

APPENDIX C-5. PACIFICORP MEASURE COMPARISON TO THE ENERGY TRUST OF OREGON

The Energy Trust of Oregon, Inc. (Energy Trust), recently completed a resource assessment¹ of potential energy efficiency and renewable energy measures to provide electricity and natural gas demand-side savings for Oregon consumers by 2030 within the Energy Trust's service territory. Cadmus reviewed descriptions of these Energy Trust measures and compiled a list of the comparable PacifiCorp measure names by state (California, Idaho, Utah, Washington, and Wyoming).

The following three tables present residential, commercial, and industrial measure names. Each table includes the sector, Energy Trust measure name, and PacifiCorp's measure names for each state. Notes in the far right column provide additional detail for certain measures. Irrigation and street lighting are included as part of industrial.²

¹ Resource Assessment for Energy Trust of Oregon – Final Report 3/28/11:
http://energytrust.org/library/reports/021611_ResourceAssessment.pdf

² In this appendix (C-5) industrial, irrigation, and street lighting are all combine into table. In appendix C-2 they are presented in separate tables.

Table C-5.1. Comparison of Energy Trust and PacifiCorp Residential Measure Names

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Residential	100% LED after 2020	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	
Residential	50% LED after 2020	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	
Residential	AC Tune - up (Z A, Z B)	Tune-up - Central Air Conditioner					
Residential	Add 16 LED lamps (using CFL base) after 2015	Lighting Specialty Lamp - Premium Efficiency LED					
Residential	Add 16 LED lamps (using incand base) after 2015	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	
Residential	Add 6 LED lamps (using CFL base) after 2015	Lighting Specialty Lamp - Premium Efficiency LED					
Residential	Add 6 LED lamps (using incand base) after 2015	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	
Residential	All LED (from 2020 base) after 2020	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	Lighting General Service Lamp - Premium Efficiency LED	
Residential	Commissioning (HP), Z A, Z B	Quality Installation - Heat Pump					
Residential	Common Area Lighting (MF Only)						Multifamily common area was treated in the commercial sector.

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Residential	Duct Sealing , Z A, Z B, Z C	Duct Sealing and Insulation - Code	Duct Sealing and Insulation - Code				
Residential	E* lighting (18 lamps)						See CFL and LED measures. Measures are considered individually in the study.
Residential	Eco Rated New Manufactured Home						Measures are considered individually in the study.
Residential	Elec ETO Dishwasher	Dishwasher - ENERGY STAR	Dishwasher - ENERGY STAR	Dishwasher - ENERGY STAR	Dishwasher - RTF ENERGY STAR	Dishwasher - ENERGY STAR	
		Dishwasher - Enhanced Efficiency	Dishwasher - Enhanced Efficiency	Dishwasher - Enhanced Efficiency	Dishwasher - RTF Enhanced Efficiency	Dishwasher - Enhanced Efficiency	
Residential	Elec Hi-eff Washer	Clothes Washer - ENERGY STAR	Clothes Washer - ENERGY STAR	Clothes Washer - ENERGY STAR	Clothes Washer - RTF Tier 1	Clothes Washer - ENERGY STAR	
Residential	Elec MEF 2.46 Washer	Clothes Washer - CEE Tier 3	Clothes Washer - CEE Tier 3	Clothes Washer - CEE Tier 3	Clothes Washer - RTF Tier 3	Clothes Washer - CEE Tier 3	
Residential	Energy Star HRV	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	Air-to-Air Heat Exchanger	
Residential	Energy Star New Home BOP 1 - ER						Measures are considered individually in the study.
Residential	Energy Star New Home BOP 1 - Heat Pump						Measures are considered individually in the study.
Residential	Energy Star New Manufactured Home						Measures are considered individually in the study.
Residential	Energy Star Television	TV - ENERGY STAR	TV - ENERGY STAR				
Residential	ER> Mini-split ductless heat pump Z A, Z B-C	Ductless Heat Pump (DHP)	Ductless Heat Pump (DHP)				

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Residential	Estar Refrigerator	Refrigerator - ENERGY STAR	Refrigerator - ENERGY STAR	Refrigerator - ENERGY STAR	Refrigerator - RTF Tier 1 (ENERGY STAR)	Refrigerator - ENERGY STAR	RTF measure modeled in WA only.
Residential	Evaporative Cooling (Direct/indirect) (Z A, Z B)	Central Cooling - Standard Evaporative Cooler					
		Central Cooling - Premium Evaporative Cooler					
Residential	Full lighting (all high efficacy)						Measures are considered individually in the study.
Residential	Heat Pump, (ER Base), Z A, Z B	Heat Pump - Air Source CEE Tier 2	Heat Pump - Air Source CEE Tier 2	Heat Pump - Air Source CEE Tier 2	Heat Pump - Air Source CEE Tier 2	Heat Pump - Air Source CEE Tier 2	Baseline: Standard Electric Furnace - HSPF 1.0
Residential	Heat Pump, (HP Upgrade), Z A, Z B	Heat Pump - Air Source ENERGY STAR	Baseline: Heat Pump - Air Source Federal Standard 2006				
		Heat Pump - Air Source CEE Tier 2	Heat Pump - Air Source CEE Tier 2	Heat Pump - Air Source CEE Tier 2	Heat Pump - Air Source CEE Tier 2	Heat Pump - Air Source CEE Tier 2	Baseline: Heat Pump - Air Source Federal Standard 2006
		Heat Pump - Air Source Enhanced	Baseline: Heat Pump - Air Source Federal Standard 2006				
					Heat Pump - Air Source RTF Tier 1		Baseline: Heat Pump - Air Source Federal Standard 2006. RTF measure modeled in WA only.
					Heat Pump - Air Source RTF Tier 2		Baseline: Heat Pump - Air Source Federal Standard 2006. RTF measure modeled in WA only.
Residential	High SEER CAC, (SEER 15) (Z A, Z B)	Central Air Conditioner - ENERGY STAR					

