Plug-in (Balcony) Solar --
Electricity Offsets and Cost Savings

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I. Objective

This study quantifies the extent to which plug-in solar photovoltaic (PV) systems of various sizes can offset: a) electricity usage by four types of home appliances; and b) average annual electricity usage in medium-sized apartments. In addition to annual usage offsets, cost savings are estimated. The study uses data representative of localities in New England (Boston and Portland, Maine) and California (San Diego and Bakersfield).

What amount of home electricity usage can be offset by plug-in (balcony) solar?

The production of four incrementally larger plug-in solar arrays, specifically 400 watts, 800 watts, 1,200 watts, and 1,600 watts, is compared to the power consumption of: (1) a window A/C unit, (2) a portable electric space heater, (3) a medium-sized refrigerator, (4) a washing machine, and (5) the annual average electricity demand of a medium-sized apartment.

We focus on apartments for two primary reasons: first, because apartment dwellers generally cannot install, and receive the benefits of, rooftop solar, and, second, because plug-in systems are far less expensive than rooftop systems and offer a potential way for low-income households to access, and benefit from, solar self-generation. While this technology offers a way for households of all income levels to reduce their electric bills, this research is particularly relevant for low-income households. It quantifies potential reductions in residential electricity bills at a time when household utility debt is escalating and power shutoffs are increasing in many parts of the country.[2]

II. Overview

Plug-in solar, aka "balcony solar", has become a remarkably popular form of solar power in Europe. There were an estimated four million balcony solar installations in Germany as of early 2025.[3] The appeal of the technology is its very simple installation. See photos below. Three US state to date, Utah, Maine and Virginia, have enacted balcony solar legislation.[4] Two dozen other states are considering or have introduced similar legislation.[5]

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[1] Bill Powers – Research and data collection and display; June Sekera – study design and policy implications.

[2] https://www.biologicaldiversity.org/programs/energy-justice/pdfs/Powerless_Report_2025.pdf
https://www.washingtonpost.com/business/2025/11/24/power-shutoffs-surge-electric-bills/

[3] Strategic Energy Europe, *The rise of Plug-In solar systems in Europe: An accessible revolution for photovoltaic energy*, March 13, 2025: https://strategicenergy.eu/plug-in-solar-europe/.

[4] https://ussolarsupplier.com/blogs/news/plug-in-solar-guide-2026?srsltid=AfmBOooHo95_om3P2RwRR6sqGvNjycVJAABMQwGxD_eFZcfazbWWcLBY

[5] New York Times, *States Weigh Bills to Allow You to Make Your Own Electricity*, February 11, 2026: https://www.nytimes.com/2026/02/11/climate/plug-in-solar-power-bills.html.

Photos of Plug-In Solar in Balcony and Ground-mounted Locations

Photos: (1) https://us.ecoflow.com/products/stream-ultra?variant=54376072413257;
(2) https://www.ankersolix.com/eu/blogs/balcony-power-plant-with-storage/lightning-protection-solar-system

This study calculates the savings of a 400 watt, 800 watt, 1,200 watt, and 1,600 watt plug-in solar system installed at apartment sites in Boston, Portland (ME), San Diego, and Bakersfield (summer A/C only).

How much a household would save varies greatly depending on the output of the system, the residential rate in kilowatt-hours (kWh) the household is currently paying for electricity, and on the orientation (east, south, west) and the angle to the sun of the panels. The output from balcony-installed panels – if installed at a near vertical angle – is substantially less than when the panels are positioned approximately perpendicular to the average angle of the sun, the most productive orientation.

Balcony solar panels are typically installed either vertically or at angle of 60º (as shown in the photos). Ground-mounted panels can be installed at the best angle for maximum annual solar production, typically about 30 to 35º in California and 40 to 45º in New England.

Cost savings depend on the residential retail electricity rate in the location of interest. The representative investor-owned utility (Eversource) rate in Boston is 38¢ kWh.[6] The average residential rate in Maine is 28¢ kWh.[7] San Diego has an average residential electricity rate of 46¢ kWh[8] (one of the highest in the country). The Bakersfield residential rate is 41¢ kWh.[9] All of these residential rates are above the US average of 17.5¢ kWh.[10] In San Diego the savings are greater than in Boston or Portland (ME) due to the higher residential rate being offset and the greater solar output of the plug-in solar system.

[6] Representative Eversource Boston-area residential monthly bill (J. Sekera).
[7] EIA, *Electric Power Monthly - Table 5.6.A. Average Price of Electricity to Ultimate Customers by End-Use Sector*, June 2025: https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a. Maine = $0.2814/kWh.
[8] The average rate of 46¢ kWh reflects a (relatively even) mix of low-electricity usage apartments at $0.44/kWh and higher rate of home usage at $0.48/kWh. SDGE 2025 residential rate (DR rate with two tiers, baseline (351 kWh/month) and "above baseline"): [(351 kWh/544 kWh) x $0.425/kWh] + [(193 kWh/544 kWh) x $0.535/kWh] = $0.46/kWh.
[9] SMUD, How are rates compare, accessed February 10, 2026 (PG&E $311/month for 750 kWh): https://www.smud.org/Rate-Information/Compare-rates.
[10] EIA, *Electricity Monthly Update*, August 26, 2025: https://www.eia.gov/electricity/monthly/update/end-use.php.

The average apartment customers in San Diego use approximately 4,250 kWh per year of electricity.[11] The average apartment customers in Boston and Portland (ME) use approximately 4,000 kWh per year of electricity.[12] The average apartment in Bakersfield uses about 6,000 kWh per year.[13] (See Table 5)

The 1,600 watt plug-in solar system can reduce the annual San Diego apartment electricity consumption by 61% to 70%, depending on the panel tilt angle; in Boston and Portland it is reduced by 56% to 62%. (See Table 5)

The annual potential cost savings in electricity bills for the four different plug-in system capacities are shown in Table i. Potential annual savings range from $173 per year with a small (400 watt) system in Portland (ME) where the utility price of electricity is the lowest in the sites studied, at 28¢ per kilowatt hour (kWh) to $1,363 per year in San Diego, which has higher solar irradiation and the residential retail electricity price averages 46¢/kWh, one of the highest in the country. For details on solar production and electricity savings, see Section IV.

