

Regional CHP Application Centers and Feasibility of CHP Projects

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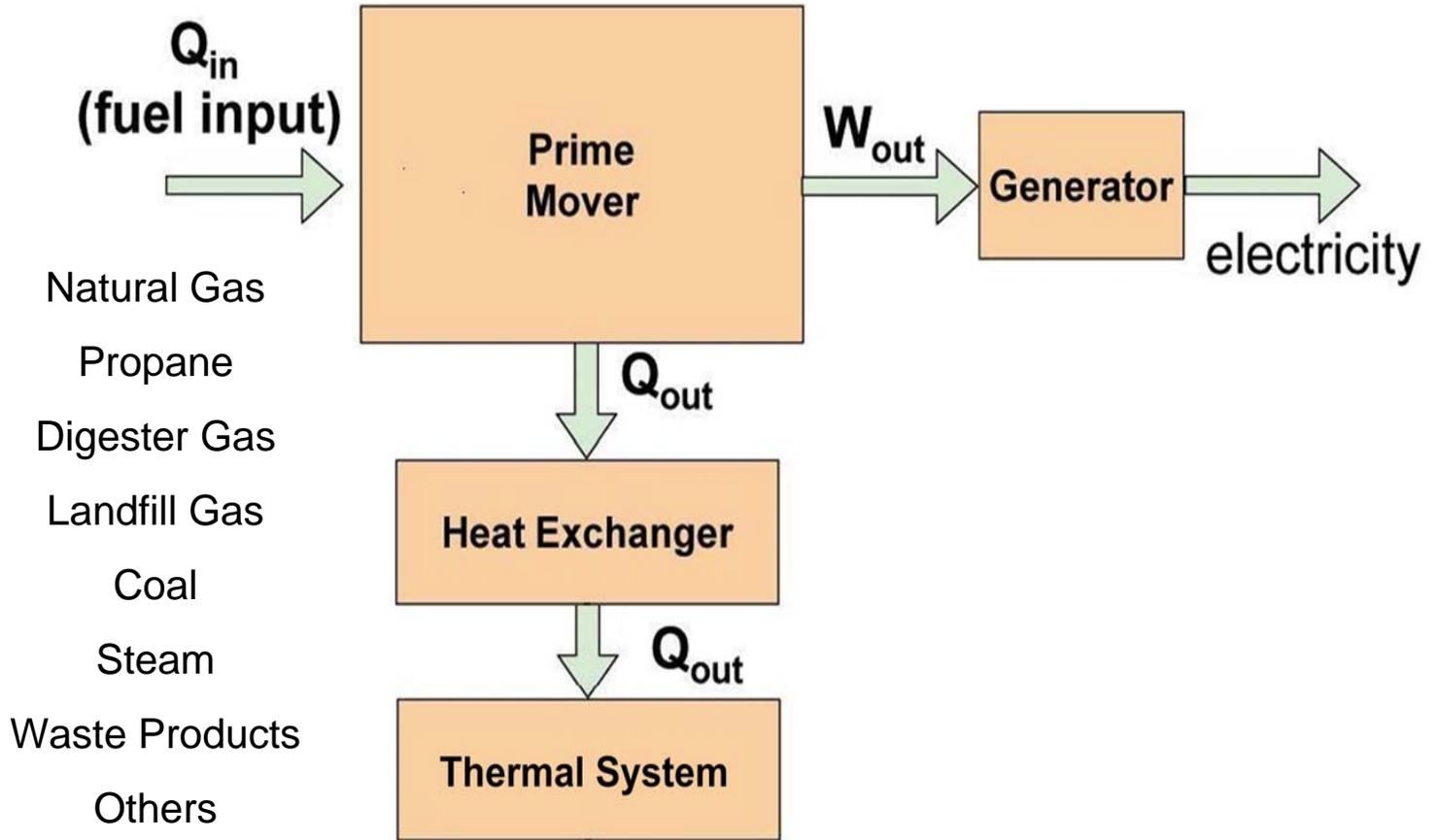
The logo features a stylized sun with orange and yellow rays on the left. A blue and green wave-like graphic is positioned in front of the sun. To the right of the sun, the year '2006' is written in large, bold, orange numbers. Below '2006', the word 'Energy' is written in large, bold, green letters.