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Residential	HRV ER, Z A, Z B	Air-to-Air Heat Exchanger					
Residential	HRV HP Z A, Z B	Air-to-Air Heat Exchanger					
Residential	HRV, Z A, Z B, Z C	Air-to-Air Heat Exchanger					
Residential	LowPowerMode Appliances						Measure not included in the study directly. Most ENERGY STAR appliances and plug load devices include low watt standby modes.
Residential	MF Corridor Ventilation						Multifamily common area was treated in the commercial sector.
Residential	MH Duct Sealing, Z A, Z B, Z C	Duct Sealing and Insulation - Code					
Residential	MH Duct Sealing, Elect Resis, Z A, Z B	Duct Sealing and Insulation - Code	Duct Sealing and Insulation - Code	Duct Sealing and Insulation - Code	Duct Sealing and Insulation - RTF	Duct Sealing and Insulation - Code	RTF measure modeled in WA only.
Residential	MH Duct Sealing, Heat Pump, Z A, Z B	Duct Sealing and Insulation - Code	Duct Sealing and Insulation - Code	Duct Sealing and Insulation - Code	Duct Sealing and Insulation - RTF	Duct Sealing and Insulation - Code	RTF measure modeled in WA only.
Residential	New MF Construction						Measures are considered individually in the study.
Residential	Refrigerator Recycle	Refrigerator - Removal of Secondary					
Residential	Retail Lights (2 lamps) after 2014	Lighting General Service Lamp - High Efficiency CFL	Lighting General Service Lamp - High Efficiency CFL	Lighting General Service Lamp - High Efficiency CFL	Lighting General Service Lamp - High Efficiency CFL	Lighting General Service Lamp - High Efficiency CFL	
Residential	Retail Lights (2 lamps) to 2014	Lighting General Service Lamp - High Efficiency CFL	Lighting General Service Lamp - High Efficiency CFL	Lighting General Service Lamp - High Efficiency CFL	Lighting General Service Lamp - High Efficiency CFL	Lighting General Service Lamp - High Efficiency CFL	

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Residential	Room AC (Z A, Z B)	Room AC - ENERGY STAR					
Residential	SF Duct Sealing, Z A, Z B	Duct Sealing and Insulation - Code					
Residential	Solar DHW (50 gal) - elec backup						Included in Supplemental Resource analysis.
Residential	Specialty Lights after 2014	Lighting Specialty Lamp - High Efficiency CFL					
Residential	Specialty Lights to 2014	Lighting Specialty Lamp - High Efficiency CFL					
Residential	Tank upgrade (50 gal)-10 yr warranty	Water Heater - Federal Standard 2015 Storage	Water Heater - Federal Standard 2015 Storage	Water Heater - Federal Standard 2015 Storage	Water Heater - RTF Market Standard Storage	Water Heater - Federal Standard 2015 Storage	Due to the new standards in 2015 for water heaters, high efficiency storage water heaters were named "Water Heater - Federal Standard 2015 Storage" for all states except WA. For WA the measure is "Water Heater - RTF Market Standard Storage."
Residential	Tank upgrade (50 gal)-20 yr warranty	Water Heater - Federal Standard 2015 Storage	Water Heater - Federal Standard 2015 Storage	Water Heater - Federal Standard 2015 Storage	Water Heater - RTF Market Standard Storage	Water Heater - Federal Standard 2015 Storage	Due to the new standards in 2015 for water heaters, high efficiency storage water heaters were named "Water Heater - Federal Standard 2015 Storage."
Residential	Tier I Heat pump water heater	Heat Pump Water Heater - ENERGY STAR					
Residential	Tier II Heat pump water heater	Heat Pump Water Heater - ENERGY STAR	Heat Pump Water Heater - ENERGY STAR	Heat Pump Water Heater - ENERGY STAR	Heat Pump Water Heater - RTF Tier 1	Heat Pump Water Heater - ENERGY STAR	RTF measure modeled in WA only.
Residential	Window replace (U=.30), ER Z A, Z B	Window (CA) - Tier 1 Above Code	Window (ID) - Tier 1 Above Code	Window (UT) - Tier 1 Above Code	Window (WA) - Tier 1 Above Code	Window (WY) - Tier 1 Above Code	

