

## New Construction- Residential California Advanced Homes Subprogram

	Mission	IOU Comments
<b>SW Program: New Construction</b>	The RNC subprogram supports transformation of California’s residential new construction consistent with the CEESP via incentive, education, outreach, marketing and training strategies aimed at the California building industry. The RNC subprogram consists of the California Advanced Home Partnership program (CAHP) coupled with Zero Net Energy Homes and an Energy Star Manufactured homes subprograms.	
<b>SW Sub-program: California Advanced Homes Program</b>	CAHP utilizes a pay-for-performance sliding scale incentive structure based on a whole building approach. CAHP will increase market demand for energy efficient homes by encouraging builders to exceed Title 24 energy efficiency standards by 15-45%. Performance Bonus adders, Design Team Incentives and some prescriptive measure incentives will be included to encourage green building initiatives, energy star appliances, compact homes and solar thermal and photovoltaic installations. Non-incentive customer services will be offered such as technical support to Energy Analysts and Design Teams, Design Team Assistance, economic modeling/measure selection support to builders, marketing support and DSM coordination for builders. The CAHP will, in addition, work with AMI teams to test and develop in-home displays.	

CA EESP Goals/Strategies Addressed by SW <u>Sub-program</u> :	CA EESP Ref. pp. #	IOU Comments
<p><u>Goal (1)</u> NC will reach ZNE performance (including clean, onsite distributed generation) for all new single and multi-family homes by 2020.</p> <p>A key element of this Goal is to develop ZNE example homes across the spectrum of housing options, including MF affordable housing in urban infill areas with access to public transportation.</p> <p><u>Goal Results:</u> (a) 50% of new homes will surpass<sup>4</sup> T24 2008 (previously 2005) standards by 20% (previously 35%) by 2012 (previously 2011)</p> <p><u>Goal Results:</u> (b) 10% of new homes will surpass T24 2008 (previously 2005) standards by 40% (previously 55%) by 2012 (previously 2011)</p>	<p>p. 11</p> <p>p. 16</p> <p>p. 11 as updated by D0909047</p> <p>p. 11 as updated by D0909047</p>	<p>IOUs agree with the SP that these “goals are extremely aggressive.” (p. 14)</p> <p>IOUs are not aware of a single existing N. American home that meets the ZNE definition.</p>

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<p><u>Strategy 1-1:</u> Drive continual advances in technologies in the building envelope, including building materials and systems, construction methods, distributed generation, and building design.  <u>Milestones 1-1:</u> By 2012-2016, 90% of new homes exceed Title 24 by 35% and 40% of new homes exceed Title 24 by 55%; by 2016-2020, 100% of new homes exceed Title 24 by 35%, and 90% exceed Title 24 by 55%</p>	<p>p. 16 p. 16</p>	
<p><u>Strategy 1-5:</u> Encourage local, regional, and statewide leadership groups to support pilots and foster communication among pioneering homeowners and builders.</p>	<p>p. 18</p>	
<p><u>Goal (2)</u> Home buyers, owners and renovators will implement whole-house approach to energy consumption that will guide their purchase and use of existing and new homes, home equipment (e.g. HVAC systems, household appliance, lighting, and "plug loads" amenities.</p>	<p>p. 11</p>	
<p><u>Strategy 3-1</u> Drive continual advances in residential energy usage, including plug loads, home energy management systems, and appliances  <u>Milestones 3-1</u> 10% reduction in plug loads by 2012-2016; 25% reduction in plug loads by 2016-2020</p>	<p>p. 21</p>	
<p><u>Goal 4:</u> Plug loads will be managed by developing consumer electronics and appliances that uses less energy and provide tools to enable customers to understand and manage their energy demand.</p>	<p>p. 11</p>	
<p><u>HVAC Strategy 3-1:</u> Aggressively promote whole building design concepts that improve the overall thermal integrity of new and existing structures  <u>HVAC Milestones 3-1:</u> Include standard program offerings that emphasize HVAC-related elements to whole building approaches. Incorporate radiant cooling, ductless systems, ground source heat pumps, etc. into 25% of more of new and existing construction by 2015 and 50% of new and existing construction by 2020</p>	<p>p. 63 p. 63</p>	<p>CLTEESP's goals for ZNE conflict with its HVAC strategy of promoting particular technologies. Diverting funding to selected technologies at expense of others will result in lower savings and additional opportunity costs.</p>
<p><u>Strategic Lighting Plan:</u> Meet the lighting power density targets and best practices by 2020 by building type.</p>	<p>p. 23</p>	<p>RNC does not have LPDs and Title 24 has no performance path (at present) with which to encourage improvements over prescriptive requirements</p>

