



CITY COUNCIL SUSTAINABILITY COMMITTEE MEETING

Hayward City Hall – Conference Room 2A
777 B Street, Hayward, CA 94541-5007

Mission Statement:

Make Hayward a more sustainable community in order to ameliorate negative impacts of climate change, conserve natural resources and promote a clean environment.

June 2, 2010
4:30 p.m. – 6:00 p.m.

A G E N D A

- I. Call to Order
- II. Roll Call
- III. Public Comments: *(Note: All public comments are limited to this time period on the agenda. For matters not listed on the agenda, the Committee welcomes public comments under this section, but is prohibited by State Law from discussing items not listed on the agenda. Items not listed on the agenda brought up under this section will be taken under consideration and may be referred to staff for follow-up as appropriate. Speakers will be limited to 5 minutes each; organizations represented by more than one speaker are limited to 5 minutes per organization.)*
- IV. Approval of Minutes of May 5, 2010
- V. Update on Development of a Residential Energy Conservation Ordinance (RECO)
Mike Gable, Mike Gable & Associates
Kali Steel, Master in Public Policy, Mills College
- VI. General Announcements and Information Items from Staff
- VII. Committee Referrals and Announcements
- VIII. Next Meeting: Wednesday, July 7, 2010
 - Overview of Community Outreach Plan
 - Draft Ordinance-Ban on Styrofoam Containers
 - Update on Formation of the Climate Action Management Team
- IX. Adjournment



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CITY COUNCIL SUSTAINABILITY COMMITTEE MEETING
Hayward City Hall – Conference Room 2A
777 B Street, Hayward, CA 94541-5007

May 5, 2010
4:30 p.m.

MEETING MINUTES

I. Call to Order – Meeting called to order at 4:34 p.m. by Mayor Sweeney.

II. Roll Call

Members:

- Michael Sweeney, Mayor
- Olden Henson, Council Member
- Bill Quirk, Council Member
- Julie McKillop, Planning Commissioner
- Al Mendall, Planning Commissioner (Absent)
- Marvin Peixoto, Planning Commissioner (Absent)
- Doug Grandt, Keep Hayward Clean and Green Task Force (KHCG)

Staff:

- Fran David, City Manager
- Alex Ameri, Deputy Public Works Director
- David Rizk, Development Services Director
- Arlyne Camire, Associate Planner
- Amelia Schmale, Sustainability Coordinator
- Katy Ramirez, Administrative Secretary (recorder)

Others:

- David Stark, Bay East Association of REALTORS®
- Ernest Pacheco, Citizens Against Pollution
- Simon Wong, Tri-City Voice Newspaper

III. Public Comments

Ernest Pacheco, Citizens Against Pollution – Mr. Pacheco said that he would like to provide the Committee with an update on the emissions for the Russell City Energy Center (RCEC). He distributed a document listing the projected amount by pounds per year of the toxic air contaminants, green house gas emissions and pollutants. Mr. Pacheco apologized for providing incorrect figures in the past and stated that the CO2 output is more than 4,200,000,000 pounds per year, which is worst than what was thought.

David Stark, Bay East Association of REALTORS®, said that he would like to share some statistics on home sales in Hayward for 2009 and noted that this information is relevant to the Residential Energy Conservation Ordinance that the Committee has discussed.

Mr. Stark said that last year there were over 3,400 active listings of single-family homes for sale in Hayward; of those about 1,200-1,400 actually sold, or 42%. There were 370 units sold in short-sale situations, or 26%; and 960 foreclosed properties sold, which represents 67% of the total homes sold. These figures bring the total of troubled properties [short sale and Real Estate Owned – (REO)] to 1,330, which is 93% of homes sold for less than the balance of the mortgage. The median sale price was \$330,000; and the short-sale median sale price was \$258,500, which is a delta of \$71,500.00. The REO median sale price was \$245,000; a delta of \$85,000.

Mr. Stark concluded by saying that he feels it important for staff and the Sustainability Committee members to understand the reality of the residential market as it relates to the Residential Energy Conservation Ordinance, and noted that point-of-sale requirements causes problems in other communities and are ineffective at reducing green house gas emissions.

Mayor Sweeney asked that Mr. Stark provide a copy of the statistics to staff, and staff will forward them to the Sustainability Committee members.

Council Member Bill Quirk said that in 2007, 2% of the energy that PG&E bought was from coal; and in 2008 it was 4%; and in 2009 it was 8%. The reason the number keeps on going up is that demand is going up but we are not building power plants, and had the Russell City Plant been built three years ago, we would have saved 12 billion pounds of CO2 emissions.

IV. Approval of Minutes of April 7, 2010 – approved.

V. Large Energy Users Program

David Rizk, Development Services Director, reminded the Committee that, as outlined in staff reports from 2009, staff initially had proposed to use \$250,000 of the \$1,361,900 Energy Efficiency and Conservation Block Grant (EECBG) funds for a revolving loan program, but that, after further consideration, it was determined that a large energy users program would be a more efficient use of such funds. He further indicated that the recommended large energy users program would still respond to the desire to ease the burden to the large energy users as it relates to the Utility Users Tax that was passed in 2009.

Mr. Rizk introduced Amelia Schmale, Sustainability Coordinator, and said that Ms. Schmale will provide an overview of staff's report and current proposal for utilizing the funds.

Ms. Schmale explained that staff proposes to move from implementing a revolving loan fund that would incur a great deal of costs, such as development of the program, qualifying applicants, reviewing credit histories, managing debtors in default, etc., to a

simpler program for large energy users in Hayward. The new proposal would piggyback onto programs that are already in existence and increase the amount of the funds allocated to those projects and rebates.

Ms. Schmale said that staff proposes to follow the PG&E model, where PG&E would identify the projects, do the audits, be involved in the implementation of the program, and qualify the customers. Ms. Schmale said that staff would like the Committee's direction as it relates to the structure and details of the program (i.e., who to target, how many grants, cap of rebates, etc.).

Mayor Sweeney asked Ms. Schmale if she had spoken with the large energy users for their reaction to this proposed program, to which she responded she had not and that staff was working with PG&E to identify large energy users.

Council Member Quirk said that he thinks working with PG&E is desirable and noted that some of the larger energy users in Hayward are non-profit organizations. Mr. Quirk expressed that he would be happy if the City spent a large portion of the funds toward upgrades to St. Rose Hospital and to the part of the Kaiser Hospital complex that is going to stay in Hayward, or to smaller non-profits, such as SAVE or ESP, whom are not major users, but are non-profits with buildings that need upgrading.

In addition, Mr. Quirk said that he is concerned that \$25,000 might not be an incentive for large corporate users and wondered if the City should concentrate on funding smaller, non-profit organizations.

Mr. Rizk said that the report titled "Energy Efficiency and Conservation Strategy" is on the agenda today (Item VI), and summarized some of the other programs that are proposed to be funded with federal Energy Efficiency and Conservation Block Grant funds, including allocating approximately \$250,000 to government and non-profit agencies for energy efficiency improvements.

Council Member Olden Henson said that he is not sure about applying all the funds toward non-profit agencies, and suggested applying partial funding because the non-profits have difficulty in meeting their own internal budgets. Mr. Henson continued that the City passed a Utility Users Tax (UUT), which was needed and supported; however, some businesses were not happy with the UUT. Mr. Henson said with passing the UUT, the City indicated it would look for other opportunities on savings for businesses, and said he wants to make sure that these businesses remain viable in the City. Mr. Henson also said that he does not want to slight large businesses because he wants them to remain in the City.

Planning Commissioner Julie McKillop questioned if this proposal would be attractive to larger energy users. Ms. McKillop supports the idea of focusing on major not-for-profits and smaller non-profits; and feels that the funds would be more beneficial to these users. Ms. McKillop also said that she likes the concept of partnering with PG&E, and to find a way to make the packages attractive for the businesses.

Doug Grandt, Keep Hayward Clean and Green Task Force, said that his concern with giving \$25,000 to non-profits is that they may still be short financially and end up applying the funds elsewhere.

Mr. Grandt also suggested applying the money to result in the most return or energy savings per dollar. He said he would like to allocate the funds toward highly-visible demonstration projects, such as solar panels, energy efficient windows, etc.; and that we need more quantitative analysis.

After further discussion, Mayor Sweeney asked staff to return to the Committee and present additional options, get more information from PG&E, and present information on what larger users may need or desire, to assist the Committee in providing additional direction.

VI. Energy Efficiency and Conservation Strategy

Development Services Director Rizk said that the report provides an update on how the City plans to use Hayward's allocated \$1,361,900 federal Energy Efficiency and Conservation Block Grant funds. He said that staff has not heard from the Department of Energy regarding Hayward's submittal of its Strategy and related documents, and asked the Committee if they had any questions or comments.

Council Member Henson referenced item number 5 of the staff report and said that he feels adequate lighting in the South Hayward BART Station area is critical as it relates to safety.

VII. General Announcements and Information Items from Staff

Development Services Director Rizk referenced a memo distributed to the Committee from Bob Bauman, Director of Public Work, regarding a State Supreme Court case that challenges the legality of a plastic bag ban in the City of Manhattan Beach.

VIII. Committee Referrals and Announcements

Council Member Henson said that the City Manager inquired about the Environmental Preferred Purchasing Program (EPP), and said that he asked Stopwaste.org to do a survey. Mr. Henson said that there are two cities doing everything on that survey – Hayward and Fremont, so Hayward is doing much more than our sister cities. City Manager Fran David asked that Mr. Henson provide the Committee with an informational update, and Mr. Henson responded that he would provide a copy of the report as an update.

Doug Grandt said that he was in Washington recently and had a conversation with the Majority Communication Director of the Committee on Environmental Public Works and during the conversation, he indicated that he really supports our work regarding CaliforniaFIRST.

XII. Next Meeting: Wednesday, June 2, 2010

X. Adjournment – Meeting adjourned at 5:20 p.m.



CITY OF
HAYWARD
HEART OF THE BAY

DATE: June 2, 2010
TO: Mayor and City Council Sustainability Committee
FROM: Development Services Director
SUBJECT: Update on the Development of a Residential Energy Conservation Ordinance (RECO)

RECOMMENDATION

That the Committee reads and comments on this report.

BACKGROUND

Climate Action Plan – The development of a Residential Energy Conservation Ordinance (RECO) for both single-family and multiple-unit homes, which are identified as Actions 3.1 and 3.2 respectively, are called for in the Climate Action Plan (CAP). The CAP, which was adopted by the City Council on July 28, 2009, lists the RECOs as relatively high priorities (11 and 12 out of the top 25 community-wide actions). Actions 3.1 and 3.2 are included in detail in an attached document (Attachment I).

February 3, 2010 Sustainability Committee Meeting - The development of a RECO was included as a priority in the City's contract with Quantum Energy Services & Technologies, Inc. (QuEST) for the Sustainability Coordinator position. Thus, the QuEST team includes Mike Gabel of Gabel Associates who has worked extensively with energy codes and municipal green building ordinance research and development, including acting as the lead technical consultant to the City of Berkeley for their new RECO. Mr. Gabel made an introductory presentation to the Committee at the February 3, 2010 meeting. Mr. Gabel's presentation¹ included an introduction to some of the issues related to the development of a RECO including the 'trigger' for compliance; deciding which energy improvements to require and their cost effectiveness; incentives and financing available to residents; enforcement; and possible exemptions. Mr. Gabel will also make a presentation at the June 2 meeting.

The Sustainability Committee voiced concerns and possible ideas that should be considered. As reflected in the minutes² of the February 3, 2010 meeting, the Committee provided alternative

¹ <http://www.hayward-ca.gov/citygov/meetings/csc/ccsc/2010/CSC-CCSC020310.pdf>

² <http://www.hayward-ca.gov/citygov/meetings/csc/ccsc/2010/CSC-CCSC030310.pdf>

triggers for compliance beyond the point-of-sale trigger seen in the City of Berkeley and others. The Committee provided ideas for incentives that could be used to reduce the financial burden of the energy improvements. The Committee also stressed the importance of community outreach during the research and development of the ordinance. Prior to the meeting, the Committee received a letter from David Stark of the Bay East Association of Realtors expressing opposition to the development of a RECO triggered by point-of-sale (Attachment II).

DISCUSSION

RECO Research- - Kali Steele, a Master of Public Policy Candidate at Mills College, performed a study of existing Residential Energy Conservation Ordinances in the United States to serve as examples for the City of Hayward. Ms. Steele compared ordinances in eight cities including Burlington, VT, Boulder, CO, and Berkeley, CA. The report compared several elements of each ordinance: the trigger, prescriptive vs. performance requirements, and types of energy efficiency measures that are required. Ms. Steele's full report is included as Attachment III.

Some notable findings include: (1) Ms. Steele's interviewees note that point-of-sale triggers can be politically unpopular; (2) some RECOs include a cap on how much the property owner is required to spend to upgrade a home; (3) the majority of RECOs involve rebates or incentives to help cover costs; and (4) RECOs were found that apply to single and multi-family units as well as rental homes. Ms. Steele's recommendations include thorough public education and involvement in the policy development, a whole house performance (as opposed to a prescriptive list) approach to measures, and meaningful enforcement. Ms. Steele will be at the June 2 meeting to answer questions regarding her research.

Federal, State, and Utility Residential Audit and Incentive Programs - It is important to consider the context of other residential energy programs that are currently in development or that are expected to launch soon. Residential energy audit standards and incentive programs are expected to be released by the Department of Energy, the State of California, and California's Investor-Owned Utilities (IOUs). These programs may offer a considerable amount of financial incentives for audits and retrofit projects that could be leveraged by a RECO in Hayward. Thus, it makes sense to incorporate these financial and technical resources into the development of a RECO. Moreover, many experts warn of the extreme "market confusion" right now because of so many new programs, administrative rules, and technical requirements. The resources available and standards required are confusing to property owners, contractors, and local governments. Therefore, it will be important to develop a comprehensive marketing/education component as part of Hayward's RECO program.

Federal Level-HOME STAR - HomeStar³ is proposed new federal legislation to create jobs in existing industries by providing strong short-term incentives for energy efficiency improvements in residential buildings. The program is designed to move quickly, with a minimum of red tape, and will act as a bridge to long-term market development of existing industries. This initiative establishes a \$6 billion rebate program to encourage immediate investment in energy-efficient appliances, building mechanical systems and insulation, and

³ For more information see the HomeStar Coalition website at <http://homestarcoalition.org/index.html>

whole-home energy efficiency retrofits. HomeStar will rapidly create jobs in both construction and manufacturing, while saving families money on their energy bills. It will build on current state programs and existing industry capacity for performing both retrofits and quality assurance, using federal standards and incentives as a common platform to lower program costs and increase consumer awareness.

California State Level- Home Energy Rating System (HERS) II- The goal of the California Energy Commission's HERS and HERS II⁴ program is to (1) certify home energy rating services and (2) provide reliable information to differentiate the energy efficiency levels among California homes and to guide investment in cost-effective home energy efficiency measures.

California Utility Whole House Retrofit Program- According to a presentation by a PG&E representative to the California Home Energy Retrofit Coordinating Committee (HERCC⁵), California Investor Owned Utilities (like PG&E) will be developing residential energy retrofit programs. These programs will offer audit services and financial incentives to residential utility customers. The exact program details are still under development but a PG&E pilot may be available by summer of 2010. Across the state, the utilities aim to achieve 20 percent energy savings in 130,000 homes by end of 2012.

Direction from the Committee - The following are specific research topics for which staff requests Committee direction to guide the next step in research to inform the development of a RECO.

- **Compliance Requirements: Prescriptive list of measures vs. building performance.**
The RECO could require a list of specific energy efficiency upgrades to be checked off for compliance. Conversely, the RECO could require a performance audit that would analyze the specific conditions and opportunities for energy improvements in the home. The performance audit (such as HERS II, see above) may be more effective in finding energy savings opportunities, but the cost of the in-depth audit must be considered. A prescriptive list of measures may be simpler to implement and inspect, but actual energy reductions are harder to measure. It may make sense to utilize the performance audit approach, and utilize funds, such as those from Hayward's Energy Efficiency and Conservation Block Grant, to pay for audits.
- **Triggers: Point-of-Sale, Date Certain, Remodels/Addition permitting.**
There are various options for the trigger for when a property-owner is subject to the requirements of a RECO. A point-of-sale trigger would be straight forward to monitor yet may be politically unpopular, particularly with the real estate community. A date certain trigger- or a set date by which all home owners must comply- would apply to the broader community, but may be more difficult to monitor compliance with due to the quantity of inspections needed. A trigger at the request for a permit to remodel or add to a home would be straight forward to enforce, but the overlap with the green building ordinance may be redundant and the percentage of Hayward homes affected may be relatively little.

⁴ For more information see the California Energy Commission HERS website at <http://www.energy.ca.gov/HERS/index.html>

⁵ <http://www.builditgreen.org/home-energy-retrofit/>

The preceding issues require direction most immediately so that research can commence as directed by the Committee. Other issues for future consideration include the enforcement and tracking of a RECO, placing a limit on the cost of energy improvements, and allowing exemptions for certain property owners including newer homes and low-income residents.

The City of Berkeley's Residential Energy Conservation Ordinance – The City of Berkeley has had a RECO since 1982. The City is currently working to substantially amend the RECO “to encourage deeper savings consistent with the scale of effort necessary to achieve the CAP goals... (and) take into account our understanding of building science which has vastly improved since RECO was adopted almost 30 years ago.”⁶ The proposed amendments change the ordinance from a basic prescriptive list of energy efficiency measures to offering two pathways to compliance: (1) a HERS rating home energy test and improvement recommendation report with a short list of currently required prescriptive measures totaling \$700 - \$1,600 or (2) a basic verified performance improvement package including air sealing and attic insulation in addition to the short list of currently required prescriptive measures, totaling \$4,000 or more, which could be offset by rebates and subsidies. A recent staff report to the Berkeley Energy Commission is included as Attachment IV.

ECONOMIC IMPACT

The economic impacts of the program are not yet fully known and depend very much upon the way the program is structured and the various federal, state, and utility incentive and audit program resources that could be leveraged. Potential costs to property owners include the cost of energy efficiency audits, upgrades, and inspection fees. Energy efficiency improvements are expected to lead to on-going monthly savings on participants' energy bills.

FISCAL IMPACT

The impact to the City of Hayward's General Fund also depends upon the structure of the program. For example, the cost to the City of monitoring compliance including inspection and of tracking results could be offset with an inspection fee.

