



SUSTAINABILITY COMMISSION
Standing Subcommittee on Solar and Green Building
CITY OF PALM SPRINGS, CALIFORNIA

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June 29, 2021
1:30 PM

Via Teleconference

AGENDA

Pursuant to Executive Order N-29-20, this meeting will be conducted by teleconference and there will be no in-person public access to the meeting location.

To view/listen/participate in the meeting live, please use the following link: <https://us02web.zoom.us/j/86112748904> / call +16699006833,,86112748904# - Meeting ID: 861 1274 8904

- Written public comment may also be submitted to cityclerk@palmspringsca.gov. Transmittal prior to the meeting is required. Any correspondence received during or after the meeting will be distributed to the Board/Commission as soon as practicable and retained for the official record.

COMMISSION STANDING SUBCOMMITTEE	
David Freedman	

Staff representatives: Patrick Tallarico, Manager, Office of Sustainability; Tracy Sheldon, Program Coordinator.

City of Palm Springs Vision Statement: Palm Springs aspires to be a unique world-class desert community, where residents and visitors enjoy our high quality of life and a relaxing experience. We desire to balance our cultural and historical resources with responsible, sustainable economic growth and enhance our natural desert beauty. We are committed to providing responsive, friendly, and efficient customer service in an environment that fosters unity among all our citizens.

Please **MUTE OR TURN OFF** all audible electronic devices for the duration of this meeting. Thank you!

CALL TO ORDER

ROLL CALL

ACCEPTANCE OF AGENDA

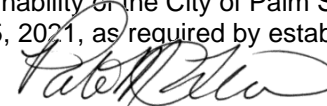
PUBLIC COMMENTS: This time is for members of the public to address the Subcommittee on Agenda items and items of general interest within the subject matter jurisdiction of the Subcommittee. The Subcommittee cannot take action on items not listed on the posted Agenda. Three (3) minutes are assigned for each speaker.

- A. Sustainable Cannabis Grow Facilities Seminar**
- B. GHG Inventory Presentation to City Council**
 - 1. Existing Home Energy Sustainability Ordinance Proposal
 - 2. Transportation and other elements
- C. EV Charger Expansion**
- D. Sustainability Scholarship and Home Energy Assessment Rebates**
- E. Legislative and Regulatory Update**
- F. DCE Issues/Updates**
- G. Agenda Items for July Commission Meeting**
- H. ADJOURNMENT** – Discuss date of the next meeting of the Sustainability Commission Solar and Green Building Subcommittee.

It is the intention of the City of Palm Springs to comply with the Americans with Disabilities Act (ADA) in all respects. If, as an attendee or a participant at this meeting, you need special assistance beyond what is normally provided, the City will attempt to accommodate you in every reasonable manner. Please contact the Office of the City Clerk at (760) 323-8204 at least 48 hours prior to the meeting to inform us of your needs and to determine if accommodation is feasible.

Pursuant to G.C. Section 54957.5(b)(2) the designated office for inspection of records in connection with the meeting is the Office of Sustainability, City Hall, 3200 E. Tahquitz Canyon Way, Palm Springs, CA 92262. Agenda and staff reports are available on the City's website www.palmspringsca.gov. If you would like additional information on any item appearing on this agenda, please contact the Office of Sustainability at 760-323-8214.

AFFIDAVIT OF POSTING: I, Patrick Tallarico, Manager, Office of Sustainability of the City of Palm Springs, California, certify this Agenda was posted at or before 1:30 a.m. on Friday, June 25, 2021, as required by established policies and procedures.


Patrick Tallarico, Manager, Office of Sustainability



MEMORANDUM

DATE: July __, 2021

SUBJECT: Palm Springs Existing Home Energy Sustainability Ordinance Proposal

TO: City Council
Patrick Tallarico, Manager, Office of Sustainability

FROM: David Freedman, Sustainability Commission Member

Background: Homes in Palm Springs have been built over the years to meet the applicable energy-related building codes, which were first put in place in 1978. Since then, new homes have gotten healthier and more efficient while some existing homes, particularly those built before 2011 that represent most of the Palm Springs housing stock, have been left behind. To help address this situation, this proposal would require homes built before 2011 undergoing additions, alterations, or remodels to make certain targeted upgrades, where applicable and feasible, to bring them closer to 2019 and 2022 Energy Code provisions. As a result of the upgrades, these homes can expect lower energy bills, a more comfortable house, and a lower carbon footprint. Community-wide greenhouse gas (GHG) emissions and energy consumption would be reduced.