Short and Long term (2010-2012) "SMART" <u>Program</u>	Source (SP, AL,	IOU Comments
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Objectives:	DR, PIP, or Staff)*	
Objective 1: Home builders of all production volumes in California will be encouraged to construct homes that exceed California’s Title 24 energy-efficiency standards by at least 15%;	AL	
Objective 2: By 2012, 50% of new homes built in California will be 20% more efficient than 2008 Title 24 standards and 10% will be 40% more efficient;	AL, SP (as updated by D 0909047)	
Objective 3: Residential New Construction will work towards reaching “ZNE” performance for all single and multi family homes by 2020	AL	

Short-term (2010-2012) “SMART” <u>Sub-program</u> Objectives:	Source (SP, AL, DR, PIP, or Staff)*	IOU Comments
<p>Objective 1: By 2012, all participating home builders of all production volumes in California will construct homes that exceed California’s Title 24 energy-efficiency standards by at least 15%- i.e. based on the below targets, 50% of participants will build to 15% above Title 24 (2008);</p> <p>(1a) 50% of CAHP participants will build homes that are 20% + more efficient than Title 24 (2008);</p> <p>(1b) This 50% includes 10% of CAHP participants that build homes that are 40% more efficient than Title 24 (2008)</p> <p>Note: IOUs request no-prejudging language as per this metric and the RRIM being included in Resolution.</p>	<p>PIP</p> <p>DR, Staff-modified</p> <p>SP</p> <p>DR, Staff-modified</p>	<p>Recommendation:</p> <p>By Q4 2012, all CAHP participating homes will be committed at levels that exceed California’s Title 24 energy-efficiency standards by at least 15%, based on the following distribution:</p> <p>70% of participant homes will exceed T24 (2008) by 15%-19%,                  23% of participant homes will exceed T24 (2008) by 20%-29%,                  5% of participant homes will exceed T24 (2008) by 30%-39%,                  2% of participant homes will exceed T24 (2008) by 40+%</p> <p>Rationale:</p> <p>This differs from the PIP for the following reasons: we now have a final version of 2008 T24, including the 2011 implementation of the CalGreen code in T24; the economic downturn has made homebuilders even more sensitive to cost increases even with 50% IMC coverage; and practical program experience in the field suggests that the September 2008 Strategic Plan targets were too aggressive.</p> <p><b>Note: The IOUs need to discuss whether and what will be communicated to ED re: Objectives and aggressive goals</b></p>

