

## APPENDIX E



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## 1. Residential Sector Measures and Activities

The following Measures and Activities may be installed or provided for in new or existing site-built or manufactured/mobile homes, including both single and multifamily dwellings as well as low-rise and high-rise residential structures. **An asterisk (\*) indicates that the measure has "deemed" savings assigned:**

### RESIDENTIAL -- DEFINED PROGRAMS

There are a number of defined programs in the region that include measures and activities that have been scrutinized and approved as cost-effective. The individual measures and activities that make up the programs are included in the RTF's list of eligible measures and activities, even if they are not listed explicitly below.

- a) ***WeatherWise\****  
the most recent program specifications
- b) ***Long Term Super Good CentsÔ\****  
the most recent program specifications
- c) ***Northwest Energy Efficient Manufactured Housing Program (Super Good CentsÔ for Manufactured Housing)\****  
the most recent program specifications
- d) ***Performance Tested Comfort SystemsÔ\****  
the most recent certification specifications
- e) ***Energy StarÔ Appliances & Lighting\****

### RESIDENTIAL -- TECHNICAL ASSISTANCE

#### f) **Audits/Energy Reviews**

including visual inspection, infrared camera building shell analysis and the use of other testing and measurement tools to assess the potential for improvements to:

1. building thermal shells,
2. space conditioning systems (furnaces, heat pumps, central air conditioners)
3. domestic water heating and pumping systems,
4. appliances,
5. lighting,
6. air tightening
7. indoor air quality

#### g) **Passive Solar Design**

1. window orientation
2. thermal storage

#### h) **Technical and Design Assistance**

includes any activities necessary to recommend cost-effective measures and to determine their potential for energy savings. Technical and design assistance activities encompass a variety of analytical methods, including:

1. general assistance and consultations
2. prescriptive paths
3. simple hand or computer calculations
4. computer simulation models
5. rebate lists
6. scale modeling
7. other types of analyses

## RESIDENTIAL -- LIGHTING

### **i) Lighting Equipment and Controls**

1. fluorescent, compact fluorescent\*, high and low pressure sodium, and metal halide lamps
2. low voltage incandescents
3. replacement of quartz halogen torchiere replacements with compact fluorescents
4. lighting controls

## RESIDENTIAL -- PLUG LOADS

### **j) Appliances**

1. Energy Star™ or better refrigerators
2. Energy Star™ or better freezers
3. Energy Star™ or better dishwashers\*
4. Energy Star™ or better clothes washers\*
5. clothes dryers
6. microwave ovens
7. garbage disposals

### **k) Home Electronics and Office Equipment**

1. Energy Star™ or better computers
2. Energy Star™ or better monitors
3. Energy Star™ or better printers
4. Energy Star™ or better scanners
5. Energy Star™ or better copiers
6. Energy Star™ or better fax machines
7. Energy Star™ or better TVs
8. Energy Star™ or better VCRs

## RESIDENTIAL -- WATER

### **l) Domestic Water Systems**

1. pumps
2. low flow showerheads
3. kitchen and bathroom faucet aerators
4. hot tub and swimming pool covers

**m) Water Heaters**

1. energy efficient electric\*, solar, and heat pump water heaters\*
2. water heater tank wraps and bottom boards
3. pipe insulation
4. tank temperature setback

RESIDENTIAL -- BUILDING ENVELOPE

**n) Insulation**

1. attic, interior/exterior roof, wall (above and below grade), perimeter, knee wall, underfloor insulation
2. hydronic pipe, and heat duct insulation
3. insulated exterior water heater closet doors

(Excludes insulation products made from asbestos or urea formaldehyde and insulated vinyl siding.)

**o) Windows, Skylights and Glass Doors and Insulated Doors**

1. Energy Star™ or better windows\*
2. multiple glazed, low-E glass, low conductivity gas filled, and jalousie window replacements
3. storm windows
4. double or triple pane sliding or French doors, and multiglazed insert doors
5. insulated metal or fiberglass doors
6. solar control glazing
7. air tight installation

**p) House Tightening Measures**

1. using blower doors, digital manometers, etc. to diagnose the pressure differentials between different rooms and from inside to attic and crawl space
2. correcting air balance problems
3. air sealing (including caulking and weatherstripping exterior doors and windows, sealing electrical/plumbing penetrations in flooring and holes under plumbing traps and tubs and installing removable “fireplace plugs”)
4. indoor air quality monitoring and mitigation

