Market Progress Evaluation Report

ENERGY STAR® Windows Program, No. 4

prepared by

quantec

*report #*E00-069

November 2000

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Final Report

Market Progress Evaluation Report for the ENERGY STAR® Windows Program, No. 4

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Northwest Energy Efficiency Alliance

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November 2000

Contents

Tables & Figures

Acknowledgements

This report was prepared by **quantec** under contract to the Northwest Energy Efficiency Alliance (the Alliance). This report would not have been possible without the aid of Denise Bauman of the Gilmore Research Group.

We would also like to thank Alliance staff members; Philipp Degens for his guidance and patience and John Jennings for his aid in obtaining program information. Finally, we thank Gary Curtis, Mike Fruzzetti, Sharon Spencer, and Jim Russell for their ongoing courtesy in providing information in the midst of trying to implement the program.

The views and opinions of the authors do not necessarily reflect those of the Alliance, its board, members, or staff.

Executive Summary

Program Description

This Market Progress Evaluation Report on the Northwest Energy Efficiency Alliance's (Alliance) ENERGY STAR® Residential Fenestration Program (Program) covers the period from June 1999 through June 2000. The Program is designed to increase market share of residential high-efficiency windows by working in partnership with market actors, including window product manufacturers, wholesaler/distributors, retail suppliers, the manufactured home industry, and builders.

The Program uses ENERGY STAR labeling, certification, and marketing to aid in transforming the Northwest window market.[1] ENERGY STAR Partners sign a Memorandum of Understanding (MOU) to use the ENERGY STAR logo in advertising, educational, and other promotional materials. Under the MOU, selected Partners are given monetary incentives and/or marketing aid to leverage transformation of the Northwest market to high-efficiency window products.

Goals of the Program are to:

- ➜ Increase market share for high-efficiency fenestration products in both the residential new construction and remodel markets to 54% by the year 2001.
- ➜ Decrease at least two market barriers – lack of awareness and initial cost premiums – that limit sales of high-efficiency fenestration products.

Summary of Research Activities for the Third Report

Research activities conducted for the third Market Progress Evaluation Report (Report) include in-depth interviews or surveys of:

- ➜ 16 regional window product manufacturers
- ➜ 49 retailers/wholesalers
- ➜ 70 home builders

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[1] ENERGY STAR ® is a trademark of the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency's (EPA) program to increase energy efficiency in a number

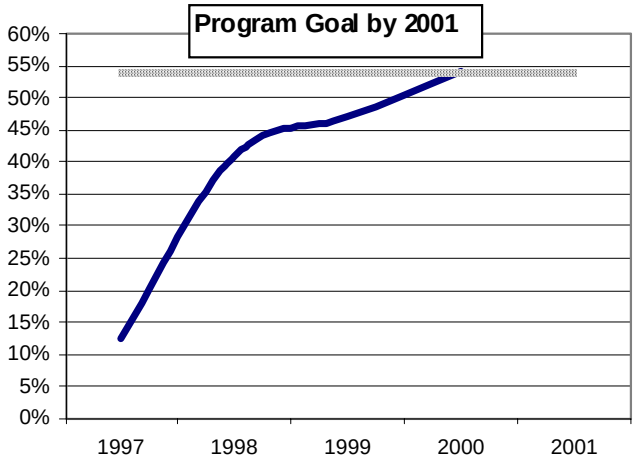
- ➜ 271 new homebuyers
- ➜ 92 remodel customers

Summary of Key Findings

Product Market Share

The first goal of the ENERGY STAR Fenestration Program is to increase market share for high-efficiency fenestration products in the residential new construction and remodel market to 54% by 2001. Figure ES-1 shows the change in ENERGY STAR windows market share in the Northwest from 1997 to 2000. In our second report, we found that market share had increased to 41% for 1998 compared to the baseline of 10%-15% in 1997.[2] Our third Report now finds an overall 47% ENERGY STAR market penetration for 1999. Furthermore, the last two available quarters of sales data (third quarter 1999 and first quarter 2000) show a 54% ENERGY STAR market penetration in the Northwest. Should this trend continue throughout 2000, the Program will have succeeded in meeting its market penetration goal a year ahead of time.

Figure ES-1
Market Share of Energy High-Efficiency Fenestration Products



of products including appliances, computers, windows, etc.

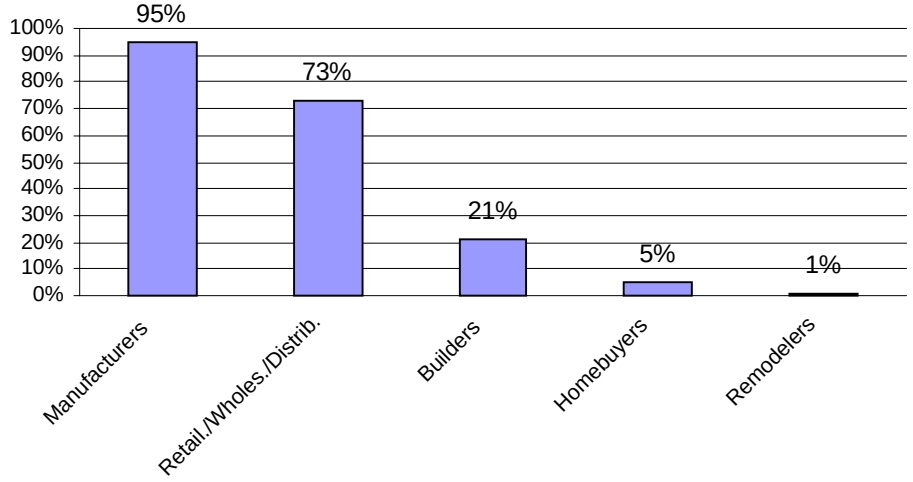
[2] Baselines numbers were developed by D&R International, Ltd., and Macro International, Inc. Figures cited here are based on sales data reported to D&R by Northwest window manufacturers comprising some 80% of the market.

