

ESTIMATED GAS SAVINGS

ThermWise® Appliance Rebates

SINGLE FAMILY

Measure	Annual Savings	Source
Natural Gas Furnace - 92% AFUE	9.69 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE	11.77 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE with ECM	11.77 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 98% AFUE with ECM	13.85 Dth/unit	2017 Nexant Energy Model Estimate
Gas Storage Water Heater	2.86 Dth/unit	2010 Deemed savings reduced by realization rate*
Tankless Gas Water Heater	9.37 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Condensing Gas Storage Water Heater	8.68 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Hybrid Gas Water Heater	8.68 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Gas Boiler Tier 1	18.7 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Gas Boiler Tier 2	25.2 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Solar Assisted Gas Water Heating (domestic)	17.5 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Solar Assisted Gas Water Heating (pool)	68.9 Dth/unit	2012 PECI Energy Model Estimate
Direct Vent Gas Fireplace	10.8 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Smart Thermostat	8.6 Dth/unit	2014 PECI Energy Model Estimate
Boiler Reset Control	5.4 Dth/unit	2017 Nexant Energy Model Estimate
Combined Space and Hot Water	19.0 Dth/unit	2017 Nexant Energy Model Estimate

MULTIFAMILY

Measure	Annual Savings	Source
Natural Gas Furnace - 92% AFUE	7.3 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE	8.8 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE with ECM	8.8 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 98% AFUE with ECM	10.4 Dth/unit	2017 Nexant Energy Model Estimate
Gas Storage Water Heater	2.15 Dth/unit	2010 Deemed savings reduced by realization rate*

*See Cadmus Phase II Evaluation

Tankless Gas Water Heater	6.0 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Condensing Gas Storage Water Heater	5.4 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Hybrid Gas Water Heater	5.4 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Gas Boiler Tier 1	12.08 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Gas Boiler Tier 2	16.11 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Solar Assisted Gas Water Heating (domestic)	17.5 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Solar Assisted Gas Water Heating (pool)	68.9 Dth/unit	2012 PECI Energy Model Estimate
Direct Vent Gas Fireplace	4.1 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Smart Thermostat	4.0 Dth/unit	2014 PECI Energy Model Estimate
Combined Space and Hot Water	14.1 Dth/unit	2017 Nexant Energy Model Estimate
ThermWise® Business Rebates		
Measure	Annual Savings	Source
Gas Storage Water Heater	3.03 Dth/unit	Calculation based upon difference between baseline and minimum efficiency energy factor
Gas Storage Water Heater (>75 kBtu)	0.29 Dth/unit	
Tankless Gas Water Heater	0.14 Dth/unit	ENERGY STAR® Residential Water Heaters Specification as of 1/5/09 and Final Criteria Analysis
Commercial Clothes Washer	2.6 Dth/unit	ENERGY STAR® Commercial Clothes Washer Calculator
Low Flow Pre-Rinse Spray Valve	10.8 Dth/unit	California Urban Water Conservation Council, Rinse & Save Program Evaluation 2005
Natural Gas Furnace - 92% AFUE	9.69 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE	11.77 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE with ECM	11.77 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 98% AFUE with ECM	13.85 Dth/unit	2017 Nexant Energy Model Estimate
Gas Boiler (Hot Water) Tier 1	0.18 Dth/unit	ENERGY STAR® Boiler Calculator
Gas Boiler (Hot Water) Tier 2 ≥ 300,000 < 2,500,000	0.2 Dth/unit	2017 Nexant Energy Model Estimate
Gas Boiler (Hot Water) ≥ 2,500,000 BTU/h	0.2 Dth/unit	2017 Nexant Energy Model Estimate

