

Recommendations for Clean Energy Municipal Projects Financed under AB811 or Mello Roos

California Home Energy Retrofit Coordinating Committee*

Introduction

This set of recommendations describes two recommended “packages” of energy efficiency and related measures that can be offered as options to homeowners to help them meet the energy efficiency elements of an AB 811 or Mello Roos Finance District program. We recommend that the homeowner be required to implement one of the first two packages – the basic or the advanced package - to be eligible for financing, *and* prior to approving financing for renewable technologies, e.g. solar photovoltaics. Our reasons are explained further in the document.

The two packages, or options, are an advanced and a basic package. The differences are the scope and cost. Ideally, both packages would be available to a homeowner from the inception of the program so as to give the homeowner the option of financing the level of improvements they desire at a cost they can afford. If the homeowner elects to pursue the basic package, the measures prescribed in it will support future implementation of the advanced package of measures if the homeowner elects to undertake the advanced package in the future.

The advanced package includes a full home energy audit with comprehensive recommendations aimed at significantly improving energy efficiency, comfort and indoor air quality. The basic package achieves more modest improvements in energy efficiency through basic air sealing and insulation of the building shell, and is not designed to achieve as extensive improvements in comfort and indoor air quality as the advanced package. The advanced package is likely to cost more, although it may not, depending on conditions in the home.

In both the basic and advanced packages a set of optional green building measures will be recommended to homeowners as best practices for home retrofits.. These energy efficiency, water efficiency, resource conservation and indoor air quality measures are not currently eligible for financing under AB811 or Mello Roos, but are nevertheless beneficial to the environment, can reduce greenhouse gas emissions, and may improve health. They are therefore deemed worthy of the homeowner’s consideration.

Finally, we have also included recommendations for HERs Rater and Contractor Qualifications and Quality Assurance (Section IV) and General Advice for Program Implementers (Section V).

***The California Home Energy Retrofit Coordinating Committee (CA HERCC)** is an ad hoc group of over 40 energy efficiency and/or program development and implementation experts from the following organizations: U.S. EPA, the California Energy Commission, the California Public Utilities Commission, the California Air Resources Board, Pacific Gas and Electric, Sacramento Municipal Utility District, the California Building Performance Contractor's Association, county/local governments, and non-governmental organizations. CA HERCC develops program implementation recommendations, conducts workshops and creates training and educational materials to support the advancement of Home Energy Efficiency Retrofitting of existing homes in California. For more information, contact Leif Magnuson at magnuson.leif@epa.gov, (415) 972-3286.

I. Package I – The Advanced Package (a.k.a. California Home Performance with Energy STAR)

A. A HERs Phase II-compliant audit and rating (Whole House Home Energy Rating with test-in and test-out and combustion safety testing) shall be performed and a report written that includes a list of recommended cost-effective measures

- To set a baseline energy score/index that will serve as a performance metric.
- To describe baseline conditions/physical infrastructure present in the home at start of project.
- To provide supporting documentation for the finance application and proposed performance of work.
- To help the homeowner understand baseline conditions and the basis for the recommended options.

B. Each project financed shall achieve a minimum of 20% reduction in HERS rating without renewables via energy efficiency measures prior to financing renewable energy projects or the home shall achieve a score of 100 or less on the HERs Phase II Index.

- To ensure maximum societal benefit; in nearly all cases, doing a reasonable amount of energy efficiency first achieves a greater amount of energy use cost reduction and greenhouse gas emission reduction per dollar spent than the same dollar investment in renewables. It also better ensures ancillary improvements like comfort and better indoor air quality.
- In the case where a home is already very energy efficient, the homeowner may be eligible to access financing for renewables right away if his/her home achieves a score of 100 on the HERs Phase II Index, according to the HERs Phase II rating performed above. *Note: this requirement will be field-tested and the score adjusted as warranted. Note: Solar water heating is permissible as an energy efficiency measure, per HERS Phase II.*

C. The minimum loan amount to be financed shall be \$5,000

- This is the minimum amount needed to fund all the easy, most cost-effective energy efficiency measures.
- The loan origination fees and program administration costs are too high to justify lesser amounts.
- The marginal decrease in monthly payments for amounts under \$5,000 is negligible, i.e. most homeowners can afford to pay for these using more conventional loans/credit terms.