NEXT STEPS

If the Committee agrees with the approach discussed in this report and provides direction as requested, staff will oversee the research into specific elements of the program development and return to the Committee with more details during the fall of 2010.

⁶ Attachment IV Neal De Snoo, Secretary. Report to Berkeley Energy Commission. Amendment to Enhance Residential Energy Conservation Ordinance.

Prepared by: Amelia Schmale, Sustainability Coordinator

Recommended by: David Rizk, AICP, Development Services Director

Approved by:

A handwritten signature in black ink, appearing to read 'Fran David', written over a horizontal line.

Fran David, City Manager

Attachments:

- Attachment I Text of Climate Action Plan Actions 3.1 and 3.2
- Attachment II Letter from East Bay Association of Realtors
- Attachment III Report: Comparative Options for Drafting Hayward's Residential Energy Conservation Ordinance by Kali Steele, Mills College
- Attachment IV Staff Report to Berkeley Energy Commission

Action 3.1 Develop and implement a Residential Energy Conservation Ordinance (RECO) for detached single-family homes

Develop and implement a Residential Energy Conservation Ordinance (RECO) for detached single-family homes which would require improved energy efficiency and energy conservation in residential buildings. Update the RECO on a regular basis to ensure buildings become more energy efficient over time. Typical energy efficiency improvements may include updates to the lighting, heating, ventilation, and air conditioning systems and improvements that lead to water conservation.

Program Goals

Phase 1 (2012 – 2017) – The goal of the first phase is to reduce electricity use by 1% and reduce natural gas use by 2.5% in participating single-unit homes. The goal is to get 12.5 % of residential units that were constructed before the City's Green Building Ordinance took effect to participate in the program by the end of the phase.

Phase 2 (2018 – 2030) – The goal of the second phase of this program is to reduce electricity and natural gas use by 20% in participating single-unit homes. The goal is to get 45 % of residential units that were constructed before the City's Green Building Ordinance took effect to participate in the program by the end of the phase.

Phase 3 (2031 – 2050) – The goal of the third phase of this program is to reduce electricity use by 100% and reduce natural gas use by 75% in participating single-unit homes. The goal is to get 100 % of residential units that were constructed before the City's Green Building Ordinance took effect to participate in the program by the end of the phase.

Action 3.2 Develop and implement a Residential Energy Conservation Ordinance (RECO) for multiple-unit homes

Develop and implement a Residential Energy Conservation Ordinance (RECO) for multiple-unit homes which would require improved energy efficiency and energy conservation in residential buildings. Update the RECO on a regular basis to ensure buildings become more energy efficient over time. Typical energy efficiency improvements may include updates to the lighting, heating, ventilation, and air conditioning systems and improvements that lead to water conservation.

Program Goals

Phase 1 (2012 – 2017) – The goal of the first phase is to reduce electricity use by 1% and reduce natural gas use by 2.5% in participating multiple-unit homes. The goal is to get 12.5 % of residential units that were constructed before the City's Green Building Ordinance took effect to participate in the program by the end of the phase.

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BAYEAST

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January 28, 2010

Erik J. Pearson, AICP
Senior Planner
City of Hayward
777 B Street
Hayward, CA 94541

Dear Mr. Pearson:

The Bay East Association of REALTORS® commends the City of Hayward for taking a leadership role in addressing climate change. We, too, are supportive of policies that create and maintain a suitable living environment. The members of the Bay East Association of REALTORS® want to help the City of Hayward address the impact residential buildings have on the environment and we are generally supportive of the Climate Action Plan (CAP). In fact, the CAP presents many opportunities for our members to partner with the City of Hayward in achieving your energy efficiency goals.

In order to make the CAP responsible to the community and an effective plan we respectfully submit the following observations and recommendations and ask they be considered as the City of Hayward proceeds with implementing the CAP.

Among the many actions proposed and discussed in the CAP is the adoption of a Residential Energy Conservation Ordinance commonly known as a "RECO." The City of Berkeley adopted a RECO that requires property owners to complete extensive energy upgrades prior to the sale of their homes or when remodeling.

The Bay East Association of REALTORS® does not have an issue with energy-saving upgrades. However, the requirement that they be installed prior to the Point-of-Sale (POS) of a property is problematic for the following reasons:

1. Point-of-sale requirements are not an effective or efficient way to implement policies that aim to improve private properties. A total of 1,572 detached (single family) units and 408 attached (town home and condo) units were sold in the City of Hayward in 2009. This represents a small percentage of the total housing stock in Hayward. An implementation strategy that focuses only on units that are for sale misses the vast majority of homes in Hayward. Additionally, some of

the oldest and least energy-efficient properties rarely change hands and would never be subject to a point-of-sale upgrade requirement.

2. Point-of-sale requirements complicate real estate transactions. The current market for resale homes in Hayward is very fragile because of challenges related to securing purchase financing; homes not appraising due to the Home Valuation Code of Conduct and difficulties closing transactions involving short sale and bank-owned (foreclosed) properties. Another layer of regulation that could require expensive and costly upgrades is not what the real estate market needs now or in the foreseeable future.
3. Point-of-Sale requirements are not feasible in the current real estate market. According to Multiple Listing Service data, 85% of the detached residential units sold in Hayward in 2009 were either "short sale" or foreclosed, bank-owned properties. In the case of a "short sale" the sales price of the home is less than the balance of the mortgage. Many of these sellers are barely able to pay their housing expenses let alone make upgrades to their properties prior to sale. Furthermore, most bank-owned properties are sold in an as-is condition and it would be difficult if not impossible to compel the banks that own these properties to comply with POS requirements.
4. Point-of-Sale requirements would add a significant administrative burden and tax city staff resources. Ensuring compliance with POS requirements would be complex and time-consuming. Given the current budget situation the City of Hayward is facing and even with the addition of new staff to manage energy efficiency issues, it is unlikely additional staff resources could be made available to enforce a point-of-sale ordinance.

It is our understanding that in addition to hiring additional staff the City of Hayward will also be engaging consultants to assist in implementing the CAP. They may suggest that POS strategies in communities such as Berkeley are both effective and embraced by the REALTOR® community. Both assertions would be false. Additionally, a RECO that includes any point-of-sale requirements will have direct negative impacts in the following areas:

- **Economic Stability:** The residential real estate market in Hayward will be extremely fragile for the foreseeable future. As noted above the bulk of properties sold in 2009 were either "short sale" or bank-owned. Purchasing these types of properties is difficult. Any additional regulation that adds to the burden of closing a transaction will either kill potential sales or discourage both home owners and potential buyers from either placing their homes on the market or considering purchasing homes sold in Hayward. Any reduction in real estate sales volume in Hayward could exacerbate the tax revenue challenges the City is currently facing and will continue to face in the future. Point-of-Sale requirements will negatively impact the economic stability of Hayward home owners, home buyers and the City budget.
- **Social Equality:** Addressing climate change is the responsibility of the entire Hayward community. The burden should be shared by all. Point-of-Sale requirements place an unfair obligation on the backs of home sellers.
- **Environmental Health:** A point-of-sale requirement is the least effective method for updating residential properties and will not improve environmental health. In fact, such requirements could be a deterrent to property owners considering selling their home. It could make more

economic sense to keep their home off the market rather than make expensive improvements. In that case, environmental health has not been improved while a home for a potential new owner is kept off the market.

We recognize the RECO and POS requirements are only one of several implementation strategies presented in the plan. However, the POS approach has too many unintended negative consequences for it to even be considered. As you move forward implementing the CAP we urge you to not pursue point-of-sale requirements.

Eliminating POS requirements as an implementation strategy will not negatively impact the ability of the CAP to achieve its goals. More prudent and effective approaches to improving energy efficiency are contained in other recommendations in the CAP including financing programs, leveraging programs offered by other entities and by teaming with the REALTOR® community and our efforts to promote energy efficiency.

The Bay East Association of REALTORS® wants to be a partner with Hayward homeowners, home buyers and the community at-large in promoting energy efficiency. Our comments are offered in the spirit of creating effective public policy based on a full understanding of the real estate market. Please let me know if you have any questions about these recommendations. You may call me at (925)730-4068 or via email at: Davids@bayeast.org.

Sincerely,

David C. Stark, Public Affairs Director
Bay East Association of REALTORS®

CC:

City Council Sustainability Committee
Greg Jones, City Manager

Options for Hayward's Residential Energy Conservation Ordinance

by

Kali Steele

B.A. Anthropology and Sociology
Mills College (2007)

Submitted to the City of Hayward in partial fulfillment of the
requirements for the degree of

Master of Public Policy
at
MILLS COLLEGE

April 2010

DISCLAIMER

This study has been prepared for the City of Hayward, CA. The author conducted this study in partial fulfillment of the requirements for the degree of Master of Public Policy at Mills College. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Mills College Public Policy Program, the sponsoring organization, or any other agency.

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EXECUTIVE SUMMARY

The City of Hayward is considering options for drafting a Residential Energy Conservation Ordinance (RECO). As a first step, the City must decide upon criteria for choosing design elements for the ordinance. I have surveyed eight RECOs that represent a cross section of possibilities. My examination of these ordinances has revealed several recurring themes in relation to the successful adoption and effective implementation of the RECO. Based on these observations, I have come to the following conclusions.

RECO Design

The City would benefit from employing a comprehensive RECO design. This would entail developing a building rating system to assess the resource-efficiency or inefficiency of each dwelling, and what improvements should be made to reduce energy and water usage levels. By basing efficiency retrofit requirements on the performance of the whole house, the City will allow property owners the flexibility to perform the improvements that will best fit their situation, thereby increasing the efficiency of the program. This option also rewards innovation, and can serve to encourage the adoption of cutting edge efficiency technologies by building owners. A prescriptive checklist of required basic retrofits could be incorporated into a comprehensive measure, especially when used in conjunction with a home energy efficiency rating system. However, rather than making each building owner adopt identical efficiency improvements, the requirements should be based on the overall efficiency performance of the dwelling.

In order for the ordinance to affect as large a portion of the existing housing stock as possible, the City should employ as many RECO triggers as stakeholders will accept. Typical triggers for RECO compliance are the construction, sale, or remodeling of a building (Zucker, 2004). Another option is the date-certain requirement, whereby all properties within the local jurisdiction must achieve a certain level of energy efficiency by a set date.

Other local governments' experiences with RECO point to the need for an efficient computerized database to track ordinance compliance and outcomes. The database should be used to provide easily accessible online information about RECO status,

energy efficiency and locally available efficiency resources to property owners. This would provide an effective delivery system for building owners to learn about what they need to do, who can do it for them, and how they may finance their efficiency retrofit.

Enforcement is necessary for an effective RECO. The City could require an on-going inspection process for quality assurance, utilizing a home efficiency rating system. Using third party inspectors and conducting random checks on their work could serve to keep the process honest. Permit fees can help to finance the administrative costs associated with the RECO. Providing diverse and sustainable sources of funding would go a long way towards achieving high levels of RECO compliance among property owners. In order for the City to promote energy efficiency in areas with minimal disposable income, low-income communities would most likely need to have upgrades completed without incurring any cost to themselves.

Barriers to Adoption

Industry research has identified several major barriers to the widespread adoption of residential resource conservation practices by property owners. Among these are: lack of information or awareness of energy conservation opportunities, high out-of-pocket costs for improving energy efficiency, and inadequate access to capital (Institute for Sustainable Communities, 2009).

Mitigations to Barriers to Adoption

Public Involvement

To help mitigate these obstacles the city should make a concerted marketing effort in order to familiarize the public with the RECO and its benefits. An inclusive public outreach process from the outset leads to higher levels of stakeholder buy-in and better results regarding ordinance compliance. When conducting public outreach, it is best to avoid jargon and technical language, keeping communications clear and any visual media simple. An effective approach to achieving stakeholder participation in the RECO design process would be to first notify the public of plans to develop a RECO through the mass media. This could be followed by a city-wide survey conducted to gauge the level of public knowledge and interest in residential resource conservation and to identify

perceived barriers to the adoption of residential efficiency retrofits. Using the survey results, the city could target different segments of the population for participation in stakeholder meetings.

Stakeholder meetings would be most effective if they include a collective visioning component where small groups of diverse citizens develop a shared understanding of what would work best in their community. These work groups can then formulate strategies, comparing ideas with the larger gathering. Finally, getting participants to commit to taking personal action will help to cement the progress made during the meetings and spread knowledge of the available innovations to their broader community. This bottom-up approach will foster a sense of ownership of the process, potentially promoting high levels of RECO compliance (Sanoff, 2005).

Financing

Hayward should also work to get as much state, federal, and county energy efficiency funding into the city as possible to help property owners finance improvements and retrofits. Currently available sources of funding include PACE funding through AB 811, HR 1424, the Million Solar Roofs Program, rebates, tax credits, and Energy Efficiency and Conservation Block Grants.

Conclusion

To be most effective, the City may consider committing to a long-term plan with incremental goals that build upon each other. This would allow time for the market transformation and workforce development necessary to achieve a sustainable change in the housing market. Sharing best practices with other cities will improve the chances for success and help to diffuse innovations throughout the market. While adopting a RECO is an important step towards improving the energy efficiency of residential buildings, this action alone will not reach all of the existing housing stock. It would benefit the city to work with the county and state on any other residential resource conservation initiatives that are currently underway.

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PROBLEM STATEMENT AND METHODOLOGY

The City of Hayward is considering drafting a Residential Energy Conservation Ordinance (RECO) as part of the implementation of the Hayward Climate Action Plan, and is currently exploring policy and implementation options. The context for the adoption of RECO is the passage of AB 32, which formalizes 2020 Greenhouse Gas (GHG) emissions reductions targets for the state of California. This report seeks to provide comparative information on RECOs already in place and alternatives to adopting a RECO. The information in this report is derived from a review of the literature and interviews with government officials, environmental consultants, and members of non-profit organizations.

BACKGROUND

AB 32, the Global Warming Solutions Act, was passed and signed into California law in 2006. This bill formalizes the 2020 Greenhouse Gas Emissions reductions targets, directs the California Air Resources Board (CARB) to prepare a Scoping Plan to map out a state GHG pollution reduction scheme, and sets a timeline for the CARB to follow. The resultant Scoping Plan, approved in 2008, sets a specific goal of reducing GHG emissions to 1990 levels by 2020, with a further 80% reduction by 2050. The plan requires California to adopt a regulation requiring mandatory reporting of GHG emissions statewide. The mandatory reporting regulation applies to state agencies responsible for implementing AB 32 measures and industrial facilities that emit high levels of GHG. This requirement is intended to create a solid foundation for determining emissions levels and tracking reductions (CARB, 2008).

The cooperation of local governments is crucial to the successful implementation of the Scoping Plan. CARB has adopted a Local Government Operations Protocol that sets guidelines for municipalities to track and report public-sector GHG emissions, and developing a protocol for tracking private-sector emissions. Tools that local governments can use to assist in determining their local emissions reduction strategies are available on the CARB website. For example, emissions inventories and calculators can be utilized in goal setting (CARB, 2008).

As 25–30% of California GHG emissions originate from buildings and their associated energy use, improving building water and energy efficiency would have immediate positive GHG reduction results (Allen, 2010). Residential buildings “... account for 30% of non-transportation energy use [and] 32% of electricity use...in California” (Merriam Fuller Energy and Resources Group, 2009). A green building strategy modeled on the California Building Standards Commission’s (CBSC) Green Building Standards Code (GBSC) is included in the Scoping Plan (CBSC, 2010). The GBSC applies to new construction in all sectors and requires a reduction in water and energy use, diversion of

construction waste away from landfills, and the use of low-polluting materials in order to reduce building-related GHG emissions. Though standards are not yet mandatory, local governments are encouraged to require green building standards more stringent than those set by the GBSC. The Scoping Plan also recommends the creation of a rating system for buildings and addresses the need to retrofit existing buildings (CARB, 2008).

The Residential Energy Conservation Ordinance (RECO) is one of the policy tools that local governments can use to meet retrofitting and green building goals. In this report I compare eight existing RECOs, examining the components of each of the ordinances for best practices. Attention is paid to the design of the RECOs as well as feasibility and implementation. I also explore methods of public outreach to encourage stakeholder buy-in.

The City of Hayward adopted a Green Building Ordinance in 2009, which requires that new residential development and existing residential remodels are constructed using the Green Point Rating System (GPRS) or an equivalent green building standard (City of Hayward Ordinance 08-20, 2009). The GPRS is a green building standard developed by Build It Green, a non-profit organization that works to promote resource-efficient dwellings in California (Build It Green, 2010). Green building standards are guidelines for constructing energy- and water-efficient buildings while conserving natural resources and practicing recycling in the construction process. Currently the city is considering options for drafting a RECO in order to address the energy efficiency of the existing housing stock.

RESIDENTIAL ENERGY CONSERVATION ORDINANCE

The RECO is a policy tool cities and counties can use to improve the energy efficiency of the existing housing stock by requiring property owners to comply with resource conservation standards. RECOs typically are comprised of energy and water efficiency requirements and a verification inspection requirement. They can be applied to single-family homes as well as multi-family rental properties (Reiss, 2007). The county or municipality adopting a RECO must determine how to incentivize compliance, and what governmental department will be responsible for implementation and enforcement (Suozzo, 1997). Costs to the government are usually offset by filing and inspection fees associated with the ordinance.

The environmental benefits of a RECO are GHG emissions reductions, energy conservation, water conservation, and improved air quality in residential buildings (Cone, 2009). The

economic benefits of RECOs may include lower utility costs and rebates for property owners and renters, lower equipment maintenance costs for utility providers, market opportunities for local businesses, and workforce development for the business sector (Suozzo, 1997).

Stakeholder groups affected by RECOs include residential property owners and tenants, community groups, neighborhood associations, members of the building trades, renewable energy vendors and contractors, utility providers, realtors, financiers, local

Research shows that improving the energy efficiency of buildings and appliances could reduce carbon dioxide emissions by 710 to 870 megatons yearly in the U.S. (Cretys *et al.*, 2007). This figure represents about 15% of U.S. total carbon dioxide emissions.

Analysis of energy data from 2008 shows that every \$1 invested in home weatherization produces a return of \$2.72 in savings on utility costs (Environmental Policy Center, 2010).