2006
Energy





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Building
Strategies



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CHP does not make sense in all applications, but where it does make technical and economic sense, it will provide

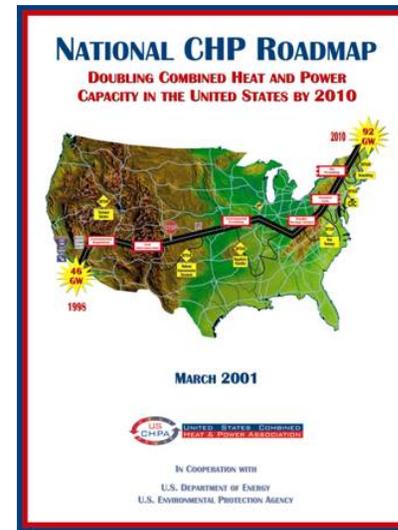
- Lower Energy Costs
- Reduced Energy Consumption
- Increased Electric Reliability
- Standby Power
- Improved Environmental Quality



U.S. DOE CHP Vision and Technology Roadmap

By 2010, **DOUBLE** the amount of CHP capacity in United States
1998, 46GW  2010, 92GW

Our CHP activities are guided by the actions identified in the National CHP Roadmap as those items required of us to meet the CHP Goal



- Raise CHP Awareness
- Eliminate Regulatory and Institutional Barriers
- Develop CHP Markets and Technologies



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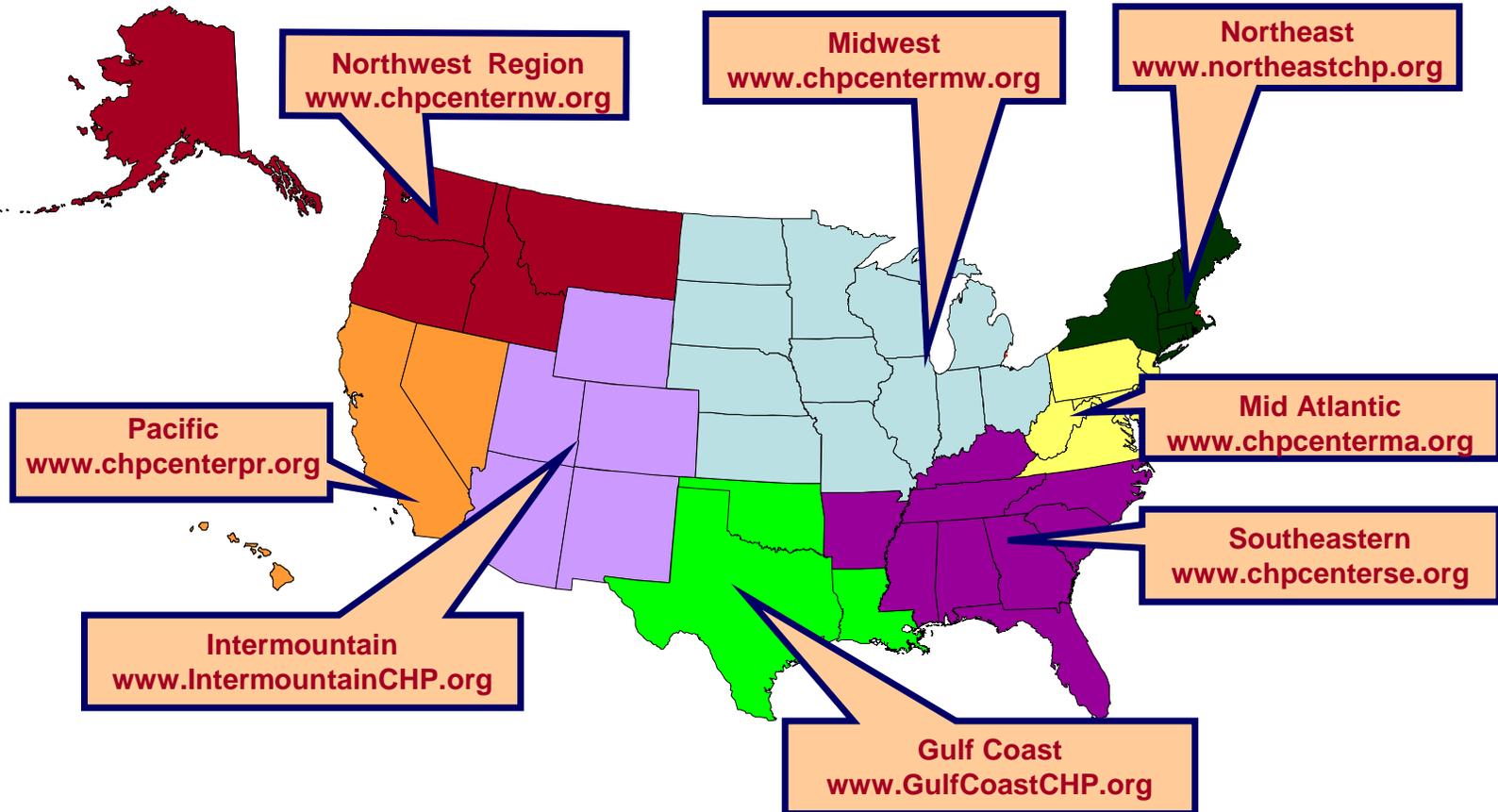


