

**RESIDENTIAL NEW CONSTRUCTION  
MARKET EFFECTS STUDY**

**FINAL STUDY PLAN**

**Version 2**

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**February 20, 2008**

## TABLE OF CONTENTS

<b>INTRODUCTION</b> .....	1
<b>PHASE I</b> .....	4
STEP 1: SCOPING STUDY.....	4
STEP 2: ANALYSIS OF MARKET EVOLUTION.....	6
STEP 3: ANALYSIS OF MARKET EFFECTS. PART 1 .....	7
STEP 4: ASSESSMENT OF ATTRIBUTION.....	9
<b>PHASE II</b> .....	10
STEP 1: ANALYSIS OF MARKET EFFECTS, PART 2 .....	10
STEP 2: ATTRIBUTION ANALYSIS .....	11
STEP 3: ESTIMATION OF NET ENERGY AND DEMAND SAVINGS.....	11
STEP 4: ASSESSMENT OF SUSTAINABILITY .....	12
<b>SCHEDULE</b> .....	13

## INTRODUCTION

The purpose of this study plan is to propose a general approach for a study of the market effects of California's energy efficiency programs on building new single-family homes. The CPUC's Market Effects Evaluation Protocol presents a working definition of market effects as "A change in the structure of a market or the behavior of participants in a market that is reflective of an increase in the adoption of energy-efficient products, services, or practices and is causally related to market intervention(s)."

This study is envisioned as:

- Having the following objectives:
  - Understanding the market effects of California's utility energy efficiency programs on on construction practices for new single-family homes.
  - Quantifying the energy savings caused by the above market effects occurring in the years 2006-2008, with special attention to non-participant spillover.<sup>1</sup>
  - Supporting the CPUC's strategic planning efforts by clarifying whether energy savings from non-participant spillover can be quantified with sufficient reliability to be treated as a resource and, potentially, afforded shareholder incentive treatment.
- Being performed in a manner that is consistent with the CPUC protocols for market effects evaluations.
- Being performed primarily as an addition to the scope of work for the New Construction/Codes & Standards (NC/CS) M&V team. The main reason for this approach is that there are extensive synergies between the work already proposed to be performed by that team and the work needed for the current study.<sup>2</sup> However, we envision the planning, analysis, and reporting for the two projects being kept separate.
- Being performed on a timeline that roughly coincides with that for the M&V study for New Construction/Codes & Standards because of the overlaps between the two studies and the administrative arrangement described above. However, due to the CPUC's need for timely results to inform its strategic planning efforts, we

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<sup>1</sup> In CPUC Decision 07-10-032 (Oct. 18, 2007), the CPUC directed its staff and consultants to examine non-participant spillover, while the CPUC's EM&V contractors were directed to evaluate participant spillover. In this decision, the savings from program participants who undertake energy efficiency improvements beyond the scope of the utility's program are defined as participant spillover. In contrast, the savings from those not directly participating in a utility program who reduce their energy use after being influenced by a utility program are defined as non-participant spillover.

<sup>2</sup> There may be some relevant work being performed by the Marketing and Outreach evaluation team, but it is not yet clear whether the work for this study would require an expansion to the current scope of work for the M&O evaluation as represented in the draft evaluation plan.

recommend that a final report be provided no later than the Summer of 2009, ahead of the February 2010 date envisioned for the final report on the New Construction/Codes & Standards M&V study. We also recommend that an interim report be provided in the late summer or early fall of 2008.

This plan has been reviewed by, and reflects input from, the CPUC staff and the Master Evaluation Contractor Team (MECT). However, the methodological approaches discussed in the plan should be viewed as tentative, pending discussions between the CIEE Market Effects team, the MECT, and the NC/CS M&V team.<sup>3</sup> The intent is to forge a general consensus on what should be studied and how, so that more detailed planning for the study can commence.

