Combined Heat and Power (CHP) Application Assessment Tool Executive Summary

Overview: The Combined Heat and Power (CHP) Application Assessment Tool is a free online software tool that helps industrial users evaluate technology and economic feasibility of using gas turbine exhaust gases for different industrial applications. The CHP application uses gas turbine exhaust gases to supply heat to the heating systems in industrial process heating systems that include fuel fired gas boilers, furnaces, ovens, heaters and heat exchangers. The tool is best utilized to produce a screening analysis of the CHP potential that delivers a simple payback estimate and generates "what-if" analysis to model different turbine types, utility and energy costs. The tool supports three most commonly used CHP applications:

1. Use gas turbine exhaust to heat gases (i.e. air, process atmosphere) or liquids (i.e. water, heating liquids);
2. Use of the turbine exhaust gases into ovens or heat recovery boilers to recover sensible heat of the exhaust gases; and
3. Use of the exhaust gases to supply oxygen (low oxygen content "air") in fuel fired burners for furnaces or boilers as it is commonly done in boilers using "duct-burners".

Results of the analysis are presented in the final report that includes estimated simple payback period for the application based on the fuel and electricity rates used in the analysis, equipment cost, engineering, installation and other costs associated with annual maintenance of the system.

Note: This tool enables plants to conduct a high level screening of CHP potential. More detailed CHP analysis is usually accomplished by consultants so this tool does not have widespread use.

Data Collection Requirements: To collect the data required to operate the tool, knowledge of industrial process heating systems and measurement methods is required. Each of the three CHP system applications is supported by a Data Collection Form. Most of the design and performance data needed to fill out the data collection sheets can be obtained from the heating equipment nameplates and manuals. The utility cost data can be collected from the utility bills while the equipment cost and operating estimates (e.g., turbine cost in $/kW, engineering and installation costs) could be obtained from the heating and generation equipment suppliers. In addition, your process engineers will help determine other technical analysis data such as oxygen percentage in flue gas, flue gas temperature, combustion air temperature and current heat input (MMbtu/hour). It is expected to take from half a day to two days to collect the necessary performance and cost data.

Qualifications: An understanding of process heating systems (fuel-fired furnaces, boilers, ovens, heaters, heat exchangers etc. used in all major industrial applications) and electricity generation is required to operate this tool. Results are best understood and interpreted by an engineer.

Usage of the tool: The tool can be used anytime to conduct a what-if analyses for CHP potential of the aforementioned most common CHP applications. This tool allows users to run project plant specific data with the help of the pre-loaded performance ratings and default cost information for common commercially available gas turbines. User can modify performance and utility cost data as necessary, or add information for turbines not included in the database.

Ease of Use/Software Compatibility: This is a downloaded tool that includes an Introduction Document and User Manual.

Last Updated: 12/16/11

System Requirements:

- Windows 2000 /Windows NT 4.0/Windows 98 with latest service pack (or later versions)
- At least 50MB free space on hard disk
- Processor (preferably Pentium) 133 MHz or faster.
- VGA or higher resolution video card and monitor.
- 12X or faster CD-ROM drive
- Microsoft Office 2000 including MS Access, MS Word and MS Excel
- Acrobat Reader

Product roll-out roadmap: The next update for the CHP tool is scheduled to be released in 2013.