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Regional Application Centers

The regional application centers will promote combined heat and power (CHP) technology and practices, serve as a central repository and clearinghouse of CHP information, and identify and help implement regional CHP projects.



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- Purpose: Facilitate deployment of CHP technologies thru:
 - Educating regional players on benefits of CHP technologies, while reducing perceived risks
 - Providing project specific support
 - Providing feedback to DOE and industry regarding future R&D program needs
 - Providing regional coordination and implementation of DOE projects



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2006 Energy Leverage

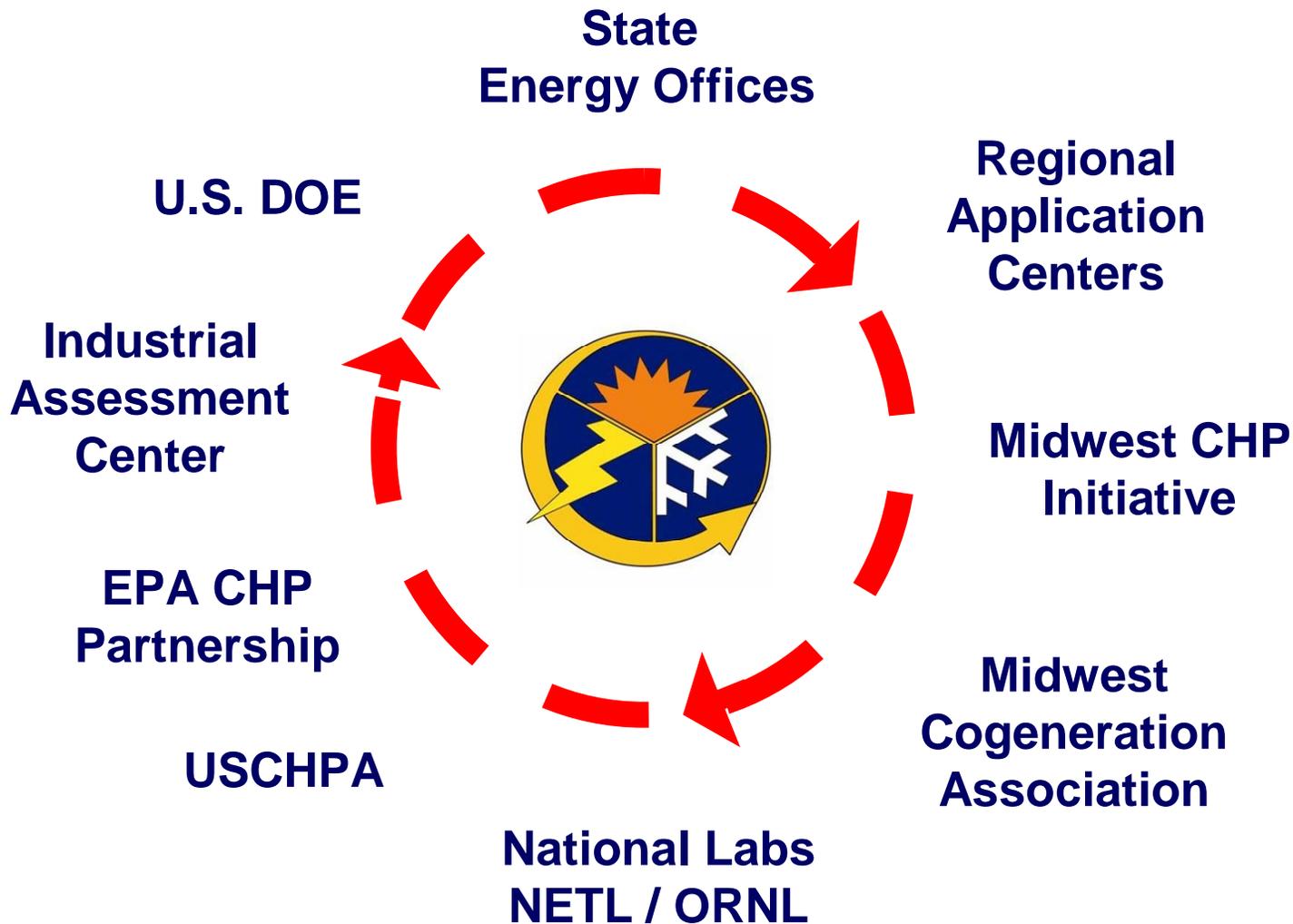


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- Website (Available & Updated)
- Site Evaluations (Screening)
- Application Analysis (Tech / Financial)
- Technical Assistance
- Training
- Workshops / Conferences
- Regulatory Interactions



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- RAC – DOE funded entity providing Education and Outreach and Project Support to develop CHP market
- Regional Initiatives – Voluntary, Ad-hoc organizations driving roadmap actions and Policy Changes in the Regions
 - Provide insight and direction to RAC
 - RAC provides HP to implement ideas
 - Initiatives then disseminate the results



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- CHP systems are a major investment
- Evaluation is time consuming
 - Done in progressive steps
 - Avoid excessive outlays before some verification of potential
- Need a low cost evaluation
- Site-Screening Walk Thru
 - End-Product: Does the site warrant a full financial analysis?



Opportunities for CHP



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- Central heating/cooling plant
- Coincident loads
- Spark spread
- Facility expansion or renovation
- Utilities expansion or renovation
- Aging heating and/or cooling equipment
- High pressure steam system
- Power reliability issues
- Available opportunity fuels

