



Canton City Schools
C. T. Branin Natatorium
Microturbine Project

Canton City School District
Ohio Department of Development
Office of Energy Efficiency
First Energy

Canton City Schools Microturbine Project



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C. T. Branin Natatorium

Microturbine Project

- Goals and Objectives of the Demonstration Project
 - Demonstration of Microturbine Technology
 - Evaluation of Component Technology for Waste Heat Utilization
 - 5 Ton Cooltech Absorption Unit
 - Unifin Heat Exchanger
 - Instrumentation/ Data Collection
 - Energy Savings Evaluation

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Microturbine Project



- System Features
- Microturbines- Two 28kw Capstones
 - Operate on 4 oz natural gas fuel pressure
 - Multi-Pac Operation (Multiple-units operate as one)
 - Grid Connect & Stand-Alone Operation
 - Stand Alone provides lighting for 1/3 of Pool area
 - NOX Emissions- Less than 9 ppm @ 15% O₂,
 - Less than 0.49 lb/ Mwh
 - Sound Emissions - less than 65dbA @ 10 meter (33ft)

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- Pool Heating-
 - 600,000+ gallons, approx. 80F operating temp.
 - Unifin MicroGen- heat exchanger 20F rise, 40 gpm
 - Maintenance- Bi-Annual check of piping

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Microturbine Project



- Cooling
 - Air Condition Offices, Classroom, Hallway
 - Absorption Chiller- Cooltec 5 ton
 - Dual Fired- Waste heat and natural gas
 - Glycol solution, 10gpm, 45-55F temperature
 - Maintenance- Typical Annual System inspection



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- Initial Operation
- Peak Shave
 - Microturbines on line
1/13/2003
 - MTs 24x7, Full Load, 2200+
hours
- CHP -Heat Recovery
 - Pool water heating Pool
Heating 3/27/2003
 - Air Conditioning 4/17/2003



Canton City Schools Microturbine Project

- Energy Savings:
 - Microturbines provide approx 45% of electric energy used at Natatorium
 - Waste heat will heat pool water and eliminate need to fire boiler for steam during summer months
 - Air conditioning provided by absorption chiller-AC for offices/common area previously non-conditioned



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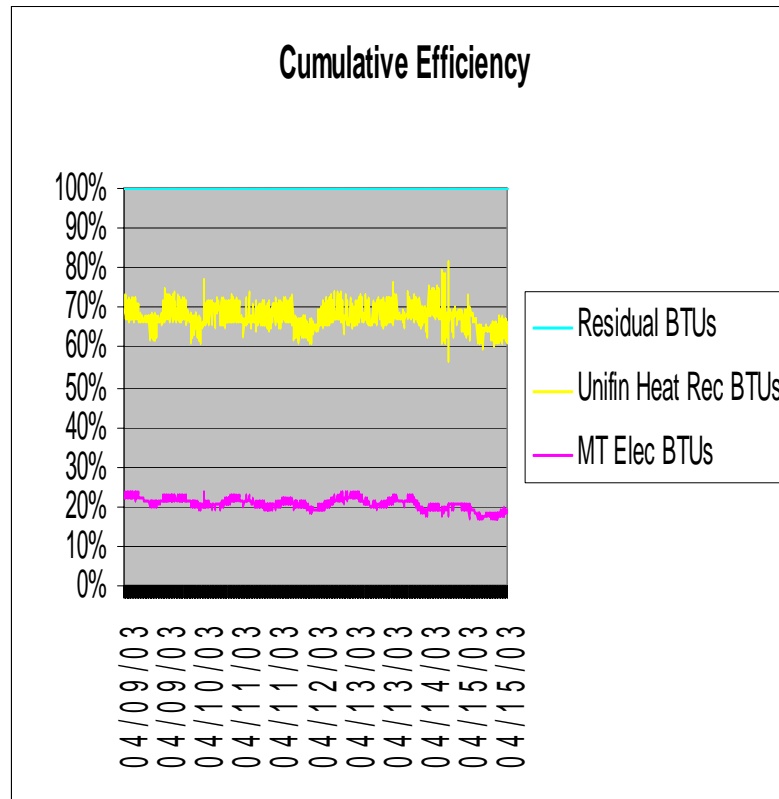


