

Conclusions

Economic

At first glance, City Hospital campus is a great candidate for CHP application. It has a central heating and cooling system, and there is a need for process heat. On top of that, the “spark spread” is much higher than the minimum recommended. As a matter of fact, cogeneration with base demand to reduce electric usage from local grid has a decent annual energy cost saving. However, after a closer examination with life cycle cost analysis which included discount rate, operating and maintenance cost, and a large capital cost for the system, the alternate design has a payback period that is too long to be economic feasible for City Hospital P 1&2 with a 1.2 MW turbine generator CHP. Equipment staging Scenario 2 has shown that CHP has a reasonable payback period if it is installed when West tower is completed.

Environment

Other than concrete costs from LCC analysis, CHP for large development such as City Hospital campus has proven its environmental benefit to be phenomenal and should not be ignored. Compared the existing building system design, CHP can reduce 54% – 82% of carbon dioxide, nitrous oxide, and sulfur dioxide emissions. According to Forbes magazine, people are increasingly invested in companies that have shown social responsibility as consciousness of the environment takes hold. By reducing energy consumption and emissions, City Hospital can establish more than just a health care provider and advance medical research, but a leader in social responsibility. Such marketing strategy is extremely invaluable. In addition, if “Emission Capped and Trade” falls in place, CHP can become an additional source of cost saving.

Recommendations

City Hospital campus development plan spans three (3) decades, it is recommended to install CHP with larger capacity at a later construction phase. It will allow MEP engineers to usage actual electricity and steam usage from occupied laboratory and office spaces whether than depend on estimated energy model to design CHP for City Hospital. Effect of the fully deregulated utility should be more apparent and easier for owner and designers to make decision.