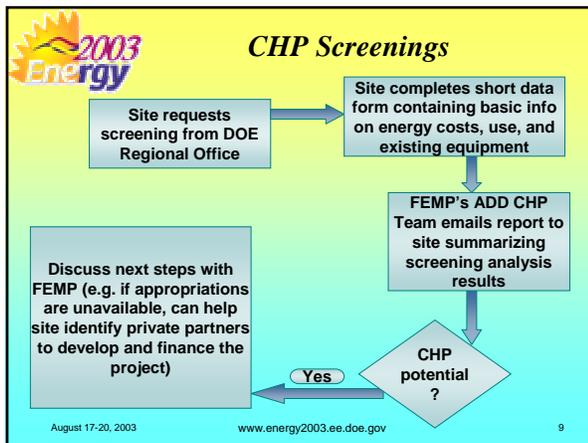
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- ### 2003 Energy Technical Assistance
- CHP screenings (over 125 sites to date)
 - CHP “next step” TA (customized to need)
 - Performance/cost estimation for various prime movers, components, configurations, base load or peak shaving, thermal storage;
 - “Head wind” indicators: incentives?; requirements for permitting, interconnection, standby/backup, exit fees, etc.
 - CHP “light touches” once project developers engage
 - Reviews of survey reports, feasibility studies, designs, technical proposals, price proposals, baselines, savings calculations, M&V
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- ### 2003 Energy Who Does What?
- **Private partners** promote, market, develop project, finance it ... implement
 - ESCOs and Utilities
 - CHP industry & associations (USCHPA, IDEA, etc.)
 - **Federal agency/site** leads
 - **FEMP** supports
 - By providing agencies unbiased expertise
 - Access through the DOE Regional Offices
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2003 Energy *CHP Examples:*
Twentynine Palms Marine Corps Air Ground Combat Center, CA

- 7.2-MW, dual-fuel cogen system
- Annual cost savings: \$5.8M
- Savings subsidized >1 MW of PV
- 75% efficiency (design target)—twice U.S. grid average
- Exhaust heat for district hot water and 200-ton chiller
- FEMP provided independent and unbiased review of design, contributed to more efficient design; Case Study in 2004



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2003 Energy *CHP Examples:*
Fort Jackson, SC



Chronology of FEMP support

- ✓ Screenings performed/revise per site requests (4/02)
- ✓ Site champion attended DG/CHP workshop (5/02)
- ✓ Site requested/awarded FEMP tech-assistance (9/02)
- ✓ Analysis performed for 13 CHP configurations to gain ESCO buy-in (12/02) (continuous, peak shaving, and extended peak shaving modes of operation; different sizes, types of prime movers)
- ✓ ESCO submits initial proposal (4/03)

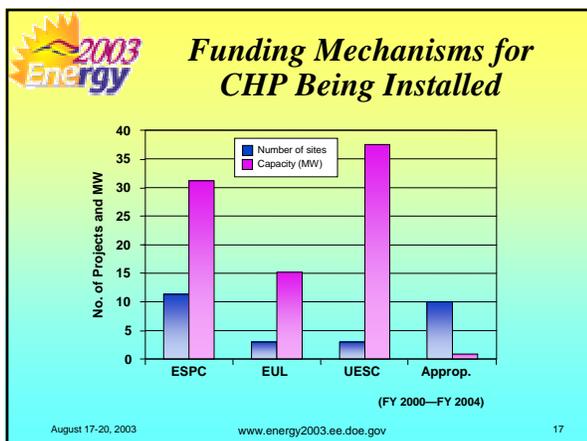
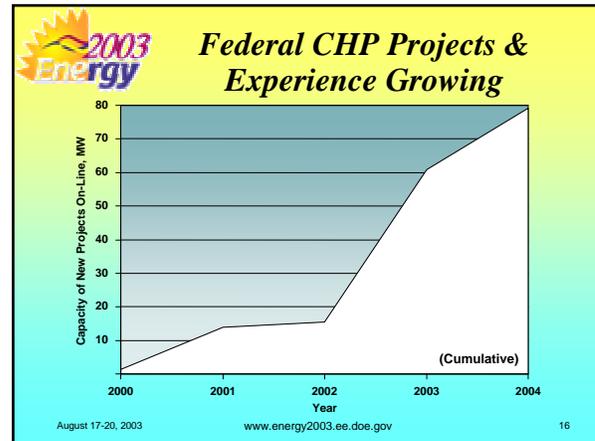
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2003 Energy *CHP Examples:*
EPA Steam Turbine, Boston, MA

