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### 5 Steps to Implementing Variable Frequency Drive continued

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**4. Provide protection.** Address power quality issues. Protect the VFD using surge protection (internal and external) and fuses (not circuit breakers). Protect the upstream circuit from harmonics by using line reactors, phase-shifting transformers, multi-pulse drives, or harmonic filters. Upgrade to inverter-duty motors or use grounding brushes on legacy motor shafts.



**5. Set things right.** Choose optimal control settings. High switching frequencies provide a cleaner sine wave output and quieter operation, but produce more heat in the VFD enclosure. Choose the appropriate control mode: volts-per-hertz or sensorless-vector. Set restart delay to avoid cycling the input power more than once every two minutes. Run auto-tune for motor capability.

Implement a preventive maintenance plan that keeps VFDs clean and dry with tight wiring connections. By taking a systematic approach, you can optimize motor performance – one step at a time.

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## New Incentives Available for Building Electrification Efforts

Silicon Valley Power is committed to reducing greenhouse gas emissions, improving the environment, and supporting energy efficient technologies. As a part of our efforts, we have expanded our program offerings to provide generous rebates for reducing the use of natural gas-fired equipment through the installation of energy efficient all-electric equipment.

### Custom Measure Rebates

Rebates are available for installing heat recovery chillers and heat pump pool heaters. Chillers dissipate heat to their surroundings through a condenser. A heat recovery chiller captures this dissipated heat, which is then redirected for various heating needs, saving heating energy. Ideal sites have simultaneous cooling and heating loads where the heat recovery chiller can be used to preheat water prior to entering a boiler.

Heat pump pool heaters can be used to replace traditional gas-fired boilers that heat swimming pools. They have much higher efficiency and lower operating costs than a traditional boiler. Heat pump pool heaters are commercially available in sizes up to 140 MBH. Depending on pool size, it may take more than one heat pump to replace a boiler. The best application may be for swimming pools with less than 10,000 gallons of water that are only used during the summer months. In any application, the use of a heat pump water heater requires both engineering and economic analysis to verify its feasibility.

Incentives for these measures are calculated based on energy savings and our energy engineers are available to assist you in determining your potential rebate based on the existing equipment and the equipment you select to install.

### Heat Pump Air Conditioner Rebates

Silicon Valley Power offers rebates for business customers to convert from natural gas heating to all-electric heating and cooling by installing a new energy efficient heat pump. Rebates of up to \$650 per ton are available. In addition, we offer up to \$1,250 to help offset the cost of infrastructure improvements needed for installing the new equipment. By converting to an all-electric heat pump air conditioner, you will significantly reduce your business's natural gas utility bill, decrease your business's overall annual energy costs, and help improve our environment.



## ***New Incentives Available for Building Electrification Efforts continued from front cover***

### **Heat Pump Water Heater Rebates**

If your existing water heater uses natural gas, replace it with a heat pump water heater and receive a rebate of \$2,000. Before you make the switch, check to ensure the electric circuit supply can support a new heat pump water heater. If not, you may need to upgrade your electric panel.

All water heaters have a metric called the “First Hour Rating” which is a function of the storage capacity and the speed at which it can heat water. Select a heat pump water heater that matches the First Hour Rating of your existing water heater.

### **Food Service Equipment Rebates**

The Food Service Equipment Rebate Program provides cash incentives for purchasing qualifying, energy-efficient commercial food service equipment. Upgrade your kitchen with the latest technologies in cooking and hot/cold storage equipment and save a bundle on your annual energy costs. Switch from natural gas equipment to electric equipment and receive a bonus rebate which may be up to five times the amount of the standard rebate, depending on the equipment type.

Note that switching from natural gas food service equipment to electric equipment does not always result in an overall savings on your energy bills, but the electric equipment may have other non-energy benefits to be considered in your decision.

Benefits may include reduced heat in the kitchen resulting in greater employee comfort, “smart” features on appliances that save staff time and improve consistency in cooking, lower cost of repair, increased safety by reducing burns and fires, a smaller kitchen footprint to achieve the same results, and reduced carbon output to help achieve your sustainability goals. For more information on commercial kitchen equipment or to take a class and try out the equipment, visit the Food Service Technology Center at [Fishnick.com/FSTC](http://Fishnick.com/FSTC).

All Silicon Valley Power rebates require pre-approval of the project before installing equipment. Contact us at 408-615-6650 to schedule a pre-inspection. For more information on our programs, visit [SiliconValleyPower.com/BusinessRebates](http://SiliconValleyPower.com/BusinessRebates).

## **Charge Up Your Forklifts: 5 Reasons to Go Electric**

Forklifts are critical in many industries, from material handling on shipping docks to shuffling pallets around grocery stores. Whatever your business, if investing in a new lift truck is on the horizon, consider how well



electrically powered units stack up against traditional internal combustion (IC) machines.

