FEMP: Making CHP Accessible to Federal Agencies

Patrick Hughes

Oak Ridge National Laboratory

International Symposium on Distributed Energy Resources

CADER

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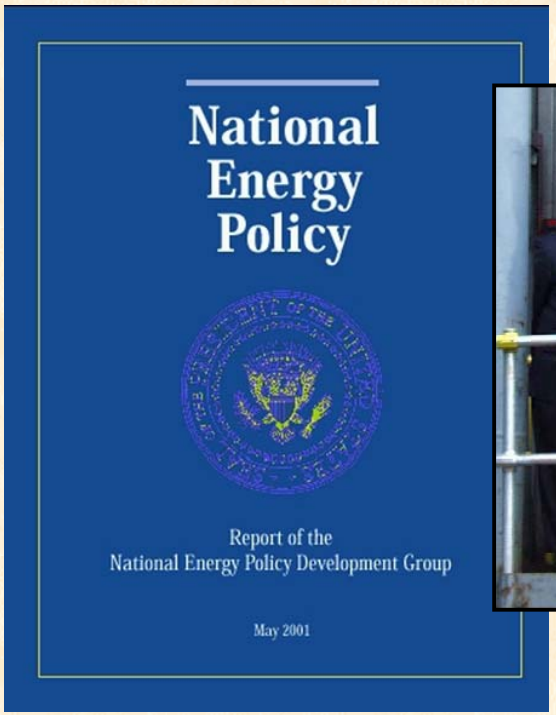
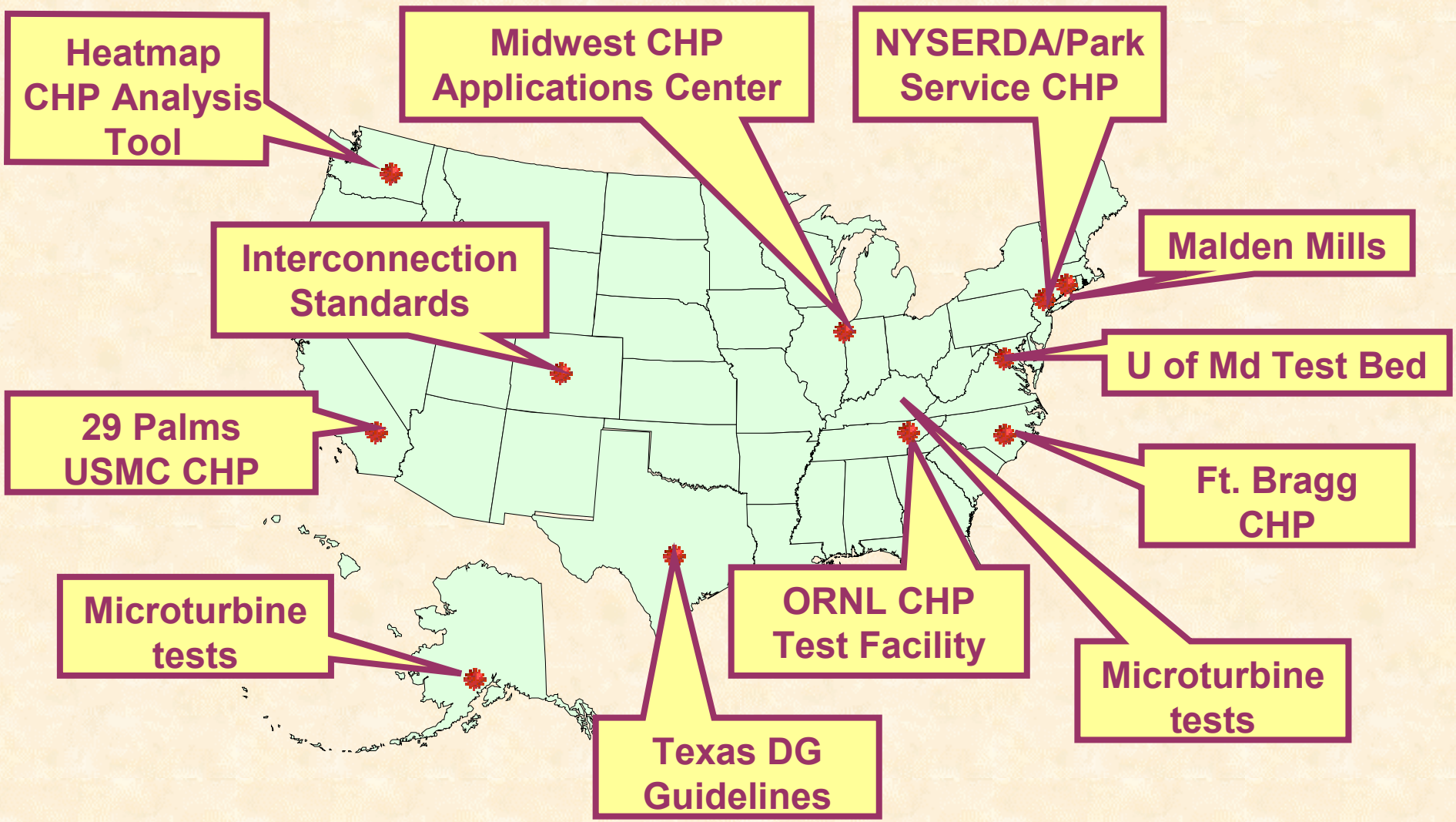
President's National Energy Policy

CHP Is a Key Component



Selected DOE Program Activities



Outline

- Existing CHP in Federal Sector
- Potential for CHP in Federal Sector
  - National Market Assessment
- ADD CHP:
  - CHP Screening & Next Steps
- Federal Facility Use of CHP R&D
- Conclusions

How Much CHP Serves the Federal Sector?

