Micro Cogeneration (mCHP) Systems: Increasing Efficiency and Reducing Emissions
CHP Market Trends in New York: Is Micro CHP Next?
CHP IN NEW YORK
CHP IN NEW YORK
NEW YORK MARKET TRENDS

- Transition from large industrial users to smaller facilities
- Multifamily, hotels, etc. gaining traction
- Smaller, packaged systems filling this niche
- Benefits include energy cost savings, enhanced resiliency, system-wide GHG emissions reductions
NEW YORK MARKET TRENDS

NY State CHP Systems <500 kW Total Capacity by Facility Type
NEW YORK MARKET TRENDS

NY State CHP Systems <500 kW, Installations by Year
NYSERDA’s CHP Program

- Market transformation
- <3MW
- The catalog approach
- Outreach and technical assistance
MICRO CHP

- Applications/use cases
- Barriers to implementation
- Are there case studies?
- What are the costs? Savings?
- Is there a resiliency benefit?
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mCHP - POINTS OF DISCUSSION

- CHP History
- Importance of right-sizing
- Market Barriers in the US
- Changing Landscape?
- Case Study/Sample Installation
Brief History of CHP

- Defined as two forms of **useable** energy from one fuel source
History of CHP (cont.)

- The CHP concept was first applied in 1882 at Thomas Edison’s Pearl Street Station, the first central power plant in the United States.
- The plant provided electricity and steam to a section of downtown New York.
The passage of the Public Utility Regulatory Policies Act of 1978 (PURPA) ushered in the modern CHP era. This law included a provision that legalized the sale of non-utility-generated electricity to the grid, which helped increase the use of CHP.
Combined heat and power (CHP) installations have been becoming steadily more popular as awareness and education about the technology has been growing over the last 40+ years. State & utility incentives have also helped facilitate new projects.
History of CHP (cont.)

• With the economic recovery and relatively low natural gas prices, we have seen interest in CHP increasing, particularly where the added benefit of electric reliability is valued.

• Another trend expected to encourage CHP in future years is increased demand for emissions reductions, especially with the EPA’s Clean Power Plan.

Source: A brief history of CHP development in the United States – ACEEE – American Council for an Energy Efficient Economy
Right Sizing Is Critical to CHP Success

• It is critical to use as much of the heat as possible in any given CHP application.
  - Highest Efficiency
  - Maximum Savings (usually)
  - Most CO2 Reduction

• Best approach is to size the system to follow the BASE THERMAL LOAD.
  (There are reasons to break from this approach based purely on economics.)
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- 250+ rooms
- 150 – 250 Rooms
- 80 – 150 rooms
- Large Home, Small Commercial, 10-80 rooms
Market Barriers in the U.S.

• Awareness and Acceptance
  • UK, Asia, Germany are years ahead of the U.S. (Thousands more mCHP)

• Scalability (Cost per kW)
  • Smaller sizes $4000 - $6000+/kW Installed

• Patience & Experience are key
  • Engineering Understanding
  • Design Specifications
  • Install Resources
  • Maintenance Plan is a must

• State Incentives have just begun including smaller systems (many states still do not)

• Trust
Changing Landscape of Energy

- Hybrid Solutions – CHP is often included in Microgrid projects with Solar & B.S.
- CHP is becoming a more widely used and adopted technology
- Those who have done larger CHP projects are more open to a smaller solution
- Electric tariffs are putting more emphasis on DEMAND charges (Time of Use)
- Seasoned CHP providers are finding ways to lower the cost of equipment and installation. As a result, mCHP project economics are improving
• Tecogen design ensure quality control & operation.
• Allow for a quick and easy installation.
• Customer can use preferred contractor & contractor can bring in leads.
• Skids are fully assembled with factory quality control.
• Integration skids can be serviced by Tecogen as well as the units themselves.
• Protects investment as run time is more achievable.
• Allows customers the option of adding BOP maintenance to the CHP service contract
Sample Installation

- 260 Herkimer, Brooklyn, NY
  - Annual run time target: 7,224 hrs
  - 138 unit apartment building
  - One 35kW CHP System
  - Installed by Tecogen
  - Start-up: 2017
  - ConEd/BQDM $$$
  - NYSERDA $$$
  - 96% of DHW load
  - ROI 2.8 years
  - Total Annual Savings: $45,909
Questions?

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