Awareness

The second goal of the ENERGY STAR Fenestration Program is to decrease the lack of awareness of high-efficiency windows and their initial cost premiums that limit sales in the Northwest. Our research indicates that almost all window product manufacturers surveyed (94%) are now aware of ENERGY STAR and that most are active in the Northwest ENERGY STAR Fenestration Program.

Seventy-three percent of retailers and wholesalers/distributors (compared to 67% last year) are generally aware of the Program, but they still believe that customers' lack of awareness and information is the major market barrier. However, awareness of ENERGY STAR windows decreases significantly once we analyze responses from builders and end consumers. Only 21% of builders are aware of ENERGY STAR windows, almost the same as that found a year ago. Furthermore, although new homebuyers and remodelers express a high level of interest in energy-efficient windows and their benefits, only 5% of new homebuyers and 1% of remodelers are aware that energy-efficient windows were a component of ENERGY STAR.

Figure ES-2
Awareness Levels of ENERGY STAR Windows



Initial Cost

Advances in technology have reduced labor costs of energy-efficient windows, but manufacturers express the belief that the next big decrease

in the cost of high-efficiency windows will come only as a result of increased consumer demand. The next, and final, Market Progress Evaluation Report will examine this issue more closely.

Other findings are summarized as follows.

Window Manufacturers

Sixteen window manufacturers were interviewed for this report. Residential window sales by these manufacturers are estimated to comprise 80% or more of windows sold in the Northwest during 1999.

- ➜ Manufacturers are the strongest allies to the program. Most continue to believe in the certification power of ENERGY STAR to consumers.
- ➜ Larger manufacturers tended to be earlier adopters of ENERGY STAR standards and technologies. Smaller/skylight manufacturers tended to lag behind the innovation curve.
- ➜ Manufacturers indicated a steady pattern of annual increase in production of windows with ENERGY STAR product making up an average of 38% of their product in 1997, 42% in 1998, and 53% in 1999.
- ➜ Manufacturers estimated the proportion of ENERGY STAR to total window product sales in the Northwest market were in the range of 45% - 50% on the whole.[3]
- ➜ Manufacturers who were interviewed indicated a steady pattern of annual increase in production of ENERGY STAR windows since 1997.
- ➜ When asked if they would require further changes (equipment, etc.) to make energy-efficient windows their standard product, 12 of the 16 manufacturers said they would require no further key changes.
- ➜ Manufacturers overall did not believe that energy-efficient windows had a different percentage mark-up on cost than did other windows.

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[3] Individual estimates ranged from 5% - 85%. The above estimate is based on a 45% average and a 50% median.

- ➜ Manufacturers believed that the next big decrease in the cost of high-efficiency windows would be a result of growth in customer demand.
- ➜ Most believed that customers might be willing to pay anywhere from 10%-15% more for high-efficiency windows.
- ➜ Eleven out of 12 Northwest Partners indicated they were using labeling either on product, brochures, samples or catalogues. Six said they put labels on 80%-100% of product now or intended to do so by the end of this year.
- ➜ Manufacturers continue to rank other factors (price, quality, appearance) as more important than energy efficiency in marketing windows. However, those large manufacturers targeted by the Program have slightly increased their ranking of the importance of energy efficiency relative to other marketing factors.
- ➜ Manufacturers continued to rank price of energy-efficient windows as the highest market barrier, availability as second, with lack of information last.

Retailers and Wholesalers/Distributors

Forty-nine window retailers and wholesalers/distributors were interviewed for this report. Residential window sales by these respondents are estimated to comprise 17%-20% or more of windows sold in the Northwest during 1999. Information was also obtained from D&R for two "big box" retailers that comprise an additional 25% of the market. This report thus summarizes market share and penetration for 42%-45% of residential windows sold in 1999.

- ➜ Retailers and wholesalers/distributors continue to believe that price and quality are the most important factors in a customer's decision to purchase windows. However, energy efficiency has replaced availability as the third most important factor in window purchases.
- ➜ More than half of retailers and wholesalers continue to believe that their customers had a high demand for high-efficiency windows. The rest were evenly split between saying customers had neutral or low demand, mostly due to the higher price of energy-efficient windows.
- ➜ Ninety-two percent of respondents continue to believe that high-efficiency windows provide a good value to customers. Half as

many as last year say they are hard to explain to customers. Retailers, wholesalers and distributors do not believe that energy-efficient windows are hard to obtain. Only price has increased as an issue; 41% of retailers said customers think energy-efficient windows are too expensive compared to 31% last year.

