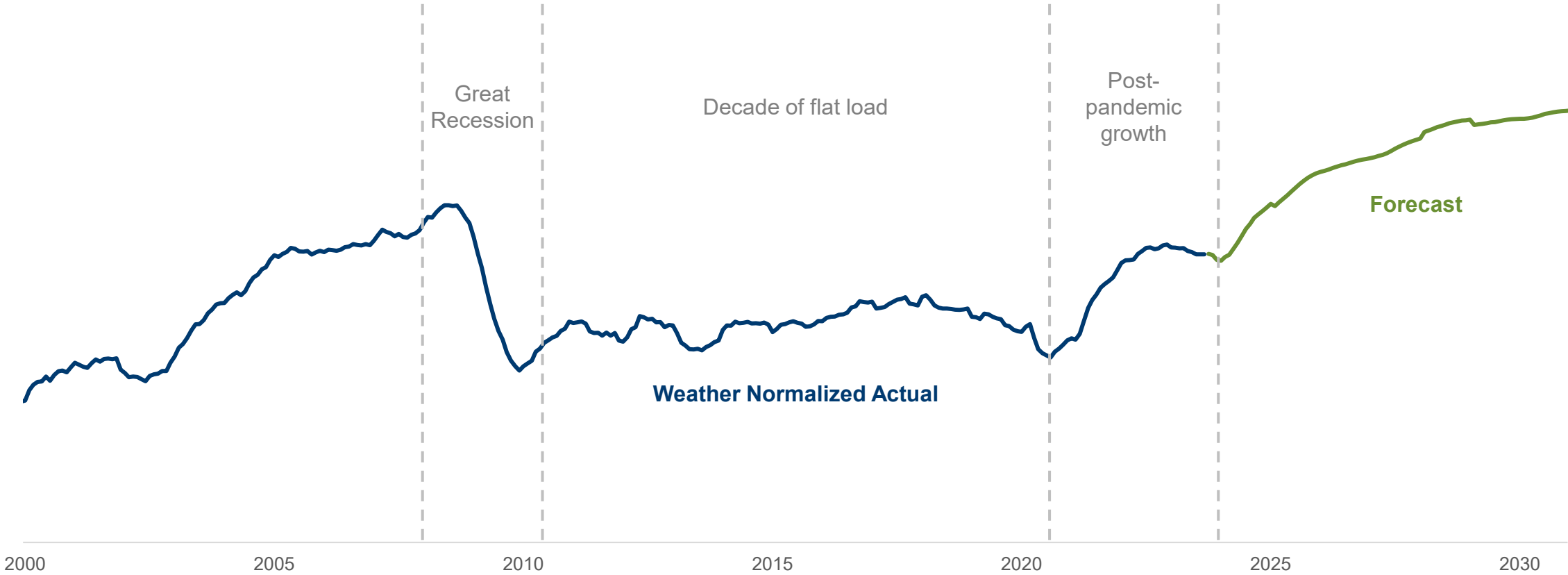




Energy Services and Programs Portfolio

Ruchi Singhal CEM, BEP
February 27, 2024

TVA's Load Growth Forecast



Demand-Side Management Objectives



Develop and Maintain the Virtual Power Plant (VPP)

Balance system needs by lowering costs, shaping energy usage and increasing capacity.

4,700 GWh of energy savings and 2,600 MW of demand reduction



Optimize Community Energy Efficiency

Maintain impactful energy equity programs in the Valley.

\$200 million in energy expense savings for low-income communities



Promote Clean Energy Services

Provide programs and services to meet consumer demand for clean energy, EVs, and resiliency offerings.