D. The maximum dollar amount financed shall be determined the following equation:

$$\text{Maximum Amount Financed} = \frac{(\text{total square footage of the building}) \times (\% \text{ energy use reduction})}{2}$$

with a total cap of \$100,000

For example, a 2,000 ft² building that proposes to reduce energy use by 20% is eligible for a maximum of \$20,000 in financing: $\$20,000 = \frac{2,000 \times 20}{2}$

- To avoid abuses by excessive amounts being financed – generally, the higher the total project cost goes, the less cost-effective the additional installed measures are.
- Better protects the lender.
- Better meets the intent of AB811.
- Ensures higher program integrity.
- Protects the homeowner/future homeowner against excessive tax bill payments that could far outstrip energy bill savings.

Note: Programs may want to increase the denominator in this equation now or in the future to lessen the total project financing available to provide an incentive for homeowners to retrofit their homes now instead of later, and to favor less expensive, more cost-effective investments in energy efficiency over more expensive, less cost-effective investments in solar or other technologies. However, the denominator should not be decreased, for all the same reasons stated above, unless energy costs increase substantially more than the 2-6% per year they have over the past 30 years.

II. Package II – The Basic Home Energy Retrofit Package

A. If this option is offered to property owners, the Advanced Home Energy Retrofit Package, as described in Section I above, shall also be offered to all property owners from the very start of program implementation.

B. Only the following list of measures shall be eligible for financing under The Basic Home Energy Retrofit Package. This package is also recommended to be required prior to approval of financing for renewables:

1. Each of the following measures must be performed (or already be done adequately based on verification by a HERS Rater) to be eligible for financing:

- Air Sealing
 - A blower door test shall be performed before and after air sealing which achieves a minimum 20% reduction in CFM @ 50 Pascals. It is recommended that reductions of greater than 20% be achieved, whenever possible, keeping in mind the California Community Services and Development (CSD) minimum ventilation standards that include number of occupants and house size.
 - Blower door Test-in and Test-out numbers must be recorded.
 - Air sealing must also be observable for verification, e.g. sealing all major penetrations and gaps in the attic, top plate, etc.
 - Weather-stripping of doors and windows shall be included.
 - Air sealing shall include repair of broken or unconnected ducts and minor sealing of major leakage areas at connections, e.g. plenum, boots and platform returns in garages. Performance of a duct blaster test is not required.
 - Major duct sealing or duct system replacement will not be performed - these can be performed only as part of the advanced package described in Section I above.

- Attic Insulation, but only after Air Sealing is completed as described above. Attic insulation must meet current Title 24 code. If code can't be met, then project must meet the requirements of the Advanced Home Performance Program.
 - Insulate the Hot Water System, including hot water tank and accessible hot water pipes and first 5 feet of cold water pipes (if space permits it) from gas vents is adequate.
 - Combustion Appliance Safety Testing shall meet Building Performance Institute (BPI), California Community Services and Development (CSD) or California Public Utility Commission's Low Income Energy Efficiency (LIEE) standards for combustion appliance safety checks.
 - Installation of a combined carbon monoxide and smoke alarm.
2. The following measures are optional, and eligible for financing:
- Installation of a programmable thermostat
 - Installation of energy efficient pool pumps and solar hot water pool heaters when replacing pool water heater that uses conventional fuels
 - Installation of Title 24-compliant lighting fixtures and/or Energy Star rated fixtures & controls
 - On-Demand Water Circulation Control Pump (*continuous* recirculating water pumps not allowed)
 - Energy STAR bathroom fan vented to the outside.

