



PROCESSING AND ENVIRONMENTAL CATALYSIS

CLEAN ENERGY TECHNOLOGIES

CONVERSION OF LOW-GRADE WASTE HEAT TO ELECTRICITY

Pyroelectric R&D Consortium

The CANMET Energy Technology Centre-Ottawa is offering organizations an opportunity to join its Pyroelectric R&D Consortium to investigate the conversion of low-grade waste heat to electricity. The successful commercialization of this technology could result in significant energy savings and reductions in greenhouse gas emissions for producers of electricity and new product lines for manufacturers.

Background

Industry world-wide discharges over 100 tera (10^{12}) joules annually of low-grade waste heat (25°C to 250°C) from electric power stations, pulp and paper mills, steel works and petrochemical plants. A technology to recover or convert this low-grade waste heat to usable, high voltage electricity could save industrial sectors tens of millions of dollars annually, through increased process efficiencies and reduced fuel costs, while substantially reducing greenhouse gas emissions.

The CANMET Energy Technology Centre-Ottawa (CETC-Ottawa), a research arm of Natural Resources Canada, filed a patent application for a pyroelectric conversion process that converts low-grade waste heat to electricity.

CETC-Ottawa has been conducting bench-scale work since November 1997. To date, CETC-Ottawa scientists and engineers have estimated that conversion efficiencies between 15% and 28% (of Carnot Cycle efficiency) are possible even after deducting for various losses.

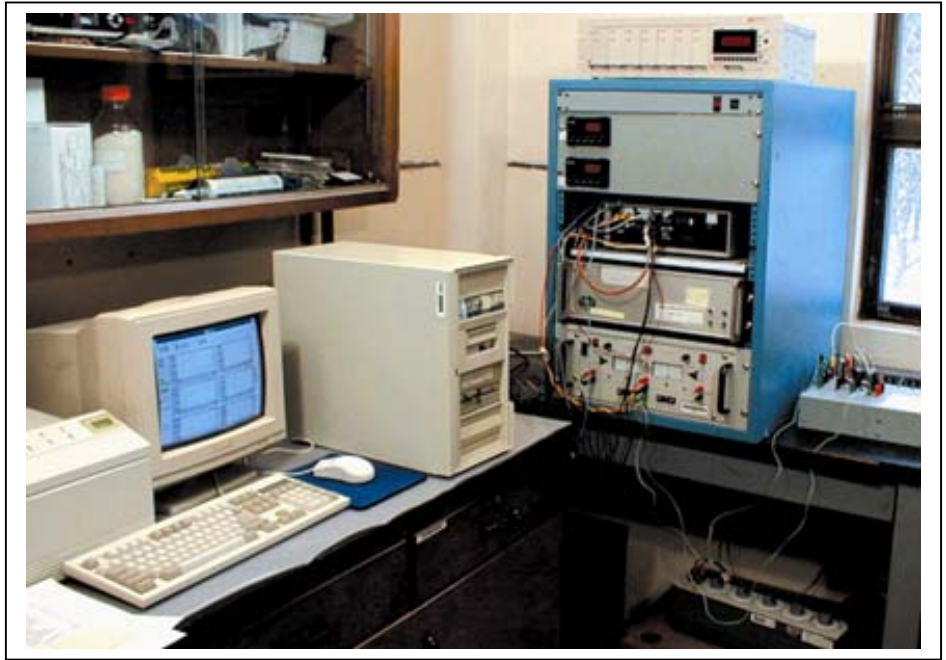
CETC-Ottawa is seeking private sector partnerships (minimum three year commitment) to co-finance on a 50/50 basis, Phase 1 of a seven-year R&D program to scale-up units from bench-scale (1 W) to pilot-scale (10-100 W).

Benefits of Pyroelectric Conversion

- Three to five percent of a waste heat stream can be converted to electricity;
- Electricity could be generated at between 3-5 ¢/kWh using pyroelectric conversion, with capital cost amortized over 20 years;
- Pyroelectric conversion units could be installed at between \$2000 and \$3000 (US) /kW;
- Reduced cost of cooling the low-grade heat waste streams before discharging; and
- Substantial CO₂ reductions in emissions are expected.

Annual membership fee per participant is thirty thousand dollars (\$30 000.00 US). When industrial field trials are successfully completed, CETC-Ottawa will either issue licenses on a preferential commercial basis to consortium co-sponsors to use the technology, or grant licensing and sub-licensing rights to licensors, ensuring preferential treatment is given to co-sponsors.

Membership in the CETC-Ottawa consortium will benefit manufacturers of heat exchangers and polymeric films and users and producers of electricity.





Above: Voltage control and data-logging section

Right: Pyroelectric convertor main





Your Invitation to Work with Us

We are interested in collaborating with you. Please contact the Business Office to discuss your particular needs.

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