- ➜ Seventy-three percent (compared to 67% last year) had heard of ENERGY STAR. Fifty-one percent of retailers and wholesalers/ distributors reported that they carried ENERGY STAR windows, but only14% said that customers had asked for them.
- ➜ Retailers/wholesalers reported that 53% of the windows, 49% of glass doors, and 31% of skylights they sell are ENERGY STAR-level efficiency.
- ➜ When asked the relative importance of energy efficiency, appearance, quality, and price in marketing windows, respondents ranked quality first and price second in last year's survey. Appearance and energy efficiency followed. This year, energy efficiency edged out appearance in the rankings.
- ➜ Lack of information has dropped in importance by 10% from last year and is now ranked second, behind price as a market barrier. Lack of availability remains a distant third.

Builders

Seventy home builders were interviewed for this report. These builders are estimated to have built approximately 10% of the new homes in the Northwest during 1999.

- ➜ Awareness of ENERGY STAR windows did not increase among builders. Only a few could identify ENERGY STAR window features.
- ➜ Builders estimated that 36% of the total units they constructed in 1999 were built with energy-efficient windows, similar to that reported for 1998.
- ➜ Builders who installed fewer energy-efficient windows in homes they constructed said they did so because of the cost of energy-efficient windows.
- ➜ Higher percentages of builders this year reported that energy-efficient windows were useful in advertising and promotion (37%) than last year (20%). A smaller percentage, 17% across

both years, said they saw no advantage to them in installing energy-efficient windows.

- ➜ However, 48% of builders said homebuyers were somewhat or very interested in energy-efficient windows.
- ➜ Builders continue to rate location, selling price, style of home, floor plan, and square footage as most important in marketing homes, although energy efficiency has increased in importance since last year.
- ➜ Among energy-efficient measures, builders rank windows as the most important marketing feature. Their relative ranking increased by 30%, surpassing other energy-efficient measures.
- ➜ Builders' rankings of lack of information, price, and lack of availability as market barriers have not changed over time. They continue to perceive price of energy-efficient windows to be the most important market barrier, with lack of information second in importance, and lack of availability a distant third.

New Homebuyers

Two hundred and seventy-one new homebuyers were surveyed for this report across the Northwest. Almost a third of new homebuyers were aware of ENERGY STAR energy-efficient appliances and products this year compared to 17% last year, probably due to ongoing efforts by ENERGY STAR programs for appliances and other products. However, this does not translate to awareness of energy-efficient windows. Only 5% of new homeowners (compared to 3% last year) mentioned windows or skylights when asked to name ENERGY STAR products.

- ➜ The most important factors that homebuyers considered were overall price, floor plan, and size of home. Respondents ranked energy-saving features behind location and number of bedrooms, but well above other factors.
- ➜ Fifty-six percent rated type of windows as "somewhat" or "extremely" important in their new home-purchasing decision. They reported that visiting model homes, family members, and builders were the most important sources of information for new homebuyers in general. Manufactured home dealers were also very important source of information to purchasers of new manufactured homes.
- ➜ Forty-two percent of homebuyers reported that they had not been given information on windows for their new home. Of those who

did report receiving information, 39% received it from the builder. When asked about the content of window information provided, however, only 44% (compared to 46% last year) said that the information concerned energy efficiency.

- ➜ Eighty-one percent of new homebuyers were willing to pay a higher price (from $0.50 to $2.15 per square foot) to have energy-efficient windows, consistent with last year's findings.
- ➜ Forty-six percent of homebuyers reported that they had energy-efficient windows.

Remodelers

Ninety-two remodelers were surveyed for this report across the Northwest.

- ➜ Remodelers reported that they replaced windows primarily because they were old or broken but that glass doors and skylights tended to be installed mostly due to remodeling or additions.
- ➜ Ninety percent of respondents ranked energy performance and durability as one of the top two factors influencing their purchase of windows, far ahead of other factors.
- ➜ Respondents to this year's survey named builders/contractors, sales people, product literature, and labels as sources of information, in that order.
- ➜ Ninety-six percent of remodelers reported that they or their spouses (compared to 81% in 1999) selected the type of fenestration product that they purchased. Thirty-three percent installed their own window products.
- ➜ Twenty-four percent of remodelers were aware of the ENERGY STAR program for energy-efficient appliances and products, compared to only 16% the prior year. However, only 1% (compared to 5% last year) were aware of ENERGY STAR windows.
- ➜ They value the features of energy-efficient window products; the majority of respondents rated cutting down on heat loss, making the home less drafty, quality, and saving energy as "somewhat" or "extremely" important.

Market Drivers

Our research has identified a number of active or potential market drivers in the transformation of the Northwest windows market, including:

- ➜ Windows manufacturers' strong levels of participation in the ENERGY STAR Windows program (and other national and regional energy efficiency market transformation efforts)
- ➜ Material and technology breakthroughs and service trends (e.g., more after-sale service) in windows manufacturing and related drops in the costs to produce energy-efficient windows vis-à-vis non-energy-efficient windows.
- ➜ A trend by manufacturers to position energy-efficient products in all or most of their product lines ("multi-level positioning") coupled with general availability of ENERGY STAR-level window products across the region to retailers and wholesalers/ distributors and their end customers
- ➜ Cumulative effects of building codes across the region (and the perception that this trend will continue)
- ➜ Increased awareness of energy efficiency in general by end consumers

Market Barriers

During the course of our evaluation efforts, we have identified specific market barriers to the transformation of the Northwest window market.