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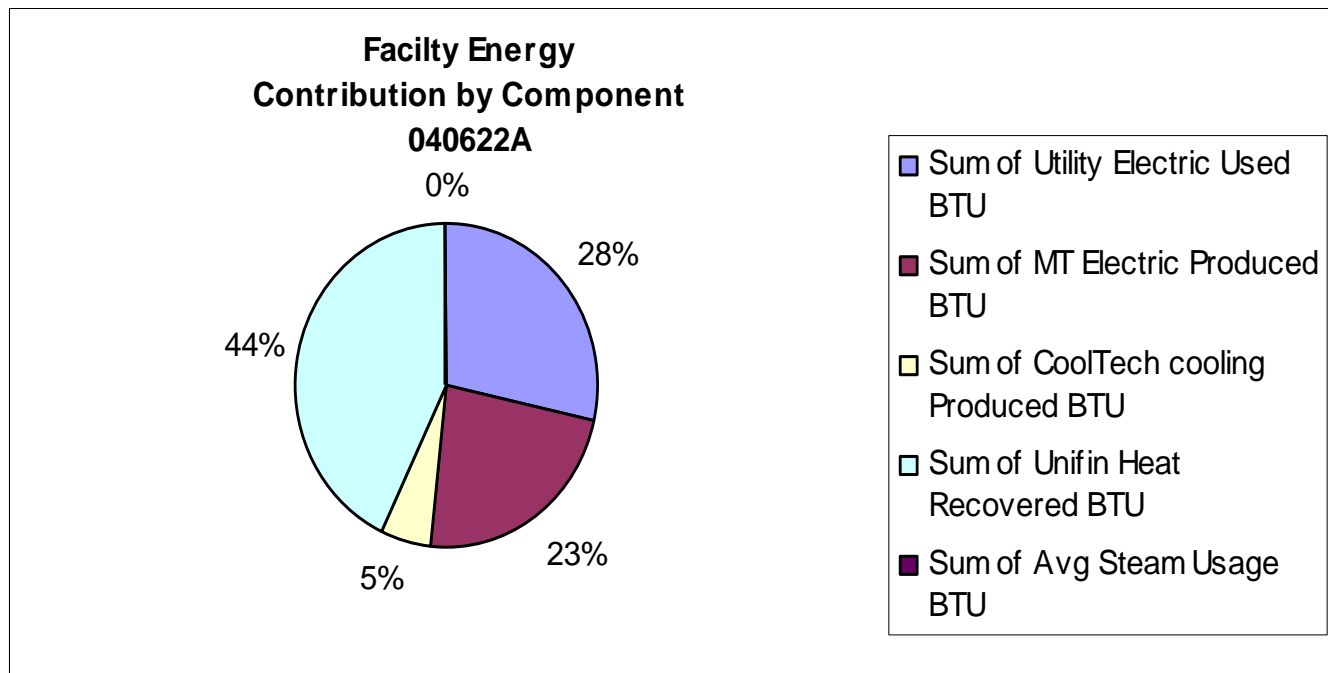
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- System Efficiency nearly 70%



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■ Energy Use by Component





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- Maintenance Considerations:
 - Expense of replacement parts;
Purchased extended 2 year warranties
 - Included CCS maintenance personnel in project for familiarization of equipment



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- Project Barriers:
 - Budget Constraints – Avoid use of CCS funds
 - Utility Negotiations – AEP more than willing to cooperate/assist in project
 - Mandatory Forms AEP – App. For Interconnection and Parallel Operation, Gen. Data Sheet, Net Energy Metering Service, Schedule GS3 – General Service Med./High load



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- Project Barriers cont:
 - Fees: AEP application - \$500, AEP pulse agreement \$700, Bidding costs - \$400
 - Administrative costs – Time & \$\$\$
 - Implementation of project in educational environment – necessary to secure equipment and reduce noise
 - Familiarity of technology with all involved



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- Future Steps
 - Data Collection
 - Energy and Economic Analysis
 - Case Study Development
 - Add New Features for Better System Control and Ease of Use