This proposal is based on and combines features from ordinances in Carlsbad and Chula Vista (San Diego County) and Piedmont (Alameda County) that have been approved by the California Energy Commission (CEC), as required by state law. If an ordinance embodying this proposal is approved by City Council and then the CEC, it would be effective January 1, 2023, simultaneously with the 2022 Energy Code.

Who Would Need to Comply: These energy saving improvements are something any home can benefit from, but because newer homes have already been built to meet more recent Energy Codes, the focus of this proposal is homes built in Palm Springs before 2011 that are doing additions, alterations or remodels that trigger the need for a building permit. Potential examples of what projects would need to comply are:

- Adding square footage
- Adding windows and doors
- Moving interior walls
- Reroofing
- Electric panel upgrades
- Kitchen / bath / laundry room remodels
- HVAC replacement
- Solar PV or thermal installation

These projects would NOT trigger this requirement:

- Projects that are medically necessary

- Repairs to existing equipment
- Additions, alterations, or remodels to homes built after 2010
- Homeowners on the CARE / FERA utility discount programs or eligible for those programs

Based on the type and value of the building permit, different energy saving measures would be required. LED lighting would be required (if not already installed) regardless of permit value. Qualifying projects having a permit value of at least \$10,000 would also be required to install the water heating package described below. Further thresholds would be set for qualifying projects having a permit value of \$25,000 (one additional measure), \$50,000 (two additional measures) and \$100,000 (three additional measures), or measures that will achieve equivalent energy savings.

The table below provides details about each potential measure that may be required, or qualify as an alternative measure, when a home built before 2011 undertakes a qualifying project. However, all homes in Palm Springs should implement some level of the energy measures listed below to reduce their energy bill, improve home air quality, and lower their carbon footprint.

What Does Energy Efficiency Mean? Below is a table that reviews the home energy efficiency standards that the proposal is trying to ensure homes meet.

Name	Description	Benefit	Implementation Notes
LED Lighting	Replace screw-in halogen, incandescent or CFL light bulbs with LED light bulbs.	LED lights can use up to 75% less energy than incandescent bulbs and are 15% more efficient than average Compact Florescent Light (CFL) Bulbs.	Not applicable to lights plugged into outlets. Energy Star bulbs recommended. Historic fixtures exempt if not compatible with LED bulbs.
Water Heating Package	A. Water Heater Blanket - Add R-6 insulation to the exterior of existing residential tank storage water heaters. manufactured before April 2015. B. Hot Water Pipe Insulation - Insulate all accessible hot water pipes with R-3 pipe insulation. C. Low Flow Fixtures - Upgrade sink and shower fittings to maximum flow rates of 1.8 gallons per minute (gpm) for showerheads and kitchen faucets, and 1.2 gpm for bathroom faucets.	Water heating can account for up to 50% of an average home's natural gas usage. By insulating the tank (if not already insulated) and exposed piping, homeowners can minimize the amount of heat that is lost on its way to homeowners. By utilizing low-flow faucets, aerators, and low-flow showerheads, homeowners not only save water but also save the energy used to heat up that water.	Only accessible hot water pipes need to be insulated. Historic fixtures exempt if not compatible with water efficiency measures.
Attic Insulation	Add attic insulation in buildings with vented attic spaces to meet R-	Attic insulation helps homes maintain a stable temperature.	Homes with existing insulation greater than R-19 or without vented attics are