The remainder of this plan is organized into sections corresponding to the key steps in a market effects study. These steps are: (1) scoping study; (2) analysis of market evolution; (3) analysis of market effects; (4) assessment of attribution; (5) estimation of net energy and demand savings; and (6) assessment of sustainability.<sup>4</sup>

We envision the study being performed in two phases, as outlined in Table 1, below.

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<sup>3</sup> In fact, this study plan is a revised version of the original study plan that was discussed in a conference call with the CIEE Market Effects team, the CPUC, the MECT, and the NC/CS M&V team on February 19, 2008.

<sup>4</sup> While these steps may end up corresponding fairly closely to tasks, we intentionally use the broader term “step” to reflect the fact that the purpose of this plan is to move toward consensus on a general approach to the study rather than to provide a detailed scope of work.

**Table 1. Summary of Proposed Residential New Construction Market Effects Study**

<b>Phase</b>	<b>Step</b>	<b>Research Activities</b>
<b>I</b>	<b>1. Scoping Study</b>	<ul style="list-style-type: none"> <li>• Characterize residential new construction (RNC) market using existing data sources</li> <li>• Review RNC market effects studies from other states</li> <li>• Develop integrated market and program theories for California</li> <li>• Refine study approach and detail market indicators to be studied</li> </ul>
<b>I</b>	<b>2. Analysis of Market Evolution</b>	<ul style="list-style-type: none"> <li>• Reconstruct historical trends concerning energy efficiency in the RNC market in California (time frame TBD).               <ul style="list-style-type: none"> <li>o Identify trends among non-participating builders/homes</li> </ul> </li> </ul>
<b>I</b>	<b>3. Analysis of Market Effects, Part I</b>	<ul style="list-style-type: none"> <li>• Analyze cumulative impact of utility programs on codes and standards.               <ul style="list-style-type: none"> <li>o Interview builders and other actors in the homebuilding industry.</li> </ul> </li> <li>• Estimate non-participant spillover for years 2006-2008, and earlier years if possible.               <ul style="list-style-type: none"> <li>o Interview larger set of non-participating builders.</li> <li>o Match interview results with onsite data if possible.</li> </ul> </li> </ul>
<b>I</b>	<b>4. Attribution Analysis</b>	<ul style="list-style-type: none"> <li>• Sift through the evidence collected to make a case regarding the role of utility RNC programs in causing the observed market effects.</li> </ul>
<b>II</b>	<b>1. Analysis of Market Effects, Part II</b>	<ul style="list-style-type: none"> <li>• Develop a hypothetical baseline of RNC efficiency trends in California<sup>5</sup> <ul style="list-style-type: none"> <li>o Utilize onsite data from inspection of homes</li> <li>o Interview non-participating builders and other actors in the homebuilding industry.</li> </ul> </li> <li>• Estimate market effects by comparing actual (from Phase I) and baseline RNC practices.</li> </ul>
<b>II</b>	<b>2. Attribution Analysis</b>	<ul style="list-style-type: none"> <li>• Sift through the evidence collected to make a case regarding the role of utility RNC programs in causing the observed market effects.</li> </ul>
<b>II</b>	<b>3. Estimation of Net Energy and Demand Savings</b>	<ul style="list-style-type: none"> <li>• Convert market effects to estimated energy and demand savings.               <ul style="list-style-type: none"> <li>o Systematically analyze the uncertainty surrounding the results.</li> </ul> </li> </ul> <p>Develop recommendations regarding treatment of any RNC market effects savings in next program cycle.</p>
<b>II</b>	<b>4. Sustainability Assessment</b>	<ul style="list-style-type: none"> <li>• Assess the extent to which any observed market effects are likely to persist in the absence or reduction of public intervention.</li> </ul>

<sup>5</sup> As discussed later in this plan, “baseline” refers to a hypothetical projection of sales patterns of energy-efficient residential new homes in the complete historical absence of publicly funded energy efficiency programs targeting residential new construction (but including building codes)

## PHASE I

### STEP 1: SCOPING STUDY

California's protocols for market effects evaluations emphasize the importance of performing a scoping study before actually embarking on a market effects study. In the words of the protocols:

The appropriate approach for a market effects study cannot be readily determined without a scoping study to define the market to be studied, develop a market theory to test in the analysis, assess data availability for the market effects study, specify a model of market change, develop a methodology for data collection and recommend an analysis approach. (p. 149.)

