

## **ENERGY STAR Homes Program – Participating Builder Survey**

The purpose of the Participating Builder Survey was to gather information from builders who were enrolled in the NYSERDA ENERGY STAR Homes Program (ESH) and built homes during 2006 and 2007. The survey was designed by GDS Associates to contribute to the Market Characterization and Assessment evaluation of the ESH program. The survey was managed by APPRISE Incorporated. Interviews were conducted by Braun Research.

### **Sample**

#### *Target Population*

The target population for the survey was active ESH builders. Active builders are defined as those who signed the latest ESH agreement and constructed one or more ESH homes during the period from 1/1/2006 to 12/31/2007. The survey respondent was the individual listed as the ESH Program contact in the CSG ESH database.

#### *Sample Frame*

Three data files were used to develop the sample frame. The files included:

1. NYESH Builders – A data file with 1,050 builders who participated in the ESH program since program inception (i.e., signed an ESH agreement with NYSERDA).
2. NYESH Active Builders – A data file with the 340 builders who built one or more projects during the target time period (1/1/2006 to 12/31/2007).
3. NYESH Projects – A data file with the 1,222 projects that have been constructed through the ESH program by 418 builders.

The NYESH Builder database was furnished by CSG. The NYESH Active Builder file and the NYESH Project file were downloaded from the Comprehensive Residential Information System (CRIS).

Working with the three data files a population of 1,090 builders was identified consisting of those who had participated in the ESH program at some time since program inception (1,050 found in File #1, 5 that were in File #2 only, and 35 that were in File #3 only). Of the 1,090 builders, 10 downstate builders were allocated to the Process Evaluation NYC study and were not eligible for selection. The population of 1,080 builders was sorted into seven groups based on their NYSERDA Agreement status and the construction of ENERGY STAR Homes.

1. Group 1 – These builders have a current ELSH agreement with NYSERDA (2006/2007 Addendum signed) and built at least one home during the target analysis period (1/1/2006 through 12/31/2007). (Total = 300, Eligible =290)
2. Group 2 – These builders have a current ESH agreement with NYSERDA (2006/2007 Addendum signed), have previously built an ESH home, but did not build a home during the target analysis period (1/1/2006 through 12/31/2007). (N=45)
3. Group 3 – These builders did not sign the current ESH agreement with NYSERDA (2006/2007 Addendum), but built at least one home during the target analysis period (1/1/2006 through 12/31/2007). (N=40)
4. Group 4 – These builders did not sign the current ESH agreement with NYSERDA (2006/2007 Addendum), have previously built an ESH home, but did not build a home during the target analysis period (1/1/2006 through 12/31/2007). (N=356)
5. Group 5 – These builders have a current ESH agreement with NYSERDA (2006/2007 Addendum signed), but have never built an ESH home. (N=152)
6. Group 6 – These builders do not have a current ESH agreement with NYSERDA (2006/2007 Addendum) and have never built an ELSH home. (N=197)

Group 1 is considered to be the Participating Builders for purposes of the target analysis period.

Groups 2, 3, and 4 are considered to be Former Participating Builders for purposes of the target analysis period.

Groups 5 and 6 are considered to be Nonparticipating Builders for purposes of the target analysis period.

*Sample Selection*

The sample frame was stratified into three groups based on the number of homes built. Table 1 shows the number of homes built and the percent of homes built for each group. Large builders were those who constructed 50 or more ESH homes during the analysis period. Moderate builders constructed 10 to 49 ESH homes, and small builders constructed less than 10 ELSH homes.

**Table 1 – Participating Builder Sample Stratification**

<b>Stratum</b>	<b>Number of ESH Builders</b>	<b>Number of ESH Homes</b>	<b>Percent of ESH Homes</b>
Large	18	2,874	68%
Moderate	37	819	19%

Stratum	Number of ESH Builders	Number of ESH Homes	Percent of ESH Homes
Small	235	550	13%
TOTAL	290	4,243	100%

The survey budget allowed for 75 interviews. The final sample procedure allocated 15 interviews to the Large stratum, 24 interviews to the Moderate stratum, and 36 interviews to the Small stratum. Using that approach, the overall population statistics achieved the target confidence interval (+/- 10% with 90% confidence) and builders with a greater market share were sampled at a higher rate. Table 2 furnishes information on the sample size by stratum, the confidence interval for each stratum, and the confidence interval for the overall sample.

**Table 2 – Participating Builder Survey Sample Allocation**

Stratum	Population	Targeted Number of Interviews	90% Confidence Interval
Large	18	15	+/- 9%
Moderate	37	24	+/- 10%
Small	235	36	+/- 12%
TOTAL	290	75	+/- 10%

## Data Collection

### *Overview of Data Collection Procedures*

The Participating Builder Survey was administered as a telephone interview with the NYSERDA project contact. Sampled contacts were mailed an advance letter from NYSERDA and one from APPRISE notifying them of the data collection effort and describing the study. Interviewers from Braun Research conducted the interviews using a computer-assisted telephone interview (CATI) survey instrument.