Research on workforce development finds that every \$1 million invested in renewable energy programs results in the creation of 11 jobs and that every \$1 million invested in energy efficiency creates 40 jobs (Long Island Energy Partners, 2010).

governments, and relevant NGOs such as environmental groups and low income housing assistance programs. The overlapping and sometimes conflicting interests of these groups make the successful design and implementation of a RECO a complicated task.

RECO COMPARISONS

Various forms of energy conservation ordinances for residential buildings have been enacted across the nation in the past thirty years. Table 1 below lists eight examples. I have chosen to examine a broad cross-section of ordinances representing different elements and requirements. Six are from cities and counties in California, with one in Colorado and one in Vermont. They include the oldest RECOs in the country as well as newly enacted ordinances. All of the RECOs in this report are mandatory.

Table 1. RECO Example Cases

	Berkeley, CA	Boulder, CO	Burlington, VT	Marin County, CA	Palo Alto, CA	Rohnert Park, CA	Roseville, CA	San Francisco County, CA
Ordinance Name	Residential Energy Conservation Ordinance	Energy Conservation and Insulation Code	Minimum Energy Efficiency Standards Ordinance	Single-family Dwelling Energy Efficiency Ordinance	Green Building Requirement	Energy Efficiency Code	Energy Conservation Audit Requirement	Residential Energy Conservation Ordinance
Administering Agency	Energy Office of the Housing Department	Department of Energy	Department of Public Works and Electrical Department	Building and Safety Division	Planning Department	Building Department	Roseville Electric Department	Office of Building Inspection
Adoption Date	1981	2009	1997	2003	2008	2007	1982	1981
Compliance	Mandatory	Y	Y	Y	Y	Y	Y	Y
	Voluntary	Y	Y	Y	Y	Y	Y	Y
Target Buildings	Single-Family Owned	Y	Y	Y	Y	Y	Y	Y
	Single-Family Rental	Y	Y	Y	Y	Y	Y	Y
	Multifamily-Rental	Y	Y	Y	Y	Y	Y	Y

Once RECOs are passed by the City Council, they are written into the building code and are commonly administered by the city's energy department or a branch of the local planning department. In some cities, different departments partner to oversee RECO enforcement. In cities where the utilities are publicly owned, the electric department is involved in RECO administration. For example, the electric department in the city of

Roseville oversees the required energy audits (Roseville Municipal Code Title 16). In the city of Burlington, the publicly owned utility company assists the Inspection Division of the Department of Public Works in enforcing ordinance compliance (Burlington Dept. of Planning and Zoning, 2004). With publicly owned utility companies typically charging 40% less than their privately owned counterparts and fully cooperating with local government mandates for renewable electricity generation, cities with public electricity appear to have an advantage in moving forward with conservation proposals (Proposition 16 City of Roseville Fact Sheet, 2010).

The majority of ordinances in this report apply to both single-family and multi-family dwellings that can be either owner-occupied or tenant occupied. Only the Marin County's ordinance excludes multi-family homes from its efficiency requirements; its ordinance applies only to single-family homes with a total dwelling size greater than 1,500 square feet (Ordinance No. 3492). The other outlier is Burlington, VT, where the ordinance only affects rental properties.

An Overview of RECO Triggers and Conservation Elements

Table 2 and Table 3 below compare the example cases in terms of what factors cause the RECO to take effect and what energy conservation measures are required. The tables are divided according to the two different approaches to designing the conservation requirements of the ordinance: prescriptive and comprehensive.

Some local governments formulate a basic checklist of prescriptive energy and water conservation elements that are uniformly required in all buildings affected by the ordinance. Other jurisdictions take a more holistic approach by setting conservation targets that can be met through a variety of means. In Table 2 and Table 3 this is referred to as the comprehensive measures. Cities with comprehensive RECOs still may include a checklist of prescriptive measure. The efficiency technologies listed under the comprehensive heading in Table 2 are non-mandatory improvements that may be used to reach the comprehensive RECO targets. Some of the comprehensive measures are based

on one or more green building rating systems. Renewable energy sources may also be used to meet ordinance requirements.

Table 2. RECO Conservation Elements

		Cities Using Prescriptive Measures			Cities Using Comprehensive Measures				
		Berkeley, CA	Roseville, CA	San Francisco County, CA	Boulder, CO	Burlington, VT	Marin County, CA	Palo Alto, CA	Rohnert Park, CA
Subcategories									
Efficiency Technologies	Air-conditioning		Y			Y		Y	
	Duct Sealing	Y	Y	Y		Y			
	Heating		Y			Y		Y	
	Insulation	Y	Y	Y	Y	Y			Y
	Lighting Efficiency	Y		Y					
	Passive Solar Design		Y						
	Shading		Y						
	Ventilation		Y			Y		Y	
	Water Conservation Fixtures	Y	Y	Y				Y	
	Weatherizing	Y	Y	Y	Y	Y			Y
	Window Retrofit				Y	Y			Y
	Renewable Energy Technologies	Biomass							Y
Daylighting					Y			Y	
Geothermal Heat Pumps			Y		Y		Y	Y	
Hydroelectric							Y	Y	
Passive Solar Space Heat					Y		Y	Y	
Photovoltaic		Y	Y	Y	Y		Y	Y	
Renewable Energy Fuel Cells								Y	
Solar Water Heat			Y		Y		Y	Y	
Wind		Y	Y				Y	Y	
Unspecified Renewable Energy Systems							Y	Y	Y

* Unspecified Performance-Based Efficiency Technologies

Prescriptive Measures

Three of the cities in the example cases have ordinances that employ prescriptive measures, which property owners must uniformly comply with. This type of ordinance provides a checklist of required efficiency improvements that typically include insulation, weatherizing, water conservation, and lighting efficiency. However, requirements vary according to climate zone. Areas that are subject to high temperatures for a significant portion of the year include specified requirements for air-conditioning, ventilation, and shading. Colder climate zones put more emphasis on insulation and heating systems.

Comprehensive Measures

A majority of the cities in this report use comprehensive measures. In this type of system, the cumulative energy efficiency performance of the whole dwelling is assessed to see if the home meets required standards. These standards either strictly adhere to or are based on industry rating systems such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification requirements, the GreenPoint Rating system developed by Build It Green, or the California Energy Commission's Home Energy Rating System Program (HERS). Cities and counties may allow property owners to use the rating system of their choice, some require different rating systems depending on the type of building or project under consideration, while others use a single system for all residential properties subject to RECO. In these systems, residential buildings are inspected by licensed energy auditors and rated according to a checklist of efficiency measures. Compliance inspections are carried out by either the administering city department's staff or by inspectors licensed with the city. An inspection basically consists of an energy audit, during which inspectors check whether housing elements such as insulation, ducts, and plumbing meet efficiency standards.

Comprehensive measures afford property owners the flexibility of implementing a variety of energy-saving and renewable energy technologies that can be tailored to best make their building RECO compliant. Included in Table 2 are some specific technologies that cities using comprehensive standards will accept as a means of improving building efficiency. These are seen as options for achieving compliance rather than a set of universal requirements. Some of the compliance requirements are arranged into tiers, with different buildings falling into different categories of requirements according to factors such as housing density, size of property, the size of the building or the remodeling project, and for multi-family dwellings, the number of housing units.

Lessons Learned - RECO Conservation Elements

Prescriptive measures appear to be more commonly used in the older RECOs. The shift away from using this trigger could be because following a prescriptive checklist may not always deliver the maximum energy savings return on the investment in the required efficiency technologies. Simply having a checklist of required efficiency measures that doesn't take into consideration the specifics of each property can create unintended inefficiencies. For example, if a building has a fairly high insulation rating, increasing that rating by just a few points to meet a prescriptive measure doesn't return a great amount of savings in relation to the cost to the property owner of installing new insulation (Personal Communication with Mike Gable, 2010). Another example would be an ordinance that requires installation of an efficient furnace without requiring that the heating ducts be tested and repaired if necessary. Not only would this result in a failure to realize the full benefits of the efficient heating system, it would also increase the cost to the property owner if leaks must be sealed later.

Additionally, a prescriptive RECO design limits options to very basic measures that can be applied across the board (Interview with Chris Cone, 2010). This can become increasingly disadvantageous over time as the market for the required energy efficiency improvements is saturated and the ordinance does not evolve to meet need needs or take advantage of technological advances. The case of San Francisco's attic insulation requirements illustrates this particular disadvantage to a prescriptive RECO. San Francisco's RECO specifies minimum attic insulation requirements. In the decades since the adoption of the RECO, most of the attics in the City have been insulated. However, in portions of the city dominated by flat roofed buildings, the attics are not insulated. The low-crawl flat roofs are below the RECO and Pacific Gas & Electric (PG&E) height minimum and are therefore exempt from the insulation requirement (Interview with Cal Broomhead, 2010).

A more effective program would offer options for meeting standards in an integrated fashion, based on building science principles. In the words of Chris Cone, Implementation Manager at Climate Protection Campaign, this would require a

“...whole-house performance approach that sees a house as a set of systems that impact each other” (Interview with Chris Cone, 2010). In this way, cost efficiency and energy efficiency would be improved as a package.

For example, the city of Berkeley, which enacted the first RECO in the country, uses a prescriptive measure but is in the process of altering that due to the inefficiencies inherent in this method. The City is currently designing a proposal for comprehensive model where each efficiency improvement is assessed for its potential to make a return on the investment. Due to push-back from members of the energy commission who want to hold onto the prescriptive measure, the checklist will still be included in the RECO, but the proposed revision would only require the improvements that can be calculated as producing a positive impact to be completed. The basic retrofit component of the proposal is still being defined. Mandating a basic retrofit requirement is challenging because the need for and cost of efficiency retrofits vary from building to building. The proposed revision is a compromise between a prescriptive and a comprehensive model. While a prescriptive checklist will still be included in the RECO, the revised ordinance will be performance based. The need for efficiency improvements and the verification of their effectiveness will be verified through testing, for example, inspecting HVAC system seals for air leaks (Interview with Billi Romain, 2010).

Included in Berkeley’s revision proposal is a plan to improve the database. This will help to appease the real estate community by reducing some of the potential RECO-related delays to closing home sales. Currently, if a sale is closed outside of the city it is hard to cross-reference the RECO status of homes that have been sold. Escrow offices outside of the city may not be aware of the Berkeley RECO requirements, and a late discovery of non-compliance by the realtor can hold up a sale at the last minute. While the city currently has a computerized database of homes sold, it only consists of a spreadsheet of residential properties. This database doesn’t facilitate any analysis, track RECO triggers, or track the outcomes of the RECO compliance process. The proposed revision includes a plan to give property owners online access to the RECO status of their building. People

would be able to look up their buildings and the potential property improvements that would help them achieve RECO compliance (Interview with Billi Romain, 2010).

RECO Triggers

Typical triggers for RECO compliance are the construction, sale, or remodeling of a building (Zucker, 2004). Another option is a deadline by which all properties within the local jurisdiction must achieve a certain level of energy efficiency. This approach, called a “date-certain trigger” can be logistically problematic and is politically unpopular with voters when coupled with a mandatory measure (Interview with Karen Kho, 2010). My research only identified one RECO that used the date-certain method; it is not included in the example cases. This approach is generally more associated with voluntary city or countywide campaigns to increase the energy and water efficiency of the building stock. RECOs that are intended to increase the efficiency of rental housing stock can be triggered by tenant complaint.

Table 3 RECO Triggers

Triggers	Cities Using Prescriptive Measures			Cities Using Comprehensive Measures				
	Berkeley, CA	Roseville, CA	San Francisco County, CA	Boulder, CO	Burlington, VT	Marin County, CA	Palo Alto, CA	Rohnert Park, CA
Addition, Remodel or Renovation Permit	Y	Y	Y	Y		Y	Y	Y
New Building Permit Application		Y		Y		Y	Y	Y
Time-of-sale	Y	Y	Y		Y			
Metering conversion			Y					
Tenant Complaint					Y			

The most common RECO trigger among the example cases is the application of a permit to remodel, renovate, or build an addition to a structure. Both cities using the prescriptive and those using the comprehensive model rely on this condition as a trigger for an energy and water efficiency inspection. Cities with comprehensive measures use permit applications for new building construction and applications for remodeling as a RECO trigger with equal frequency. The final permit approval is conditional on passing inspection.

The combination of a time-of-sale trigger with prescriptive efficiency requirements is a design that is most common with the older RECOs. All of the case cities that employ this approach have ordinances that were established prior to 1990. All of the prescriptive measures in the example cases are triggered by the sale of a property or the application for a permit to remodel, renovate, or build an addition to an existing structure. Unique among the cities using prescriptive measures is San Francisco's metering conversion trigger for RECO. Here the RECO comes into effect when one or more units in a multi-family dwelling is taken off of the master electric meter and hooked up to an individual meter (City of San Francisco Housing Code Chapter 12).

Burlington's ordinance differs from all of the others because the RECO only applies to rental properties. This is why it is the only city with a RECO that has a "tenant complaint" trigger; this ordinance is also brought into effect by the sale of a rental property (Burlington Code of Ordinances Chapter 18). This RECO was enacted specifically to improve the energy efficiency of rental units. As this city is in a cold climate zone, the ordinance focuses on elements that will reduce heating-related energy outlays. Burlington's RECO is intended to benefit both landlords and tenants by improving building performance in a climate where snow and ice can cause structural damage and low temperatures result in high heating expenses (Suozzo *et al.*, 1997).

Lessons Learned - Triggers

Judging by the example cases, the time-of-sale trigger seems to have declined in popularity in recent years. This is most likely due to both practical and political considerations. The time-of-sale RECO trigger spurs political opposition from realtors because they feel that are put in a position where they are the default enforcers of the ordinance among their client base (Interview with Karen Kho, 2010). Realtors believe that injecting the RECO process into a real estate sales transaction is awkward. This is because each property must be individually assessed in order to formulate a plan to bring the building up to code in a way that maximizes results through a judicious combination of resources. Such an endeavor takes longer than the average sales process (Interview with Chris Cone, 2010).

A possible mitigation to the obstacle posed by realtors was suggested to me by Billi Romain, Sustainability Coordinator at the City of Berkeley's Planning Department, while discussing the proposed revision of the Berkeley RECO. Currently, when selling a property, sellers can transfer RECO compliance responsibilities to buyers, who must complete efficiency improvements within a year of the sale. This can only be done a single time. Once a property has been sold with the transfer of responsibility, the new owner cannot turn the property around and file a form to transfer RECO compliance responsibilities to the next owner. The proposed revision includes an option to allow for multiple transfers of responsibility. This would ease the burden of public education that realtors currently perceive to have fallen on their shoulders. While this may be seen as a weakening of the ordinance, it should be viewed in light of the updated computer system that will perform tracking and periodically send out automatic reminders to property owners prompting them to complete efficiency improvements. The knowledge that compliance is required within one year, coupled with the currently available financing and rebates should serve as a positive motivation for property owners to complete efficiency improvements.

Energy and Climate Programs Manager at the City of San Francisco, Cal Broomhead, offered a different approach to the political opposition posed by the realtors' associations.

Prior to the adoption of a RECO, members of this stakeholder group could be brought in as partners and given green certifications in return for helping the City market high-efficiency technologies and practices to their clients. The green certification would give realtors the advantage of a new way to distinguish themselves in the market.

Participating realtors could see the value in this because buildings with high-efficiency features fetch higher selling prices. Realtors could build relations with former clients by keeping clients updated on residential resource conservation information with newsletters and flyers. Once realtors have bought into the idea of the value of green homes, City staff may have a better chance of gaining their support for a time-of-sale RECO trigger. The concept could be framed in terms of expanding the green building market and fulfilling people's right to have information on residential energy efficiency and to avail themselves of the benefits inherent in RECO upgrades when selling or buying a property (Interview with Cal Broomhead, 2010).

The more recently enacted RECOs in the example cases do not employ the time-of-sale RECO trigger. The new building and remodel permit triggers are more popular with cities and counties that adopted RECOs after 2000. This approach faces less political opposition from realtors and voters (Interview with Cal Broomhead, 2010). It is also easier to disseminate information about the program. Property owners can receive RECO information packets at the time that they apply for permits. Additionally, the contractors, who are largely responsible for the necessary construction work, are a relatively small audience. It doesn't take long before all the contractors, who represent a limited pool of people in a particular area, are educated about the ordinance requirements. Thus, cities can maintain more rigorous control of contractors than other groups such as realtors or homeowners (Interview with Karen Kho, 2010).

As previously mentioned, the date-certain trigger is not generally used to activate mandatory building efficiency measures. When tried in the past, this approach proved to be problematic, because the local infrastructure was unable to meet the demand created by the rush of property owners who waited until the last minute to complete efficiency improvements. This problem occurred in Madison, WI in the 1980s with the result that

when city residents were scrambling to complete energy upgrades, the existing supply of licensed contractors was insufficient for the sudden spike in demand. In this instance, fraudulent companies from the surrounding five-state-area took advantage of the situation, swindling property owners by charging for incomplete work. For example, some homeowners thought they had paid to have insulation installed in their homes when in fact, bags of uninstalled insulation were simply left in attics (Interview with Cal Broomhead, 2010).

The above example shows that the date-certain trigger makes quality control challenging. If a city or county were to adopt this type of RECO trigger, a more sustainable model would be to phase-in date-certain upgrade requirements according to building age, or geographically, by region. In this way, businesses can incorporate RECO mandated upgrades into a business model that will last ten to twenty years. By gradually phasing in a building efficiency program, the city or county enacting the RECO can build a market and develop a quality assurance program (Interview with Cal Broomhead, 2010).

Setting a target date has one advantage over other approaches that may make it an option deserving of serious consideration. Due to the hectic nature of most people's lives, getting people to actually perform energy upgrades can become a very complex calculation. People's living spaces are disrupted during the retrofit process, and this causes a good deal of procrastination. Property owners generally have to be pushed into completing efficiency improvements (Interview with Cal Broomhead, 2010). If mandatory upgrades were spatially and temporally staggered, the date-certain trigger could be an effective means of achieving the retrofit of a large portion of the existing housing stock.

RECO Enforcement and Tracking

Procedures for RECO enforcement are specified in the text of each ordinance. All of the cases included in this report require an inspection for compliance verification. Inspections are performed by city staff or city-licensed inspectors. The inspector either verifies that the building meets required standards or directs the property owners to perform efficiency upgrades (Suozzo *et al.*, 1997). Property owners that remain in

violation of RECO requirements after the time of the final inspection face a variety of penalties. The most common consequence of failure to meet ordinance standards is a fine. Some cities issue civil penalties.