More than 10 million tons of CO2 reduced and 200,000 EVs on Valley roadways by 2028

Impact by 2035

Portfolio At-a-Glance

Energy Efficiency

Residential

- Home Energy Rebates & Financing
- New Homes Incentives for builders
- Home Energy Assessments & Evaluations
- Home Uplift
- Home Energy Workshops

Business & Industry

- Energy Efficiency Incentives
- Strategic Energy Management
- Federal Energy Services Program
- Industrial Energy Assessments
- School Uplift
- Small Business Uplift

Demand Response

- Interruptible Power
- Peak Power Partners
- Voltage Optimization
- Piloting Bring Your Own Thermostat in FY24

Clean Energy Services and Electric Vehicles

- Fast Charge Network
- EV consumer awareness
- Efficient Electrification Incentives

Energy Efficiency

Business & Industry Incentives

Save energy and money

Designed to provide unbiased information to help customers make sound, electrical investment decisions to reduce operating costs and to offset the additional cost of more efficient technology projects. Incentives help to reduce the project payback period and increase the likelihood of implementation.

Who is eligible to participate?

Commercial, industrial, LPC & federal customers may participate with qualifying projects. Examples of participants include gas stations, offices, arenas, hospitals, schools, hotels, prisons, post offices, car dealerships, churches, grocery stores, casinos, manufacturers, farms, courthouses, museums, restaurants, airports and retail stores.

How it helps customers

Financial incentives for energy upgrades:

- Offset the cost of upgrades.
- Reduce energy consumption.
- Free up funds previously allocated to energy to put back into business and local economy.
- Help to meet corporate ESG and sustainability goals.
- Improve indoor air quality, productivity, health and safety of facilities.
- Become more competitive in the marketplace with lower operation costs.

Energy Efficiency Incentives

PARTNERSHIPS MAKE IT ALL ADD UP

Customers contribute greatly to the economy, job creation and quality of life in the Valley. When commercial, industrial and federal customers succeed, our region succeeds, advancing TVA's mission to make life better for the people of the Valley.

LPC



- Commercial Customers
- Industrial Customers
- Federal Customers

PPN



- Find A Contractor
- Request Expert Solutions

TVA



- Energy Service Consultants
- TRC Companies
 - PPN Outreach
 - Engineering
 - Call Center

TVA BUDGET SUPPORTS THE INCENTIVE PROGRAM ENERGY EFFICIENCY GROWTH FOR FY24

Incentive Rates by Technology Types:

Incentives: 2.8.24 Changes




Custom energy efficiency
Up to **\$0.12/kWh** - No longer eligible for fuel switching.




Indoor lighting upgrades to LED
\$0.10/kWh

Rules: 2.8.24 Changes



Company Cap
Increases from \$1M to **\$3M**.

Incentives: No Changes



HVAC projects
(Energy Efficiency)

\$80/ton - Energy efficient and like-for-like replacements of unitary A/C units, Variable Refrigerant Flow (VRF) and dual fuel heat pumps.


\$250/ton - Fuel switching to VRF and dual fuel heat pumps.

\$175/ton - Energy efficient cooling replacements with unitary A/C units with Advanced Tier efficiencies.

(Electrification)

\$175/ton - For unitary A/C units with Advanced Tier efficiencies.

\$250/ton - For VRF and heat pumps if project involves new construction or facility expansion.




Refrigeration

\$50 per EC motor


\$200 per evaporator fan controller

\$100 per linear foot/open cases


\$200 per linear foot/medium & low temperature cases.




Outdoor lighting and street lighting upgrades to LED
\$0.04/kWh



Thermal ice storage
\$9.00/ton-hour (partial)
11.00/ton-hour (full)



Forklift class 1 and 2
\$1,000/leased
\$2,000/purchased



Variable Speed Drives (VSD)
\$100 per horsepower (HP) - VSD installation on existing HVAC equipment.

New installations of HVAC and Refrigeration could be in a new building, addition to a building, or new equipment in an existing building.

Highlight of Program Rules

- Maximum 70% of material cost
- Maximum incentive cap **\$3,000,000** per company per TVA fiscal year
- All projects, exception select Standard HVAC equipment, require pre-approval.
- Get started by connecting with a PPN:
 - Find A Contractor (FAC)
 - Request Expert Solutions (RES)
 - Existing contractor join PPN



Preferred Partners Network (PPN)

Expert Trade Ally Network

The Preferred Partners Network is a group of trusted, vetted commercial and industrial trade allies committed to promoting energy efficiency technologies and equipment with exclusive access to incentives. PPN members submit incentive applications online for their customers and respond to requests with online proposals.