- **"CHP Federal Managers Resource Guide" (Aspen Systems Report, March 2000):**

  16 CHP Systems = 540 MW

- **Present estimate: 70 CHP systems = 975 MW**

Most increase is from discovery, but over 15 MW is new installation.

Discovery is work in progress… contributions welcome!

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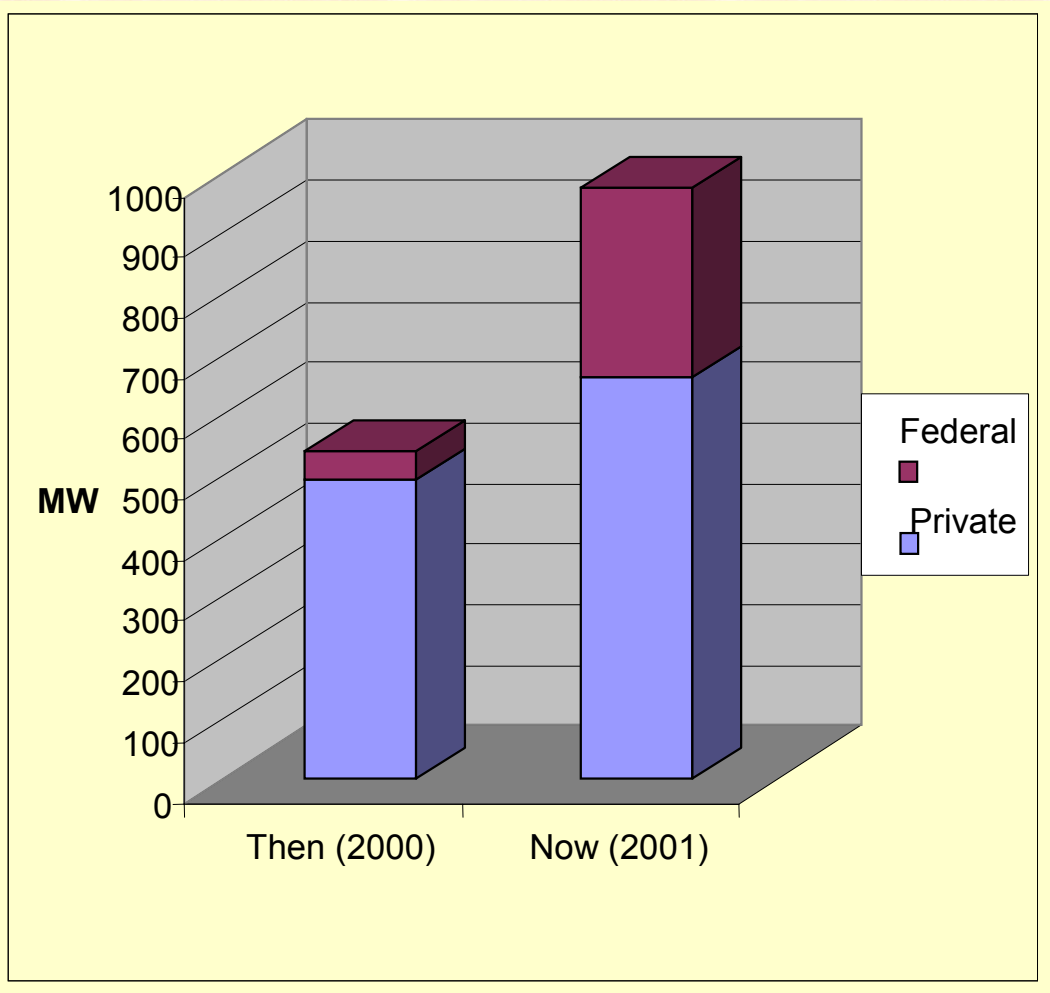
The majority of CHP capacity serving federal sites is privately operated



