FY20 Direct Install Program - Eligible Measures Listing:

a) *Lighting*:

- DLC qualified LED Luminaires including LED linear tube replacements
- Energy Star Approved LED Screw In Lamps
- T8 fixture replacements & retrofits
- T5 fixture replacements
- LED Exit Signs & Retrofits
- Lighting Controls (Occupancy, Photocell, Time Clock)

b) HVAC (Electric Cooling):

- Up to 25 Ton Packaged Unitary Units
- Up to 7.5 Ton Electric Split Systems (ductless allowed)
- Up to 15 Tons Heat Pumps (air or water source)

c) HVAC (Natural Gas, Oil, Propane Heating)

- Low Intensity IR Heaters (Gas Only)
- Furnaces up to 140Mbh
- Boilers up to 1,500Mbh
- For K-12 schools, series boiler approach allowed for boilers up to 3,000Mbh
- Oil to gas conversions allowed for furnaces and boilers only
- Water Heaters (storage or tank-less)
- Combo Boilers/Water Heaters
- Indirect Water Heaters

d) Variable Frequency Drives:

- Up to 10Hp controlled (existing VAV in HVAC systems)
- Investigating HVAC constant volume solutions

e) Premium Motors:

- TEFC & ODP motors up to 10Hp

f) HVAC & Hot Water Controls:

- Dual Enthalpy Economizers
- Electronic Fuel Use Economizers for Hot Water Heat, Steam Heat, Forced Hot Air, & AC
- Programmable Thermostats
- Outdoor Temp Sensors & Outdoor Resets for Boilers
- Demand Control Ventilation

- Pipe Wrap Insulation
- Faucet Aerators
- Low-Flow Showerheads
- Pre-Rinse Spray Valves

g) Refrigeration:

- LED Lighting for Refrigerated/Freezer Cases
- Electronically Commutated Motors
- Evaporator/Compressor Controllers
- Cooler/Freezer Door Heater Controls
- Aluminum Night Covers
- Electric Defrost Controls
- Novelty Cooler Shutoff
- Refrigerated Vending Machine Controls
- Refrigerated Case Doors
- LED Lighting for Refrigerated Case Doors

Direct Install Program Eligible Measures Minimum Efficiencies and Guidelines:

1. **Lighting**
    a. All materials must be UL listed. Reflectors must be UL classified.
    b. SPECULAR REFLECTORS: The reflector must have the appropriate UL Classification Marking. "These devices have been evaluated by UL to determine that when used in accordance with the manufacturer's instructions, they do not adversely affect the operation of the complete fixture."
    c. 4' T8 LAMPS: All installed 4' T8 lamps must meet the minimum requirements prescribed by CEE High-Performance T8 Specification or CEE Reduced Wattage T8 Specification.
    d. ELECTRONIC BALLASTS: All installed electronic ballasts in 4' T8 systems must be included on CEE qualified products list. All installed electronic ballasts must have a Total Harmonic Distortion < 20%.
    e. LED FIXTURES: All installed LED fixtures must be ENERGY STAR® or Design Lights Consortium (DLC) qualified.
    f. LED SCREW-INS: All supplied LED screw-in lamps must be ENERGY STAR® qualified.

2. **Refrigeration**
    a. REFRIGERATION CONTROLS: All eligible refrigeration control devices must be listed by UL or other OSHA approved Nationally Recognized Testing Laboratory (NRTL) in accordance with applicable US standards.
    b. REFRIGERATED CASE LEDs: All eligible refrigerated case LEDs must be Design Lights Consortium (DLC) qualified.

c. ELECTRONICALLY COMMUTATED MOTORS: Applicable to the installation of ECMs to replace shaded pole or permanent split capacitor motors driving evaporator fans in refrigerated cases.
d. EVAPORATOR/COMPRESSOR CONTROLLER: Applicable to existing refrigerated cases with continuously running evaporators and compressors.
e. DOOR HEATER CONTROL: Applicable to existing refrigerated cases with continuously running anti-sweat door heaters.
f. REFRIGERATED CASE DOORS: Applicable to open-type refrigerated cases only. Replacement of existing doors is not an eligible measure. Installed doors must have either heat reflective treated glass, be gas-filled, or both.
g. ELECTRIC DEFROST CONTROL: Applicable to existing evaporator fans with a traditional, time operated defrost mechanism.
h. ALUMINUM NIGHT COVERS: Retractable, woven aluminum covers are applicable to open-type refrigerated cases only.
i. ELECTRIC DEFROST CONTROL: Applicable to existing evaporator fans with a traditional, time operated defrost mechanism.
j. NOVELTY COOLER SHUTOFF: Applicable to existing novelty coolers that run continuously.

3. Motors

a. All installed motors must be new, three phase, NEMA Design A & B, Open Drip Proof or Totally Enclosed Fan-Cooled, 1200, 1800 or 3600 RPM induction motors.
b. Efficiency ratings are to be full-load nominal efficiencies tested in accordance with IEEE Standard 112, Test Method B. Minimum program efficiency rating requirements for eligible measures are below.