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Residential	Window replace (U=.30), HP Z A, Z B	Window (CA) - Tier 1 Above Code	Window (ID) - Tier 1 Above Code	Window (UT) - Tier 1 Above Code	Window (WA) - Tier 1 Above Code	Window (WY) - Tier 1 Above Code	
Residential	Window, retro (U=.20), Z A, Z B, Z C	Window (CA) - Tier 3 Above Code	Window (ID) - Tier 3 Above Code	Window (UT) - Tier 3 Above Code	Window (WA) - Tier 3 Above Code	Window (WY) - Tier 3 Above Code	
Residential	Window, retro (U=.35), Z A, Z B, Z C	Window (CA) - Code	Window (ID) - Code	Window (UT) - Code	Window (WA) - Code	Window (WY) - Code	
Residential	Windows U=.30, ER, Z A, Z B	Window (CA) - Tier 1 Above Code	Window (ID) - Tier 1 Above Code	Window (UT) - Tier 1 Above Code	Window (WA) - Tier 1 Above Code	Window (WY) - Tier 1 Above Code	
Residential	Windows U=.30, HP, Z A, Z B	Window (CA) - Tier 1 Above Code	Window (ID) - Tier 1 Above Code	Window (UT) - Tier 1 Above Code	Window (WA) - Tier 1 Above Code	Window (WY) - Tier 1 Above Code	
Residential	Wx (ceiling, floor, wall) ER, Z A, Z B						Measures are considered individually in the study.
Residential	Wx (ceiling, floor, wall) HP, Z A, Z B						Measures are considered individually in the study.
Residential	Wx (ceiling, floor) ER, Z A, Z B						Measures are considered individually in the study.
Residential	Wx (ceiling, floor) HP, Z A, Z B						Measures are considered individually in the study.
Residential	Wx Air Sealing, Z A, Z B, Z C	Infiltration Control					
Residential	Wx insulation (ceiling, floor), Z A, Z B, Z C						Measures are considered individually in the study.
Residential	Wx insulation (ceiling, floor, walls), Z A, Z B, Z C						Measures are considered individually in the study.

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Residential	Wx SF Ceiling Insulation, Zone A, Zone B, Zone C	Ceiling Insulation (CA) - Above Code	Ceiling Insulation (ID) - Above Code	Ceiling Insulation (UT) - Above Code	Ceiling Insulation (WA) - Above Code	Ceiling Insulation (WY) - Above Code	
		Ceiling Insulation (CA) - Code	Ceiling Insulation (ID) - Code	Ceiling Insulation (UT) - Code	Ceiling Insulation (WA) - Code	Ceiling Insulation (WY) - Code	
Residential	Wx SF Duct Sealing, Z A, Z B, Z C	Duct Sealing and Insulation - Code					
Residential	Wx SF Floor Insulation, Zone A, Zone B, Zone C	Floor Insulation (CA) - Above Code	Floor Insulation (ID) - Above Code	Floor Insulation (UT) - Above Code	Floor Insulation (WA) - Above Code	Floor Insulation (WY) - Above Code	
		Floor Insulation (CA) - Code	Floor Insulation (ID) - Code	Floor Insulation (UT) - Code	Floor Insulation (WA) - Code	Floor Insulation (WY) - Code	
Residential	Wx SF Wall Insulation, Zone A, Zone B, Zone C	Wall Insulation 2x4 (CA) - Below Code	Wall Insulation 2x4 (ID) - Below Code	Wall Insulation 2x4 (UT) - Below Code	Wall Insulation 2x4 (WA) - Below Code	Wall Insulation 2x4 (WY) - Below Code	
		Wall Insulation 2x6 (CA) - Above Code	Wall Insulation 2x6 (ID) - Above Code	Wall Insulation 2x6 (UT) - Above Code	Wall Insulation 2x6 (WA) - Above Code	Wall Insulation 2x6 (WY) - Above Code	
		Wall Insulation 2x6 (CA) - Code	Wall Insulation 2x6 (ID) - Code	Wall Insulation 2x6 (UT) - Code	Wall Insulation 2x6 (WA) - Code	Wall Insulation 2x6 (WY) - Code	