**q) Structural Repairs Required Prior To Installation of Insulation, Windows, Skylights, Glass and/ or Insulated Doors**

1. roof repair
2. addition of attic and crawlspace ventilation
3. door and window jam repair or replacement

RESIDENTIAL -- HVAC EQUIPMENT

**r) Furnace or Heat Pump Efficiency Improvements**

1. Performance Tested Comfort System™ certified heating systems\*
2. higher efficiency system replacements or upgrades with properly sized equipment
3. control testing and repair
4. refrigerant charge testing and recharging
5. higher efficiency compressor replacements
6. gas furnace efficiency upgrades to reduce electric fan blower use

**s) Central and Window Air Conditioning Efficiency Improvements**

1. Energy Star™ or better system replacement or upgrades\*
2. control testing and repair
3. refrigerant charge testing and recharging
4. higher efficiency compressor replacements
5. filter cleaning and/or replacement
6. installation of whole house fans
7. solar gain controls such as exterior shades

**t) Heat Pumps**

1. Energy Star™ or better air-source\*
2. Energy Star™ or better ground-source (geothermal)\*
3. Energy Star™ or better water-source
4. Energy Star™ or better exhaust-air
5. solar-assisted heat pumps

**u) Thermostats and Controls**

1. clock thermostats
2. electronic and vapor diaphragm thermostats
3. low-voltage micro-processor controlled thermostats for central heating, ventilation and air conditioning systems
4. heat pump thermostats with heating/cooling lockout features that prevent cross-cycling between heating and cooling
5. heat pump programmable electronic setback thermostats with ramped/intelligent recovery to limit supplemental heat during recovery periods

**v) Dehumidifiers**

1. central
2. portable systems

**w) Whole House Ventilation Systems**

1. air-to-air heat exchangers
2. other forms of heat-recovery ventilation
3. high efficiency fans and controls

**x) Air Distribution System (duct) Sealing and Insulation**

1. system diagnostics
2. tightening
3. insulation
4. air flow balancing
5. addition of supplies and return ducts

**2. Commercial Sector Measures and Activities**

The following Measures and Activities may be provided installed in new or existing, or remodeled, commercial, institutional, or public buildings and facilities. Where applicable, all Measures must be Underwriter's Laboratory (UL) listed or classified. **An asterisk (\*) indicates that the measure has "deemed" savings assigned:**

## COMMERCIAL -- DEFINED PROGRAMS

### a) *Energy Smart Design*

The individual measures and activities included in the most recent program specifications are included in the RTF's list of eligible measures, even if they are not listed explicitly below.

## COMMERCIAL -- TECHNICAL ASSISTANCE

### b) **Audits/Energy Reviews**

including inspection and analysis of potential improvements to:

1. building thermal shells
2. space conditioning systems and controls (furnaces, heat pumps, chillers, economizers, central air conditioners, time clocks, energy management systems)
3. domestic water heating and pumping systems
4. refrigeration
5. lighting
6. air tightening
7. indoor air quality

### c) **Startup and Aftercare**

including activities that ensure the proper installation and/or operation of measures or other items that affect energy consumption in a commercial building by achieving conservation, or by ensuring the persistence of energy savings. The startup and aftercare activities can include:

1. repairs, operations and maintenance actions
2. building operator training and certification
3. building commissioning and retro-commissioning services (Building Commissioning includes activity to involve building owners and managers in the operation of their facilities. Standard commissioning procedures for HVAC, lighting, motors, and refrigeration are established for each facility.)

### d) **Resource Efficiency Management Services**

1. comprehensive, on-going, utility cost tracking
2. resource accounting
3. other services such as training, efficiency opportunity identification, operation and maintenance planning,

### e) **Technical and Design Assistance**

including activities necessary to recommend cost-effective measures and to determine their potential for energy savings. Technical and design assistance activities encompass a variety of analytical methods, including:

1. general assistance and consultations
2. prescriptive paths
3. simple hand or computer calculations
4. computer simulation models
5. rebate lists
6. scale modeling
7. utility cost analysis
8. contractor referral
9. other types of analyses and assistance.

