



# Consumer Attitudes About Renewable Energy: Trends and Regional Differences

Natural Marketing Institute  
*Harleysville, Pennsylvania*

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

**Subcontract Report**  
NREL/SR-6A20-50988  
April 2011

Contract No. DE-AC36-08GO28308

# Consumer Attitudes About Renewable Energy: Trends and Regional Differences

Natural Marketing Institute  
*Harleysville, Pennsylvania*

NREL Technical Monitors: Lori Bird and Jenny Sumner  
Prepared under Subcontract No. AGG-1-11880-01

**NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.**

**This publication received minimal editorial review at NREL.**

### **NOTICE**

This report was prepared as an account of work sponsored by an agency of the United States government. Neither the United States government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government or any agency thereof.

Available electronically at <http://www.osti.gov/bridge>

Available for a processing fee to U.S. Department of Energy and its contractors, in paper, from:

U.S. Department of Energy  
Office of Scientific and Technical Information

P.O. Box 62  
Oak Ridge, TN 37831-0062  
phone: 865.576.8401  
fax: 865.576.5728  
email: <mailto:reports@adonis.osti.gov>

Available for sale to the public, in paper, from:

U.S. Department of Commerce  
National Technical Information Service  
5285 Port Royal Road  
Springfield, VA 22161  
phone: 800.553.6847  
fax: 703.605.6900  
email: [orders@ntis.fedworld.gov](mailto:orders@ntis.fedworld.gov)  
online ordering: <http://www.ntis.gov/help/ordermethods.aspx>

Cover Photos: (left to right) PIX 16416, PIX 17423, PIX 16560, PIX 17613, PIX 17436, PIX 17721



Printed on paper containing at least 50% wastepaper, including 10% post consumer waste.

## **Acknowledgments**

This paper was authored by Gwynne Rogers at Natural Marketing Institute, an international strategic consulting, market research, and business development company specializing in the health, wellness, and sustainability marketplace.

This work was funded by the U.S. Department of Energy's (DOE's) Office of Energy Efficiency and Renewable Energy (EERE). Lori Bird and Jenny Sumner of NREL served as technical monitors. The author wishes to thank Linda Silverman and the EERE technology programs for their support of this work. The author also wishes to thank Blaine Collison of the U.S. Environmental Protection Agency; Heidi Eggert of the Bonneville Environmental Foundation; Bridgett Neely of Green Mountain Energy; Orrin Cook, Jennifer Martin, and Alex Pennock of the Center for Resource Solutions; and Lynn Billman, Gail Mosey, and Robin Newmark of NREL for their thoughtful review of the document, as well as Sheri Anstedt for her editorial support.

## Executive Summary

### Significant Results, Trends, and Regional Differences

The data in this report are taken from Natural Marketing Institute's (NMI) Lifestyles of Health and Sustainability (LOHAS) Consumer Trends Database<sup>®</sup>. Created in 2002, the syndicated consumer database contains responses from 2,000 to 4,000 nationally representative U.S. adults (meaning the demographics of the sample are consistent with U.S. Census findings) each year. A sample of 2,000 has a confidence interval of +/-2.2 percentage points at the 95% confidence level, which decreases to +/- 1.2 percentage points with 4,000 respondents. NMI used the database to analyze consumer attitudes and behavior related to renewable energy and to update previously conducted related research. Specifically, this report will explore consumer awareness, concerns, perceived benefits, knowledge of purchase options, and usage of renewable energy as well as provide regional comparisons and trends over time.

Based on this analysis, NMI found the following:

- The majority of consumers (80%) indicated that they care about the use of renewable energy. However, concern has diminished slightly over time, which is consistent with other broad environmental consumer attitudes (such as concerns related to environmental protection or sustainable agriculture).
- Consumers primarily associate renewable energy with environmental benefits, despite the other potential benefits renewable energy has to offer and the recent efforts to broaden its appeal.
- Consumer awareness of renewable energy purchase options remains relatively low, with approximately one in six consumers aware of the green power options provided by their electric suppliers, although approximately half of consumers have options available to them.
- Consumers are more price sensitive for renewable energy than in the past, mirroring an increased price sensitivity NMI has observed across the green consumer landscape.
- Despite the common perception, there are few differences in consumer attitudes across regions. However, consumers in the West are more aware of renewable energy terminology, such as renewable power and carbon footprint. In addition, Western consumers, compared to Midwestern consumers, are more aware of their purchase options, are less price sensitive, and are more likely to have already purchased at least some type of renewable energy.
- Seven percent of the adult population reports buying at least some renewable energy for their home. According to similar research, this is a significantly lower percentage than the proportion of the population that cares about renewable energy and a higher percentage than penetration rates reported by utilities and marketers that offer renewable energy options to consumers.
- Opportunities exist for continued market growth in renewable energy as indicated by the differential between concern and usage and declining premiums. However, the modest awareness levels of renewable energy options are a challenge.

# Table of Contents

- List of Figures ..... vi
- List of Tables ..... vi
- 1 Introduction..... 1**
  - 1.1 Project Background and Objective ..... 1
  - 1.2 U.S. LOHAS Consumer Trends Database Research Methodology..... 2
- 2 Consumer Perceptions of Renewable Energy..... 4**
  - 2.1 Consumer Awareness of Renewable-energy-related Terminology, Trended..... 4
  - 2.2 Consumer Awareness of Renewable-energy-related Terminology, by Region..... 5
  - 2.3 Consumer Caring About Using Renewable Energy, Trended ..... 6
  - 2.4 Consumer Caring About Using Renewable Energy in the Context of Other  
Environmental Attitudes ..... 7
  - 2.5 Consumer Caring About Using Renewable Energy, by Region..... 8
  - 2.6 Perceived Benefits of Renewable Power, Trended..... 9
- 3 Consumer Purchasing of Renewable Energy..... 10**
  - 3.1 Consumer Awareness of Renewable Power Purchase Options, Trended..... 10
  - 3.2 Consumer Price Sensitivity for Renewable Energy, Trended ..... 12
  - 3.3 Consumer Price Sensitivity for Renewable Energy, by Region ..... 13
  - 3.4 Consumer Stated Purchase of at Least Some of Their Household Power from Renewable  
Sources Over the Past Two Years..... 14
- 4 Conclusion ..... 16**
- References ..... 18**
- Appendix A. Full Survey Question Text..... 19**

## List of Figures

Figure 1.	In Q.14, percent of the general population indicating awareness of renewable-energy-related terminology .....	4
Figure 2.	In Q.9, percent of the general population indicating that they agree completely or agree completely/somewhat with the statement, “I care about use of renewable energy sources” .....	6
Figure 3.	In Q.9, percent CAGR among the general population indicating that they agree completely/somewhat with the statement, “I care about...” .....	7
Figure 4.	In Q.9, percent of the general population, by region, indicating that they agree completely or agree completely/somewhat with the statement, “I care about use of renewable energy sources” .....	8
Figure 5.	In Q.123, percent of the general population indicating their response to the question, “I believe the most important benefit of renewable power is that it’s...” .....	9
Figure 6.	In Q.122, percent of the general population indicating their choice of renewable power purchase options.....	10
Figure 7.	In Q.122, percent of the general population, by region, indicating their renewable power purchase options.....	11
Figure 8.	In Q.122, percent of the general population indicating their price sensitivity regarding renewable energy (trended); Q31, percent of the general population agreeing with each statement.....	12
Figure 9.	In Q.122, percent of the general population, by region, stating that they would spend \$5–\$20 extra each month (\$5–\$10 prior to 2009) to have some of their household power come from a renewable source .....	13
Figure 10.	In Q.122, percent of the general population stating that they currently buy at least some of their household power from a renewable source.....	14
Figure 11.	In Q.122, percent of the general population, by region, stating that they currently buy at least some of their household power from a renewable source .....	15
Figure 12.	Summary of consumer interest in renewable energy (2010 data).....	16

## List of Tables

Table 1.	Report Categories by Geographic Region .....	3
Table 2.	In Q.14, Percent of the General Population, By Region, Indicating Awareness of Renewable-energy-related Terminology .....	5

# 1 Introduction

## 1.1 Project Background and Objective

The voluntary renewable energy market has grown considerably since its inception in the 1990s. In 2009, more than 30 million MWh of renewable energy were sold in the voluntary market, a nearly four-fold increase compared to 2005 and almost equal to the amount of new renewables required to meet 2009 state renewable portfolio standards.