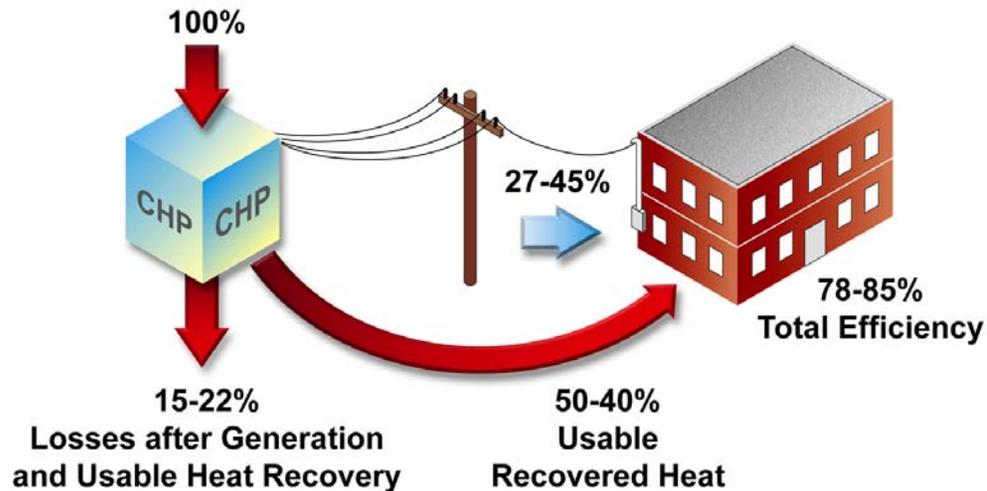
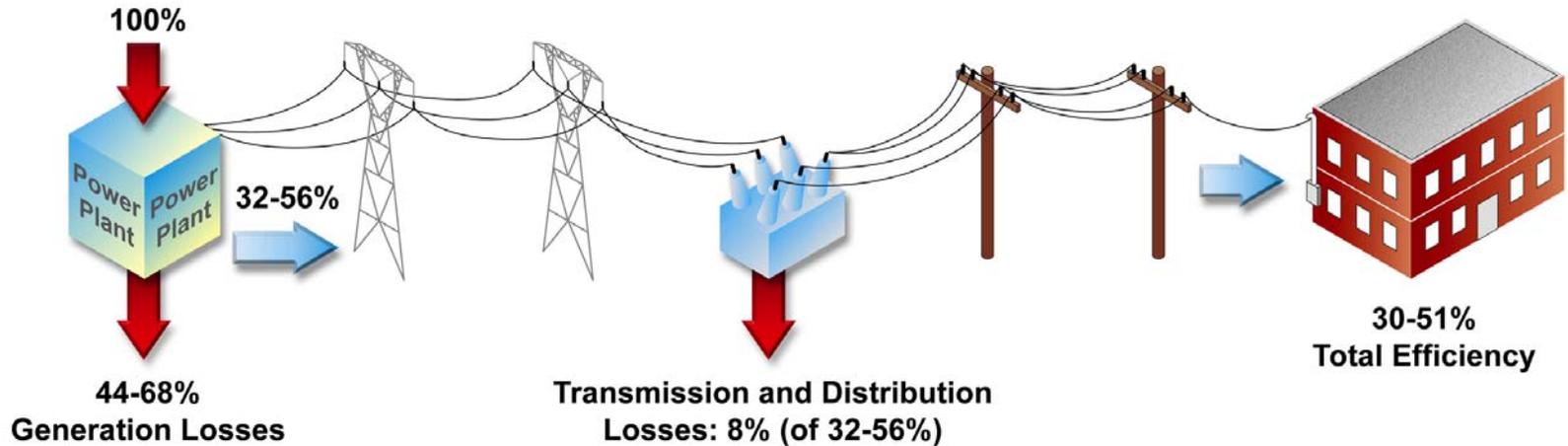


