

# Financing Energy Security

Approaches to Increase Reliability and Reduce  
Costs Without Depending on Appropriations

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**OAK RIDGE NATIONAL LABORATORY  
U. S. DEPARTMENT OF ENERGY**



# *Outline*

- **Energy Security – Mission Critical**
- **Role of DG/CHP**
- **Challenges to Financing Large DG/CHP**
- **Assessment: How to Facilitate Access to Best Value Projects**
- **Progress and Consultation**

# ***Federal Energy Security Requirements***

- **Mandates:**
  - **Executive Order on Critical Infrastructure Protection (10/2001)**
  - **E.O. 12656 Emergency Preparedness Responsibilities (11/1988)**
- **Bottom Line:**
  - ***Installations* must assure energy supply will be available for all critical mission operations**

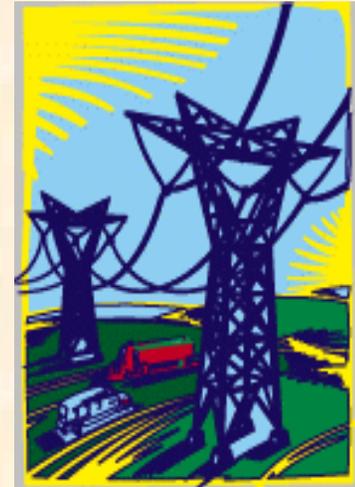
# ***FEMP's Mission***

**FEMP increases *energy security* and reduces energy cost and the environmental impact of government by promoting:**

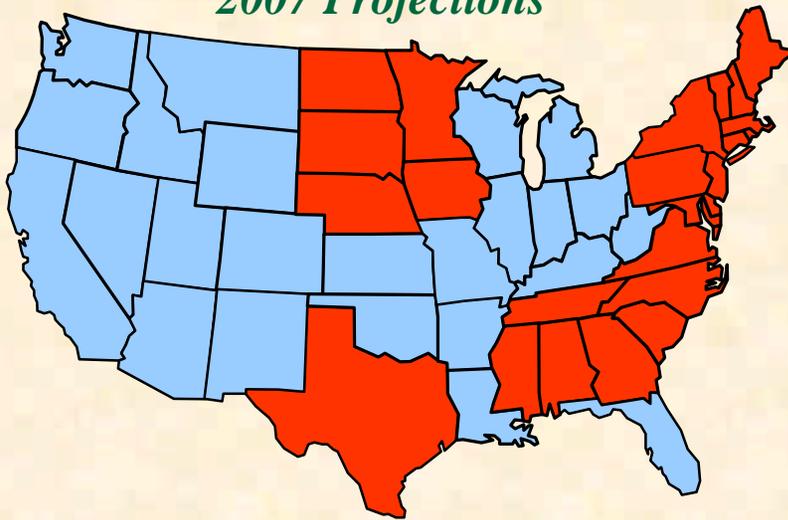
- Energy efficiency and water conservation**
- Use of distributed and renewable energy**
- Sound utility management at Federal sites**

# Electric System Reliability

Systems are being run “closer to the limit” than ever before, and the risk of a disturbance precipitating a cascading outage is great. There were 58 system disturbances in 2000. –NERC, 2001



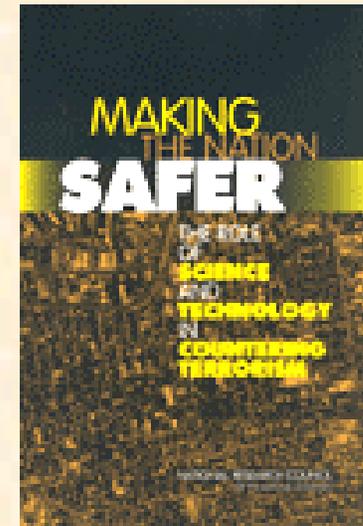
Areas with Capacity Margins < 10 percent  
*2007 Projections*



Source: National Energy Reliability Council, 1999

“Millions of dollars per hour. It’s so important, you almost can’t calculate the value” says Jeffery Byron, Oracle’s Energy Director, when asked about the worth of self sufficiency. -- *Wall Street Journal*, May 11, 2000.

# *National Academy of Sciences and others:*



- **Distribution systems (grid, pipelines) are vulnerable**
- **Command, communications and data centers are critical and sensitive**
- **Solutions include Distributed Generation and “Adaptive Islanding”**
  - *Minimize damages*
  - *Enable faster recovery*

# ***DG is Key Component to Security Solutions:***

- **Distributed Generation (DG): can provide high quality, on-site power when & where needed**
- **More reliable if base-loaded or peak-shaving**