Renewable energy is available to consumers in three forms: (1) utility green pricing programs offered in regulated states, (2) competitive retail electricity products in deregulated or competitive markets, and (3) renewable energy certificates (RECs) purchased in over-the-counter transactions or through independent REC marketers.

Customer participation in utility green pricing programs and competitive market programs has increased over the years, though penetration rates remain low. More than 1.4 million consumers purchase green power through their utility or retail electricity provider or in the REC market, with the vast majority (99%) of consumers purchasing through their utility or retail electricity provider. However, in 2009, the average participation rate among utility green pricing programs was 2.0%, while penetration rates in competitive markets ranged from 1.7% to 2.5%. The top 10 programs in 2009 had participation rates ranging from 5.1% to 20.8%. (Bird and Sumner 2010)

The objective of this report is to explore trends in consumer interest and awareness of renewable energy options through analysis of historical and regional survey data. Specifically, the report provides a historical and regional analysis of consumer responses to questions that indicate how much people care about renewable energy sources, how aware they are of options to buy renewable energy, their willingness to pay for renewable energy, and their opinions on the benefits of renewable energy. Only the renewable energy data are summarized here, provided by Natural Marketing Institute's (NMI's) Lifestyles of Health and Sustainability (LOHAS) Consumer Trends Database, a survey instrument conducted annually since 2002 that covers a broad range of environmental issues.

This report also provides an update to previously conducted research on consumer attitudes regarding renewable energy. Earlier consumer market research revealed consumer interest in supporting renewable energy. For example, utility market research on consumer preferences found that 52%–95% of residential consumers were willing to pay at least a modest amount (\$3–\$10) for renewable energy on a monthly basis (Farhar 1999). Deliberative polling of Texas electricity consumers also found that the median willingness to pay among consumers in various utility territories ranged from \$1.50 to \$6.50 per month (Lehr et al. 2003). In addition, a 2007 Opinion Research Corporation poll found similar results to 2007 NMI data regarding familiarity with the term renewable energy, awareness of purchasing options, and purchase rates.<sup>1</sup>

---

<sup>1</sup> The Opinion Research Corporation 2007 poll found that 55% of consumers were either very or somewhat familiar with the term renewable energy. The poll also found that 16% of consumers were aware of a renewable energy purchase option through their utility company or electricity supplier. Of those consumers who were aware of an option to purchase, 29% reported that they did in fact purchase renewable energy through their utility company or electricity supplier.



The updated data on consumer attitudes and awareness presented here are useful for utilities or marketers engaged in the voluntary renewable energy market. The data on trends and regional differences in attitudes towards renewable energy may also be useful for policymakers, stakeholders, and the renewable energy industry as a whole.

## **1.2 U.S. LOHAS Consumer Trends Database Research Methodology**

### **1.2.1 Survey Scope**

LOHAS describes the consumers and organizations that put health and sustainability first and foremost in their lives. NMI first designed the LOHAS Consumer Trends Database in 2002 to measure and describe the marketplace for LOHAS products and services within the total U.S. population, the consumers who use them, consumer expectations of corporate behavior, and attitudes toward environmental and social issues. Particular attention is paid to consumer attitudes, behaviors, psychographics, lifestyle activities, and product and service usage patterns in order to provide the information needed to capitalize on growing sustainability and corporate responsibility initiatives. Renewable energy has been included since the beginning of the research.

### **1.2.2 Data Collection**

Undertaken by NMI on behalf of its sponsor clients, the 2010 research was conducted in July via an online survey of 4,000 U.S. general population adults. Survey participants included those who had opted in to a panel as well as a demographically balanced, random subset of the panel. As respondents completed the survey, additional sample data were sent to provide balance demographics for any groups that were underrepresented at that point. To correct for any minor variations in the sample's demographic characteristics and the population as a whole, the data have been post-weighted to match multiple U.S. Census demographic measures. No individual respondent's weighting factor is greater than three or less than 0.3. The study utilized a leading online research firm and was designed, managed, and analyzed by NMI. The text of the questions used in this report is included in Appendix A.

### **1.2.3 Statistical Significance**

The results of this survey are nationally projectable to the U.S. adult population and statistically valid at the 95% confidence level +/- 1.2%. Throughout this report, capital letters indicate statistically significant differences between regions at the 95% confidence level using *t*-tests. The *t*-tests reflect the probability that the difference in two numbers being compared is not due to sampling error. In regional charts and graphs, each region is assigned a letter as a short-hand code. A significant regional difference is noted on the region with the higher value by referencing the capital letter of the region with the lower value.

### **1.2.4 Geographic Division**

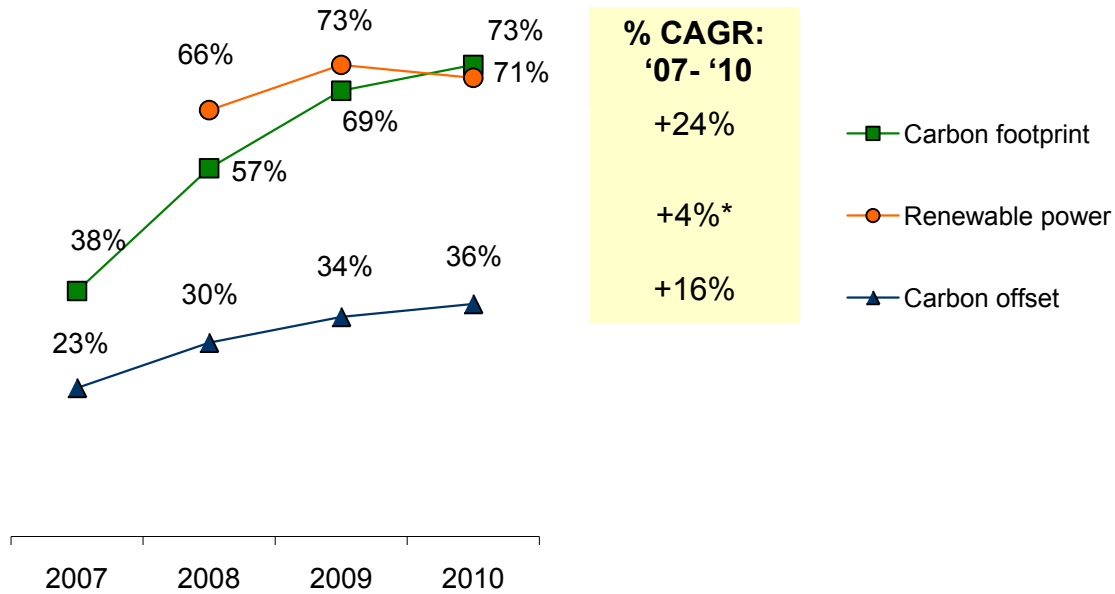
This report includes analyses by geographic region. The regions are defined in Table 1 and are consistent with industry and market research standards.

