

UAF Combined Heat & Power (CHP) Plant: A Discussion on Financial Risks

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Why Important?

- The University of Alaska Fairbanks' heat and power plant provides electricity and steam heat to more than 3.1 million square feet of public facilities on the Fairbanks main campus. The plant's main coal boilers were put in service in 1964.
- The UAF main campus is home to billions of dollars in state infrastructure. It all rests on the foundation of an ever-aging heat and power plant.

What have we done?

- The university has examined a broad range of boiler replacement options, with an eye on both fiscal stewardship and environmental responsibility. A key requirement of any plant upgrade is that it provides **both heat and power** to campus. This cogeneration approach makes the most efficient use of the fuel.
 - Separate generation is about 52 percent efficient.
 - Cogeneration is at least 65 percent efficient.
- After extensive study, including advice from engineers and economists, and meetings with industry and environmental groups, UAF determined that a new solid fuel option made the most sense in terms of long-term operating cost and viability and reduced pollution.

- The proposal is to construct a major upgrade to the plant. The project would replace the existing coal boilers with two circulating fluidized bed boilers which would burn both coal and up to 15 percent biomass to generate up to 17 megawatts of power and enough steam to heat the campus. The university would retain its two existing backup diesel and gas boilers and will continue with campus energy conservation measures and exploration of renewable options. This plan will allow the university to meet its energy needs for the next 50 years and nearly eliminate the need to purchase higher cost electricity from Golden Valley Electric Association.

What will be the cost?

The total project cost for the upgraded plant is \$245 million. Because fuel costs are lower with the new boilers and plant upgrade, UAF could afford to finance up to \$50 million of the project and cover that annual payment with the money saved annually in fuel costs.

What are the consequences of plant failure?

The consequences, should all or parts of the plant fail, would be financially devastating to the university and state:

- UAF could be forced to switch to oil-fired heat and electricity, increasing annual fuel costs from approximately \$9.8 million per year to in excess of \$33 million per year.
- If the plant were to fail during the winter, there is real danger of freeze-up, academic mission failure around UAF, and significant damage to every facility on the Fairbanks campus, including research. Purchasing electricity from GVEA does not provide heat to rapidly cooling buildings.
- Diesel boilers provide backup when maintenance is needed on the coal fired boilers. Cost of diesel has gone up, so cost for diesel for 2 weeks is projected at \$350,000; for a full year for both boilers cost of diesel is projected at \$20M.

Various financial options to fund the power plant?

We are exploring many financing options. We have discussed various approaches with the Governor's OMB, Senate Finance leadership, Department of Revenue, Legislative Finance, and these discussions will continue. Options discussed include:

- Traditional state capital budget request with UA revenue bond funded via future fuel savings – as included in the request. The cost of the CHP major upgrade is \$245M, UAF fuel savings of \$4.6M annually is sufficient to fund \$50M of the \$245M.
- A 50 year no-interest state loan to be funded with future fuel savings plus modest reallocation (\$4.9M annually) – in discussion thus far this is not supported by Governor's OMB, Legislative Finance, Senate staff.
- A Public Private Partnership – there are significant tax liabilities that increase the cost dramatically thus this isn't viable without legislative changes which are not prudent to pursue at this time.
- Reconstituting the UA Heating Corporation – a non-profit entity for bond financing may help with financing options and/or sources such as AEA/AIDEA
- State GO Bond – depending on the politics during the session a GO Bond may surface as the funding vehicle.

Fall-back financial option in case no funding is available from the state?

- UAF doesn't believe there is a fall-back plan for capital funding. Upgrading a utility plant is not a project likely to appeal to private philanthropy. Although UAF has additional unused bond capacity, UAF would need to make bond repayments from its operating budget, and given revenues are already not keeping pace with fixed costs, UAF does not feel incurring an additional fixed cost is prudent.
- UAF would therefore continue operating the existing plant, working to stay abreast of major maintenance issues, hoping that significant operating problems do not arise in the near future. The risk register provided explains the potential operating budget issues that might arise with this approach

Fall-back options in case only partial funding is available from the state?

Partial funding increases the fiscal risk of the project, as the project cannot be managed holistically. Permitting was the first step and nearing completion. The next step is to solicit bids for the major piece of equipment and design a building to enclose and protect them. The cost of this next step is between \$75 and \$100M. UAF is not in a position to bond the first portion of a phased approach as completion of the project must be assured for UAF to achieve the fuel savings, which will be the source for the bond payment.

Why the power-plant was not put on deferred maintenance/ replacement/ upgrade earlier?

- The CHP has been on UA's capital lists consistently starting in the early 2000's. More recently, because of the size of the project it was submitted as a stand-alone project request separate from the overall DM/R&R lists.
- The CHP project has been part of Board capital budgets starting in 2008.

- Permitting was the first step (\$3M primarily from a 2012 DM Debt), Initial design was requested last year to begin after permitting (design not funded). This year's request includes design and construction. The decision to request the full amount is financially most prudent and was influenced significantly by the advise of Senate Finance leadership and Legislative Finance.
- The CHP has been identified as the UA system top risk since 2010, and a project status update has been provided regularly in Board meetings.

Do other universities operate their own heat and power plants?

Yes. There are more than 500 schools, colleges and universities with combined heat and power plants, including Auburn University, Colorado State University, Iowa State University, Northern Arizona and Princeton University, which was recently recognized for providing power and heat during Hurricane Sandy.

What happens if the university can't get funding to upgrade the plant?

Without a major upgrade to the plant, UAF will need to spend \$35 million in the coming years on temporary patches to the system as it approaches the end of its useful life. The patches would keep the plant going for a little while longer if construction on the upgraded plant does not begin soon, but would still not guarantee continued operation. A large portion of those costs would go toward replacing the pipes inside the main boilers, which would not be transferable as part of an upgraded plant. The pipes will need to be replaced by 2015 if the plant upgrade project is not underway.

Why not build a gas plant instead?

We did examine both the operating and fuel costs of a gas option. The capital costs for a gas plant are lower, however gas is a more expensive fuel than coal. All of our models are just that—models—because there is currently not a reliable source of gas available. Using today's prices, our fuel costs with the new boilers would be about \$5.3 million each year. The current cost estimates for natural gas, should it be available in Fairbanks, would be about triple that. Until a lower-cost, reliable supply of gas becomes a reality in Fairbanks, a gas option is not viable

Why can't UAF just buy power from GVEA?

UAF's plant provides heat and power for campus. All of the campus buildings depend on steam from the plant to keep them warm in the winter and cool in the summer. Purchasing electricity would keep the lights on, but not supply the heat.