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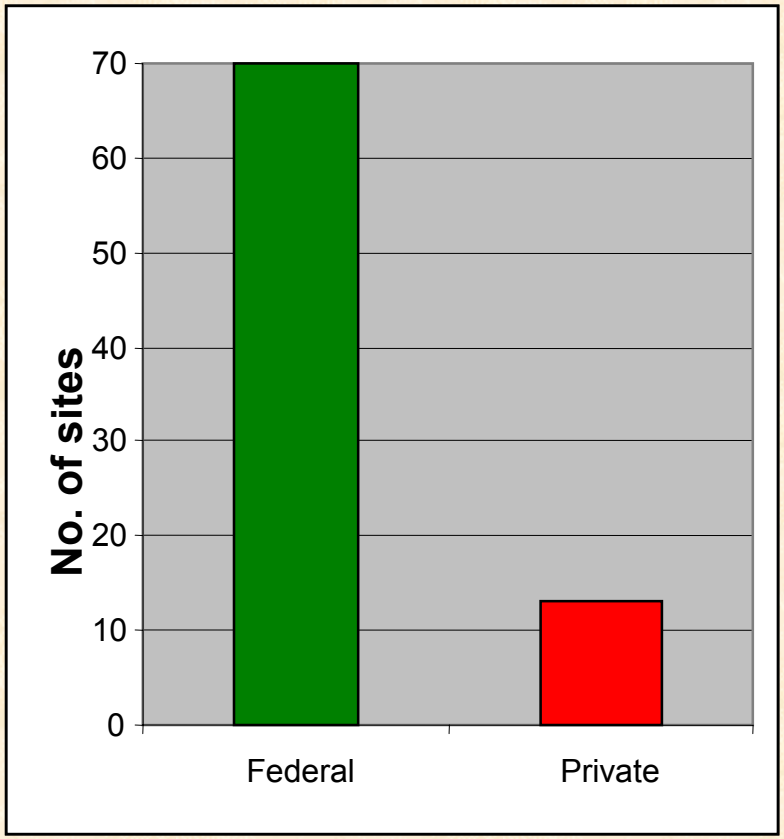
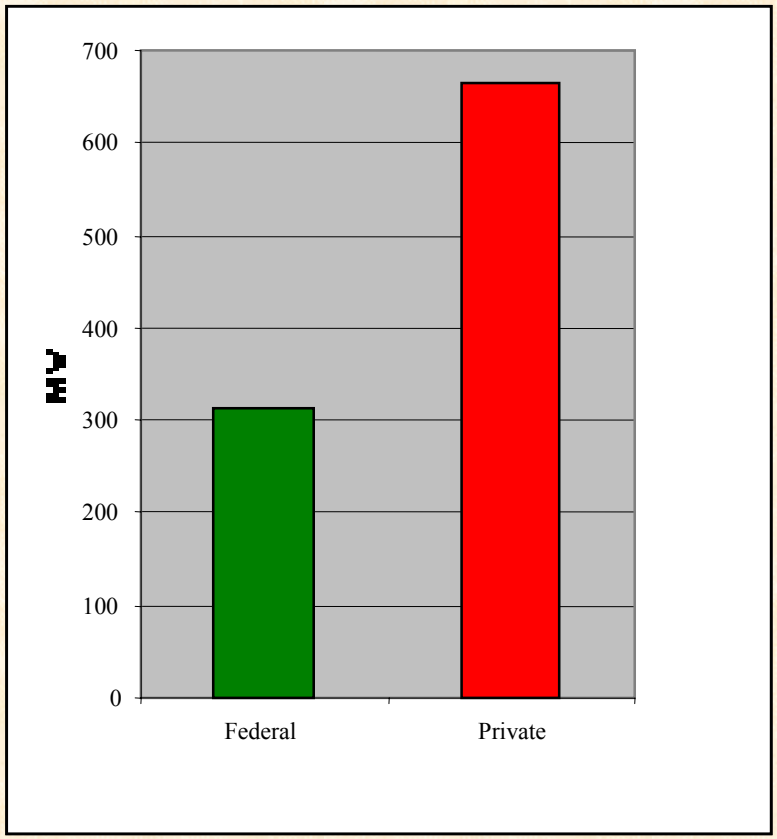
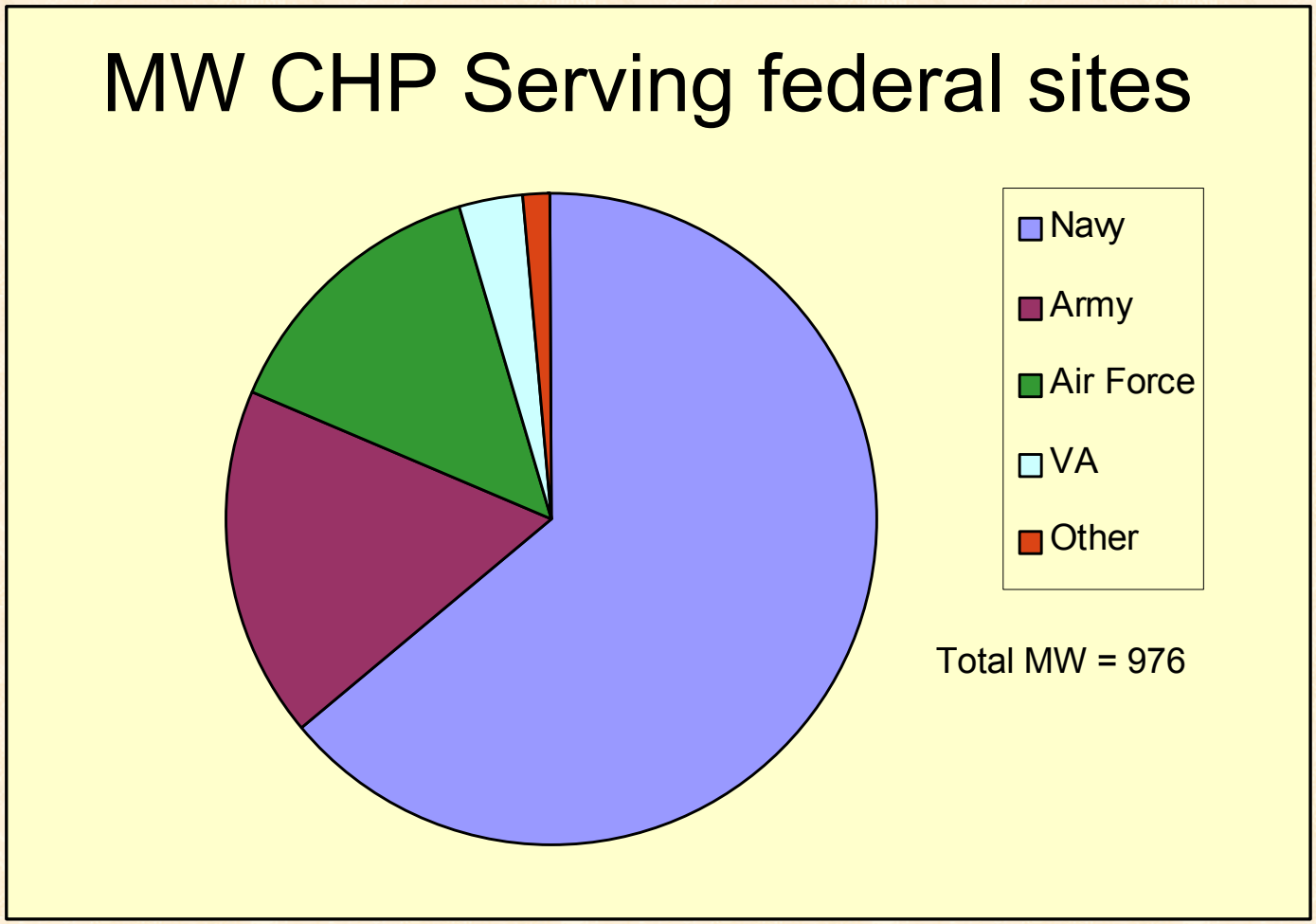
While there are many federal CHP systems, the few private ones are 10 times larger (on average)