A later passage in the market effects protocol succinctly summarizes the required components of a scoping study when performed at an enhanced level of rigor, as follows:

Define the market by its location, the utilities involved, the equipment, behaviors, sector and the program years of interest. Develop market theory and logic model. Detail indicators. Identify available secondary data and primary data that can be used to track changes in indicators. Outline data collection data collection approach. Recommend hypotheses to test in the market effects study. Recommend the analysis approach most likely to be effective. (p. 150.)

Consistent with the protocols, the first step in this market effects study will be a scoping study, to include all of the components summarized above. The current document is itself the first step of the scoping study, but represents only the beginning of the process. While methodological approaches are discussed in this study plan, these should be viewed as tentative, pending the results of the full scoping study and an associated public workshop.

The remainder of this section highlights some of the components of the scoping study that we believe will be most important.<sup>6</sup>

#### A. Relevant Programs

The market effects protocols specify that market effects studies should be performed at the market level, focusing on the effects of groups of programs in the market over multiple program cycles (p. 143). Utilities in CA have conducted programs to promote energy efficiency in new residential housing for many years. For the 2006-08 program cycle, the New Construction and Codes and Standards evaluation will consider 21 utility

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<sup>6</sup> Our intent is to highlight and resolve some key conceptual issues, and not to propose a detailed plan for the scoping study. As such, not all important components of the scoping study are reviewed here. For example, while the following issues are not discussed further here, the scoping study will need to include interviews with industry experts, program staff and other key informants, and will need to clarify what data will need to be requested from the utilities and other program administrators.

energy efficiency programs focused on new construction or supporting the California State Codes and Standards activities. Each of the four investor-owned utilities (IOUs) operates similar residential new construction (RNC) programs, and each supports a coordinated Codes and Standards effort. However, changes in the RNC programs are worth noting. In 2004, all four of the state's IOUs implemented programs to promote building of ENERGY STAR new homes, which in California must be at least 15% more energy efficient than the energy code under which they were permitted. These programs used a performance-based approach to qualification. In contrast, the 2006-08 residential new construction programs provide support to encourage high-performance building design that exceeds the 2005 Title 24 Standards in overall performance design by 15% or more, while also aiming to increase the adoption and installation of individual high efficiency measures, such as efficient heating, cooling, lighting, and appliances in residential new construction. Although the four IOUs are all offering RNC energy-efficiency incentives, the scope and focus of the programs vary among the IOUs. While all of the programs include a performance-based goal and incentive, the number and type of prescriptive measure rebated by each IOU vary.

Although the utility programs target both single-family and multi-family dwelling units, we envision that the focus of this market effects study is the single-family home market. Compared to the multi-family market, the single-family market is larger, accounts for more energy use, and has more potential for energy savings. In addition, the data needed to conduct a market effects study are more readily available. Nonetheless, to the extent possible, this study should conduct some exploratory investigation of possible market effects in the multi-family home market.

The market effects study should also take into consideration how other programs (e.g., those offered by municipal utilities, marketing and outreach) may have affected building practices for new homes.

## **B. Development of Market and Program Theories**

Another key component of the scoping study is the development of market and program theories for RNC. In the words of the protocols:

The assessment, refinement, and/or development of a market theory with logic models are key activities of the scoping study. The *2001 Framework Study* and the *Evaluation Framework* both address the value and process of developing a program or market theory. The evaluation contractor will need to articulate a market theory in order to proceed with baseline measurement for market effects evaluation. At a minimum, this market theory shall describe how the market operates and articulate market assumptions and associated research questions. This must be done at a level of detail sufficient to develop data collection instruments for baseline measurement. If the assessment includes programs that are designed specifically to change the way a market operates, the program theory should also be consistent with and embedded in the theory of how the market operates. (p. 150.)