## COMMERCIAL -- LIGHTING

### **f) Interior and Exterior Lighting Systems**

1. removal of inefficient lamps and fixtures\*
2. installation of efficient fixtures, including heat recovery fixtures, T8 , T5, T3 and parabolic reflectors (if old fixtures are removed)\*
3. installation of efficient ballasts, including electromagnetic ballasts, and high frequency electronic ballasts, if listed on the Lighting Design Lab's approved ballast list\*
4. microwave sulfur lamps (with light guides)
5. installation of efficient lamps (e.g., initial installation or replacement of incandescent or low efficiency mercury vapor lamps with high pressure sodium, low pressure sodium, metal halide, T8, T5 or T3 fluorescent or low-watt fluorescent lamps), and low voltage (tungsten) lighting\*
6. installation of microprocessors to control illumination levels
7. use of natural light and daylighting, including perimeter dimming systems, and installation of automatic dimming control systems
8. installation of corridor light timers, switching for selective control illumination, occupancy sensors, and LED self-powered exit lights

## COMMERCIAL -- PLUG LOADS

### **g) Appliances**

including energy efficient:

1. Energy Star™ or better refrigerators
2. Energy Star™ or better freezers
3. Energy Star™ or better dishwashers\*
4. Energy Star™ or better clothes washers\*
5. clothes dryers
6. microwave ovens
7. garbage disposals

### **h) Office Equipment and Plug Loads**

1. replacement of monitors, computers, copiers, scanners and printers with models that are more efficient or have advanced power management features
2. plug load control devices

## COMMERCIAL -- WATER

### **i) Domestic Hot Water Systems**

1. insulation of hot water piping or hot water storage tanks with wraps, bottom boards, or convection loops
2. installation of flow restrictors, faucet aerators, and low flow showerheads to limit water use
3. installation of chemical dishwashing system
4. use of heat recovery systems, including packaged systems, to heat water
5. replacement of central systems with local, tankless, point-of-use heating units
6. use of heat pump or solar water heating systems
7. installation of timers, circulating pump controls, or turning off hot water pumps during off hours
8. installation of time clocks to turn off water heaters during unoccupied periods

9. installation of efficient electric water heaters

## COMMERCIAL -- BUILDING ENVELOPE

### **j) Building Envelope Measures**

1. installation of wall, roof, or ceiling insulation
2. installation of floor, foundation (crawl space), or slab perimeter insulation
3. reduction of space heating loads by reducing outside air infiltration (e.g., caulking, weather stripping)
4. installation of window and skylight insulation (curtains)
5. installation of storm windows or sash-mounted storm windows
6. installation of low-E glass or multiple glazed windows
7. reduction of solar heat gain with solar film, window tints, overhangs, awnings, louvers, screens, or other shading devices
8. installation of storm doors or double pane sliding doors, or screen doors
9. replacement of existing doors with insulated doors
10. enclosure of loading docks with shelters and seals
11. installation of vestibules to reduce infiltration and exfiltration
  
12. sealing vertical shafts (e.g., elevators, stairwells) to reduce infiltration and exfiltration, and installation of air curtains

## COMMERCIAL -- HVAC EQUIPMENT

### **k) Heating and Air Conditioning Measures, including Energy Management Systems**

1. installation of advanced HVAC systems/strategies including terminally regulated air volume (TRAV) systems, occupancy-based ventilation strategies, underfloor HVAC, low-temperature systems, etc.
2. installation of oversized condenser water cooling towers to decrease approach temperature
3. installation of primary/secondary de-coupled chilled water systems
4. optimize chilled water and condenser water setting
5. installation of automatic condenser cleaning
6. replacement of air-cooled condensers with cooling towers
7. installation of spot cooling or earth cooling tubes, or roof spray systems
8. installation of high efficiency air-conditioning units\*
9. installation of chiller economizers (water side), or air side economizers
10. installation of air side heat recovery systems (ventilation air tempering, packaged systems, etc.)
11. isolation of off-line chillers and cooling towers
12. prevention of simultaneous heating/cooling through use of automatic controls
13. reset of hot deck or cold deck temperatures using automatic controls
14. zone optimization of reheat systems
15. use of duty cycling for fan control, or installation of high efficiency air handlers
16. installation of warm-up cycle controls, optimum start controls, automatic night setback/set up devices, or dead band thermostats
17. reduction of pump energy requirements by reducing resistance or flow rates
18. insulation of ducts or piping
19. replacement of forced air heating system with spot radiant heaters, or resistance heating with heat pumps, or installation of air, ground, or water source heat pumps
20. installation of solar pool/spa heating systems, swimming pool/spa covers and heat recovery