Avg. fed CHP < 5 MW; Avg. private CHP = 50 MW

What federal agencies are served?



New Federal CHP Potential By 2010

- Assessment of CHP Potential at Federal sites (ORNL, Draft Oct. 2001)
- Uses:
  - GSA federal building database
  - EIA-CBECS energy intensities
  - EIA Year 2000 industrial energy rates
  - CHP system price/performance
  - "mean optimism" assumptions
- Under 10-year simple payback

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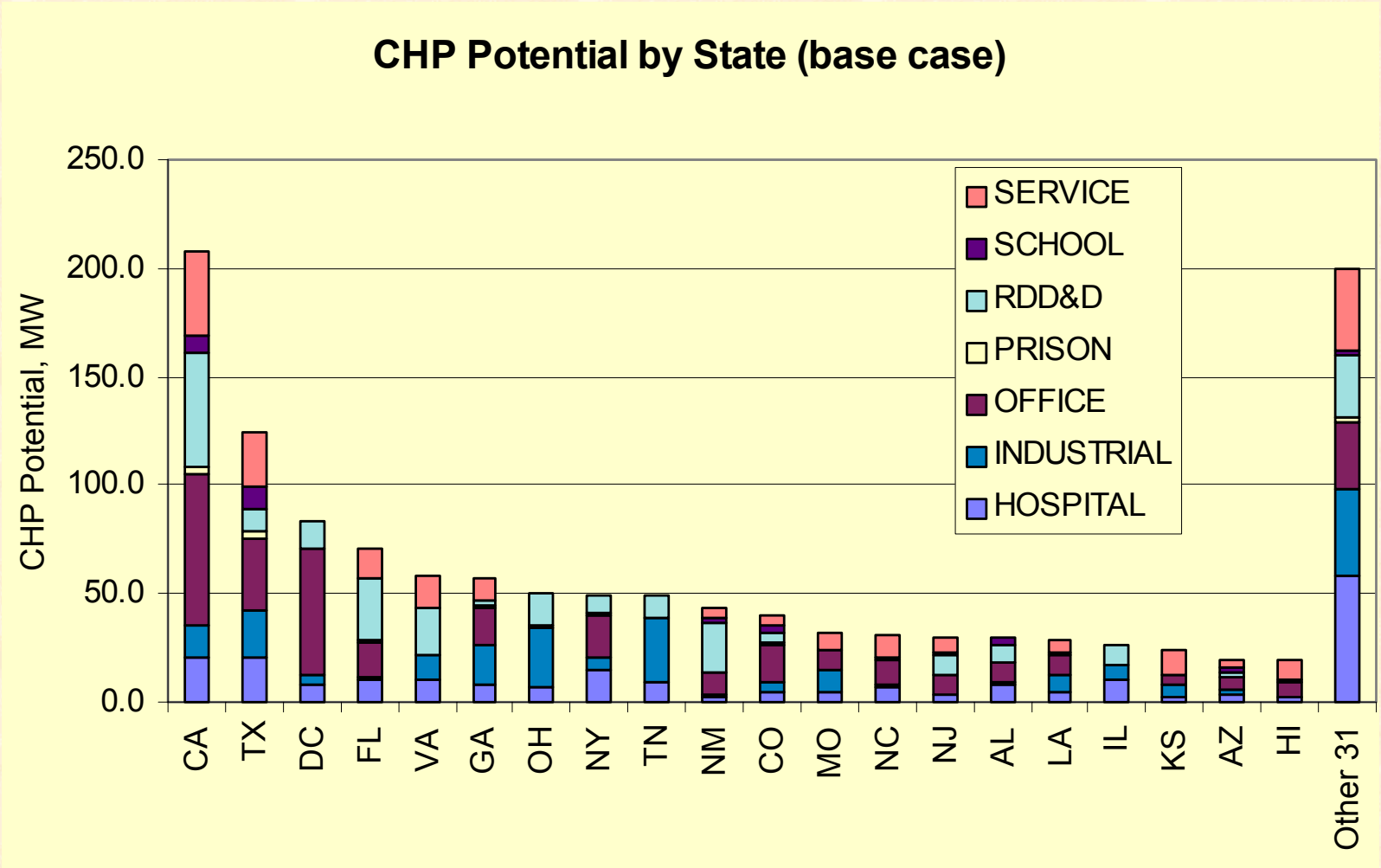
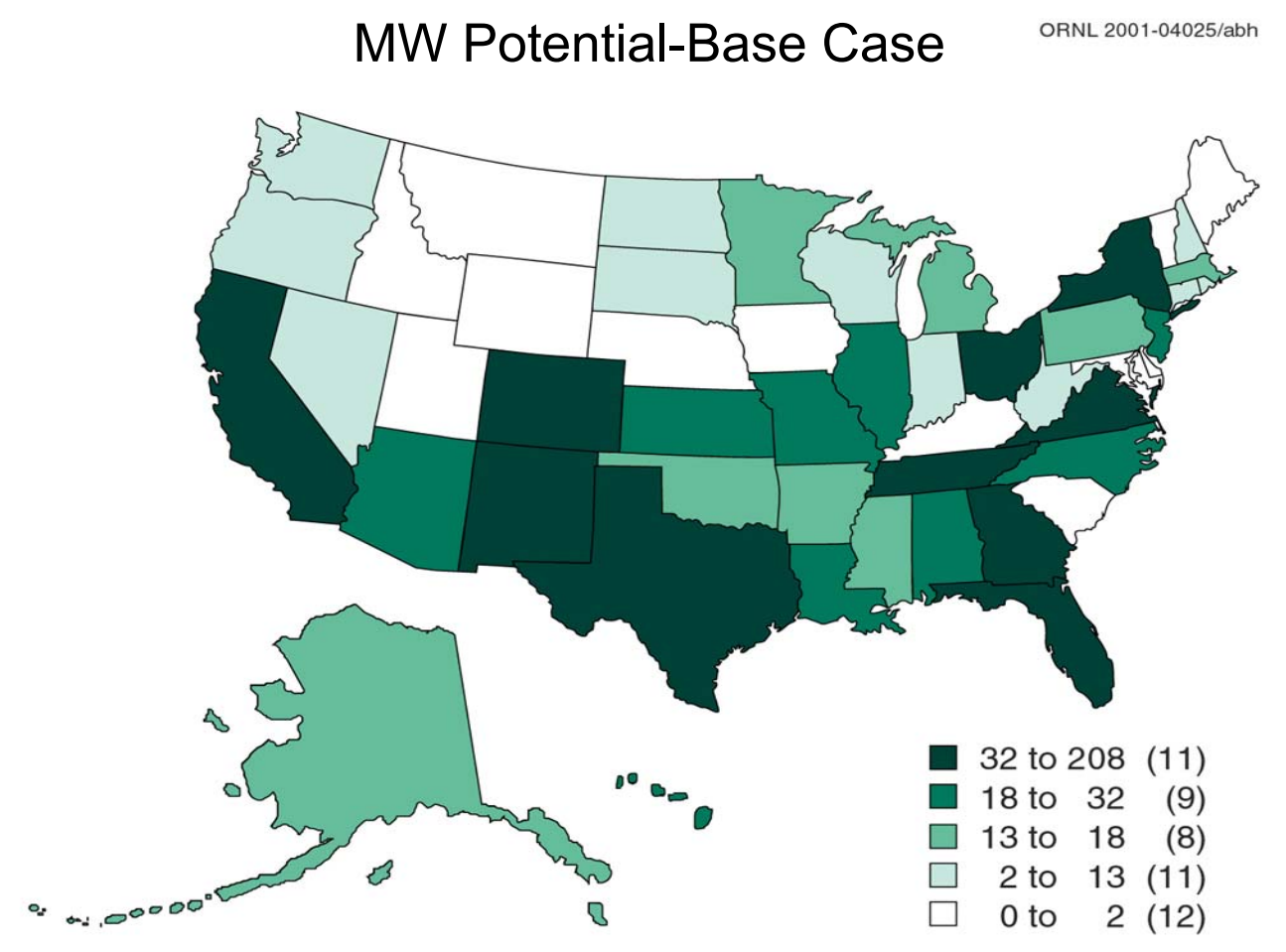
Assessment Results: 1.3 GW