**Table 1. Report Categories by Geographic Region**

<b><u>Northeast</u></b>	<b><u>Midwest</u></b>	<b><u>South</u></b>	<b><u>West</u></b>
<ul style="list-style-type: none"> <li>• Connecticut</li> <li>• Delaware</li> <li>• District of Columbia</li> <li>• Maine</li> <li>• Massachusetts</li> <li>• New Hampshire</li> <li>• New Jersey</li> <li>• New York</li> <li>• Pennsylvania</li> <li>• Rhode Island</li> <li>• Vermont</li> <li>• West Virginia</li> </ul>	<ul style="list-style-type: none"> <li>• Illinois</li> <li>• Indiana</li> <li>• Iowa</li> <li>• Kansas</li> <li>• Michigan</li> <li>• Minnesota</li> <li>• Missouri</li> <li>• Nebraska</li> <li>• North Dakota</li> <li>• Ohio</li> <li>• South Dakota</li> <li>• Wisconsin</li> </ul>	<ul style="list-style-type: none"> <li>• Alabama</li> <li>• Arkansas</li> <li>• Florida</li> <li>• Georgia</li> <li>• Kentucky</li> <li>• Louisiana</li> <li>• Maryland</li> <li>• Mississippi</li> <li>• North Carolina</li> <li>• Oklahoma</li> <li>• South Carolina</li> <li>• Tennessee</li> <li>• Texas</li> <li>• Virginia</li> </ul>	<ul style="list-style-type: none"> <li>• Alaska</li> <li>• Arizona</li> <li>• California</li> <li>• Colorado</li> <li>• Hawaii</li> <li>• Idaho</li> <li>• Montana</li> <li>• Nevada</li> <li>• New Mexico</li> <li>• Oregon</li> <li>• Utah</li> <li>• Washington</li> <li>• Wyoming</li> </ul>

## 2 Consumer Perceptions of Renewable Energy

### 2.1 Consumer Awareness of Renewable-energy-related Terminology, Trended



**Figure 1. In Q.14, percent of the general population indicating awareness of renewable-energy-related terminology**

\*% Compound annual growth rate (CAGR) 2008–2010<sup>2</sup>

Source: 2010 LOHAS Consumer Trends Database

Generating market interest in renewable energy starts with raising awareness of commonly used terms. Since NMI began measuring awareness of renewable power in 2008, at least two-thirds of consumers have been aware of the term, with a statistically higher number in 2010 (as shown in Figure 1). In the same timeframe, consumer awareness of carbon-related terminology has increased more rapidly. The awareness of the term carbon footprint has grown particularly quickly, up 24% annually since 2007, with most of the growth between 2007 and 2008, when media coverage of this issue was more prevalent, especially in the Northeast and West where there are established carbon regulations (i.e., RGGI in the East and Western Climate Initiative in California). As newer terms, and those commonly used by the media, many consumers have latched onto them.

The term carbon offset has not seen the same dramatic increase in awareness as carbon footprint and is still below the 2007 carbon footprint awareness level. While the two terms may be clearly linked within the business community, the same cannot be said of consumers. While carbon footprints are commonly discussed in consumer media, specifically when talking about how to

<sup>2</sup> Compound annual growth rate (CAGR) is reported throughout this document. The CAGR reports growth from the first year to the most current year as if annual rates had changed at a steady rate and thus reduces the effects of year-to-year fluctuations.

reduce a carbon footprint, reports often refer to energy efficiency and conservation, use of renewable energy, and carbon offsets, among other approaches. Since carbon offsets are just one of the approaches to manage a carbon footprint, it could explain why awareness of this term is lower.

Interestingly, the term carbon footprint has overtaken the term renewable power in awareness. Since the term renewable power has been used for decades, it is remarkable that carbon footprint has eclipsed it after just a few years. While more consumers may be aware of specific types of renewable energy, such as solar and wind (85% of consumers were aware of wind energy in 2009, for instance), perhaps the umbrella term is not as well known. Therefore, communicators in this field need to be mindful of consumer familiarity with these terms in their publications.

As a comparison, 85% of consumers are aware of the term “biodegradable” (the highest scoring term measured) and 60% are aware of the term “sustainability.” Awareness of both renewable power and carbon footprint, therefore, is comparable to other green industry terms. Of course, awareness is *not* the same as understanding. While awareness is a starting point, presumably fewer understand the terms. Ensuring accurate understanding is also important to generating interest in the marketplace.

## 2.2 Consumer Awareness of Renewable-energy-related Terminology, by Region

**Table 2. In Q.14, Percent of the General Population, By Region, Indicating Awareness of Renewable-energy-related Terminology**

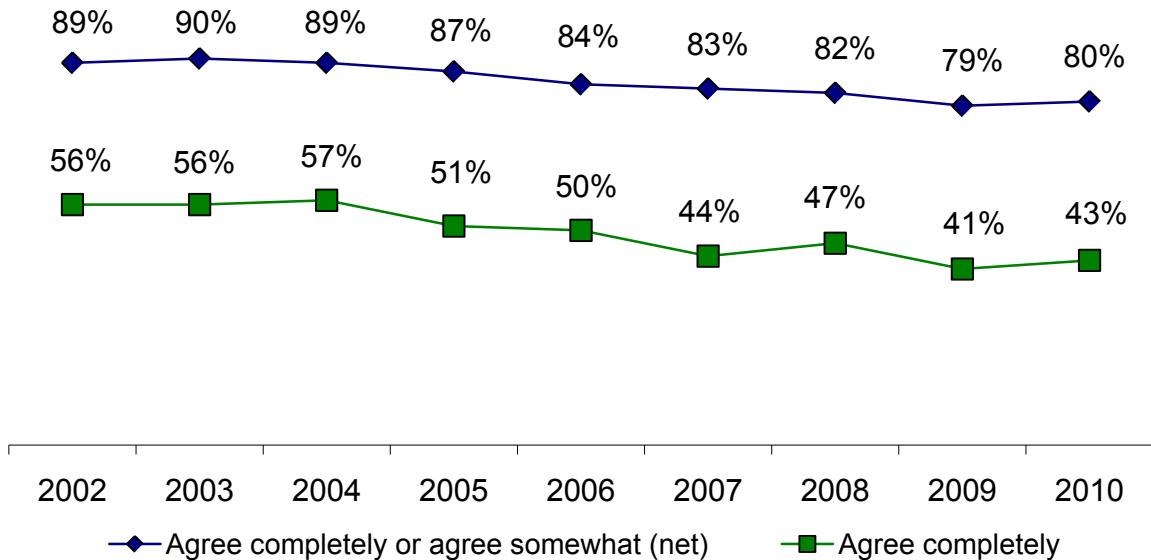
	Northeast (A)	Midwest (B)	South (C)	West (D)
Carbon footprint	74%	71%	70%	78% <sup>BC</sup>
Renewable power	68%	71%	70%	78% <sup>ABC</sup>
Carbon offset	33%	34%	34%	44% <sup>ABC</sup>

Note: Capital letters indicate significant differences between regions at the 95% confidence level. For example, we are 95% confident that consumers in the West are more aware of “carbon footprint” than consumers in the Midwest (B) and South (C).

Source: 2010 LOHAS Consumer Trends Database

As shown in Table 2, consumers on the West Coast are significantly more aware of these three terms than consumers in other regions who have statistically equivalent awareness. West Coast residents are often thought to be more attuned to environmental issues than consumers elsewhere in the country. However, even in the West, nearly one-quarter of the population is unaware of the term renewable power.

## 2.3 Consumer Caring About Using Renewable Energy, Trended



**Figure 2. In Q.9, percent of the general population indicating that they agree completely or agree completely/somewhat with the statement, “I care about use of renewable energy sources”**

Source: 2010 LOHAS Consumer Trends Database

According to Figure 2, a strong majority of consumers care about renewable energy, ranging from about 80% to 90% over the survey period. Slightly fewer consumers care about using renewable energy now than they did in 2002, down 1% annually over the nine-year horizon. This decline has come primarily from the people who agree completely (down 3% annually), meaning that there is an absolute decline and a decline in intensity.