- ➜ **Lack of awareness and information** on the benefits of energy-efficient windows, complicated by communication breakdowns between market actors. The breakdown in communicating the advantages of ENERGY STAR windows appears crucial at the homebuilding stage in which builders control many if not most window choices.
- ➜ **Perceived higher first cost of energy-efficient windows** compared to other windows in a competitive marketplace. This barrier is evidenced throughout the extremely competitive windows market, with manufacturers, retailers/wholesalers/ distributors, and builders competing on extremely small profit margins.
- ➜ **Split incentive** (i.e., the person who incurs the initial costs does not also reap the benefits) – This barrier remains particularly evident in the decisions of builders who incur the initially higher

costs yet do not reap the long-term benefits of energy-efficient windows. Builders, in general, do not yet understand consumers' high valuation of the advantages of energy-efficient windows and the potential marketing advantages this may convey to them.

- ➜ **Bounded rationality –** Limiting the amount of information that can be meaningfully processed in order to make decisions. This remains a barrier from the retailer/wholesaler/distributor stage, through builders, down to end consumers. ENERGY STAR provides a vehicle to simplify the complexity of this "decision," but it has not yet been successfully conveyed to these decision makers.
- ➜ **Product inseparability** – The bundling of energy-efficient windows with a myriad of other housing components, including house style, location, price, neighborhood, etc., which must be consumed as a package or not at all. This may eventually be alleviated by the national ENERGY STAR emphasis on energy-efficient appliances and whole-house energy-efficiency.

Recommendations

In two previous Market Progress Evaluation Reports (July 23, 1999, and January 13, 2000), we have recommended that the ENERGY STAR Program:

- ➜ Continue to build customer demand for ENERGY STAR products at every level
- ➜ Provide extended marketing and training support to specific market actors

With the end of the ENERGY STAR Program in sight, the Alliance's attention must now necessarily refocus on what must be accomplished by the end of the program on December 31, 2000, and what steps should follow.

We believe that the Alliance and the national ENERGY STAR program effort should continue to maintain a focus on increasing the awareness of ENERGY STAR products. Retailers/wholesalers/distributors and home builders must be aware of ENERGY STAR and clearly understand the benefits to them so that they can communicate its benefits to their customers. For example, if builders understand the marketing advantages of ENERGY STAR windows, they will provide more information to

consumers, who in turn will have more information with which to express their demand.

We also believe it is now time to focus on additional market actors. Smaller window manufacturers, regional skylight manufacturers, manufactured home dealers, builders, and remodel contractors should be targeted. We understand that it may require considerable resources and that strategies may vary in terms of cost-effectiveness. However, we continue to observe gaps in builder/consumer awareness and demand that cannot be met solely through current program strategies.

In this report, we specifically recommend the following steps to the Alliance regarding the ENERGY STAR Window Program.

- ➜ Program strategies for the remainder of the ENERGY STAR Program should also include explicit consideration of promotional and testing/technology conversion support for smaller window and skylight manufacturers who still face substantial technology and testing cost barriers to converting to ENERGY STAR standards.

We also recommend that the Alliance and the national ENERGY STAR effort pursue the following strategies in regard to ENERGY STAR products.

- ➜ Continued information and promotional efforts with retailer and wholesaler/distributors who are not yet aware of the advantages of ENERGY STAR.
- ➜ Low cost promotional, marketing, and testing/technology support for smaller window and skylight manufacturers. Aggregator marketing strategies present one approach in which smaller manufacturers can obtain smaller orders of ENERGY STAR marketing product at the same volume discount enjoyed by larger manufacturers.
- ➜ Enhanced web site support by utilities providing information and contact names for ENERGY STAR product.
- ➜ Working with the mortgage/financing community to develop financing at more favorable rates for ENERGY STAR homes and products (including windows) based on their energy savings and durability benefits.
- ➜ Research on the effects of builders trading off window efficiencies against lessened efficiency standards, particularly in certain states and in manufactured housing.

➜ Campaigns to expand efforts with other regional and national energy efficiency groups to educate end consumers on the benefits of ENERGY STAR products, including windows. These should include an ENERGY STAR training strategy in product sales and installation across product lines for retailers and wholesalers/distributors and builders.

I. Introduction

The goals of the Northwest Energy Efficiency Alliance's ENERGY STAR Program are to:

- ➜ **Increase market share** for high-efficiency fenestration products in the residential new construction and remodel market to 54% after 2001.
- ➜ **Decrease at least two market barriers** – lack of awareness and initial cost premiums – that limit sales of high-efficiency fenestration products.

The ENERGY STAR program seeks to affect their energy efficiency awareness and behaviors of key market actors through a variety of program strategies. Key actors include a wide range – window product manufacturers, regional utilities, building code officials, builders, the manufactured home industry, retailers, wholesalers, and other government agencies. The Program specifically tries to increase the brand awareness and value of energy-efficient windows, and positively influence ENERGY STAR window purchasing decisions.