	49.		exempt.
Raised Floor Insulation	In existing homes with raised floors and no insulation, add R-19 insulation.	Insulating crawl space ceilings will make homes more efficient and comfortable.	Homes without raised floors are exempt.
Duct Sealing	Air seal all accessible ductwork with a goal of reducing duct leakage to be equal to or less than 10% of system airflow. -or- Replace existing ductwork with entirely new ductwork to meet 2022 Energy Code requirements.	Duct leakage can be as high as 30% in average California homes. This means that up to 30% of the air homeowners are paying to heat or cool is being lost before it reaches its destination. Additionally, leaky ducts can allow a pathway for dust or other indoor air quality concerns to enter rooms.	The 2022 Energy Code will require duct sealing when more than 25 feet of new or replacement space-conditioning system ducts are installed. This measure would apply if not already required by Code.
Air Sealing	Apply air sealing practices throughout all accessible areas of the building. Homes with one or more vented combustion appliances MUST have a Building Performance Institute (BPI) Combustion Appliance Safety Inspection performed after air sealing.	Houses built over the past five years are over 20 percent tighter than those built a decade earlier. This means the air homeowners paid to heat or cool can escape and increases energy bills and outside pollutants can enter home. By sealing homes, owners can make it safer and healthier.	Only accessible areas need to be sealed. Attics with crawl space are considered accessible. Combined with other building envelope measures to be cost effective.
Wall Insulation	Blow-in R-13 wall insulation in existing homes that currently have no insulation in the walls (pre-1978 vintages).	Without wall insulation, the air homeowners paid to heat or cool can escape.	
Cool Roof	Only applicable if project includes re-roofing or addition of steep-slope roofs. Install a roofing product rated by the Cool Roof Rating Council (CRRC) with an aged solar reflectance of 0.25 or higher and thermal emittance of 0.85 or higher.	Cool roofs help save energy by increasing the amount of solar energy that gets reflected away from homes and minimize the need for cooling on hot days.	Only for steep-slope roofs (shallow slope roofs already covered).

Windows	Replace existing single pane windows with a dual pane product.	Energy efficiency windows not only reduce heating and cooling costs they can also reduce the ability of moisture and noise to enter your home.	Look for U-factor equal to 0.32 or lower and a Solar Heat Gain Coefficient (SHGC) equal to 0.25 or lower.
Water Heater Replacement	High Efficiency Heat Pump Water Heater: Replace natural gas storage water heater, or, tankless water heater having an Energy Factor of .81 or less, with Heat Pump Water Heater -or- High Efficiency Tankless Water Heater: Replace natural gas storage water heater, or, less efficient tankless water having an Energy Factor of .81 or less with tankless water heater.	About 18% of average homes energy is used for heating water. Heat Pump Water heaters are on average 200% to 300% more efficient than traditional water heaters while tankless units are 8% to 34% more efficient. Additionally, because heat pump water heaters store their hot water, they can minimize energy usage during peak periods.	Heat Pump Water Heater with Uniform Energy Factor (UEF) of at least 3.1 (Northwest Energy Efficiency Alliance Tier 3). -or- Tankless water heater with a minimum Energy Factor of 0.96.
Air Conditioner Replacement	High Efficiency Air Conditioner: Replace an existing air conditioner having a SEER rating of 13 or less with a high efficiency air conditioner having a SEER of at least 18. -or- High Efficiency Heat Pump: Replace an existing air conditioner having a SEER rating of 13 or less with a Heat Pump having a SEER of at least 18.	When running air conditioners can be the biggest energy user in a home so installing high efficiency units can prevent higher bills. It is also important to ensure ducting is sealed and installed and filters are regularly changed.	Install an air conditioner or heat pump rated to at least 18 SEER.
Exterior Lighting Controls	Install a screw-in photosensor control in outdoor lighting luminaires.	Photosensor controls reduce operating hours on average 20 percent each day. Helps City achieve its dark sky objectives.	

PV + Electric-Ready Measures	Add electric-ready measures for future replacement of natural gas furnace and water heater with heat pumps, along with installation of an on-site PV system.	Enables buildings initially equipped with natural gas appliances to replace them with electric appliances later.	Electric-ready measures only required when already installing an on-site PV system.
Electric Panel Upgrade /Kitchen / Laundry Room / + Electric-Ready Measures	Add electric-ready measures for future replacement of cooktop and clothes dryer with electric appliances, along with electric panel upgrade or kitchen / laundry room remodel.	Enables buildings initially equipped with natural gas appliances to replace them with electric appliances later.	Electric-ready measures only required when already doing an electric panel upgrade or kitchen / laundry room remodel.

Benefits: As mentioned in the table above there are numerous benefits that these upgrades can provide depending on the home. Below is some more information about the main benefits.