(CHP with <10 year simple payback)

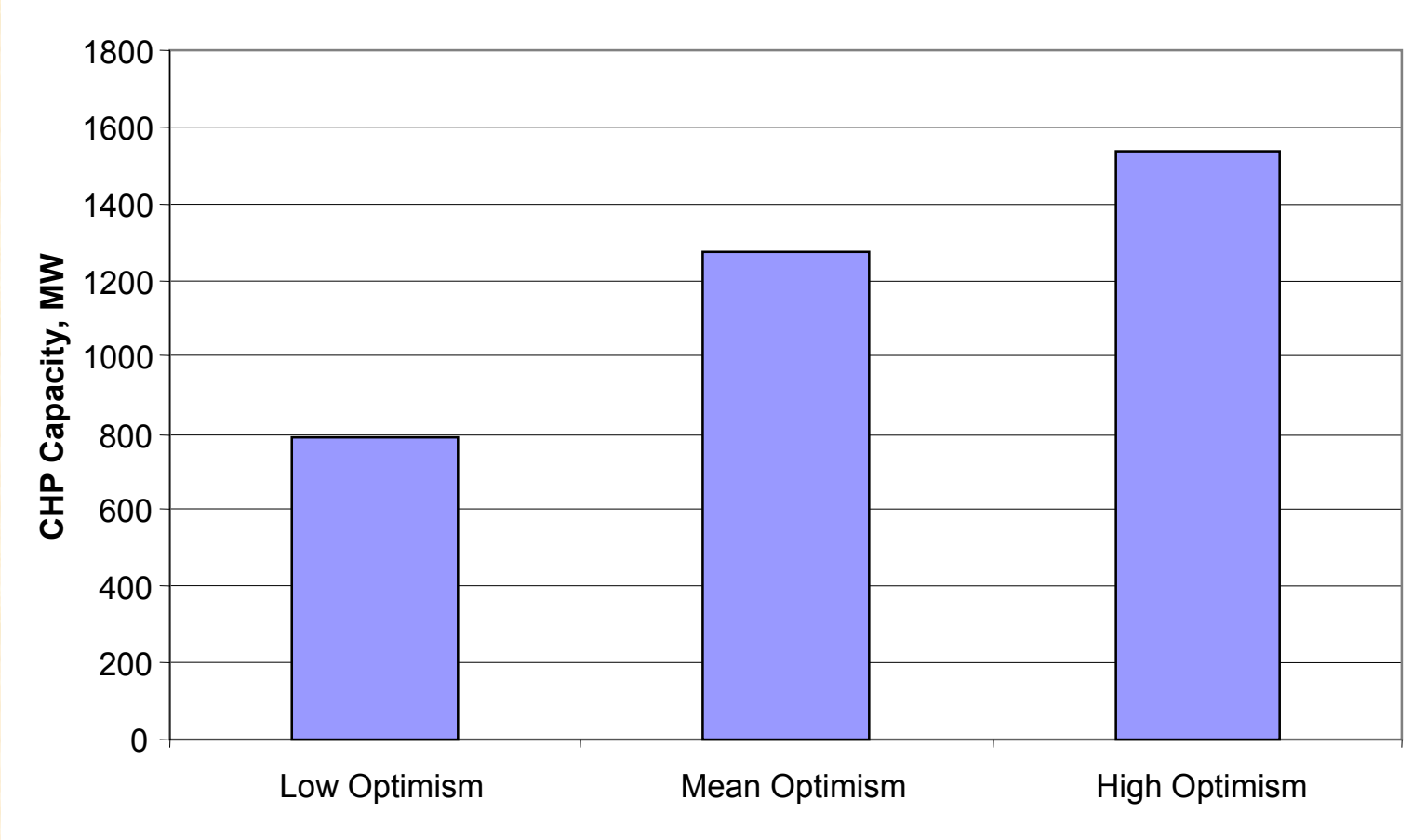


Where is federal CHP potential?



Total = 1,274 MW; CA = 208 MW

MW of potential depends on assumptions and many variables: cost/efficiency factors



Assessments are nice but here's how the federal market really works....

- CHP project potential and development process is very *site-specific*
- Sometimes, federal facility is only part of a larger load
- Agencies never have enough money (multiple finance mechanisms): ESPC, UESC, Enhanced Use Lease, etc.