Table 4. RECO Implementation Considerations

Subcategories	Berkeley, CA	Boulder, CO	Burlington, VT	Marin County, CA	Palo Alto, CA	Rohnert Park, CA	Roseville, CA	San Francisco County, CA
Enforcement	Plan Check at Permit Stage	Y	Y	Y	Y	Y	Y	Y
	Final Inspection Verification	Y	Y	Y	Y	Y	Y	Y
Violation Penalties	Civil Penalty			Y		Y		
	Fine	Y		Y		Y		Y
	Infraction	Y					Y	
	Order of Abatement							Y
	Permit Denial		Y		Y			
	Stop Order					Y		
Effectiveness	15% Decrease in Energy Use		64,700 Tons CO ₂ Emissions Reduction		> 200 Tons CO ₂ Emissions Reduction			15% Decrease in Energy Use

* Info not available

With the exception of Roseville, all of the cities that use any type of construction permit as a RECO trigger require an evaluation of the project for ordinance compliance at the time of the permit application. The most common penalty for non-compliant projects issued by cities using this type of trigger is a denial of the requested permit. Rohnert Park issues a stop order and San Francisco issues an order of abatement. Some cities offer online self-administered energy audits that can be taken by property owners who wish to plan and perform their own efficiency upgrades.

Lessons Learned – Enforcement and Tracking

All of the literature on the subject of residential energy savings programs states the importance of tracking the impacts of the installed improvements. However, limited data are available for evaluation. The cities that published percentages of reduced energy use or amounts of emissions reductions did not explain how their figures were calculated.

The city of Berkeley has maintained a database for tracking RECO-related activity since the 1980's. As previously mentioned, the proposed revision of Berkeley's RECO includes a plan to upgrade the existing database. This new system would track RECO

compliance and automatically generate reminder letters to be sent to property owners until efficiency upgrades were completed. The proposal also includes plans for an internal electronic database, to allow city staff to check on individual properties' RECO status. This would give the City the means to start tracking outcomes (Interview with Billi Romain, 2010).

When the City of San Francisco adopted a RECO, records were not kept on an electronic database. Attempting to create a database now would be a formidable proposition because the City lacks the staff to do the data entry necessary for updating RECO information from a paper trail into a computerized system. This has made quality assurance and outcomes tracking challenging. When verifying the RECO status of a building in the records, the only information available in the file is whether the property is checked off. No information on efficiency inspection results or who completed the retrofit is recorded. In order to find such information, one would have to check each paper file to see who signed off on the document and ask that person what was done. This presents an unfeasible workload for city staff (Interview with Cal Broomhead, 2010).

RECO enforcement is a major challenge for cities and counties. In most cases, after the final inspection there is no follow up. The city of Roseville does not verify that required efficiency improvements have been completed. Some experts in the environmental field claim that even the long-established RECOs are not very strongly enforced (Interview with Karen Kho, 2010 and Personal Communication with Mike Gable, 2010). Half of the example cases levy fines for RECO violations, most cities and counties impose some sort of civil penalty for non-compliance. Criminal penalties are not a practical choice for enforcement due to the high administrative costs associated with this option (Interview with Billi Romain, 2010).

With time-of-sale triggered RECOs, enforcement necessarily involves the County Recorder's office. RECO compliance comes up when housing deeds are being recorded. RECO compliance is supposed to be verified prior to closing a property sale, however

this may not be done until several weeks after a sale is closed. In situations where the Recorder's Office is instrumental in RECO enforcement, counties have a definite advantage over cities. For example, the City of San Francisco's ordinance applies to both the City and County of San Francisco, so it is a simple matter for city planning staff to check compliance with the Recorder's Office because the county seat is located in the city. City and County personnel maintain close working relationships. However, in the case of a city like Berkeley, the Alameda County recorder's office is a separate entity located in a different city, and it is not as easy for city staff to check up on RECO enforcement (Interview with Cal Broomhead, 2010).

A further challenge to enforcement is agency capture. Relationships of dependency can develop between agencies and the sectors that they are responsible for regulating. This can degrade the stringency of the enforcement process. For example, realtors can develop relationships with certain inspectors who are known to have less stringent standards than others.

One city official suggests ways to circumvent these problems. He recommends instituting an accreditation program for residences. The program would have a labeling system for home energy and water conservation performance. The labeling system would require periodic home performance tests. Using third-party home performance inspectors to monitor the buildings would avoid the problem of agency capture (Interview with Cal Broomhead, 2010).

An official at the city of Berkeley had similar suggestions in relation to the proposed revision of her city's RECO. Currently, any qualified HERS 2 rater can perform RECO inspections. According to this official, the HERS 2 rating system is not well vetted and the RECO compliance process would be streamlined by the use of a standardized national rating system. Quality control can be ensured by using a national rating system and employing inspectors licensed with a state agency and registered with the city. This is because a certain number of jobs are checked by the state agency, and the city can conduct random quality assurance checks on inspectors. This would also help to avoid

agency capture. Additionally, inspections by state agency inspectors would not be as expensive as full-blown HERS 2 inspections, which can cost up to \$700 (Interview with Billi Romain, 2010).

The RECO requirements in the revision would be funded by rebates from the Energy Efficiency Block Grant, Homestar funding, and county financing. It is expected that 25-30 % of properties would be reached by the ordinance within ten years. It is hoped that the combination of voluntary county-wide measures, the RECO, and currently available rebates will encourage property owners to retrofit buildings now. In this way Berkeley hopes to transform the market. This is seen not just as the promotion of green buildings but also of green jobs with a living wage.

BARRIERS TO ADOPTION

Industry research has identified several major barriers to the widespread adoption of residential resource conservation practices by property owners. Among these are: lack of information or awareness, high out-of-pocket costs, inadequate access to capital, and split incentives (Institute for Sustainable Communities, 2009). One of the most significant obstacles policy makers encounter when attempting to implement energy efficiency policy initiatives is political opposition from stakeholder groups.

Lack of Information or Awareness

Property owners are generally unaware of the energy efficiency performance of their buildings. This speaks to the need for a standardized building efficiency rating system (Institute for Sustainable Communities, 2009). Including a home energy audit requirement in the design of a RECO would give property owners valuable information on the status of their building.

However, simply identifying what areas to target is not enough; building owners need to know what efficiency measures will return the most savings for their investment (Institute for Sustainable Communities, 2009). Ensuring that the information available to decision

makers is clear and easily grasped without a lot of technical understanding is a key step in overcoming this barrier. Making information about available efficiency technologies, service providers, and sources of financing easily accessible to the end user in a single location increases the likelihood that people will invest in efficiency improvements (Interview with Chris Cone, 2010).

Widely disseminating information about home energy audits and the resources available to property owners would require a broad public education campaign. Utilizing local media outlets to spread the word can reach many segments of the population. However, low-income communities require a more hands-on approach. Industry research suggests that setting up energy efficiency centers in the target low-income communities increases the likelihood that of participation by this segment of the population (Institute for Sustainable Communities, 2009). The services offered would need to be specifically tailored to the needs of the particular population and be based on government and utility assistance programs than would not create out-of-pocket any costs for the end-user.

A recent instance of effective face-to-face community outreach can be drawn from the city of Sebastopol. While this city does not have a RECO, it can still serve as a useful example. The city of Sebastopol is involved in a voluntary Sonoma County efficiency retrofit campaign attempting to achieve the retrofit of 80% of the building stock by 2015. In order to get the word out about this goal, volunteers walked the entire city and delivered information packets to every building, both commercial and rental. The information packets included utility rebate coupons, CLF vouchers, and information about energy efficiency and the retrofit plan. While Hayward has a population about twice the size of Sebastopol's, this strategy could be modified to reach important targets or segments of the population that are less likely to be civically engaged.

High Out-of-Pocket Costs

Some cities and counties cap the amount of money the property owner must be required to spend on efficiency improvements. For remodels this can be a certain dollar amount per foot of building included in the project plan, or a percentage of the renovation cost.

Time-of-sale RECOs use a percentage of the sales tax as a cost ceiling. The figures I found ranged from 1% - 3%. The cost limit can also be a pre-determined dollar amount. Property owners are not required to undertake the projects that incur costs in excess of cost caps. Table 5 shows the various options used by the cities with published spending caps.

Table 5. Cost Limit to Property Owner

		Berkeley, CA	Burlington, VT	San Francisco County, CA
	Percent of Renovation Cost	Y		
Cost Limit to Property Owner	Percent of Sales Price	Y	Y	Y
	\$ Per Square Foot	Y		
	Set Spending Cap		Y	

When evaluating options for designing a spending cap it is important to consider the particular characteristics of the housing market in the region. Depending on the prevailing trends in the local market, a percentage of the sales price of a building can represent very different dollar amounts. Table 6 compares the median home value, median household income, and cost of living index of the example cases with Hayward's statistics. As the table shows, the figures representing Hayward fall roughly in the middle of the range represented by the examples. However, Hayward falls in the lower range when compared to the nearby cities from the example cases. The dollar amount represented by a percentage of a home's selling price in San Francisco or Palo Alto represents far more money for efficiency upgrade projects than a percentage of the sales price of a typical home in Hayward would yield. Populations with lower incomes and housing values have less disposable income to use for efficiency improvements. In a lower-end market, making financing available to property owners is key to promoting adoption of efficiency technologies.

Table 6. Home Value and Household Income (Source: city-data.com)

	Median Home/ Condo Value (2008 Estimate)	Median Household Income (2008 Estimate)	Cost of Living Index Dec. 2009 (U.S. Average: 100)
Berkeley	\$752,200	\$64,434	181.3
Boulder	\$530,100	\$57,231	121.0
Burlington	\$249,956	\$43,127	102.0
Hayward	\$439,100	\$61,880	154.2
Marin	\$922,600	\$91,982	174.6
Palo Alto	\$1,338,628	\$108,020	196.1
Roseville	\$381,000	\$76,039	93.6
Rohnert Park	\$434,206	\$60,908	157.0
San Francisco	\$824,300	\$73,798	180.2

Inadequate Access to Capital

The initial out-of-pocket costs of efficiency upgrades is one of the most limiting factors for property owners faced with efficiency upgrade requirements (Merrian Fuller and Energy Resources Group, 2009). This is why financial incentives are the most popular mechanism for encouraging RECO compliance. Table 7 shows that six of the eight example cases offer rebate programs and five offer loans or financing. However, it should be noted that financing is not as useful for vulnerable populations in low-income groups. To address this barrier, Berkeley and San Francisco provide assistance to low-income homeowners in partnership with PG&E's CARE program.

Table 7. RECO Compliance Incentives

	Subcategories	Berkeley, CA	Boulder, CO	Burlington, VT	Marin County, CA	Palo Alto, CA	Rohnert Park, CA	Roseville, CA	San Francisco County, CA
Compliance Incentives	Expedited Permit				Y				Y
	Fee Waiver				Y				
	Height Variance								Y
	Loan/Financing		Y	Y		Y		Y	
	Low Income Assistance	Y							Y
	Property Tax Exclusion							Y	
	Rebates	Y	Y		Y	Y		Y	Y
	Tax Credit							Y	
Technical Assistance			Y	Y					

Available Sources of Financing for RECO

A.B. 811

Various bills in support of AB 32 have been passed since 2006. One that helps to provide financing for RECO projects is AB 811, signed by the governor on July 21, 2008. This bill authorizes California municipalities to designate the city, county, or a portion thereof as a “contractual assessment district,” an area in which private property owners may receive public financing for permanently fixed energy efficiency improvements or alternative energy installations. The financing takes the form of low-interest loans, payable twice yearly along with property taxes. The loans are land-secured and do not require credit checks or credit ratings, have a minimum of \$5,000 with no maximum, and can be passed on to new owners if the property is sold (CSA, 2008).

The goal of this bill is to spur energy efficiency improvements and installations immediately by making them affordable to property owners with no initial out-of-pocket expenses. This opportunity has been underutilized due to limited knowledge of its availability. As nearly a quarter of California GHG emissions originate from buildings and their associated energy use, widespread adoption of this option would have immediate positive GHG reduction results. The benefits to communities that take advantage of this bill go beyond GHG emissions reductions. Adoption provides opportunities for economic development by employing people to carry out improvements

and has the potential to encourage an upswing in green business (Allen, 2010). These improvements also increase property values, which could lead to increased property tax revenues for local governments.

The Berkeley FIRST solar financing program is the original impetus behind AB 811. This program, adopted by the City of Berkeley in 2008, allows property owners to install solar photovoltaic (PV) systems without incurring up-front costs. Backed by the City, Berkeley FIRST provides financing to home owners who want to install PV systems. The solar energy system costs are repaid over the course of 20 years through a property tax that does not reduce home equity and can be transferred to the buyer in the event that the property is sold (Fuller *et al*, 2009). The State of California passed AB 811 to empower other municipalities to adopt similar programs following the Berkeley FIRST model. Such programs have come to be known as Property Assessed Clean Energy (PACE) financing, which has drawn national attention (pacefinancing.org, 2010). The city of Berkeley has joined a state-wide consortium working to develop a California FIRST program to deliver PACE financing to a state-wide market and increase the types of efficiency technologies eligible for funding (Berkeley FIRST, 2010).

Energy Efficient Conservation Block Grants (EECBG) Program

This federal program includes formula and competitive grants to local jurisdictions that require funding for energy efficiency and conservation projects (U.S. Department of Energy, 2009). This program is locally administered by the California Energy Commission (CEC). Small cities and counties are awarded funds to finance conservation projects of their choice. While some funds have already been committed, \$10.6 million remain unallocated. The CEC is currently accepting and reviewing applications for the EECBG program (California Energy Commission, 2009).

The Energy Commission estimates that energy efficiency investments from this program can annually save consumers 61.2 million kilowatt-hours of electricity; reduce CO₂ emissions by 22,541 tons, save local jurisdictions in excess of \$9 million in energy costs and create or retain community jobs.
(<http://www.energy.ca.gov/recovery/blockgrant.html>)

H.R. 1424

There are also opportunities for funding from the federal government. H.R. 1424, the Emergency Economic Stabilization Act of 2008, enacted October 3, 2008, includes renewable energy legislation that provides federal tax credits for residential solar panel installations. From January of 2009 until 2017, property owners who buy solar electric systems are eligible for a tax credit worth 30% of their solar panel purchase and installation expense. This legislation overrides a previous \$2,000 limit for residential solar installations (H.R. 1424 Library of Congress, 2008).

Million Solar Roofs Program

The federal renewable energy legislation, H.R. 1424, fits nicely with California's Million Solar Roofs Program (MSRP). The goal of this program is to install 3,000 megawatts of new solar system electricity by 2017. MSRP requires public utilities to help finance incentives for solar power (CARB, 2008). However, any entity requesting solar incentives would have to adhere to energy efficiency standards addressing more aspects of the building than just the solar roofs. The MSRP is designed to help make solar energy a more attractive market by reducing costs. The cost per megawatt of solar generated electricity has been steadily declining for the past 20 years, and the addition of incentives and tax breaks makes solar an increasingly attractive option for municipalities to utilize in their emissions reduction plans (Cochran, 2008).

Rebates

A variety of rebates are available from PG&E for customers who install high-efficiency appliances and heat, ventilation, and air-conditioning (HVAC) systems, and seal the ducts in their residences. However, the incentives currently offered by PG&E for HVAC systems are not very significant when compared to the cost of purchase and installation. Consequently, the rebates alone are not a strong motivation for building owners to upgrade their HVAC systems (Interview with Cal Broomhead, 2010). The rebates for appliances represent a larger portion of the cost of purchase. Correspondingly, the PG&E rebate program is more effective at influencing consumers to buy high-efficiency appliances (Personal Communication with Sarah Rosendhal). Information on the

available PG&E rebates can be found at:

<http://www.pge.com/myhome/saveenergymoney/rebates/>.

Tax Credits

The American Recovery and Reinvestment Act (ARRA) of 2009 makes tax credits available to homeowners who invest in efficiency improvements. Eligible technologies are insulation, duct sealing and infiltration reduction, energy-efficient windows and skylights, high-efficiency central air conditioners and air-source heat pumps, high-efficiency gas furnaces and boilers, and high-efficiency water heaters. The tax credits are capped at \$1,500, and improvements must be installed by December 31, 2010 (energystar.gov, 2010). ARRA gave a boost to PACE funding by eliminating a provision that limited the use of Investment Tax Credits for projects that subsidized energy efficiency financing (pacefinancing.org, 2010).

Split Incentives - RECO and Residential Rental Energy Efficiency

Renters generally have lower incomes than homeowners and have less control over the level of energy efficiency in their homes. Energy efficiency in rental units is a special challenge due to the problem of split incentives between landlords and renters. The typical landlord is reluctant to invest in energy efficiency improvements that will benefit their tenants through reduced utility bills while only serving to increase the out-of-pocket costs to the landlord. Renters typically do not have the financial resources or the authority to make energy efficiency improvements to their dwelling. Even those who may be able to afford the improvements and obtain permission to undertake them are disinclined to invest in improving a building that they must vacate at the landlord's discretion, possibly before they have received a return on their investment (Williams, 2008). It is also very hard for tenants to persuade landlords to make the improvements themselves, even though doing so would increase the value of their property. The power imbalance between landlord and tenant creates an inequity for renters when it comes to control over their carbon footprint. The RECO can circumvent this principal agent problem by making efficiency upgrades mandatory across the board (Zucker, 2004). There is also some benefit to the landlord in terms of increased building value due to efficiency improvements. This assertion can be borne out by the fact that even in the

current poor housing market, buildings with green features in Santa Clara and Palo Alto are some of the top draws in the area (Conrad, 2007).

Residential Rentals in San Diego

Several California cities have developed alternative ways to overcome the principal agent and split incentive obstacles to energy efficiency in rental housing. The following is an example of how one city is utilizing AB 811 funds to improve multifamily residential energy efficiency. (AB 811 is discussed above.)

The City of San Diego has adopted a Multifamily Affordable Solar Housing (MASH) program to incentivize the use of renewable energy in the form of solar photovoltaic (PV) and solar thermal water heating systems in the affordable housing market. This program is targeted towards landlords of multifamily units and non-profit housing providers that meet at least one of several “low-income residential housing” criteria. Unlike similar programs, the incentive levels for this program are not set to decline. They are divided into two tracks (California Center for Sustainable Energy, 2009).