A later passage details what should be included in a market theory and logic model:

Articulate market theory and, if reasonable, develop graphical model of market theory. Market theory should include market operations and conditions, and changes occurring in the market... Develop multiple program theory and logic models for those programs intervening in the market. Integrate the market theory and program theory/logic models to examine external and programmatic influences, assumptions about changes in the market and associated research questions. Theories and logic models should be generated through interviews or workshops with program staff from each of the programs and a sample of a wide variety of market actors. Use a literature review and other studies of these markets and iteration with program staff to ensure thoroughness in measuring the critical parameters for both market development from external influences and market effects. (p. 151.)

The protocols appear to require the development of detailed *program* theories only when the programs involved have been designed specifically to change the way a market operates. We have two reasons for believing that the development of a detailed program theory laying out how the programs might be influencing the RNC market is a critical component of the current study. First, we believe many of the market actors in California who are responsible for designing and fielding these programs view them as being focused as much on market transformation as on resource acquisition, suggesting that it is important to elucidate the manner in which these participants in the process anticipate that the programs will generate market effects. Second, there are very similar programs across the nation that are viewed formally as market transformation initiatives, and there is a body of evaluation evidence that these programs have had market effects.

### **C. Literature Review**

A third component of the scoping study will be a review of the existing literature on market effects from RNC programs, with an eye toward lessons learned and methods that are worth replicating. Core to this review, to the extent they can be obtained, will be RNC market effects studies that have been performed in recent years in Massachusetts, New York, Vermont, Wisconsin, Long Island.<sup>7</sup>

## **STEP 2: ANALYSIS OF MARKET EVOLUTION**

Because market effects generally occur slowly over time, understanding the long-term evolution of the market is critical to any market effects evaluation. Ideally, this is achieved through ongoing evaluation efforts over the course of many years. However, in the current study we are making a one-shot effort to develop our best understanding of the market effects of California's RNC programs. An important part of this effort will be attempting to reconstruct historic trends in actual RNC efficiency practices in California. However, trends in other key variables such as builder awareness and attitudes and costs of efficiency measures are also of interest.

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<sup>7</sup> Note that a broader review of the literature on market effects from energy efficiency programs is already planned as a separate CIEE project, so that effort is not repeated here.

An issue to be considered is whether RNC practices should be characterized at the level of whole-house compliance with the code, or whether installation of specific prescriptive measures should also be included. With respect to whole-house compliance, a complicating factor is that the requirements of the Title 24 code have changed (most recently in 2005), so it will be necessary to account for this in constructing a consistent portrait of market.

It will be useful to explicitly identify trends for non-participant builders and/or homes.

For developing a picture of past trends in actual building practice, the past RNC baseline studies, as well as the baseline assessment planned for the 2006-08 program evaluation, are a key source of data. Other data sources that may prove useful include data on numbers of Energy Star qualifying homes, DEER, and past evaluations of RNC programs in California.

### **STEP 3: ANALYSIS OF MARKET EFFECTS. PART 1**

We envision two broad approaches to analyzing the market effects of California's RNC programs. Phase I would focus on (1) determining the extent of spillover among non-participant builders, and (2) analyzing the cumulative impact of utility programs on codes and standards.

Phase II (described below) may conduct a comparison of what has actually happened in California with a hypothetical baseline that estimates what would have happened without the efficiency programs (but with the building codes and any other non-utility interventions).<sup>8</sup> The difference would represent the total market effects of the programs.

A considerable amount of the data needed to support the analysis of market effects and spillover is already being collected as part of the NC/C&S M&V plan. However, because the M&V plan is focused on measuring direct program impacts and participant spillover, the data collection efforts described in the M&V plan will need to be expanded and, in some cases, supplemented with separate data sources.