D&R International, Ltd., the program implementer of the ENERGY STAR Residential Fenestration Program, says the foundation of its business is the ability to broker partnerships, building coalitions to build upon relationships within industry. D&R was given a scope of work that included determining the Northwest window products market baseline and establishing the ENERGY STAR Program, developing solutions for major market barriers, developing promotional materials and launching awareness and information campaigns, conducting marketing and seeking ongoing feedback to the program. They began their task in April 1998 and will end it December 31, 2000.

Structure of this Report

This is our third report examining the progress of the ENERGY STAR Program in transforming the energy efficiency of the Northwest residential fenestration market. It examines the Program's performance over the period from approximately June 1999 through June 2000. The report updates findings from our first two Market Evaluation Reports and highlights the Program's progress towards meeting its goals preparatory to market exit. The final report is scheduled for early in 2001. It will update

market assessments and finalize impact findings and recommendations regarding the Program.

The main body of this report is divided into eight chapters. This chapter (Chapter I) provides a summary of evaluation methods employed and an overview of the ENERGY STAR Program in relation to market barriers. Chapter II summarizes the findings on the Program's penetration of the market through first quarter 2000. Chapter III revisits the impact of the ENERGY STAR Program on window manufacturers' perceptions and levels of energy-efficient production. Chapters IV and V re-examine window retailers' and wholesalers/distributors' and homebuilders' perceptions and practices. Chapters VI and VII present the most recent results of the consumer surveys of new homebuyers and remodel customers. Chapter VIII summarizes conclusions and provides recommendations on ENERGY STAR. Cost-effectiveness assumptions made for this report remain constant from the last report; thus recommendations made in our second report remain in effect.

Methodology

Four approaches were used for collecting the research and data used for this Report:

1. Assessment of window manufacturer sales data reports
2. In-depth interviews of window product manufacturers
3. Surveys of retailers and wholesalers/distributors, builders, new homebuyers, and remodel customers
4. Use of the Analytic Hierarchy Process (AHP) approach for assessing preferences

Window manufacturer sales data were provided by D&R International, Inc., the program implementers of ENERGY STAR.

Information on market effects was elicited directly from market actors. Surveys of window manufacturers, retailers and wholesalers/distributors, builders, new homebuyers, and remodelers were conducted in first quarter 2000 (Table I-1). **quantec** staff interviewed 16 regional window and skylight manufacturers, 49 retailers and wholesalers/distributors, and 70 builders. Gilmore Market Research also conducted 271 surveys of new homebuyers and 92 remodel customers across the four states on behalf of **quantec**.

The AHP approach was employed to assess retailers and wholesalers/distributors' ranking of the importance of various factors in decision-making.[4] The appendix contains the questionnaires used for the direct elicitation and AHP portions of this study.

Table I-1
Survey Summary

Segment	Completed Surveys	Notes
Window Product Manufacturers	16	A mix of ENERGY STAR participants and nonparticipants across the region by size and type (windows/skylight).
Retailers and Wholesalers	49	A mix of ENERGY STAR participants and nonparticipants from the four states
Builders	70	Selected from all four states
New Homebuyers	271	New homebuyers from Idaho, Oregon and Washington. (Sample was not available for Montana)
Remodel Customers	92	Remodel customers from all four states

Overview of the ENERGY STAR Program

The Program's objective is to make the choice of purchasing energy-efficient windows an easy, informed decision for Northwest consumers by using the marketing potential of ENERGY STAR labeling and by offering marketing incentives and promotional assistance.[5] Targets are new residential construction, multi-family, remodel, and manufactured housing.

Key partners and allies include window product manufacturers, regional utilities, retailers and wholesalers/distributors, builders, the manufactured housing industry, building code agencies, and other government agencies.[6] Industry Partners sign a Memorandum of Understanding (MOU) to use the

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4 A description of the AHP methodology is included in Chapter III.

5 The window target is aligned with the U.S. DOE/EPA Northern Region ENERGY STAR criteria. All ENERGY STAR Window products must be rated and certified by the National Fenestration Rating Council (NFRC) and be labeled for both U–Factor and Solar Heat Gain Coefficient (SHGC). One recommended window product designation is made for each of three climate regions: Northern ($U \leq 0.35$, no applicable SHGC), Central ($U \leq 0.40$, $SHGC \leq 0.55$), and Southern ($U \leq 0,75$, $SHGC \leq 0.40$). Skylights must have a U-factor of ≤ 0.45 in the Northern or Central climates and ≤ 0.40 or below in the Southern climate region.

6 These include DOE, EPA, SEO's, and the NFRC.

ENERGY STAR logo in advertising, educational, and other promotional materials. In return, they label qualified ENERGY STAR products and educate staff on the advantages and selling points of energy-efficient products.[7]

In January 1999, in addition to promotional materials, training, and sales support, the Program began to offer monetary incentives to selected window manufacturers in order to leverage ENERGY STAR windows marketing, advertising and promotional activities. The Program continues to build these relationships as well as reach out to other market actors (utilities, retailers, builders, glass manufacturers, etc.) in order to build and leverage the ENERGY STAR Program.