- The assessment gives an estimate of how much potential is probable, by sector, under given assumptions

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FEMP – "ADD CHP"

- **Accelerated Development and Deployment of Cooling, Heat and Power systems**

- **ADD CHP Goal: make advanced CHP easily accessible to federal agencies**

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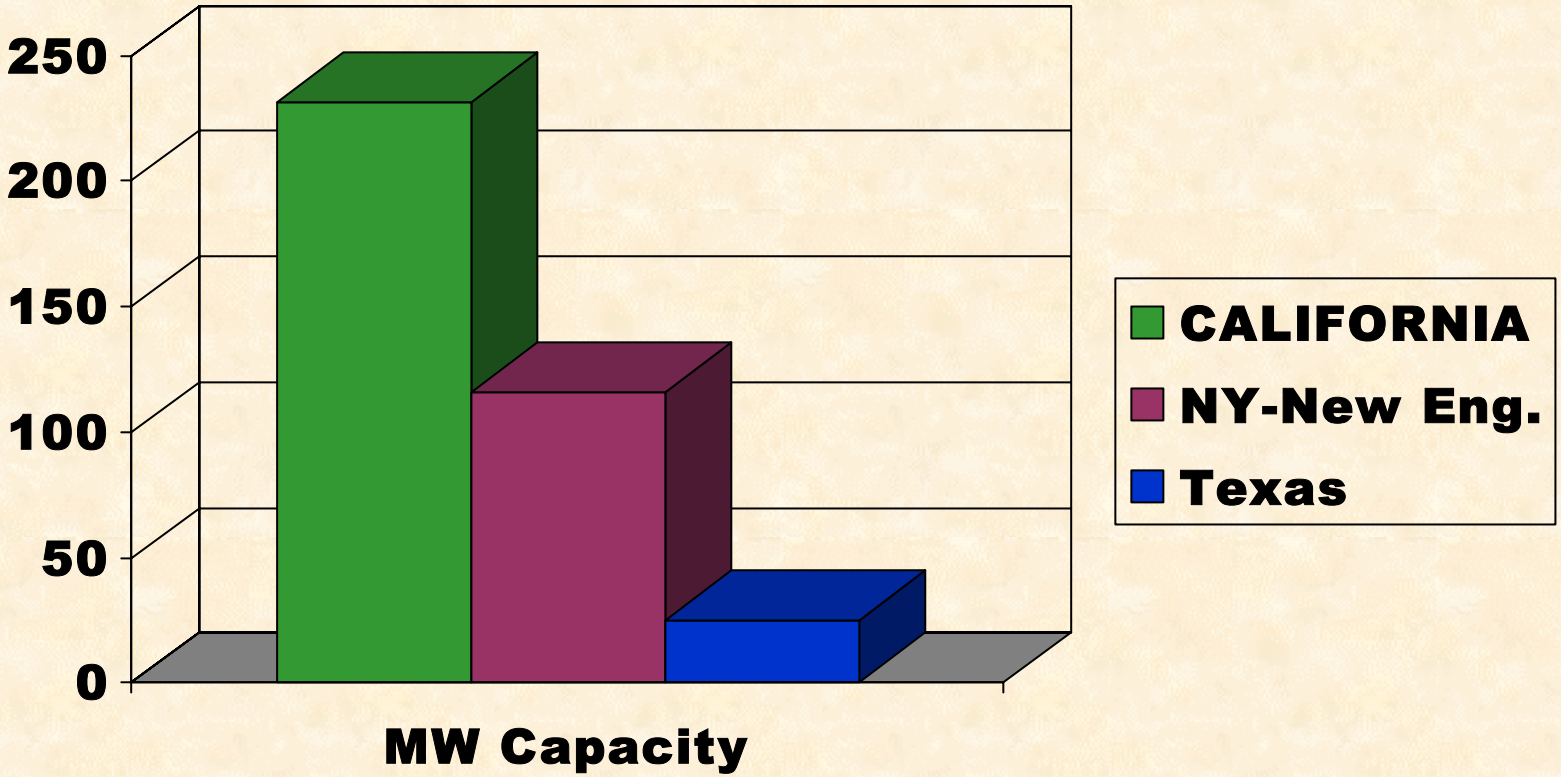
Outreach – "Quick Census" to Identify Sites with CHP Potential & Interest