Table i
Annual Potential Electricity Cost Savings, Plug-In Solar Installed at Ideal Tilt[14]

	400 watt	800 watt	1,200 watt	1,600 watt
Location	$/yr saved	$/yr saved	$/yr saved	$/yr saved
Boston, 38¢ kWh	**$234**	**$467**	**$701**	**$934**
Portland, 28¢ kWh	**$173**	**$346**	**$519**	**$692**
San Diego, 46¢ kWh	**$341**	**$682**	**$1,022**	**$1,363**
Bakersfield, 41¢ kWh	**$323**	**$647**	**$970**	**$1,294**

<u>Offsets and cost savings summary</u>

Highlights

- *400 W system can offset 100% of a refrigerator or washing machine at all sites.*
- *800 W system can offset 100% of window unit A/C demand in Boston, Portland and San Diego.*
- *1600 W system can offset 100% of window unit A/C demand in Bakersfield.*
- *1600 W system can offset 100% of portable heater demand in San Diego and more than half in Boston and Portland.*
- *$1,363 annual savings – medium size apartment, San Diego – 1600 W system*

The smallest (400W) plug-in photovoltaic (PIPV) system can entirely offset the electricity usage of a refrigerator or a washing machine in all four locations studied, effectively allowing those appliances to be run "for free". An 800 watt system in three of the locations and a 1,600 watt system in Bakersfield can

[11] EIA, *Use of energy explained - Energy use in homes*, updated December 18, 2023: https://www.eia.gov/energyexplained/use-of-energy/electricity-use-in-homes.php. Use "West" for California and "Northeast" for Maine.
[12] Ibid.
[13] Ibid. Assume "Midwest" profile for Bakersfield versus the coastal Pacific "West" profile.
[14] NREL, PVWatts Calculator [60° tilt, zero losses (DC=AC), south facing]: https://pvwatts.nrel.gov/

offset 100% of window unit A/C electricity usage in the summer season, effectively allowing A/C to be run “for free”. A 1,600 watt system can offset 100% of portable heater usage in San Diego, making the operation of the space heater “free”, and can offset 58% in Boston, reducing the electric bill by $344.

Of course, electricity is only “free” once the system has been paid for. At that point the marginal cost of production is essentially zero because the fuel cost – sunshine -- is zero (0). See discussion of purchase prices and cost effectiveness below.

Of particular interest for this study is the extent to which plug-in solar can reduce dangerous summertime heat exposure and consequent heat-related deaths and illness for people who cannot now afford the operating cost of window A/C units. For people in a location with very high ambient heat in summer, like Bakersfield, California, a 400 watt PIPV system can offset nearly 30% - and a 1,600 watt system 100% - of the cost of window unit A/C during the summer season. With a 1,600 watt system installed at ideal tilt, in all four sites the window unit A/C could, effectively, be run “for free”.

In winter, households that turn to portable space heaters to keep warm can see enormous electricity bills. In Boston a space heater consuming a typical 1,560 kWh in the 5-month winter period (see Table 2) can cost $593 at the utility’s rate of 38¢ kWh. A 1,600 watt plug-in system can produce 906 kWh for a potential savings of $344 for the Boston winter season. In San Diego a, 1,600 watt system can cover 100% of the space heater usage (Table 2), allowing the portable space heater to be run “for free”.

In terms of the overall electricity bill for residents of a medium-sized apartment, savings are greatest with the largest PIPV system examined -- 1600 watts -- and in locations with higher irradiation and higher electricity prices.

In San Diego, with high irradiation and high electricity prices, residents of a medium-sized apartment can potentially reduce their annual electricity bill by $1,363 with a 1,600 watt plug-in system.

Purchase cost

Plug-in solar is just beginning to be commercially available in the US. System prices are consequently much higher in the US than in the far larger European market. For example, in Germany, the cost of an 800 watt system, the typical size in that country, is about US $533.[15]. In the United States the price is twice as much. An 800 watt system in the US currently ranges from $1,099 to $2,199. The cost of a 1600 watt system in the U.S. ranges from $1,899 to $4,399.[16]

Savings and costs summary

Plug-in solar can substantially offset electricity usage and thereby reduce residential electric bills. But cost effectiveness for individual consumers varies and is a function of several factors; the kWh price of residential electricity; the angle of panel installation; solar irradiation at the site, and the purchase cost of the system. In Portland, ME, where the electricity rate is the lowest of the four sites studied, the simple payback period for an 800 watt system costing $1,099 is a little over three years. But in San Diego, where

[15] EcoFlow available at Ikea

[16] U.S. prices, February 2026 at EcoFlow and Craftstrom.

a typical apartment dweller can see $682 in annual electric bill savings with a 800 watt system costing $1,099, the simple payback period is only 1.6 years.

For households unable to pay cash for a plug-in kit, low-cost financing can still make plug-in solar cost-effective. For example, an 800 watt system costing $1,099 financed over 3 years at 5% interest would cost $404 per year.[17] Annual bill savings in Boston, San Diego, and Bakersfield would be more than $404 per year, as shown in Table I, and close to $404 per year in Portland. After the first 3 years the system would be paid for and solar production in future years would be zero cost.

There is another pathway to make plug-in solar more accessible for very low-income households – financial aid. Given that federal support for renewable energy has been dismantled, potential sources for financial aid to the low-income are state governments and philanthropies. Organizations working with low-income populations are in a position to advocate for and obtain such financial aid.

US system prices are very high compared to Europe, where nations have passed laws and taken actions to make this technology more accessible and less expensive. Increased effective demand in the United States could lower prices. Increased demand would result in more firms entering the market, followed by greater price competition and economies of scale in system production and distribution. Enactment of state legislation now pending in two dozen states would remove current barriers to plug-in solar and vastly expand effective demand,[18] making solar self-generation more affordable and accessible.

In the balance of this report we address, first, offsetting plug-in solar production compared to appliance electricity consumption (Section III) and then solar production offsets and cost savings for overall annual apartment electricity usage (Section IV).

III. Heating, Cooling and Appliance Demand vs Plug-In Solar Production

This section looks at the power consumption of four home appliances: (1) a window A/C unit, (2) a portable electric space heater[19], (3) a medium-sized refrigerator, and (4) a washing machine. Estimates are provided for the amount of that power usage that can be offset by the electricity production of four incrementally larger plug-in solar arrays: 400-, 800-, 1200- and 1,600-watt systems.

➢ Air conditioning; summertime

The project team accessed "cooling degree days – CDD" databases to determine the approximate number of days in the July to September summer period that residents in the target study areas would likely use air conditioning (A/C) to offset elevated ambient temperature. It is assumed that the A/C unit is used 8 hours a day when in use. In Boston and Maine, residents are anticipated to use A/C about 40 days of the 90-day peak summer period. In San Diego, residents are assumed to use A/C for 60 days of the 90-

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[17] M. Lindeburg, *Mechanical Engineering Review Manual, 6th Edition*, p. 2-26, 1980. Multiplier for levelized payments at 5% interest over 3 years = 0.3672. Therefore, $1,099 x 0.3672 = $404/year.