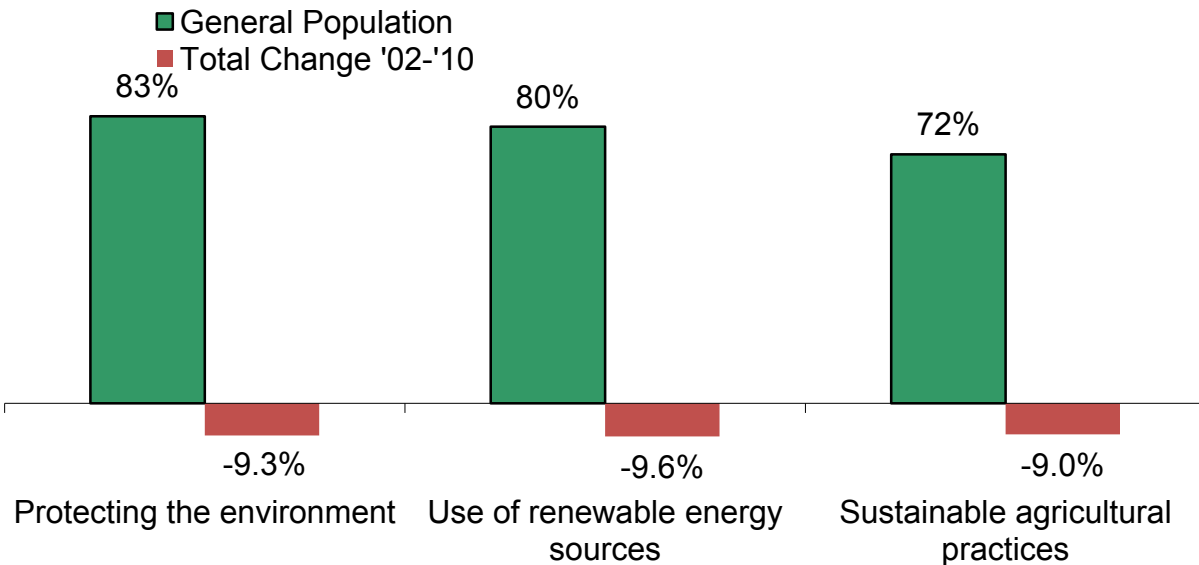
Note that more consumers report concern about use of renewable energy than are aware of the term renewable power. There are a few possible explanations for this apparent disconnect. First, the terms renewable energy and renewable power have subtle but important differences.<sup>3</sup> Second, the question format may affect response; for example, the awareness question asked respondents to check all they were aware of, whereas this question uses a five-point Likert scale format. A question using with a Likert scale asks respondents to answer using a scale (in this case, from “agree completely” to “disagree completely”), which is more appropriate for a question about concern or caring and also elicits a more thoughtful response.

As shown in Figure 3, concerns about other broad-based environmental issues have also experienced this decline. While the decline may seem ironic during a decade that saw significant growth in renewable energy development and considerable expansion in the number of green products on the market, the trends may actually be related. The increased development and availability of renewable energy may indicate to consumers that the associated environmental

<sup>3</sup> Renewable energy is a little broader than power, and there are forms of renewable energy that do not generate electricity, such as solar hot water.

problems have been solved, or are at least being addressed, which may allay their concerns. However, the data between 2009 and 2010 are stable, which could signal the end of the decline.

## 2.4 Consumer Caring About Using Renewable Energy in the Context of Other Environmental Attitudes



**Figure 3. In Q.9, percent CAGR among the general population indicating that they agree completely/somewhat with the statement, “I care about...”**

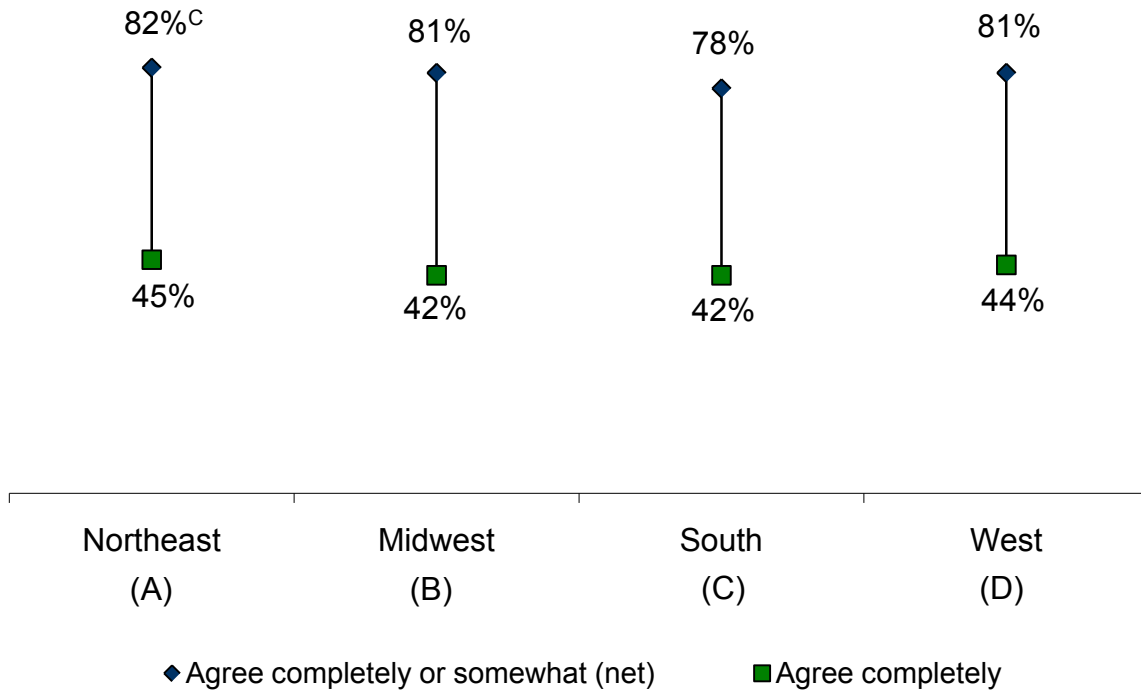
Source: 2010 LOHAS Consumer Trends Database

As mentioned above, and displayed in Figure 3, other broad-based environmental attitudes have declined since NMI started measuring these attitudes in 2002, and the change in renewable energy is consistent with the other changes.

In addition to product proliferation potentially affecting consumer concerns, the overall level of discourse may be leading consumers to think that there is less reason for concern. Environmental issues are in the mainstream news frequently, and it would be reasonable for consumers to believe that with all of the discussion that conditions are actually improving, or are at least being addressed.

As consumer concerns appear to be diminishing, consumers are also doing more than ever to help the environment. More consumers are buying green products, for example, usage of compact fluorescent lighting (CFL) is up 15% annually since 2003 and the purchase of organic foods is up 6% annually in the same time frame. In addition, more than three times as many consumers take their own reusable bags to the store and almost twice as many say they avoid product brands with practices they do not agree with, among dozens of other behavioral changes. It is somewhat unusual for attitudes to decline while behaviors grow; however, many of these behaviors have become less burdensome for consumers, which is probably contributing to their rise.