Track 1 pays up-front fixed rebates depending on the size and expected performance of the PV system installed. An online calculator is provided for prospective users to determine the expected performance level of the PV system under consideration. Rebates are received within thirty days of the approval and inspection of the installed PV system (California Center for Sustainable Energy, 2009).

Track 2 offers higher incentives than Track 1 for projects that create additional tenant benefits. This is a grant proposal with two application periods per year. Qualifying projects must include energy efficiency upgrades to the housing units and a reduction of costs to the tenants. They must educate tenants on energy efficiency and provide green job training or green job creation for the tenants (California Center for Sustainable Energy, 2009).

An example of a winning application is a non-profit low-income housing assistance organization’s proposal to install a PV system in a 107-unit affordable housing

development. This project, approved in November of 2009, is expected to reduce individual tenants' expenses by \$100 a year. The performance monitoring system that will be installed with the PV system is going to be modified in order to provide free wireless internet access to all tenants. Energy efficiency workshops will be held for the residents of the housing development. A training program will be offered to residents who wish to help install the system; participants will then be eligible for jobs in the field. Additionally, a part-time solar maintenance technician and a full-time energy efficiency educator will be hired from the tenant pool (<http://energycenter.org/index.php/incentive-programs/multifamily-affordable-solar-housing/incentives>).

There are several different utility providers in the San Diego area and MASH is administered by whatever provider covers the area in which the qualifying building is located.

Political Opposition

RECO policies may meet political resistance prior to adoption and implementation and are often defeated at the crucial stage of adoption by the public. In the face of political opposition, some local governments have even scrapped plans to pass RECOs prior to implementation. In other cases, the ordinance has passed only to later be repealed. Cities and counties that engage in widespread community outreach and education are the most likely to adopt and successfully implement a RECO (Suozzo, 1997). Such experiences highlight the importance of effective communication with stakeholders in order to foster a broad base of support.

Achieving Stakeholder Buy-in

In order to overcome barriers to adoption and to affect behavior, it is necessary to meet people where they are. Communication with the public must be tangible and simple. The goal of influencing public behavior can be furthered by finding a specific audience for proposals who can in turn influence the broader public. Public opinion research can inform this process.

Research in the social sciences and marketing describes the process of the diffusion and adoption of innovations, dividing populations into groups according to their place in this process (Rogers, 2003). Employing such an approach to community outreach could play a role in identifying and determining what segments of each stakeholder group it would be most productive to engage.

Analysis of industry data has found that segmenting target markets in order to understand the barriers to implementation specific to each community increases the effectiveness of energy conservation programs (Institute for Sustainable Communities, 2009). Marketing research identifies the following groups involved in the adoption of innovations, as shown in Table 8.

Table 8. Group Segmentation in the Process of Adopting Innovations (Source: Moore, 2002)

Innovators	Early adopters	Early Majority	Late majority	Laggards
Ahead of their time. Rarely get credit for their efforts. Generally a small group that acts as pioneers. However, innovation adoption is a collective process, and the contributions of innovators are important. (For example, in a social movement, the innovators lay the foundation on which others can base their work.	Want to be change agents. This group, while larger than the innovators, is still relatively small. These people desire a competitive edge and welcome a departure from the status quo. Early adopters expect to deal with discontinuity between the old and the new and are prepared to learn how to adapt to innovations.	Get involved when the innovation starts to take off. About one third of a given target population. Seek an improvement but wish to minimize discontinuity. Don't want a revolutionary product or innovation, but rather an evolution of current technologies or ideas that can be smoothly integrated into the status quo. Willing to make some adjustments, but wish to avoid the necessity of acquiring extensive new knowledge or technical facility. Seek "...well-established references before investing."	Wait until something is well established before adopting the innovation. Makes up about one third of the population. Do not want to have to acquire any new knowledge and won't get involved with an innovation unless there is an easily accessible support system in place	Completely uninterested in innovations.

Technology Adoption Life Cycle

Groups are distinguished from each other based on their characteristic response to discontinuous innovations created by new technology

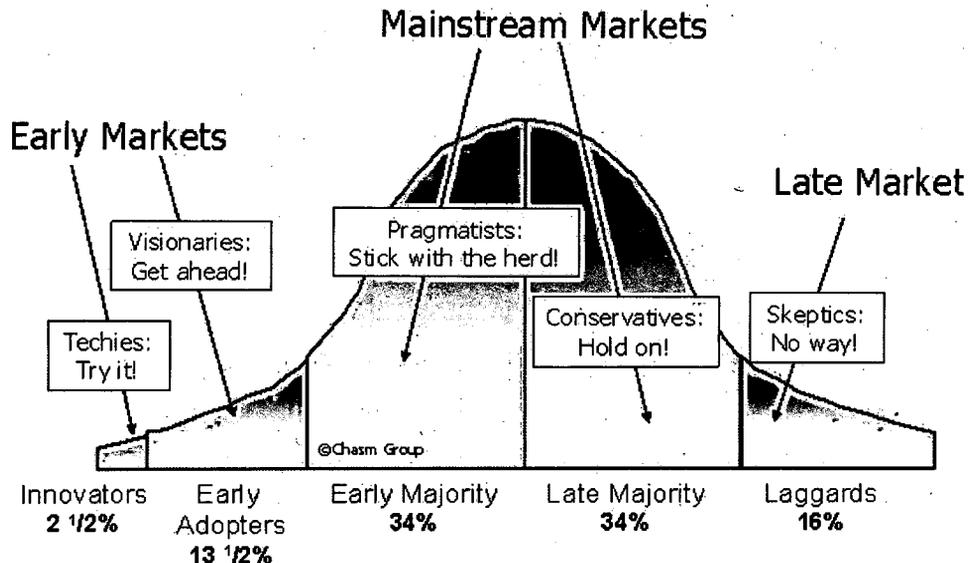


Figure 1. Technology Adoption Lifecycle (Source: Moore 2002)

Marketing research further identifies a “chasm” that must be breached when bringing an innovation from the early adopters to the larger public. This specifically refers to the gap between early adopters and the early majority (Moore, 2002). It is very challenging to bridge this gap because the early majority segment requires a suitable reference before they are sold on an idea. The reason this poses such a challenge is that the early majority generally only perceive others in the early majority to be suitable references (Rogers, 2003). Thus, promoters of innovations who target this group are operating without a reference or support base in an area that is highly reference- and support-oriented.

While sustainable building practices are widely accepted in the architectural field, risk aversion among consumers, financiers, and developers is one of the main reasons why green building standards are not more widely practiced (Zucker, 2004). This can be seen in terms of the need for standard references when attempting to cross the chasm from the early adopter phase of innovation diffusion to the early majority. Another issue that acts as a barrier to more widespread adoption is the association of increased capital costs with

green building practices (Yates, 2001). This is why financial incentives are such an effective policy tool. However, the availability of financial incentives alone is not enough to tip sustainable building practices into mainstream usage.

When trying to effect change, it is important to find a specific group to target and use as a lever to influence others to support the innovation. Change agents often use opinion leaders within a particular social system as their leverage points, because opinion leaders validate the change for broader adoption by others. The trust and respect they garner from others makes their example a desirable one to follow (Rogers, 2003). This is a way to bridge the early adopter to early majority chasm.

A key to successful leveraging is to choose a group that can influence the process both upstream and downstream (Gladwell, 2002). In the example of San Francisco's RECO, the broader community was engaged in the process from the beginning of the RECO process, but contractors emerged as the effective leverage point. Half of the certification inspectors were drawn from private sector contractors. The contractors who trained as RECO inspectors were already members of the group. Presumably, some of them had reputations that were generally respected among their peers. Their endorsement of RECO would have provided the trusted reference needed to diffuse the innovation among their colleagues. The contractors had influence on San Francisco's construction and retail industry downstream and developers upstream (Zucker, 2004). This combination helped to push RECO into the mainstream as a generally accepted part of doing business.

In the current economic environment, getting the support of contractors will not be enough to create a broad base of support for Hayward's proposed RECO. The East Bay Association of Realtors® has already stated their opposition to the consideration of a point-of-sale trigger for efficiency upgrades. Engaging realtors and all other stakeholder groups is crucial to crafting a successful RECO.

Below, options are presented for engaging the community in the design of the RECO. The criteria used to evaluate these alternatives are cost, city staff time, time to completion, access to experts, stakeholder participation, inclusion and equity for the

community, quality of feedback, and balanced feedback. For the purposes of this discussion the following monetary values are assigned to price rankings: Low - \$1,000, Medium - \$10,000, High - \$50,000-\$100,000.

- Community Meeting

This is the status quo, city staff held community meetings during the crafting of the Hayward Climate Action Plan. It is a low-cost option that requires moderate input of staff time, offers no access to experts, and can be completed within two months. Public meetings promote equity because they are open to all. As a large proportion of the city population is Latino, the provision of Spanish translators could enhance the inclusiveness of this format. Another option would be to hold some meetings in Spanish, with English translation provided. While this method holds potential for involving all the stakeholders, the quality of feedback is moderate, because in this type of public forum it is often the case that only the loudest voices are heard. Additionally, only the staff is involved in developing the ideas that are presented at the meetings; it isn't a collaborative process.

- Informal Survey

Similar to the first option, informal surveys are a low-cost option that require moderate input of staff time, offer no access to experts, and can be completed in a minimum of two months. The breadth of stakeholder participation depends on how and to whom the survey is administered. Surveys aren't inherently inclusive; the respondents are most likely self-selected. While the feedback is balanced because all respondents are answering the same questions, the quality of feedback is low due to selective response, bias, and the generally limited possibilities for narrative and interactive communication in survey responses.

- Meeting in a Box (MIAB)

This is a low-cost process that requires little expenditure of staff time and can be completed in two months. The staff sets an agenda and devises the workshop materials, which are placed in a box and disseminated to community members who agree to facilitate workshops for ten to fifteen other city residents (Enger, 1998). While there is no access to experts, the quality of stakeholder feedback is very rich and balanced with a

high potential for inclusion and equity; attendees don't have to read or speak English fluently in order to participate at a high level.

- **Public Hearing**

This is a low-cost option that requires moderate input of staff time, offers access to experts, and can be completed in a minimum of two months. There is potential for breadth of stakeholder participation; attendance is dependent on who is invited and able to attend. However, because public hearings are a formal procedure, this model isn't specifically designed to involve a population that isn't already comfortable with civic engagement. Feedback isn't balanced; the quality and level of feedback is weighted in favor of the experts, who are given more time and leeway than other stakeholders present at the hearings.

- **Citizen Work Group**

This is a low-cost option requiring moderate staff time that can offer access to experts, and may be completed in a minimum of two months. There is potential for diverse stakeholder participation. Following an expert presentation to introduce the meeting topic, citizens work together in small groups to develop a shared vision of a strategic plan for the community. This format allows for a high degree of stakeholder feedback.

The process of designing, adopting and implementing a RECO can be a long process. Each of these methods of community engagement can be utilized at different points in the development and promotion of the ordinance.

Stakeholder Buy-in – Examples

Berkeley

When the City of Berkeley initially went through the RECO adoption process, city staff held a series of stakeholder meetings. These included technical advisory meeting, as well as meetings with contractors and the real estate community. However, the stakeholder process in Berkeley is unique because of its diverse array of Commissions, made up of city staff and private citizens. Most community engagement goes on in one of the thirty-two commissions in Berkeley. In the case of the RECO-related outreach, a large part of

public involvement came in the form of community workshops held by the Energy Commission (Interview with Billi Romain, 2010).

Marin County

Marin County full involved the public in developing its RECO. Public education workshops were held in communities throughout the county to introduce the public to the concept of the RECO. Technical Advisory and Task Force Meetings, open to the public, followed the workshops. The Technical Advisory Committee has roughly fifty members drawn from the building trades, real estate community, and architectural field; as well as experts in planning, energy consultation, building performance, and building inspection. In order to forestall push-back from the realty industry, special sessions were held with this group in order to incorporate their suggestion into the ordinance. Finally, before the final adoption, public hearings were held in all the jurisdictions adopting the ordinance (Correspondence with Omar Pena, 2010).

San Francisco County

When the City of San Francisco originally enacted its RECO, PG&E was offering rebates that were hefty enough to motivate property owners to perform efficiency upgrades. Additionally, the City was running a program that provided free home energy inspections to residents. RECO compliance was leveraged with the free inspections and the PG&E rebate program. However, PG&E terminated the program in late 1980s (Interview with Cal Broomhead, 2010).

AN ADDITIONAL APPROACH TO IMPROVE ENERGY EFFICIENCY

Cities and counties adopting a RECO should be prepared to make a long-term commitment to the process of market transformation. Depending on what triggers are included in the ordinance design, it may take decades for the housing stock to be transformed. With this in mind, I have examined an additional approach to achieving residential energy efficiency, the voluntary county-wide efficiency retrofit program. The RECO and the voluntary program are not mutually exclusive. No single approach will fully saturate the market with resource efficient housing. It will take a broad spectrum of

programs to achieve the building-related GHG emissions reduction targets set by the state in the AB 32 Scoping Plan.

Voluntary Efficiency Retrofit

The Climate Protection Campaign (CPC) is a non-profit organization that that assists local governments and communities in formulating strategies for reducing GHG emissions. In Sonoma County, CPC authored a campaign to create a Community Climate Protection Plan in 2008. The intent of this plan is to meet the 2005 local government goal to reduce GHG emissions to 25% below 1990 levels by 2015. Towards this end, a voluntary county-wide program was developed to retrofit 80% of the housing stock by 2015. The CPC is working with the Sonoma County Regional Climate Protection Authority, an offshoot of the Transportation Authority, which is made up of elected officials from all the local governments in the county. The process has been vetted by a statewide taskforce that has provided expert information (Interview with Chris Cone, 2010).

The retrofit program proponents recognize the need to transform the local contracting market to reach a capacity sufficient to meet the necessary scale of the program. In order to stimulate the market, funding is being injected into the process. The first round of funding is coming from the EECBG Program and the second round of funding is from the state energy retrofit program. The county governments launched the retrofit campaign in coordination with the PG&E Prescriptive Whole House Retrofit Program (PWHRP) and the Federal Home Star Incentive Program (Interview with Chris Cone, 2010). The county will make two financing streams available to the consumer: the local government retrofit funds and the PG&E PWHRP. Information on available efficiency resources will be disseminated through Flex Your Power (FYP). FYP is a “comprehensive statewide marketing and outreach campaign” that provides information on resources for energy efficiency in California (FYP, 2010). These three resources are meant to be easily accessible and used in conjunction. Currently, the authors of the retrofit program are formulating an easily recognizable logo under which all three

resources can be easily identified and simultaneously accessed by the end-user (Interview with Chris Cone, 2010).

The retrofit program is designed as a two track system. Track 1 consists of a \$1000 rebate for a basic retrofit that would cover duct sealing, insulation upgrades, a combustible equipment safety test and water heater insulation. Track 2 provides a \$3500 rebate for an advanced home performance retrofit that involves analyzing building efficiency and then completing specific performance-based efficiency improvements based on the results of the analysis. The intention of this approach is to improve cost efficiency and energy efficiency as a package. For example, a property owner may not install a new furnace without also properly sealing the air ducts in order to take advantage of the full potential of the high-efficiency HVAC system (Interview with Chris Cone, 2010).

Sonoma County is partnered with all other Bay Area counties, including Alameda County, to receive shares of the \$10.75 million Energy Efficient Conservation Block Grant (EECBG) funds. Both Sonoma and Alameda Counties are ahead of the curve and are promoting public demand, market transformation and workforce development. Both counties are working on different parts of the retrofit project. At a future date, all the counties will come together to share best practices and adopt measures tested by each county. Both Sonoma and Alameda Counties will have rigorous countywide programs to promote retrofitting. Proponents see this program as reaching beyond a simple GHG reduction scheme. It is being promoted as a local economic recovery program because the government has made money available to focus on green job creation and transformation to a green market that will reduce costs for residential energy consumers and increase property values (Interview with Chris Cone, 2010).

Lessons can be drawn from the deliberative and inclusive process that program proponents in Sonoma County underwent to involve stakeholders in the program design. The process was started one year ago with the formation of a committee to explore

options for GHG emissions reductions. The committee held stakeholder meetings with different groups and conducted outreach to community and neighborhood groups.

The timeline of the stakeholder outreach process illustrates a good model that Hayward could potentially utilize. In December 2009, a community event was held for consultants to introduce the program concepts, let people know what was coming, and gauge interest in the proposal. The program design process was begun in January 2010. From February through March the committee held stakeholder meetings with the following groupings of stakeholders: government and workforce, building trades and utilities, NGOs and financiers, realtors and building owners. During the same time period, the committee held forums for efficiency technology vendors and contractors as well as community groups. At the time of my interview with Chris Cone the committee had yet to meet with multifamily rental tenants.

These meetings aren't market research or focus groups; they are specifically concerned with program design. The community is not being told what will be required but is actively participating in decisions. An advisory committee will fine-tune the program over time, as it's rolled out. In the next three to six months the countywide retrofit models will be developed. It is interesting to note that one of the core committee members is a realtor who kept the committee apprised of the issues important to the realtor community, thus avoiding potential contentious confrontations with the North Bay Association Of Realtors® (Interview with Chris Cone, 2010).

The lead agency for the retrofit program in Alameda County is creating retrofit standards for single-family, multifamily, and commercial buildings. They are focusing on designing systems for retrofit tracking, contractor training, contractor qualifications, GHG quantifications, and quality assurance. Detailed market analysis (phone surveys, focus groups, market targeting) and industry stakeholder meetings (with contractors, realtors, non-profit and training organizations) are currently under way. The official consumer launch will not begin until after initial contractor trainings have been held. Plans for single-family residences will be rolled out this summer, with multifamily

housing plans following a few months later. As mentioned in the discussion of the Sonoma County retrofit program, rebates will be bundled for easy access by consumers. All 14 cities in Alameda County have pooled their resources to undertake the countywide retrofit effort. The program is leveraging local funding with state and federal grants (Interview with Karen Kho, 2010).

RECOMMENDATIONS

Building on best practices from other cities' experiences with RECOs I have formulated the following recommendations for the city of Hayward.