### *Survey Instrument*

The survey instrument was designed to collect information on key performance indicators identified for the ESH in the Program Theory and Logic Model. One objective of the survey instrument was to update the time series measurements of market indicators obtained from previous surveys. So, it was important to ensure that questions were consistent with the prior surveys. However, the survey also addressed some new issues of interest to NYSERDA program staff. Those questions, in particular, needed to be pretested to ensure that they collected the required information and used clear and

concise language. Pretests found that the language for certain questions in the questionnaire needed to be improved and several skip instructions required revision.

*Survey Administration*

Interviewers called project contacts between 9 am and 5 pm on weekdays. If they reached the contact’s voice mail, they left a message on first contact. After the first contact, they left a message every other day. The study was in the field for three weeks. Attempts were made with each project contact at least once per day during the field period. Once the target number of interviews for a stratum was completed, interviewing was discontinued for that stratum. Survey administration averaged 21 minutes per completed interview.

Table 3 shows the final disposition of the sample.

**Table 3 – Participating Builder Survey Sample Disposition**

Disposition		Number	Percent
Complete	Complete	75	51%
	Partial	1	1%
Contacted	Refused	7	5%
	Not Completed	52	35%
Not Contacted	Quota Met	0	0%
Excluded	Duplicate	0	0%
	Business or contact no longer available	6	4%
	Information not available for business/contact	0	0%
	Not Eligible	6	4%
TOTAL		147	100%

Table 4 shows the number of sampled cases, the number of completed interviews, and the response rate by sample stratum. The overall survey response rate was 63%.<sup>1</sup>

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<sup>1</sup> The survey was fielded in June 2008. We were informed by industry representatives that builders would have been more responsive during the period from January through March.

**Table 4 – Participating Builder Survey Response Rate**

<b>Stratum</b>	<b>Eligible Sample Size</b>	<b>Number of Interviews</b>	<b>Response Rate</b>
Large	18	15	83%
Moderate	35	22	63%
Small	66	38	58%
TOTAL	119	75	63%

**Data Processing**

*Coding*

The survey included many “field-coded” questions. In these questions, the respondent was asked an open-ended question. The interviewer had the choice of coding the response as one (or more, for some questions) of a number of pre-coded categories that were coded from the open-ended responses for the prior survey, or coding the response as “Other” and entering a text string to summarize the response. For each applicable question, staff reviewed each “Other” response and then selected one of the pre-coded responses or made the response eligible for development of a new code. After reviewing all questionnaires, text responses were grouped into categories. If a group represented at least 5% of responses (three or more), a new code was created. If there were less than three responses, it was left as “Other.”

*Data Processing*

The survey data were checked for consistency with the CATI survey instrument. The survey data were combined with the sample frame data. A number of data file formats were developed, including SAS, SPSS, Stata, and Excel. All files were labeled with variable labels and value labels.

*Weights*

Since the survey was stratified and differential sampling rates were applied to each stratum, survey weights were developed and used for analysis of the data. Three weights were developed – a participant weight, a production weight, and a homes weight.

- Participant Weight – The same participant weight is computed for all completed interviews in the stratum. The formula for the participant weight (PW) is  $PW = \# \text{ of Eligible Builders} / \# \text{ of Interviews}$ . [See Table 5]
- Production Weight – The production weight is based on two factors – the stratum factor and the respondent production. The formula for the stratum factor (SF) is  $SF = (\text{Sum of Stratum$

Production)\*(Eligible Population Rate) / Sum of Production for Stratum Respondents. The formula for the production weight (PW) for each respondent is  $PW = SF * Production$ . [See Table 6]

- Homes Weight – The homes weight is based on two factors – the stratum homes population and the number of respondents. The formula for the stratum homes population (SHP) is  $SHP = \text{sum of } PW * \text{Homes Constructed}$  for all respondents in the stratum. The formula for the homes weight (HW) is  $HW = SHP / \text{Number of respondents}$ . [See Table 7]

For the 2006 sample, a PPS sample based on production savings was implemented. Since a PPS sample is self-weighting with respect to the measure-of-size variable, the analysis for 2006 used unweighted data. The Production Weight will yield comparable results to the 2006 procedures.

The purpose of the Homes Weight (HW) is to allow analysts to compare respondents from the three ESH builder surveys - Participant Builders, Former Participant Builders, and Nonparticipant Builders. The Homes Weight for each of those surveys represents the share of all homes in NYS “represented” by this builder.

**Table 5 – Participating Builder Survey Participant Weights**

Stratum	Population	Number of Interviews	Participant Weight
Large	18	15	1.20
Moderate	37	22	1.68
Small	235	38	6.18
TOTAL	290	75	N/A

**Table 6 – Participating Builder Survey Production Weights**

Stratum	Stratum Production Total	Respondent Production Total	Stratum Factor	Average Weight
Large	2,784	2,614	1.10	191.60
Moderate	819	535	1.53	37.23
Small	550	97	5.67	14.47
TOTAL	4,243	3,246	N/A	56.57

**Table 7 – Participating Builder Survey Home Weights**

<b>Stratum</b>	<b>Stratum Home Total</b>	<b>Respondents</b>	<b>Weight</b>
Large	3,574	15	238.24
Moderate	1,746	22	79.35
Small	5,161	38	135.82
TOTAL	10,480	75	N/A