## 2.5 Consumer Caring About Using Renewable Energy, by Region

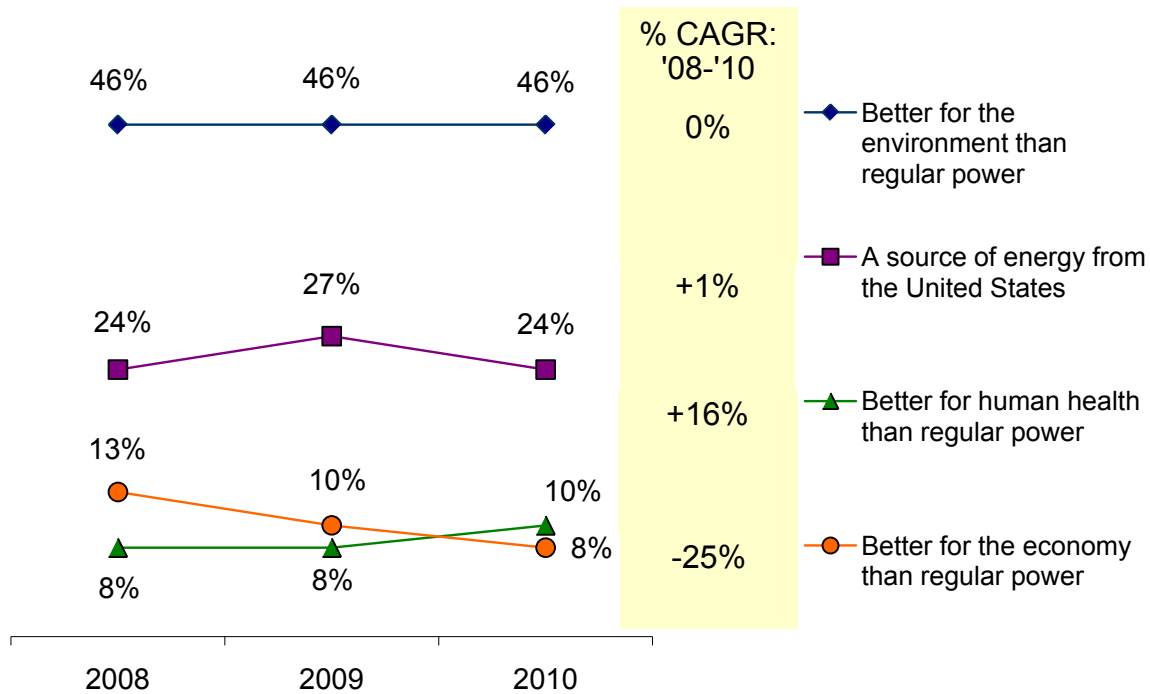


**Figure 4. In Q.9, percent of the general population, by region, indicating that they agree completely or agree completely/somewhat with the statement, “I care about use of renewable energy sources”**

Capital letters indicate significant differences between regions at the 95% confidence level  
 Source: 2010 LOHAS Consumer Trends Database

As shown in Figure 4, unlike awareness of renewable energy terminology, wherein consumers in the West had the highest awareness, consumers in the Northeast are slightly more likely to care about the use of renewable energy sources, particularly in comparison to consumers in the South. The difference between consumers in the Northeast and consumers in the South is significant at the 95% confidence level. Even with the Northeastern region’s slight lead over the rest of the country, the concern for renewable energy is nearly equal across regions.

## 2.6 Perceived Benefits of Renewable Power, Trended



**Figure 5. In Q.123, percent of the general population indicating their response to the question, “I believe the most important benefit of renewable power is that it’s...”**

Source: 2010 LOHAS Consumer Trends Database

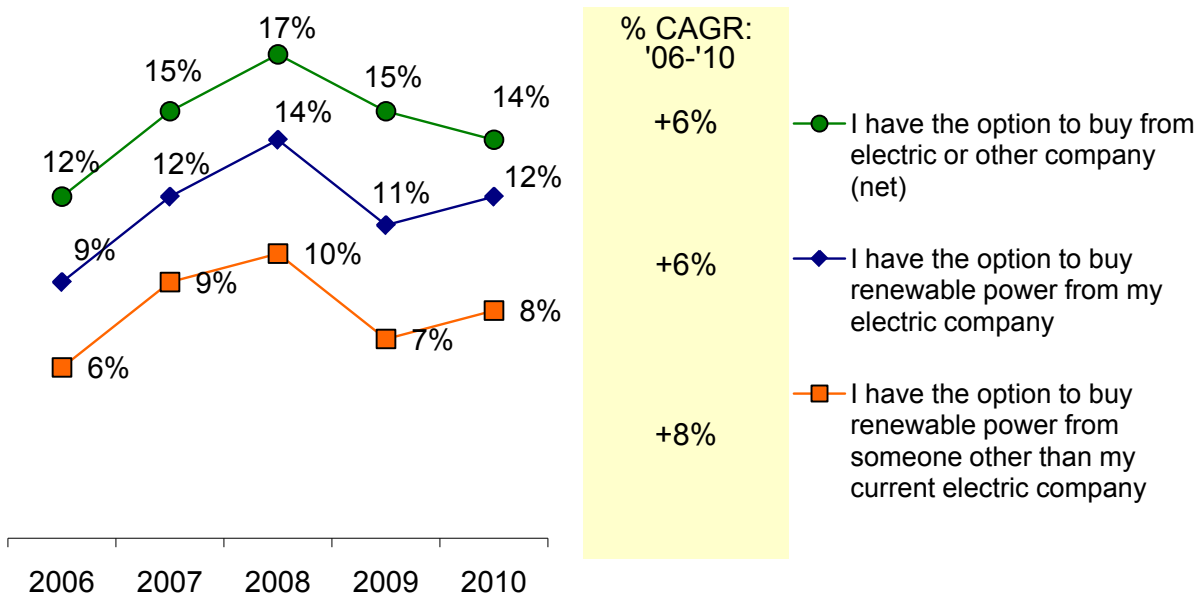
This question asks consumers to pick a single, primary benefit of renewable power, though all of the choices could be seen as benefits. A stable plurality of consumers associate renewable power primarily with environmental benefits, as indicated in Figure 5. Other benefits are much less likely to be cited as the primary benefit, even those benefits that have recently been touted heavily, namely the economic benefits. The economic benefits are actually on a downward decline, by almost 50% from their 2007 level (a statistically significant decline). Following the trend of earlier data, few differences are evident by region, though the South is slightly more likely to associate renewable power with economic benefits than the Midwest.

One strategy to grow renewable energy usage beyond its current level (7%) would be to better promote the health and economic benefits, since this would widen the target audience, and it is easier to reposition a product to be relevant to consumers than it is to convince them of its relevance. As Figure 5 shows, the messaging related to health and economic benefits has not yet been effective; changing these perceptions would require very persuasive educational campaigns. In addition, to achieve further market growth, research is needed to better understand whether these benefits are not believable, not as important, or if there are other barriers to consumer acceptance.



### 3 Consumer Purchasing of Renewable Energy

#### 3.1 Consumer Awareness of Renewable Power Purchase Options, Trended



**Figure 6. In Q.122, percent of the general population indicating their choice of renewable power purchase options**

Source: 2010 LOHAS Consumer Trends Database

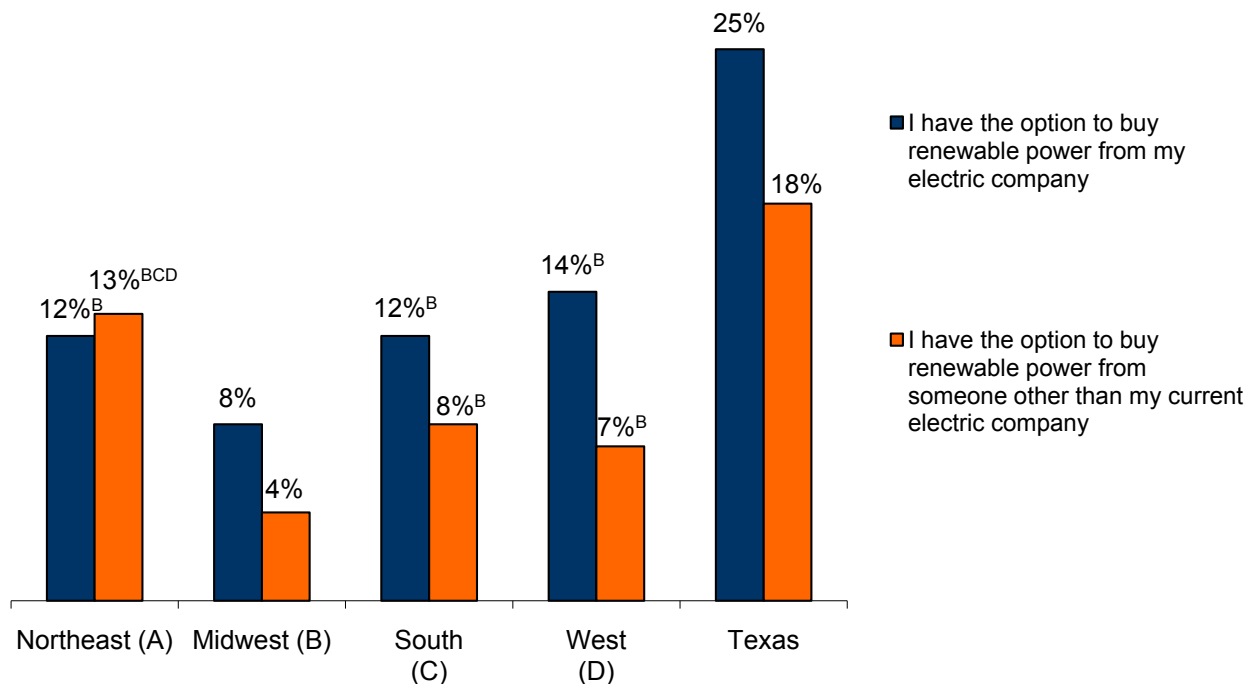
As depicted in Figure 6, approximately one in six adults know that they have the option to buy renewable power, either from their electric company or another provider. Consumers are much more likely to know they can get renewable power from their current electric provider since they are existing customers and receive regular communications with their monthly bills. Compared to the findings reported by NREL (Bird and Sumner 2010), the 14% of consumers who know they can buy renewable power through their utility or another company is considerably less than those who actually can (more than 50% of consumers have the option to purchase some type of green power product directly from a retail electricity provider, while all consumers have the option to buy RECs).