Open Drip Proof (ODP) Motors			
HP	1200 RPM	1800 RPM	3600 RPM
1	82.5%	85.5%	77.0%
1.5	86.5%	86.5%	84.0%
2	87.5%	86.5%	85.5%
3	88.5%	89.5%	85.5%
5	89.5%	89.5%	86.5%
7.5	90.2%	91.0%	88.5%
10	91.7%	91.7%	89.5%

Totally Enclosed Fan Cooled (TEFC) Motors			
HP	1200 RPM	1800 RPM	3600 RPM
1	82.5%	85.5%	77.0%
1.5	87.5%	86.5%	84.0%
2	88.5%	86.5%	85.5%
3	89.5%	89.5%	86.5%
5	89.5%	89.5%	88.5%
7.5	91.0%	91.7%	89.5%
10	91.0%	91.7%	90.2%

4. Variable Frequency Drives

a. Measure is applicable to installation of variable frequency drives on Variable Air Volume (VAV) HVAC system motors and chilled water pumps between 1 and 10 HP.

5. Electric HVAC

a. GAS HEATING UNITS: All installed equipment with electric cooling and gas heating must meet or exceed cooling mode specifications below and have a heating mode efficiency rating of 80% or better and have two-stage or modulating burners.

b. Installed equipment must meet or exceed the following efficiency ratings in cooling and heating mode, determined in accordance with appropriate standards and associated rating conditions prescribed by AHRI:

Electric Unitary & Split Systems	
Cooling Capacity	Cooling Efficiency
< 5.4 Tons (Single-Phase)	15 SEER
< 5.4 Tons (Three-Phase)	14 SEER
≥ 5.4 to < 11.25*	12 EER; 12.7 IEER
≥ 11.25 to < 20	12 EER; 12.2 IEER
≥ 20	10.6 EER; 11.4 IEER

Air Source Heat Pumps		
Tons	Cooling Efficiency	Heating Efficiency
< 5.4 Tons	15 SEER	8.5 HSPF
≥ 5.4 to < 11.25**	12 EER; 12 IEER	3.4 COP
≥ 11.25 to < 20	11.5 EER; 11.4 IEER	3.2 COP

Water Source Heat Pumps		
Tons	Cooling Efficiency	Heating Efficiency
All Sizes	14 EER	4.3 COP

*7.5 Ton split systems must meet 11.5 EER @ AHRI Conditions

**7.5 Ton Air Source heat pumps must meet 11.5 EER & 3.4 COP

c. The requirement for a Tier 1, 7.5 Ton Air Source Heat Pump at 47 deg F db/43 deg F wb testing conditions is 3.4 COP, which is approximately equal to an HSPF of 11.6 (COP = 0.293*HSPF). However, the requirement drops significantly when the testing conditions are not as specified above (2.4 COP or 8.2 HSPF @ 17 deg F db/15 deg F wb). So, the contractor needs to be sure the reported efficiency is tested at the correct conditions.

6. Heating & Hot Water

a. LOW-INTENSITY INFRARED HEATERS: All eligible infrared heating units must be listed by UL or other OSHA approved Nationally Recognized Testing Laboratory (NRTL) in accordance with applicable US standards.

b. Installed equipment must meet or exceed the following efficiency ratings, determined in accordance with appropriate standards and associated rating conditions prescribed by AHRI:

Fossil-Fuel Fired Equipment		
Equipment Type	**Min. Efficiency**	**Eff. Units**
Low Intensity IR Heating Unit (Gas)	83%	Et
Gas-Fired Furnace	92%	AFUE
Oil-Fired Furnace	83%	AFUE
Propane-Fired Furnace	92%	AFUE
Gas-Fired Boiler (<300 MBH)	93%	AFUE
Gas-Fired Boiler (≥300 MBH)	93%	Et
Oil-Fired Boiler (<300 MBH)	85%	AFUE
Oil-Fired Boiler (≥300 MBH)	85%	Et
Propane-Fired Boiler (<300 MBH)	85%	AFUE
Propane-Fired Boiler (≥300 MBH)	85%	Et
Gas-Fired Storage Water Heater (≤50 Gal; ≤75 MBH)	67%	EF
	64%	UEF
Gas-Fired Storage Water Heater (≤50 Gal; >75 MBH)	85%	Et
	64%	UEF
Gas-Fired Storage Water Heater (>50 Gal; ≤75 MBH)	67%	EF
	64%	UEF
Gas-Fired Storage Water Heater (>50 Gal; >75 MBH)	85%	Et
	64%	UEF
Gas-Fired Tankless Water Heater	82%	EF
	81%	UEF
Gas Fired Combination Boiler/Water Heater	90%	Et
Gas -Fired Indirect Water Heater	90%	AFUE
	90%	Et

7. HVAC & Hot Water System Improvements

a. All eligible HVAC controls must be listed by UL or other OSHA approved Nationally Recognized Testing Laboratory (NRTL) in accordance with applicable US standards.