Intervention Strategies

The Program itself focuses on developing industry partnerships and leveraging these to induce change in the marketplace. While partnership efforts were initially focused on six large regional window manufacturers in the program's beginning, types of partnership were expanded throughout 1999 and the first half of 2000 to include utilities, window component manufacturers, retailers, and builders. The overall Strategic Marketing Plan was developed to reach a diverse audience with a wide variety of media approaches in order to increase the brand awareness and value and to positively influence the purchasing of ENERGY STAR Windows. Key messages were that ENERGY STAR Windows provide more comfort, have aesthetic appeal, reduce maintenance, provide protection from fading due to sun, and are more energy efficient than standard windows. Materials developed by D&R to market ENERGY STAR windows include fact sheets, press releases, brochures, newsletters, trade show exhibits, print media advertisements, special "give-a-ways," sales team training kits, point-of-purchase materials, and builder sales kits. Media and promotional campaigns have included trade shows, the Street of Dreams, the Parade of Homes, monthly trade association meetings, industry conferences, golf tournaments, and advertising such as promotional banners at special events (e.g., a Seattle Mariners baseball game) to recognize achievements of leading ENERGY STAR partners.

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[7] Includes Oregon, Washington, Montana, and Idaho. Skylights must have a U-factor rating of 0.45 for the Northern region, 0.45 and a SHGC rating of 0.55 or below for the Central region, and a U-factor of 0.75 or below and a SHGC of 0.40 or below for the Southern region.

Review of the 1998 ENERGY STAR Windows Program

The first year of the Program focused on building a positive image for ENERGY STAR in the Northwest, particularly in the market sectors that ultimately serve the consumer: utilities, window manufacturers, the building industry, and window retailers. At the beginning of 1998, the Northwest Project was still a separate regional effort. In February 1998, the Alliance supported the decision to move to the federal ENERGY STAR performance level. By spring 1998, the Northwest ENERGY STAR Windows program was rolled out. Throughout the remainder of the year, meetings with builders, window manufacturers, and attendance at trade shows in the region continued. A retailer "kit" was developed, premised on a boxed point-of-sale set of materials ready for use by the retailer in the store. By December, the ENERGY STAR Windows program was working with the window industry to find alternative technologies to make high-efficiency window products without argon gas by using stainless steel spacers, spectrally selective low e coatings, and better frame design. The end result of the new approach is lessened production time and decreased costs for high-efficiency windows.

By the end of 1998, a new marketing direction was developed, shifting emphasis toward marketing incentives and aid to regional window manufacturer Partners. The hope was that the strategy would actively engage industry Partners to achieve higher margin sales to retailers through value-added marketing assistance, and simple messages to consumers. The strategy envisioned that retailers in turn would order more ENERGY STAR Window products, thus increasing production by manufacturers of high-efficiency windows, completing the cycle.

1999 ENERGY STAR Windows Program through May 2000

Throughout 1999 and into this year, the ENERGY STAR staff has continued to meet with window manufacturers, retailers and wholesalers/distributors, manufactured home builders, and builders to present marketing strategy, seek cooperation, and provide marketing aid to the six partner window manufacturers that represent an estimated 80% of the Pacific Northwest sales.

Regional partner recruitment was expanded to include manufactured home builders, retailers, single-family and multi-family builders, and a window component manufacturer. ENERGY STAR met with utilities (Idaho Power, PGE, Seattle Power, Montana Power, EWEB, etc.) and other potential program partners. Program marketing materials were developed and

distributed to the media, partners and their affiliated window distributors and retailers, and at home shows in all four states. Meetings with builder associations and selected builders continued and public relation plans developed for the single-family, multi-family and remodel sectors. Meetings began again with manufactured home builders, and specific promotional campaigns included television ads to be co-sponsored by partners and a Seattle Mariners baseball game promotion for retailers. Retailer training was held throughout the region. Co-op ads were developed with Parr Lumber and Best Built Windows.

By the end of last year, the six window manufacturer partners and three window glass and window distributors had made matching contributions to ENERGY STAR of more than $760,000. Northwest manufacturers' estimated advertising/promotion budgets for 2000 are expected to reach $1.2 million.[8]

The Program focused its efforts on the six selected regional window manufacturers. Table I-2 shows the expansion of the Program's efforts to enroll partners, including those window manufacturers, manufactured home builders, retailers, and others (builders, window component manufacturers, etc.). The Program worked with a total of 33 Partners by the end of 1998, including window manufacturers, retailers and distributors, manufactured home builders, and other allies (glass manufacturers, etc.). By May 2000, this had risen to 55 Partners. Much of the increase was attributable to ENERGY STAR Program efforts to add window retailers and distributor partnerships.

Table I-2
ENERGY STAR Partnership Efforts: 1998 – May 2000

	1998	1999 – May 2000
Manufacturers	20	26
Retailers/Wholesalers/Distributors, etc.	13	29
Total	33	55

ENERGY STAR efforts during the rest of this year include continued coordination of market approaches with regional utilities, windows manufacturers, their clients and the distribution infrastructure, including:

- ➜ Point-of-sale programs

[8] Sharon Spencer and Gary Curtis, D&R, International, Inc., June 23, 2000.

- ➜ Continued program training
- ➜ Co-operative advertising and promotional programs.

Also included is a “Retailer Round-Up” promotion slated to kick-off in July. It is designed to encourage window manufacturer representatives to obtain signed MOUs with their retailers and builders.

Market Barriers and Program Intervention Strategies

This third Market Progress Evaluation Report includes updated findings for window manufacturers, builders, retailers and wholesaler/distributors, homebuyers and remodel customers. It describes the barriers to the downstream flow of energy efficiency and specifies which barriers are the most critical to market actors.

