

## **Saving Waste Heat - Is It Worth It?**

The coal-fired plant at Belledune was recently recognized by an industry group as one of the most economic coal-fired generators in North America. To improve on this success, NB Power is trying to decide whether to install some new equipment at the Grand Lake coal-fired plant. The equipment will recover waste heat that normally goes up the smokestack with the emissions. They've hired you as a consultant to help them with the decision. "Economizers" added to coal-fired boilers use hot flue gas to preheat water for the boilers. Heat "exchangers" can be installed with along with some required air pollution control equipment that they also plan to install. The "exchangers" will remove heat from hot flue gas and recycle it to heat the boiler plant. Reducing the temperature of the hot flue gas will protect the air pollution control equipment. Both economical and environmental factors must be considered when making a decision concerning the purchase and installation of this equipment.

### **Economic Issues**

The plant burns 150,000 tons of coal in an average year. Under its current contract, the company has been paying \$102.71 for a ton of coal. The "economizers" will save 850 tons of coal annually. The "exchangers" will save 325 tons of coal annually. The total cost of buying and installing the equipment is \$1,250,000.

1. If the equipment is installed, the amount of coal the company must buy each year will be reduced. Calculate the annual savings for each piece of equipment separately and for both of them combined. Show your work.
2. How long will it take the company to recover the cost of the equipment?
3. In addition to the savings from the reduction in coal used, how might the installation of the heat equipment save money?

### **Environmental Issues**

4. List four or five environmental impacts (positive or negative) associated with this project.
5. What is your position on the purchase and installation of this equipment? Justify your position.