- Energy Bill Reductions – Over the expected life of the products all the measures (except kitchen / laundry room + electric-ready) are expected to save energy and reduce the home’s energy bills by more than the cost of installing them. A summary of cost-effectiveness findings is provided in Attachment 1.
- Improved Indoor Air Quality – Leaky homes and ducts are one of the largest ways that outdoor pollutants like dust and pollen can enter a home. Properly sealing homes and ducts can help increase indoor air quality. But all homes need ventilation, especially homes using fuel-fired appliances – gas water heaters, heating systems and stoves need ventilation, but homes can be sealed up too tight to allow this. If homeowners seal homes beyond the recommended 15% of system airflow, the home may need mechanical ventilation to ensure it is still receiving fresh air. Residents can have a third party verify their home’s air leakage.
- Reduce Carbon Emissions – Home energy use is one of the largest contributors to climate change in Palm Springs. By saving energy residents will also reduce GHG emissions. The model included with the cost-effectiveness analysis estimates community-wide GHG emission reductions.

Compliance credits: If homeowners have already made these, or similar, upgrades, or the upgrades will be a part of the homeowner’s addition, alteration or remodel project, homeowners will be benefiting from a more energy efficient home and do not need to make any additional upgrades. Potential examples of compliance credits are:

- Similar measures have already been completed, including participation in a low-income weatherization program (a deferment will be provided to qualifying homes that have applied for weatherization programs but not received the work yet).
- Home achieves a Home Energy Score (HES) score of at least 8 out of 10 or a HERS whole-house rating score of 85 or lower. The Office of Sustainability offers a rebate of up to \$100 on the cost of a home energy assessment.
- Home has on-site photovoltaics (PV) offsetting at least 95% of the annual electricity and gas-equivalent usage.

- An alternative, voluntary, set of energy measures is concurrently being completed that will achieve equivalent energy savings to the prescriptive packages.
- Homes on an eligible carbon-free electricity plan, such as Desert Community Energy's Carbon Free program or Southern California Edison's Green Rate at the 100% level, could receive compliance credit for the LED lighting measure.

What if These Upgrades Will Not Work for the Project: Because of unique characteristics of some homes, these upgrades may not work as intended for all residents. To help ensure that residents are not negatively impacted by this requirement, the following additional exemptions would also be allowed.

- A measure is beyond the authority of the homeowner because of an HOA covenant.
- Prescribed measures would be technically infeasible or not be cost-effective due to unique characteristics of the home or other special circumstances (e.g., historic preservation rules).

Palm Springs Existing Home Energy Sustainability Ordinance Proposal

Summary Cost-Effectiveness Results

Background

The energy efficiency requirements in the proposed Palm Springs Existing Home Energy Sustainability Ordinance (EHESO) were derived from statewide cost-effectiveness studies produced by California's major utility companies.¹ The studies evaluated a variety of measures for homes of various ages and each climate zone in the state, estimating the total installation cost and utility bill savings for each. These estimates were based on a prototype single family home and prototype multi-unit building considered typical of California's older housing stock and standard construction practices during the periods evaluated.² From these studies the measures that indicated a good payback have been selected.

Measuring Cost Effectiveness

There are two common measures of cost effectiveness.

Simple Payback divides the up-front installation cost of a measure by the expected utility bill savings each year.³ The result is a simple measure of the number of years it takes to "pay back" the initial investment. The lower the number, the quicker a measure pays back and the more cost effective it is. *Simple Payback* does not take into account financing costs.

Benefit-to-Cost Ratio divides the on-bill lifecycle benefits over the one-time costs. Lifecycle benefits are summed over 30 years and discounted at 3%. The costs assume that the owner borrows money to make improvement at common mortgage rates.⁴ *Benefit-to-cost ratios* above 1.0 are considered cost effective and the higher the ratio, the better.

Results

The table below shows the cost effectiveness for certain measures or packages of measures under the proposed ordinance.⁵