*See Cadmus Phase II Evaluation

Gas Boiler (steam)	0.18 Dth/unit	ENERGY STAR® Boiler Calculator
Gas Boiler(Steam) (Except Natural Draft) ≥ 300,000 Btu/h	0.07 Dth/unit	ENERGY STAR® Boiler Calculator
Gas Boiler (Steam) (Natural Draft) ≥ 300,000 Btu/h	0.12 Dth/unit	ENERGY STAR® Boiler Calculator
Direct Contact Gas Water Heater	0.23 Dth/unit	PG&E -CPUC 2004-2005 / Single Family Rebate Program
Condensing Gas Water Heater	10.2 Dth/unit	2016 Nexant Energy Model Estimate
Hybrid Water Heater	10.2 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Combined Space / Water Heater	18.7 Dth/unit	2014 Nexant Engineering Estimate
Unit Heater (NonCondensing)	0.06 Dth/unit	PG&E 2004 and ACEEE 2003 Reports
Unit Heater (Condensing)	0.17 Dth/unit	
Infrared Heating System	0.48 Dth/system	1) Gas Networks Savings Estimates 2) GDS Report 3) ASHRAE Research #4643
Modulating Infrared Heaters (NC or Replacing Non IR)	.55 Dth/unit	2014 Nexant Engineering Estimate
Modulating Infrared Heaters (Replacing Non IR)	.07 Dth/unit	2014 Nexant Engineering Estimate
Condensing RTU's	.41 Dth/unit	2014 Nexant Engineering Estimate
Gas Boiler Outside Air Reset Control	74.1 Dth/unit	GDS Report 2004 CA Statewide Gas Potential Study Kema-Xenergy 2003
Gas Boiler Tune-up – Tier 1	9.8 Dth/unit	2013 Nexant Engineering Estimate
Gas Boiler Tune-up – Tier 2	48.86 Dth/unit	GDS Report 2004 CA Statewide Gas Potential Study Kema-Xenergy 2003
Gas Boiler Tune-up – Tier 3	72.0 Dth/unit	2013 Nexant Engineering Estimate
Smart Thermostat	.007 Dth/sq. ft.	2016 Nexant Energy Model Estimate
Gas Fryer	40.4 Dth/unit	ENERGY STAR® Gas Fryer Calculator
Gas Steam Cooker	35.3 Dth/unit	ENERGY STAR® Steam Cooker Calculator
Gas Convection Oven	16.15 Dth/per vat	PG&E -CPUC 2006-2008 / Single Family Rebate Program
Gas Combination Oven	40.3 Dth/unit	PG&E -CPUC 2006-2008 / Single Family Rebate Program

*See Cadmus Phase II Evaluation

Gas Griddle	8.8 Dth/unit	PG&E -CPUC 2006-2008 / Single Family Rebate Program
Wall Insulation (retrofit)	0.004 Dth/ sq. ft.	DOE-2 modeling against ASHRAE 90.1-2004 Baseline
Roof Insulation (retrofit)	0.0023 Dth/ sq. ft.	2017 Nexant Energy Model Estimate
Charbroiler	75 Dth/unit	2015 Nexant Energy Model Estimate
Conveyor Oven	88.40 Dth/unit	2015 Nexant Energy Model Estimate
Gas Dryer Moisture Sensor	11.20 Dth/unit	2015 Nexant Energy Model Estimate
Modulating Gas Dryer	32 Dth/unit	2015 Nexant Energy Model Estimate
Solar Water Heater – Pool (business)	68.90 Dth/unit	2015 Nexant Energy Model Estimate
Demand Control Ventilation Tier 2	.0068 Dth/CFM	2017 Nexant Energy Model Estimate
Demand Control Ventilation Tier 1	27.2 Dth/unit	2017 Nexant Energy Model Estimate
Custom Measures	1,000 Dth/project	2014 Nexant Engineering Estimate
Pipe Insulation (Hot Water)	.84 Dth/ sq. ft.	2017 Nexant Energy Model Estimate
Pipe Insulation (Steam)	3.13 Dth/ sq. ft.	2017 Nexant Energy Model Estimate
ThermWise® Builder Rebates		
SINGLE FAMILY		
Measure	Annual Savings	Source
HERS Index 62 or lower	5.2 Dth/unit	2016 CLEAResult Energy Model Estimate
HERS Index 55 or lower	10.4 Dth/unit	2016 CLEAResult Energy Model Estimate
HERS Index 48 or lower	15.6 Dth/unit	2016 CLEAResult Energy Model Estimate
ENERGY STAR® Bonus	2.78 Dth/unit	2016 CLEAResult Energy Model Estimate
Natural Gas Furnace - 92% AFUE	8.1 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE	10.13 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE with ECM	10.13 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 98% AFUE with ECM	12.15 Dth/unit	2017 Nexant Energy Model Estimate
Gas Storage Water Heater	2.86 Dth/unit	2010 Deemed savings reduced by realization rate*

*See Cadmus Phase II Evaluation

Tankless Gas Water Heater	8.56 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Gas Condensing Storage Water Heater	8.68 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Hybrid Gas Water Heater	8.68 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Gas Boiler Tier 1	9.06 Dth/unit	2017 Nexant Energy Model Estimate
Gas Boiler Tier 2	16.11 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Solar Assisted Gas Water Heating (domestic)	17.5 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Solar Assisted Gas Water Heating (pool)	68.9 Dth/unit	2012 PECI Engineering Estimate
2X6 R-23 Walls	5.4 Dth/unit	2016 CLEAResult Energy Model Estimate
Windows R-5	0.029 Dth/per sq. ft.	PECI Energy Model (REM/Design v. 12.61)
Smart Thermostat	4.3 Dth/unit	2014 PECI Energy Model Estimate
Combined Space and Hot Water	18.3	2017 Nexant Energy Model Estimate
MULTIFAMILY		
Measure	Annual Savings	Source
HERS Index 62 or lower	2.3 Dth/unit	2016 CLEAResult Energy Model Estimate
HERS Index 55 or lower	4.6 Dth/unit	2016 CLEAResult Energy Model Estimate
HERS Index 48 or lower	6.9 Dth/unit	2016 CLEAResult Energy Model Estimate
ENERGY STAR® Bonus	1.13 Dth/unit	2016 CLEAResult Energy Model Estimate
Natural Gas Furnace - 92% AFUE	6.1 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE	7.6 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 95% AFUE with ECM	7.6 Dth/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 98% AFUE with ECM	9.1 Dth/unit	2017 Nexant Energy Model Estimate
Gas Storage Water Heater	1.39 Dth/unit	2010 Deemed savings reduced by realization rate*
Tankless Gas Water Heater	5.4 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Condensing Gas Storage Water Heater	5.4 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Hybrid Gas Water Heater	5.4 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Gas Boiler Tier 1	9.06 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Gas Boiler Tier 2	16.11 Dth/unit	PECI Energy Model (REM/Design v. 12.61)