Table C-5.2. Comparison of Energy Trust and PacifiCorp Commercial Measure Names

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	Cooling-2010 CEE Tier 1 AC - 15 ton (at rep), (new)	DX Package 135 to 240 kBTU/hr - High Efficiency	DX Package 135 to 240 kBTU/hr - High Efficiency	DX Package 135 to 240 kBTU/hr - High Efficiency	DX Package 135 to 240 kBTU/hr - High Efficiency	DX Package 135 to 240 kBTU/hr - High Efficiency	
Commercial	Cooling-2010 CEE Tier 1 AC - 25 ton (at rep), (new)		DX Package 240 to 760 kBTU/hr - High Efficiency	DX Package 240 to 760 kBTU/hr - High Efficiency	DX Package 240 to 760 kBTU/hr - High Efficiency	DX Package 240 to 760 kBTU/hr - High Efficiency	Measure applies to large office and/or retail which was not modeled in CA.
Commercial	Cooling-2010 CEE Tier 1 AC - 3 ton (at rep), (new)						Less than 5 ton (residential sized) units were not included in the commercial sector.
Commercial	Cooling-2010 CEE Tier 1 AC - 7.5 ton (at rep), (new)	DX Package 65 to 135 kBTU/hr - High Efficiency	DX Package 65 to 135 kBTU/hr - High Efficiency	DX Package 65 to 135 kBTU/hr - High Efficiency	DX Package 65 to 135 kBTU/hr - High Efficiency	DX Package 65 to 135 kBTU/hr - High Efficiency	
Commercial	Cooling-2010 CEE Tier 3 AC - 15 ton (at rep), (new)	DX Package 135 to 240 kBTU/hr - Premium Efficiency	DX Package 135 to 240 kBTU/hr - Premium Efficiency	DX Package 135 to 240 kBTU/hr - Premium Efficiency	DX Package 135 to 240 kBTU/hr - Premium Efficiency	DX Package 135 to 240 kBTU/hr - Premium Efficiency	
Commercial	Cooling-2010 CEE Tier 3 AC - 25 ton (at rep), (new)		DX Package 240 to 760 kBTU/hr - High Efficiency	DX Package 240 to 760 kBTU/hr - High Efficiency	DX Package 240 to 760 kBTU/hr - High Efficiency	DX Package 240 to 760 kBTU/hr - High Efficiency	Measure applies to large office and/or retail which was not modeled in CA.
Commercial	Cooling-2010 CEE Tier 3 AC - 3 ton (at rep), (new)						Less than 5 ton (residential sized) units were not included in the commercial sector.
Commercial	Cooling-2010 CEE Tier 3 AC - 7.5 ton (at rep), (new)	DX Package 65 to 135 kBTU/hr - Premium Efficiency	DX Package 65 to 135 kBTU/hr - Premium Efficiency	DX Package 65 to 135 kBTU/hr - Premium Efficiency	DX Package 65 to 135 kBTU/hr - Premium Efficiency	DX Package 65 to 135 kBTU/hr - Premium Efficiency	
Commercial	Ceramic Metal Halide	Lighting Interior - Metal Halide - Above Standard	Lighting Interior - Metal Halide - Above Standard	Lighting Interior - Metal Halide - Above Standard	Lighting Interior - Metal Halide - Above Standard	Lighting Interior - Metal Halide - Above Standard	
Commercial	CFL 9W to 39W hardwired	Lighting Interior - Screw Base CFL - Above Standard	Lighting Interior - Screw Base CFL - Above Standard	Lighting Interior - Screw Base CFL - Above Standard	Lighting Interior - Screw Base CFL - Above Standard	Lighting Interior - Screw Base CFL - Above Standard	All CFL potential was included under this measure regardless of application type (hardwired vs. non-hardwired).

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	Chiller System Optimization	Chilled Water / Condenser Water Settings-Optimization					
Commercial	Chiller Tower 6F approach	Cooling Tower- Decrease Approach Temperature					
Commercial	Computerized Water Heater Control	Demand Controlled Circulating Systems	Energy Trust measure refers to installation of intelligent controls on the hot water circulation loops. Assumed similar to demand controlled circulating systems.				
Commercial	Covered Parking Regional Average - New, NR	Covered Parking Lighting					
Commercial	Daylight Control (overhead)	Dimming-Continuous, Fluorescent Fixtures					
Commercial	Daylight perimeter zone	Daylighting Controls, Outdoors (Photocell)					
Commercial	DCV	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	
Commercial	DDC HVAC controls	Direct Digital Control System-Optimization					

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	DestratificationFan						This measure was not included in the study. High uncertainty in savings potential and limited applicability in PacifiCorp territory.
Commercial	DHW Faucets	Low-Flow Faucet Aerators					
Commercial	DHW Pipe Ins	Hot Water (SHW) Pipe Insulation					
Commercial	DHW Recirc Controls	Demand Controlled Circulating Systems					
Commercial	DHW Shower Heads	Low-Flow Showerheads					
Commercial	DHW Wrap						This measure was not included in the study. Measure not included as part of PacifiCorp's program offerings. Low remaining potential.
Commercial	Ducts	Duct Repair and Sealing					
		Insulation - Duct					
Commercial	ECM Fan Powered Boxes New	Motor - VAV Box High Efficiency (ECM)	Motor - VAV Box High Efficiency (ECM)	Motor - VAV Box High Efficiency (ECM)		Motor - VAV Box High Efficiency (ECM)	
Commercial	Economizer Diagnostic, Damper Repair & Reset	DX Tune-Up / Diagnostics					

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	Efficient Estar Dishwasher	Dishwasher Residential					
		Dishwashing - Commercial - High Temp					
		Dishwashing - Commercial - Low Temp					
Commercial	EMS Retrofit	Direct Digital Control System-Optimization	Installation of EMS or DDC system was not included in this study. Optimization of existing EMS/DDC was included.				
Commercial	Estar Commercial Clothes Washer	Clothes Washer Commercial					
Commercial	Estar Convection Oven	High Efficiency Convection Oven	High Efficiency Convection Oven	High Efficiency Convection Oven	High Efficiency Convection Oven	High Efficiency Convection Oven	
Commercial	EStar Fryer	Fryers - New CEE Efficient Electric Deep Fat Fryers	Fryers - New CEE Efficient Electric Deep Fat Fryers	Fryers - New CEE Efficient Electric Deep Fat Fryers	Fryers - New CEE Efficient Electric Deep Fat Fryers	Fryers - New CEE Efficient Electric Deep Fat Fryers	
Commercial	EStar Griddle	Griddle	Griddle	Griddle	Griddle	Griddle	
Commercial	EStar Steam Cooker	Steam Cooker	Steam Cooker	Steam Cooker	Steam Cooker	Steam Cooker	
Commercial	Exit Signs	Exit Sign - LED					
		Exit Sign - Photoluminescent or Tritium					
Commercial	Exterior LED Lighting	Exterior Building Lighting	Exterior Building Lighting	Exterior Building Lighting	Exterior Building Lighting	Exterior Building Lighting	LED technology is bundled in this measure.
Commercial	Floating Head Control	Floating Condenser Head Pressure Controls					