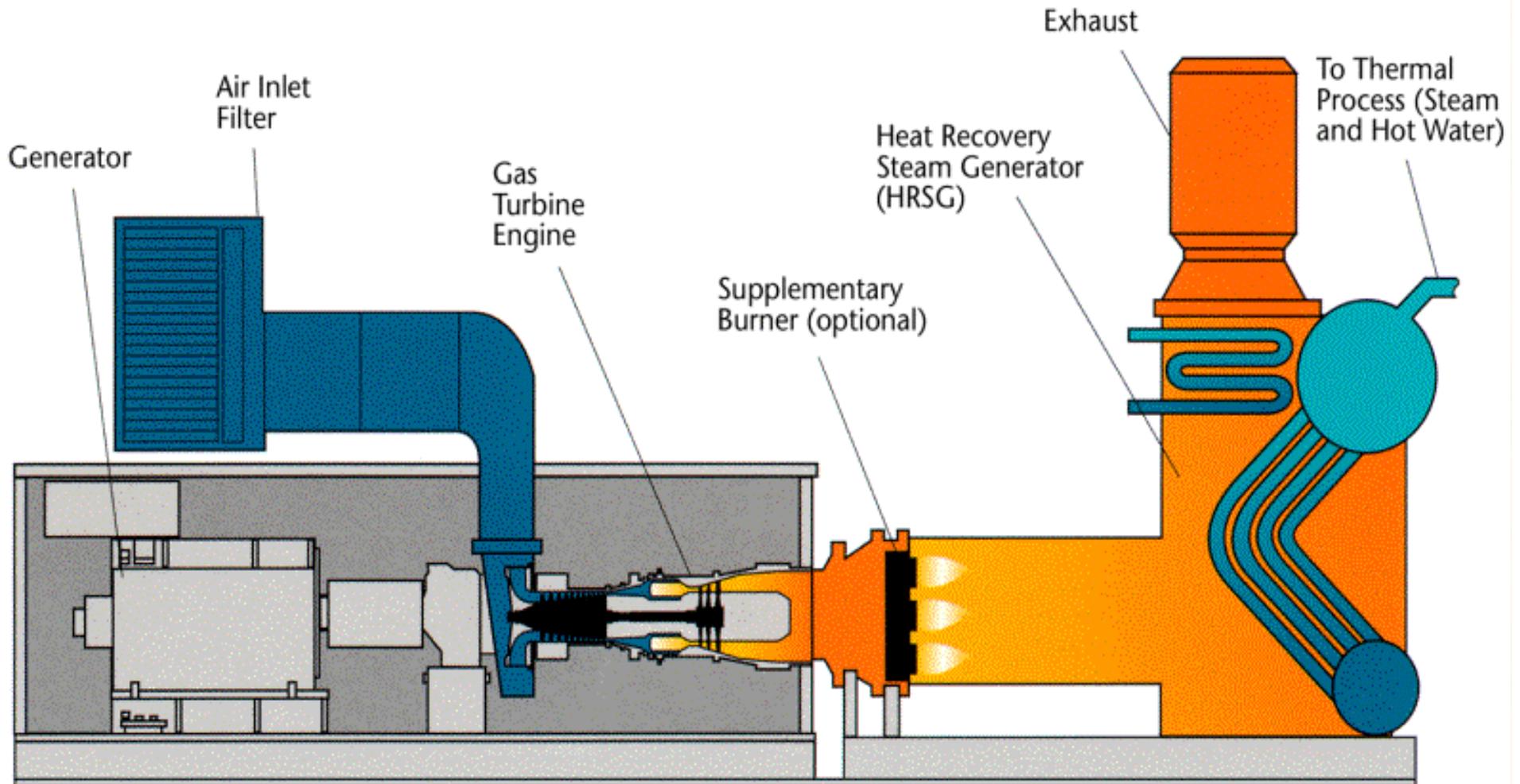
**“You know its ready for an emergency if it operates every day”**



## *Why Combined Heat & Power (CHP or Cogeneration)?*

- **More efficient form of DG**
- **Commercially available today**
- **Investments can be privately financed from savings**
- **Proven (but underutilized)**
- **Agencies interested (but process is often not easy)**

# *What is CHP? Producing electricity on-site and using waste heat for productive purposes.*



# *What is Federal CHP Potential?*

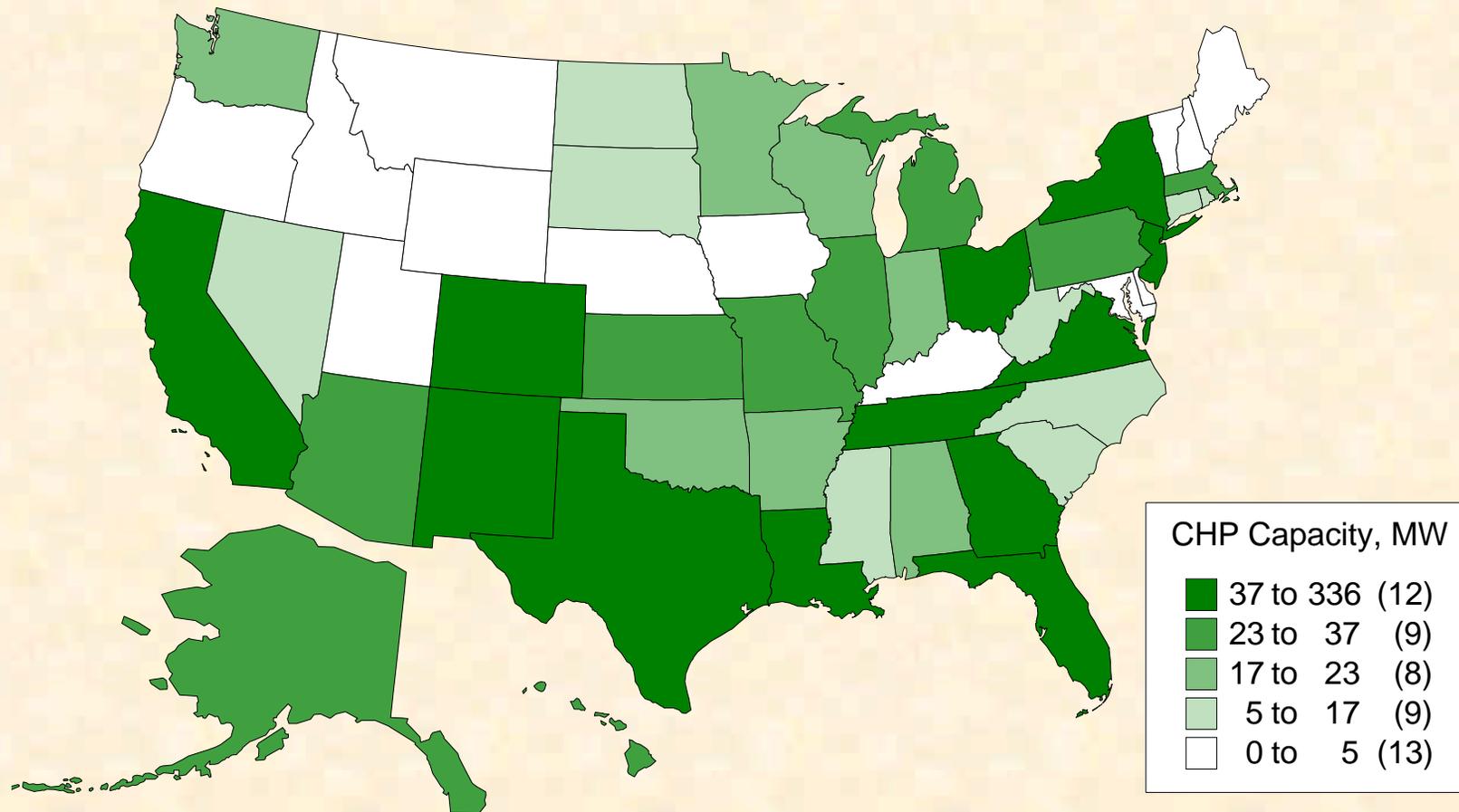
- **Base Case: Sites with simple payback in less than 10 years = 1600 MW (using gas Recip-ICE or Gas Combustion Turbine)**
- **Market Assessment of CHP at Federal sites (2002). Summary report on FEMP website:**