*See Cadmus Phase II Evaluation

Solar Assisted Gas Water Heating (domestic)	17.5 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Solar Assisted Gas Water Heating (pool)	68.9 Dth/unit	2012 PECI Engineering Estimate
Windows R-5	0.021 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Smart Thermostat	1.7 Dth/unit	2014 PECI Energy Model Estimate
Combined Space and Hot Water	12.0 Dth/unit	2017 Nexant Energy Model Estimate
Energy Star High Rise	1.13	2017 Nexant Energy Model Estimate
ThermWise® Home Energy Plan		
Measure	Annual Savings	Source
Kitchen Sink Aerator	1.32 Dth/unit	2010 Nexant Engineering Calculation
Pipe Insulation	1.4 Dth/system	DOE Rebuild America Reenergize Energy Efficiency Guidebook
Faucet Aerator	0.44 Dth/unit	DOE Rebuild America Reenergize Energy Efficiency Guidebook
Low Flow Shower Head	5.79 Dth/unit	Nexant 2006 Market Study Report
ThermWise® Weatherization Rebates		
SINGLE FAMILY		
Measure	Annual Savings	Source
Windows – R-5	0.0698 Dth/sq. ft.	Nexant 2011 Engineering Calculation
Wall Insulation	0.0053 Dth/sq. ft.	2010 Deemed savings reduced by realization rate*
Attic Insulation Tier 1	0.0053 Dth/sq. ft.	2010 Deemed savings reduced by realization rate*
Attic Insulation Tier 2	0.0013 Dth/sq. ft.	2010 Deemed savings reduced by realization rate*
Floor Insulation	0.0068 Dth/sq. ft.	2010 Deemed savings reduced by realization rate*
Duct Sealing & Duct Insulation	13.48 Dth/System	Nexant 2011 Engineering Calculation
Air Sealing	0.0048 Dth/system	Nexant 2011 Engineering Calculation
Pipe Insulation	0.19 Dth/sq.ft.	2017 Nexant Energy Model Estimate

*See Cadmus Phase II Evaluation

ICAST pilot	12.5 Dth/system	2017 Nexant Energy Model Estimate
MULTIFAMILY		
Measure	Annual Savings	Source
Windows – R-5	0.0698 Dth/sq. ft.	Nexant 2011 Engineering Calculation
Wall Insulation	0.0053 Dth/sq. ft.	2010 Deemed savings reduced by realization rate*
Attic Insulation Tier 1	0.0053 Dth/sq. ft.	2010 Deemed savings reduced by realization rate*
Attic Insulation Tier 2	0.0013 Dth/sq. ft.	2010 Deemed savings reduced by realization rate*
Floor Insulation	0.0068 Dth/sq. ft.	2010 Deemed savings reduced by realization rate*
Duct Sealing & Duct Insulation	8 Dth/system	Nexant 2011 Engineering Calculation
Low Income Assistance Program		
Measure	Annual Savings	Source
Natural Gas Furnace - 95% AFUE (with & without ECM)	11.77 Dth/unit	PECI Energy Model (REM/Design v. 12.61)
Natural Gas Furnace - 98% AFUE with ECM	13.85 Dth/unit	2015 PECI Energy Model Estimate
Note: An approved non-profit or governmental organization may apply for rebates under the ThermWise® Appliance and Weatherization programs for qualifying measures listed in sections 2.10 and 2.14 of the Tariff.		

ThermWise® Energy Comparison Report		
Measure	Annual Savings	Source
Energy Comparison Report	1.22 Dth/report	2017 Dominion Energy Model Estimate