(based on voluntary participation in census)

ADD CHP FOCUS – Today's Potential

- Site interest - champion with clout
- Large projects and high "spark spread"
- Load profile fit (electric and thermal)
- Infrastructure fit (district energy systems with central plants and large buildings with mechanical rooms)
- Most recently: sites with energy security and vulnerability concerns

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Examples Of ADD CHP NEXT STEPS After The "Quick Census"

- Site missed out on the "quick census"
  - free CHP screening
- Site unsure the project is viable
  - walk-through & preliminary study
- Site doesn't have the $$ - needs a partner
  - educate them about ESPC, UESC, EUL, etc.
- Site is partnered but nothing is happening
  - baseline data collection

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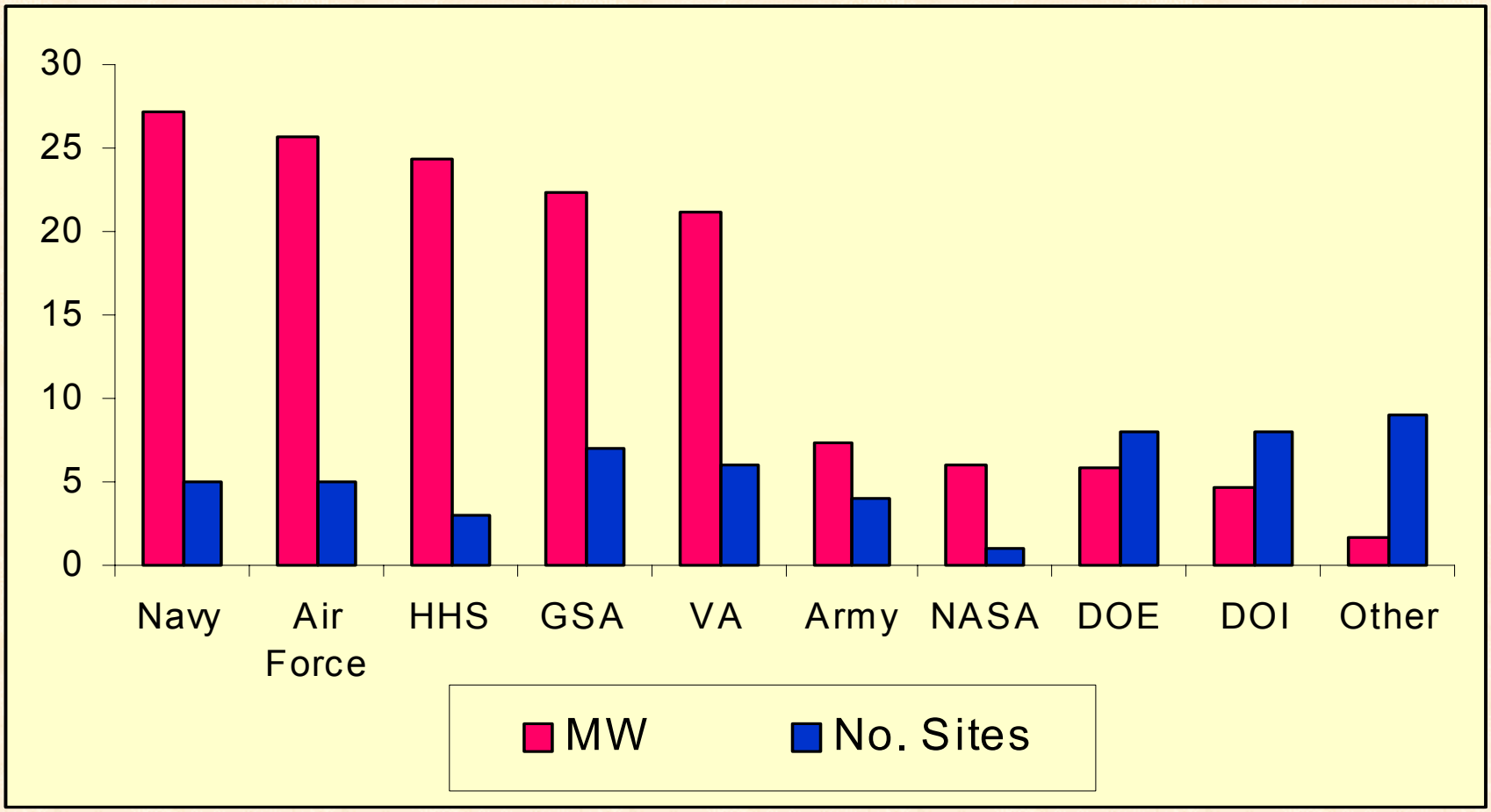
Federal Agencies Are Embracing CHP As Never Before

- **Secure, reliable power for mission support**
- **Mitigate electric rate increases**
- **Achieve energy/emission reduction mandates**