[www.eere.energy.gov/femp/techassist/der\\_resources.html](http://www.eere.energy.gov/femp/techassist/der_resources.html)

or full analysis at:

[www.ornl.gov/femp/pdfs/chp\\_market\\_assess.pdf](http://www.ornl.gov/femp/pdfs/chp_market_assess.pdf)

# *Distribution of CHP Potential at Federal Sites: 1600 MW*



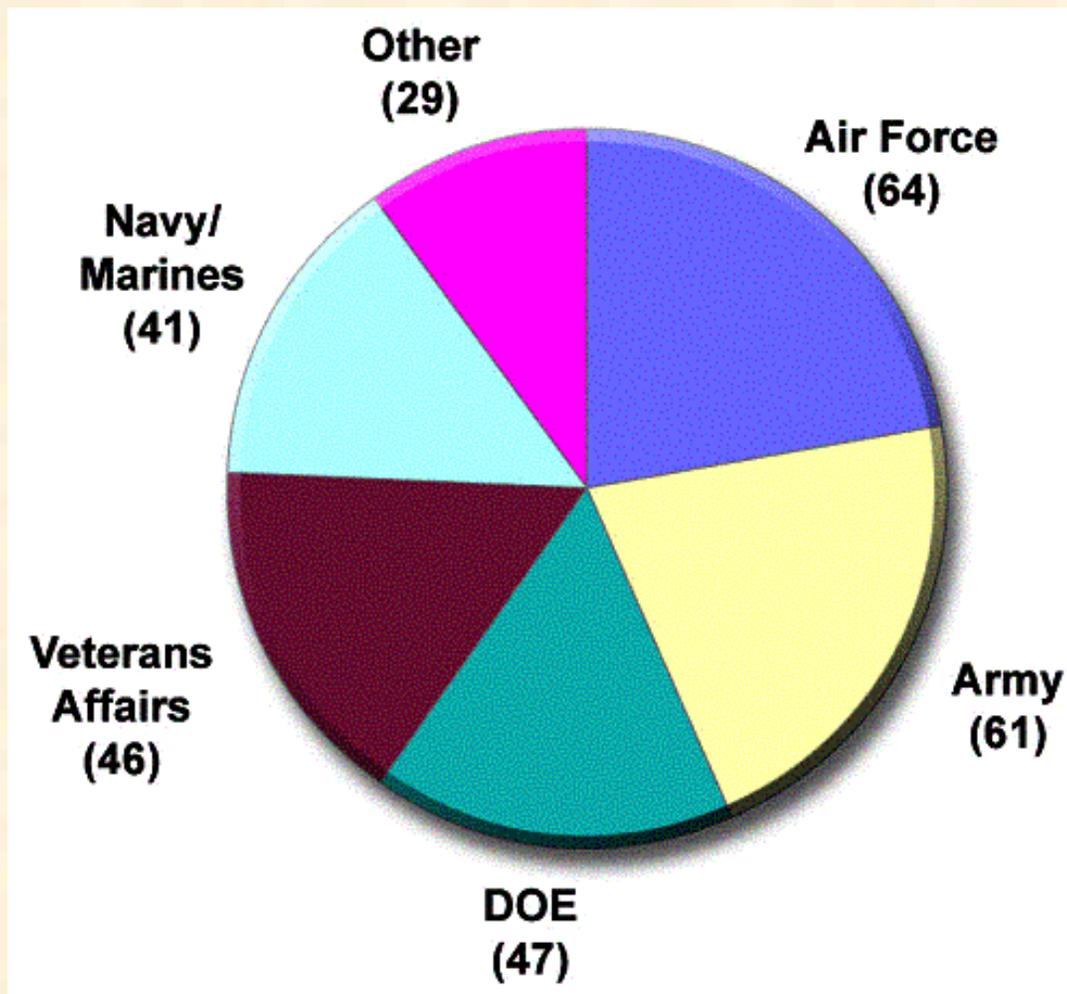
# Federal Facilities Are Interested in CHP