[18] "Effective" demand refers to the *ability* to pay and thereby to actually purchase. It is contrasted with "latent" demand, which refers to the *desire* to buy without the ability to pay. Effective demand can be increased via public or philanthropic financial assistance to low-income households.

[19] In the U.S., 15 to 18 million portable space heaters are sold annually. They are generally rated at a maximum of 1,500 watts. Households often see their electric bills soar when operating them. See, e.g., Space heaters may be the number one culprit of high energy bills in Mason County (Washington state).

day peak summer period. Finally, in Bakersfield, an inland California location that is continuously warm to hot in summer, A/C usage is assumed to be continuous, eight hours every day in the 90-day peak summer period.

Table 1 compares the summer A/C demand, assuming a single room 8,000 Btu window A/C unit, at the four study locations to four plug-in solar capacities: 400-, 800-, 1,200-, and 1,600 watts at 60° tilt and ideal angle. The assumed A/C usage rate during the 90-day peak summer period is assumed to be: (1) in Boston and Portland (ME), 40 days at 8 hours/day, (2) in San Diego, 60 days at 8 hours/day, and (3) in Bakersfield, 90 days at 12 hours/day. As shown Table 1, a 400 watt system provides the majority of window A/C unit demand in Boston, Portland (ME), and San Diego. An 800 watt system is needed to fully offset A/C demand in Boston and Portland (ME). A 1,200 watt system is needed to fully offset A/C demand in San Diego. Finally, a 1,600 watt system in Bakersfield will largely offset (93%) summer window A/C demand at 60° tilt and will offset 100% of window A/C demand at ideal tilt.

In Bakersfield, where three months of A/C costs $323, a 400 watt plug-in system installed at 60° tilt can offset $75 in electricity cost. At an ideal tilt the 400 watt system can offset $95 in Bakersfield, nearly a 30% seasonal A/C cost savings. In all four locations, a 1,600 watt system meets or exceeds 100% of A/C demand. For a 1,600 system installed at ideal tilt, the potential cost savings are**: Portland, $66; Boston, $89; San Diego, $161 and Bakersfield $323 for the 3-month summer season**.

Table 1.

Summer A/C Demand[20] (Usage) vs Plug-In Solar Production

Location	A/C usage, 3-month	Tilt	Plug-in system 3 month production, July-Sept			
			400 watt	**800 watt**	**1,200 watt**	**1,600 watt**
	kWh A/C usage		kWh produced	kWh produced	kWh produced	kWh produced
Boston	234	60°	149	298	446	595
		ideal	175	349	524	698
Portland, ME	234	60°	151	302	453	604
		ideal	176	352	527	703
San Diego	350	60°	159	318	477	636
		ideal	207	413	620	826
Bakersfield	788	60°	184	368	551	735
		ideal	232	464	696	928

Offset amounts are shown graphically for 60° tilt 400 watt and 1,600 watt systems in Bakersfield, Boston and San Diego (Figures 1.a, 1.b, 1.c). The principal difference between Bakersfield and Boston is the much higher number of peak summer month A/C usage days in Bakersfield.

[20] Average A/C demand for 8,000 Btu/hr unit = 0.73 kWh.

Figure 1a.
Bakersfield
Summer A/C Offset Achieved
with 400 Watt and 1,600 Watt Plug-In Systems, 60° tilt

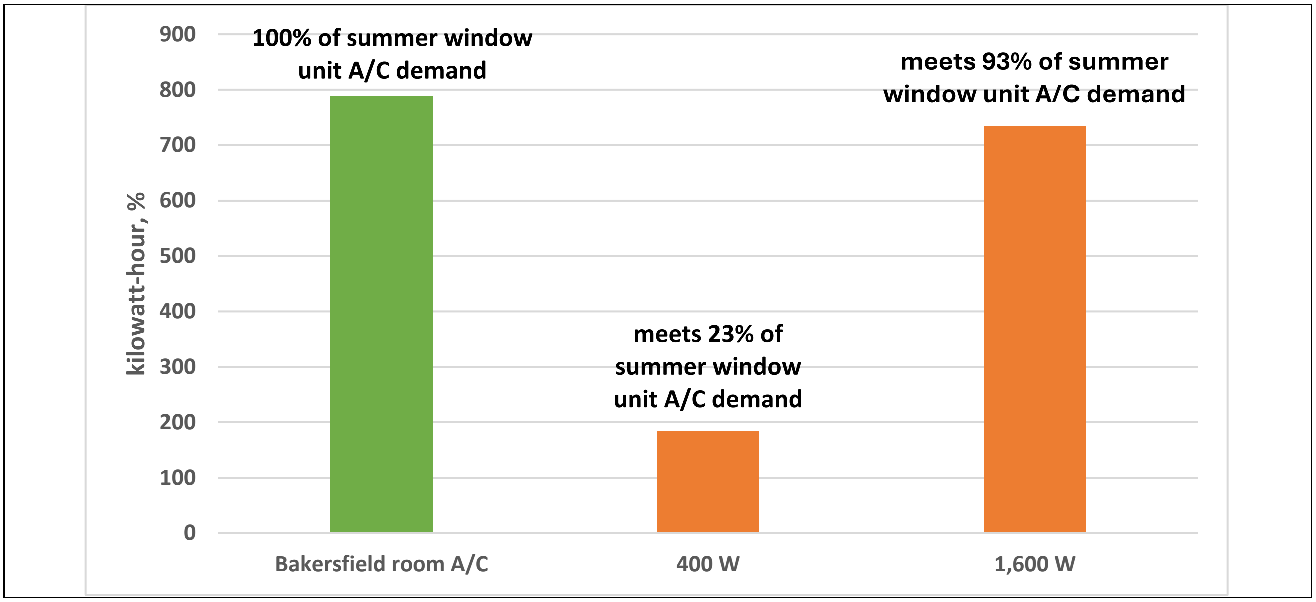


Figure 1b.
Boston
Summer A/C Offset Achieved
with 400 Watt and 1,600 Watt Plug-In Systems, 60° tilt