The M&V plan (section 7.2.6) describes how participant spillover will be analyzed, and also briefly discusses non-participant spillover. It says:

Non-participant Spillover are the measures purchased and installed or advance

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<sup>8</sup> Note that the term "baseline" in the baseline studies refers to actual building practices, whereas "baseline" in the context of market effects analysis typically refers to a hypothetical estimate of how the market would have evolved in the absence of the programs under consideration. In this case, the hypothetical baseline would include Title 24 building codes, but not the various utility programs that impact new home construction. Despite alternative uses of the term, we use the term "baseline" for the no-program scenario because we believe this has become a convention in the field of market effects research.

practices used by true non-participant builders<sup>9</sup> that were inspired to purchase the energy efficient measures or use advanced practices because of program advertising or because more efficient measures are available in the market due to program actions. It also includes those measures and practices employed by possible partial-participant builders<sup>10</sup> that were not motivated by their involvement in the program on other projects, but were motivated by the advertising or market effects of the program. These market effects include the combined forces of competition with other builders, demand in the market, indirect education on the benefits and costs and on efficient design practices, and increased availability (and potentially improved “price points”) for energy efficient equipment in the marketplace.

It also says, “To the extent possible, we will also help the Market Effects group to identify true non-participant builders through our work with non-participant buildings as part of the Residential Baseline research.”

For the purposes of the market effects study, it will be necessary to give more attention to the non-participant homes and builders. The M&V plan envisions interviews with various types of participant builders that will include spillover questions. Similar interviews can be conducted for non-participant builders, and their reporting of effects from utility programs can be compared to the actual building practices for their homes in the on-site survey. It may be helpful to distinguish between current non-participant builders who previously participated in the program and those who have not, since spillover is more likely for builders who previously participated. To deal with the limitations of the self-reporting method, care will need to be given to the framing of questions.

The interviews may not reveal non-participant spillover effects that the builders are not fully aware of. To better evaluate these other factors (such as those mentioned in the above paragraph on Non-participant Spillover), it may be helpful to supplement the analysis of self-reported information with interviews with other actors in the homebuilding industry who may have relevant insights (e.g., building department officials, Title 24 consultants, and building product suppliers), onsite inspection of homes, and analysis of construction industry trends.<sup>11</sup>

Thought will need to be given about how the Statewide Marketing & Outreach (M&O) – the statewide umbrella marketing campaigns that support California’s 2006-2008 energy

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<sup>9</sup> The M&V plan defines True Non-participant Builders as builders who have built residential structures in California between 2006 and 2008 and have received no incentives under any Residential New Construction programs.

<sup>10</sup> The M&V plan defines Possible Partial-Participant Builders as builders who have been or will be paid an incentive for the completion of residential buildings between 2006 and 2008, but have managed and constructed other residential buildings during 2006-2008 that were not participant structures out of a different office as their participant structures.

<sup>11</sup> One issue will be about the extent to which high-efficiency water heaters and furnaces are spillover from the program or simply market changes that belong in the baseline.

efficiency programs – may affect practices of non-participating builders. These campaigns may increase awareness of and interest in energy efficiency practices among prospective homebuyers, which could in turn affect building practices, without builders being aware of that effect. This study should coordinate with the M&O evaluation to consider how best to account for impacts of this nature.

New codes and standards institutionalize program-induced gains in energy efficiency. The residential new construction program may be only minimally responsible for a given change, or may have had a significant influence on the codes and standards that were adopted. As part of Step 3, the cumulative impact of utility residential new construction programs on codes and standards will be analyzed. Prior to conducting this analysis, two documents need to be reviewed for guidance and to minimize duplicative efforts: (1) the CPUC’s Codes and Standards and Compliance Enhancement Evaluation Protocol and (2) the Codes and Standards Program evaluation plan<sup>12</sup>.

#### **STEP 4: ASSESSMENT OF ATTRIBUTION**

This step will involve sifting through all the evidence developed in Step 3 to make a case regarding the nature of the market effects that occurred in the years 2006-2008.

Conclusions regarding attribution of the effects to utility programs should be based on:

- Whether comparisons between estimates of actual and hypothetical baseline RNC practices show significant differences.
- Whether supply-side informants attribute market effects to the programs, and if so, what kind of effects and which programs.