- **Strong Demand for CHP Screening Service**
- **Energy Security is driver for many military sites**
- **Over 120 sites have requested and received CHP screening reports**
- **Over half merit further study**

# *Screening Results—projects with strong potential*

**MW of CHP Potential by Agency, from results of screened projects showing merit for further study**

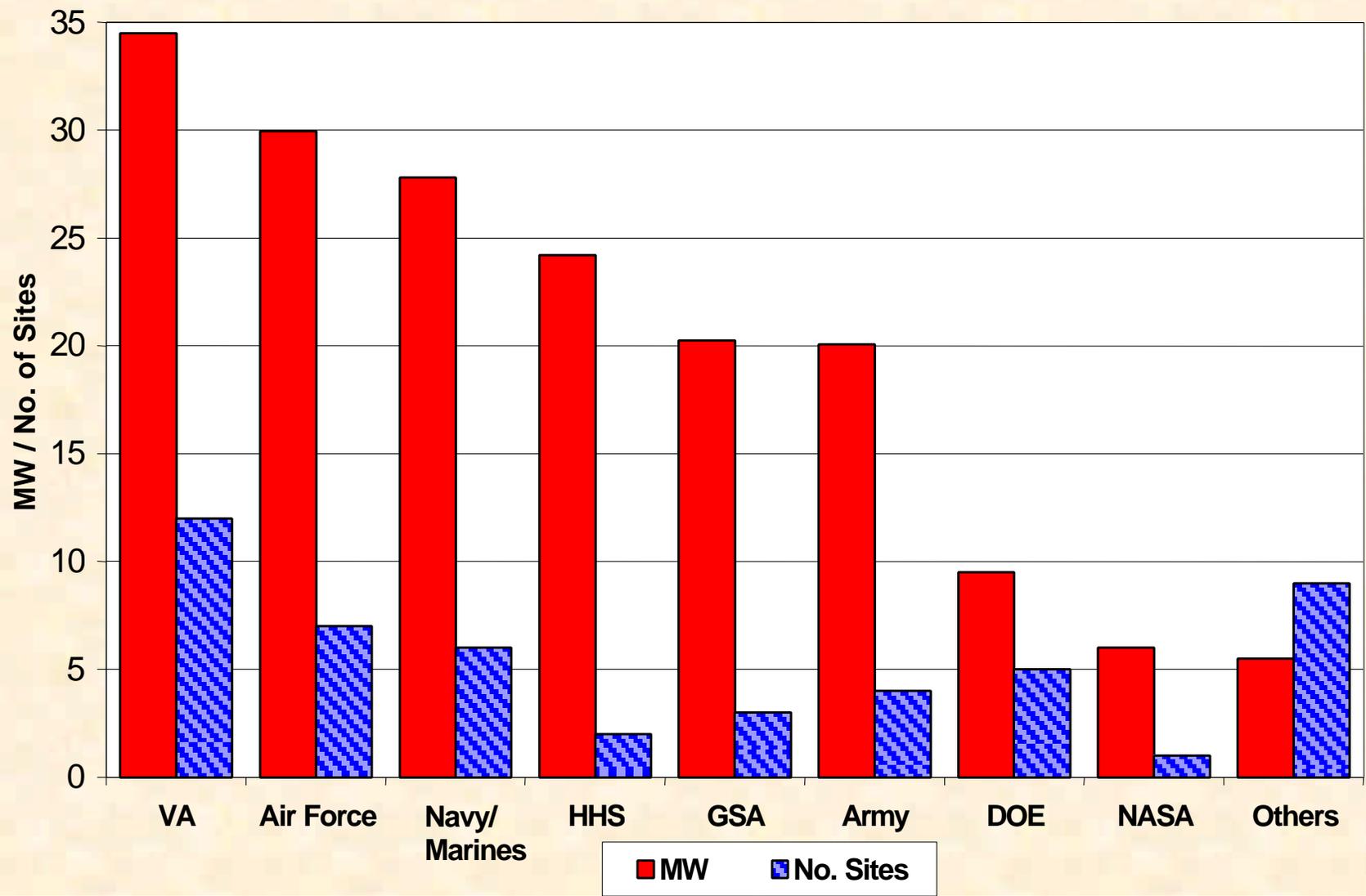
(total = 69;  
ORNL 2003)



## ***DG/CHP Projects Recently Completed or Underway***

- **Navy/Marine Corps sites have used ESPC (San Diego, Portsmouth, USMC 29 Palms)**
- **Serving Utilities support DG/CHP (Patrick AFB, Navy-Balboa Hospital)**
- **Veteran's Affairs recently showed how EUL can support private CHP (Mountain Home, North Chicago)**