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	Ground Source Heat Pump - Air Source HP Base	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	
Commercial	Heat Pump Water Heat	Heat Pump Water Heater - ENERGY STAR	Heat Pump Water Heater - ENERGY STAR	Heat Pump Water Heater - ENERGY STAR	Heat Pump Water Heater - RTF Tier 1	Heat Pump Water Heater - ENERGY STAR	
Commercial	Heat Pump, 2010 CEE Tier 1	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	
Commercial	Heat Reclaim	Exhaust Air to Ventilation Air Heat Recovery					
		Water Cooled Refrigeration with Heat Recovery	Water Cooled Refrigeration with Heat Recovery	Water Cooled Refrigeration with Heat Recovery	Water Heater - RTF Market Standard Storage	Water Cooled Refrigeration with Heat Recovery	
Commercial	High Bay HID Large to T5	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Lighting Interior - High Bay Fluorescent High Output - Above Standard	
Commercial	High Bay HID Medium to T8	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Lighting Interior - High Bay Fluorescent High Output - Above Standard	Lighting Interior - High Bay Fluorescent High Output - Above Standard	
Commercial	High Efficacy LED Display	Display Case LEDs					

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	High Efficiency Chiller	Chillers <150 tons (screw) - High Efficiency					
		Chillers 150-300 tons (screw) - High Efficiency					
			Chillers >300 tons (centrifugal) - High Efficiency				
Commercial	Hot Food Holding Cabinet	Hot Food Holding Cabinet	Hot Food Holding Cabinet	Hot Food Holding Cabinet	Hot Food Holding Cabinet	Hot Food Holding Cabinet	
Commercial	HVAC System Commissioning						Commissioning for new construction was not included in this study. Recommissioning was included for existing construction in this study.
Commercial	HVAC System Retro Commissioning	Re-Commissioning	Re-Commissioning	Re-Commissioning	Re-Commissioning	Re-Commissioning	
Commercial	Indirect/Direct Evaporative Cooling ~20 ton	Evaporative Cooler replaces DX Package 135 to 240 kBTU/hr - Advanced Efficiency	Evaporative Cooler replaces DX Package 135 to 240 kBTU/hr - Advanced Efficiency	Evaporative Cooler replaces DX Package 135 to 240 kBTU/hr - Advanced Efficiency	Evaporative Cooler replaces DX Package 135 to 240 kBTU/hr - Advanced Efficiency	Evaporative Cooler replaces DX Package 135 to 240 kBTU/hr - Advanced Efficiency	
Commercial	Indirect/Direct Evaporative Cooling >60 ton	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	Evaporative Cooler replaces DX Package 240 to 760 kBTU/hr - Advanced Efficiency	Evaporative Cooler replaces DX Package 240 to 760 kBTU/hr - Advanced Efficiency	Evaporative Cooler replaces DX Package 240 to 760 kBTU/hr - Advanced Efficiency	Evaporative Cooler replaces DX Package 240 to 760 kBTU/hr - Advanced Efficiency	

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	Install Economizer	Chiller-Water Side Economizer	Chiller-Water Side Economizer	Chiller-Water Side Economizer	Chiller-Water Side Economizer	Chiller-Water Side Economizer	
		DX Package-Air Side Economizer					
Commercial	Lighting Scheduling/ Controls				Time Clock		Measure based on PacifiCorp's program offering.
		Daylighting Controls, Outdoors (Photocell)					
		Bi-Level Control, Stairwell Lighting					
Commercial	Mini-Split Heat Pump						Mini-split heat pumps not included in commercial sector. Measure included in the residential sector.
Commercial	Occupancy Sensors	Occupancy Sensor Control					
Commercial	Ozone Laundry Treatment						Measure not included in the study. All clothes washers were included under Clothes Washer Commercial.
Commercial	Roof Insulation - Attic 11-30, R0-30	Insulation - Ceiling					
Commercial	Roof Insulation - Blanket R0-19, R0-30	Insulation - Ceiling					
Commercial	Roof Insulation - Blanket R11-30, R11-41	Insulation - Ceiling					
Commercial	Roof Insulation - Rigid R0-11, R0-22	Insulation - Ceiling					

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	Roof Insulation - Rigid R11-22, R11-33	Insulation - Ceiling					
Commercial	Roof Insulation - Roofcut 0-22	Insulation - Ceiling					
Commercial	RTU Fleet DCV - NO HR	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Measure applications bundled into one measure.
Commercial	RTU Fleet DCV - With Heat Rec	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors)	Measure applications bundled into one measure.
Commercial	Solar Hot Water						Included in Supplemental Resource analysis.
Commercial	Surface Parking Regional Average - New, NR, Retro	Surface Parking Lighting					
Commercial	Sweep Control						This measure was not included in the study. While sweep control technology is different from occupancy control, PacifiCorp assumed all potential can be found under lighting controls of Occupancy Sensor Control.
Commercial	T12, T8 to HP T8	Lighting Interior - Fluorescent High Performance - Above Standard	Lighting Interior - Fluorescent High Performance - Above Standard	Lighting Interior - Fluorescent High Performance - Above Standard	Lighting Interior - Fluorescent High Performance - Above Standard	Lighting Interior - Fluorescent High Performance - Above Standard	