-
- ¹ The Codes and Standards Program under the auspices of the California Public Utilities Commission has issued cost-effectiveness studies to help local jurisdictions determine which measures save energy and are cost effective and support the cost-effectiveness finding required by state law to adopt measures that exceed the California Energy Code. The most recent Codes and Standards Program cost-effectiveness study for single-family home upgrades (*2019 Cost-Effectiveness Study: Existing Low-rise Residential Building Efficiency Upgrades, V2* (June 2021)) considered three unique building vintages: pre-1978, 1978-1991, and 1992-2010. The vintages were defined based on review of historic Energy Code requirements and selecting year ranges with distinguishing features. Multifamily energy efficiency measures were reviewed in *2019 Cost-Effectiveness Study: Existing Low-rise Residential Building Efficiency Upgrade, V1* (February 2020). The full studies can be accessed at <https://localenergycodes.com/content/resources>.
 - ² The Cost-Effectiveness Study prototypes for existing single-family residential buildings are 1,665 ft² for a three-bedroom single-family home and 960 ft² per two-bedroom unit for a multifamily building.
 - ³ The 2021 Cost-Effectiveness Study for single-family homes uses electricity rates from Southern California Edison (SCE) effective February 1, 2021, and gas rates from Southern California Gas (SoCalGas) for the 12-month period ending March 2021 (see pages 59-61). The 2020 Cost-Effectiveness Study for multifamily homes describes the SCE and SoCalGas rates it used on pages 24-26. Utility savings could potentially be higher for Desert Community Energy (DCE) customers on its Carbon Free product or SCE customers on its Green Rate at the 100% level and slightly lower for DCE customers on its Desert Saver product. The on-bill cost data do not include either the social cost of higher greenhouse gas emissions leading to air and water pollution, droughts and wildfires or the non-energy benefits of improved public health and a sustainable economy.
 - ⁴ The calculations generally assume an escalation of utility rates and first incremental costs being financed into a mortgage or loan of 30 years at a rate of 4% for single-family homes and 10 years at a rate of 4% for multifamily homes. Maintenance costs were not included for any measures because there are no incremental maintenance costs expected for any of the measures evaluated. Replacement costs were factored in for lighting measures.
 - ⁵ The figures in the table are derived from the Codes and Standards Program's online Cost-Effectiveness Explorer (<https://explorer.localenergycodes.com>), which uses data from the March 2021 version of the single-family study and the February 2020 multifamily study referred to in footnote 1 (the Explorer is being updated to reflect the June 2021 version of the single-family study). The Codes and Standards Program has developed the Cost-Effectiveness Explorer as an online tool using data from the cost-effectiveness studies that local jurisdiction staff and other stakeholders could use to simplify initial reach code

EHESO Proposal Summary Cost Effectiveness Results

Measure	Year Built	Cost Effectiveness		Per Home Results		
		Benefit / Cost Ratio	Simple Payback (years)	Incremental Cost	Annual Bill Savings	Lifecycle Savings
Single family						
LED Lighting ⁶	Before 2011	3.37	7.06	\$13.56	\$1.92	\$45.00
Water Heating Package	Before 2011	1.37	9.04	\$208	\$23.00	\$630
R-49 Attic Insulation	Before 1978	3.40	6.22	\$3,332	\$536	\$12,720
	1978-1991	2.16	9.81	\$2,874	\$293	\$6,960
	1992-2010	1.01	20.8	\$1,852	\$89.00	\$2,100
Duct Sealing	Before 1978	24.6	0.859	\$683	\$795	\$18,840
	1978-1991	16.0	1.32	\$683	\$519	\$12,300
	1992-2010	5.44	3.88	\$423	\$109	\$2,580
New Ducts	Before 1978	6.80	3.10	\$3,986	\$1,285	\$30,450
	1978-1991	5.30	3.98	\$3,986	\$1,002	\$23,730
	1992-2010	1.66	12.7	\$3,986	\$313	\$7,410
Cool Roof (when reroofing)	Before 1978	6.96	3.03	\$778	\$257	\$6,090
	1978-1991	5.31	3.97	\$778	\$196	\$4,620
	1992-2010	2.53	8.37	\$778	\$93.00	\$2,220
R-13 Wall Insulation	Before 1978	1.95	10.8	\$3,360	\$310	\$7,380
Windows	Before 1978	2.10	10.0	\$9,810	\$978	\$23,160
	1978-1991	1.70	12.4	\$9,810	\$792	\$18,750
Exterior Lighting Controls	Before 2011	1.11	21.3	\$85.16	\$4.00	\$94.80

research. The tool allows users to identify cost-effective reach code options as well as to better understand the impacts on their local communities of different possible scenarios.

⁶ Assumes six CFL bulbs are replaced with LED bulbs in a home.