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<p>Objective2: By 2012, at least <u>30%</u> of new housing units of all production types (SF/MF) commit to participate in the program across California, includes all committed IOU programs units versus all new residential units.</p>	<p>PIP, DR, ED-IOU discussions, Staff</p>	<p>Recommendation: Delete "Affordable" from objective, make target "at least 30%"</p> <p>Rationale: Because IOUs cannot enroll builders outside their territory, achieving 30% penetration of all residential units with just IOU participants would require even higher penetration to account for non-IOU-territory builders. A 30% market penetration is possible, but beyond historical experience of the IOU programs, 50% (doubling of penetration rates) is not reasonable in a 3-year period.)</p> <p>Distinguishing between SF and MF makes sense, but not "Affordable" housing. This data is currently not available.</p>
<p><del>Objective 3: A steadily increasing number (xx%) every year of CAHP program homes utilize incentives for one or more of the following:</del>  <del>(a) 30% above Title 24 NSHP \$1000 SF bonus (MF \$/unit is TBD);</del>  <del>(b) Green Homes incentive;</del>  <del>(c) kW reduction incentive (peak kW PV reduction);</del>  <del>(d) compact home incentives;</del>  <del>(e) Prescriptive measures, if and when added to the program, including CAHP increased incentives for high efficiency appliances; IHD, PCT could be added, dependent on policy decisions in DR proceeding.</del>  <del>(f) Energy Star kicker</del></p>	<p>PIP, Staff</p>	<p>Recommendation: Delete objective.</p> <p>Rationale: All program participant homes must use a whole house approach to qualify for the program, with or without kickers. To imply that increasing usage of kickers increases homes using whole house approach is inaccurate. As the kickers result in no additional savings, achieving higher level of efficiencies without them would result in lower costs to ratepayers. IOUs will track items a –d and f.</p> <p>Notes: For PG&amp;E these kickers are not available in our MF program. For item (e) the IOUs have dropped appliance/deemed incentives for the time being, and given other pending policy decisions regarding AMI and PCTs, we are unable to offer those items at this time. The IOUs are exploring various measures to add and can clarify later.</p>
<p><del>Objective 4: By 2012, an increasing number of participant homes are located in high energy use areas; 4b) and areas with low code compliance</del></p>	<p>Staff</p>	<p>Recommendation: Delete objective.</p>

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		<p><b>Rationale:</b>          In concept, this seems well-intentioned, but we have several concerns. First, in order to measure, clear definitions of “high energy use areas” and “areas with low code compliance” would be necessary. Second, because the programs and the Strategic Plan targets ALL new homes in California, this objective is inconsistent with those goals. Third, the 2010-2012 graduated program incentives (\$/unit of energy) already provides significantly larger incentives for homes built in more energy intensive climates, so encouraging greater participation is built-in to the incentive design. Fourth, the NC programs have no influence over where developers choose to build. Fifth, determining low code compliance areas would likely require extensive EM&amp;V, which is outside the scope of type-2 metrics.</p>
<p>Objective 5: By 2012, incorporate radiant cooling, ductless systems, ground source heat pumps, etc into 5% of participating CAHP homes</p>	<p>SP, p. 63 (also applies to existing construction)</p>	<p><b>Recommendation:</b>          Delete this objective.</p> <p><b>Rationale:</b>          While we agree that ducts in attics have some inherent inefficiencies, the Strategic Plan goes too far in selecting specific solutions of radiant cooling, ductless systems, ground source heat pumps and thermal energy storage technologies. Other more cost-effective solutions are available, such as better sealed and insulated ducts, cool roofing materials, radiant barrier, and locating ducts in conditioned spaces, to name a few. However, the program is designed to be technology neutral. To do otherwise risks favoring certain industries or vendors over others, which would harm IOU credibility in the market as a neutral third party. To support a true “whole building” design approach, the IOUs must allow designers and builders the freedom to choose the best combination of design and efficiency measures at least cost to achieve maximum efficiency.</p> <p><b>Notes:</b>          CLTEESP’s goals for ZNE conflict with its HVAC strategy of promoting particular technologies. Diverting funding to selected technologies at expense of others will result in lower savings and additional opportunity costs.</p>

