

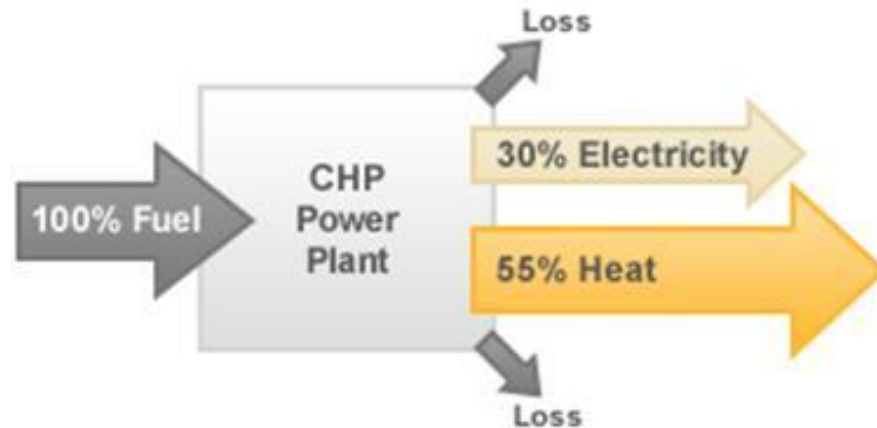
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**Combined Heat & Power (CHP)**

March 22, 2016

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# Combined Heat & Power (CHP)



## Good Applications

- Significant demand for power and thermal energy
- Year-around electric and thermal loads
- Long operating hours (> 5,000 full-load operating hours)
- Sufficient cost differential between electricity (grid) and CHP fuel “Spark Spread”

# Good types of Projects

- Project Champion
- Both the CHP and grid supply electricity to the customer
- Substantial Operating Hours
- Coincident Thermal and Electric Loads
- Corporate Willingness and Desire for Benefits

# Thermal Heat Usage

- Captured thermal heat from the CHP system is used for:
  - Space Heating
  - Space Cooling
  - Process Heating and/or Cooling
  - Dehumidification and reheat applications

# CHP Program

## Program Eligibility

- Must maintain a minimum system efficiency of 65% (HHV)
- Project must pass the Total Resource Cost (TRC) Test (>1.0)
- Incentives up to \$2.5 million/project
  - Split \$1.25 million for Design & Installation
  - \$1.25 million on Production
- No net metering or exporting
- Pre-Approval and MRD issued by **12/31/17**
- Project up and running by **12/31/19**

# CHP Incentive

## Financial Incentive

1. Design Incentive - \$75/ kW
2. Installation Incentive - \$275/ kW < up to 250 kW  
\$175/ kW > 250 kW or greater
3. Production Incentive 1 – \$0.07/kWh 1<sup>st</sup> 6 months
4. Production Incentive 2 – \$0.07/kWh 2<sup>nd</sup> 6 months
5. Production Incentive 3 – \$0.07/kWh 3<sup>rd</sup> 6 months

## Sample Calculation:

- 1,000 kW system running 8,000 hours/year
- **Design Incentive:**  $\$75 * 1,000 = \$75,000$
- **Installation Incentive:**  $\$175 * 1,000 = \$175,000$
- **Production Incentive:**  $\$0.07 * 8,000 * 1,000 * 1.5 = \$840,000$
- **Total Incentive: \$1,090,000**

# CHP Program

## What we're seeing:

- Installed CHP Project Cost are running \$2,500/kW to \$4,500/kW
- Incentives are generally \$750/kW to \$1,100/kW
- Total CHP incentive covers 20-40% of project cost

## Activity in the community:

- Range in Technology
- Range in project size from 60kw to 8 MW
- Range in Markets (Health care, Casino, Fitness Center, Universities, Manufacturing, Hotels, Military, WWTC, School districts; and Defense Contractors)

# CHP Program Budget and Savings

2016	MW	MWh	Incentive
Forecasted	7.9	55,252	\$3,000,000
Goal	6.2	42,469	\$5,063,218

Since program launch in 2012:

- 6 projects installed
- 9 additional projects approved
- 4 Technical Review



# Hospital

## Hospital

1,990 kW (1.99 MW)

\$1,750,000 incentive

13,000,000 annual kWh gen

Simple Payback: 8.1 years

(w/ incentive included)



# Casino

## Casino

1.15 MW

\$1,271,178 incentive

9,287,538 annual kWh gen

Simple Payback: 8.3 years

(w/ incentive included)



# Health Club

## Health Club

60 kW

\$66,000 incentive

427,672 annual kWh gen

Simple Payback: 4.7 years

(w/ incentive included)



# How do we go to Market

- Trade Secret – Sophisticated Match makers
- Identified viable markets
- Identified customers who could benefit from CHP
- Individually introduced ourselves and the CHP program
- Market seminars / Educational lunch n learns / plant tours
- CHP events catered to targeted markets
- Panel discussion with peers
- Partnered with anyone and everyone to promote CHP
- Presented to ASHRAE, CASHE, AEE, AIA, RMI, ESG, ETC...

# Common Barriers to CHP

- One sided support ex: Facility Engineer
- Competition for capital dollars
- Mid Atlantic region challenge to use heat during summer
- Risk Management – not core business
- Availability of Natural Gas
- Don't want to be first syndrome
- Financial Investment and time frame