EHESO Proposal Summary Cost Effectiveness Results

Measure	Year Built	Cost Effectiveness		Per Home Results		
		Benefit / Cost Ratio	Simple Payback (years)	Incremental Cost	Annual Bill Savings	Lifecycle Savings
PV + Electric-Ready Measures	Before 1978	1.71	12.4	\$19,281	\$1,551	\$36,720
	1978-1991	1.69	12.6	\$19,281	\$1,529	\$36,210
	1992-2010	1.52	14.0	\$19,281	\$1,376	\$32,580
R-49 Attic + Air Sealing ⁷	Before 1978	2.67	7.93	\$4,806	\$606	\$14,400
	1978-1991	1.63	13.0	\$4,348	\$335	\$7,950
R-49 Attic + Duct Sealing	Before 1978	6.76	3.12	\$4,015	\$1,285	\$30,480
	1978-1991	4.63	4.56	\$3,557	\$780	\$18,480
	1992-2010	1.79	11.8	\$2,275	\$193	\$4,590
R-49 Attic + Air Sealing + Duct Sealing ⁷	Before 1978	5.19	4.07	\$5,489	\$1,350	\$32,010
	1978-1991	3.44	6.14	\$5,031	\$819	\$19,440
	1992-2010	1.21	17.4	\$3,749	\$216	\$5,100
R-49 Attic + Air Sealing + New Ducts ⁷	Before 1978	4.46	4.74	\$8,792	\$1,856	\$44,010
	1978-1991	3.29	6.41	\$8,334	\$1,300	\$30,810
	1992-2010	1.19	17.8	\$7,312	\$411	\$9,750
Attic + Air + Duct Seal + Wall + Windows ⁷	Before 1978	2.58	8.19	\$18,659	\$2,277	\$54,030
Multifamily (per unit data)						
LED Lighting ⁸	Before 2011	3.37	7.06	\$13.56	\$1.92	\$45.00
Water Heating Package	Before 2011	2.92	8.91	\$168	\$18.87	\$509
	Before 1978	6.00	3.82	\$594	\$156	\$3,695

⁷ Does not include \$350 for BPI Combustion Safety Testing.

⁸ Assumes six CFL bulbs are replaced with LED bulbs in a home.

EHESO Proposal Summary Cost Effectiveness Results

Measure	Year Built	Cost Effectiveness		Per Home Results		
		Benefit / Cost Ratio	Simple Payback (years)	Incremental Cost	Annual Bill Savings	Lifecycle Savings
R-38 Attic Insulation ⁹	1978-1991	3.33	6.87	\$526	\$76.54	\$1,816
	1992-2010	2.79	8.20	\$526	\$64.13	\$1,521
Duct Sealing	Before 1978	57.1	0.401	\$120	\$299	\$7,101
	1978-1991	28.2	0.812	\$120	\$148	\$3,501
	1992-2010	24.5	0.931	\$120	\$129	\$3,051
Envelope & Duct Package ¹⁰	Before 1978	9.67	2.37	\$1,054	\$445	\$10,568
	1978-1991	5.26	4.35	\$987	\$227	\$5,382
	1992-2010	4.51	5.07	\$987	\$195	\$4,613
Cool Roof (when reroofing)	Before 1978	14.0	1.63	\$184	\$113	\$2,666
	1978-1991	10.9	2.09	\$184	\$87.91	\$2,080
	1992-2010	9.00	2.54	\$184	\$72.46	\$1,714
Windows	Before 1978	2.26	10.1	\$5,873	\$581	\$13,772

A model shows the aggregate effects of this proposal.¹¹ Over the five-year period that it would be in effect (based on CEC guidance that cost-effectiveness data would need updating after five years), aggregate compliance costs would be approximately \$2 million. Over that five-year effectiveness period plus the 30-year lifecycle, aggregate lifecycle on-bill savings would be approximately \$6.5 million. Over that same time frame, electricity consumption would be reduced by approximately 15 million kilowatt hours, and natural gas consumption would be reduced by approximately 1.6 million therms. Residential GHG emissions would be reduced by approximately 9,000 MTCO_{2E}. Most of the GHG emissions reductions would come from the water heating package, while most of the on-bill and energy savings would come from duct and air sealing and attic insulation because of the large number of DCE customers using carbon-free electricity.