21. conversion of existing constant volume air distribution systems to variable air volume systems
22. installation of energy management systems
23. test and balancing of air distribution systems
24. cleaning isolated circulation systems in cooling or heating loops
25. installation of reflective roof treatments or surfaces
26. installation of direct or indirect evaporative cooling, evaporative pre-cooling, and absorption cooling

**l) Ventilation Measures**

1. installation of CO<sub>2</sub>-controlled building ventilation or CO<sub>2</sub>-controlled covered parking ventilation
2. automatically reducing ventilation during unoccupied periods
3. reducing minimum outside air requirements
4. recirculating exhaust air using activated carbon filters
5. installation of vortex hoods in restaurants or separate make-up air for exhaust hoods
6. use of evaporative cooling of outdoor air or desiccant dehumidification
7. reducing fan energy consumption by reducing air flow rates and the resistance to air flow, or use of dual speed fans
8. installation of high efficiency fans with larger ductwork
9. installation of attic ventilation or low leakage dampers
10. installation of air destratification systems (e.g., ceiling fans)
11. installation of outside air reset controls
12. automatically reducing or minimizing outside air intake by control modifications
13. installation of nighttime pre-cooling controls and systems

**m) Heat Recovery Equipment**

1. installation of equipment to transfer heat to or from a liquid or gas and to or from an existing or proposed process which will offset electric or other fuel use

**n) Thermal Storage**

1. installation of equipment to store energy in the form of hot or cold fluids or mass to provide heating or cooling capacity for later use

**o) Cooling Tower Efficiency Improvements**

including installation of modifications to cooling towers to improve their efficiency, such as:

1. conversion from counterflow to crossflow cooling
2. installation of "Strainer Cycle" operations to provide direct cooling
3. installation of high efficiency motors, adjustable speed drives, or other fan or pump control systems

**COMMERCIAL -- PROCESS ENERGY**

**p) Refrigeration**

1. fixing refrigerant leaks
2. optimize defrosting controls or capacity controls through new controls
3. increasing condensing unit efficiencies
4. optimize cooling tower controls (i.e., coolant or air flow modulation) using new controls
5. installation of variable speed chiller motors or high efficiency chillers
6. installation of time clocks on circulating pumps, or installation of efficient compressors

7. more efficient compressor systems
8. motors
9. reduced speed or cycling of evaporator fans
10. suction pressure re-set
11. heat exchangers
12. oil cooling
13. auto purgers
14. refrigerant upgrades
15. use of heat recovery from exhaust air, or use of thermal storage (ice, chilled water, hot water)
16. installation of variable speed drives on pumps
17. installation of floating condenser head pressure controls
18. reduction of heat gains to refrigerated spaces (anti-sweat controls, demand defrost, efficient case lighting, case doors)

**q) Efficient Motors**

1. installation or replacement of existing motors with ones that meet the Consortium for Energy Efficiency's standards for "Premium Efficiency," for motors up to 200 HP, and the NEMA MG-1, Table 12-10, "Energy Efficient Motor Standard" for motors between 200 and 500 HP including comprehensive motor management services\*
2. comprehensive motor management services

**r) Adjustable/Variable Speed Drives or "ASD/VSD"**

1. installation of drives to control motor and driven equipment speed to meet variations in process requirement

**s) Pumps and Fans**

1. replacement
2. trimming pump impellers
3. rebuilding, or modifying fans, compressors, blowers, pumps, impellers or fluid conveyance systems with energy saving units

**t) Transformers**

4. replacement of existing or proposed transformers with higher efficiency transformers

### **3. Industrial Sector Measures and Activities**

The following Measures and Activities may be provided or installed in industrial or industrial-type facilities (e.g., sewage treatment plants), or the facility's electric distribution system. **An asterisk (\*) indicates that the measure has "deemed" savings assigned:**

#### **INDUSTRIAL -- DEFINED PROGRAMS**

**a) *Energy Savings Plan***

The individual measures and activities included in the most recent program specifications are included in the RTF's list of eligible measures, even if they are not listed explicitly below.