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	Transformers	Power Supply Transformer/Converter					
Commercial	VSD on HVAC motors	Motor - Pump & Fan System - Variable Speed Control	Motor - Pump & Fan System - Variable Speed Control	Motor - Pump & Fan System - Variable Speed Control	Motor - Pump & Fan System - Variable Speed Control	Motor - Pump & Fan System - Variable Speed Control	
Commercial	Wall Insulation - Blown R11	Insulation - Wall					
Commercial	Wall Insulation - Spray On for Metal Buildings	Insulation - Wall					
Commercial	Waste Water Heat Exchanger	Drainwater Heat Recovery Water Heater					
Commercial	Water Source Heat Pump High Efficiency						Measure not included in the study. Other heat pumps were included in this study are: Air Source Heat Pump and Ground Source Heat Pump.
Commercial	Windows - Add Argon to Vinyl Lowe	Windows-High Efficiency	PacifiCorp did not include the exact Energy Trust measure iteration for windows. PacifiCorp's measure varies by equipment U-value, but does not map directly to the Energy Trust measure name.				
Commercial	Windows - Add Low E and Argon to Vinyl Tint	Windows-High Efficiency	PacifiCorp did not include the exact Energy Trust measure iteration for windows. PacifiCorp's measure varies by equipment U-value, but does not map directly to the Energy Trust measure name.				

Sector	Energy Trust Measure Name	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Commercial	Windows - Add Low E to Vinyl Tint	Windows-High Efficiency	PacifiCorp did not include the exact Energy Trust measure iteration for windows. PacifiCorp's measure varies by equipment U-value, but does not map directly to the Energy Trust measure name.				
Commercial	Windows - Non-Tinted AL Code to Class 36,40,45	Windows-High Efficiency	PacifiCorp did not include the exact Energy Trust measure iteration for windows. PacifiCorp's measure varies by equipment U-value, but does not map directly to the Energy Trust measure name.				
Commercial	Windows - Double to Class 36, 40, 45, VEA	Windows-High Efficiency	PacifiCorp did not include the exact Energy Trust measure iteration for windows. PacifiCorp's measure varies by equipment U-value, but does not map directly to the Energy Trust measure name.				
Commercial	Windows - Single to Class 36, 40, 45,VEA	Windows-High Efficiency	PacifiCorp did not include the exact Energy Trust measure iteration for windows. PacifiCorp's measure varies by equipment U-value, but does not map directly to the Energy Trust measure name.				
Commercial	Windows - Tinted AL Code to Class 36, 40, 45	Windows-High Efficiency	PacifiCorp did not include the exact Energy Trust measure iteration for windows. PacifiCorp's measure varies by equipment U-value, but does not map directly to the Energy Trust measure name.				

Table C-5.3. Comparison of Energy Trust and PacifiCorp Industrial Measure Names

Sector	Energy Trust Measure	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Industrial	Air Compressor Demand Reduction	Air Compressor Demand Reduction	Air Compressor Demand Reduction	Air Compressor Demand Reduction	Air Compressor Demand Reduction	Air Compressor Demand Reduction	
Industrial	Air Compressor Equipment1 & 2	Air Compressor Equipment	Air Compressor Equipment	Air Compressor Equipment	Air Compressor Equipment	Air Compressor Equipment	
Industrial	Air Compressor Optimization	Air Compressor Optimization	Air Compressor Optimization	Air Compressor Optimization	Air Compressor Optimization	Air Compressor Optimization	
Industrial	Clean Room: Change Filter Strategy		Clean Room: Change Filter Strategy	Measure pertains only to specific industry types and is not applicable in all states.			
Industrial	Clean Room: Chiller Optimize		Clean Room: Chiller Optimize	Measure pertains only to specific industry types and is not applicable in all states.			
Industrial	Clean Room: Clean Room HVAC		Clean Room: Clean Room HVAC	Measure pertains only to specific industry types and is not applicable in all states.			
Industrial	Cold Storage Retrofit	Cold Storage Retrofit	Cold Storage Retrofit	Cold Storage Retrofit	Cold Storage Retrofit	Cold Storage Retrofit	
Industrial	Cold Storage Tuneup	Cold Storage Tuneup	Cold Storage Tuneup	Cold Storage Tuneup	Cold Storage Tuneup	Cold Storage Tuneup	
Industrial	Efficient Centrifugal Fan	Efficient Centrifugal Fan	Efficient Centrifugal Fan	Efficient Centrifugal Fan	Efficient Centrifugal Fan	Efficient Centrifugal Fan	

