

Industry: Fertilizer Manufacturing

Owner: The J.R. Simplot Company

Location: Pocatello, Idaho

Capacity: 15.9 MW

Average Capacity Factor: ~ 52%

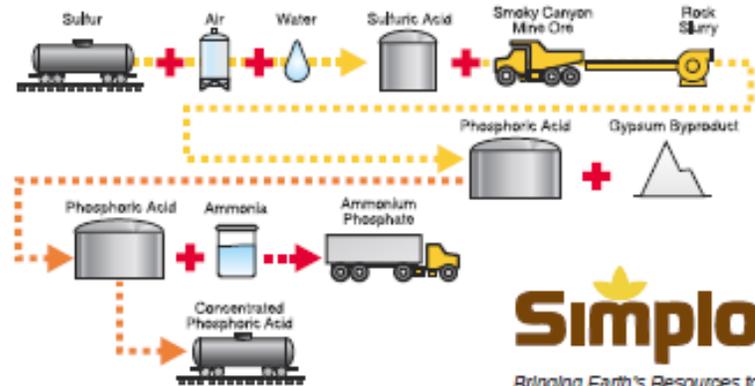
Annual Energy Output: 72,000 MWh
per year

Use of Electrical Energy: Sold back
to utility

Equipment: Heat recovery boiler, Westinghouse 15.9 MW Steam turbine

Commercial Operation: 1987

How We Make Fertilizer



Project Description

J.R. Simplot's sulfuric acid and phosphoric acid manufacturing are collocated in their Pocatello, ID manufacturing facility. The excess heat produced in the exothermic sulfuric acid process is piped to the phosphoric acid plant, where it is used in the production of dry and liquid phosphate and nitrogen fertilizers, feed phosphates, and purified phosphoric acid. Excess heat from the sulfuric acid plant is converted to steam in a waste heat boiler. Most of the steam is then used in the phosphoric plant to produce phosphate products. The excess steam is utilized to drive steam turbine connected to a generator.

J.R. Simplot installed the waste heat to power system as a cost saving measure in 1987. Rather than venting the excess heat from the manufacturing process to the atmosphere, the plant utilizes the



The Heat is Power Association is the trade association of the Waste Heat to Power (WHP) industry. The not-for-profit organization is committed to educating decision makers and the public about the characteristics of waste heat to power as a source for emission-free electricity and an economic driver for global competitiveness. The Heat is Power Association promotes the efficient, industrial use of emission-free electricity generated through WHP processes. To learn more, visit www.heatispower.org.

waste heat to produce power with no additional fuel and no additional emissions. It is more cost effective for the plant to sell the electricity it produces back to the utility, than it is to use it onsite, so J.R. Simplot sells the power to the grid at the avoided cost rate and purchases electricity from the utility at the lower industrial rate. The cost savings from this waste heat to power project are \$3,800,000 per year. Environmental benefits include 50,800 metric tons of CO₂ emissions per year avoided.

Because J.R. Simplot does not rely on the electricity it produces to run its operations, it does not need to maintain a constant supply of waste heat (in the form of steam) to the WHP system. Therefore, the waste heat to power system generates electricity when excess steam is available, and does not produce much or any electricity if all steam produced is needed in the manufacturing process or if the manufacturing process is not running.

Operational Benefits

- Uses an onsite waste product that had principally been vented as waste heat

Economic Benefits

- Electricity produced is sold to the grid, creating income for J.R. Simplot

Environmental Benefits

- Generates about 72,000 MWh per year emission-free electricity
- Avoids the production of 50,800 metric tons of CO₂ per year, the amount of CO₂ the utility would produce to generate 10MW of electricity, which is equivalent to taking 10,583 cars off the road or 6,989 homes off the grid for one year, or not burning 218 railcars of coal or 118,139 barrels of oil or 2,116,662 cylinders of propane.



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