#### **INDUSTRIAL -- TECHNICAL ASSISTANCE**

**b) Audits/Energy Reviews**

including analyses of industrial sector conservation opportunities by qualified individuals or firms to identify conservation implementation options, their estimated costs, and their estimated savings

**c) Technical and Design Assistance**

including activities necessary to recommend cost-effective measures and to determine their potential for energy savings. Technical and design assistance activities encompass a variety of analytical methods, including:

1. general assistance and consultations
2. prescriptive paths
3. simple hand or computer calculations
4. computer simulation models
5. rebate lists
6. scale modeling
7. other types of analyses

**INDUSTRIAL -- LIGHTING**

**d) Interior and Exterior Lighting Systems**

1. removal of inefficient lamps and fixtures\*
2. installation of efficient fixtures, including heat recovery fixtures, T8 , T5, T3 and parabolic reflectors (if old fixtures are removed)\*
3. installation of efficient ballasts, including electromagnetic ballasts, and high frequency electronic ballasts, if listed on the Lighting Design Lab's approved ballast list\*
4. microwave sulfur lamps (with light guides)
5. installation of efficient lamps (e.g., initial installation or replacement of incandescent or low efficiency mercury vapor lamps with high pressure sodium, low pressure sodium, metal halide, T8, T5 or T3 fluorescent or low-watt fluorescent lamps), and low voltage (tungsten) lighting\*
6. installation of microprocessors to control illumination levels
7. use of natural light and daylighting, including perimeter dimming systems, and installation of automatic dimming control systems
8. installation of corridor light timers, switching for selective control illumination, occupancy sensors, and LED self-powered exit lights

**INDUSTRIAL -- WATER**

**e) Water Recycle Processes**

1. upgrading existing water recycle or reclaim processes to conserve electrical energy

**INDUSTRIAL -- BUILDING ENVELOPE**

**f) Building Envelope Measures**

1. installation of wall, roof, or ceiling insulation
2. installation of floor, foundation (crawl space), or slab perimeter insulation
3. reduction of space heating loads by reducing outside air infiltration (e.g., caulking, weather stripping)
4. installation of window and skylight insulation (curtains)
5. installation of storm windows or sash-mounted storm windows

6. installation of low-E glass or multiple glazed windows
7. reduction of solar heat gain with solar film, window tints, overhangs, awnings, louvers, screens, or other shading devices
8. installation of storm doors or double pane sliding doors, or screen doors
9. replacement of existing doors with insulated doors
10. enclosure of loading docks with shelters and seals
11. installation of vestibules to reduce infiltration and exfiltration
12. sealing vertical shafts (e.g., elevators, stairwells) to reduce infiltration and exfiltration, and installation of air curtains

**g) Insulation**

1. installation of insulation to reduce heat transfer losses in a process

**INDUSTRIAL -- HVAC**

**h) Energy Management Systems**

1. reducing the electrical energy consumption of systems by optimizing the control of fluid flows, material handling, and controlled variables such as temperatures, pressures, scheduling, and sequencing

**i) Heating and Air Conditioning Measures, including Energy Management Systems**

1. installation of advanced HVAC systems/strategies including terminally regulated air volume (TRAV) systems, occupancy-based ventilation strategies, underfloor HVAC, low-temperature systems, etc.
2. installation of oversized condenser water cooling towers to decrease approach temperature
3. installation of primary/secondary de-coupled chilled water systems
4. optimize chilled water and condenser water setting
5. installation of automatic condenser cleaning
6. increasing evaporator and/or decreasing condenser water temperatures and modifying controls
7. replacement of air-cooled condensers with cooling towers
8. installation of spot cooling or earth cooling tubes, or roof spray systems
9. installation of high efficiency air-conditioning units\*
10. installation of chiller economizers (water side), or air side economizers
11. installation of air side heat recovery systems (ventilation air tempering, packaged systems, etc.)
12. isolation of off-line chillers and cooling towers
13. prevention of simultaneous heating/cooling through use of automatic controls
14. reset of hot deck or cold deck temperatures using automatic controls
15. zone optimization of reheat systems
16. use of duty cycling for fan control, or installation of high efficiency air handlers
17. installation of warm-up cycle controls, optimum start controls, automatic night setback/set up devices, or dead band thermostats
18. reduction of pump energy requirements by reducing resistance or flow rates
19. insulation of ducts or piping
20. replacement of forced air heating system with spot radiant heaters, or resistance heating with heat pumps, or installation of air, ground, or water source heat pumps
21. installation of solar pool/spa heating systems, swimming pool/spa covers and heat recovery
22. conversion of existing constant volume air distribution systems to variable air volume systems