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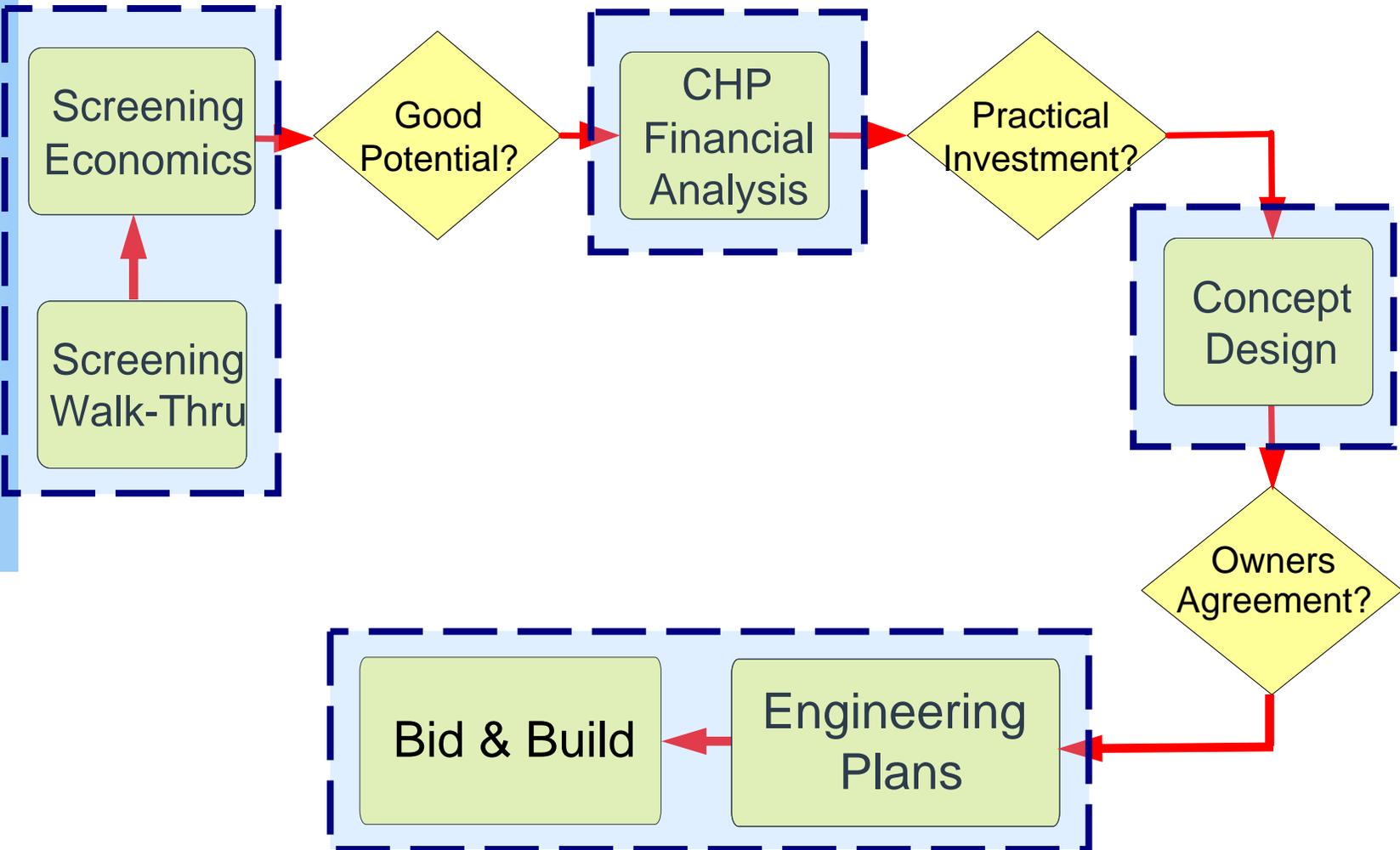
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CHP Feasibility Process



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- Asking for Utility Bills
 - Can obtain understanding of facility consumption
 - Indicator of what facility is paying
 - May not provide full details on rate schedules

Questions for the Facility Operator

Obtain 12 Months of Electric Bills

Do Bills Contain Monthly Demand Values?
 Bills Contains On-Peak and Off-Peak Consumption?
 Name of Rate Schedule(s) Used

<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
	<input type="text"/>
	<input type="text"/>

Obtain 12 Months of Gas Bills

Do Bills Contain Energy Usage?
 Is Gas Purchased Under Contract?
 Name of Rate Schedule(s) Used

<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
	<input type="text"/>
	<input type="text"/>

Obtain 12 Months of Fuel Oil Bills (If Used)

Do Bills Contain Amount Used

<input type="checkbox"/>	
<input type="checkbox"/>	<input type="text"/>

Type of Fuel Oil Used

<input type="checkbox"/>	No. 2
<input type="checkbox"/>	No. 6

Ge
Lit



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- Operating Hours are Essential in Projecting from Monthly Consumption to Hourly Consumption



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Industrial Loads - Ask for Information on Operating Schedules

Number of Hours of Operation on Weekdays? Hrs./Day

Number of Hours of Operation on Weekends? Hrs./Day

Schedule of Major Process Heat Loads? Hrs./Day

Does the Plant Have a Steam System?
Operating Pressure psig

Commercial Loads - Ask for Information on Operating Schedules

Hours Facility is Open for Business or Largely Occupied? Hrs./Day

Type of Heating System(s)?
Indicate All Types

Type of Cooling System(s)?