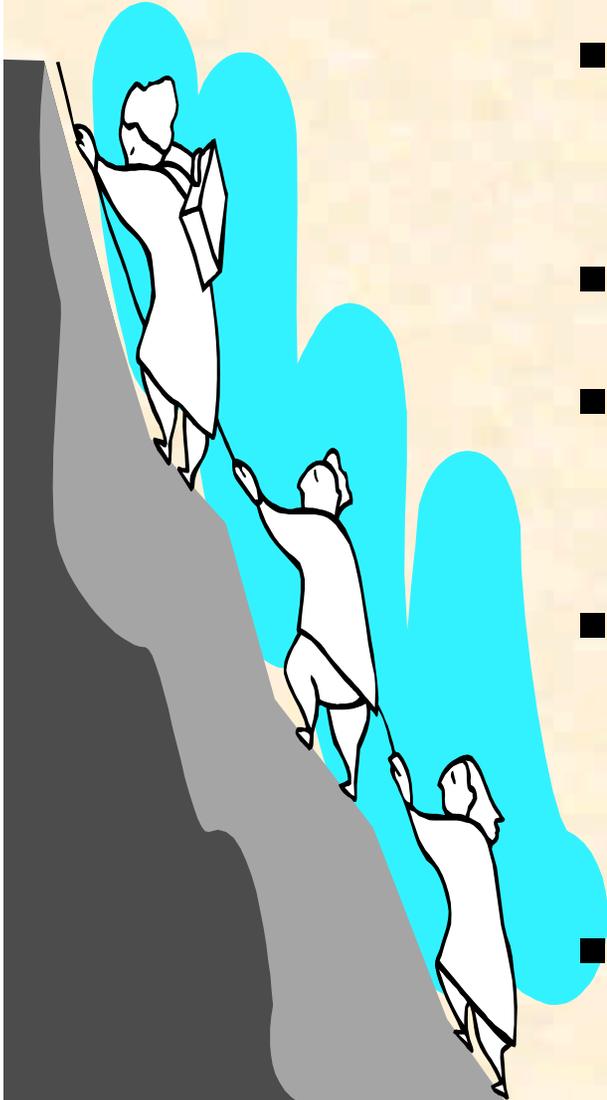
# *CHP: Where the Action Is*



## ***Some lessons learned (part 1)***

- **Best DG/CHP economics: large systems, energy intensive sites (hospitals, military)**
- **Projects require large capital investment but appropriations (MilCon, ECIP) are scarce**
- **Financing with ESPC and UESC is possible but some installations prefer more privatized approach**

# DoD *Hurdles to DG/CHP*



- **Uncertainty about future mission**
- **Low utility electric rates**
- **Staff turnover and budgets limit large, long-term projects**
- **Prefer to avoid responsibilities of power business--concerns about O&M, R&R**
- **Utility Privatization**

# *Could Another Approach Facilitate Access to CHP?*

- **Property management authorities provide one alternative**
  - Out-lease to private developer that finances, builds, owns and operates power plant
  - Energy commodities/services purchased by site under separate agreement
- **Better fit with some agency needs, policies? ...FEMP Assessment**

# ***FEMP Assessment***

- **Overcome hurdles--facilitate federal access to DG/CHP**
- **Respond to customer concerns**
- **Promote input and participation of customers (agencies) and partners**
- **Recommendations for best value to USG**

# *Various Actions Considered*

- **No Action**
- **Support IDIQ contract (existing or new Tech-Specific ESPC for DG/CHP)**
- **Modify ESPC Authority to permit out-lease (then compete new Tech-Specific)**
- **Public-Private Venture or Integrate DG/CHP with Utility Privatization (DoD)**
- **Facilitate information and tools for out-lease approach (new tech-specific mechanism for leasing)**

# ***FEMP Assessment – Steps and Progress to Date***

- **Past experience, existing authorities**
- **Agency issues, interest**
- **Private sector issues, interest**
- **Show-stoppers, legal, contractual**
- **Recommendations**

- ***Past Experience  
Financing DG/CHP***

- **Appropriations (smaller & older projects)**
- **ESPC (most recent, large CHP projects)**
- **Utility (UESC or DSM)**
- **Public-Private Venture/Partnerships**
- **Enhanced Use Lease (EUL) based on out-lease (VA examples)**

## 2. Authorities Vary:

<b>Authority</b>	<b>Legal Basis</b>	<b>Max. Term</b>	<b>Asset Owner</b>	<b>Risk if T for C</b>
<b>MilCon Appropriations</b>	Congressional budget line item	NA	Govt.	Govt.
<b>UESC</b>	10 USC 2865	10	Govt.	Govt.
<b>ESPC</b>	42 USC 8287	25	Govt.	Govt.
<b>Public-Private Venture</b>	10 USC 2394 10 USC 2483	30	Private owner	Terms define
<b>Utility Privatization (DoD)</b>	10 USC 2688	50	Private owner	Terms define (either)
<b>Enhanced Use Lease (VA)</b>	38 USC 8161	75	Private owner	Private owner
<b>Enhanced Lease (DoD)</b>	10 USC 2667	Indefinite	Private owner	Private owner

### ***3. Agency & Partner Issues***

- **Allocation of risk**
- **Ease of procurement**
- **Minimize red-tape**
- **Cost of financing**

**=====**

- **Private sector very interested**
- **Consultations with federal agencies**

## 4. Any procurement, legal, other show-stoppers?

- **Legislation to combine EUL with ESPC unlikely**
- **Agency property management and energy folks live in different worlds**
  - May be a good thing?
- **Out-lease authorities may be too agency/site-specific for an umbrella**
- **Need agency buy-in to tech-specific selection process from start**