Compared to 2006, there has been little change in consumer awareness of purchase options, despite a peak in 2008 that did not last. Providers may have pulled back on promotions, assuming that in the height of the recession consumers had other priorities for their discretionary spending. There appears to be a bit of a correction in that, however, between 2009 and 2010.

Because electricity is such a low involvement category, meaning that consumers do not deliberate this decision extensively (if at all) or experience any consequences of their decision, these low figures are not surprising.<sup>4</sup> Nevertheless, there is a wide gulf between the number of

<sup>4</sup> The quintessential high involvement category is a car or a house, where the purchase decision is very involved and impacts daily life. Consumer packaged goods are also a much more involved category because consumers have a

consumers who reportedly care about renewable energy and those who know they can buy it (let alone those who actually do, which will be covered later in this report). If voluntary purchases are to be important to growing the renewable energy market, consumers obviously need to know they have the option of putting their money where their values are.



**Figure 7. In Q.122, percent of the general population, by region, indicating their renewable power purchase options**

Capital letters indicate significant differences between regions at the 95% confidence level  
 Source: 2010 LOHAS Consumer Trends Database

As shown in Figure 7, there are regional variations in consumer awareness of renewable power purchase options—above and beyond most other regional differences examined in this report. Midwestern consumers are least likely to know of their options, while those on the coasts are more aware. Northeastern consumers, where retail competition exists and several alternative providers operate, are relatively more aware of both options, and the most aware of buying from an alternate supplier. In fact, this is the only region where equal numbers of consumers recognize that they have the option of buying from either type of supplier.

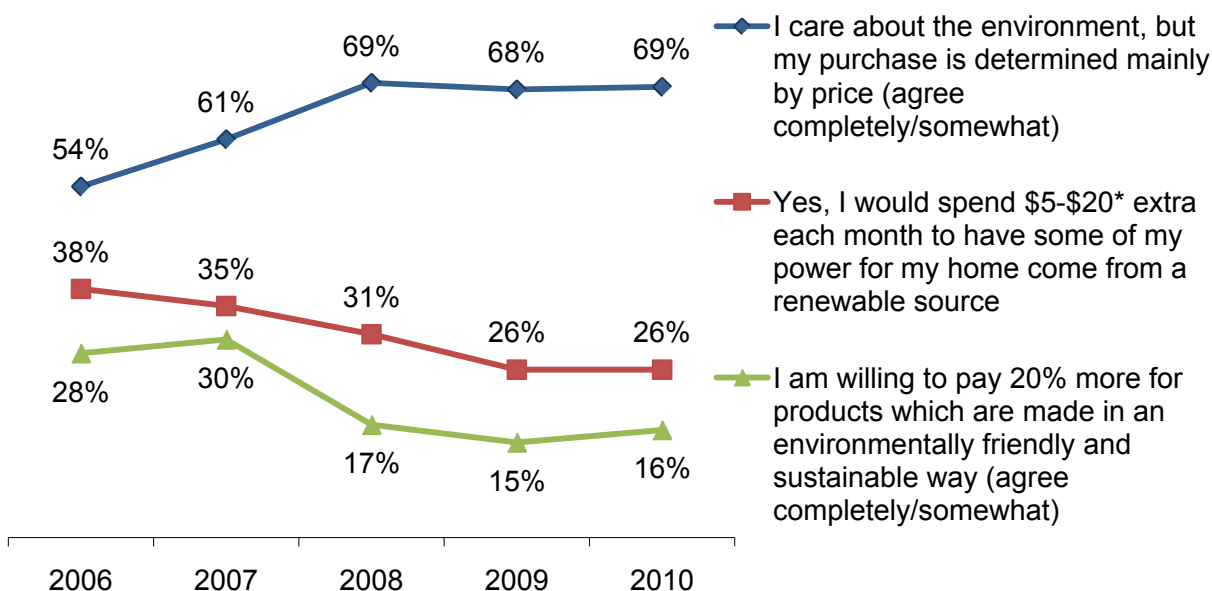
The most striking difference is in Texas, where one-quarter of consumers are aware of renewable power purchase options. The Texas market is one of the most competitive in the United States, with dozens of options for consumers to choose from, and Texans are most aware of their

---

more personal interaction with them (e.g., ingesting food or putting the product on the body), and the purchase cycle is rapid, meaning they are making these decisions on a weekly basis or even more often.

alternatives. It is also important to note that without Texas, the awareness figures for the South would be significantly lower.

### 3.2 Consumer Price Sensitivity for Renewable Energy, Trended



**Figure 8. In Q.122, percent of the general population indicating their price sensitivity regarding renewable energy (trended); Q31, percent of the general population agreeing with each statement**

\*\$5-\$10 prior to 2009

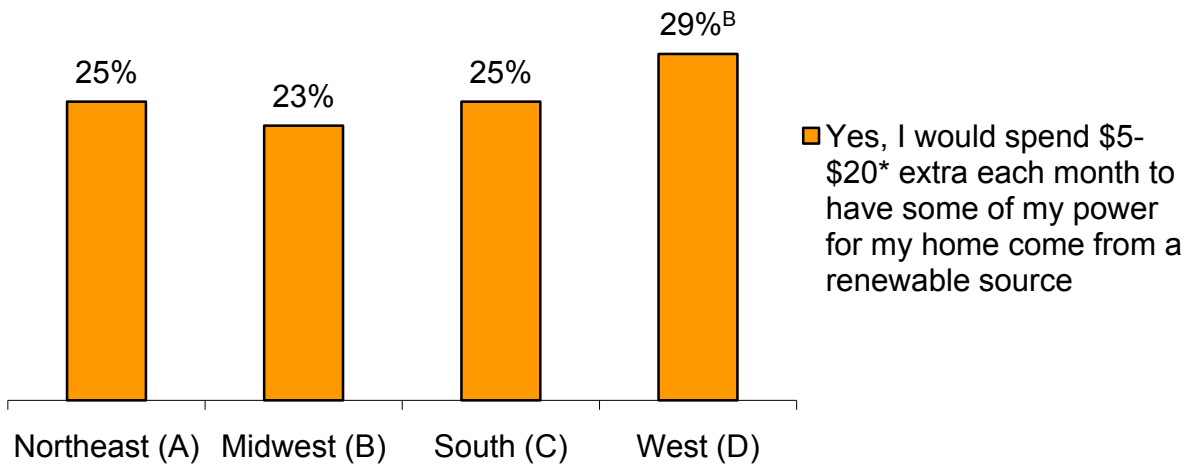
Source: 2010 LOHAS Consumer Trends Database

According to Figure 8, consumer price sensitivity for renewable energy has increased over the past five years, in conjunction with overall increased price sensitivity for other green products, as well as the overall consumer marketplace. The change between 2006 and 2010 reveals a 9% annual decline in the number of consumers willing to spend between \$5 and \$20 more on renewable energy for their home.