Who Is Eligible To Participate?

Trade professionals committed to the design, installation, servicing and promotion of energy solutions and technologies for businesses in your area. If interested, we're ready for you. Contact us at ppn@tva.gov

How It Helps Customers

The PPN helps your B&I customers:

- Hire a well-trained contractor confidently.
- Take advantage of TVA EnergyRight incentives.
- Find the right energy-saving solutions for their business.
- Meet their sustainability goals.

Promoting the PPN also assists with your local economic development efforts, helping your community thrive

Start Saving Now!

Participation is easy! Simply visit EnergyRight.com using this QR code.

Once you've identified equipment to replace, work with a contractor to get the project started!

You can select a contractor from TVA's Preferred Partners Network (PPN) or Request Expert Solutions from multiple PPN contractors.

Already have a contractor? No problem! Contractors can submit one project without being a PPN member.

Be sure to check out the website for things to consider when applying for incentives.
<https://energyright.com/business-industry/incentives/applying-for-incentives/>



Community Energy Efficiency Strategy

Strategy

Maintain impactful energy equity programs in the Valley and enable deployment of federal funding

- Provide support and improve energy equity for underserved communities and residents through Home Uplift, School Uplift, and Small Business Uplift
- Hold flat energy efficiency programs, and promote incentives, with a focus on underserved federal opportunity zones and Justice 40 tracts
- Promote the Federal Energy Services Program (FESP) to federal facilities in underserved communities to increase energy efficiency and reduce carbon emissions in the Valley
- Partner with State Energy Offices, local power companies, and others to leverage recent federal funding, estimated at over \$200 million (IIJA and IRA) to supplement TVA funding of energy programs

USDA REAP and Qualifying Energy Efficiency Measures

Funds may be used for the purchase, installation and construction of energy efficiency improvements, such as:

- High efficiency heating, ventilation and air conditioning systems (HVAC).
- Insulation.
- Lighting.
- Cooling or refrigeration units.
- Doors and windows.
- Electric, solar or gravity pumps for sprinkler pivots.
- Switching from a diesel to electric irrigation motor.
- Replacement of energy-inefficient equipment.

Energy Efficiency Improvement applications must contain **an Energy Audit, or Energy Assessment** (depending on Total Project Costs) that complies with Appendix A to RD Instructions 4280-B