Above all, conclusions regarding the extent of the market effects that can be attributed to California’s RNC programs will be based on the extent to which the above findings are consistent with one another and with the program theory developed. At the end of the day, attribution in this study will be based on a preponderance of evidence approach, under which the researcher attempts to construct an argument as to just what has transpired based on the convergence of evidence from a wide range of sources, and the consistency of this evidence with the program theory.

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<sup>12</sup> It is our understanding that the evaluation of the Codes and Standards Program will not be evaluating the impact of the residential new construction programs on codes and standards, but there may be evaluation activities that could complement this type of evaluation.

## PHASE II

### STEP 1: ANALYSIS OF MARKET EFFECTS, PART 2

#### Comparison of Actual and Hypothetical Baseline RNC Practices in California

Phase I would provide a portrait of the evolution of actual RNC practices in California. More challenging is constructing a hypothetical baseline.<sup>13</sup> This section describes possible approaches, but we welcome other ideas that may be viable.

The approach used in some studies of market effects — using the market in a comparable state that has not had significant efficiency programs as a proxy for a hypothetical baseline for California — is not viable in the case of RNC. Differences in the content and evolution of building codes between states, as well as climatic differences that affect building practices, make it difficult to conduct an accurate comparison.

In developing a hypothetical baseline of building practices, data on non-participant homes in the M&V baseline assessments may come close to a representation of what would be happening in California in the absence of utility RNC programs. However, the hypothesis to be examined in this ME study is that non-participant builders and homes have been affected by the RNC programs. To the extent that such non-participant spillover is found to exist, the data on non-participant builders and homes would not be an accurate representation of baseline practices (as the term is used in this study).

One possible way of dealing with this issue would be to create a sub-sample of non-participant builders and homes in regions of California where the RNC programs have not operated. The likely difficulty of this approach is that the programs have operated in the areas where most of the homebuilding is taking place, so practices in regions where the RNC programs have not operated may not be representative of what would be happening statewide in California in the absence of RNC programs.

Another approach could involve identifying a sub-sample of non-participant builders and homes for which there is a high degree of certainty that there was no effect from the utility programs. This might be established on the basis of interviews with the builders and other actors. One would then have to see if this sub-sample seems to be representative of building practices in different geographic areas.

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<sup>13</sup> Note that the term “baseline” in the baseline studies refers to actual building practices, whereas “baseline” in the context of market effects analysis typically refers to a hypothetical estimate of how the market would have evolved in the absence of the programs under consideration. In this case, the hypothetical baseline would include Title 24 building codes, but not the various utility programs that impact new home construction. Despite alternative uses of the term, we use the term “baseline” for the no-program scenario because we believe this has become a convention in the field of market effects research.

## **STEP 2: ATTRIBUTION ANALYSIS**

This step will involve sifting through the evidence developed in Step 1 to make a case regarding the causes of the market effects identified. Conclusions regarding the extent of the market effects that can be attributed to California's RNC programs will be based on the extent to which the findings are consistent with one another and with the program theory developed. At the end of the day, attribution in this study will be based on a preponderance of evidence approach, under which the researcher attempts to construct an argument as to just what has transpired based on the convergence of evidence from a wide range of sources, and the consistency of this evidence with the program theory.

## **STEP 3: ESTIMATION OF NET ENERGY AND DEMAND SAVINGS**

In this task, the market effects identified in Steps 3 and 4 will be converted into a stream of estimated energy (kWh and therms) and demand (kW) savings.<sup>14</sup> In the case of RNC, this will require careful application of energy savings data developed in the M&V evaluations, especially from the on-site data collection. For example, Steps 3 and 4 may identify market effects in terms of numbers of homes built to various percentages above the code. These percentages would need to be quantified in terms of energy and demand savings.