- At EPA request, evaluated routing purchased steam to produce electricity prior to its use for building heat
- **Technology configuration**
 - 150-kW backpressure steam turbine
 - Modest 5% increase in steam flow required
- **Benefits**
 - 2 yr simple payback
 - ~\$75k implementation cost
 - Cost savings: >\$40k/yr
 - Energy savings: 2,400 MMBtu/yr



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2003 Energy *Is CHP for You?*

- High electric rates?
- Energy security upgrades planned?
- Gas/alternate fuel available?
- Thermal demand on site? --follows electric load?
- Compatible infrastructure (central heat and cooling systems)?
- Large, steady energy loads?



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2003 Energy *What Have We Learned?*

- Strongest market drivers for CHP are energy security, costs, equipment upgrades
- Potential savings are significant
- Dual fuels and/or intelligent operating controls reduce susceptibility to changing fuel costs
- Savings from CHP can “subsidize” renewables
- Site champions are critical for success

More lessons and case studies from federal colleagues in sessions 5, 6, & 7 – don't miss them!

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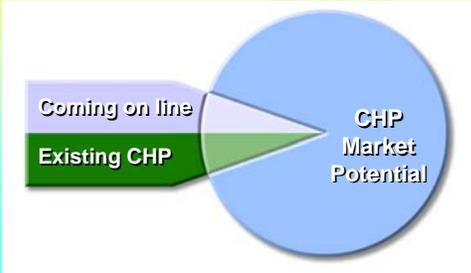
2003 Energy *Technical Issues*

- IC engines, large gas turbines, HRSGs, steam turbines — tried and true
- Gas compressors and peripherals for microturbines—varied results
- Fuel cells— appealing but costly



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2003 Energy *Federal CHP*
Currently Only a Fraction of Total Federal Potential



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2003 Energy *FEMP DG/CHP Information*

- DER “How-To” Guide
- Case Studies, Fact Sheets
- CHP Market Analysis
- Environmental permitting guide
- New interconnection guide

See FEMP booth for these and other publications and visit the web site:
<http://www.eere.energy.gov/femp.html>

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2003 Energy *CHP Training in 2004*

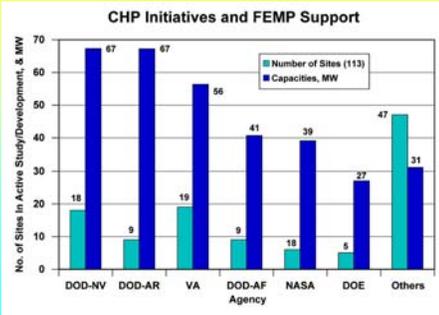
- DER hands-on training for federal managers, Albuquerque, NM: April 28-29, Sept 15-16
- Two web-based workshops (spring/summer)
- Energy 2004—August—Rochester NY
- DG/CHP for Federal Facilities Regional Workshops—see presentations from past events and see what's coming in '04 on web

FEMP website for outreach information:
<http://www.eere.energy.gov/femp.html>

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2003 Energy *CHP Interest and Initiatives*

CHP Initiatives and FEMP Support



Agency	Number of Sites (113)	Capacities, MW
DOD-NV	18	67
DOD-AR	9	67
VA	19	56
DOD-AF	9	41
NASA	18	39
DOE	5	27
Others	47	31

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2003 Energy **CHP—Looking Forward**

What else should be done to facilitate projects? Ideas are welcome. Meeting here at 4 p.m. on Wed.

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*Comments?
Questions?
Thank you!*

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