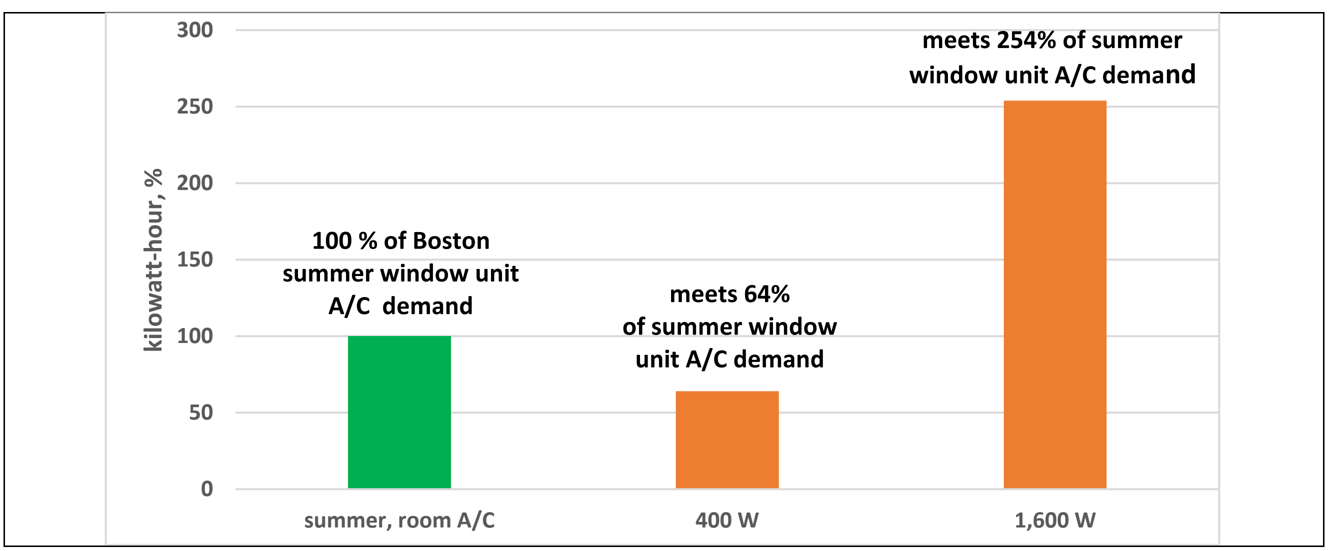
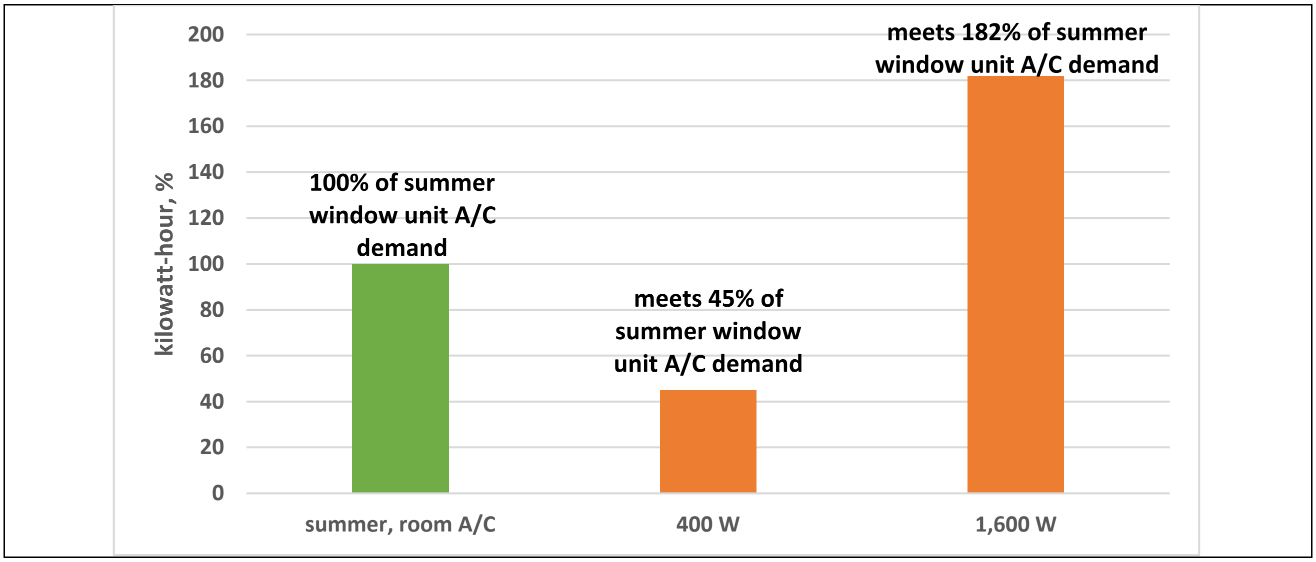


Figure 1c.

San Diego
Summer A/C Offset Achieved
with 400 Watt and 1,600 Watt Plug-In Systems, 60° tilt



➢ Space heater, winter

Table 2 compares the 5-month winter heating demand of a 1,500 watt portable electric heater to the solar production at 60° tilt during the same 5-month period at the four locations studied. The portable heater is assumed to operate for eight hours per day when in use. The number of days during the five-month winter period has been estimated from heating degree days (HDD) data for each site.

Table 2.

Winter Heating Demand (Usage) vs Production

Location	heating demand, 5-month	Tilt	Winter production, Nov – March (5-month)			
			400 watt	**800 watt**	**1,200 watt**	**1,600 watt**
	kWh usage		kWh produced	kWh produced	kWh produced	kWh produced
Boston	1,560	60°	227	463	680	906
		ideal	223	447	670	893
Portland, ME	1,560	60°	228	457	685	937
		ideal	224	449	673	897
San Diego	1,080	60°	284	568	851	1,135
		ideal	281	561	842	1,122

Figures 2a and 2b compare the winter season electricity demand of a 1,500 watt portable electric heater to the winter season solar production of 400 watt and 1,600 watt balcony systems with 60° tilt in San Diego and Boston.

Figure 2a.
San Diego
Electric Heater Offset Achieved with
400 Watt and 1,600 Watt Plug-In Systems, 60° tilt

