

COMMISSION FOR HIGHER EDUCATION

Friday, February 10, 2012

DISCUSSION ITEM E: Boiler Plant Project (Geothermal) – Ball State University

Staff Recommendation

That the Commission for Higher Education discuss the following project: *Boiler Plant Project (Geothermal) – Ball State University*. Staff is continuing review and analysis of this project and will provide a recommendation at a later date.

Background

By statute, the Commission for Higher Education must review all projects to construct buildings or facilities costing more than \$500,000, regardless of the source of funding. Each repair and rehabilitation project must be reviewed by the Commission for Higher Education and approved by the Governor, on recommendation of the Budget Agency, if the cost of the project exceeds seven hundred fifty thousand dollars (\$750,000) and if any part of the cost of the project is paid by state appropriated funds or by mandatory student fees assessed all students. Such review is required if no part of the project is paid by state appropriated funds or by mandatory student fees and the project cost exceeds one million five hundred thousand dollars (\$1,500,000). A project that has been approved or authorized by the General Assembly is subject to review by the Commission for Higher Education. The Commission for Higher Education shall review a project approved or authorized by the General Assembly for which a state appropriation will be used. All other non-state funded projects must be reviewed within ninety (90) days after the project is submitted to the Commission.

The Trustees of Ball State University seeks authorization to proceed with the continuation of the Boiler Plant Project (Geothermal Project) by beginning Phase II. Original General Assembly authorization (2005) for the project was \$48 million and thus far \$44.9 million has been approved by CHE and the State Budget Committee. The expected cost of the project is \$3,100,000 and would be funded from 2005 General Assembly bonding authority. This project is pending review from the Commission for Higher Education.

Supporting Document

Boiler Plant Project (Geothermal) – Ball State University, February 10, 2011.

**BOILER PLANT PROJECT (GEOTHERMAL)
BALL STATE UNIVERSITY**

Project Description and Staff Analysis

Ball State University's central plant provides heating and cooling to buildings across campus through a district system. The heat has historically been provided by steam produced primarily by four coal-fired boilers that range in age from 54 to 71 years old. Chilled water is distributed to campus buildings to provide air conditioning, and is produced by five electric-powered centrifugal chillers.

Due primarily to the age of these system components, but also due to federal environmental regulations and additional capacity needs, the University began the planning several years ago for the replacement of its district system. Initial plans were for the replacement of the old boilers with more efficient and cleaner boilers and the purchase of additional chillers to provide more cooling capacity.

The 2005 Indiana General Assembly authorized Ball State University to issue \$48,000,000 in debt to proceed with the project. The Commission for Higher Education and the State Budget Committee subsequently reviewed and approved requests of \$3,100,000 for architectural and engineering consultants and \$41,800,000 for the purchase of a new boiler.

As a result of several factors, including increased world-wide demand for boilers, escalating prices for component parts, and stricter regulatory requirements, the University eventually concluded that the boiler replacement was not a viable option. Alternatively, the University began to explore the possibility of other options, ultimately deciding to implement geothermal heat pump technology on a district scale.

After working with scientists and engineers from the National Renewable Energy Laboratory (NREL) and the Oak Ridge National Laboratory, the University began to move forward with the geothermal system conversion. The new system would provide both heat and chilled water to the campus through the use of two district energy stations, four large capacity heat pump chillers, and nearly 4,000 boreholes connected by miles of loop piping and distribution piping. The geothermal system will eventually replace the coal fired boilers, reducing the University's carbon footprint by half and eliminating the dependence on coal.

With the State's approval, the University utilized the \$41,800,000 intended for the boiler purchase to begin the geothermal conversion project. Those funds, together with federal grant awards, R&R appropriations, and University funds, have allowed the University to complete Phase I of the project and begin Phase II. Phase I of the project will serve the northern portion of campus and consisted of approximately 1,800 vertical boreholes, a district energy station with two heat pump chillers, pump controls, miles of horizontal piping for hot and chilled water, and modifications to building systems. Phase II will address the southern portion of campus and include the same components. The \$3,100,000 remaining from the original bonding authority will allow the University to continue work on Phase II of the project.

