

Storage of dry industrial products at a Simplot facility. *Photo courtesy of Simplot*

Idaho Office of Energy Resources and DOE Demonstrate the Value of Strategic Energy Management through a Pilot Project at the J.R. Simplot Company

The J.R. Simplot Company hosting two onsite energy engineers helped to save nearly \$3 million in energy costs within the first year.

With \$5.6 billion in annual sales, the J.R. Simplot Company (Simplot) is one of the largest privately held food and agribusiness firms in the nation, producing frozen foods, fertilizers, seeds, agriculture services, and beef cattle.¹ Simplot is headquartered in Boise, Idaho, and has 16 industrial facilities in 9 states. Eight of the facilities are agribusiness plants focused on mining and fertilizer manufacturing, and the other eight are part of Simplot's food processing business, specializing in potato and other frozen food processing.

Energy at Simplot

In 2009, Simplot's facilities consumed more than 9.5 trillion British thermal units (Btu), with associated energy expenditures of nearly \$100 million (for natural gas, electricity, diesel, butane, coal, and propane).² Equipment and processes within Simplot's industrial facilities use steam and refrigeration systems, air compressors, and process heating.³ Within the food processing plants, the most energy-intensive pieces of equipment are the boilers (or steam systems)—which typically use natural gas—while the refrigeration systems comprise the largest electrical loads.⁴ In the agribusiness plants, pumping systems are the largest users of electricity at both their mines and chemical plants. At the chemical plants fans are also large consumers, while diesel engines are large energy-users at the mines for handling/moving earth.⁵

For this reason, Simplot has been aggressively tackling energy use since 2000. In the early years, Simplot participated in several energy assessments (also known as audits). At least 8 of the company's industrial facilities received a total of 13 energy assessments.⁶ For example, an assessment conducted at one of Simplot's fertilizer plants in 2006 resulted in steam system energy efficiency improvements that produced \$338,000 in annual energy savings.⁷

When it comes to energy, Simplot is a leader in efficiency and conservation. The company engages its employees in best

practices that reduce Simplot's energy footprint and capture opportunities in its industrial processes.⁸ This company-wide mindset has built a longstanding partnership with the Idaho Office of Energy Resources (OER) and the U.S. Department of Energy (DOE). Simplot has worked with the state and federal government for over a decade to identify industrial energy-savings opportunities by leveraging financial and technical resources to deploy energy-saving technologies and practices.

Simplot also established energy teams at all of its industrial facilities, each of which is led by an employee who has volunteered to be the "energy champion." Each team was given the liberty to decide how it would operate, but Simplot encouraged them to meet at least monthly to focus on energy issues and opportunities.⁹

Simplot and OER serve together on the Board of Directors for the Idaho Strategic Energy Alliance—a public-private effort focused on improving the energy future of Idaho.¹⁰

In 2009, Simplot joined the Better Plants Program—a DOE initiative driven by companies that establish a voluntary goal to reduce their energy intensity by 25% over a 10-year period.

Opportunity Knocks

Although Simplot had identified significant cost-saving improvements through energy assessments, the company did not have the full-time personnel available to undertake all of the energy efficiency projects. OER had identified this as a considerable barrier for many industrial facilities.

In 2009, OER was awarded a DOE grant funded through the American Recovery and Reinvestment Act of 2009. As part of the grant, OER decided to undertake a pilot project that aimed to demonstrate the value of in-house energy engineering expertise at Simplot. The pilot set out to prove that the engineers could save the company twice as much as the annual cost of its services by implementing energy efficiency.¹¹

The grant funding provided \$179,000 to Simplot over an 18-month period for the pilot. Simplot cost-shared the full cost of staffing the two energy engineers—\$422,625—including salary, benefits, travel expenses, etc.

The pilot project began in the spring of 2010¹² when Simplot hired two professional engineers—Mark Lynn and Don Strickler. Both men had significant operational experience with Simplot, which helped ensure that they understood the business and facilities. Mr. Lynn was to focus on Simplot's eight agribusiness facilities and Mr. Strickler on the eight food processing facilities.

Mr. Lynn's background is in chemical engineering. He had worked for Simplot for nine years in food processing before being selected to participate in the pilot.

Mr. Strickler's background is in electrical engineering. He had worked for Simplot for 12 years in food production processes before being selected to participate in the pilot.



Engineers evaluate equipment lifecycles. Their efforts have resulted in an improved efficiency culture at Simplot.
Photo courtesy of Simplot

Energy Engineers at Work

Simplot's new energy engineers immediately began tackling their responsibilities by establishing a set of initial priorities, which included the following:

- Achieving full integration with each facility's energy team
- Improving partnerships with local utilities
- Conducting a thorough review of data and recommendations from previously completed energy audits
- Initiating capital planning and project management
- Coordinating a public relations campaign to communicate internally and externally about accomplishments.