MEASURE LIFE

ThermWise® Appliance Rebates

*See Cadmus Phase II Evaluation

SINGLE FAMILY		
Measure	Lifetime	Source
Natural Gas Furnace - 92% AFUE	18	2013 PECE estimate
Natural Gas Furnace - 95% AFUE (with & without ECM)	18	2011 PECE estimate
Natural Gas Furnace - 98% AFUE with ECM	18	2013 PECE estimate
Gas Storage Water Heater	13	2011 PECE estimate
Tankless Gas Water Heater	20	2011 PECE estimate
Condensing Gas Storage Water Heater	13	2011 PECE estimate
Hybrid Gas Water Heater	15	2011 PECE estimate
Gas Boilers	20	2011 PECE estimate
Solar Assisted Gas Water Heaters	20	2011 PECE estimate
Direct Vent Natural Gas Fireplace	20	2011 PECE estimate
Smart Thermostat	15	2014 PECE estimate
Boiler Reset Control	18	2017 Nexant Energy Model Estimate
Combined Space and Hot Water	15	2017 Nexant Energy Model Estimate
MULTIFAMILY		
Measure	Lifetime	Source
Natural Gas Furnace - 92% AFUE	18	2013 PECE estimate
Natural Gas Furnace - 95% AFUE (with & without ECM)	18	2011 PECE estimate
Natural Gas Furnace - 98% AFUE with ECM	18	2013 PECE estimate
Gas Storage Water Heaters	13	2011 PECE estimate
Tankless Gas Water Heaters	20	2011 PECE estimate
Condensing Gas Storage Water Heater	13	2011 PECE estimate
Hybrid Gas Water Heater	15	2011 PECE estimate
Gas Boilers	20	2011 PECE estimate

*See Cadmus Phase II Evaluation

Solar Assisted Gas Water Heaters	20	2011 PECE estimate
Direct Vent Natural Gas Fireplace	20	2011 PECE estimate
Smart Thermostat	15	2014 PECE estimate
Combined Space and Hot Water	15	2017 Nexant Energy Model Estimate
ThermWise® Business Rebates		
Measure	Lifetime	Source
Gas Storage Water Heater	15	Calculation based upon difference between baseline and minimum efficiency energy factor
Tankless Gas Water Heater	15	ENERGY STAR Residential Water Heaters Specification as of 1/5/09 and Final Criteria Analysis
Commercial Clothes Washer	10	ENERGY STAR Commercial Clothes Washer Calculator
Low Flow Pre-Rinse Spray Valve	5	California Urban Water Conservation Council, Rinse & Save Program Evaluation 2005
Natural Gas Furnace - 92% AFUE	18	2013 Nexant estimate
Natural Gas Furnace - 95% AFUE (with & without ECM)	18	ENERGY STAR Furnace Calculator
Natural Gas Furnace - 98% AFUE with ECM	18	2013 PECE estimate
Gas Boiler (hot water)	20	ENERGY STAR Boiler Calculator
Gas Boiler (hot water) ≥ 2,500,000 Btu/h	20	2014 Nexant estimate
Gas Boiler (steam)	15	ENERGY STAR Boiler Calculator
Gas Boiler (Steam) Except Natural Draft	15	2014 Nexant estimate
Gas Boiler (Steam) Natural Draft	15	2014 Nexant estimate
Direct Contact Gas Water Heater	20	PG&E -CPUC 2004-2005 / Single Family Rebate Program
Condensing Gas Water Heater	15	PECE Energy Model (REM/Design v. 12.61)
Hybrid Gas Water Heater	15	PECE Energy Model (REM/Design v. 12.61)
Combined Space / Water Heater	15	2014 Nexant estimate
Unit Heaters	18	PG&E 2004 and ACEEE 2003 Reports
Infrared Heating System	17	1) Gas Networks Savings Estimates, 2) GDS Report, 3) ASHRAE Research #4643

*See Cadmus Phase II Evaluation

Modulating Infrared Heaters (NC or Replacing Non IR)	17	2014 Nexant estimate
Modulating Infrared Heaters (Replacing Non IR)	17	2014 Nexant estimate
Condensing RTU's	15	2014 Nexant estimate
Boiler Outside Air Reset Control	20	GDS Report 2004 CA Statewide Gas Potential Study Kema-Xenergy 2003
Boiler Tune-up (tiers 1, 2, & 3)	2	GDS Report 2004 CA Statewide Gas Potential Study Kema-Xenergy 2003
Smart Thermostat	15	2014 PECEI estimate
Gas Fryer	8	ENERGY STAR® Gas Fryer Calculator
Steam Cooker	10	ENERGY STAR® Steam Cooker Calculator
Convection Oven	12	PG&E -CPUC 2006-2008 / Single Family Rebate Program
Combination Oven	12	PG&E -CPUC 2006-2008 / Single Family Rebate Program
Griddle	12	PG&E -CPUC 2006-2008 / Single Family Rebate Program
Wall Insulation (retrofit)	35	DOE-2 modeling against ASHRAE 90.1-2004 Baseline
Roof Insulation (retrofit)	35	DOE-2 modeling against ASHRAE 90.1-2004 Baseline
Charbroiler	10	2015 PECEI Energy Model Estimate
Conveyor Oven	12	2015 PECEI Energy Model Estimate
Gas Dryer Moisture Sensor	10	2015 PECEI Energy Model Estimate
Modulating Gas Dryer	10	2015 PECEI Energy Model Estimate
Solar Water Heater – Pool (business)	20	2015 PECEI Energy Model Estimate
Demand Control Ventilation Tier 2	10	2017 Nexant Energy Model Estimate
Demand Control Ventilation Tier 1	10	2016 Nexant Energy Model Estimate
Pipe Insulation (Hot Water)	10	2017 Nexant Energy Model Estimate
Pipe Insulation (Steam)	10	2017 Nexant Energy Model Estimate
ThermWise® Builder Rebates		
SINGLE FAMILY		
Measure	Lifetime	Source
HERS Index 62 or lower	30	2016 CLEARResult Energy Model Estimate
HERS Index 55 or lower	30	2016 CLEARResult Energy Model Estimate