TVA

**TENNESSEE
VALLEY
AUTHORITY**

Appendix

LED Lighting

Key Features

Amount

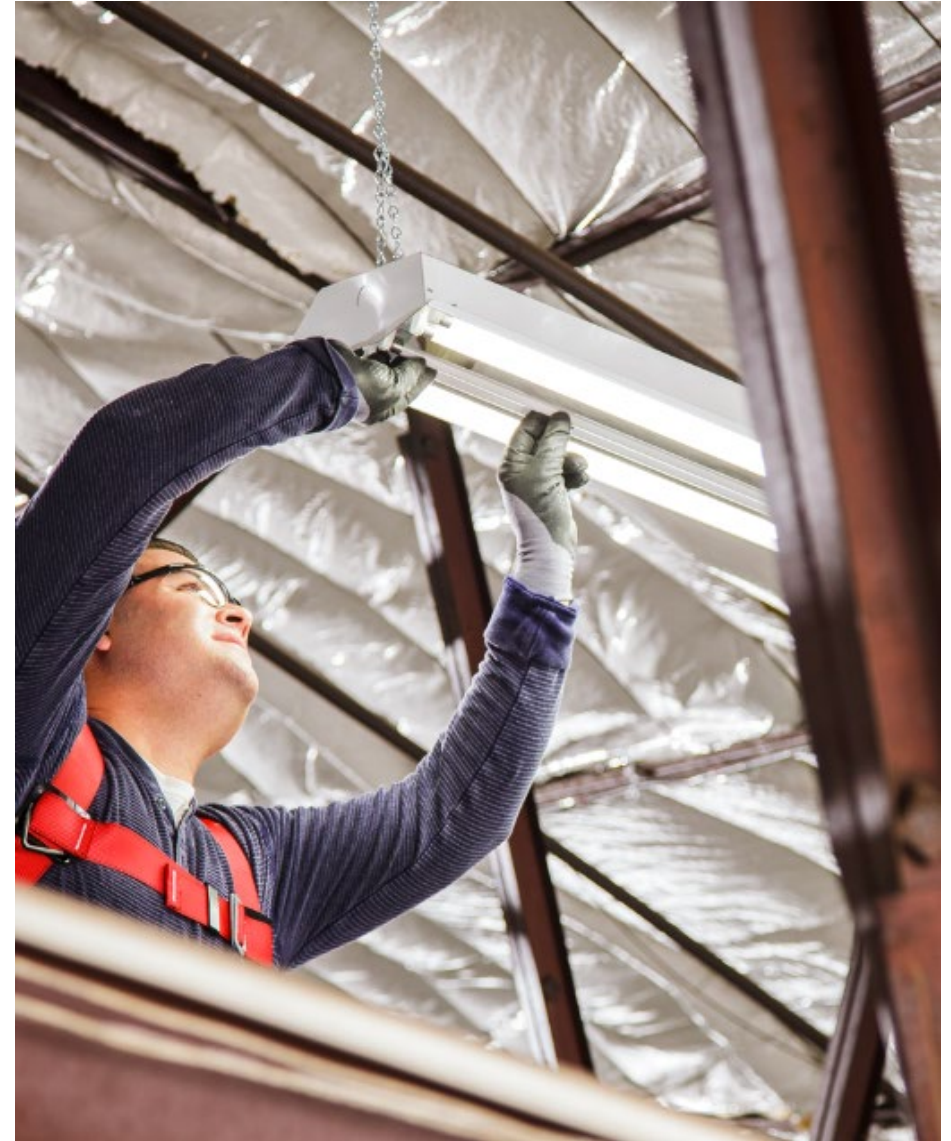
- **Indoor lighting at \$0.10/kWh**
- Outdoor lighting at \$0.04/kWh

Qualifying Units

- Upgrades to LED
- Indoor
- Exterior
- Street Lighting

Requirements

- T12 will be reverted to a T8 baseline
- Must be a retrofit, re-grid or re-lamping
- PPEC lighting tool & online application required to be submitted for each project
- Must select highest wattage on multi-wattage fixtures
- Pre-Approval is required
- No DLC Qualified Product List Requirement



