National and Regional Status of CHP

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What is CHP?

- Integrated System
- Located At or Near a Building/Facility
- Provides a Portion of the Electrical Load
- Utilizes the Thermal Energy
  - Cooling
  - Heating
  - Dehumidification
  - Process Heat

Distributed Generation Technologies

Storage

Reciprocating Engine

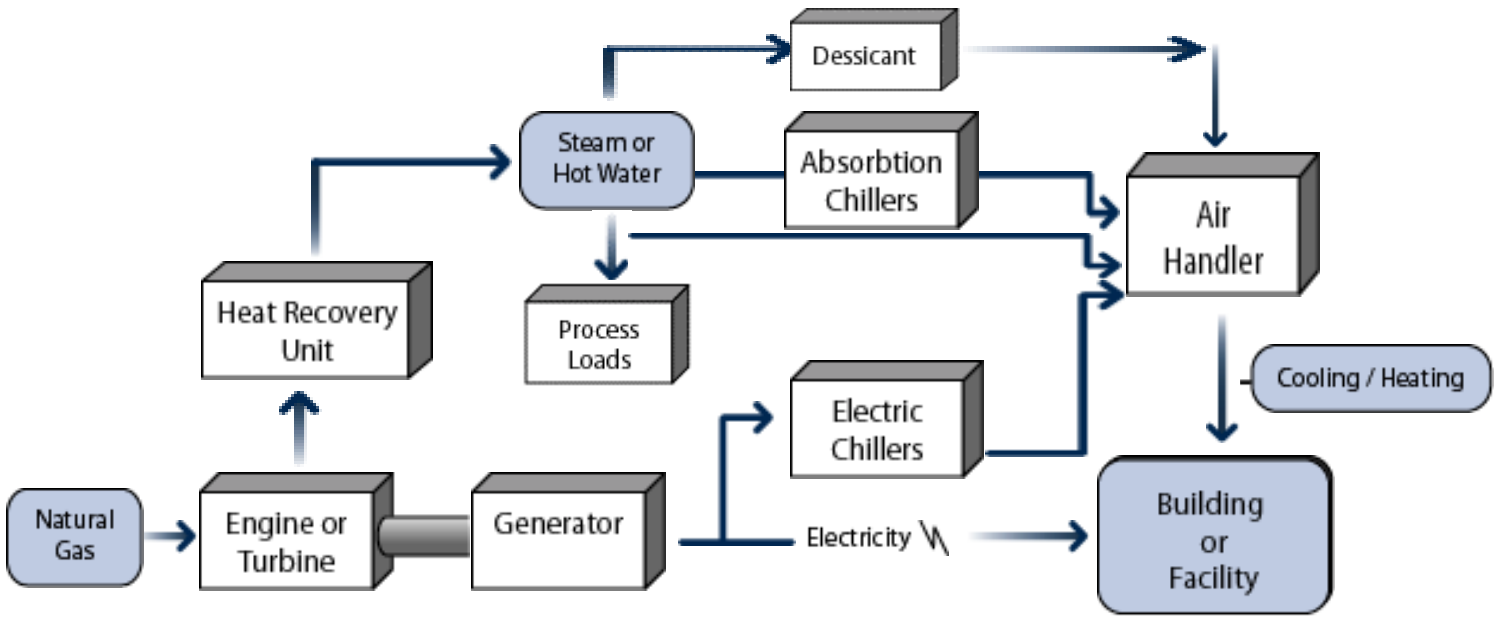
Photovoltaics

Fuel Cells

Wind

Microturbines

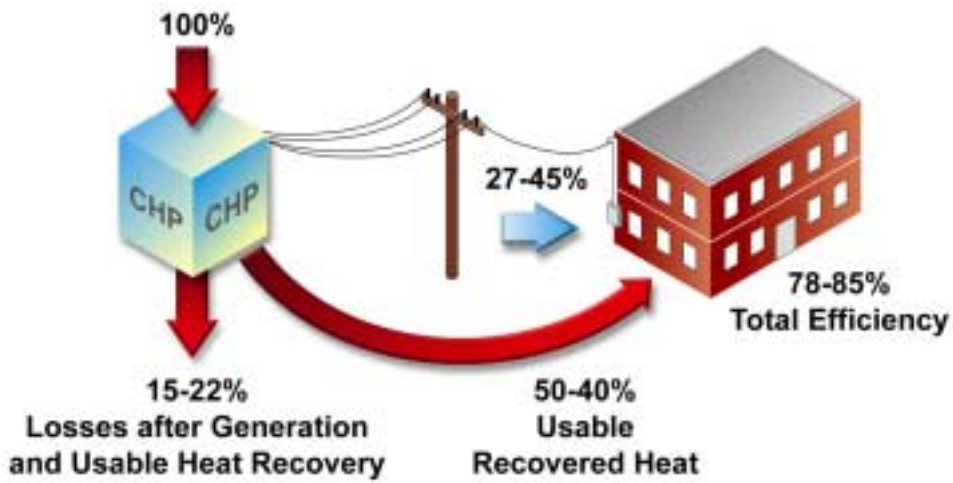
Typical Commercial CHP System



CHP System Sizes *(Terminology)*

System Designation	Size Range	Comments
Mega	**50 to 100+ MWe**	• **Very Large Industrial** • **Usually Multiple Smaller Units** • **Custom Engineered Systems**
Large	**10's of MWe**	• **Industrial & Large Commercial** • **Usually Multiple Smaller Units** • **Custom Engineered Systems**
Mid	**10's of kWe to Several MWe**	• **Commercial & Light Industrial** • **Single to Multiple Units** • **Potential Packaged Units**
Micro	**<60 kWe**	• **Small Commercial & Residential** • **Appliance Like**

How CHP Saves Energy



Benefits of CHP

High Efficiency, On-Site Generation Means….