*See Cadmus Phase II Evaluation

HERS Index 48 or lower	30	2016 CLEAResult Energy Model Estimate
ENERGY STAR® Bonus	30	2016 CLEAResult Energy Model Estimate
Natural Gas Furnace - 92% AFUE	18	2013 PECEI estimate
Natural Gas Furnace - 95% AFUE (with & without ECM)	18	2011 PECEI estimate
Natural Gas Furnace - 98% AFUE with ECM	18	2013 PECEI estimate
Gas Storage Water Heater	13	2011 PECEI estimate
Tankless Gas Water Heater	20	2011 PECEI estimate
Condensing Gas Storage Water Heater	13	2011 PECEI estimate
Hybrid Water Heater	15	2011 PECEI estimate
Residential Gas Boiler	20	2011 PECEI estimate
Solar Assisted Gas Water Heater	20	2011 PECEI estimate
2X6 R-23 Walls	30	2011 PECEI estimate
Windows – R-5	30	2011 Nexant estimate
Smart Thermostat	15	2014 PECEI estimate
Combined Space and Hot Water	15	2017 Nexant Energy Model Estimate
MULTIFAMILY		
Measure	Lifetime	Source
HERS Index 62 or lower	30	2016 CLEAResult Energy Model Estimate
HERS Index 55 or lower	30	2016 CLEAResult Energy Model Estimate
HERS Index 48 or lower	30	2016 CLEAResult Energy Model Estimate
ENERGY STAR® Bonus	30	2016 CLEAResult Energy Model Estimate
Natural Gas Furnace - 92% AFUE	18	2013 PECEI estimate
Natural Gas Furnace - 95% AFUE (with & without ECM)	18	2011 PECEI estimate
Natural Gas Furnace - 98% AFUE with ECM	18	2013 PECEI estimate
Gas Storage Water Heater	13	2011 PECEI estimate
Tankless Gas Water Heater	20	2011 PECEI estimate
Condensing Gas Storage Water Heater	13	2011 PECEI estimate
Hybrid Gas Water Heater	15	2011 PECEI estimate

*See Cadmus Phase II Evaluation

Gas Boiler	20	2011 PECl estimate
Solar Assisted Gas Water Heaters	20	2011 PECl estimate
Windows – R-5	30	2011 Nexant estimate
Smart Thermostat	15	2014 PECl estimate
Combined Space and Hot Water	15	2017 Nexant Energy Model Estimate
Energy Star High Rise	30	2017 Nexant Energy Model Estimate
ThermWise® Home Energy Plan		
Measure	Lifetime	Source
Kitchen Sink Aerator	10	DOE Rebuild America Reenergize Energy Efficiency Guidebook
Pipe Insulation	10	DOE Rebuild America Reenergize Energy Efficiency Guidebook
Faucet Aerator	10	DOE Rebuild America Reenergize Energy Efficiency Guidebook
Low Flow Shower Head	10	Nexant 2006 Market Study Report
ThermWise® Weatherization Rebates		
SINGLE FAMILY		
Measure	Lifetime	Source
Windows – R-5	30	2011 Nexant estimate
Wall Insulation	35	RMP Home Energy Savings Program Filing 2006
Attic Insulation	35	RMP Home Energy Savings Program Filing 2006
Floor Insulation	35	RMP Home Energy Savings Program Filing 2006
Duct Sealing & Duct Insulation	20	RMP Home Energy Savings Program Filing 2006
Air Sealing	20	Nexant 2011 Engineering Calculation
Pipe Insulation	10	2017 Nexant Energy Model Estimate
ICAST pilot	18	2017 Nexant Energy Model Estimate
MULTIFAMILY		
Measure	Lifetime	Source
Windows – R-5	30	2011 Nexant estimate
Wall Insulation	35	RMP Home Energy Savings Program Filing 2006
Attic Insulation	35	RMP Home Energy Savings Program Filing 2006
Floor Insulation	35	RMP Home Energy Savings Program Filing 2006
Duct Sealing & Duct Insulation	20	RMP Home Energy Savings Program Filing 2006
Low Income Assistance Program		

*See Cadmus Phase II Evaluation

Measure	Lifetime	Source
Natural Gas Furnace - 95% AFUE (with & without ECM)	18	2011 PECEI estimate
Natural Gas Furnace - 98% AFUE with ECM	18	2015 PECEI Energy Model Estimate
ThermWise® Energy Comparison Report		
Measure	Lifetime	Source
Program Measures	1	2017 Dominion Energy Report estimate