HVAC

Key Features

Amount

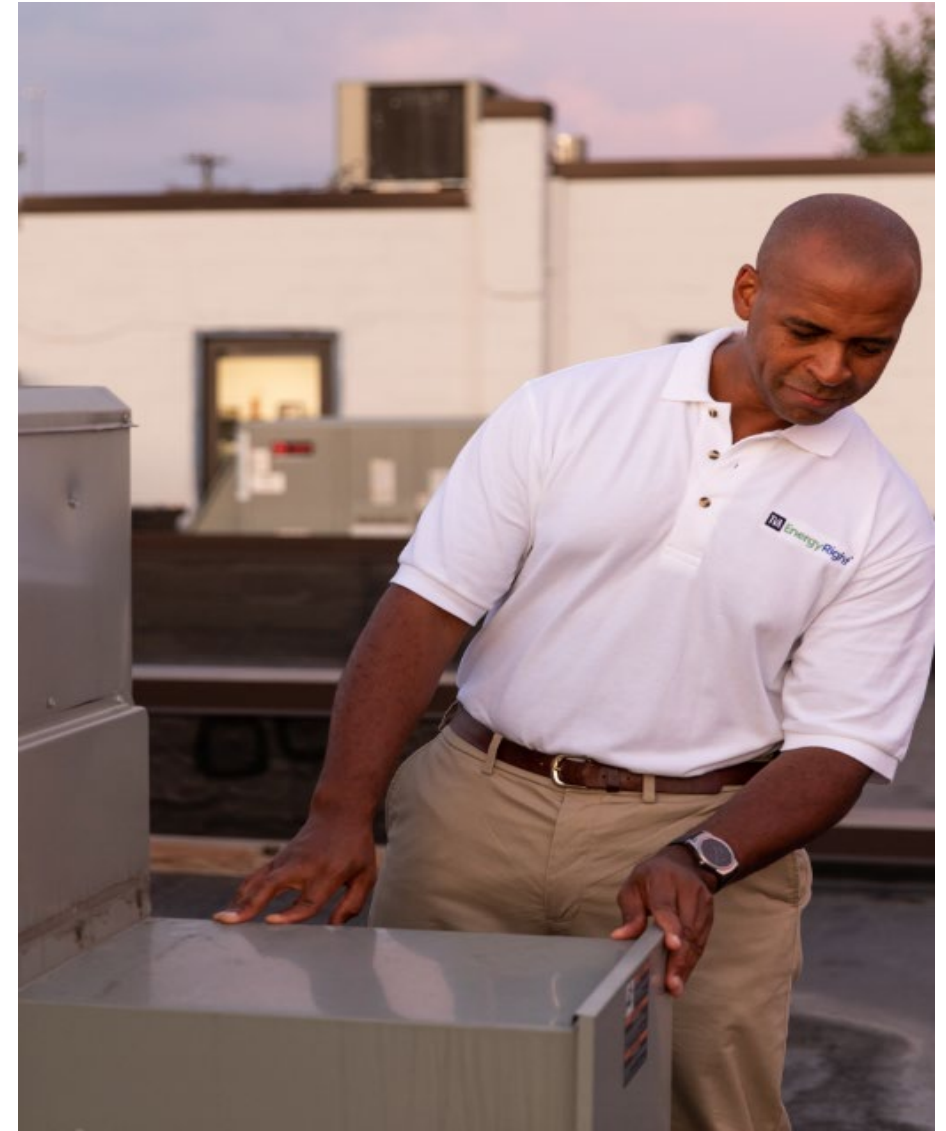
- \$250/ton for fuel switching**
- \$175/ton for advanced Tier EE or Expansion*
- \$80/ton for energy efficiency replacements

Qualifying Units

- Unitary AC
- Unitary Heat pump
- Dual Fuel Heat Pump
- Variable Refrigerant Flow (VRF) Heat Pump

Requirements

- Pre-approval not required before purchase or installation
- Online application must be received within 60 days of installation to be eligible
- HVAC must meet updated efficiency requirements
- Unitary HP cannot have electric resistance heat
- New installations could be in a new building, addition to a building or new equipment in an existing building.
- Increased efficiency requirements



Electric Forklifts

Key Features

Amount

- \$2,000/purchased forklift
- \$1,000/leased forklift

Qualifying Units

- Class 1:
Electric Motor
Counterbalanced
rider
- Class 2: Electric
Motor narrow Aisle

Requirements

- Replace IC (class 4 or 5)
- Can be fleet expansion
- Purchase new or refurbished forklifts
- Refurbished forklifts must have new battery
- Pre-approval required
- Rentals are not eligible



Thermal Ice Storage

Key Features

Amount

- Partial Storage
\$9/ton/hours
- Full Storage
\$11/ton/hours

Qualifying Units

- Ice Storage
- Chilled Water Systems

Requirements

- Pre-approval required
- Projects may require pre and post M&V
- Must submit detailed energy calculations and SOW
 - Ton hours
 - kWh savings
 - CO2 savings



Refrigeration

Key Features

Amount

- \$50 per Electronically commutated motors (ECM)
- \$200 per evaporator fan controller
- Energy Efficiency only

Qualifying Units

- Reach-in coolers
- Walk-in freezers
- Evaporator fan controller

Requirements

- Pre-approval required

EC Motor Replacements

- **\$50** per ECM
- Motor types: constant CFM, constant RPM, and/or constant torque
- Retrofits of existing refrigeration cases, walk-in refrigerators and walk-in freezers
- Replacement of existing Shaded-Pole motor with ECM
- Replacement of motors not directly related to refrigeration may be eligible through the custom offering

Evaporator Fan Controllers

- **\$200** per controller
- Installed on an ECM
- Retrofits of existing refrigeration cases, walk-in refrigerators and walk-in freezers