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- Electric connection issues can be a major "showstopper" in CHP applications to existing facilities
- Special needs such as electric back-up capability and improved power quality may sell CHP even when economics alone won't

Electric Parameters

Certain Issues with the Current Electric Power Service Can Impact CHP Economics. These Questions Investigate Power Service Issues

How Many Electric Services Drops Are There to the Facility?	<input type="text"/>
How Many Electric Meters Serve the Facility?	<input type="text"/>
Estimate the Distance Between the Multiple Meters in Your Facility	<input type="text"/> Feet
Do All of Your Service Drops Originate at the Same Utility Feeder?	<input type="text"/>
Has the Facility Experienced Problems with Power Quality Such as: Low Voltage?	<input type="checkbox"/> If Yes, Please Describe: <input type="text"/>
Poor Frequency Quality?	<input type="checkbox"/> If Yes, Please Describe: <input type="text"/>
Does the Facility Have Any Significant Need for UPS Systems?	<input type="checkbox"/> If Yes, Please Describe: <input type="text"/>
Estimate the Number of Momentary Electric Power Outages <i>Momentary Power Drops are Power Fluctuations that Cause Computer Equipment to Reset a Full Blackout</i>	<input type="text"/> (<1 Second) per year
Estimated Cost of a Momentary Power Outage	<input type="text"/>
Estimate the Number of Non-momentary or Complete Electric Power Outages	<input type="text"/> Occurances per year
Estimate Cost of a Non-Momentary Power Outage	<input type="text"/> per Hour
Does the Facility Have Back-Up Generation?	<input type="checkbox"/>
What is the Size of the Back-Up Generators	<input type="text"/> kW/No
Are the Back-Up Generators Diesel Fuel?	<input type="checkbox"/>
How Old are the Back-Up Generators	<input type="text"/> Years
What is the Facilities Current Power Factor <i>(This Question Can Generally be Skipped for Commercial Buildings)</i>	<input type="text"/>



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- The CHP system must have some way to deliver heating and cooling to the overall building load

Overall Location and Equipment Questions

Overall Location Questions: It is Important to Find a Location for the CHP System That Allows the System to be Affordably Connected to the Electric and Thermal Loads

If CHP is Installed - Where Can it Be Located?

How Close are the Existing Electric Feeders to This Location? Feet

Does a Single Electric Distribution System Exist that Can be Used?
(Question Important for Multi-Building Campuses)

Does a Hot Water or Steam Piping System Exist that Could be Used?

How Close is the Existing Heating Plant? Feet

Existing Equipment: A CHP system will need to tie into existing heating and cooling systems. The current state of these systems will affect the savings and the first cost

What is the Approximate Efficiency of the Existing Heating System? %

How Old is the Current Heating System? Years

How is Heat Distributed to the Building? Steam, Hot Water, or Hot Air

If Steam, What Operating Pressure? If Water, At What Delivery Temp?



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- Some miscellaneous issues are important



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Other Questions

Questions to Consider that Facility Operators May Be Able to Help With

Would the Facility be Able to Obtain Gas at a Lower Rate if the Gas Consumption of the Facility Were Larger?

Yes

No

What are the Electric Utility Stand-By Charges in This Area?

\$/kW/Mo

Is the Facility Eligible for any State/Federal/Utility Rebate Programs?

Is the Facility Owned by a For-Profit Company?
If Yes, What is Their Marginal Corporate Tax Rate?

Would the Facility be Interested in Leasing a CHP Plant?

Please Explain:

Would the Facility be Interested in Having a Third Party Own the CHP Plant and Sell Them Power/Heating/Cooling?

Please Explain:



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2006 Energy Summary



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- CHP resources available through Regional Application Centers
- CHP systems
 - provide energy efficiencies up to 85%
 - help optimize utility operations
 - reduce overall electric demand from the grid
 - provide utility reliability for electricity, heating, and/or cooling
- Each site requires its own CHP evaluation



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2006 Energy Thank you



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For more information,
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www.CHPCenterMW.org



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