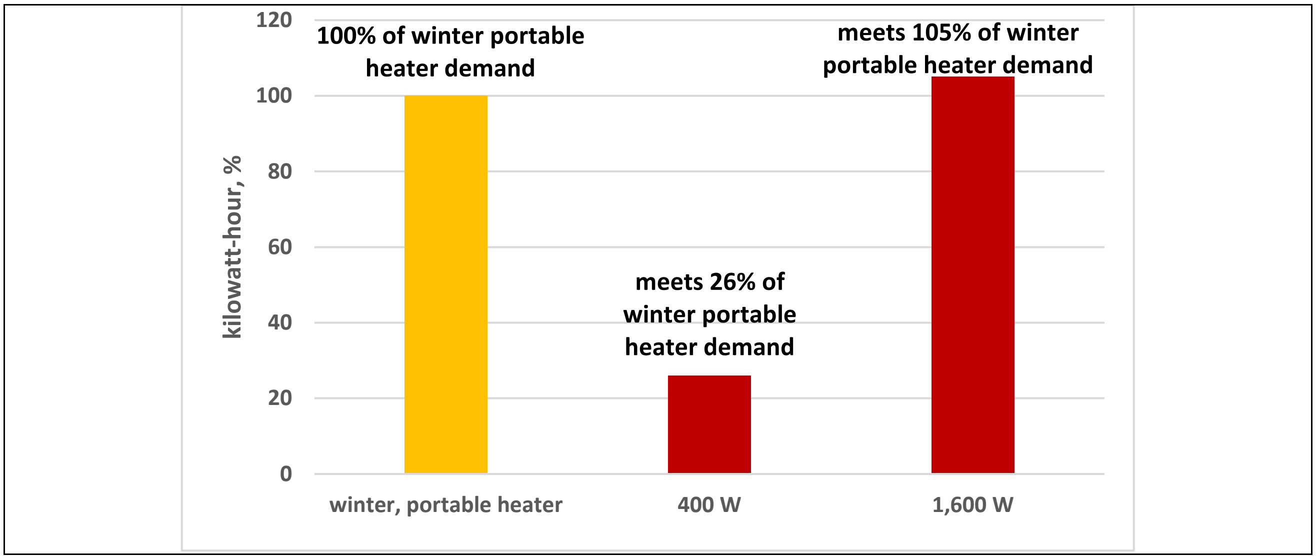
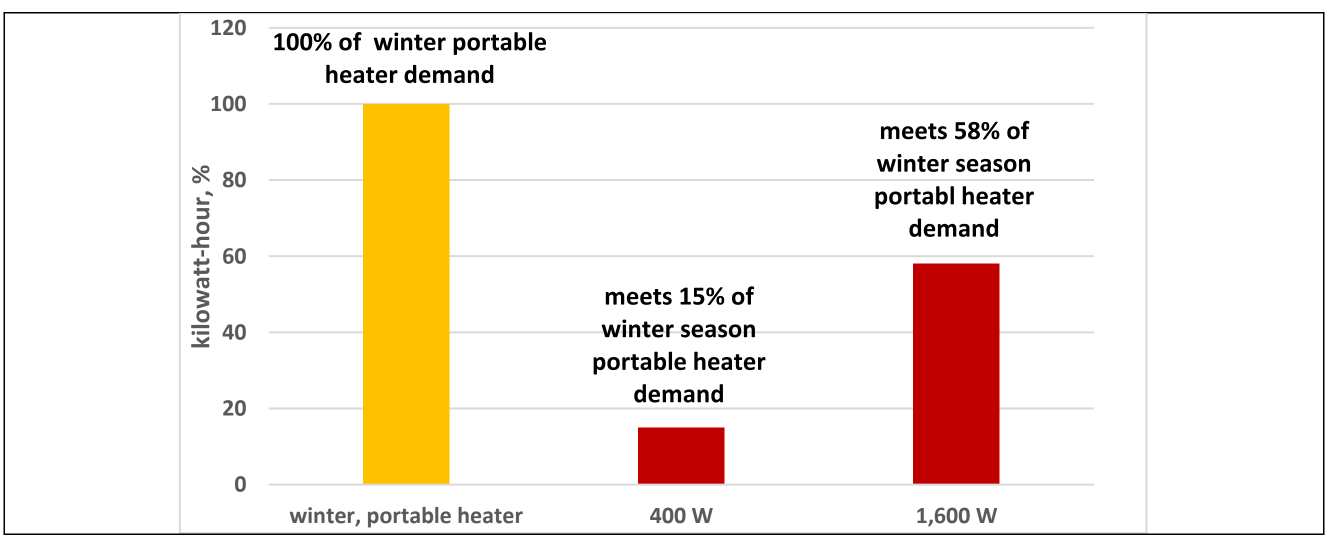


Figure 2b.
Boston
Electric Heater Offset Achieved with
400 Watt and 1,600 Watt Plug-In Systems, 60° tilt



➢ Refrigerator

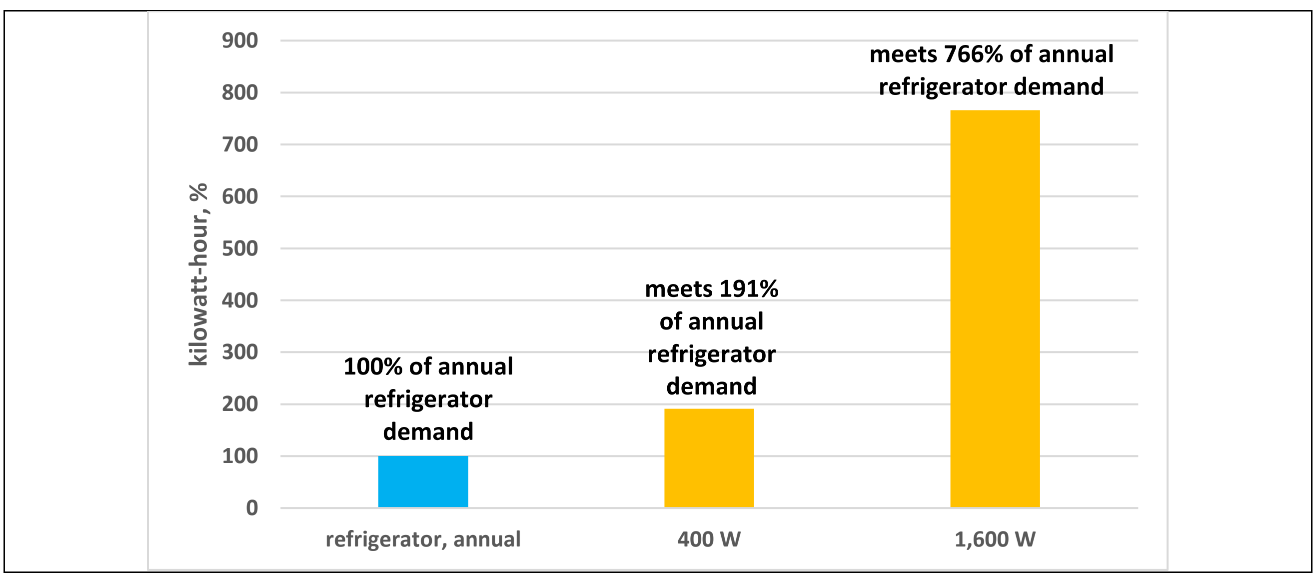
A medium-size 14 cubic foot Energy Star refrigerator uses 336 kWh per year of electricity. Table 3 compares annual refrigerator demand to the annual production of solar electricity at the four solar array capacities studied at three sites, Boston, Portland (ME), and San Diego. In all cases the solar plug-in system produces more electricity than the refrigerator uses.