Sector	Energy Trust Measure	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Industrial	Efficient Lighting 1, 2,3 Shift	T8 High Performance Linear Florescent					
		T5 Linear Florescent					
		T8 Reduced Wattage Linear Florescent					
		T8 Linear Florescent					
		Screw Base CFL					
		Screw Base LED					
Industrial	Elec Chip Fab: Eliminate Exhaust		Elec Chip Fab: Eliminate Exhaust	Measure pertains only to specific industry types and is not applicable in all states.			
Industrial	Elec Chip Fab: Exhaust Injector		Elec Chip Fab: Exhaust Injector	Measure pertains only to specific industry types and is not applicable in all states.			
Industrial	Elec Chip Fab: Reduce Gas Pressure		Elec Chip Fab: Reduce Gas Pressure	Measure pertains only to specific industry types and is not applicable in all states.			
Industrial	Elec Chip Fab: Solidstate Chiller		Elec Chip Fab: Solidstate Chiller	Measure pertains only to specific industry types and is not applicable in all states.			
Industrial	Energy Project Management	Facility Energy Management	Facility Energy Management	Facility Energy Management	Facility Energy Management	Facility Energy Management	Single measure includes Plant Energy Management, Energy Project Management, Pump Energy Management
Industrial	Fan Energy Management	Improved Controls - Fans					
Industrial	Fan Equipment Upgrade	Fan Equipment Upgrade	Fan Equipment Upgrade	Fan Equipment Upgrade	Fan Equipment Upgrade	Fan Equipment Upgrade	
Industrial	Fan System Optimization	Fan System Optimization	Fan System Optimization	Fan System Optimization	Fan System Optimization	Fan System Optimization	

Sector	Energy Trust Measure	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Industrial	Food: Cooling and Storage	Food: Cooling and Storage	Food: Cooling and Storage	Food: Cooling and Storage	Food: Cooling and Storage	Food: Cooling and Storage	
Industrial	Food: Refrig Storage Tuneup						This measure was accounted for in the commercial sector: Controlled Atmosphere - Fruit Storage - Fruit Storage Refrigeration Tuneup.
Industrial	Grocery Distribution Retrofit						This measure was not in the study. Segmentation of grocery distribution centers was not included in study.
Industrial	Grocery Distribution Tuneup						This measure was not in the study. Segmentation of grocery distribution centers was not included in study.
Industrial	HighBay Lighting 1, 2, 3 Shift	Efficient Metal Halide (High Bay)					
		Induction (High Bay)					
		LED (High Bay)					
		Linear Fluorescent (High Bay)					
		Metal Halide (High Bay)					
Industrial	Integrated Plant Energy Management	Recommissioning / Facility Energy Management					
Industrial	Irrigation: Ditch > Pipe						This measure was not in the study. All irrigation improvement measures were bundled in one measure: Irrigation System Improvements.

Sector	Energy Trust Measure	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Industrial	Irrigation: Nozzles, Pump Systems Adjust, Pump Systems Repair	Irrigation System Improvements	Irrigation System Improvements	Irrigation System Improvements	Irrigation System Improvements	Irrigation System Improvements	
Industrial	Irrigation: Water Management	SIS	SIS	SIS	SIS	SIS	
Industrial	Kraft: Efficient Agitator			Kraft: Efficient Agitator	Kraft: Efficient Agitator		Measure pertains only to specific industry types and is not applicable in all states.
Industrial	Kraft: Effluent Treatment System			Kraft: Effluent Treatment System	Kraft: Effluent Treatment System		Measure pertains only to specific industry types and is not applicable in all states.
Industrial	Lighting Controls	Lighting Controls	Lighting Controls	Lighting Controls	Lighting Controls	Lighting Controls	
Industrial	Material Handling VFD1, VFD2	Material Handling VFD	Material Handling VFD	Material Handling VFD	Material Handling VFD	Material Handling VFD	
Industrial	Material Handling1, Handling2	Material Handling	Material Handling	Material Handling	Material Handling	Material Handling	
Industrial	Metal: New Arc Furnace	Metal: New Arc Furnace	Metal: New Arc Furnace	Metal: New Arc Furnace	Metal: New Arc Furnace	Metal: New Arc Furnace	
Industrial	Motors: Rewind 101-200 HP	Motors: Rewind 101-200 HP	Motors: Rewind 101-200 HP	Motors: Rewind 101-200 HP	Motors: Rewind 101-200 HP	Motors: Rewind 101-200 HP	
Industrial	Motors: Rewind 201-500 HP	Motors: Rewind 201-500 HP	Motors: Rewind 201-500 HP	Motors: Rewind 201-500 HP	Motors: Rewind 201-500 HP	Motors: Rewind 201-500 HP	
Industrial	Motors: Rewind 20-50 HP	Motors: Rewind 20-50 HP	Motors: Rewind 20-50 HP	Motors: Rewind 20-50 HP	Motors: Rewind 20-50 HP	Motors: Rewind 20-50 HP	
Industrial	Motors: Rewind 501-5000 HP	Motors: Rewind 500+ HP	Motors: Rewind 500+ HP	Motors: Rewind 500+ HP	Motors: Rewind 500+ HP	Motors: Rewind 500+ HP	
Industrial	Motors: Rewind 51-100 HP	Motors: Rewind 51-100 HP	Motors: Rewind 51-100 HP	Motors: Rewind 51-100 HP	Motors: Rewind 51-100 HP	Motors: Rewind 51-100 HP	
Industrial	Panel: Hydraulic Press	Panel: Hydraulic Press	Panel: Hydraulic Press	Panel: Hydraulic Press	Panel: Hydraulic Press	Panel: Hydraulic Press	
Industrial	Paper: Efficient Pulp Screen			Paper: Efficient Pulp Screen	Paper: Efficient Pulp Screen		Measure pertains only to specific industry types and is not applicable in all states.

