

## Summary Cost-Effectiveness Analysis<sup>1</sup>

Potential Action	Benefit	Cost	Benefit / Cost Ratio
Require solar PV for new non-residential buildings and major renovations of non-residential buildings. <sup>2</sup>	\$10,476	\$5,566	1.9
Require solar for major residential additions. <sup>3</sup>			
Require energy efficiency measures for major renovations of existing single-family and multifamily residential buildings. <sup>4</sup>	\$20,971	\$3,472	6.04
Require all-electric Code compliant home for new residential construction. <sup>5</sup>	\$5,349	\$3,090	1.7
As alternative to all-electric Code compliant home, require new mixed-fuel residential buildings to be more energy efficient than all-electric home. <sup>6</sup>	\$2,179	\$2,179	1.0
Require new mixed-fuel residential buildings to be prewired for future electric cooking, clothes drying and water heating. <sup>7</sup>	0	\$600	N/A
Require new mixed-fuel residential buildings to be prewired for future battery storage. <sup>8</sup>	0	\$8,800	N/A
Require electric heat pump water heaters in new mixed-fuel residential buildings. <sup>9</sup>	\$203	\$294	1.45

<sup>1</sup> Costs for initial installation and annual operation, and on-bill benefits from reduced energy costs, are calculated over the life cycle of the equipment (30 years unless otherwise noted). The prototypes for new residential buildings are 2,100 ft<sup>2</sup> for a single-family home and 6,960 ft<sup>2</sup> for an 8-unit multifamily building, and for existing residential buildings are 1,665 ft<sup>2</sup> for a single-family home and 960 ft<sup>2</sup> per unit for a multifamily building. The figures are derived from data for Climate Zone 15 (where Palm Springs is located) in cost-effectiveness studies issued by the statewide Codes and Standards Program under the auspices of the California Energy Commission.

<sup>2</sup> Based on adding a 3kW PV system to a 24,691 ft<sup>2</sup> medium retail building. Source: *2019 Nonresidential New Construction Reach Code Cost Effectiveness Study*, Figure 62, page 73.

<sup>3</sup> Figures and Source: *TBA*.

<sup>4</sup> Envelope and duct package consisting of attic insulation, air sealing and duct sealing upgrades to a pre-1978 single-family home. The benefit /cost ratio is 9.67 for a multifamily building. Source: *2019 Cost-Effectiveness Study: Existing Low-rise Residential Building Efficiency Upgrade*, Tables 47 and 48, page 51.

<sup>5</sup> For a single-family home. The benefit /cost ratio is 6.4 for a multifamily building. Source: *2019 Cost-effectiveness Study: Low-Rise Residential New Construction*, Table 14, page 34, and Table 16, page 38.

<sup>6</sup> For a single-family home. The benefit /cost ratio is 1.35 for a multifamily building. Source: *Ibid*, Table 81, page 114, and Table 82, page 115.

<sup>7</sup> For a single-family home. The cost estimate is \$450 per unit for a multifamily building. Source: *Ibid*, Table 6, page 16.

<sup>8</sup> Source: *TBA*.

<sup>9</sup> 15-year life cycle. Incremental cost comparison is to a tankless gas water heater. The per unit benefits and costs are the same for single-family and multifamily buildings. Source: *Ibid*, Table 3, page 9. and Table 4, page 12.

Potential Action	Benefit	Cost	Benefit / Cost Ratio
Require a heat pump or solar thermal system for new residential pool construction, if the pool is to be heated. <sup>10</sup>	\$1,102	\$868	1.27
Require more stringent cool roofs for newly constructed buildings. <sup>11</sup>	\$2,536	\$33	75.8
Require more stringent cool roofs for alterations and additions to existing buildings. <sup>12</sup>	\$5,537	\$635	8.72

---

<sup>10</sup> 10-year life cycle. Source: *Cost Effectiveness Study: All Electric Heat Pump Pool Heating - Non-Preempted*, Page 7 and Table 4, page 11.

<sup>11</sup> Incremental cost of adding a cool roof to a single-family home. The benefits are calculated using the Energy Commission’s Time Dependent Valuation (TDV) lifecycle cost methodology, which is intended to capture the “societal value or cost” of energy use. The benefit / cost ratio is 81.8 for a multifamily building. Source: *Cost-Effectiveness Study for Cool Roofs FINAL Report for All Climate Zones*, page 78.

<sup>12</sup> Incremental cost of adding a cool roof to a pre-1978 single-family home already installing a new roof as part of the remodel. The benefit / cost ratio is 14.0 for a pre-1978 multifamily building. Source: *2019 Cost-Effectiveness Study: Existing Low-rise Residential Building Efficiency Upgrade*, Tables 47 and 48, page 51.