III. Optional Green Building Measures for both Basic and Advanced Packages

The following green building measures are a subset of Build It Green's GreenPoint Rated Existing Homes rating system. Retrofit programs have the unique opportunity to educate homeowners about the benefits of including these measures in their retrofit scope. These measures add little or no cost, and rebates are available for many of them. With the implementation of these additional measures, the home could meet the prerequisites for a GreenPoint Rated Elements label, enabling the homeowner to obtain a third-party verified consumer label for their home. Specifications and verification recommendations for these green building measures will be provided in future guidance. Look to GreenPoint Rated for many other green building practices: <http://www.builditgreen.org/existinghome>.

Implementation of the following measures is recommended during either a Basic or an Advanced Home Energy Retrofit, but these measures are not eligible for financing:

- Energy Efficiency
 - Install energy efficient lighting (lamps, bulbs) and refrigerator
 - Install energy and water efficient dishwasher and clothes washer
 - Install smart power strips
- Water Efficiency
 - Fix plumbing leaks
 - Install water-efficient fixtures (toilets, sinks, showers)
 - Install high efficiency irrigation systems
- Resource Conservation
 - Divert all cardboard, concrete, asphalt and metals from retrofit process
 - Insulation contains 75% recycled content

- Indoor Air Quality
 - Insulation is low emitting
 - Composite Woods (Plywood, MDF and particleboard) are low emitting
 - Test for radon in high risk areas

IV. Recommended HERS Rater and Contractor Qualifications and Quality Assurance

A. The program shall maintain three lists of approved (trained and accredited) raters and contractors:

- HERS-certified Raters
- Contractors
- BPI accredited contractors

B. All Raters shall be CEC-certified through a HERS provider in one of the following ways:

- California Whole House Home Energy Rater, or;
- Building Performance Contractor, trained by a California Energy Commission-approved building performance training program and certified by the Building Performance Institute (BPI)

C. All Contractors shall be trained and certified in one of the following ways:

- California Community Services and Development (CSD) or Utility weatherization training certification
- California Building Performance Contractor (CBPCA) prescriptive path contractor certification (coming Fall 2009)
- California Energy Commission HERS-II home performance contractor

D. All Contractors must possess a valid Class B license under the California Contractors State Licensing Board and either be BPI-accredited or gain BPI accreditation relevant to their area of expertise within 12 months of signing his/her first contract financed by the program.

E. There shall be a mandatory program orientation for all contractors at which all contractors shall sign a contractor performance agreement stipulating the training, certification, accreditation, work quality performance and quality assurance requirements for the rater/contractor.

F. Quality Assurance for work performed shall be accomplished as follows:

- Rater – 5% of all jobs shall be third party audited
- Contractor – 15% of all jobs shall be third party audited for quality assurance until contractor is BPI-accredited
- BPI-accredited contractors – 5% of all jobs shall be third party audited

V. General Advice for Program Implementers:

Program Implementers should:

- Consider whether all available rebates/incentives are taken first, and the total amount financed adjusted accordingly.
- Have an exception review process for each of the above recommendations to allow for non-typical situations that may still merit funding/approval.
- Evaluate what actually occurs in homes using pre- and post-retrofit bills, and adjust these recommendations accordingly. Utilities could help gain approvals/provide incentives to get this data from homeowners. This can be accomplished by developing a sample of homes early in the program whose actual energy use is continually tracked throughout program implementation. This on-going feedback loop allows programs to make continuous improvements/mid-course corrections.
- Refer all duct/HVAC work to the Advanced Package/Home Performance Program pathway described in Section I. Strong efforts should be made to recruit HVAC contractors and all HVAC jobs performed into the program.
- Evaluate these program measures at least every two years to accommodate new technologies, code changes, financial incentives, etc. For example, when HERS Phase II is fully implemented should a HERS Phase II audit be a requirement for the Basic Package as well as for the Advanced Package?