INCREMENTAL COST

ThermWise® Appliance Rebates		
SINGLE FAMILY		
Measure	Incremental Cost	Source
Natural Gas Furnace - 92% AFUE	\$238/unit	2014 PECEI estimate
Natural Gas Furnace - 95% AFUE	\$182/unit	2014 PECEI estimate
Natural Gas Furnace - 95% AFUE with ECM	\$873/unit	2016 CLEAResult Energy Model Estimate
Natural Gas Furnace - 98% AFUE with ECM	\$1,105/unit	2014 PECEI estimate
Gas Storage Water Heater	\$161/unit	2014 PECEI estimate
Tankless Gas Water Heater	\$517/unit	2014 PECEI estimate
Condensing Gas Storage Water Heater	\$1,082/unit	2014 PECEI estimate
Hybrid Gas Water Heater	\$1,413/unit	2014 PECEI estimate
Gas Boiler Tier 1	\$452/unit	2014 PECEI estimate
Gas Boiler Tier 2	\$1,123/unit	2014 PECEI estimate
Solar Assisted Gas Water Heating (domestic)	\$4,500/unit	2014 PECEI estimate

*See Cadmus Phase II Evaluation

Solar Assisted Gas Water Heating (pool)	\$2,250/unit	2014 PEI estimate
Direct Vent natural gas fireplace	\$500/unit	2014 PEI estimate
Smart Thermostat	\$170/unit	2014 PEI estimate
Boiler Reset Control	\$500/unit	2017 Nexant Energy Model Estimate
Combined Space and Hot Water	\$1,722/unit	2017 Nexant Energy Model Estimate
MULTIFAMILY		
Measure	Incremental Cost	Source
Natural Gas Furnace - 92% AFUE	\$238/unit	2014 PEI estimate
Natural Gas Furnace - 95% AFUE	\$182/unit	2014 PEI estimate
Natural Gas Furnace - 95% AFUE with ECM	\$873/unit	2014 PEI estimate
Natural Gas Furnace - 98% AFUE with ECM	\$1,328/unit	2014 PEI estimate
Gas Storage Water Heater	\$161/unit	2014 PEI estimate
Tankless Gas Water Heater	\$517/unit	2014 PEI estimate
Condensing Gas Storage Water Heater	\$1,082/unit	2014 PEI estimate
Hybrid Gas Water Heater	\$1,413/unit	2014 PEI estimate
Gas Boiler Tier 1	\$452/unit	2014 PEI estimate
Gas Boiler Tier 2	\$1,123/unit	2014 PEI estimate
Solar Assisted Gas Water Heating (domestic)	\$4,500/unit	2014 PEI estimate
Solar Assisted Gas Water Heating (pool)	\$2,250/unit	2014 PEI estimate
Direct Vent natural gas fireplace	\$500/unit	2014 PEI estimate
Smart Thermostat	\$170/unit	2014 PEI estimate
Combined Space and Hot Water	\$1,722/unit	2017 Nexant Energy Model Estimate
ThermWise® Business Rebates		
Measure	Incremental Cost	Source
Gas Storage Water Heater	\$400/unit	ENERGY STAR Residential Water Heaters Specification as of 1/5/09 and Final Criteria Analysis
Gas Storage Water Heater (>75 kBtu)	\$6.78/kBtu	PG&E -CPUC 2004-2005 / Single Family Rebate Program
Tankless Gas Water Heater	\$4.24/kBtu	CA Statewide Gas Potential Study (Kema-Xenergy, 2003)