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Short-term <u>Sub-program</u> PPMs:	Source (SP, AL, DR, PIP, or Staff)*	Metric Type (2a or 2b)**	Baseline Study Required (Y/N)	IOU Comments
PPM 1: Number and percentage of <u>committed</u> CAHP participant homes (applied and accepted) with modeled, ex ante savings exceeding 2008 T24 units (SF and MF) by 15%-19%, by 20%-29%, 30%-39%, 40+%	DR	2a	N	Recommendation: Edits are incorporated directly into the PPM.  All % are ex ante modeled.
PPM 2: Number and percentage of CAHP participant homes committed (applied and accepted) utilizing incentives for one or more of the following:- (a) 30% above Title 24 NSHP \$1000/SF (TBD for MF) bonus; (b) Green Homes incentive; (c) kW reduction incentive (peak kW PV reduction); (d) compact home incentives; (e) Prescriptive measures, if and when added to the program, including CAHP increased incentives for high efficiency appliances; IHD, PCT could be added, dependent on policy decisions in DR proceeding. (f) Energy Star kicker	DR, Staff	2a	N	Recommendation: Delete PPM 2.  Rationale: All program participant homes must use a whole house approach to qualify for the program, with or without kickers. To imply that increasing usage of kickers increases homes using whole house approach is inaccurate. As the kickers result in no additional savings, achieving higher level of efficiencies without them would result in lower costs to ratepayers. IOUs will track items a –d and f.  Notes: For PG&E these kickers are not available in our MF program. For item (e) the IOUs have dropped appliance/deemed incentives for the time being, and given other pending policy decisions regarding AMI and PCTs, we are unable to offer those items at this time. The IOUs are exploring various prescriptive measures to add and will clarify at a later date via an AL.
PPM 3: Market penetration in IOU service territories of program participants.	DR		N	Recommendation: Edits are incorporated directly into the PPM.
PPM 3a) Percentage of (current year SF CAHP program paid units)/		2a		Rationale:

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<p>(2009 SF building permits within service territories)</p> <p>PPM 3b) Percentage of (current year MF CAHP program paid units)/ (2009 MF building permits within service territories)</p>		2a		<p>The IOUs agree with the idea that a market penetration metric is useful, but ratio needs to be of two easily and clearly defined numbers. Numerators are clearly defined and available in program tracking data. Denominators are available through non-IOU CA data sources, although may need to be adjusted to reflect IOU service territories. Reason for using previous year's permits is to accommodate delay in construction.</p> <p>Notes: This PPM is not perfect, but should give an approximate idea of market penetration over time. Note that metric will consistently underestimate true program penetration because denominator is not adjusted for permitted homes that are not built. Recommend a process evaluation to optimize metric versus data available.</p>
<p>PPM 4: Number and percentage of program homes in high usage areas and low compliance jurisdictions</p>	<p>Staff (EM&amp;V results)</p>	2a	Yes	<p>Recommendation: Delete PPM 4.</p> <p>Rationale: In concept, this seems well-intentioned, but there are several issues. First, in order to measure, clear definitions of "high energy use areas" and "areas with low code compliance" would be necessary. Second, because the programs and the Strategic Plan targets ALL new homes in California, this objective is inconsistent with those goals. Third, the 2010-2012 graduated program incentives (\$/unit of energy) already provides significantly larger incentives for homes built in more energy intensive climates, so encouraging greater participation is built-in to the incentive design. Fourth, the NC programs have no influence over where developers choose to build. Fifth, determining low code compliance areas would likely require extensive EM&amp;V, which is outside the scope of type-2 metrics.</p>
<p>PPM 5: Number and percentage of <u>installed</u>, participant, CAHP units</p>	<p>DR, Staff</p>	a) 2b-	N/Yes if	<p>Recommendation:</p>

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exceeding Title 24 (SF and MF) by 15%-19%; 20%-29%; 30%-39%; 40%+		ins tal led	5(b) is included	Edits are incorporated directly into the PPM.  Rationale: IOUs can only report on installed. Item (b) was deleted, (reporting metered savings) as it will require an EM&V study is inconsistent with definition of 2b.  Notes: (In response to ED comment) Tracking attrition rate is valuable, and something the IOUs should pursue via a separate process improvement study
PPM 6: Average lighting power density of participating SF and MF homes	Strategic Lighting Plan	2b	Yes	Recommendation: Delete metric.  Rationale: RNC does not have LPDs and Title 24 has no performance path (at present) with which to encourage improvements over prescriptive requirements  Notes: Could be a type 3 metric. Will require a baseline study to establish typical LPD

\*SP=Strategic Plan, AL=Advice Letter, DR=Data Request Response, PIP=program plans, Staff=ED proposed. [Include page reference when applicable.]