As discussed at the beginning of this plan, a key purpose of this study is to help establish whether savings from market effects can be quantified with sufficient reliability to be treated as a resource by the CPUC. Given this objective, a key component of this task will be an effort to understand and manage the uncertainty surrounding estimates of savings from market effects. Specifically, the uncertainty surrounding final estimates of savings from market effects should be systematically analyzed, using either Monte Carlo simulations or other appropriate methods.

Based on the results of the study, recommendations will be made regarding whether and how savings credit for RNC non-participant spillover might reliably be established in the next program cycle. For example, one approach that has been used in other jurisdictions is to develop a range for estimated savings from market effects and, in order to be conservative, credit program administrators with the bottom of the range. However, other approaches are also possible.

Finally, as part of this task, the effects of any savings from non-participant spillover documented by this evaluation on the cost-effectiveness of California's RNC programs should be analyzed.

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<sup>14</sup> If Steps 3 and 4 indicate that there are negligible market effects outside of direct program impacts and participant spillover, Step 5 may not be needed.

#### STEP 4: ASSESSMENT OF SUSTAINABILITY

Sustainability refers to the extent to which the observed market effects can be expected to last into the future. Thus defined, it would appear that analyzing the sustainability of any RNC market effects documented by this study is not necessarily essential to support either of the two primary objectives of the study, estimating savings from market effects for the years 2006-2008, and clarifying the extent to which savings from market effects can be quantified with sufficient reliability to be viewed as a resource. It is not needed to support the first of these objectives because we do not need to know about future savings in order to estimate savings for the years 2006-2008. It is not needed to support the second of the objectives because our understanding is that the CPUC's primary focus is on understanding current rather than future savings.

Nonetheless, we recommend that an assessment of the sustainability of market effects be included in this study. Gaining an understanding of the sustainability of any observed market effects could be very helpful in shaping the direction of future programming efforts in this market.

If a sustainability analysis is included, we recommend that a primary focus be, in the words of the Protocols:

Identifying changes in market structure and operations, and how the changed market contains mechanisms to sustain them. This could include examining profitability analyses for important support businesses or business operations and how these are maintained without continued program intervention.

Recent market effects evaluation work in Massachusetts provides a potential model for applying the general approach described above to the RNC market. The Massachusetts work draws on a 2000 paper by David Hewitt<sup>15</sup> that proposed answering the following questions in order to help assess the extent to which a market has been transformed:

- Is someone making money by offering it?
- Has a private market developed to continue the facilitation?
- Has the profession or trade adopted it as a standard practice?
- Would it be difficult or costly to revert to earlier equipment or practices?
- Are end-users requesting or demanding it?
- Have the risks to private market actors been reduced or removed?

The Massachusetts evaluation work brings to bear a wide range of data sources deployed for other purposes to answer the above questions. Implementing this approach in the current study would thus impose few incremental data collection costs.

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<sup>15</sup> Hewitt, D.C. 2000. "The Elements of Sustainability." In *Efficiency & Sustainability, Proceedings of the 2000 Summer Study on Energy Efficiency in Buildings*. Washington DC: American Council for an Energy-Efficient Economy. pp. 6.179-6.190.

## **SCHEDULE**

The development of a detailed schedule for this study must await the completion of the scoping study. In general, however, because of the extensive overlaps with the NC/CS M&V study, we envision the two studies being performed on roughly parallel tracks. At the same time, our understanding is that the CPUC would like to have results from the market effects studies as soon as possible in order to inform its strategic planning efforts in a timely manner, and a final report for the NC/CS study is not scheduled until February, 2010.

It appears that most of the individual data collection tasks that the market effects study is intended to draw on would be completed by Spring 2009, suggesting that it may be possible to have a final report on the market effects study by Summer 2009. We recommend that the possibility of accelerating the final report from this schedule be explored once the study scope is established in more detail.

Given the CPUC's need for timely results, we propose that the Phase I report be provided, perhaps in the late summer or early fall of 2008. The Phase I report would incorporate all results to date, and include initial technical and policy recommendations to the extent possible. The schedule for the Phase II report would be determined after the completion of the Phase I report.