In comparison to other green products, price sensitivity is actually lower for renewable energy. In 2010, 16% of the population reports that they would pay 20% more for products made in an environmentally-friendly and sustainable way, whereas one-quarter will pay \$5-\$20 more each month for renewable energy, which covers the premium in many cases.

These figures actually far exceed the number of consumers who indicated that they currently buy renewable energy (7%). While not everyone who says that they will pay more for renewable energy will follow through on those actions, it still suggests that there is room for market expansion.

### 3.3 Consumer Price Sensitivity for Renewable Energy, by Region



**Figure 9. In Q.122, percent of the general population, by region, stating that they would spend \$5-\$20 extra each month (\$5-\$10 prior to 2009) to have some of their household power come from a renewable source**

\*\$5-\$10 prior to 2009

Note: Capital letters indicate significant differences between regions at the 95% confidence level

Source: 2010 LOHAS Consumer Trends Database

As shown in Figure 9, West Coast consumers are less price sensitive than those consumers in the eastern regions and statistically less price sensitive than those in the Midwest. While these data may suggest that renewable energy marketers could charge more in the West than elsewhere in the country, it may also suggest that this region has higher market potential.

### 3.4 Consumer Stated Purchase of at Least Some of Their Household Power from Renewable Sources Over the Past Two Years



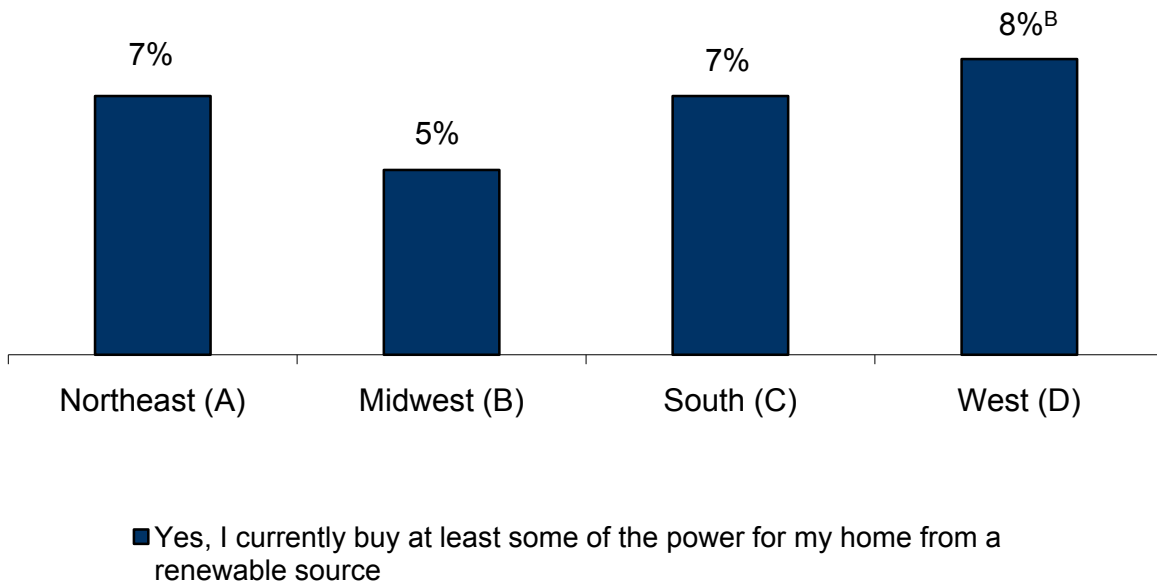
**Figure 10. In Q.122, percent of the general population stating that they currently buy at least some of their household power from a renewable source**

Source: 2010 LOHAS Consumer Trends Database

As shown in Figure 10, 7% of the population reports that they buy at least some of their household power from a renewable source. This is significantly higher than the percentage of consumers who participate in programs offered by consumer utilities and competitive marketers (approximately 1% of households). However, survey data may include individuals who know that renewable energy is part of the grid’s mix in their service territory, who have solar-powered garden lights, solar water heating, solar electric systems, or other on-site renewable energy systems.

As other studies have found, this percentage is far below the portion of the population who care about renewable energy or who would pay more for it. Importantly, it is not that different from the percentage of people who know that they have the option to buy renewable energy. Simply providing consumers with greater awareness of their purchase options may be the most important factor in growing the renewable energy market.

Usage of other “green” market products may be helpful for comparative purposes (though the purchase process for these products is quite different than that for renewable energy). For example, one-quarter of the population has purchased a natural cleaning product, nearly 50% have purchased a CFL, and 30% have purchased rechargeable batteries in the past year.



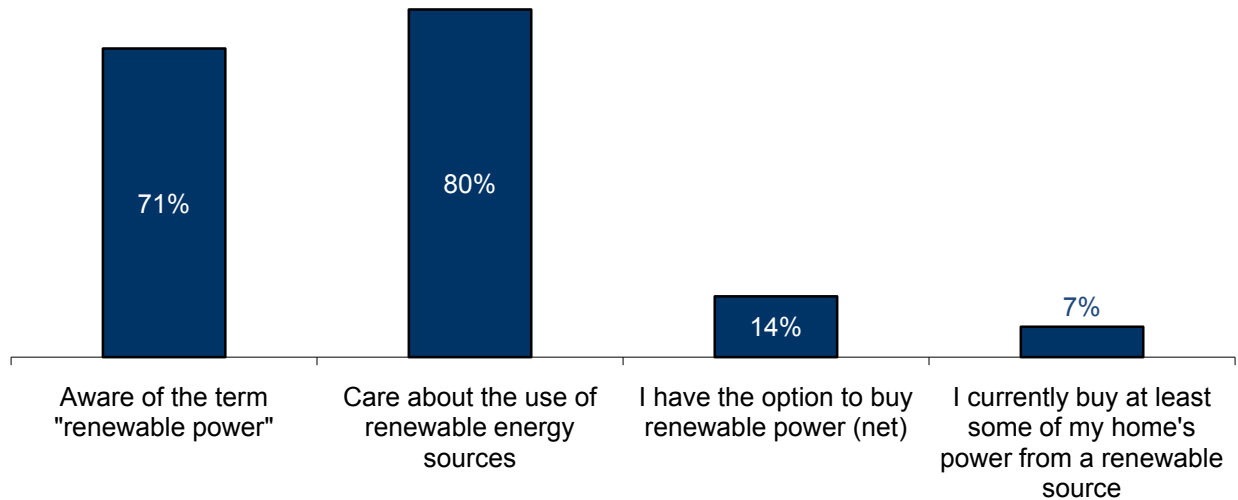
**Figure 11. In Q.122, percent of the general population, by region, stating that they currently buy at least some of their household power from a renewable source**

Capital letters indicate significant differences between regions at the 95% confidence level  
 Source: 2010 LOHAS Consumer Trends Database

As shown in Figure 11, Midwestern survey data indicates that consumers in this region are statistically less engaged than those in the West, with just 5% stating that they buy some of their power from a renewable source. This is not surprising, since the consumers in this region are the most price sensitive and the least aware of their purchase options.

## 4 Conclusion

Overall, consumers have a high degree of awareness and concern for renewable energy, but few are aware of their purchase options or follow through on their stated concern, as indicated in Figure 12.