⁹ The 2020 Cost-Effectiveness Study is based on the 2019 Energy Code standard of R-38 insulation and has not yet been updated for multifamily homes to reflect the 2022 Energy Code standard of R-49 insulation.

¹⁰ This is the combination of R-38 Attic Insulation, Air Sealing, and Duct Sealing upgrade measures. Does not include \$350 for BPI Combustion Safety Testing.

¹¹ The model was developed by local energy policy consultant Eric Engelman, who developed the Cost-Effectiveness Explorer for the Codes and Standards Program and whose assistance was provided by the Codes and Standards Program at no cost to the City. The model is derived from the calculations reflected in the Codes and Standards Program 2020 and 2021 residential retrofit cost-effectiveness studies referred to in footnote 5, residential permit data from January 1, 2015, to May 25, 2021, provided by the Building Division and assumptions on how many residences would be required to carry out the various energy efficiency upgrades and which measures they would choose based on work Mr. Engelman carried out as a consultant for the City of Chula Vista on its Existing Home Energy Sustainability Ordinance, on which this proposal is based.

Policy Impacts	Affected Units Per Year	Total Affected Units	Aggregate Compliance Cost	Aggregate Bill Savings	Net Emissions Savings (mtco2e)	Net Emissions Savings from Gas (mtco2e)	Net Emissions Savings from Electricity (mtco2e)	Gas Saved (therms)	Electricity Saved (kWh)
								All	All
[+] Single Family Measures									
LED vs. CFL	833	4,163	\$56,455	\$59,952	5	0	5	0	224,820
Water Heating Package	750	3,749	\$780,868	\$1,732,972	7,151	7,151	0	1,311,031	0
Duct Sealing	151	753	\$468,477	\$3,197,669	318	72	246	13,111	10,554,809
[NET] Duct Sealing + R-49 Attic Insulation	19	93	\$265,768	\$641,765	100	66	34	12,087	2,158,383
[NET] Duct Sealing + R-49 Attic Insulation + Air Sealing	34	172	\$286,094	\$172,140	38	29	9	5,363	566,633
SF Total	833	7,912	\$1,857,662	\$5,804,498	7,612	7,318	295	1,341,592	13,504,644
[+] Multifamily Measures									
LED vs. CFL	320	1,598	\$14,571	\$21,689	2	0	2	0	86,638
Water Heating Package	144	719	\$120,845	\$272,818	1,270	1,270	0	232,770	0
Duct Sealing	29	144	\$17,336	\$265,238	37	13	23	2,452	1,003,677
[NET] Duct Sealing + R-49 Attic Insulation	7	36	\$21,013	\$75,821	14	10	4	1,827	278,890
[NET] Duct Sealing + R-49 Attic Insulation + Air Sealing	13	66	\$21,040	\$24,271	7	6	1	1,017	90,372
MF Total	320	1,598	\$194,805	\$659,838	1,330	1,299	31	238,065	1,459,578
[+] Combined Measures									
LED vs. CFL	1152	5,761	\$71,026	\$81,641	7	0	7	0	311,457
Water Heating Package	894	4,468	\$901,713	\$2,005,790	8,421	8,421	0	1,543,801	0
Duct Sealing	179	897	\$485,814	\$3,462,907	354	85	269	15,563	11,558,487
[NET] Duct Sealing + R-49 Attic Insulation	26	128	\$286,781	\$717,586	115	76	39	13,914	2,437,273
[NET] Duct Sealing + R-49 Attic Insulation + Air Sealing	48	238	\$307,134	\$196,411	45	35	10	6,380	657,005
SF & MF Total	1152	9,510	\$2,052,467	\$6,464,336	8,942	8,616	326	1,579,658	14,964,222

Assumptions

Building Stock Values (dwelling units, zone 15)	Pre-1978	1978-1991	1992-2010	2011+	All
Single Family	12,485	5,964	5,628	4,248.9	28,326
Multifamily	5,956	3,053	231	169	9,409
Total					37,735

Global Assumptions

Policy Takes Effect	2023
Active Policy Duration (years)	5
Current Renewable Electricity Share	88.26%
Natural Gas Emissions Factor (mtco2e)	0.0054544