Public Engagement

The RECO design process would be most productive if it were the result of robust public participation. Stakeholders should be involved in the design of the ordinance as much as is practical. In order to avoid push-back in the implementation process, a strong effort should be made to engage all the affected stakeholder groups from the beginning. Groups to reach out to include members of the building trades, utility providers, NGOs, financiers, the real estate community, city staff, residential property owners, residential tenants, community groups, and neighborhood associations. The latter two groups can be recruited to facilitate the process of communication between citizens and the City. When engaging these groups in dialogue, avoid jargon and technical language, keeping communications clear and any visual media simple. Identifying the opinion leaders in any group will assist the city in influencing the larger group.

An effective approach could be to first notify the public of plans to develop a RECO through the mass media. This could be followed by conducting a city-wide survey to gauge the level of public knowledge and interest in residential resource conservation and identify perceived barriers to the adoption of efficiency upgrades. Using the survey results, the city could target different segments of the population for participation in stakeholder meetings.

It is important to note that "significant changes in human behavior can be brought about rapidly only if the persons who are expected to change participate in deciding what the change shall be and how it shall be made" (Verba, 1961). For this reason, stakeholder meetings may be most effective if they include a collective visioning component where small groups of diverse citizens develop a shared understanding of what would work best in their community. These work groups can then formulate strategies, comparing ideas with the larger gathering. Finally, getting participants to commit to taking personal

action will help to cement the progress made during the meetings and hopefully spread knowledge of the available innovations to their broader community. This bottom-up approach will foster a sense of ownership of the process, potentially promoting high levels of stakeholder buy-in (Sanoff, 2005).

RECO Design

RECO Triggers

Besides one problematic attempt in the 1980's, the date-certain trigger does not appear to have been attempted in the context of RECO. However, if the relevant parties favorably receive this option, it is an effective way to make sure that the entire housing stock receives efficiency upgrades. Of course, if choosing this option it is of paramount importance to gradually phase in the program so as to allow the market a chance to develop the capacity to adequately meet consumer demand.

While it is unknown what sort of RECO design will be favored by stakeholders, initial reactions from the realtors in the Hayward area indicate that a time-of-sale trigger would meet with political opposition from that group. The City may consider making a special outreach effort to positively engage this community in the design process. It may be possible to persuade this group that they stand to benefit from including this option in the RECO design.

Additional triggers the City could use are the remodel and the addition permit. These are used by most of the cities that have enacted RECOs and appear to be generally accepted, or at least tolerated, by stakeholders. All options should be left on the table in the RECO design process. The more ordinance triggers are in place, the larger the portion of the housing stock positively impacted by the RECO will be.

Comprehensive RECO

The example cases examined in this report point to the use of a comprehensive whole-house measure as an effective design for RECO conservation requirements. Such a design gives property owners the option to perform the improvements that will best fit their situation, thereby increasing the efficiency of the program. This design would entail

developing a building rating system to assess the resource-efficiency or inefficiency of each dwelling, and what improvements should be made to reduce energy and water usage levels. This option also rewards innovation, and can serve to encourage property owners to adopt the most cutting-edge efficiency technologies.

A prescriptive list could still be incorporated into a comprehensive measure, especially when used in conjunction with a home energy efficiency rating system. Rating systems generally supply a checklist of efficiency technologies that can be used to reduce residential resource consumption. However, rather than requiring each building owner to adopt identical efficiency improvements, the requirements are based on the overall efficiency performance of the dwelling. For example, if a comprehensive ordinance included a prescriptive checklist that required the installation of one-gallon-per-flush toilets but a property owner used a waterless composting toilet, the performance based evaluation of the building would recognize the water savings and the building owner would not be compelled to buy the toilet specified by the checklist.

Diffusion of Innovation

Once the ordinance has been passed, an extensive public outreach and education campaign should be undertaken in order to disseminate information about the ordinance as widely as possible. Outreach could include mailers, electronic communication, mass media, public events, and direct face-to-face contact. It should be easy for property owners to access information and resources in a one-stop-shop type of delivery system. A key factor to achieving program success is ensuring that a high proportion of property owners are aware of and understand the benefits of completing building efficiency upgrades. Such actions may increase the pool of likely RECO adopters.

A possible strategy for diffusing the adoption of the RECO measures throughout the population could be to target key decision makers. The City staff could be the first to conduct home performance tests and energy retrofits. This would give them an understanding of what an energy retrofit entails and provide firsthand knowledge of the opportunities and benefits the RECO provides. Once this group has grown comfortable

with the process and come to see it as the norm, they will be well suited to promote the adoption of a RECO and give guidance to others (Interview with Cal Broomhead, 2010).

Other local governments' experiences with RECO point to the need for an efficient computerized database to track ordinance compliance and outcomes. The database could also be used to provide easily accessible online information about RECO status, energy efficiency and locally available efficiency resources to property owners. This would be an effective delivery system for building owners to learn about what they need to do, who can do it for them, and how they may finance their efficiency retrofit.

Implementation

Enforcement is necessary for an effective RECO. The City could require an on-going inspection process for quality assurance, utilizing a home efficiency rating system. Using third-party inspectors and conducting random checks on their work could serve to keep the process honest. Permit fees can help to finance the administrative costs associated with the RECO.

Providing diverse and sustainable sources of funding would go a long way towards achieving high levels of RECO compliance among property owners. The City could apply for energy efficiency and conservation block grant funding from the federal government to help property owners finance RECO compliance projects. It would be judicious to also seek more localized sources of funding from the state, foundations, utilities, banks, and other financial institutions. Providing financing to property owners would help to overcome the barrier to adoption posed by the up-front costs of efficiency improvements. In order for the City to achieve energy efficiency in areas with minimal disposable income, low-income communities would most likely need to have upgrades completed without incurring any cost to themselves.

To be most effective, the City may consider committing to a long-term plan with incremental goals that build upon each other. This would allow time for the market transformation and workforce development necessary to achieve a sustainable change in the housing market. Sharing best practices with other cities will improve the chances for success and help to diffuse innovations throughout the market. While adopting a RECO

is an important step towards improving the energy efficiency of residential buildings, this action alone may not reach all of the existing housing stock. It would benefit the city to work with the county and state on any other residential resource conservation initiatives that are currently underway.

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INTERVIEWS

Cal Broomhead, Energy and Climate Programs Manager, City and County of San Francisco

Chris Cone, Implementation Manager, Climate Protection Campaign

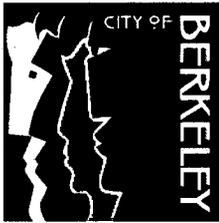
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Berkeley Energy Commission

March 24, 2010

To: Berkeley Energy Commission

From: Neal De Snoo, Secretary

Subject: Amendment to Enhance Residential Energy Conservation Ordinance

INTRODUCTION

The Berkeley Climate Action Plan calls for enhancing the existing Residential Energy Conservation Ordinance (RECO) to achieve deep and sustained energy savings in existing homes. Staff has drafted an amendment to RECO intended to stimulate demand for energy upgrades such as energy audits and retrofits, keep money in the local economy, generate green jobs, and contribute to meeting greenhouse gas (GHG) reductions of 33% by 2020 and 80% by 2050.

This staff report explains the proposed changes for discussion by the Commission. Based on this discussion, staff will draft an amended ordinance and present it at the April 28, 2010 Berkeley Energy Commission meeting for approval and/or modification. The goal is to present the amended ordinance approved by the Energy Commission to the City Council on June 22, 2010 for Council adoption.

SUMMARY

The existing RECO requires that residential buildings being sold or undergoing substantial renovation have 10 basic energy and water conservation measures installed. The amendment being considered would move from a prescriptive list of energy and water saving measures with limited effectiveness to a "performance-based" approach that encourages deeper savings. Building performance is determined by a series of diagnostic tests to building systems -- such as thermal resistance of walls and air leaks in the floor and attic -- to identify customized cost effective energy improvements. Since the costs of energy performance improvement vary highly from home to home, it is difficult to mandate standard improvements. The proposed RECO amendment proposes two pathways to compliance. The first HERS Rating pathway to compliance may be met with a home energy test and improvement recommendation report, as well as a short list of some of the currently-required prescriptive measures and would cost an estimated \$700 to \$1,600. A second pathway would be available for homeowners who want to take advantage of available energy efficiency retrofit incentives. This pathway would require a basic verified performance improvement package that includes air sealing and attic insulation (which are or will soon be available through subsidized weatherization or utility-funded programs) as well as a short list of some of the currently-required prescriptive measures prescriptive list. The cost of this option would be \$4,000 and up, but could be offset considerably by rebates and

subsidies. A list of currently available and upcoming programs providing subsidies and incentives for home energy retrofits is provided in Attachment 1.

The Home Energy Rating and Report, which is part of the lower cost compliance alternative, provides a rating of the home's relative energy efficiency and provides site specific recommendations with cost and payback analysis on how to reduce use. The information encourages homeowners to voluntarily schedule projects in conjunction with other home repair, remodel and maintenance activities when incremental costs can be minimized. The rating corresponds to eligibility requirements for energy performance improvement rebate programs including the City's free low-income weatherization program, the City's upcoming Energy Efficiency Block Grant Funds, PG&E's upcoming whole home performance program, as well as State and Federal incentives and financing programs. These measures not only save energy and lower utility bills, they also improve comfort, durability and indoor air quality by reducing air and moisture infiltration.

In addition to performance testing and rating, or a basic retrofit package, the following prescriptive measures would be required for eligible RECO transactions:

1. Furnace duct repair
2. Toilets, showerheads and aerators
3. Water piping insulation
4. Door weather-stripping
5. Fireplace closures
6. Multi-unit only – High efficiency common area lighting

These low-cost requirements are consistent with the current Energy Code and contribute to performance improvement by reducing wasted energy used for water and space heating.

Additional changes proposed in the amendment include eliminating requirements for insulation in attics because building science has shown that insulation less effective without proper air sealing, eliminating water heater blanket requirements, which are unnecessary on modern water heaters, updating standards for low-flow plumbing devices to be consistent with current building code, and several process improvements to enhance customer service, accountability and the ability to track outcomes. See Attachment 1 for a comparison to the current RECO and the rationale for the proposed changes.

CURRENT SITUATION AND ITS EFFECTS

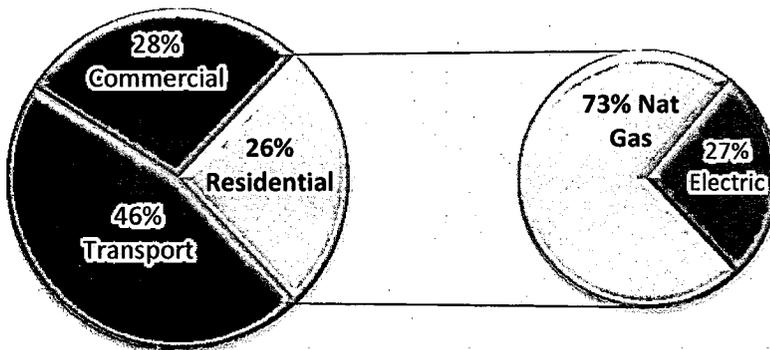
Adopted in 1982, RECO has required approximately 500 to 700 multi and single family buildings sold or renovated each year to install a prescriptive list of water and energy efficiency measures. While some of the measures are no longer consistent with current codes, others are no longer considered appropriate, such as the installation of attic

insulation prior to sealing hidden air leaks. Updates are needed to encourage deeper savings consistent with the scale of effort necessary to achieve the CAP goals. The proposed amendment takes into account our understanding of building science which has vastly improved since RECO was adopted almost 30 years ago and reflects the importance of sequencing measures to maximize effectiveness. The amendment would also provide consistency with other local, State and Federal performance improvement incentive program requirements and position Berkeley property owners to be eligible for rebates and financing opportunities for voluntary performance improvements. By requiring testing to identify the most effective energy-saving strategies and verification of any home performance improvements, home owners are able to verify results and measure expected energy savings.

BACKGROUND

While Berkeley was the first U.S. city to adopt RECO, six cities, including Davis and San Francisco and the State of Nevada, now have residential energy point-of-sale and renovation laws in place. In addition, the City of Boulder and many Bay Area cities have RECO adoption indicated in their climate action plans. Since Berkeley's adoption of RECO, there have been two amendments; the first in 1987 to update the conservation measures and the second in 1991 to expand the requirement to include buildings undergoing renovation in addition to buildings being sold. An estimated 10,000 residential units have been affected by RECO. The ordinance played a role in achieving a 14% reduction in residential natural gas use over the past 10 years. Because energy savings from RECO are not currently measured or verified, it is impossible to know exactly what role RECO is playing to save energy in our community although total residential natural gas consumption in the community has declined since 2000.

Berkeley Greenhouse Gas Emissions from Homes - 73% from Natural Gas



Residential building energy use is responsible for just over a quarter of Berkeley's GHG emissions. Three quarters of those emissions are from natural gas, primarily for space and water heating. Though Berkeley has a mild climate, 90% of Berkeley homes were built prior to the first energy codes in 1978 and waste a tremendous amount of heating energy. According to home performance contractors, many homes could reduce their greenhouse gas emissions by 25% to 45% with investments from \$5,000 to \$10,000. A successful RECO amendment would establish more effective minimum requirements while also providing a roadmap to homeowners who wish to participate in rebate, tax credit and financing programs to voluntarily capture deeper energy savings.

A Technical Advisory Group (TAG) comprised of national energy experts from Lawrence Berkeley National Laboratory, UC Berkeley, the California Energy Commission, energy service providers, PG&E, and home performance specialists, was convened for a series of meetings to discuss what would be the most effective measures and triggers for RECO and appropriate qualifications for service providers. In addition stakeholder meetings were held with realtors, builders, and green jobs specialists to discuss measures, process improvements and workforce development.

Energy standards and services at all levels of government are rapidly changing to reflect the urgency of climate change and our improved understanding of building science. State and regional financing programs (modeled on the BerkeleyFIRST program), as well as forthcoming utility rebate programs will all be based on performance programs that provide diagnostic tests with verified results. These programs entail some combination of insulating and sealing attics, floors, walls and

heating ducts, depending on the home. This approach is favored by energy experts and building scientists because it results in measureable energy reductions and a host of non-energy benefits, including:

- Improved durability of housing stock by reducing opportunities for moisture damage;
- Improved comfort by reducing drafts and balancing temperature; and
- Improved health and indoor air quality by reducing infiltration of dust, moisture and molds.

Overview of RECO Amendment under Consideration:

Consistent with TAG recommendations and current building science, the proposed RECO amendment is designed to result in a home energy rating and verifiable voluntary energy improvements. In shifting strategies from prescriptive to home performance, the amendment has a new requirement for a Home Energy Rating and Audit Report, or equivalent verified improvements. The report, estimated to cost in the range of \$600 to \$1,000 for single family homes (\$100 - \$500 per multi-family unit), helps differentiate the relative energy efficiency among Berkeley homes and provides guidance on cost-effective efficiency measures. A short list of low-cost measures consistent with the current building code and energy performance would also be required. The events that trigger RECO, point of sale and substantial renovation, would remain unchanged. What follows is an overview of the main components of the RECO amendment including the home energy rating, raters, triggers, and process improvements.

1. Home Energy Rating Pathway OR Verified Basic Retrofit Package Pathway

a. Home Energy Rating and Audit Report Compliance Pathway

The California Whole House Energy Rating System (HERS Phase II), approved by the California Energy Commission (CEC) in 2009 was designed to allow comparison of the relative energy efficiency of homes and to guide investment in cost effective home energy measures. The HERS Compliance Pathway for RECO would include a Whole House Home Energy Diagnostic Report (HERS II) and a natural gas appliance combustion safety test. The report includes:

- **Rating Certificate** – HERS scale runs from 250 to 0 (0 = zero energy home)
- **Field Audit with data collection and diagnostics** – using audit protocols approved by the CEC including thermal mass, ventilation and infiltration, duct leakage and natural gas combustion safety
- **Energy consumption analysis** – including greenhouse gas emissions, energy consumption and costs
- **Existing energy efficiency features** – high level summary
- **Recommendations for energy efficiency improvement** – generated by CEC-approved modeling software providing cost effective measures with estimated costs and improvement to HERS score in the following areas:

building envelop, distribution systems and equipment tuning, appliances and lighting and HVAC and water heating

OR

b. Basic Verified Retrofit Package Pathway

A verified basic energy performance improvement verified with a blower door test and duct leakage test, that meets minimum standards for air sealing and attic insulation may also be accepted. This provision would allow income-qualified homeowners to achieve RECO compliance with subsidized weatherization services.

2. Supplemental List of Prescriptive RECO Measures

The Raters will also verify the following prescriptive measures:

- Furnace duct repair
- Toilets, showerheads and aerators
- Water piping insulation
- Door weather-stripping
- Fireplace closures
- Multi-unit only – High Efficiency Common area lighting

3. RECO Raters

In order to stimulate demand and job growth in the energy efficiency sector, the proposed amendment would rely on private sector individuals who have received training and certification as a Whole House Energy Rater (through the CEC HERS II program) to provide the RECO Rating or Basic Retrofit Verification and verification of prescriptive measures. Qualified RECO raters would be required to register with the City and attend a RECO Rater orientation.

Under the CEC's HERS II program there are two types of HERS raters: independent HERS II Raters who do HERS reports only and Building Performance Contractors who are licensed contractors authorized to provide HERS reports as well as make performance improvements and repairs. Building performance contractors are subject to verification and quality assurance protocols stipulated by the CEC. Either of these service providers may register to become RECO Raters.

4. Triggering Events and Scope

RECO alone will not achieve the 80% reduction goal in the residential building sector. It has limited reach and relies on incentive programs to achieve voluntary improvements. It is a critical component of a larger market transformation strategy that includes stimulating demand, leveraging incentives, and developing capacity in the energy efficiency industry. The RECO triggers at time of sale and major renovation are projected to affect approximately 500 housing units per year, or approximately 20% of the single family housing stock over the next 10 years. Programs are being developed at the local, regional, State and Federal level to provide rebates and financing for home performance improvements. Establishing a baseline of a home's

existing energy performance using the HERS II rating is a critical first step in measuring and encouraging targeted improvements. Rebates being offered by the City and PG&E will be contingent on improvements to HERS II scores. Compliance with the proposed RECO amendment will position property owners to take advantage of those and other incentive programs.

Additional triggers were considered by the TAG, such as date certain or time of lease. No changes to the events that trigger RECO are proposed at this time because of difficulties with compliance and enforcement. Point of sale and time of renovation are unique opportunities in which transactions are easily tracked by the City and barriers to entry are reduced.