Refrigeration Continued

Key Features

Amount

- \$100 per linear foot/open cases
- \$200 per linear foot/medium & low temperature cases

Qualifying Units

- Reach-in cooler/freezer
- Walk-in cooler/freezer
- Evaporator fan controller

Requirements

- Pre-approval required
- High efficiency reach-in cases are required to have the following:
 1. Energy-efficient LED case lighting
 2. ECM installed on evaporator fan motor
 3. High efficiency low/no anti-sweat heat display case doors (applicable to reach-in cases)
- Installation of new refrigeration cases
- Replacement of existing refrigeration systems
- Existing refrigeration cases must be standard efficiency



Variable Speed Drive (VSD)

Key Features

Amount

- \$100 per horsepower (HP)
- Energy Efficiency only

Qualifying Units

- Cooling Tower Fans
- Chiller Water Pumps
- Condenser Water Pumps
- Hot Water Pumps
- Supply/Return Fans

Requirements

- Pre-approval required
- Eligible for the installation of VSDs on existing equipment only.
- Replacement of multispeed motor, and agriculture and industrial process VSD projects may be eligible through the custom incentive.
 - *Reach out to the program for more information.*



Custom

Key Features

Amount

- **Up to \$.12/kWh**
- Energy Efficiency only
- Custom project incentive minimum of \$1,500

Sample Technologies

- Chiller System Optimizations
- Industrial Optimization
- Compressed Air
- Building Management Controls
- Cool Roof
- Non-Standard HVAC
- 23. Transformers

Requirements

- Pre-approval required
- Projects may require pre and post M&V
- Must submit full scopes of work and energy model
- Highly suggested to contact the program to discuss SOW before application submission.
- Engineering and design costs can be included in the material costs
- Eligible projects must be system retrofits
- Fuel switching, custom lighting and resistance heat projects are NOT eligible.
- Subscription-based software is NOT eligible for incentives
- Leased equipment is not eligible for incentives.
- Savings estimates can be submitted using proprietary spreadsheets



Chiller Plant Optimization Project

Example - 1

LPC served industrial customer in Tennessee - Operates 3 shifts year-round

Before:

- 3,558 Ton Chiller system operating standard conditions since original installation.
- Baseline consumption 7,503,688 kWh.

After:

- Installed and commissioned BTU and flow meters to chilled water and condenser water loops; differential pressure sensors at various points around evaporator and condenser loops;
- Install VFDs for primary chilled water and condenser water pumps; integrate an existing heat exchanger so that the plant can utilize free-cooling when conditions are appropriate.
- New consumption 5,823,108 kWh.

Cost Justification:

- Capital cost \$316,600
- Electrical savings approximately \$50,700 annually
- Incentive capped at \$150,000 (old program cap)
- Simple Payback – 3.3 years

Costs updated for today's offering:

- Capital cost \$316,600
- Electrical savings approximately \$50,700 annually
- Incentive capped at \$169,000 (\$0.10/kWh)
- Simple Payback – 2.9 years

Process VFDs

Example - 2

Direct served industrial customer in Mississippi – 3 shift operation

Before:

- Pump ran 24 hours a day 7 days a week and utilized a throttling valve to control flow rate.
- Original process also included partial recirculation, and pumps were not selected to operate at their best efficiency point (BEP). Total nameplate of three pumps is 1,900 HP.

Cost Justification:

- Capital cost \$208,518
- Electrical kWh savings 3,324,959 annually
- Electrical savings approximately \$166,248 annually
- Incentive \$96,423
- Simple Payback – 0.7 years

After:

- Installed slightly larger motors and impellers on all three pumps to operate at BEP (added benefit that cooler motor generally last a bit longer).
- Installed and commissioned a VFD along with pressure sensors on the trim pump to control flow rate and maintain acceptable flow conditions, allowing removal of the throttling valve.

Costs updated for today's offering:

- Capital cost \$208,518
- Electrical savings approximately \$166,248 annually
- Incentive \$145,962 (capped at 70% of capital)
- Simple Payback – 0.4 years