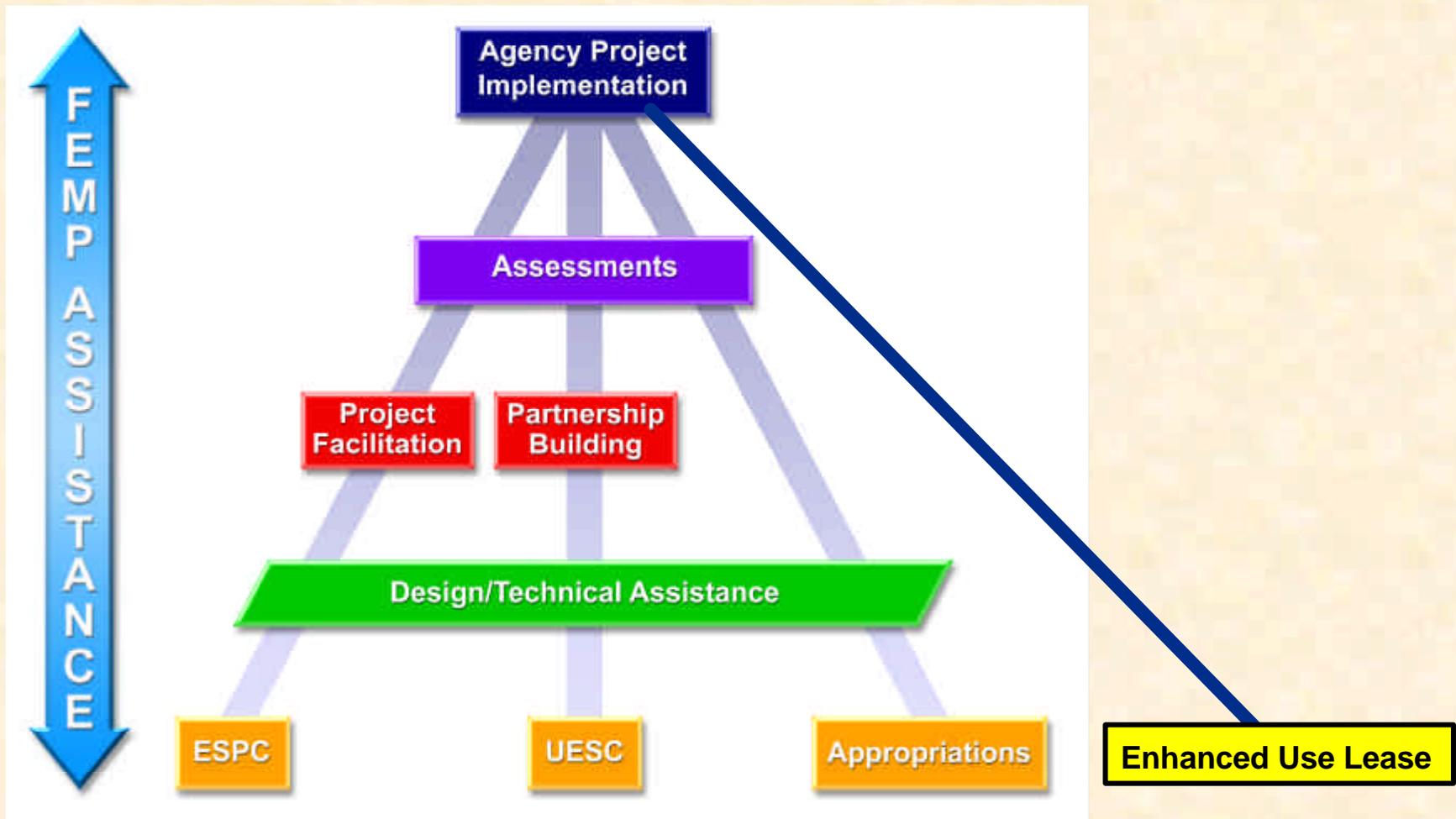
## ***5. Recommendations (?)***

- **Preliminary--work in progress**
- **GAO to DoD: use leasing authority**
  - ***see [www.gao.gov/](http://www.gao.gov/) Report number GAO-02-475***
- **Out-lease authorities appear to offer some advantages**

## *More lessons*

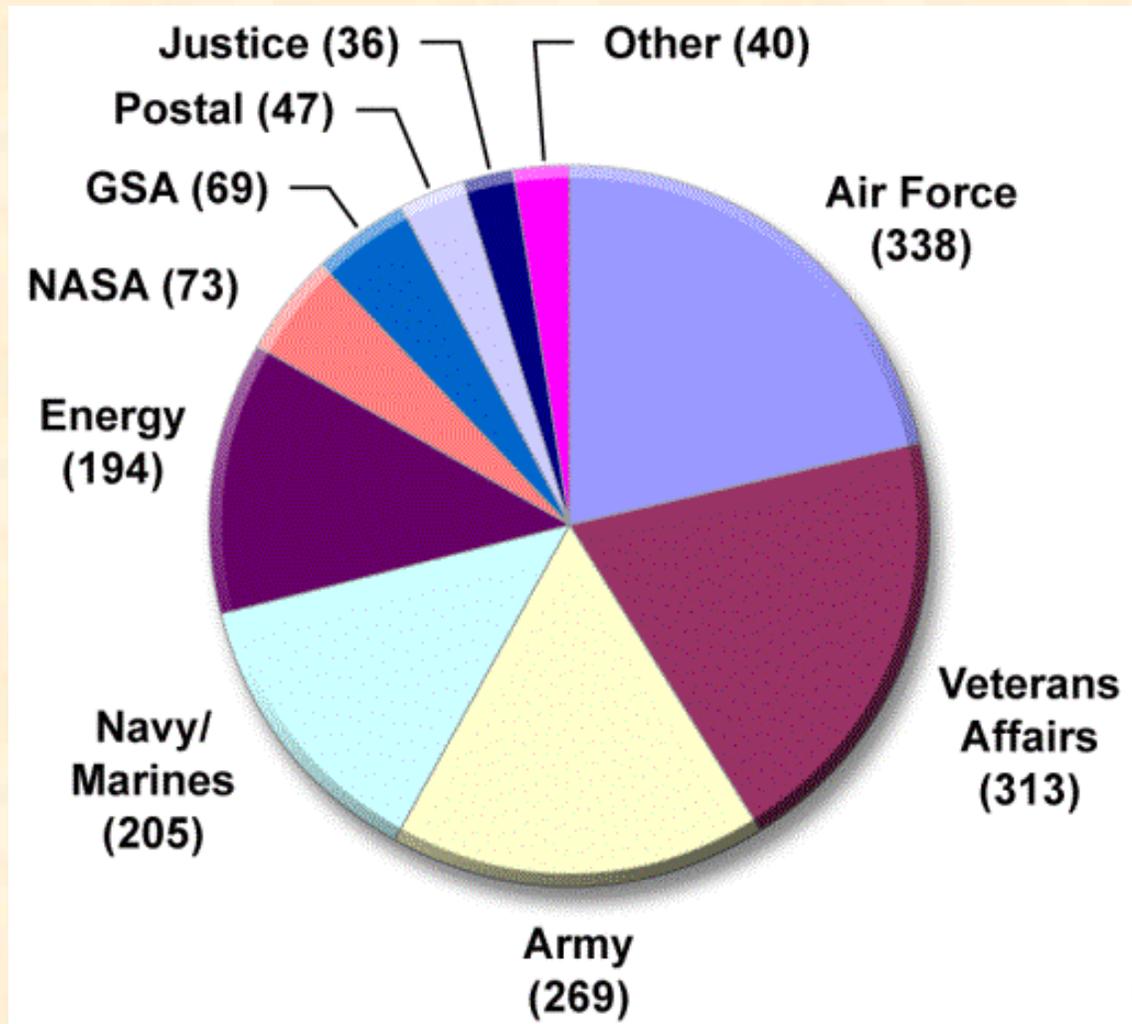
- **EUL authority could bring private \$\$ to develop/build/operate DG/CHP for energy security**
- **Out-lease authority gaining support -- strategic tool to reduce costs and upgrade facilities**
- **EUL could compliment Utility Privatization**