Table I-3 presents a brief summary of market barriers and Program intervention strategies identified for key market actors. Issues identified as potential market barriers to transformation of the Northwest market include lack of awareness, lack of information, first cost, split incentives, bounded rationality, product inseparability, and lack of availability. Lack of awareness and lack of information are self-explanatory; if end consumers cannot define the parameters of a product because they lack information, they cannot meaningfully express their demand for it in the market. The problem of first cost is illustrated by manufacturers and retailers who produce and market a better, but more costly, good (such as energy-efficient windows) that must compete with a wide array of cheaper, although inferior, products. Split incentives is the issue that those who must incur the initial cost of a better, but more costly, product (such as builders) may not also incur the benefits of that product. This is particularly the case when the product is energy-efficient windows, which have higher initial costs for the builder but provide a steady stream of energy savings and other benefits to the end user over the lifetime of the measure. Bounded rationality refers to the problem that end consumers may not be able to evaluate the cost-effectiveness of energy-efficient windows due to the wide array of information required to make a meaningful decision. Product inseparability is best illustrated by the dilemma that the new homebuyer faces when he or she tries to choose a new house – house style, location, price, and windows are all dimensions of a bundled good that cannot be meaningfully separated. Lack of availability refers to whether a product, such as high-efficiency windows, are available in the marketplace.

Table I-3
Market Barriers and Intervention Strategies

Market Actor	Market Barriers	Intervention Strategies
Window Manufacturers	• **Lack of Information** • **First Cost**	• Developing strategies to facilitate the production and lower the cost of producing ES Windows • Signing MOUS (some with cash incentives) to promote marketing of ES Windows • Marketing promotions • Dissemination of information though design and provision of brochures, advertising, articles, media spots, point-of-sale kit, etc
Retailers/Wholesalers/ Distributors	• **Lack of Information** • **First Cost** • **Split Incentives** • **Bounded Rationality**	• Signing MOUs to promote marketing of ES Windows • Marketing promotions • "Buddy Calls" to manufacturer representatives • Dissemination of information though design and provision of brochures, advertising, articles, media spots, point-of-sale kit, etc. • Providing training materials for retail staff
Builders/ Developers	• **Lack of Awareness** • **Lack of Information** • **Split Incentives**	• Signing MOUs to promote marketing of ES Windows • Advertising in magazines • "Buddy Calls" to manufacturer representatives • Ongoing promotion and attendance at home builder shows • Trade association advertising and public relations contacts • Development of sales kits
New Homebuyers/ Remodelers	• **Lack of awareness** • **Insufficient information** • **Lack of Availability** • **Bounded rationality** • **Product Inseparability**	• Promotions at home and garden, remodeling shows • Point of sale displays • New labels on windows • Increasing availability and lowering cost through upstream interventions (e.g., with manufacturers and builders)

II. Market Assessment

This Report updates the market characterization for ENERGY STAR windows in the Northwest region (Idaho, Montana, Oregon, and Washington) and provides an assessment of the market potential for the Program. It examines the roles of consumers (new homebuyers and remodelers), builders, retailers and wholesalers/distributors, and window product manufacturers in affecting market transformation. It specifically examines changes in their level of awareness and knowledge of ENERGY STAR and the importance of factors in their decisions.

Market Assessment Overview

The Alliance has set the goal of increasing market share of high-efficiency fenestration products at 54% of the residential new construction and remodel market. This increase in penetration is to be achieved by decreasing at least two market barriers – lack of awareness and initial cost premiums. Baseline evaluations done in 1997 showed an estimated ENERGY STAR level windows market share in the Northwest in 1997 of 10%-15%.[9] This chapter reassesses market share based on information gathered from a wide range of market actors – window manufacturers, retailers/wholesalers/distributors, homebuilders, and consumers.

Market Share

Product market share for this Report is derived from a number of sources, including:

- ➜ Residential window sales figures for 1998, 1999 and first quarter 2000 collected from participating Northwest window manufacturers.
- ➜ In-depth interviews of window product manufacturers, retailers and wholesaler/distributors, and builders
- ➜ Surveys of new homebuyers and remodel customers

In sharp contrast to the 10%-15% market penetration estimated for ENERGY STAR windows in 1997, sales data reported by manufacturers for

[9] D&R International, Ltd. (D&R) and Macro International (Macro) conducted two separate evaluations (D&R Annual Report, 1998, and Macro, 1999) in order to ascertain the 1997 market share for products with a U-factor of 0.35 or lower.

1998 indicated a 41% ENERGY STAR penetration of windows in the Northwest. By the end of 1999, the annual penetration rate had climbed to 47%. Table II-1 provides a summary of the data sources collected and analyzed to date providing support for this estimate. The current surveys of retailers and wholesalers/distributors, builders, and consumers provide further evidence of the reasonableness of the overall estimate of 47% for 1999 ENERGY STAR market penetration.