23. installation of energy management systems
24. test and balancing of air distribution systems
25. cleaning isolated circulation systems in cooling or heating loops
26. installation of reflective roof treatments or surfaces
27. installation of direct or indirect evaporative cooling, evaporative pre-cooling, and absorption cooling

**j) Ventilation Measures**

1. installation of CO<sub>2</sub>-controlled building ventilation or CO<sub>2</sub>-controlled covered parking ventilation
2. automatically reducing ventilation during unoccupied periods
3. reducing minimum outside air requirements
4. recirculating exhaust air using activated carbon filters
5. installation of vortex hoods in restaurants or separate make-up air for exhaust hoods
6. use of evaporative cooling of outdoor air or desiccant dehumidification
7. reducing fan energy consumption by reducing air flow rates and the resistance to air flow, or use of dual speed fans
8. installation of high efficiency fans with larger ductwork
9. installation of attic ventilation or low leakage dampers
10. installation of air destratification systems (e.g., ceiling fans)
11. installation of outside air reset controls
12. automatically reducing or minimizing outside air intake by control modifications

**k) Dehumidifiers**

1. replacement of an existing or proposed electric dehumidification system with a more energy efficient system

**l) Heat Recovery Equipment**

1. installation of equipment to transfer heat to or from a liquid or gas and to or from an existing or proposed process which will offset electric or other fuel use

**m) Thermal Storage**

1. installation of equipment to store energy in the form of hot or cold fluids or mass to provide heating or cooling capacity for later use in a process

**n) Cooling Tower Efficiency Improvements**

1. installation of modifications to cooling towers to improve their efficiency, such as conversion from counterflow to crossflow cooling
2. installation of "Strainer Cycle" operations to provide direct cooling
3. installation of high efficiency motors, adjustable speed drives, or other fan or pump control systems

**INDUSTRIAL -- PROCESS ENERGY**

**o) Refrigeration Systems**

including replacement of existing or proposed mechanical refrigeration processes or their components with systems or components of higher efficiency. This may include:

1. fixing refrigerant leaks
2. optimize defrosting controls or capacity controls through new controls
3. increasing condensing unit efficiencies

4. optimize cooling tower controls (i.e., coolant or air flow modulation) using new controls
5. installation of variable speed chiller motors or high efficiency chillers
6. installation of time clocks on circulating pumps, or installation of efficient compressors
7. more efficient compressor systems
8. motors
9. reduced speed or cycling of evaporator fans
10. suction pressure re-set
11. heat exchangers
12. oil cooling
13. auto purgers
14. refrigerant upgrades
15. use of heat recovery from exhaust air, or use of thermal storage (ice, chilled water, hot water)
16. installation of variable speed drives on pumps
17. installation of floating condenser head pressure controls

**p) Premium Efficiency Motors**

1. installation or replacement of existing motors with ones that meet the Consortium for Energy Efficiency's standards for "Premium Efficiency," for motors up to 200 HP, and the NEMA MG-1, Table 12-10, "Energy Efficient Motor Standard" for motors between 200 and 500 HP including comprehensive motor management services\*
2. comprehensive motor management services

**q) Adjustable/Variable Speed Drives or ASD/VSD**

1. installation of drives to control motor and driven equipment speed to meet variations in process requirements

**r) Energy Efficient Drive Power**

1. installation of energy efficient drive devices in place of lower efficiency equipment such as change out of flat or V-belts with synchronous belts and pulleys or with cogged belts

**s) Pumps and Fans**

1. replacement
2. trimming pump impellers
3. rebuilding
4. modifying fans, compressors, blowers, pumps, impellers or fluid conveyance systems with energy saving units

**t) Process Heating and Cooling Equipment**

1. installation of equipment or implementation of efficiency improvements to process heating, process cooling or distribution systems

**u) Compressed Air Systems**

1. installation of efficiency improvements such as humidity controls for purge controls on twin tower dryers
2. automatic shutdown timers
3. compressor change outs
4. improved sequencing controls
5. adding receiver capacity to systems with load/unload controls
6. piping upgrades

