

PNM Business Energy Efficiency Programs



Variable Speed Drives



Upgrade and Save

To help your company install energy-efficient VSDs, the PNM Business Energy Efficiency Program offers specific rebates for VSDs installed on HVAC fans and pumps, and custom rebates for VSDs installed on non-HVAC loads. Energy savings after VSD installation are often significant, so payback time can be short.

- Consider VSDs for pumping applications that range from 1-1,000 horsepower; the higher the horsepower, the more cost-effective the VSD installation.
- Centrifugal loads with variable-torque requirements, such as centrifugal pumps or fans, have the greatest potential for energy savings.
- Identify large motors that operate for long periods of time or those that are production-critical; they offer the best energy-savings opportunities.

PNM Business Energy Efficiency Programs offer rebates that lower the cost of upgrading to new energy efficient equipment. The rebate can reduce project costs and shorten your project payback period. Depending on the scope of the project, hours of operation, and size of facility, you could see significant savings.

**Don't leave money on the table!
Reserve rebates for your facility today.**

Energy Profile

Businesses with large electric loads, large equipment and variable processes are prime candidates for the benefits of variable speed drives (VSDs). Water pumping stations, HVAC systems and manufacturers that use compressed air systems can save energy and money by installing VSDs on electric motors. Applications where energy load requirements vary are prime candidates. Examples include centrifugal pumps with variable torque loads and systems with fans and blowers.

Equipment Facts

Every day, millions of motors are hard at work operating everything from winding machines in aluminum mills to ventilation systems in office buildings. Motors drive the pumps that bring water to Santa Fe via the Buckman Direct Diversion project and pull air through filter stages in clean rooms to remove contaminants. In the manufacturing sector, half of all the electricity consumed is used to power electric motors. By some estimates, 90% of the motors in the world are not equipped with drives. Those statistics add up to energy-efficiency opportunities that you could be taking advantage of today.

How It Works

Motors operate at a specific speed but are often throttled or fluctuate on and off to meet requirements, wasting significant energy and increasing demand charges. Regulative airflow may reduce the air speed through a duct, but the speed of the motor remains unchanged. VSDs control the rotational speed of motor-driven equipment, adjusting the motor's speed to match actual demand. In situations where motors don't run when they aren't needed, energy consumption can be reduced by 20-50%. VSDs are reliable, small changes reap large benefits, payback time can be short, and your project may qualify for rebates from PNM.



Pumping Systems

Most pumps operating today are oversized. Pumps are usually designed to meet maximum system demand; therefore, they rarely operate at full capacity. When throttling valves are used to control flow, the result is a loss of efficiency. However, energy-efficient VSDs can be installed in place of throttling valves. VSDs provide efficient flow control by varying the pump's rotational speed. Even small decreases in speed or flow can significantly reduce energy use: reducing the speed by 20% can reduce input power requirements by approximately 50%.

Why Improve Energy Efficiency?

- 1 Cuts operating and maintenance costs and improves profitability.
- 2 Savings can help finance future improvements.
- 3 Improves customer and staff satisfaction.
- 4 Distinguishes your business as caring about environmental sustainability.
- 5 Helps you remain competitive in an ever-changing business landscape.

Good Neighbor Fund

The PNM Good Neighbor Fund is a program that helps income-qualified New Mexico families pay their electric bills during times of hardship. The fund is supported by donations from PNM customers, employees, and shareholders, and has supported thousands of households across the state. You can make a meaningful impact by donating all or a portion of your Energy Efficiency Program incentive to the Good Neighbor Fund. Simply submit your energy efficiency project through [PNM's Business Energy Efficiency Program Online Application](#) and choose to allocate all or a portion of your incentive to the Good Neighbor Fund. It's a simple way to give back while supporting your sustainability goals.

Learn More

Visit PNMenergyefficiency.com
Call 505-938-9400
Email energyefficiency@pnm.com

Find a Contractor

Visit PNMenergyefficiency.com/findacontractor to view a complete list of Program Authorized Contractors.

Variable frequency drives (VFDs) are the most common type of VSD in use today. Besides energy savings, VFDs offer "soft-starting" capabilities, which reduce thermal and mechanical stress on belts and other parts, decreasing maintenance costs. VFDs also reduce voltage fluctuations that can occur when starting large motors, improving system reliability.

Doing the Math

Due to the mechanical features of fans and pumps and what are called the "Affinity Laws", small decreases in equipment rotating speed or fluid flow result in substantial reductions in power consumption. Energy savings associated with the reduction in speed are cubed, which adds up to significant energy cost savings, especially when large horsepower motors are involved. In hydraulics and air flow, the affinity laws express the relationship between the variables involved in fan and pump performance and power. The law is expressed as a ratio of the horsepower (hp) to the cube of the speed:

$$Hp2 / Hp1 = (RPM2)^3 / (RPM1)^3$$

So if the speed of a 10 Hp motor is reduced 20% the formula becomes:

$$Hp2 = (8,000)^3 / (10,000)^3 \times 10Hp$$
$$Hp2 = 5.12 Hp$$

And the new horsepower needed to run the fan is nearly cut in half!

Small decreases in equipment rotating speed or fluid flow equal significant reductions in energy use. The affinity laws apply to pumps, fans and hydraulic turbines and are for both centrifugal and axial flows.

Transportation Electrification Program

The PNM Transportation Electrification Program offers rebates and resources that make it simple for you to install qualified EV chargers at residential and commercial locations. Visit ev.pnm.com for the latest information on charger qualifications, installation assistance, and rebates available.