Sector	Energy Trust Measure	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Industrial	Paper: Large Material Handling			Paper: Large Material Handling	Paper: Large Material Handling		Measure pertains only to specific industry types and is not applicable in all states.
Industrial	Paper: Material Handling			Paper: Material Handling	Paper: Material Handling		Measure pertains only to specific industry types and is not applicable in all states.
Industrial	Paper: Premium Control Large Material			Paper: Premium Control Large Material	Paper: Premium Control Large Material		Measure pertains only to specific industry types and is not applicable in all states.
Industrial	Paper: Premium Fan			Paper: Premium Fan	Paper: Premium Fan		Measure pertains only to specific industry types and is not applicable in all states.
Industrial	Plant Energy Management	Facility Energy Management	Facility Energy Management	Facility Energy Management	Facility Energy Management	Facility Energy Management	Single measure includes Plant Energy Management, Energy Project Management, Pump Energy Management
Industrial	Pump Energy Management	Facility Energy Management	Facility Energy Management	Facility Energy Management	Facility Energy Management	Facility Energy Management	Single measure includes Plant Energy Management, Energy Project Management, Pump Energy Management
Industrial	Pump Equipment Upgrade	Pump Equipment Upgrade	Pump Equipment Upgrade	Pump Equipment Upgrade	Pump Equipment Upgrade	Pump Equipment Upgrade	
Industrial	Pump System Optimization	Pump System Optimization	Pump System Optimization	Pump System Optimization	Pump System Optimization	Pump System Optimization	
Industrial	Replace Streetlight: 100WHPS>LED60W	LED (78 W) 100 Watt Equivalent	LED (78 W) 100 Watt Equivalent	LED (78 W) 100 Watt Equivalent	LED (78 W) 100 Watt Equivalent	LED (78 W) 100 Watt Equivalent	LED wattages defined by PacifiCorp's program offering.
Industrial	Replace Streetlight: 100WHPS>LED78W	LED (78 W) 100 Watt Equivalent	LED (78 W) 100 Watt Equivalent	LED (78 W) 100 Watt Equivalent	LED (78 W) 100 Watt Equivalent	LED (78 W) 100 Watt Equivalent	LED wattages defined by PacifiCorp's program offering.
Industrial	Replace Streetlight: 150HPS>LED111W	LED (106 W) 150 Watt Equivalent	LED (106 W) 150 Watt Equivalent	LED (106 W) 150 Watt Equivalent	LED (106 W) 150 Watt Equivalent	LED (106 W) 150 Watt Equivalent	LED wattages defined by PacifiCorp's program offering.
Industrial	Replace Streetlight: 150HPS>LED117W	LED (106 W) 150 Watt Equivalent	LED (106 W) 150 Watt Equivalent	LED (106 W) 150 Watt Equivalent	LED (106 W) 150 Watt Equivalent	LED (106 W) 150 Watt Equivalent	LED wattages defined by PacifiCorp's program offering.

Sector	Energy Trust Measure	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Industrial	Replace Traffic Light: Green Arrow						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Green Ball 12-inch						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Green Ball 8-inch						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Green Bi-Modal Arrow						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Orange Countdown						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Orange Hand						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Red Arrow						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.

Sector	Energy Trust Measure	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Industrial	Replace Traffic Light: Red Ball 12-inch						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Red Ball 8-inch						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: White Walking Person						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Yellow Ball 12-inch						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Yellow Ball 8-inch						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Replace Traffic Light: Yellow Bi-Modal Arrow						Traffic lights were not included in the study. PacifiCorp has achieved high saturation of LED traffic lights and potential was assumed to be minimal.
Industrial	Retro Rural MV>LED117W						PacifiCorp did not allocate measures explicitly for rural applications. Measure covered under the Energy Trust measure of "Retro Streetlight."

Sector	Energy Trust Measure	PacifiCorp Measure Name					Notes
		CA	ID	UT	WA	WY	
Industrial	Retro Streetlight: 100WHPS>LED60W	LED (78 W) 100 Watt Equivalent	LED wattages defined by PacifiCorp's program offering.				
Industrial	Retro Streetlight: 100WHPS>LED78W	LED (78 W) 100 Watt Equivalent	LED wattages defined by PacifiCorp's program offering.				
Industrial	Retro Streetlight: 150HPS>LED111W	LED (106 W) 150 Watt Equivalent	LED wattages defined by PacifiCorp's program offering.				
Industrial	Retro Streetlight: 150HPS>LED117W	LED (106 W) 150 Watt Equivalent	LED wattages defined by PacifiCorp's program offering.				
Industrial	Rural Area Lights						PacifiCorp did not allocate measures explicitly for rural applications. Measure covered under the Energy Trust measure of "Retro Streetlight."
Industrial	Synchronous Belts	Synchronous Belts	Synchronous Belts	Synchronous Belts	Synchronous Belts	Synchronous Belts	
Industrial	Transformers-New, Retrofit	Transformers	Transformers	Transformers	Transformers	Transformers	
Industrial	Wood: Replace Pneumatic Conveyor	Wood: Replace Pneumatic Conveyor	Wood: Replace Pneumatic Conveyor	Wood: Replace Pneumatic Conveyor	Wood: Replace Pneumatic Conveyor	Wood: Replace Pneumatic Conveyor	