# *Future: special support for EUL-like approaches?*



***Over 80% of Federal CHP Market (Economically Viable) is in Agencies with EUL-like authority***

Potential by Agency, in MW  
FEMP Market Assessment  
2002



# ***U.S. Army is moving forward with EUL:***

**Guidelines, tools and procedures are being developed to facilitate use by installations**

***“We will find ways to make more efficient use of our resources by bringing the best business practices of corporate America into our department.”***

***-The Honorable Thomas A. White, Secretary of the Army***

## ***Army Guide to EUL--Steps:***

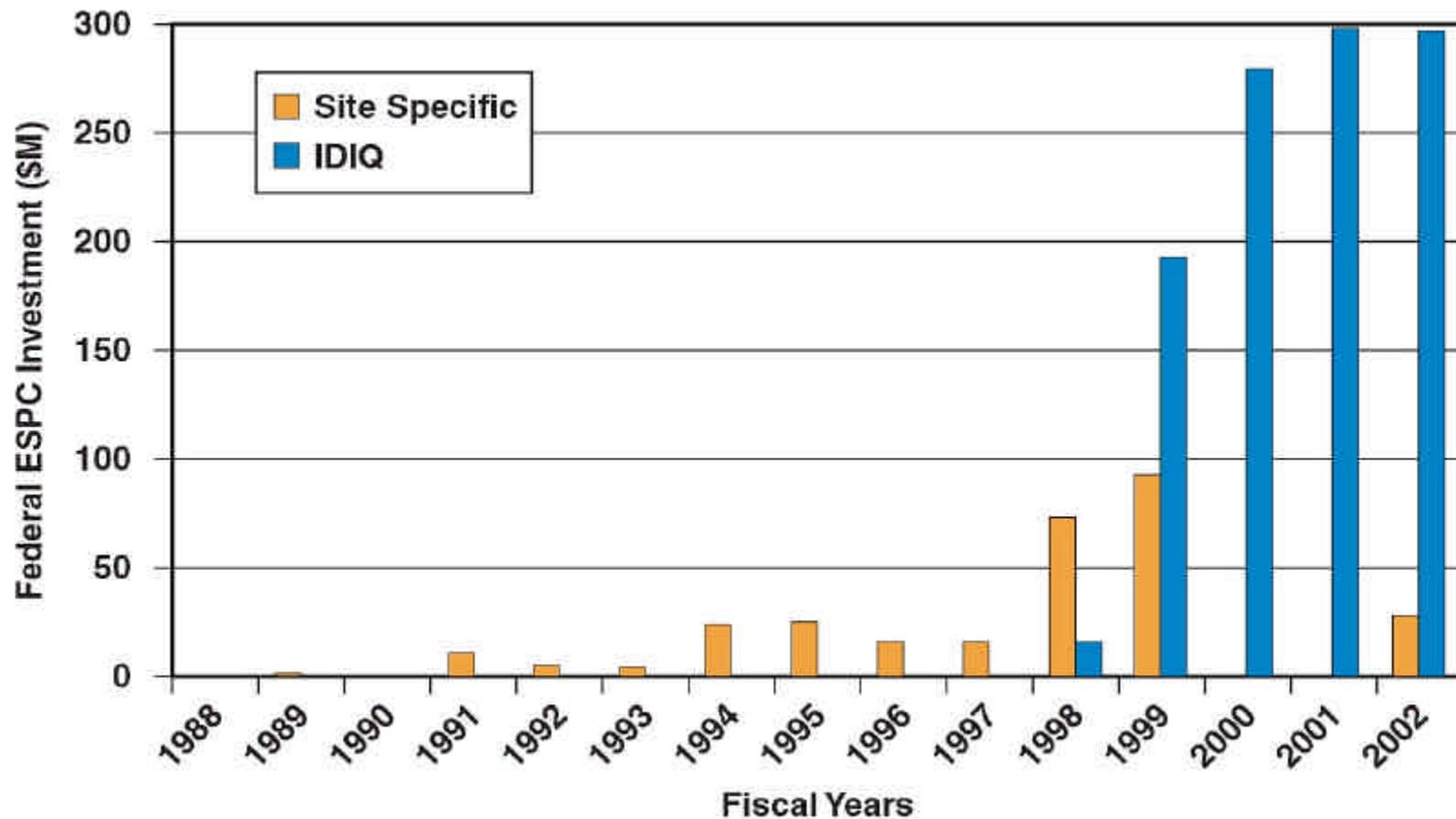
- **Identify potential**
- **Prepare property for lease**
- **Market Property**
- **Develop and negotiate business, management and leasing plans and sign final lease**
- **Manage lease (ongoing)**

