

Potential for Combined Heat and Power in Massachusetts

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Agenda

- Research Objectives
- Current CHP Use
- Technical Market Potential
- Methodology
- Massachusetts CHP Potential
- Conclusions





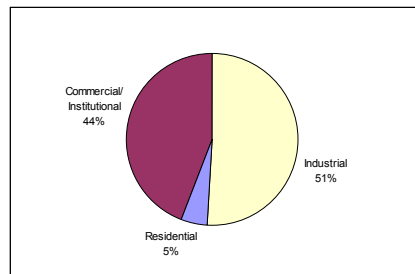
Research Objectives

- Quantify the market for CHP in Massachusetts
- Evaluate current market penetration
- Consider economic viability of potential CHP projects
- Support further development of CHP
 - Evaluation of benefits/costs of CHP and impact of potential policy changes
 - Direction of outreach & technical development



Current CHP Use in the U.S.

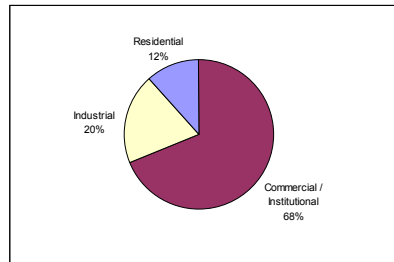
- 2,866 sites with 81,000 MW total capacity
- Average size is 28 MW





Current CHP Use in Massachusetts

- 121 sites with 375 MW total capacity
- Average size is 3.1 MW

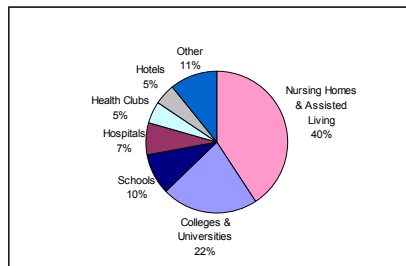


Sector	# of Sites	Total Capacity (MW)	Average Size (MW)
Commercial/Institutional	83	206	2.5
Industrial	24	166	6.9
Residential	14	2	0.13
TOTAL	121	375	3.1

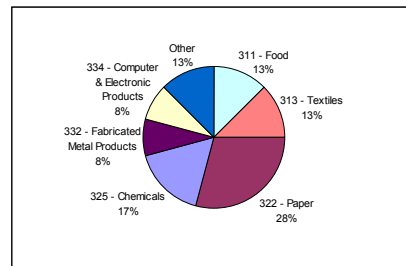


Current CHP Use in Massachusetts

Distribution of Commercial & Institutional Systems:



Distribution of Industrial Systems:





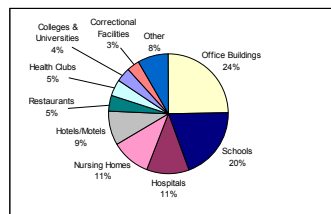
Technical Market Potential for CHP

- Potential capacity for CHP in existing facilities based on their current energy consumption
 - Limited only by technical feasibility of CHP based on average energy consumption for each facility type & basic criteria
 - Not considered:
 - Interest, economics
 - Availability of natural gas
 - Future growth predictions
 - Ease of integrating CHP with existing systems in specific buildings

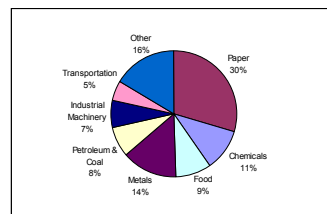


National CHP Potential

60-80,000 MW
Commercial &
Institutional:



70-90,000 MW
Industrial:



- Areas with little use of CHP to date
- Smaller systems under 5 MW



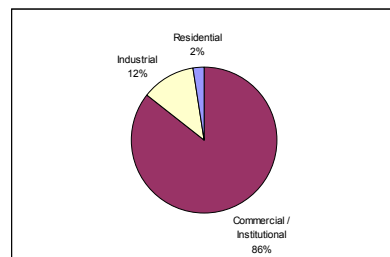
Methodology

- Identify target facility types
 - CHP compatible with energy consumption profiles
 - Based on previous studies by DOE & NYSERDA
- Calculate average energy consumption per employee using DOE survey data
- Find number and size of target facilities
- Determine CHP system size ranges for target facility groups
- Calculate potential CHP capacity for each facility type/industry



Massachusetts CHP Potential

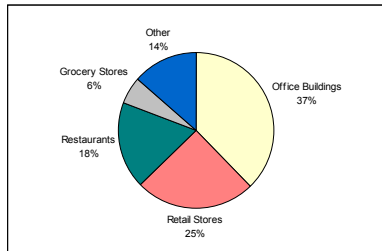
- 18,549 sites with 4,751 MW total capacity
- 256 kW average size
- 87% in 50-500 kW size range



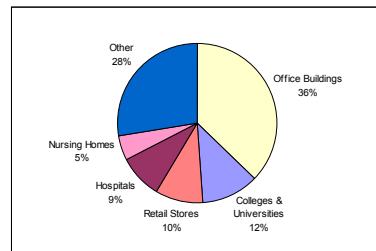


Massachusetts Commercial/Institutional Potential

Number of Systems:

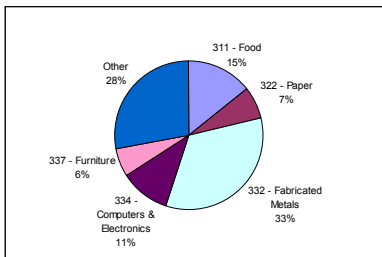


Total Capacity:

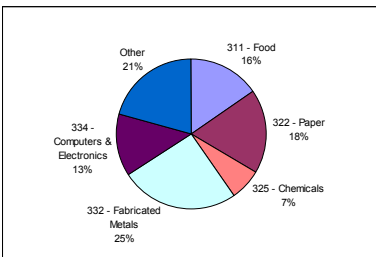


Massachusetts Industrial Potential

Number of Systems:



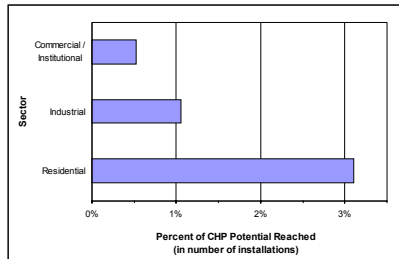
Total Capacity:



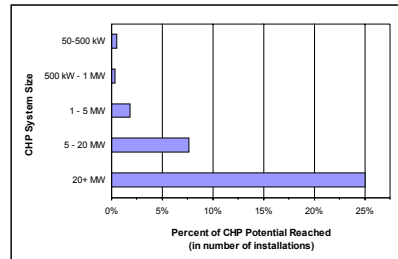


Massachusetts Market Penetration

Sector:



System Size:



Conclusions

- Different distribution of CHP potential in Massachusetts than at the national level

	Potential Capacity in Commercial/Institutional Sector	Potential Capacity in Systems Below 5 MW
Massachusetts	83%	79%
New York	77%	74%
United States	46%	50%

- Lower industrial market penetration here

	Industrial Potential Capacity Met	Commercial/Institutional Potential Capacity Met
Massachusetts	19%	5%
United States	33%	6%



Conclusions

- Potential, policy and economics of CHP are specific to each state, utility service area and facility.
- Significant untapped potential for energy efficiency with CHP in Massachusetts.
- Economic viability of CHP is highly variable. Significant savings is possible.



For more information

- See the report [Technical Analysis of the Potential for Combined Heat and Power in Massachusetts](#) on the Northeast CHP Application Center website:
<http://www.northeastchp.org/nac/librarylinks/library.htm>