*See Cadmus Phase II Evaluation

Commercial Clothes Washer	\$300/unit	Energy Star Commercial Clothes Washer Calculator, confirmed with CEE
Low Flow Pre-Rinse Spray Valve	\$32/unit	California Urban Water Conservation Council, Rinse & Save Program Evaluation, 2005
Natural Gas Furnace - 92% AFUE	\$238/unit	2013 Questar Gas furnace survey
Natural Gas Furnace - 95% AFUE	\$182/unit	2013 Questar Gas furnace survey
Natural Gas Furnace - 95% AFUE with ECM	\$873/unit	2013 Questar Gas furnace survey
Natural Gas Furnace - 98% AFUE with ECM	\$1,105/unit	2013 Questar Gas furnace survey
Boiler (hot water)	\$5.08/kBTU	CA Statewide Gas Potential Study (Kema-Xenergy, 2003)
	\$6.50/kBTU	
Boiler (steam)	\$4.22/kBTU	2014 Nexant Engineering Estimate
	\$5.08/kBTU	CA Statewide Gas Potential Study (Kema-Xenergy, 2003)
	\$5.39/kBTU	2014 Nexant Engineering Estimate
Direct Contact Gas Water Heater	\$2.17/kBTU	PG&E -CPUC 2004-2005 / Single Family Rebate Program
Condensing Gas Storage Water Heater	\$1,150/unit	PECI Energy Model (REM/Design v. 12.61)
Hybrid Gas Water Heater	\$1,238/unit	PECI Energy Model (REM/Design v. 12.61)
Combined Space / Water Heater	\$1,722/unit	2014 Nexant Engineering Estimate
Unit Heater (Non Condensing)	\$2.50/kBTU	Analysis of Standard Options for Unit Heaters and Duct Furnaces (PG&E 2004)
Unit Heater (Condensing)	\$12.00/kBTU	
Infrared Heating System	\$11.43/kBTU	Cost review based upon Vendor Costs (Grainger)
Modulating Infrared	\$25/unit	2014 Nexant Engineering Estimate
	\$75/unit	
Condensing RTU's	\$25/unit	2014 Nexant Engineering Estimate
Boiler Outside Air Reset Control	\$835/unit	2004-2005 California DEER Database
Boiler Tune-up – Tier 1	\$300	2013 Nexant Engineering Estimate
Boiler Tune-up – Tier 2	\$600	CA Statewide Gas Potential Study (Kema-Xenergy, 2003)
Boiler Tune-up – Tier 2	\$800	2013 Nexant Engineering Estimate
Smart Thermostat	\$0.23/sq. ft.	2014 Nexant Engineering Estimate
Gas Fryer	\$3,796/unit	ENERGY STAR® Gas Fryer Calculator
Gas Steam Cooker	\$6,221/unit	ENERGY STAR Steam Cooker Calculator
Gas Convection Oven	\$1,572/per vat	PG&E -CPUC 2006-2008 / Single Family Rebate Program
Gas Combination Oven	\$21,797/unit	PG&E -CPUC 2006-2008 / Single Family Rebate Program

*See Cadmus Phase II Evaluation

Gas Griddle	\$4,575/unit	PG&E -CPUC 2006-2008 / Single Family Rebate Program
Gas Charbroiler	\$7,500	2015 PECEI Energy Model Estimate
Gas Conveyor Oven	\$7,500	2015 PECEI Energy Model Estimate
Gas Dryer Moisture Sensor	\$199	2015 PECEI Energy Model Estimate
Modulating Gas Dryer	\$525	2015 PECEI Energy Model Estimate
Solar Water Heater – Pool (business)	\$2,250	2015 PECEI Energy Model Estimate
Wall Insulation (retrofit)	\$0.64 sq. ft.	Database for Energy Efficient Resources (DEER), California Energy Commission (CEC), and California Public Utilities Commission (CPUC). 2006
Roof Insulation (retrofit)	\$0.20 sq. ft.	Database for Energy Efficient Resources (DEER), California Energy Commission (CEC), and California Public Utilities Commission (CPUC). 2006
Demand Control Ventilation Tier 2	\$0.17 CFM	2017 Nexant Energy Model Estimate
Demand Control Ventilation Tier 1	\$1,500 unit	2017 Nexant Energy Model Estimate
Custom Measures	\$8,000/project	2012 Estimate
Pipe Insulation (Hot Water)	\$8.50/sq. ft.	2017 Nexant Energy Model Estimate
Pipe Insulation (Steam)	13.35/sq. ft.	2017 Nexant Energy Model Estimate
ThermWise® Builder Rebates		
SINGLE FAMILY		
Measure	Incremental Cost	Source
HERS Index 62 or lower	\$858/unit	2016 CLEAResult Energy Model Estimate
HERS Index 55 or lower	\$1,715/unit	2016 CLEAResult Energy Model Estimate
HERS Index 48 or lower	\$2,573/unit	2016 CLEAResult Energy Model Estimate
ENERGY STAR® Bonus	\$429/unit	2016 CLEAResult Energy Model Estimate
Natural Gas Furnace - 92% AFUE	\$238/unit	2014 PECEI estimate
Natural Gas Furnace - 95% AFUE	\$182/unit	2014 PECEI estimate
Natural Gas Furnace - 95% AFUE with ECM	\$873/unit	2014 PECEI estimate
Natural Gas Furnace - 98% AFUE with ECM	\$1,105/unit	2014 PECEI estimate
Gas Storage Water Heater	\$161/unit	2014 PECEI estimate
Tankless Gas Water Heater	\$517/unit	2014 PECEI estimate