# ***EUL Process can take time***

- **VA example at Mtn. Home, TN**
  - **two years for preparations (steps 1-2: identify potential and approvals for lease proposal)**
  - **two more years to sign final agreements (market property and develop business, management and leasing plans)**
  - **Successful 6.7 MW project in operation since 2001**

# Umbrella contracts?

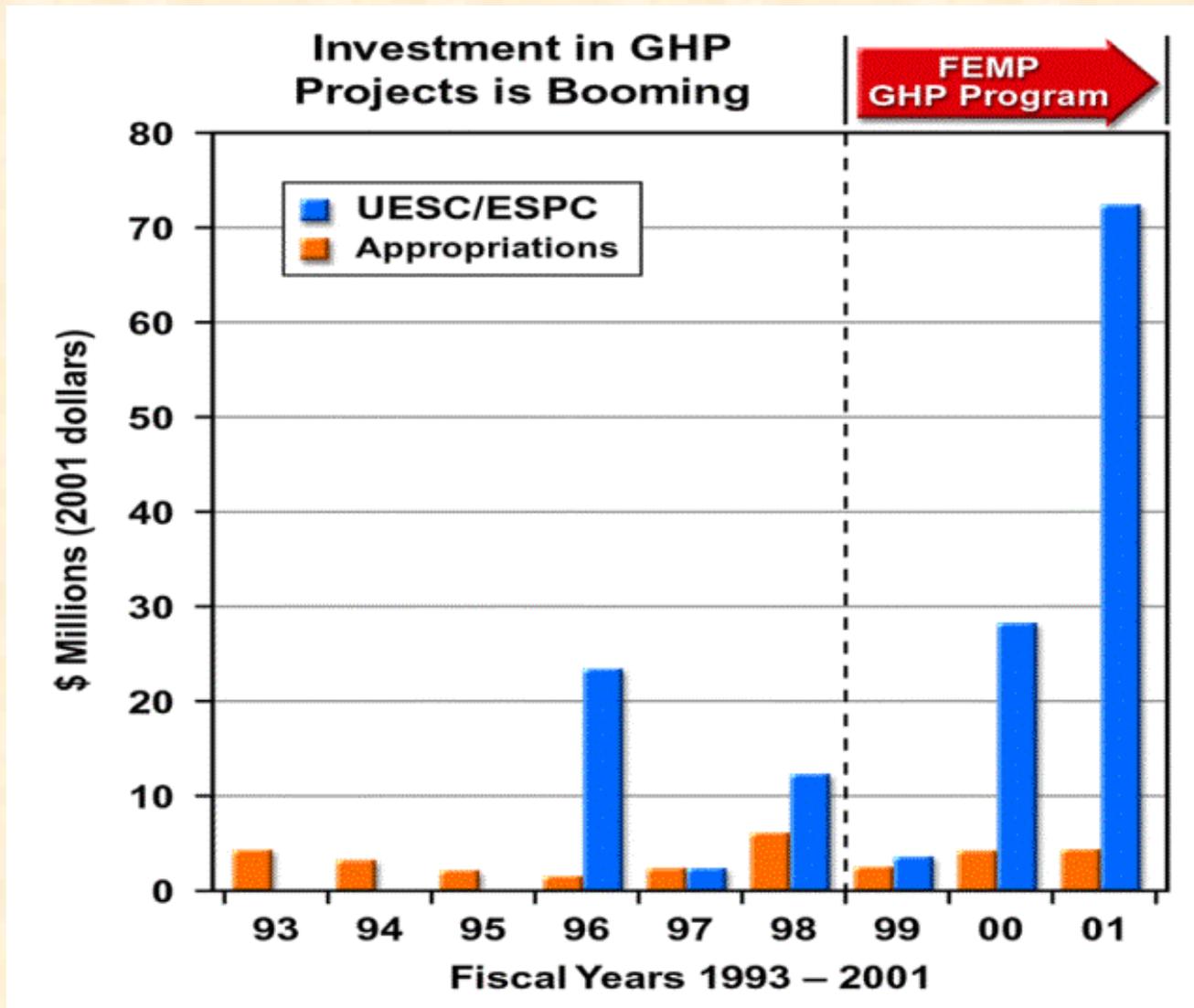
—they certainly helped ESPC



# Tech

# -th

# ESCOs?



## *Discussion topics:*

- **Is this assessment of interest?**
- **Anything missing?**
- **Special concerns, criteria?**
- **Ideas for possible pilot projects?**
- **Next Steps...**
  - **NDIA Paper <http://www.ornl.gov/femp/>**
  - **Stakeholder comments**
  - **Decision paper**

If you feel strongly one way or the other about the options and developing support to make DG/CHP more accessible, please let us know.

**Thank you for your attention**

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