\*\*Metric type: 2a = reported annually, 2b = reported by end of cycle.

Notes: PG&E rejects ~ 50% of applications. Attrition rate high in economic downturn, with construction delays.

Long-Term (2013-2020) "SMART" <u>Sub-program Objectives</u> :	Source (SP, AL, DR, PIP, or Staff)*	IOU Comments
Objective 1: By 2013-2016, 90% of new homes participating in program exceed Title 24 (2008) by 35%, and 40% of new homes participating in program exceed Title 24 by 55%; by 2016-2020, 100% of new homes participating in program exceed Title 24 by 35%, and 90% of new homes	SP, Staff, p. 16	Reasonable if code proceeds on schedule and at 15% incremental improvements/iteration (2013, 2016, 2019 implementation years)



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<p>participating in program exceed Title 24 (2008) by 55%</p>		
<p><del>Objective 2: By 2013-2016, homes participating in program achieve a 10% reduction in plug loads; by 2016-2020, homes participating in program achieve a 25% reduction in plug loads</del></p>	<p>SP, Staff, p. 21</p>	<p>Recommendation: Delete Objective 2.</p> <p>Rationale: No influence in either current program design or T24 over plug loads</p> <p>Notes: Consider allowing CAHP to claim savings from plug load or to partner with Consumer Electronics program.</p>
<p><del>Objective 3: By 2015, CAHP standard program offerings emphasize HVAC-related elements to whole building approaches such that radiant cooling, ductless systems, ground source heat pumps, etc. are incorporated into 25% or more of participating homes; by 2020, 50% of participating homes incorporate HVAC-related whole house elements such that radiant cooling, ductless systems, ground source heat pumps, etc.</del></p>	<p>SP, Staff, p. 63</p>	<p>Recommendation: Delete objective 3</p> <p>Rationale: While we agree that ducts in attics have some inherent inefficiencies, the Strategic Plan goes too far in selecting specific solutions of radiant cooling, ductless systems, ground source heat pumps and thermal energy storage technologies. Other more cost-effective solutions are available, such as better sealed and insulated ducts, cool roofing materials, radiant barrier, and locating ducts in conditioned spaces, to name a few. However, the program is designed to be technology neutral. To do otherwise risks favoring certain industries or vendors over others, which would harm IOU credibility in the market as a neutral third party. To support a true “whole building” design approach, the IOUs must allow designers and builders the freedom to choose the best combination of design and efficiency measures at least cost to achieve maximum efficiency.</p> <p>Notes: CLTEESP’s goals for ZNE conflict with its HVAC strategy of promoting particular technologies. Diverting funding to selected technologies at expense of others will result in lower savings and additional opportunity costs.</p>

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Objective 4: <del>CAHP program participant homes meet the lighting power density targets and best practices by 2020 by building type.</del>	SP, Staff, Strategic Lighting Plan	<p>Recommendation: Delete Objective 4</p> <p>Rationale: Code and program don't address LPD in RNC. Will require a baseline study to establish typical LPD.</p>
Objective 5: <del>Program is designed to support declining average costs for homes exceeding Title 24 and ZNE homes</del>	SP, Staff	<p>Recommendation: Delete Objective 5.</p> <p>Rationale: The IOUs hope to achieve this, but cost reductions are a by-product of volume production, not program design. It is not clear that Program Incentives do result in lower IMCs over time.</p> <p>Notes: New construction IMCs are difficult to calculate and cost reductions are likewise difficult to measure in the field given the whole-building nature of CAHP.</p>