As part of the pilot activity, Mr. Lynn and Mr. Strickler documented their work in detail throughout the grant period. This thorough account of results was critical for enabling Simplot to determine the cost-effectiveness of employing energy engineers in order to justify their need as permanent positions.

An early action item was to conduct a detailed review and analysis of each facility's utility bill. Before these new energy engineer positions were created, the accounting department would receive the bill and pay it quickly. The simple step of looking at Simplot's energy bill readily resulted in the identification and elimination of a \$175,000 error for the Rock Springs, Wyoming, facility.¹³

Next, the two identified a set of energy projects that could be pursued immediately without additional study beyond the completed energy assessments—pending availability of capital. For instance, purchasing a new motor or boiler with higher efficiency or installing higher-efficiency lighting.

In addition to managing the technical, energy-related aspects of the projects, the two engineers also manage the business aspects of the projects, including soliciting approval for capital expenditures and securing buy-in from facility managers and corporate leaders.

Some energy projects, however, do not require capital investment. One example is Simplot's "leak-tag" program, which involves employees identifying leaks in compressed air or refrigeration pipes and reporting the issue to maintenance. Although the program had existed for a number of years before the energy engineers came on board, each facility experienced varying degrees of success, and the program at many plants was reinvigorated by the energy engineers. **This "leak-tag" program saved an estimated \$448,253 in cumulative energy costs by mid-2011 at Simplot's Caldwell, Idaho, facility alone.**¹⁴

For the three fiscal years since joining the Better Plants Program (September 2009–August 2012), Simplot has achieved energy savings of 1.3 trillion Btu within its industrial facilities.¹⁵ In addition, since 2009, more than 10 of Simplot's industrial facilities have reduced their energy intensity by more than 5%,¹⁶ and **5 facilities have already met their DOE Better Plants Program goal by achieving a 25% energy-intensity reduction well in advance of the 10-year target.**¹⁷

New Compressors at Moses Lake

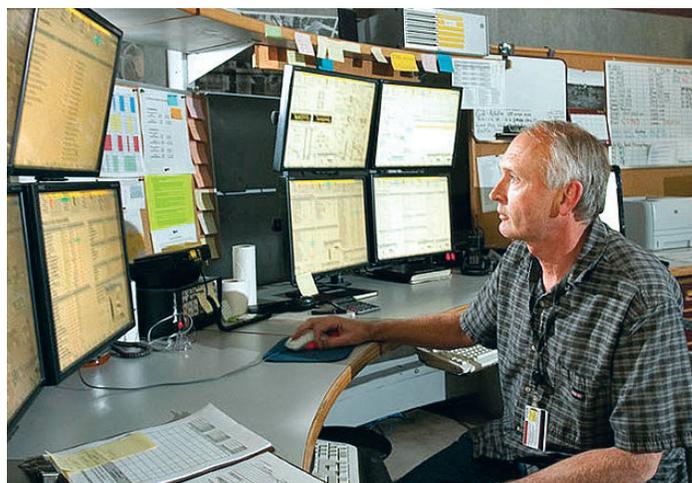
Simplot's Moses Lake, Washington, plant processes a variety of potato products, including hash browns and french fries.

Mr. Strickler helped complete a project at this site that replaced a packaged two-stage refrigeration compressor system with two independent compressors that are piped into the existing, efficient two-stage system.

A maintenance issue necessitated the replacement of the two-stage refrigeration compressors, which presented Simplot with the opportunity to install the two independent compressors with controls. This project allowed for greater control of the system so that the vapor could be saturated rather than superheated.

Before implementing the project, Mr. Strickler worked with the facility's utility—Bonneville Power Administration (BPA)—to demonstrate eligibility for an \$187,863 energy efficiency rebate for the project.

The project was completed in 2011 with BPA verifying energy savings of 861,282 kilowatt hours per year, saving the company almost \$12,000 in annual energy costs.



Operational details are monitored around the clock at Simplot plants. *Photo courtesy of Simplot*

VFD Fan at Simplot's Don Plant

One of the first projects that Mr. Lynn championed as the new energy engineer for Simplot's agribusiness facilities involved upgrading a granulation 3-scrubber fan to a variable frequency drive (VFD) fan at the company's Don Plant. The plant, which produces high-quality phosphate fertilizer and feed phosphates, was constructed in 1944 in Pocatello, Idaho, and was the first fertilizer production facility built by Simplot.