Table 3.
Annual Refrigerator Demand vs Annual Solar Production

Location	Energy Star, 14 ft³, kWh/yr[21]	Tilt	Annual production, kWh			
			400 watt	**800 watt**	**1,200 watt**	**1,600 watt**
	kWh usage per yr		kWh produced	kWh produced	kWh produced	kWh produced
Boston	336	60°	563	1,125	1,688	2,250
		ideal	615	1,230	1,844	2,459
Portland, ME	336	60°	567	1,134	1,701	2,268
		ideal	618	1,236	1,853	2,471
San Diego	336	60°	643	1,287	1,930	2,573
		ideal	741	1,482	2,222	2,963

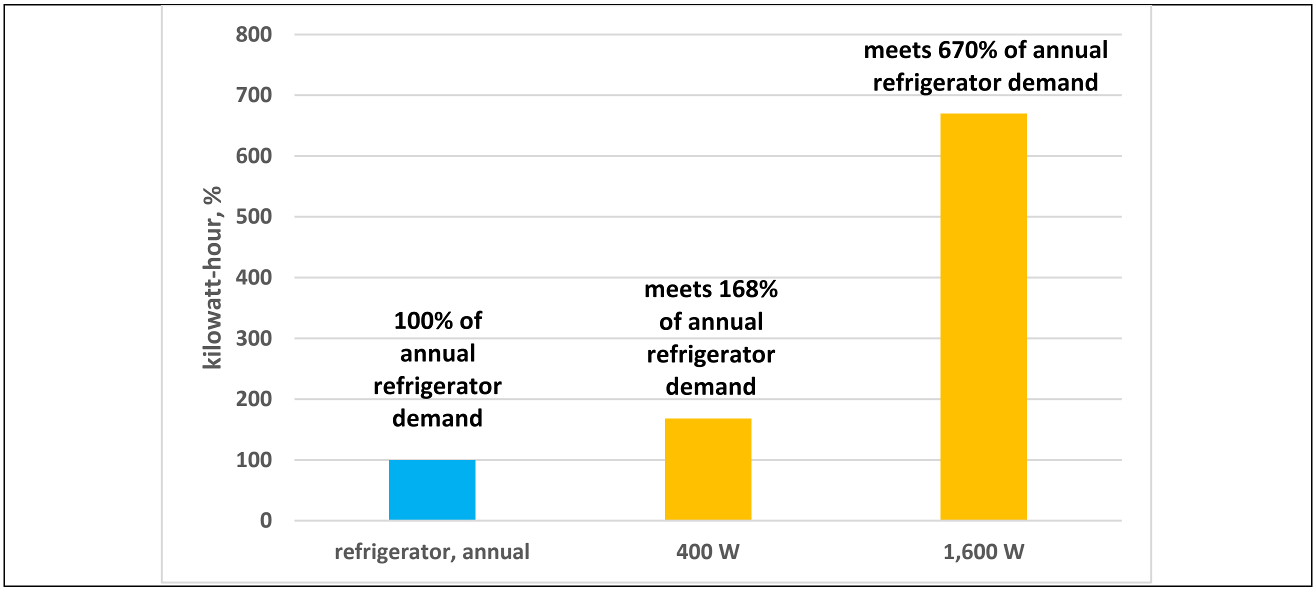
Figures 3a and 3b compare the annual 14 cubic foot refrigerator electricity demand to the annual solar production of 400 watt and 1,600 watt balcony systems with 60° tilt in San Diego and Boston.

Figure 3a.
San Diego
Refrigerator Offset Achieved with
400 Watt and 1,600 Watt Plug-In Systems, 60° tilt



[21] Best Buy, 14.2 ft³, 333 kWh/yr (28 kWh/mo), $460, accessed February 2, 2026: https://www.bestbuy.com/product/insignia-14-2-cu-ft-top-freezer-refrigerator-with-energy-star-certification-white/J2FPJKSF86..

Figure 3b.
Boston
Refrigerator Offset Achieved with
400 Watt and 1,600 Watt Plug-In Systems, 60° tilt



➢ Washing machine

The annual electricity demand of a washing machine doing two warm wash, cold rinse washes per week is 239 kWh per year. Table 4 compares annual washing machine demand to the annual solar production at the four solar array capacities studied at three sites, Boston, Portland (ME), and San Diego. In all cases the solar plug-in system produces more electricity than the washing machine uses.

Table 4.
Annual Washing Machine Demand Usage) vs Annual Solar Production

Location	Warm wash cold rinse, 2x per week, kWh/yr	Tilt	Annual production, kWh			
			400 watt	**800 watt**	**1,200 watt**	**1,600 watt**
	kWh/yr usage		kWh produced	kWh produced	kWh produced	kWh produced
Boston	239	60°	563	1,125	1,688	2,250
		ideal	615	1,230	1,844	2,459
Portland, ME	239	60°	567	1,134	1,701	2,268
		ideal	618	1,236	1,853	2,471
San Diego	239	60°	643	1,287	1,930	2,573
		ideal	741	1,482	2,222	2,963

Figures 4a and 4b compare the annual washing machine electricity demand to the annual solar production of 400 watt and 1,600 watt balcony systems with 60° tilt in San Diego and Boston.

Figure 4a.

San Diego
Washing Machine Offset Achieved,
400 Watt and 1,600 Watt Plug-In Systems, 60° tilt