5. Process Improvements

The amendment will allow for transfer of responsibility from seller to buyer and provide deferrals for hardships or pending construction work. A software tracking system will facilitate measurement and verification of outcomes, as well as give convenient access to the RECO status to improve customer service.

6. Costs

Current compliance costs for a single family home for the existing RECO range from \$170 to \$2,520. Total estimated costs of the proposed RECO revision range from \$800 to \$1,200 for a single family and \$100 to \$500 per unit for a multi-family building, with the unit cost decreasing as the number of units increases.

7. Deferrals

One year deferrals will be available for point of sale triggers to accommodate distressed sellers, bank-owned properties and other situations. An additional one year deferral will be available if remodeling work is planned on the property.

POSSIBLE FUTURE ACTIONS

The proposed timeline is set forth below.

March 2010	Report to Berkeley Energy Commission
April 2010	Ordinance to Berkeley Energy Commission
June 2010	Ordinance Adoption by Council
July - Aug 2010	Rater registration and workshops
July – Dec 2010	Outreach and education
January 2011	Enhanced RECO Required

FISCAL IMPACTS OF POSSIBLE ACTION TAKEN

The RECO program is intended to be fully cost-recovering through fees. There is currently a \$20 filing fee paid by the property owner for RECO. That fee will be set to recover costs of administration of the amended ordinance.

CONTACT PERSON

Billi Romain, Sustainability Coordinator, Planning Department, 981-7432

Attachment 1: Overview RECO Enhancements

Attachment 2: Sample Home Energy Rating Certificate

Attachment 1 RECO Enhancement Summary

Table 1. Summary of Proposed Enhancements

	Current RECO	Enhanced RECO	Rationale
Requirements	Prescriptive list	Home Energy Audit and Rating plus Prescriptive List OR Basic Retrofit Package plus Prescriptive List	Encourage deep emissions reductions Based on building science Verifiable outcomes Consistent standards Eligibility to leverage other resources
Triggering Event	Point of Sale Substantial Remodel	Point of Sale Substantial Remodel	Transactions with notification and reduced barriers to entry
Cost Range	Total \$120-\$2,120 \$0 - \$2,000 Measures \$100 Audit fee \$20 Filing fee	Total \$700-\$1,600 \$0 - \$500 Measures ~\$100 Filing Fee (estimate) \$600-\$1,000 HERS Rating and measure verification	Test provides an asset rating, road map and baseline from which to measure deep energy savings and leverage efficiency incentives
RECO Rater/Auditor	Community Energy Services for sales & City Building Inspector for renovations	Any Certified HERS Whole House Home Energy Rater	Standards consistent with protocols set by California Energy Commission (CEC)
Deferrals	12 months upon buyer acceptance at point of sale	12 months upon buyer acceptance at point of sale and Additional 12 months if repair work is planned	Buyers often do some remodeling work in the first two years. The second deferral would integrate RECO with work that didn't occur within the first year.
RECO REQUIREMENTS			
Home Energy Audit and Rating	Not currently required	<ul style="list-style-type: none"> • HERS Rating Certificate • Field Audit with data collection & diagnostics • Energy consumption analysis • Existing energy efficiency features • Recommendations for improvements • Verification of Prescriptive List 	Performance tests provide asset rating and recommendations for energy improvements. They are required for Berkeley's Rebate Program, PACE financing and utility funded retrofit rebates (#1 thru 4 on the Voluntary Incentive Programs Table).

	Current RECO	Enhanced RECO	Rationale
Optional Basic Retrofit Package (in lieu of Home Energy Audit and Rating)	Not currently required	<ul style="list-style-type: none"> • Air sealing to State and Federal blower door standards • R-38 Attic insulation • Combustion safety test • Verification 	Basic Retrofit verified by blower door test provided by fully subsidized weatherization or utility funded programs (# 5 thru 7 on Voluntary Incentive Programs Table)
Prescriptive list in addition to one of the options above:			
Attic insulation	Insulate to R-30 value or greater	No longer required	Air leaks in attic must be sealed prior to installation in order for insulation to be effective
Water heater blankets	Insulation wrap of R-12 value	No longer required	Not necessary for modern water heaters
Toilets	1.6 gal/flush, or flow reduction devices	1.6 gal/flush or High Efficiency Toilet (HET) 1.3 gal/flush or	Current code is 1.6 gal/flush. EBMUD HET rebates up to \$50
Showerheads	3.0 GMP	2.5 GPM	Current code Free devices from EBMUD
Faucet aerators	2.75 gal/min. flow rate kitchen & bathroom	Kitchen-1.5 gal/min Bathroom-1 gal/min	Current code Free devices from EBMUD
Hot & Cold Water Piping	Insulate the first two feet from the heater to R-3 value	Same	Highly cost effective
Hot Water Piping in Re-circulating Heating Systems	Insulate all exposed pipes to R-3 value	Same	Highly cost effective
Door Weather-stripping	Permanently affix weather-stripping on exterior doors	Permanently affix weather-stripping on all doors leading to unconditioned space	Current code
Furnace duct work	Seal duct joints add insulation to R-3 value	Same	Current code
Fireplace chimneys	Must have dampers, doors or closures	Same	Current code
Common area lighting (multi-unit buildings)	Replace incandescent bulbs with compact fluorescent lamps	Replace incandescent bulbs with high efficiency lighting	Allow for additional high efficiency lighting types

Table 2. Voluntary Incentives Programs Table: Energy Efficiency Audits & Retrofits

Programs	Incentive Estimates	Date Available	Eligibility Standards
1. Berkeley Energy Efficiency Block Grant (Federal Stimulus) Incentives		July 2010	Improvements must be made from a baseline Home Energy Audit and Rating
a. Single Family Rebates	Average rebate \$200 for audit and approx. \$2,000 for retrofit		
b. Multi-family Grant Program	Based on competitive proposals		
2. Property Assessed Clean Energy (PACE) Financing – Managed by Alameda County with Federal Stimulus funds	Property-based loan to qualifying property owners for comprehensive retrofit	Summer 2010	
3. PG&E Comprehensive Retrofit Package Rebate – mandated by the CPUC funded by rate payers	Up to \$3,500 for single family property owners for comprehensive retrofit	Summer 2010	
4. Home Star Program GOLD – Proposed Federal program not yet funded by Congress	Up to \$12,000 for comprehensive retrofits	TBD	
5. Home Star Program SILVER – Proposed Federal program not yet funded by Congress	Up to \$4,000 for Basic Retrofit Package	TBD	
6. PG&E Basic Retrofit Package Rebate – mandated by the CPUC funded by rate payers	Up to \$1,000 for single family property owner for Basic Retrofit verified work	Summer 2010	
7. Income-Qualified Weatherization Assistance Basic Retrofit Program – fully subsidized by State funds and Federal Stimulus	Fully-subsidized Basic Retrofit for low to moderate income qualified residents	Current	
8. Federal Energy Tax Credits	Up to \$1,500 tax credit for materials	Current	Energy Star equipment and materials

OPTIONS FOR HAYWARD'S RESIDENTIAL ENERGY CONSERVATION ORDINANCE

Kali Steele

RECOS SURVEYED

- Berkeley, CA
- Boulder, CO
- Burlington, VT
- Marin County, CA
- Palo Alto, CA
- Rohnert Park, CA
- Roseville, CA
- San Francisco County, CA

BUILDINGS CONTRIBUTE TO CATASTROPHIC GLOBAL CLIMATE CHANGE



Source: San Francisco Homes Market Update 2008

THE RECO CREATES ENVIRONMENTAL AND ECONOMIC BENEFITS



©HomeBuilding, TheFunTimesGuide.com

Source: HomeBuilding



Source: Shidler College of Business

RECO ELEMENTS

- Administration
- Triggers
- Conservation Requirements
- Enforcement
- Incentives

BARRIERS TO ADOPTION

- **Lack of Information or Awareness**
- **High Out-of-Pocket Costs**
- **Inadequate Access to Capital**

RECOMMENDATIONS

- **Multiple RECO Triggers**
- **Comprehensive RECO Design**
- **Apply for Diverse Sources of Funding**
- **Public Engagement**
- **Work with State & County**

City of Hayward RECO Ordinance: Key Research & Development Issues

June 2, 2010

**Prepared for the City of Hayward
Sustainability Committee
by Gabel Associates, LLC**



Today's Meeting

- Consider key issues and choices in developing and implementing a Hayward Residential Energy Conservation Ordinance (RECO)
- Understand the scope of work involved, focus on several of the important topics
- **Goals: Review and discuss –**
 - **Major issues affecting overall structure**
 - **Overall approach or direction the RECO may take**
 - **What kinds of research and analysis may be most useful in supporting the RECO development process**



Initial RECO Questions

- **Trigger Events and Conditions**
- **Prescriptive and/or Performance Requirements**
- **Development Schedule**

Issues for Consideration

- **Cost to Homeowner and Cost-Effectiveness**
- **Context: Federal, State and Utility Programs**
- **Administration**



Policy Context

➤ RECO in Hayward Climate Action Plan

Table 11: Proposed actions for reducing community-wide emissions: listed in order of priority

Action Number	Short Description	Estimated Annual Emissions Reductions (metric tons CO2e)		Priority
		2020	2050	
Action 3.1	develop and implement Residential Energy Conservation Ordinance for single-family homes	639	39,304	11
Action 3.2	develop and implement Residential Energy Conservation Ordinance for multiple-family homes	983	33,033	12

Program Goals

Phase 1 (2012 – 2017) – The goal of the first phase is to reduce electricity use by 1% and reduce natural gas use by 2.5% in participating single-unit homes. The goal is to get 12.5 % of residential units that were constructed before the City’s Green Building Ordinance took effect to participate in the program by the end of the phase. (Page 158)

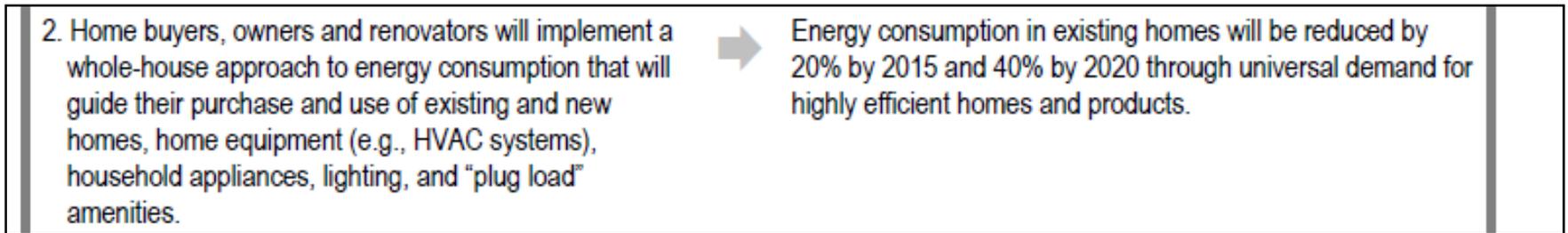


Policy Context

California Energy Commission Goals

➤ California Long Term Energy Strategic Plan

“Goal 2: Transform home improvement markets to apply whole-house energy solutions to existing homes.”



“To achieve both widespread and deep levels of energy efficiency throughout the existing housing stock will require local government leadership. Individual local governments can adopt residential energy conservation ordinances (RECOs) for energy ratings and possible improvements at the time of sale.”



RECO Triggers

➤ Remodels (including Additions)

- Generally defined as total cost of construction (e.g. \$50,000)
- Other conditions could be established
- Clearly defined event: building permit
- Used in most RECOs
- Cost is usually considered reasonable vs. other expenditures



RECO Triggers (continued)

➤ Point of Sale

- Seller completes required measures prior to sale; or
- Buyer completes required measures within “x” months of sale (e.g., 12 months or 24 months)
- Clearly defined event: transfer of ownership
- Used in a few RECOs including the City of Berkeley
- Cost may be considered reasonable vs. other costs associated with the sale and some remodeling by buyer
- Resistance by the real estate industry

➤ Market Penetration

- Berkeley estimates Remodels and Point of Sale triggers combined will reach 20% of single family homes in the next ten years



RECO Triggers (continued)

➤ **Date Certain**

- All dwelling units must have required measures installed by a fixed date (e.g., 2020)
- Much greater RECO impact on existing construction; however,
- No clear administrative or procedural event: City must track down all building owners to inform, monitor and enforce
- No model of it yet implemented in a current RECO
- A large percentage of home owners may delay until the fixed date
- Real estate industry might not oppose this approach

➤ **Market Penetration**

- With possible exemptions and other factors reducing compliance, a Date Certain trigger might achieve a 75% to 85% compliance rate



RECO Triggers

➤ Remodels (including Additions)

- Estimated 200 permits per year over 500 square feet
 - 1,000 units over 5 years

➤ Point of Sale

- Approximately 1,200 home sales per year
 - 6,000 homes over 5 years

➤ Date Certain

- 27,801 single family units
 - 75% compliance would equal 20,850 single family units by end date

2020 Goal from CAP

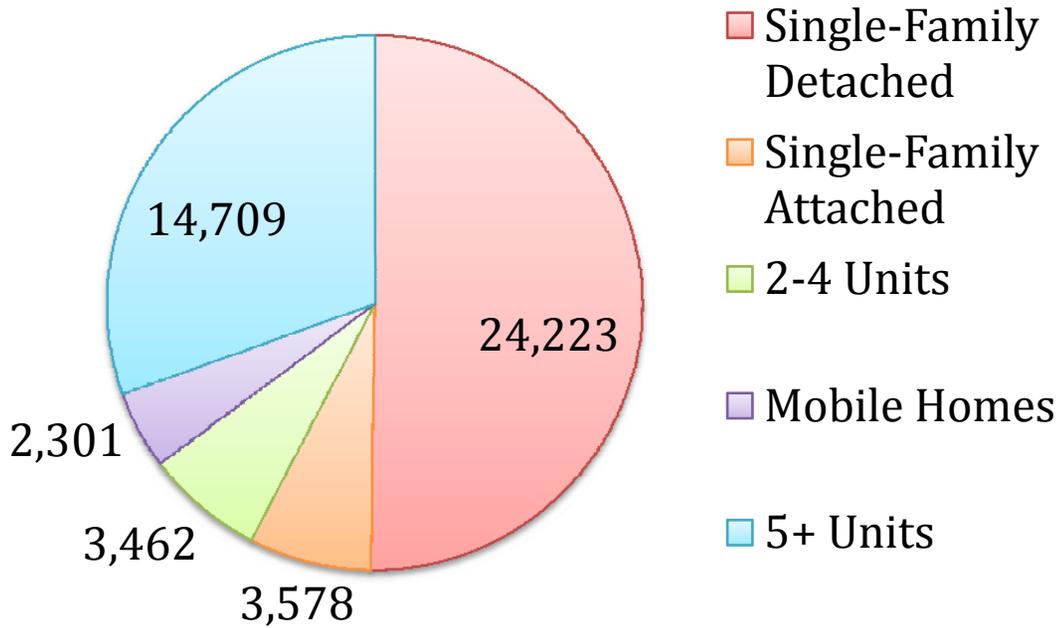
- 12.5% of residential units
- 3,475 single family units



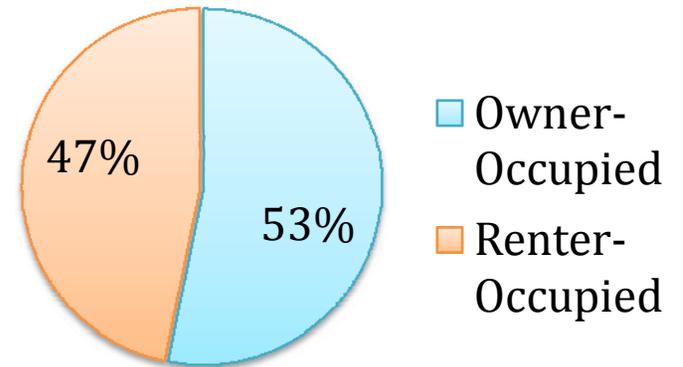
Hayward Housing Data

Total Number of Housing Units 48,273

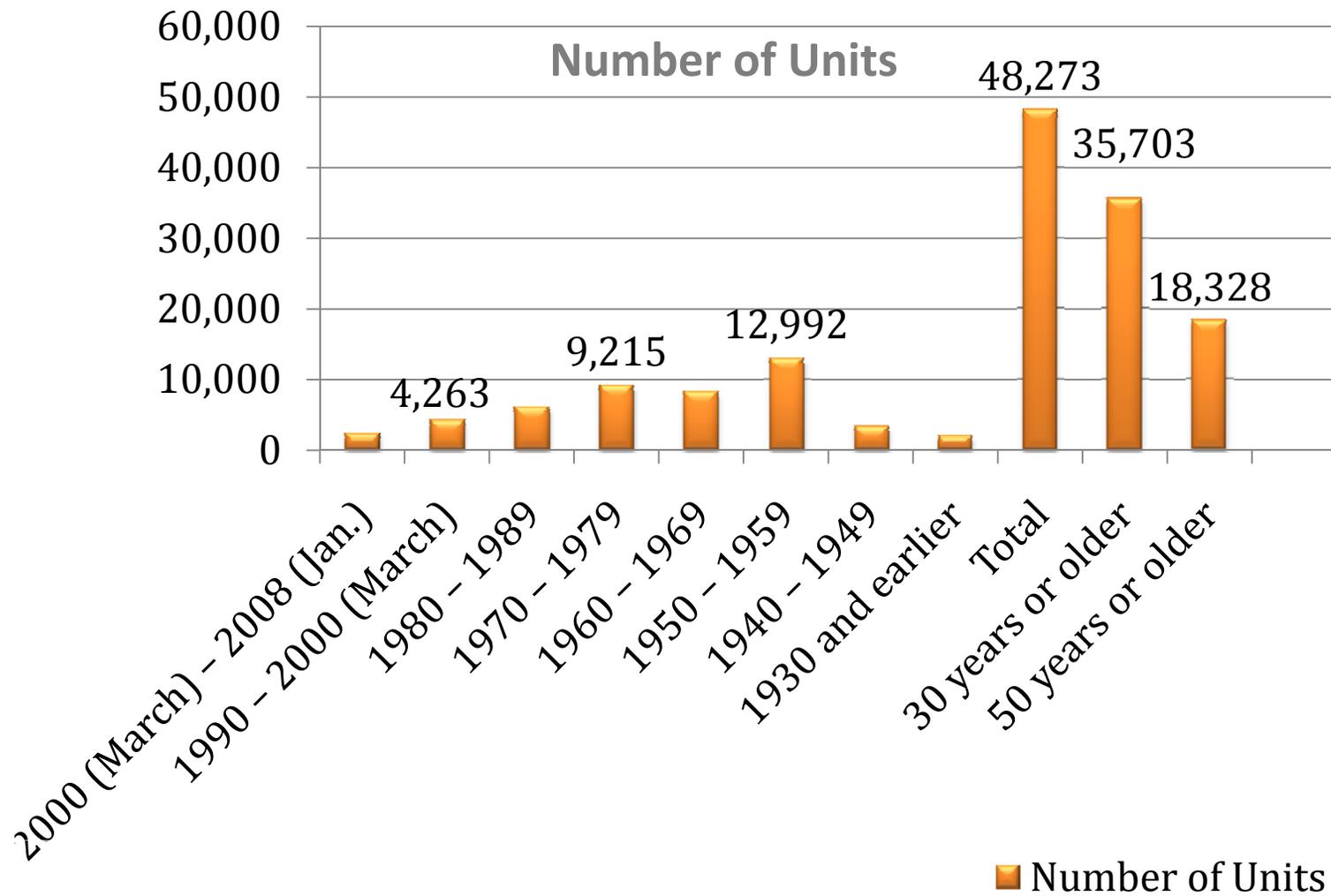
Unit Types



Owner vs. Renter Occupied



Housing Unit Age: City of Hayward



Retrofit Measures: Building Performance Testing

- Building science research has shown that **building performance testing is the key to achieving energy savings** in existing and new buildings