- Improved Reliability
- Lower Energy Costs
- Better Power Quality
- Provides Standby Power
- Lower Emissions

- Support Grid Infrastructure
  - Fewer T&D Constraints
  - Defer Costly Grid Upgrads
  - Price Stability
- Facilitates Deployment of New Clean Energy Technologies
- Enhances Competition

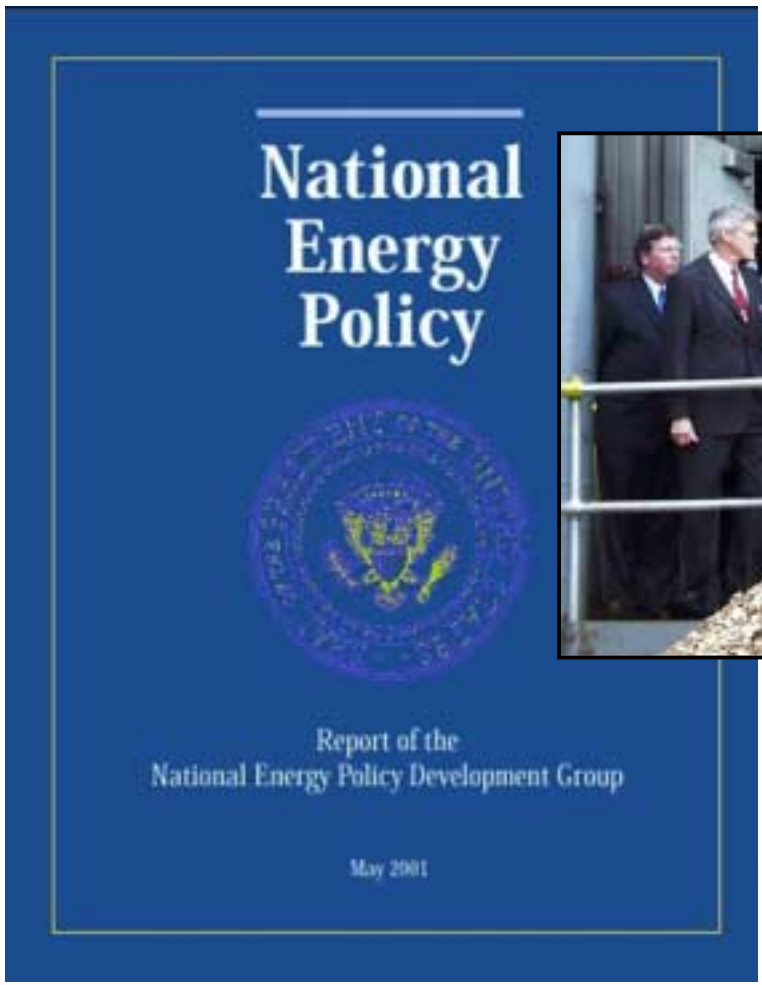
Top Challenges

1. **Interconnection –** Inconsistent standards, complex processes, network Issues and unpredictable, high costs
2. **Utility Tariffs –** Standby charges, exit fees, ratchet rates
3. **Electric Utility Response –** Often times, ambivalent at best, Hostile at worst
4. **Large Financial Investment –** Significant investment decision for end users often requiring financing
5. **Lack of Awareness –** Regarding technologies, advantages, benefits

CHP Is A Triple Win

- Saves Money --- End User
- Energy Efficiency and Cleaner Environment --- Government
- Provides Business Opportunity --- Industry

The President's National Energy Policy



May 17, 2001, St.Paul, MN

CHP Is a Key Component

Distributed Energy (DE) Program Mission

- Lead a national effort to:
  - Develop the next generation of clean, efficient, reliable and affordable distributed energy technologies
  - Document the energy, economic and environmental benefits of the expanded use of distributed energy resources
  - Implement deployment strategies and address infrastructure, energy delivery, institutional and regulatory needs

Vision and Goals

The United States will achieve the cleanest, most efficient and reliable energy system in the world by maximizing the use of affordable distributed energy resources.

•***2005-2007***: Address the institutional and regulatory barriers(siting/permitting, rates)

•***2010***: Achieve 20 percent of new capacity additions in the U.S. while providing reliable, quality electric power.

The Ultimate Goal: A Competitive Marketplace for Reliable, Clean, Efficient, Cost-Effective Distributed Energy Resources

Summary

- DE complements the existing electric energy infrastructure making it more energy efficient and reliable and increasing energy security.
- DE can provide benefits to end users, industry and government
- The Primary benefits to end users include:
  - Economic savings
  - Improved reliability
- The DOE's DE Program addresses the following needs:
  - R&D
  - Regulatory
  - Educational