

## FOR BOARD ACTION

Agenda Item # 5

Meeting Date: 5/29/07

**SUBJECT:** University of Minnesota – Rochester/RPU Research Project  
Hybrid Energy System Study (HESS)

**PREPARED BY:** Jim Walters, Director of Customer Relations

### ITEM DESCRIPTION:

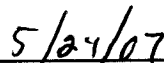
Overview...RPU approached the University of Minnesota – Rochester (UMR) in 2003 about researching the feasibility of combining a geothermal heat pump with a fuel cell. The idea was to determine if significant synergies, i.e., heated water from the fuel cell used in process with a geothermal heat pump, etc. are available. Phase I (completed in 2004) and II (completion projected for mid-2008) have and are documenting that the idea has merit. A HESS team was formed which includes the following: CDES, UMTC-Louise Goldberg PhD(Eng), UMR-Hal Ottesen, PhD, UMR-Jim Licari, PhD, and RPU employee Jim Walters EdD.

Next Steps...Planning for field application is divided into two initiatives: Evolution-I and II (EV-I & EV-II). Planning for real-time/in the field application, which is founded on completed Phase I and partial completion of Phase II HESS research, has matured to the point where the HESS team must begin working to secure the needed financing for EV-I. We are planning to launch EV-I by mid-2008. The HESS team will submit funding proposals to other entities such as the U.S. Department of Energy (DOE) beginning next month. At this time, the HESS team needs quantify RPU's commitment to EV-I and EV-II to show the gap in funding and the level of leverage for the project.

RPU management met with the HESS team and recommends that we continue to support HESS as detailed in the handout and listed briefly below:

1. Provide 2,500 square feet of laboratory space and 3,600 square feet of attached outside space (Westside Energy Site).
2. Provide \$200,000-\$350,000/year funding. This amount is dependent upon final calculations associated with the U.S. Department of Energy's grant request next month.
3. Estimate the value of anticipated RPU wind turbine by HESS Evolution I. This would be an in-kind contribution of \$400,000. However, exact details of how to include this value need to be discussed and confirmed with the University Sponsored Projects Administration. The value of the power supplied to the project by the wind turbine would be an in-kind contribution of \$100,000.
4. Provide operational data from the wind turbine estimated in-kind contribution of \$30,000.
5. Provide RPU in-kind contribution to monitor the energy use of a number of local residences (10 minimum) in the amount of \$40,000.

  
General Manager

  
Date

**ROCHESTER PUBLIC UTILITIES**

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Benefits to RPU Customers....Our customers expect RPU to provide them with renewable energy generation options. In addition, new state legislation is driving utilities to have 25% renewables by 2025. This research may provide utilities with a viable comprehensive pollution free source of electric and thermo energy for home and business energy needs. Further, the research could provide a significant means of meeting our expected Conservation Improvement Program (CIP) mandate to reduce sales in the future.

The financial benefits may be significant as well. The research could lead to significant royalties for RPU.

### UTILITY BOARD ACTION REQUESTED:

A motion from the Board is requested to:

1. Recommend that staff include in the 2008 RPU budget support for Evolution-I (EV-I) HESS research with in-kind contributions ranging from \$1.16 million to \$1.22 million and funding ranging from \$200,000 to \$350,000 per year over four years subject to Common Council approval of the electric utility budgets for these years.
2. Authorize RPU personnel to work with the University of Minnesota – Rochester in securing a grant from the U.S. Department of Energy to fund EV-I HESS research.

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General Manager

\_\_\_\_\_  
Date

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