Courtesy of Rick Chitwood , 2010 CABEC Annual Conference --

- Test equipment started becoming available in 1985
- Now we have the ability to evaluate true installed performance of residential energy features
- As each feature is evaluated, large opportunities for improvement are found
- Large energy savings (e.g., up to 50%) are achievable
- Improvements in comfort, indoor air quality (IAQ), durability, moisture infiltration and health & safety



Retrofit Measures: Air Sealing

Courtesy of Rick Chitwood , 2010 CABEC Annual Conference

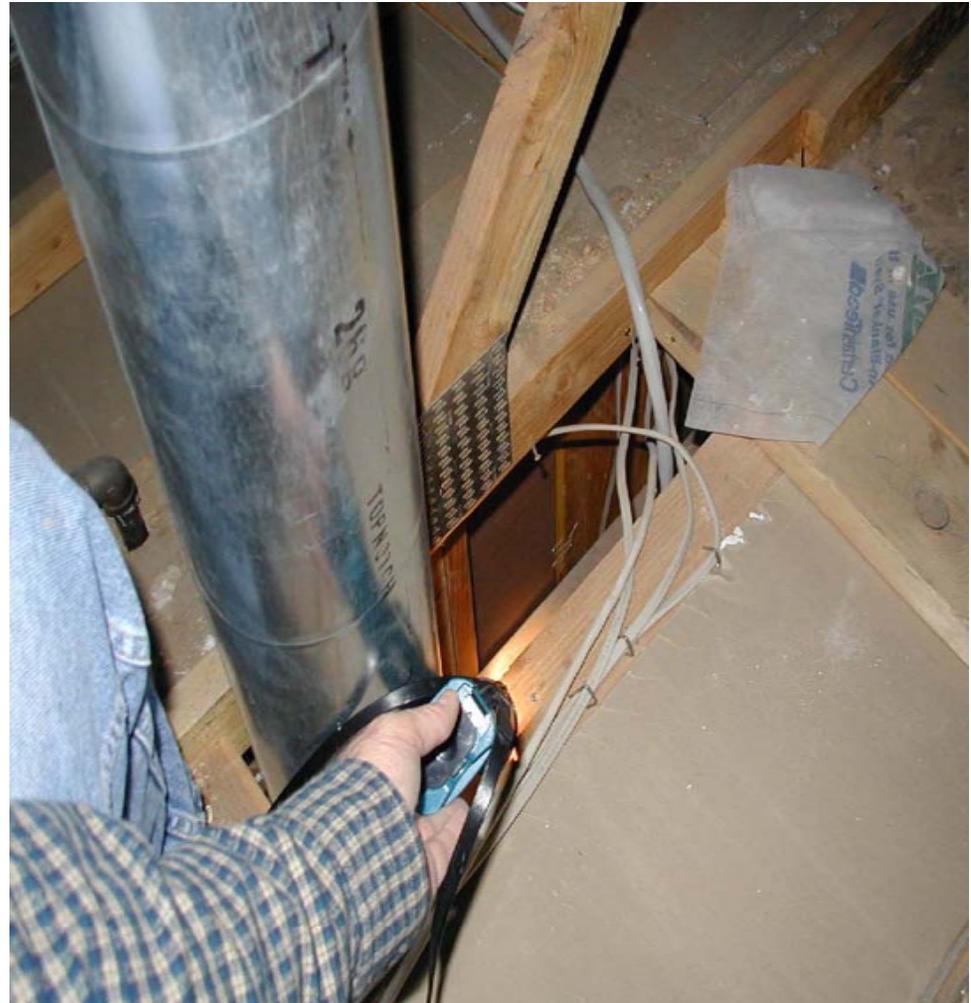
- Continuous and air tight ceiling air barrier
- Insulation in contact with the air barrier
- No gaps or voids; no compression
- Ceiling insulation performance is dependent on a continuous air barrier
- Even 1.5% area thermal bridging can cut R-30 to R-15



Retrofit Measures: Fire Safety

Courtesy of Rick Chitwood , 2010 CABEC Annual Conference

- Fire Safety and Air Infiltration is dependent on an air tight fire stop
- Fire stop also provides a continuous air barrier



Retrofit Measures: Reduced Duct Leakage

From a 2001 paper by John A. Bryant, Ph.D., P.E. from Texas A&M University: First International Conference for Enhanced Building Operations --

In the late 1980s, researchers began to realize that a significant relationship existed between residential air duct systems and energy loss (EPRI, 1996). Previous studies showed that air duct losses on the order of 35% were typical in residential construction (Jump, et.al., 1994). Today, industry experts conclude that air duct leakage in existing homes increases a home's heating and cooling costs by 20 to 30 percent (Home Energy, 1993).



Test Equipment for QA: Installation & Verification

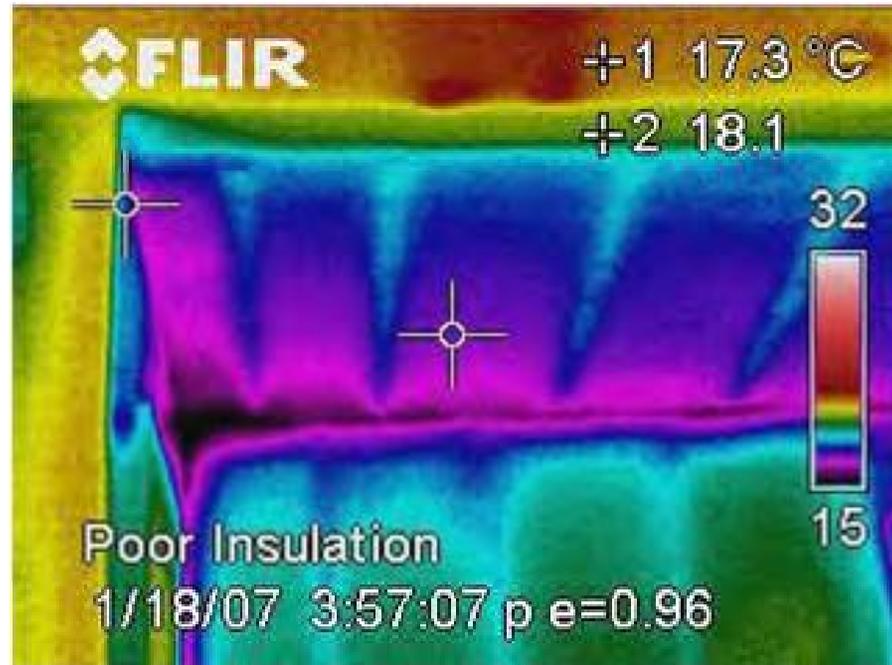
Current field tools for installing contractors, building performance contractors, third party diagnostic testing:

- Blower door testing equipment to find and fix specific leaks; and measure the overall tightness of the whole building envelope



Test Equipment for QA: Installation & Verification

- Infrared cameras used to find thermal bridging from air leakage and/or insulation flaws



Test Equipment for QA: Installation & Verification

- Duct testing equipment to find leaks in the ducts and measure the overall leakage of the system



Prescriptive List of Example Retrofit Measures

➤ *Basic Prescriptive*

- Air sealing
- Attic insulation (quality installation)
- Duct testing and sealing
- Insulation of water heater and pipes
- Combustion safety and CO alarm

Loading order: must do air sealing before insulating

➤ *Other Recommended Measures (optional)*

- Low flow faucet aerators, shower heads, toilets
- New distribution (duct) system
- New heating equipment
- New water heater
- Floor insulation



Performance Options

➤ *California Whole House Energy Rating System (HERS Phase II)*

- HERS II pre-inspection and analysis by a HERS II Rater
- Standard or customized report recommending cost-effective measures to install
- Cost: \$600 to \$1000 estimate for HERS II Rating only
- Improvements and post-inspection verification may show , for example, a 20% increase in energy efficiency (PACE funding)
- Eligibility for utility incentives and state tax credits

➤ *GreenPoint Rated for Existing Homes (GPR-EH)*

- GPR-EH checklist referenced in the current Hayward GBO
- Uses HERS II metrics, pre- and post-alteration inspections
- Cost: \$1500 estimate for pre- and post-alteration audit/testing

➤ *U.S. HOME STAR Program (not yet funded)*

- HOME STAR Gold requirements for federal tax credits
- Building Performance Institute (BPI) accredited contractor



Hayward RECO Development Time Line

- **Talk by Panama Bartholomy, chief aide to California Energy Commission Chair Karen Douglas, 5/8/10**
 - Extreme “market confusion” right now because of so many new programs, administrative rules and technical requirements
 - Recommends that a local government considering a new RECO wait four to six months to make any final decisions
 - Concerned about working out the differences between federal (HOME STAR) and state (HERS II) programs

- **Interview with Rick Chitwood, leading researcher and building performance contractor**
 - Recommends working on key issues, but not deciding final local policies until there is a clearer picture of the new program criteria, rules, QA, availability of certified professionals



Cost to Homeowners

- **Based on list of measures**
 - Low and high end costs for a typical Hayward home
- **Based on additional measures**
 - Low and high end costs for a typical Hayward home
- **Must collect typical cost data from local building performance contractors (and other sources)**
- **Must consider cost of any audits, inspections and registering compliance with the City**



Cost Effectiveness and Additional Value

- **What is the average annual energy savings?**
 - Field data may be limited, especially in Climate Zone 3
 - Case study energy model normalized to RASS data may be helpful even if not definitive

- **Are the measures cost-effective?**
 - During their useful life
 - Using the Property Assessment for Clean Energy (PACE) funding 20-year model

- **Additional Benefits**
 - Improved fire safety & combustion test as part of air sealing
 - Improved indoor air quality
 - Improved occupant comfort in winter and summer
 - External costs of climate change not included
 - Reduction of GHG in support of AB32 goals



Status of Voluntary Programs for Credits/Incentives

(HOME STAR, California HERS II Rating & Utility Programs)

U.S. HOME STAR Program:

➤ **Prescriptive (“Silver Star”) Path**

- Homeowner receives \$1,000 to \$1,500 for each measure installed by a certified installer up to \$3,000 or 50% of total costs

➤ **Performance (“Gold Star”) Path**

- Energy audit before work begins by a certified professional from BPI, RESNET or state-approved other
- Test-out when retrofit is complete
- Homeowner receives \$3,000 for modeled savings $\geq 20\%$; + \$1,000 for each additional 5% savings

➤ **Status: Passed the U.S. Congress, but not funded yet**

- Only a handful of BPI-accredited individuals in the state



Status of Voluntary Programs for Credits/Incentives

California Home Energy Rating System (HERS Phase II) for Existing and New Homes:

➤ Established by Public Resources Code 25942

- Goal: consistent, accurate and uniform rating based on a single statewide rating scale
- Estimates of potential utility bill saving and recommendations on cost-effective measures to improve energy efficiency
- Training and certification procedures for HERS II Raters for quality assurance and consumer protection
- Labeling procedures: 2008 Title 24 home = **100**; existing home > **100** (e.g., 180); Net Zero Energy home = **0**

➤ Status: Training/testing of HERS II Raters getting started

- HERS II software still in beta version
- Program not yet ready for prime time



Status of Voluntary Programs for Credits/Incentives

PG&E Residential Retrofit Incentive Program:

➤ Existing Rebates for individual measures

- \$150 for insulating > 1,000 sf attic
- \$100 for duct sealing
- Other rebates for new HVAC, appliances, etc.
- <http://www.pge.com/myhome/saveenergymoney/rebates/>

➤ Whole House Retrofits

- Up to \$3,500 for single family property owners
- Pending approval by the California Energy Commission



Consistency & Coordination of Voluntary Programs

CA HERCC (California Home Energy Retrofit Coordinating Committee)

- Ad hoc group 90+ energy efficiency & program development/implementation experts from many agencies/groups
- Developing program implementation recommendations, conducting workshops and creating training and educational materials to support the advancement of Home Energy Efficiency Retrofitting of existing homes in California
- April 26, 2010 latest draft of *Recommended Technical Specifications for Proposed Eligible Measures*
- Status: Progress being made on resolving differences or ambiguities in federal, state, utility and Berkeley RECO requirements and installation criteria; but these issues not yet resolved



Proposed Berkeley RECO (Tentative)

- **Major remodels and point-of-sale triggers (unchanged)**
- **Mandatory Measures; and,**
 - Furnace duct repair (duct sealing visually without testing)
 - Toilets, showerheads and aerators
 - Water piping insulation
 - Door weather-stripping
 - Fireplace closures
 - Multi-unit only: high efficiency common area lighting
- **Owner picks one of two compliance paths**
 1. **Home Energy Rating & Audit (HERS II) Report; or,**
 2. **Basic Verified Retrofit Package**



Proposed Berkeley RECO (Tentative)

- **HERS II Rating & Report; or**
 - Rating Certificate
 - Field Audit with data collection and diagnostics
 - Energy consumption analysis
 - Existing energy efficiency features
 - Recommendations for energy efficiency improvement

- **Basic Verified Retrofit Package**
 - Air sealing to State and Federal blower door standards
 - R-38 attic insulation
 - Combustion safety test and CO alarm

- **RECO Raters**
 - HERS II Raters or BPI Certified Installers

- **Estimated Cost**
 - \$800 to \$1,200 single family; \$100 to \$500 multi-family



Administrative Plan

➤ Long Term Staffing

- Detailed plan
- How to cover additional cost
- Department(s) responsible
- Job descriptions

➤ Implementation, outreach and education

- Web site
- Staff to work directly with property owners

➤ Tracking, monitoring compliance, enforcement



Quality Assurance (QA)

➤ **Who is eligible to perform the work?**

- Licensed/certified contractors
- Certified building performance contractors (e.g., BPI certified)

➤ **Who is eligible to inspect the work?**

- Building department inspectors only
- Licensed/certified third party inspectors

➤ **Related questions**

- Will work (measures) completed prior to the effective date of the ordinance be considered acceptable?



Sustainability Committee Monthly Meeting Topics for 2010

Presenting Department	Date	Topics	Climate Action Plan Action Number (priority)
DS	January 6, 2010	Annual Review of Green Building Ordinances and Implementation	Actions 4.1, 4.2, 4.3
DS		Bay Area Climate Collaborative (BACC)	
DS		Summary of Education and Outreach Efforts (Permit Center-Green Display, Website, etc.)	Actions 9.1, 9.2, 9.3
DS Sustainability Coordinator	February 3, 2010	Introduction of Sustainability Coordinator and Initial Discussion on the Residential Energy Conservation Ordinance (RECO) and Commercial Energy Conservation Ordinance (CECO)	Actions 3.1(11), 3.2(12), 3.3(2)
DS		Review of Purpose and Productivity of the Sustainability Committee and 2010 Meeting Topics	
PW	March 3, 2010	Summary of Issues and Regional Efforts Regarding a Ban on Plastic Bags and Styrofoam Containers	Action 6.4(25)
DS	April 7, 2010	South Hayward BART Form-Based Code Parking Strategies Options	Action 1.3(23)
DS		Opposition to State Proposition 16	
DS Sustainability Coordinator	May 5, 2010	Large Energy Users Program	Actions 3.9(1), 5.2(5)
DS		Energy Efficiency and Conservation Strategy (Informational Item Only)	
DS Sustainability Coordinator; Grad Student Kali Steele	June 2, 2010	Update on Development of a Residential Energy Conservation Ordinance (RECO)	Actions 3.1(11), 3.2(12), 3.3(2)
DS Sustainability Coordinator	July 7, 2010	Overview of Community Outreach Plan	Actions 9.2*(10), 9.3*(11)
PW		Draft Ordinance-Ban on Styrofoam Containers	Action 6.4(25)
DS		Update on Formation of the Climate Action Management Team	CAP Implementation
	August 2010	No Meeting - annual recess	
DS Sustainability Coordinator	September 1, 2010	Update on Development of Residential Energy Conservation Ordinance (RECO)	Actions 3.1(11), 3.2(12), 3.3(2)
DS Building Division Staff	October 6, 2010	Update on State Green Building Code and its Impacts on Hayward's Green Building Ordinance, including Solar Requirements	Actions 4.1(9), 4.2(7), 5.3(8)
DS Sustainability Coordinator	November 3, 2010	CaliforniaFirst Pilot Financing Program Implementation and Program Continuation	Actions 3.7(3), 3.8(4), 3.9(1), 5.1(15), 5.2(5),
PW	December 1, 2010	Increase Participation in Food Scraps Collection, Recycling, and Construction and Demolition Debris Programs	Actions 6.1(14), 6.2(13), 6.3(6), 6.6(19)
		Update on Ordinances to Ban Plastic Bags	Action 6.4(25)

*emissions reductions not quantified in the Climate Action Plan