7. reduction of air leaks when accompanied by an ongoing monitoring and maintenance program
  8. unloaders to existing or proposed compressed air systems
- v) **Material Handling**
1. upgrading material handling systems by replacing pneumatic conveyors with mechanical systems, optimizing product flows, or other measures
- w) **Power Factor Improvement**
1. installation of capacitors to improve power factor and reduce on-site line losses
- x) **Transformers**
1. replacement of existing or proposed transformers with higher efficiency transformers
- y) **Furnace Upgrades**
1. replacement of existing electric furnaces with more efficient electric furnaces
- z) **Upgrade of Electrolyzer Cathode and Anode Tubes**
1. reconditioning and redesigning electrolyzer cathode and anode tubes in an electrochemical chlorine production facility to improve their conductivity and increase the efficiency of the process
- aa) **Plant Process System Efficiency Improvements**  
including changes to system configuration, controls, operation and industrial process such as:
1. conversion from mechanical aeration to biological digestion in waste water treatment
  2. rectifier conversion efficiency improvements
  3. inter cell bus bar connection improvements
  4. cell cathode and anode coatings
  5. high performance membranes used in chlorine cell production to improve energy efficiency
  6. chlorine cell diaphragm modifications to improve energy efficiency
  7. heat recovery for wastewater
  8. bus bar improvements to increase efficiency
  9. increasing and/or reconfiguring anode and cathode surface areas for energy improvement
  10. improvements in electrical distribution
  11. wiring for voltage line loss reduction
  12. raw material processing improvements
  13. cleaning of anode and cathode surfaces to improve efficiency
  14. other industry specific process , including energy use monitoring and data collection that reduces the electric energy required to produce a unit of plant output

#### 4. Agricultural Sector Measures and Activities

The following measures and activities may be provided or installed in agricultural sector facilities. **An asterisk (\*) indicates that the measure has "deemed" savings assigned:**

##### AGRICULTURAL -- DEFINED PROGRAMS

###### a) *WaterWise*

The individual measures and activities included in the most recent program specifications are included in the RTF's list of eligible measures, even if they are not listed explicitly below.

## AGRICULTURAL -- TECHNICAL ASSISTANCE

### **b) Audits/Energy Reviews**

1. analyses of agricultural sector conservation opportunities by qualified individuals or firms to identify conservation implementation options, their estimated costs, and their estimated savings;

### **c) Technical and Design Assistance**

includes any activities necessary to recommend cost-effective measures and to determine their potential for energy savings. Technical and design assistance activities encompass a variety of analytical methods including:

2. general assistance and consultations
3. prescriptive paths
4. simple hand or computer calculations
5. computer simulation models
6. rebate lists
7. scale modeling
8. other types of analyses

### **d) Soil Moisture Monitoring Equipment and Services**

1. moisture probes and meters, infra-red remote scanning services, field soil type mapping, weather data monitoring equipment and station maintenance

### **e) Water Management Software and Services**

1. programs or services that recommend irrigation water application rates based on soil type and moisture conditions, crop type and age and evaporation/transpiration data

## AGRICULTURAL -- IRRIGATION

### **f) Conversion of Water Transport Canals to Pipes**

### **g) Sprinklers and Nozzles**

1. low pressure spray heads, low pressure impact sprinkler heads, low angle heads and nozzles
2. flow control nozzles and flow control diffusers
3. low pressure stainless steel, brass, or plastic nozzles
4. low pressure end guns and low pressure big guns
5. drops for spray heads and pressure regulators
6. drip and underground irrigation systems

### **h) Center Pivot Sprinkler Equipment**

1. pressure regulators, drop tubes, goosenecks, elbows, nipples, bushings and booms
2. tubing braces and harnesses
3. swivel fittings, hoses and hose clamps
4. computer assistance for the sizing of nozzles
5. low pressure end gun booster pumps and accessories
6. electric valves essential to control operation of new low pressure equipment on corner catchers
7. Individual nozzle control for precision applications

**i) Handmove and Sideroll Sprinkler Equipment**

1. swing pipes, flex pipes, elbows, and sprinkler levelers necessary for offsetting

**j) Mainline Equipment**

1. thrust blocks, saddles, cones, tapers, couplers, flanges, bolts, seals, and gaskets
2. vacuum, pressure relief, check, drain, gate, and butterfly valves
3. PVC pipe, reducers, expanders, sleeves, elbows, tees, transition connectors, and risers
4. steel pipe (coated and uncoated), reducers, expanders, sleeves, elbows, tees, electrolytic corrosion protection, and risers
5. trench digging
6. fill material

