ESRP MEASURE REFERENCE GUIDE

Typical Measure Life	The Typical Measure Life is the estimated life of product calculated in years for energy efficiency savings calculations. The actual life of a product may vary. Measure Life is not a performance guarantee.
Retrofits versus New Construction and Major Remodels	Retrofits are depicted as replacing a product with an energy efficient model; where as a new construction or major remodel represents equipment that services a new load or process. The baseline for a retrofit is typically the performance of the existing equipment using a deemed or calculated approach, whereas, the baseline for a new construction or major remodel takes into consideration code requirements and/or performance testing.
Incentive Rates	Incentive rates captured in the Incentive Rate Reference Table are captured in dollars per kWh saved; unless otherwise stated. Incentive rates are renewed annually prior to Open Enrollment and Open Season windows. Promotional incentive rates may be offered for a limited-duration and may supercede standard incentive rates.

IRRIGATION		DESCRIPTION	SPECIAL CONSIDERATIONS
Motors/Drives	Custom motor	Incentives are available for new premium motors. The premium efficiency motor standards apply to • NEMA Design A, a three-phase, low voltage induction moter rated between 1 and 500 horsepower (hp), and • NEMA Desgin B, a medium-voltage 250 to 500 hp motor designed for service at 5,000 volts or less.	The baseline for this measure is a new standard efficient motor rather than the existing motor's efficiency.
	Green Motors (Rewinds)	The Green Motor Initiative is a third-party program sponsored by BPA. Motor rewinds must be performed at an approved service center and adhere to rewind procedures. Learn more about the program by visiting www.bpa.gov/energy-and-services/efficiency/industrial/motors.	An application is not required for this offer and does not require program approval. This program applies to all Reserved Power customers and Retail Utilities who receive power from BPA.
	Variable Frequency Drives (VFD)	BPA recommends that all new VFD installations meet the IEEE 519 harmonics standard. This measure provides an annual energy savings of 10% to 30% of the calculated annual energy usage of the application. This measure applies to pumping operations that deliver, distribute, or transport irrigation water with qualifying VFDs from 7.5 to 1,000 horsepower (hp).	The incremental cost of a variable frequency drive is considered to be the entire cost of the drive in new construction and retrofit applications. For application submission complete the VFD calculator located in Resources & Tools Section (Required Support Documents) of the ESRP website. A revised calculator is required as part of the Final Report if scope changes occurred.

Pumping Improvements	New Efficient Pump	This measure requires the installation of a new (e.g., newly manufactured) turbine or centrifugal-style irrigation pump to replace an existing pump. This measure applies to pumping operations that deliver, distribute, or transport irrigation water. The pump must range from 20 to 500 horsepower (hp). The existing pump being replaced must be centrifugal, turbine, or submersible turbine.	If there is no nameplate, contact your energy efficiency engineer to help you convert utility kilowatt readings to horsepower. The new replacement pump must have the same or lower horsepower rating, unless it is coupled with a VFD. A New Pump Project Information Form (PIF) must be submitted as part of the Final Report. The New Pump PIF is located in Resources & Tools (Required Support Documents) on the ESRP website. A change from a turbine pump to a centrifugal pump, or a centrifugal pump to a turbine pump is allowed. This measure may be used alone or in combination with the retrofit measures, Variable Frequency Drive (VFD) for Centrifugal Agricultural Pumps or VFD for Turbine Agricultural Pumps.
	Pump Rebuilds	As an alternative to pump replacements, pump rebuilds may be a more cost-effective solution. Over time and through normal use, pumps become less efficient. This measure seeks to capture the incremental savings from rebuilding the pump.	Baseline is calculated by metering and monitoring an existing pump's performance. Prior to applying for this measure, it is recommended to contact **ESRP@BPA.GOV** or a technical representative to establish baseline.
	Reduce pumping plant friction loss	As fluids flow through pumps, pipes and fittings, resistance decreases pumping pressure and velocity, which adversely affects pumping efficiency. Excessive friction loss leads to high horsepower (hp) requirements and increased energy consumption. The amount of energy lost due to friction depends on a number of factors. This measure intends to capture operation and maintenance improvements that improve the overall efficiency of the plant.	Broken or damaged equipment is eligible for this incentive unless the replacement parts must improve the overall system's efficiency. If applicable, water savings must be captured on application.
Sprinkler system improvements on pressurized systems		Incentives are available for irrigation hardware upgrades, which includes new sprinkler nozzles, sections, drain gaskets, goose necks, drop tube, regulators, and sprinklers.	This measure is only applicable to on-farm applications that receive Reserved Power electrical rates and water from eligible irrigation districts. On-farm applications that receive power from their local utility do not qualify.