*\*SP=Strategic Plan, AL=Advice Letter, DR=Data Request Response, PIP=program plans, Staff=ED proposed. [Include page reference when applicable.]*

<b>Long-Term Sub-program MT Indicators:</b>	<b>Source (SP, AL, DR, PIP, or Staff)*</b>	<b>Metric Type (3)**</b>	<b>Baseline Study Required (Y/N)</b>	<b>IOU Comments</b>
MT Indicator 1: Total number/percentage of California-wide, new homes of all production types (SF, MF), modeled 15-19%, 20-29%, 30-39%,40+% above T24 (2008) code. Includes participants and non-participants; for all indicators suggested, baseline year would be years from which data for baseline study is drawn.	SP	3	Y	<p>Recommendation: Edits are incorporated directly into the MT Indicator. Combine MT1 and MT2.</p> <p>Rationale: Deleted affordable – we don't have a reliable way to track this item. Objective is to know how California new housing stock is improving in efficiency in 2010-2020.</p>

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				<p><b>Notes:</b> This evaluation would need to reflect 2008 code baseline versus code in effect through 2020. This is a significant evaluation effort, involving ongoing new construction statewide baseline studies. Probably more directly relevant to Codes &amp; Standards work.</p>
MT Indicator 2: Number/percentage of ZNE, and zero peak new homes of all production types (SF, MF) in California (includes participants and non-participants)	SP	3 or 2b?	Y or N if 2b	<p><b>Recommendations:</b> Edits are incorporated directly into the MT Indicator. Removed high performance homes at 40+%, as it is covered in MT Indicator 1</p> <p><b>Notes:</b> Zero Peak is a preferred goal to ZNE because of the regulatory and rate implications to an IOU from significant adoption of ZNE.</p>
MT Indicator 3: Average cost of new homes more efficient than Title 24 (2008) (and subsequent code levels) by: 15%-19%; 20%-29%; 30-39%, 40+%; ZNE and zero peak homes	SP	3	Y	<p><b>Recommendation:</b> Edits are incorporated directly into the MT Indicator.</p> <p><b>Rationale:</b> Although we recommend deletion of this item in objective 5, the IOUs wish to clarify that this is because cost reductions are only an indirect byproduct of <i>program</i> intervention. However, cost reductions are an important metric for long-term <i>market transformation</i>.</p> <p>While the program wishes to achieve this, cost reductions are a by-product of volume production, not program design. It is not clear that Program Incentives do result in lower IMCs over time.</p> <p><b>Notes:</b> New construction IMCs are difficult to calculate and cost reductions are likewise difficult to measure in the field given the whole-building nature of CAHP. Would be a separate study from MT 1, 2, and 4</p>
MT Indicator 4: Average electricity and energy use levels of California new residential units (KW/ft2; KBTU/ft2/year)	SP	3	Y	<p><b>Recommendation:</b> Edits are incorporated directly into the MT Indicator.</p>

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			<p><b>Rationale:</b> Although the IOUs recommend deletion of this item in objective 4, this is an important metric for long-term <i>market transformation</i> toward ZNE. Nevertheless, overall energy intensity reductions exceed the current program design which only covers the HVAC and DHW.</p> <p><b>Notes:</b> Current T24 for new residential units does not cover include all end-uses. MT Indicator 4 covers T24-performance-based (HVAC, DHW,) as well as non-T24 performance-based: lighting, appliances, and plug loads. Only T24 performance-based measures and some appliances* are included in CAHP (*Anticipated 2011). This study could be combined in one study with MT 1 and 2.</p>
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\*\*Metric type: 3 = data collection, tracking, and reporting [by IOUs, CPUC staff, and/or other entities] to be determined later.