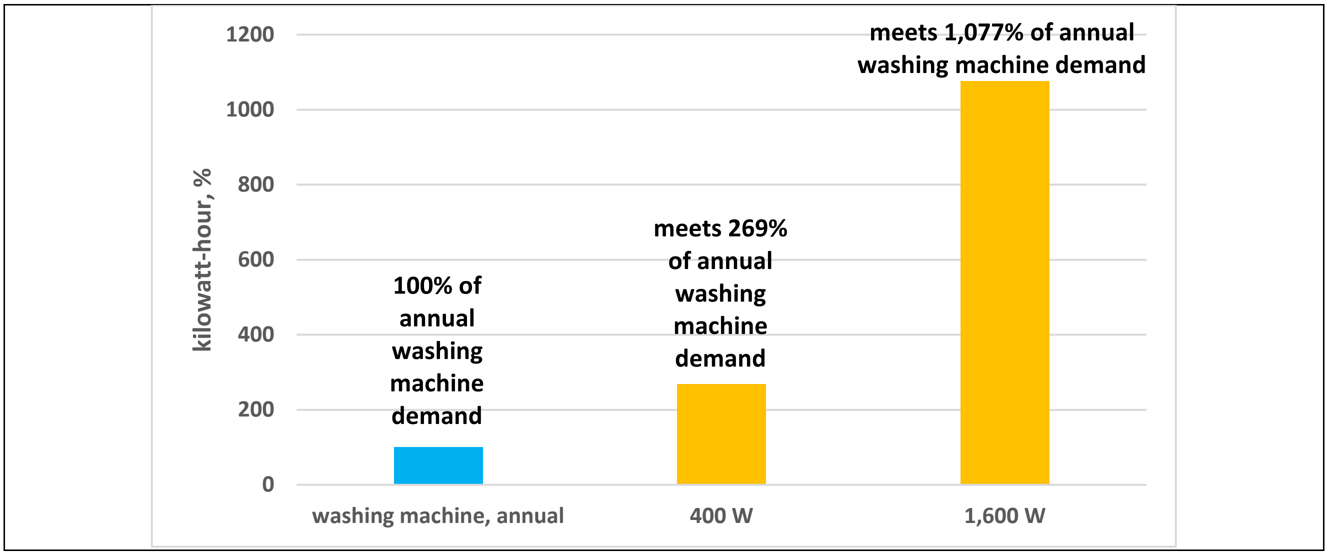
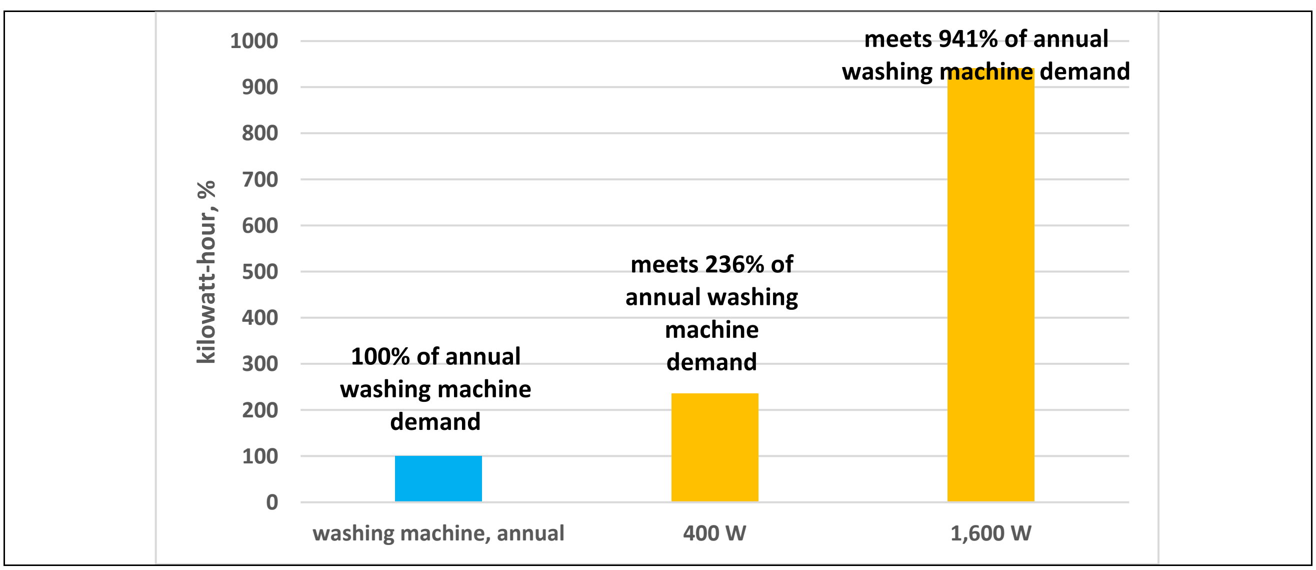


Figure 4b.

Boston
Washing Machine Offset Achieved,
400 Watt and 1,600 Watt Plug-In Systems, 60° tilt



IV. Solar Production and Electricity Savings of Four Plug-In Solar Configurations

Table 5 compares the annual apartment electricity demand in Boston, Portland (ME), San Diego, and Bakersfield to the solar production of 60° tilt and ideal tilt plug-in solar arrays with capacities ranging from 400 to 1,600 watts. The percent of demand (usage) met by plug-in solar ranges from 11% in Bakersfield and 14% in New England with a small system (400 watt) at 60° tilt, to 70% for a large system (1,600 watt) with ideal tilt angle (30°) in San Diego, which has lower annual demand than Bakersfield and greater irradiation than New England. (For the annual kWh production on which the percentages are based, see Tables 6a and 7a.)

Table 5.

Annual Apartment Demand (Usage)
vs % Reduction Due to Plug-In Solar Production

Location	Usage; Annual kWh/yr	Tilt	Usage offset, %			
			400 watt	**800 watt**	**1,200 watt**	**1,600 watt**
Boston	4,000	60°	14%	28%	42%	56%
		ideal	15%	31%	46%	61%
Portland, ME	4,000	60°	14%	28%	43%	57%
		ideal	15%	31%	46%	62%
San Diego	4,250	60°	15%	30%	45%	61%
		ideal	17%	35%	52%	70%
Bakersfield	6,000	60°	11%	23%	34%	46%
		ideal	13%	26%	39%	53%

Figures 5a and 5b compare the annual apartment electricity demand in Boston and San Diego to the solar production of 60° tilt balcony solar arrays with capacities of 400 watts and 1,600 watts. In both cases, the 1,600 watt balcony solar alternative provides about 60% of the annual apartment electricity demand.

Figure 5a.

San Diego
Annual Apartment Offset Achieved,
400 Watt and 1,600 Watt Plug-In Systems, 60° tilt

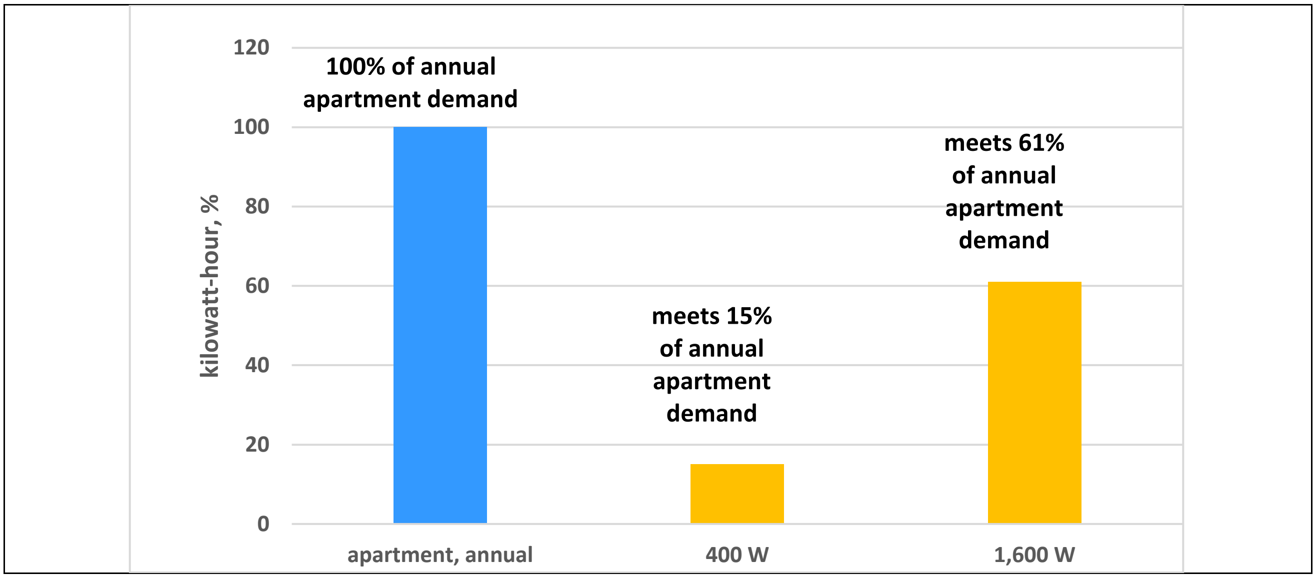


Figure 5b.