			The incentive may be calculated using the incentive rates as defined in the Incentive Rate Reference Table or may utilize a prescriptive approach. (e.g. $3 per nozzle) A full list of prescriptive incentives is available upon request.
System Lift Reduction		This measure is intended to capture energy savings from changing the water source by calculating the reduction of head (or change of height captured in feet). Typical projects include decommissioning wells and developing new pumping stations that utilize surface water as the primary water source. This measure is commonly implemented with new energy efficient pumps with variable frequency drives.	System lift reduction projects a BPA technical representative will outline required information fo The calculation of energy and water savings is required.
Water Delivery	Existing Pipe Lining (CML)	Cement Mortar Lining (CML) is designed for rehabilitating existing steel and cast iron pipes designed to transport water. CML may reduce friction loss and repair leaks.	These measures do not apply to catastrophic breaks or repairs. Calculation of the water savings potential is required.
	Canal lining	Incentives are available for relining upgrades to existing canals and to convert existing open canals to closed piping delivery systems.	Project must be an upgrade to an existing system; replacing old or worn-out lining do not qualify for incentives unless the lining has exceeded its useful life. Calculation of the water savings potential is required.
	Canal and Lateral piping (plastic & fiberglass)	Converting laterals with PVC piping, helps reduce seepage loss, and may contribute to major water savings and instream flow improvements.	The baseline cost is the smallest diameter pipe size with a water velocity less than or equal to 5 feet per second. Therefore, the incremental cost is determined by the difference in pipeline costs between the pipe size with a water velocity less than or equal to 5 feet per second and the costs of going to a larger pipe size. The project must be an upgrade to an existing system; thereby replacing old or worn-out lining does not qualify for incentives unless the lining has exceeded its useful life. Calculation of the water savings potential is required.

Water Management	Advanced On-farm water management	Advanced On-farm water management entails decision-making based on soil moisture, weather, and evapotranspiration as means to reduce water and energy consumtpion.	This measure is only applicable to on-farm applications that receive Reserved Power electrical rates and water from eligible irrigation districts. On-farm applications that receive power from their local utility do not qualify. Calculation of the water savings potential is required.
	System Upgrades	System upgrades are operational and maintenance improvements that increase system efficiency and deliver water savings.	Simple payback of improvement must be greater than one year. Calculation of the water savings potential is required.
	Automated Gates (real-time flow and controls)	Incentives are available for automated gates and with real-time metering. Being able to accurately measure and control the amount of water that flows down these lines has the potential of saving millions of gallons of water each yearand, as a result, reduces the pumping load necessary to provide the needed water supply. An ideal method of flow control would be to use automated flow gates with real-time metering. When integrated into active canal systems, irrigators from around the world are finding up to 60% in water savings using this technology.	Project costs related to the calculation of the water savings may be included in total project costs. Calculation of the water savings potential is required.
Other Improvements			
Air Compressor system improvements		Incentives are available to improve the efficiency of air compressor systems. Typical improvements include pressure reduction, eliminating air leaks, hardware replacement, controls, heat recovery and air temperature reduction.	For application submission complete the Compressed Air calculator located in Resources & Tools Section (Required Support Documents) of the ESRP website. A revised calculator is required as part of the Final Report if scope changes occurred.
Building Shell	Insulation	Incentives are available for electrically heated facilities, which includes both single family residences and non-residential buildings.	All attic, floor and wall insulation applications must be installed according to the BPA Residential Weatherization Specifications & Best Practices Guide. Final installed R-values for a reportable measure must meet the required final R-value, at a minimum. However, if a physical barrier prevents the full depth of insulation from being installed, which may be common in non-residential applications, then the R-value shall meet the maximum achievable R-Value within the available space.