Measure Assumptions	Cost Effectiveness	Policy Trigger	Penetration Rate	Applicability Rate	Baseline Installation Rate		
					Yrs 1-10	Yrs 11-20	Yrs 21-30
<u>Single Family Measures</u>							
LED vs. CFL	3 vintages	All Permits	6.92%	50%	50%	75%	100%
Water Heating Package	3 vintages	\$10K+	6.23%	50%	0%	33%	66%
Duct Sealing	3 vintages	\$25K+ (WH + Lighting + 1 measures)	0.78%	80%	50%	75%	100%
[NET] Duct Sealing + R-49 Attic Insulation	3 vintages	\$50K+ (WH + Lighting + 2 measures)	0.38%	20%	15%	30%	50%
[NET] Duct Sealing + R-49 Attic Insulation + Air Sealing	3 vintages	\$100K+ (WH + Lighting + 3 measures)	0.16%	90%	15%	30%	50%
<u>Multifamily Measures</u>							
LED vs. CFL	3 vintages	All Permits	6.92%	50%	50%	75%	100%
Water Heating Package	3 vintages	\$10K+	6.23%	25%	0%	33%	66%
Duct Sealing	3 vintages	\$25K+ (WH + Lighting + 1 measures)	0.78%	40%	50%	75%	100%
[NET] Duct Sealing + R-49 Attic Insulation	3 vintages	\$50K+ (WH + Lighting + 2 measures)	0.38%	20%	15%	30%	50%
[NET] Duct Sealing + R-49 Attic Insulation + Air Sealing	3 vintages	\$100K+ (WH + Lighting + 3 measures)	0.16%	90%	15%	30%	50%

Modeling Approach to Reducing Transportation Greenhouse Gas (GHG) Emissions in Palm Springs

Introduction: Objective is to use the PlaceWorks GHG inventory model to forecast changes needed in the transportation sector in Palm Springs to meet CA GHG reduction targets for 2030 (40% below 1990 levels) and 2050 (80% below 1990 levels). Specifically, (1) miles travelled within the city and (2) mix of vehicle types (gasoline powered, natural gas powered [busses], hybrid, and electric) will be considered. It should be noted that the transportation sector contributes 44% of the GHG emissions in PlaceWorks' 2020 projection for the city. The near-term focus should be on 2030.

Approach: Use the PlaceWorks model to determine overall changes in miles travelled and vehicle mix needed to meet reduction targets. Assuming sufficient granularity in the model, more detailed scenarios for meeting targets can be developed. Then policies, programs, and plans for infrastructure changes needed (requesting funding in city budget) can be proposed and started now.

Things to be considered in scenarios:

(1) Miles travelled within the city – reducing motor vehicle trips within the city

- Eliminate motor vehicle traffic on some downtown streets, permanently or temporarily (some # days per week)
- Encourage walking
 - Tie in with pedestrian safety and safe routes to school projects
 - Additional sidewalks
 - Add pedestrian corridors
 - From hotels to downtown
- Encourage bicycling
 - Revisit bicycle routes and map. Close gaps.
 - Bicycle racks and parking
 - Integrate bicycle routes with the CV Link On and off-ramps
- Eliminate fast-food restaurant drive-throughs (It should be noted that a drive-through Starbucks drive-through is being built at Sunrise and Vista Chino)
- McCormick's auction (2x/year) creates temporary spike in emissions from many old cars
- Promote SunLine bus service with electric vehicles
 - Students at new COD campus
 - Add connections to outlying residential areas in city (e.g., Four Seasons and Mountain Gate)
- Promote ride-sharing
- Promote reducing of the number of shopping trips by combining them

- Bring back Buzz service with electric or low-emissions vehicles + establish parking areas
- What to do about Uber and Lyft? Low emission or electric vehicles?

(2) Mix of vehicles

- Enable transition to electric vehicles (ref: CA requirement to eliminate sale of gas-powered vehicles by 2035)
- Encourage now (and incentivize) purchase of low emission and especially electric vehicles
- Increase EV charging infrastructure in the city
 - Additional city locations (beyond current 2021-21 plan)
 - PSP – CIP for rental car area improvement
 - Hotels
- Increase city's vehicle fleet (city to serve by example)
 - Electric vehicles for Citizens on Patrol, Code Compliance
 - Hybrid and electric (currently Ford) trucks for maintenance
 - Police and Fire Departments?
 - Review and approval of vehicle purchases by the Office of Sustainability

Submitted by Sustainability Chair Roy Clark on June 13, 2021.