



## Resource List: Mine Operations Energy Efficiency

Technology is advancing quickly and your operations team can take advantage of opportunities to save energy and money and increase profitability for your facility.



### Did you know?

An LED lighting retrofit can save money over the long term in several ways:

- Reduce maintenance time - fewer replacements
- Reduce lamp disposal costs - fluorescent lamps contain mercury, LEDs do not
- Lower utility bills - save energy

Installing Variable Frequency Drives (VFDs) on selected equipment motors, such as ventilation fans and belt drives, can:

- Increase motor and equipment life
- Reduce maintenance
- Lower utility bills -save energy

### Where Can I Find More Information?

- DMME – is your first stop to improve operational energy efficiency. Contact [Nick.Polier@DMME.Virginia.gov](mailto:Nick.Polier@DMME.Virginia.gov) in Big Stone Gap or [Dan.Farrell@DMME.Virginia.gov](mailto:Dan.Farrell@DMME.Virginia.gov) in Richmond.
- [Genedge Alliance](#) – Provides business solutions and consulting services to Virginia businesses.
- [Industrial Assessment Centers](#) – IACs provide no-cost energy, productivity and waste assessments to small and medium sized firms. East Tennessee State University and North Carolina State University offer services in Virginia.

**Case Study** *(Help us find a Virginia Case Study: Contact Nick or Dan)*

**Freeport McMoRan Inc. (FMI) Sierrita Mine** is a surface copper and molybdenum mine south of Tucson, Arizona. The company's mine conveyors, which ran parallel to each other, were driven by maintenance-intensive, inefficient, high torque, 600 hp wound-rotor AC motors and direct gear drives. The facility installed replacement drives based on high-efficiency 600 hp AC motors as well as new hydraulic couplings/drives that eliminated the need for the wound-rotor motor's high startup torque capability.

Energy savings were based on pre- and post-metered data collected through the customer's supervisory control and data acquisition (SCADA) system. The measurement period occurred over several months to establish a baseline on the pre-retrofit configuration and over several weeks after project completion. Tonnage conveyance rates were consistent for both pre- and post-retrofit operation. The energy savings realized by this project is primarily from one for one replacement of five relatively low efficiency 600HP motors with high efficiency 600HP motors on overland conveyors along with new drive components that complimented the new motor startup characteristics.

Project	Annual Energy Savings	Demand Reduction	Percentage Savings vs Baseline	Estimated Annual Energy Cost Savings
Overland Conveyor Upgrade	1,778,578 kWh	219 kW	16%	\$108,500

**The Hycroft mine** in Nevada encompasses approximately 72,000 acres and operates 24/7. The facility mines gold using an open pit heap leaching process. As a part of a renovation and expansion of the site, the facility installed 80 Watt interior and exterior light-emitting diode (LED) lighting at the new facilities, rather than the 250 Watt metal halide lighting seen at most mine sites. LED lighting was chosen for both interior and exterior crushing operations due to its superior energy efficiency, significant quality improvement, greater durability in the harsh environment, and longer useful life. Annual energy savings: 708,910 kWh.<sup>1</sup>

Project	Annual Energy Savings	Demand Reduction	Percentage Savings vs Baseline	Estimated Annual Energy Cost Savings
LED Retrofit	708,910 kWh	135 kW	72%	\$49,600

<sup>1</sup> McGinley, Karen, et al. "Striking Gold: How Innovations and Productivity Improvements in the Mining Industry Leverage Energy Efficiency Technologies." American Council for an Energy-Efficient Economy, 2010, [aceee.org/files/proceedings/2015/data/papers/6-210.pdf](http://aceee.org/files/proceedings/2015/data/papers/6-210.pdf).