	Windows		Installation of replacement window assemblies that have a National Fenestration Rating Council-rated U-value of 0.30 or lower.
Distribution Efficiency Improvements		Incentives are available for operating and maintaining transformer equipment that result in energy savings. Learn more about the types of measures available at www.bpa.gov/energy-and-services/efficiency/utility-distribution.	Eligible for Irrigation Districts that receive transmission services directly from BPA, and/or have transformer usage metered. The incremental cost of a variable frequency drive is considered to be the entire cost of the drive in new construction and retrofit applications. For application submission complete the Distribution System calculator located in Resources & Tools Section (Required Support Documents) of the ESRP website. A revised calculator is required as part of the Final Report if scope changes occurred.
Generator –Engine Block		Incentives are available for energy efficient onsite block heater upgrades.	The forced-circulation generator engine block heater must replace a thermosiphon, electric-resistance block heater or be a new block heater. The generator or engine must be stationary and fixed. Post-condition, installed generator engine block heaters must be forced-circulation heaters.
HVAC	Building Automation	Incentives are available for electrically heated facilities, which includes single family residences and non-residential buildings. Typical energy measures include ducted and ductless heat pumps, building controls, and thermostats. Additionally, non-residential facilities may be eligible for energy efficiency measures that facilitate cooling and ventilation.	Building automation incentives take into account the hardware and software solutions to monitor and manage loads through set points, setbacks, and scheduling.
	Efficient Equipment		The incremental cost is the difference between the cost of a standard code HVAC (unit) and a premium-efficiency HVAC (unit).
	Connected/Smart Thermostats		BPA does not recommend smart thermostats be installed to control variable-speed heat pumps as savings and compatibility are are uncertain at this point.
	Variable Frequency Drives		The incremental cost of a variable frequency drive is considered to be the entire cost of the drive in new construction and retrofit applications.

LED Lighting & controls		Incentives are available for interior and exterior LED lighting, delamping and controls.	For application submission complete the Lighting calculator located in Resources & Tools Section (Required Support Documents) of the ESRP website. A revised calculator is required as part of the Final Report if scope changes occurred.
Process Motors/ Drives	Custom motor	Incentives are available for new premium motors. The premium efficiency motor standards apply to • NEMA Design A, a three-phase, low voltage induction moter rated between 1 and 500 horsepower (hp), and • NEMA Desgin B, a medium-voltage 250 to 500 hp motor designed for service at 5,000 volts or less.	The baseline for this measure is a new standard efficient motor rather than the existing motor's efficiency.
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	Pump Rebuilds	As an alternative to pump replacements, pump rebuilds may be a more cost-effective solution. Over time and through normal use, pumps become less efficient. This measure seeks to capture the incremental savings from rebuilding the pump.	Baseline is calculated by metering and monitoring an existing pump's performance. Prior to applying for this measure, it is recommended to contact **ESRP@BPA.GOV** or a technical representative to establish baseline.
Water Heating		Incentives are available for heat pump water heaters (HPWH). Other eligible measures include pipe insulation, efficient circulating pumps and thermostatic shut-off valves (TSV).	Unitary and Split-System HPWHs must be listed on BPA's HPWH Qualified Products List.

*The ESRP Measure Reference Guide is a condensed set of eligible energy efficiency measures that are commonly implemented in the Energy Smart Reserved Power (ESRP) Program. If you are pursuing a measure that is not listed in the reference guide, please contact **esrp@bpa.gov** for further assistance. The ESRP Incentive Rate Reference Table is supplemental to this guide and provides incentive caps by measure for retrofit and new construction/major remodel projects.*