Boston
Annual Apartment Offset Achieved,
400 Watt and 1,600 Watt Plug-In Systems, 60° tilt

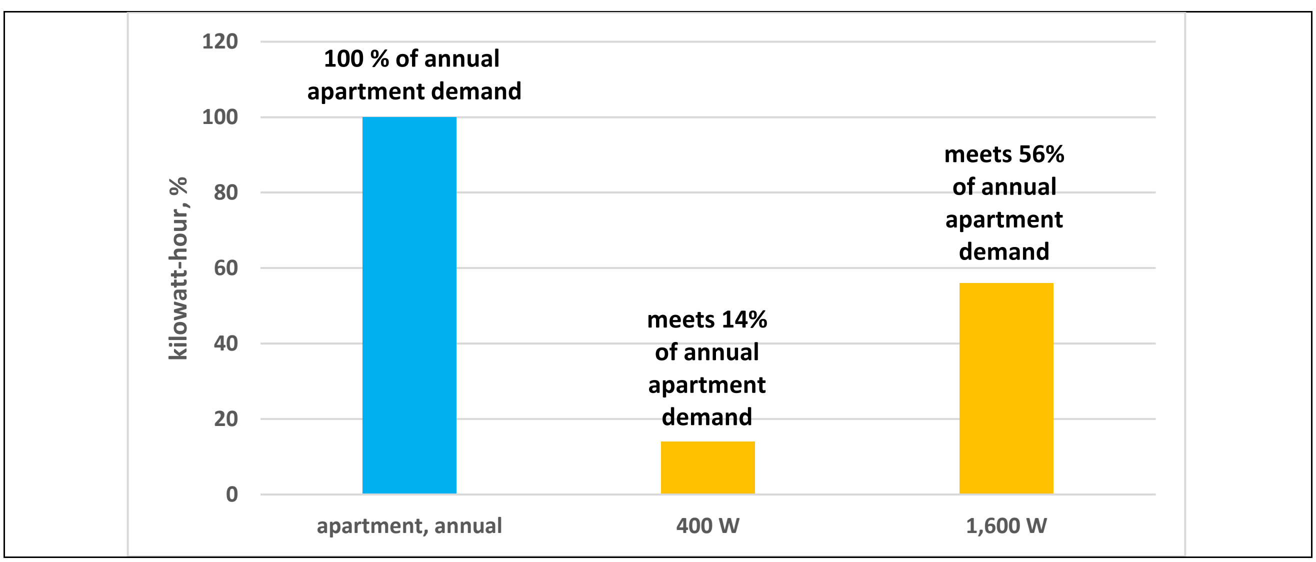


Table 6a shows the potential amount of electricity produced annually by each size system installed at 60° tilt, and Table 6b shows the corresponding cost savings for each configuration and location. Tables 7a and 7b show the same information for systems installed at an ideal tilt.

Table 6a.

Annual Electricity Production, Plug-In Solar, 60° Tilt [22]

	400 watt system	**800 watt** system	**1,200 watt** system	**1,600 watt** system
Location	*kWh / yr*	*kWh / yr*	*kWh / yr*	*kWh / yr*
Boston	563	1,125	1,688	2,250
Portland (ME)	567	1,134	1,701	2,268
San Diego	643	1,287	1,930	2,573
Bakersfield	688	1,377	2,065	2,753

Table 6b.

Annual Potential Electricity Cost Savings, Plug-In Solar, 60° Tilt [23]

Location	400 watt, $/yr	800 watt, $/yr	1,200 watt, $/yr	1,600 watt, $/yr
Boston, 38¢ kWh	**$214**	**$428**	**$642**	**$855**
Portland, 28¢ kWh	**$159**	**$318**	**$476**	**$635**
San Diego, 46¢ kWh	**$296**	**$592**	**$888**	**$1,184**
Bakersfield, 41¢ kWh	**$282**	**$565**	**$847**	**$1,129**

[22] NREL, PVWatts Calculator [60° tilt, zero losses (DC=AC), south facing]: https://pvwatts.nrel.gov/
[23] NREL, PVWatts Calculator [60° tilt, zero losses (DC=AC), south facing]: https://pvwatts.nrel.gov/

Table 7s.

Annual Electricity Production,
Plug-In Solar, Ideal Tilt[24]

	400 watt system	**800 watt** system	**1,200 watt** system	**1,600 watt** system
Location	*kWh / yr*	*kWh / yr*	*kWh / yr*	*kWh / yr*
Boston	615	1,230	1,844	2,459
Portland (ME)	618	1,236	1,853	2,471
San Diego	741	1,482	2,222	2,963
Bakersfield	789	1,578	2,367	3,156

Table 7b.

Annual Potential Electricity Cost Savings,
Plug-In Solar, Ideal Tilt[25]

Location	400 watt, $/yr	800 watt, $/yr	1,200 watt, $/yr	1,600 watt, $/yr
Boston, 38¢ kWh	**$234**	**$467**	**$701**	**$934**
Portland, 28¢ kWh	**$173**	**$346**	**$519**	**$692**
San Diego, 46¢ kWh	**$341**	**$682**	**$1,022**	**$1,363**
Bakersfield, 41¢ kWh	**$323**	**$647**	**$970**	**$1,294**

V. Conclusion

Plug-in solar has the potential to substantially offset the electricity usage of selected home appliances and make a meaningful reduction in electricity bills. Depending on the capacity of the system, plug-in solar can also offset a substantial portion of annual apartment electricity demand in the locations evaluated.

[24] NREL, PVWatts Calculator [30° tilt or 40° tilt (Boston/Portland), zero losses, south facing]: https://pvwatts.nrel.gov/
[25] NREL, PVWatts Calculator [60° tilt, zero losses (DC=AC), south facing]: https://pvwatts.nrel.gov/