Advances in motors, batteries and charging technology have allowed electric lift trucks to capture a larger share of the market over the last decade, and that trend is likely to continue. Modern electric forklifts are gradually replacing even some of their more powerful IC competitors.

Switching to electric forklifts can bring a number of benefits to your business:

- 1. Reduced fuel consumption.** Modern 80-volt units cost less to run than their propane counterparts. The Electric Power Research Institute (EPRI) Lift Truck Comparison calculator can be used to compare the cost of operating an LPG unit to one powered by a battery. Assuming a propane cost of \$3/gallon and electricity at \$0.11/kWh (kilowatt hour), running the electric lift saves over \$30 per day.
- 2. Lower maintenance costs.** Electric motors have fewer moving parts than IC engines and don't require regular fluid or filter changes. Also, there's no need to handle or store highly flammable fuels such as gasoline, propane or diesel.
- 3. Increased workplace health and safety.** Electric forklifts offer quiet, emission-free operation that complies with Occupational Safety and Health Administration (OSHA) standards for carbon monoxide and noise exposure. Electric models also eliminate most hazards associated with fuel or oil leaks.
- 4. Improved motor and battery technology.** Over the last decade, the introduction of AC motors and fast charging technologies have allowed electric units to complete most tasks formerly reserved for their IC cousins. Some newer models can support loads of 15,000 pounds while reaching the highest shelf on a pallet rack. Moreover, high frequency charging allows the battery to last all day on a single nightly charge.

- 5. Outdoor capability.** It's commonly believed that only IC equipment can be used outside. Two studies by EPRI indicate that, as long as the lift truck can negotiate uneven terrain and operate in inclement weather, electric units work just as well as IC equipment both inside and outside the warehouse.

Although electric forklifts have significant advantages, you must decide whether they're the best choice for your business. IC units cost less upfront, but the extra fuel and maintenance can cost you more over time. Electric units, however, require OSHA-compliant charging stations and large batteries that must be regularly cleaned and charged.

Charge batteries at night to avoid adding to peak demand charges. A 24/7 operation may require additional batteries on-site to prevent downtime. Finally, the electrical capacity of your facility must meet the voltage and amperage requirements of the charging station.

Work carefully with your supplier to make sure electric units are the right fit for your application.

Silicon Valley Power offers a rebate of \$2,000 per forklift for the purchase of a Class-1 or Class-2 electric forklift. Limit three forklifts per electric account. Customers may also be eligible for additional incentives through the California Air Resources Board and the Bay Area Air Quality Management District. For more information, visit [SiliconValleyPower.com/Forklift](http://SiliconValleyPower.com/Forklift).

## **5 Steps to Implementing Variable Frequency Drives**

Looking to save energy and money by switching to variable frequency drives (VFDs)? Get up to speed using this step-by-step process.

- 1. Survey the situation.** Evaluate your needs and load requirements. If you need soft-starting, a much less expensive reduced voltage starter might work. If your motor is too large for the load and short-cycles, then replacement with a smaller motor or using a gear reducer is a better solution.
- 2. Select carefully.** Choose the right application. VFDs save energy if the motor speed can be reduced most of the time and only runs at a rated speed less than 15% of the time. The best VFD applications are variable torque loads like pumping liquids, blowing air or running centrifugal compressors.
- 3. Size things up.** Size correctly for the torque load. Sizing for variable torque loads is easy. Size the VFD to meet the amperage (not horsepower rating) requirements of the motor. Sizing for constant torque applications like rotary screw compressors, mixers and conveyors requires knowing the starting torque mode and other factors. Engage a professional.

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Employee Profile:



### **Scott Anderson** Principal Electrical Estimator

**Background:** Before joining Silicon Valley Power (SVP), Scott Anderson worked as a Senior Electric Service Planner at Burbank Water and Power. He also worked as a C-130 Engine Mechanic in the California Air National Guard prior to retiring from the military. He now works for SVP as a Principal Electrical Estimator. Scott is responsible for preparing and reviewing plans, creating electrical design drawings, estimating costs for the development of new customer electrical systems and overall project management.

**Comment:** “There’s a high volume of challenging projects here at SVP that keeps me on my toes, and I’m enjoying the busy pace and new area. I can multitask pretty well, so I like jumping from one project to the next.”

**Favorite pastime:** Scott recently retired from coaching his four kids’ American Youth Soccer Organization (AYSO) teams for the past 13 years. His proudest achievement was helping take all his competitive teams to the finals for the last 10 years. Now, in his free time he likes to travel and go to concerts with his family.

**Working at SVP:** Scott appreciates learning from his new leadership and teammates. He is flexible and willing to take on any roles that are needed to be a team player to help the utility.