**k) Turbine Pumps**

1. refurbishment of bowl assemblies
2. new bowls, columns, and accessories
3. impellers
4. camera inspection work
5. removal and re-setting pumps
6. precipitate removal
7. high pressure well flushing
8. shaft repair
9. impeller trim and balancing
10. pump and lineshaft bearings
11. parts to adapt new or modified pump to motors
12. screens and strainers, and rust treatment of screens and strainers
13. headshafts, seals, new coatings, oil tubes and shot peen
14. airline or well access ports
15. water level gauges

**l) Centrifugal Pumps**

1. pump replacements, impellers, impeller trim and balancing
2. seals and packing
3. bearings
4. screens/strainer assemblies

**m) Motors**

1. installation or replacement of existing motors with ones that meet the Consortium for Energy Efficiency's standards for "Premium Efficiency," for motors up to 200 HP, and the NEMA MG-1, Table 12-10, "Energy Efficient Motor Standard" for motors between 200 and 500 HP including comprehensive motor management services\*
2. motor bases
3. brushes and bearings

**n) Adjustable Speed Drives and Associated Controls for Electric Motors**

**o) Electrical Equipment**

1. panel improvements, time clocks or twist timers, and power factor correction capacitors.

**p) Suction Fittings Equipment**

1. screen or strainer assemblies
2. piping, foot valves, flow straightener vanes and intake bells
3. gaskets or sealers
4. smooth elbows, eccentric tapers, flanges, and couplers

**q) Discharge Fittings Equipment**

1. steel piping
2. nuts and bolts
3. gaskets and sealers
4. glycerin-filled pressure gauges
5. tapered fittings and cones
6. check valves, smooth elbows, and tees
7. flanges and couplers
8. discharge control valves

**AGRICULTURAL -- CHANGES IN CROP MIX OR LOCATION**

**r) Changes In Crop Mix or Location**

1. moving crops that have high moisture demands to locations where pumping lifts are lower and/or soil conditions permit less irrigation
2. changing to crops with lower moisture demands

**s) Acquisition of Consumptive Water Rights**

includes actions that results in reduced pumping loads and /or increased hydro generation.

**5. Utility System Measures and Activities**

The following conservation activities, technologies or practices may be provided or installed in utility facilities. **An asterisk (\*) indicates that the measure has "deemed" savings assigned:**

**a) Distribution System Efficiency Improvements**

1. power transformer replacements
2. service conductor replacement
3. insulator additions and replacement
4. higher distribution primary voltage
5. transformer load management (replacement of improperly sized transformers for loss improvement)
6. operation improvements (reconfiguration and phase load balancing)
7. conservation voltage reduction (CVR), including both distribution level and customer level (e.g. house, business) voltage regulation
8. de-energize seasonally unloaded transformers

**b) Power Factor Improvement**

1. measures to improve power factor and reduce line losses
2. VAR management
3. voltage management
4. fixed and switched shunt capacitors

**c) Service Distribution Transformers**

1. replacement of existing or proposed transformers with higher efficiency transformers
2. multiple-transformer vs. single transformer, based on system analysis

**d) Service Connection Standards**

1. minimum efficiency standards that must be met prior to connection to or change in service connection load rating to the utility distribution system
2. service wire, transformer sizing

**e) Remote Feedback or Load Control Equipment**

1. equipment that provides consumers with real time consumption information
2. load management controls (i.e. water heaters, time of use, etc.)
3. other devices that permit the utility or consumers to monitor and manage electricity consumption.

**f) Station Service Loads**

such as lighting, motors, etc. that are replaced, or upgraded with more efficient components (in the same criteria as if it were an industrial facility).

## **6. Other Conservation Measures and Activities**

The following conservation activities, technologies or practices may be provided or installed in facilities not covered in other sectors. **An asterisk (\*) indicates that the measure has "deemed" savings assigned:**

**a) Traffic Lights**

1. new or conversion of existing incandescent traffic signals to more efficient light sources

**b) Street & Area Lighting**

1. replacement or upgrading of existing or proposed street and/or area lighting systems that are not metered as a commercial or industrial account to reduce electrical energy use and maintain or improve light levels and quality

**c) Vending Machines**

1. installation of more efficient lighting, timers and other measures that reduce the electrical consumption of refrigerated vending machines

**d) Energy Code Enforcement Support**

1. provision of support for code training, design assistance, plan review and field inspection services

**e) Contractor Training and Support**

1. educational seminars and classes
2. equipment purchases (testing and measurement equipment, blower doors, etc.)
3. referral services purchases
4. referral services
5. co-marketing