55 federal sites are studying, requesting assistance for, or actively developing CHP projects…

Federal Agencies Where The CHP Action Is



Federal Facility Use Of DOE's CHP R&D

- **R&D By Office of Power Technologies**
  - CHP Integration Laboratory
  - "Packaged CHP" industry teams
  - CHP screening tools
  - Multi-site micro-turbine field test
  - Turbine & engine materials research

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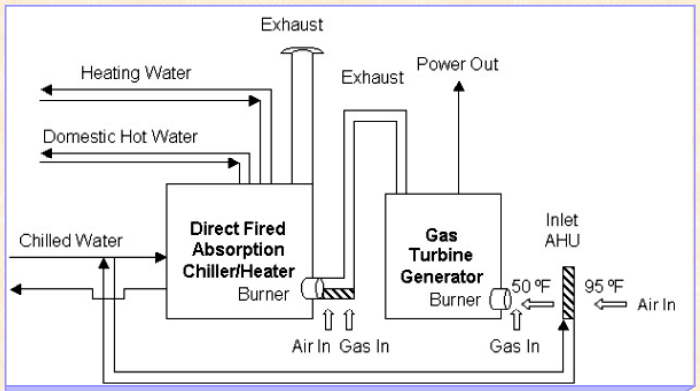
OPT's Vision: "Packaged CHP"

2001: Individually optimized components, custom design for each site, field assembly, large CHP economic in some places

2005: Optimized systems, factory assembled, "plug and play cooling, heating and power in a box"

Lower Cost, Same or Better Performance

CHP Economic In More Places & Smaller Sizes



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Industry Teams Cost-Sharing The Development Of "Packaged CHP" Systems

- Burns & McDonnell/Solar Turbines/Broad USA
- Capstone/Broad USA/Thermax/Mitsubishi
- Gas Technology Institute/Trane/Waukesha Engines
- Honeywell/GE/Broad USA/I.C. Thomasson
- Ingersoll Rand/Hussman
- NiSource Energy Technologies
- United Technologies Research Center/DTE/Carrier

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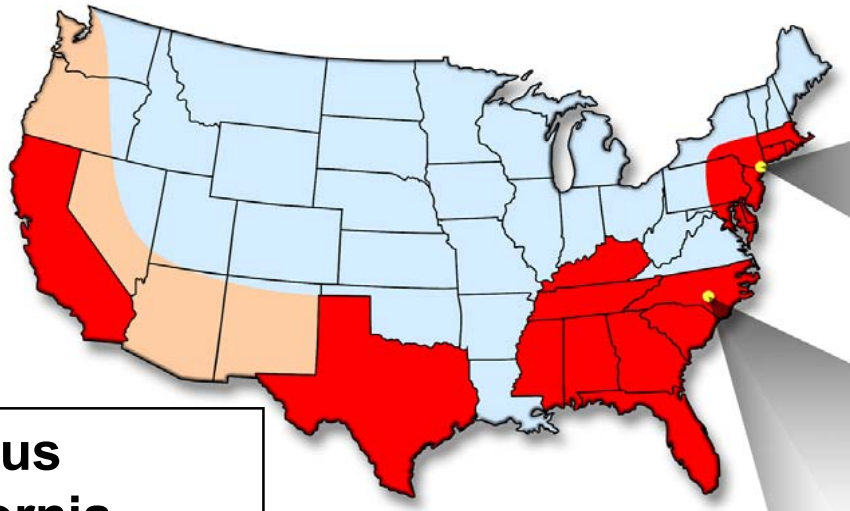
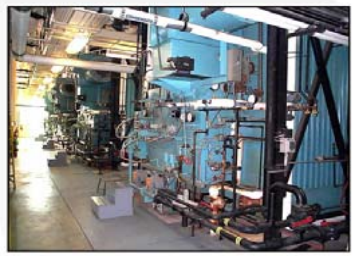
ADD CHP Projects Are Hosting Demonstrations Of 1st Generation "Packaged CHP" Systems



Various California Sites Under Consideration

Gateway National Recreation Area, National Park Service, Brooklyn, NY



Army's Fort Bragg, NC

Notes from CHP Roadmap: Significant Progress towards Goals (2000-2001)

- ✓ Assessments of CHP opportunities
- ✓ TA to facilities interested in CHP
- ✓ Identify new sources of funding
- ✓ Conduct case studies to document CHP
- ✓ Install 5 GW in federal facilities

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ADD CHP is part of FEMP's Distributed Energy Resources (DER) Program

- Technical Assistance
- Technology Demonstration
- Education/Outreach

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TA under FEMP's DER Program

- FEASIBILITY STUDIES
- DESIGN REVIEW
- DATA ANALYSIS
- MONITORING DER SYSTEMS
- EMPHASIS: Sites with vulnerability

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Summing up: CHP Policy Day Conclusions

- CHP is a critical component of the new National Energy Policy
- The Department of Energy is engaged in R&D, education, and outreach to further CHP
- Keys to Success:
  - government-industry partnerships
  - federal leadership by example
- There is enormous untapped potential but much work is needed to realize it

Remarks of David Garman, Assistant Secretary, Office of Energy Efficiency and Renewable Energy, U.S.D.O.E. June 27, 2001, Washington, D.C

Useful FEMP CHP Contacts

- **Websites: http://www.eren.doe.gov/femp and http://www.eren.doe.gov/power/ (OPT)**
- **DER/CHP programs at FEMP: Shawn.Herrera@ee.doe.gov (202) 586-1511**
- **ORNL FEMP/CHP program manager: Patrick Hughespj1@ornl.gov (865) 574-9337**

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