**Figure 12. Summary of consumer interest in renewable energy (2010 data)**

Source: 2010 LOHAS Consumer Trends Database

Major findings of this report include the following:

- Concern about renewable energy is quite high, with 80% of the general population caring completely or somewhat about the use of renewable energy sources. Although concern has decreased from 89% in 2002, such decline is consistent with a general decline in caring about environmental attributes, such as protecting the environment and sustainable agricultural practices.
- Consumers continue to believe that the most important benefit of renewable energy is that it is better for the environment than regular power, although some consumers believe that the most important benefits are domestic sourcing and to a lesser extent human health or economic benefits.
- Consumer awareness is a challenge for utilities or companies providing renewable energy options to consumers. Despite a modest increase in consumer awareness, only 14% of consumers were aware of renewable energy purchase options in 2010. In addition, consumer willingness to pay more for renewable energy has declined in recent years.
- Despite the common perception that there are regional differences in attitudes about renewable energy, these data generally do not demonstrate strong regional differences, although the following differences do exist:

- Consumers in the West are more aware of the terms carbon footprint, renewable power, and carbon offset than consumers in other regions who have equivalent awareness. Consumers in the West are also less price sensitive than consumers in other regions and are more likely to report buying at least some of their household power from renewable sources.
- Consumers in the Midwest are the least likely to be aware of their renewable power purchase options, while consumers in Texas and the Northeast, where retail competition exists and multiple alternative providers operate, are most aware of renewable energy purchase options.

Given low levels of product awareness, and that half of consumers who are aware of options to buy renewables do say they purchase renewables, these data suggest further opportunity for market growth in this sector, particularly if heightened consumer awareness can be achieved.



## References

Bird, L.; Sumner, J. (September 2010). *Green Power Marketing in the United State: A Status Report (2009 Data)*. NREL/TP-6A20-49403. Golden, CO: National Renewable Energy Laboratory, 69 pp.

Farhar, B. (July 1999). *Willingness to Pay for Renewable Electricity: A Review of Utility Market Research. Topical Issues Brief*. NREL/TP-550-26148. Golden, CO: National Renewable Energy Laboratory, 28 pp.

Lehr, R.L.; Guild, W.; Thomas, D.L.; Swezey, B.G. (June 2003). *Listening to Customers: How Deliberative Polling Helped Build 1,000 MW of New Renewable Energy Projects in Texas*. NREL/TP-620-33177. Golden, CO: National Renewable Energy Laboratory, 27 pp.

Natural Marketing Institute. (2002-2010). *Lifestyles of Health and Sustainability (LOHAS) Consumer Trends Database*. Harleysville, PA.

## Appendix A. Full Survey Question Text

The questions reported in this paper appeared as follows in the 2010 LOHAS Consumer Trends Database. In some cases, other measures were included in the survey but not reported here, and those measures are not listed below.

9. Please indicate your level of agreement or disagreement with the following statements in terms of your own personal beliefs. *Please select one rating for each statement.* [randomize]

<b>I care about....</b>	<b>Agree Completely</b>	<b>Agree Somewhat</b>	<b>Neither Agree Nor Disagree</b>	<b>Disagree Somewhat</b>	<b>Disagree Completely</b>	<b>Don't Understand/ Never Heard Of</b>
a. Protecting the environment						
b. Sustainable agricultural practices						
c. Use of renewable energy sources						

14. Which of the following terms are you aware of? *Please select all that apply.* [randomize]

1. Biodegradable
2. Carbon footprint
3. Carbon offset
4. Sustainability

31. Thinking about how products are made and sold, please indicate your level of agreement or disagreement with the following statements in terms of how they affect your purchasing of products. *Please select one rating for each statement.* [randomize]

<b>When it comes to purchasing products or services...</b>	<b>Agree Completely</b>	<b>Agree Somewhat</b>	<b>Neither Agree Nor Disagree</b>	<b>Disagree Somewhat</b>	<b>Disagree Completely</b>
a. I am willing to pay 20% <u>more</u> for products which are made in an environmentally friendly and sustainable way.					
b. I care about the environment, but my purchase is determined mainly by price.					

63. Which of the following types of products have you or someone in your household purchased in the past 12 months? *Please select all that apply.*

1. Compact fluorescent light bulbs (CFLs)

117. Please indicate the frequency with which you do the following: *Please check one for each.*  
**[randomize]**

	Daily	Weekly	Monthly	Less Than Monthly	Never
a. Not buy products from a brand or company that has practices I don't like					
b. Take my own bag to the grocery store or other stores I shop frequently					

122. For the purposes of this survey, “renewable power” means electricity supplied from renewable energy sources, like wind and solar power. These energy sources are considered renewable sources because they are continuously replenished on the Earth. Renewable power can be used in exactly the same way as regular power. *Please select one response for each of the following.* **[randomize]**

	Yes	No	Don't Know
a. I have the option to buy renewable power from my electric/utility company.			
b. I have the option to buy renewable power from someone other than my current electric/utility company.			
c. I would spend \$5–\$20 extra each month to have some of the power for my home come from a renewable source.			
d. I currently buy at least some of the power for my home from a renewable source.			

123. What do you think is the most important benefit of renewable power? *Please select one.*  
**[randomize]**

1. Better for the environment than regular power
2. A source of energy from the United States
3. Better for human health than regular power
4. Better for the economy than regular power
5. None of the above **[anchor]**

# REPORT DOCUMENTATION PAGE

*Form Approved*  
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Executive Services and Communications Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

**PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION.**

<b>1. REPORT DATE (DD-MM-YYYY)</b> April 2011			<b>2. REPORT TYPE</b> Subcontract Report		<b>3. DATES COVERED (From - To)</b>	
<b>4. TITLE AND SUBTITLE</b> Consumer Attitudes About Renewable Energy: Trends and Regional Differences				<b>5a. CONTRACT NUMBER</b> DE-AC36-08GO28308		
				<b>5b. GRANT NUMBER</b>		
				<b>5c. PROGRAM ELEMENT NUMBER</b>		
<b>6. AUTHOR(S)</b> Natural Marketing Institute				<b>5d. PROJECT NUMBER</b> NREL/SR-6A20-50988		
				<b>5e. TASK NUMBER</b> SAO9.3102		
				<b>5f. WORK UNIT NUMBER</b>		
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Natural Marketing Institute 272 Ruth Road Harleysville, PA 19438				<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b> AGG-1-11880-01		
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> National Renewable Energy Laboratory 1617 Cole Blvd. Golden, CO 80401-3393				<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b> NREL		
				<b>11. SPONSORING/MONITORING AGENCY REPORT NUMBER</b> NREL/SR-6A20-50988		
<b>12. DISTRIBUTION AVAILABILITY STATEMENT</b> National Technical Information Service U.S. Department of Commerce 5285 Port Royal Road Springfield, VA 22161						
<b>13. SUPPLEMENTARY NOTES</b> NREL Technical Monitor: Lori Bird and Jenny Sumner						
<b>14. ABSTRACT (Maximum 200 Words)</b> The data in this report are taken from Natural Marketing Institute's (NMI's) Lifestyles of Health and Sustainability Consumer Trends Database. Created in 2002, the syndicated consumer database contains responses from 2,000 to 4,000 nationally representative U.S. adults (meaning the demographics of the sample are consistent with U.S. Census findings) each year. NMI used the database to analyze consumer attitudes and behavior related to renewable energy and to update previously conducted related research. Specifically, this report will explore consumer awareness, concerns, perceived benefits, knowledge of purchase options, and usage of renewable energy as well as provide regional comparisons and trends over time.						
<b>15. SUBJECT TERMS</b> renewable energy; trends; consumer awareness; benefits; green pricing programs; retail electricity; renewable energy certificates; REC						
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b> UL	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b>	
<b>a. REPORT</b> Unclassified	<b>b. ABSTRACT</b> Unclassified	<b>c. THIS PAGE</b> Unclassified			<b>19b. TELEPHONE NUMBER (Include area code)</b>	