*See Cadmus Phase II Evaluation

Condensing Gas Storage Water Heater	\$1,082/unit	2014 PECl estimate
Hybrid Gas Water Heater	\$1,413/unit	2014 PECl estimate
Gas Boiler Tier 1	\$452/unit	2014 PECl estimate
Gas Boiler Tier 2	\$1,123/unit	2014 PECl estimate
Solar Assisted Gas Water Heating (domestic)	\$4,500/unit	2011 PECl estimate
Solar Assisted Gas Water Heating (pool)	\$2,250/unit	2012 PECl estimate
2X6 R-23 Walls	\$1,000/unit	2016 CLEAResult Energy Model Estimate
Windows – R-5	\$4/ sq. ft.	2011 Nexant estimate
Smart Thermostat	\$170/unit	2014 Nexant estimate
Combined Space and Hot Water	\$1,722/unit	2017 Nexant Energy Model Estimate
MULTIFAMILY		
Measure	Incremental Cost	Source
HERS Index 62 or lower	\$340/unit	2016 CLEAResult Energy Model Estimate
HERS Index 55 or lower	\$681/unit	2016 CLEAResult Energy Model Estimate
HERS Index 48 or lower	\$1,021/unit	2016 CLEAResult Energy Model Estimate
ENERGY STAR® Bonus	\$170/unit	2016 CLEAResult Energy Model Estimate
Natural Gas Furnace - 92% AFUE	\$238/unit	2014 PECl Estimate
Natural Gas Furnace - 95% AFUE	\$182/unit	2014 PECl Estimate
Natural Gas Furnace - 95% AFUE with ECM	\$873/unit	2014 PECl Estimate
Natural Gas Furnace - 98% AFUE with ECM	\$1,105/unit	2014 PECl Estimate
Gas Storage Water Heater	\$161/unit	2014 PECl Estimate
Tankless Gas Water Heater	\$517/unit	2014 PECl Estimate
Condensing Gas Storage Water Heater	\$1,082/unit	2014 PECl estimate
Hybrid Gas Water Heater	\$1,413/unit	2014 PECl estimate
Gas Boiler Tier 1	\$452/unit	2014 PECl estimate

*See Cadmus Phase II Evaluation

Gas Boiler Tier 2	\$1,123/unit	2014 PECl estimate
Solar Assisted Gas Water Heating (domestic)	\$4,500/unit	2011 PECl estimate
Solar Assisted Gas Water Heating (pool)	\$2,250/unit	2012 PECl estimate
Windows – R-5	\$4/ sq. ft.	2011 Nexant estimate
Smart Thermostat	\$170/unit	2014 PECl estimate
Combined Space and Hot Water	\$1,722/unit	2017 Nexant Energy Model Estimate
Energy Star High Rise	\$170/unit	2017 Nexant Energy Model Estimate
ThermWise® Home Energy Plan		
Measure	Incremental Cost	Source
Kitchen Sink Aerator	\$2.65/unit	Niagara Conservation
Pipe Insulation	\$3.35/unit	US Department of Energy's Rebuild America Reenergize Energy Efficiency Guidebook
Faucet Aerator	\$2.75/unit	Niagara Conservation
Low Flow Shower Head	\$4/unit	Nexant 2006 Market Study Report
ThermWise® Weatherization Rebates		
SINGLE FAMILY		
Measure	Incremental Cost	Source
Windows – R-5	\$3.52/sq.ft.	2011 Nexant estimate
Wall Insulation	\$0.64/sq.ft .	RMP Home Energy Savings Program Filing 1
Attic Insulation	Tier 1 - \$0.30/sq.ft .	2017 Nexant Energy Model Estimate
	Tier 2 - \$0.09/sq.ft.	
Floor Insulation	\$0.42/sq.ft.	RMP Home Energy Savings Program Filing 1
Duct Sealing & Duct Insulation	\$657/system	RMP Home Energy Savings Program Filing 1 & Lawrence Berkeley National Laboratory Home Energy Saver (Salt Lake City)
Air Sealing	\$0.40/sq.ft.	2011 Nexant estimate
Pipe Insulation	\$2.61/unit	2017 Nexant Energy Model Estimate
ICAST pilot	\$400/unit	2017 Nexant Energy Model Estimate
MULTIFAMILY		
Measure	Incremental Cost	Source
Windows – R-5	\$3.52/sq.ft.	2011 Nexant estimate
Wall Insulation	\$0.64/sq.ft.	RMP Home Energy Savings Program Filing 1

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Attic Insulation	Tier 1 - \$0.34/sq.ft.	2009 Weatherization Participant Data and Insulation Vendor Estimates
	Tier 2 - \$0.11/sq.ft.	
Floor Insulation	\$0.42/sq.ft.	RMP Home Energy Savings Program Filing 1
Duct Sealing & Duct Insulation	\$273/system	RMP Home Energy Savings Program Filing 1 & Lawrence Berkeley National Laboratory Home Energy Saver (Salt Lake City)
Low Income Assistance Program		
Measure	Incremental Cost	Source
Natural Gas Furnace - 95% AFUE	\$182/unit	2013 Questar Gas furnace survey
Natural Gas Furnace - 95% AFUE with ECM	\$400/unit	2017 Nexant Energy Model Estimate
Natural Gas Furnace - 98% AFUE with ECM	\$1,105/unit	2015 Peci Energy Model Estimate
ThermWise® Energy Comparison Report		
Measure	Incremental Cost	Source
Program Measures	\$1.82/project	2014 Questar Gas Energy Comparison Report estimate

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