The VFD fan was installed on a 450-horsepower motor that drives a fan. The fans blows air through a scrubber system that cleans the air before it is discharged to the atmosphere. Previously, the fan had a damper on it. The VFD allows Simplot to open the damper and run the fan slower, operating efficiently without using any more power than is necessary to perform the task. The project had been identified by Cascade Energy as an opportunity. Energy efficiency incentives from Idaho Power—totaling \$46,000—helped to make the payback period on the VFD project more attractive.

Mr. Lynn was able to get the project approved internally by Simplot and completed the required forms for receiving the incentives from Idaho Power. The project was completed in 2011 and is projected to save 384,379 kilowatt hours per year, which will save the company approximately \$14,197 in annual energy costs.

Proven Value through Energy Savings

In the pilot project's first year, Simplot saved 318,359 million Btu—enough energy to power 35,400 homes for a year—and eliminated more than 95 metric tons of greenhouse gas emissions—equivalent to removing almost 30,000 cars from the road for a year. The associated cost savings for Simplot was nearly \$2.9 million.¹⁸

A simple benefit-cost analysis shows that every dollar Simplot spent on the costs of the energy engineers resulted in \$10.28 in energy savings for the company.

Endnotes

- ¹ J.R. Simplot Company. (2012). "J.R. Simplot Company Sustainability Summary." Available at http://www.simplot.com/fileUploads/sustainability_report.pdf.
- ² Don Sturtevant, J.R. Simplot. *Energy Efficiency Engineer Business Case*. October 3, 2011, p. 4.
- ³ "Large Plant Assessments." (2013). U.S. Department of Energy, Advanced Manufacturing Office. Available at <http://www1.eere.energy.gov/manufacturing/assessment/default.aspx>.
- ⁴ Conversation with Don Strickler of J.R. Simplot on May 10, 2013.
- ⁵ Conversation with Mark Lynn of J.R. Simplot on May 22, 2013.
- ⁶ "Large Plant Assessments." (2013). U.S. Department of Energy, Advanced Manufacturing Office. Available at <http://www1.eere.energy.gov/manufacturing/assessment/default.aspx>.
- ⁷ "Steam System Efficiency Optimized After J.R. Simplot Fertilizer Plant Receives Energy Assessment." (2008). U.S. Department of Energy, Advanced Manufacturing Office. Available at http://www1.eere.energy.gov/manufacturing/tech_assistance/pdfs/42788.pdf.
- ⁸ J.R. Simplot Company. (2012). "J.R. Simplot Company Sustainability Summary." Available at http://www.simplot.com/fileUploads/sustainability_report.pdf.
- ⁹ Conversation with Don Strickler of J.R. Simplot on May 10, 2013.
- ¹⁰ "Members." (2013). Idaho Office of Energy Resources, Idaho Strategic Energy Alliance. Available at <http://www.energy.idaho.gov/energycastle/members.htm>.
- ¹¹ U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Industrial Technologies Program. (2009). "Idaho Save Energy Now - Industries of the Future." Available at https://www1.eere.energy.gov/manufacturing/states/pdfs/idaho_save_energy_now.pdf.
- ¹² Don Sturtevant, J.R. Simplot. *Energy Efficiency Engineer Business Case*. October 3, 2011, p. 5.
- ¹³ Don Sturtevant, J.R. Simplot. *Energy Efficiency Engineer Business Case*. October 3, 2011, p. 37.
- ¹⁴ Email communication with Don Sturtevant of J.R. Simplot on June 16, 2011.
- ¹⁵ J.R. Simplot Company. (2012). "J.R. Simplot Company Sustainability Summary." Available at http://www.simplot.com/fileUploads/sustainability_report.pdf.
- ¹⁶ Robert Bruce Lung, Alliance to Save Energy, "U.S. CEEM Members in Action: J.R. Simplot Company," January 7, 2013. Available at <http://www.ase.org/efficiencynews/us-ceem-members-action-jr-simplot-company>.
- ¹⁷ Phone conversation with Don Sturtevant of J.R. Simplot on May 6, 2013.
- ¹⁸ Don Sturtevant, J.R. Simplot. *Energy Efficiency Engineer Business Case*. October 3, 2011, p. 6.

For Simplot, the conclusion of this pilot program has been very easy to decipher—the energy engineers more than amply paid for their own salaries through the energy savings they helped the company achieve.

Not only did Simplot decide to keep the two energy engineers on staff in their new roles permanently after the grant period ended, but Simplot also decided to invest in employing a third energy engineer at its Smokey Canyon facility in Afton, Wyoming, by utilizing an incentive offered by the Bonneville Power Administration. Simplot is also actively considering hiring additional full-time personnel who would be dedicated to steam, refrigeration, and compressed air systems.

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For more information, visit: <http://energy.idaho.gov/> August 2013

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