New Jersey Energy Master Plan
Strategy Template
2005-2020

Pfister CHP Strategy

SUBMITTED BY	
Name of Organization: Pfister Energy	
Mailing Address: 80 East 5th St. Paterson, NJ 07524	
Contact Name: Tom Ryan	Telephone #: 973-539-5465 E-mail address: tryan@pfisterenergy.com

Objective : Initiative to Expand the Implementation of Combined Heat and Power in New Jersey

The stated goal of the Energy Master Plan (EMP) is to analyze how each unit of fuel energy that comes into the sate is utilized and to examine how to increase that efficiency toward to goal of achieving the stated reductions of 20% by 2020. According to the EPA, "two-thirds of the energy in the fuel is lost – vented as heat – at most power plants in the United States". Our initiative is to capture as much of this "lost" heat as possible. The family of technologies that is characterized as Combined Heat and Power (CHP) together represent the highest efficiency use of fuel in producing electricity and high quality thermal energy.

CHP is broadly defined as the use of a gaseous fuel, normally natural gas, to generate electricity onsite in a distributed manner while capturing and efficiently using the "waste" heat that results from the power generation. There are several technologies that convert the fuel to electricity. They include: combustion turbines, reciprocating engines, boilers with steam turbines, microturbines, and fuel cells.

Due to the distributed generation nature of these technologies, they can be easily coupled with "back end" heat recovery and generate electricity more efficiently than most offsite (grid) based power production. Grid supply power generation ranges from 25-35%. CHP plant compare favorably because when their prime movers are properly linked with heat recovery devices that produce thermal energy as anything from hot air to hot water to steam, those efficiencies rise to approach 80%.

Clearly CHP technology delivers very positively into the goals of the EMP. In fact, the benefits of CHP touch on virtually every topic explored by the EMP subgroups. The Electrical Efficiency group would likely be pleased to see how the generation efficiency of CHP is raised from standard grid supply efficiencies. The Peak Demand group may be interested to learn how CHP provides stability to the grid during times of peak demand due to the grid-parallel nature of its operation, hence freeing up grid resources (Oak Ridge National Laboratory report). When utilizing

renewable fuels such as biofuels or landfill gas, CHP is clearly a viable Class I technology. However, we chose to introduce our position paper on CHP to the heating efficiency group because it is the special ability of this technology to utilize heat that would otherwise be wasted that is a hallmark of CHP.

Strategy:
Previous attempts in New Jersey to incentivize CHP, particularly the ’06 round of solicitation met with inaction. We attribute this inaction to a lack of clear evaluation criteria. Clearly CHP is not ideal for all facilities. Potential host facilities must consistently have a heating (as natural gas consumption) higher than the CHP system provides. The same is true for electrical demand vs. CHP system generation. We propose an objective grading system that removes subjective “judging” and, instead, clearly demonstrates appropriateness of a given facility as a potential CHP host. Factors subject to the scoring system include adherence to baselevel natural gas consumption, adherence to baselevel electricity consumption, relative efficiency of prime mover, emissions per MWh, and quality of waste heat. Other factors such as location in a load pocket may prove to also be good indicators of a potentially successful CHP project.

Responsible Party - Host facility must, with the help of a qualified installer, consultant, or engineer, study their electric and thermal demands to ensure a data set that sufficiently informs the approval process.
The NJCEP, in conjunction with the four gas utilities, already has a program to support CHP. This strategy to increase the utilization of CHP technology could build on the old program, with the NJCEP (in conjunction with the four gas utilities) taking the lead in administering the program.

Timeline of action : Solicitation for CHP projects should be ongoing, with the projects that show the most potential incentivized as they are presented to the NJCEP. The annual submittal nature of the recent CHP proposals is problematic because when there are delays in approving projects, such as we are currently experiencing in this program, customers tend to pull their support due to their perceived lack of commitment by the state.

Strategy outcome - Our strategy outcome is clearly a reduction of fossil fuel consumption, hence cost, to produce a targeted percentage of the total state electrical and thermal energy load. Electrical efficiency can be gained on a 2:1 basis, i.e. each MW of CHP funded will save approximately 1MW worth of fuel used to produce electricity. Natural gas savings are expected to be in the 1.2:1 range considering the efficiency of a typical natural gas fired boiler at about 80%.

Implementation cost/benefits – Implementation costs will vary dramatically based on the extent of program implementation. It is our contention that all monies dedicated to this program will have multi-faceted benefits, including reduced emissions, greater grid stability and, the prime focus of this Master Plan, maximum efficiency of energy conversion for New Jersey facilities. Additionally, we believe this program will help maintain a competitive energy cost structure for New Jersey companies which concern was brought out by Gerdau Ameristeel and other members of the New Jersey Large Energy Users’ Coalition. Finally, we expect that incrementally increased

reliance upon natural gas, which fuel accounts for a large percentage of CHP projects, will help the gas utilities maximize their base-loaded capacity, thus stabilizing the utilization of their facilities.

Source of Funding

Facility Co-investment
SBC or other state-based incentive arising from EMP study

Funding sources	Yes	No
Private sector funds	x	
Public sector funds	?	
Consumer/ratepayer Funds	x	

Indicators - Measured MWh and thermal output
- Reduction in NOx , CO2, sulfur, PM and other emissions
- Cost effective management of energy

Source

A. Current state of indicator
Increased participation of this effective technology as compared with current program.

B. Indicator Projection to 2020.
Too early to tell, as magnitude of success depends upon magnitude of commitment.