Table II-1
ENERGY STAR Windows Market Penetration

Sources	Reported Penetration		
	1998	1999	1st Q 2000
Window Manufacturers Sales Data [1]	41%	47%	54%
Retailers and Wholesalers/Distributors [5]	40%	53%	
New Homebuyers			
• Single-family[2]	35%	36%	
• Multi-family[2]	44%	38%	
• Manufactured [3]	19%	NA	
Remodeled Homes [4]	66%	64%	

1 AAMA sales data provided by D&R, Inc.

2 **quantec** builder 1999 and 2000 surveys

3 Personal communication, Bob Davis, Ecotope, May 3, 1999

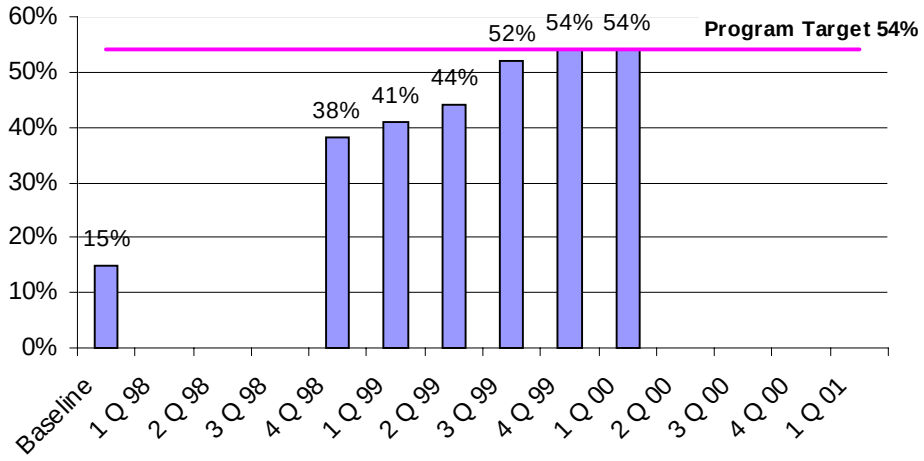
4 **quantec** remodel customer 1999 and 2000 surveys – based on total EE product 1999, low e windows 2000

5 **quantec** retailer and wholesalers/distributors 1999 and 2000 surveys

Figure II-1 shows quarterly ENERGY STAR window penetration estimates sales reported by window product manufacturers.[10]

10 Based on data for manufacturers with approximately 80% of the market (D&R, Northwest ENERGY STAR Window Program, 1998 Annual Report, p. 15).

Figure II-1
ENERGY STAR Window Sales by Northwest Manufacturers: 1997 through 1st Quarter 2000*



* Quarterly data are available beginning in fourth quarter 1999. The increase between second and third quarter 1999 is due to one manufacturer increasing ENERGY STAR production and another correcting totals to include ENERGY STAR windows sold to manufactured housing builders. Missing data for one manufacturer for first quarter 2000 has been projected by using fourth quarter 1999 data.

Based on the above level of reported window sales, ENERGY STAR penetration levels reached 52% in the third quarter and 54% for fourth quarter 1999 and first quarter 2000. If the trend shown by the last three quarters continues, the Alliance's goal of 54% market penetration will have been met a year earlier than expected.[11] These results will continue to be tracked over the remainder of 2000 to ascertain whether market transformation has been "locked in" for the remainder of the Program planning period.

[11] This also assumes that the remaining windows manufacturers (most of whom are now ENERGY STAR Partners), would have the same ENERGY STAR penetration as reported by ENERGY STAR Partners in 1998.

III. Manufacturers Survey

Window manufacturers, like all other manufacturers, base their production decisions on actual or anticipated demand for their products. Their profit motives are driven by their major client needs downstream. This report examines the changes in window manufacturers' perceptions and behaviors regarding ENERGY STAR and ENERGY STAR-equivalent energy efficiency window products since our last interviews with manufacturers in early 1999.

Methodology

In order to understand the needs and perceptions of window manufacturers, **quantec** conducted two waves of interviews, one year apart, with Northwest window and skylight manufacturers. A few of these, including Jeld-Wen, Empire Pacific Industries, Insulate Industries, Viking, Philips, Carefree, and Milgard Manufacturing, are responsible for the majority of the regional sales. Sixteen window manufacturers were interviewed for this report. Residential window sales by these manufacturers are estimated to comprise 80% or more of windows sold in the Northwest during 1999.[12]

The sample quotas for the first and second rounds of interviews were ten and 15, respectively. The increase in the quota was to ensure that the viewpoints of more manufacturers were included. Actual final sample sizes were 11 and 16 (Table III-1).

Table III-1
Manufacturer Samples - 1999 and 2000

Interview Date	Quota	Interviews	Refusals
March 1999	10	10*	1
March 2000	15	16	0

* Eleven interviews were conducted based on Partner lists. One later was found to be a distributor and was removed from results.

[12] Confidentiality concerns prevented direct computation of market share for individual manufacturers. This estimate is arrived at indirectly based on D&R's knowledge that some seven manufacturers included in our 1998 sample constituted 80% of the market; these same manufacturers and additional manufacturers were included in the 1998 sample, leading to the above estimate for 1999.

We used both direct elicitation and Analytical Hierarchy Process (AHP) in conducting the phone surveys. The manufacturers were asked a number of exploratory questions during interviews, including:

- ➜ Is the market for high-efficiency fenestration products increasing, decreasing, or staying the same? Why?
- ➜ What is the difference in production costs and prices between regular and high-efficiency fenestration products?
- ➜ What are consumers willing to pay for high-efficiency fenestration products?
- ➜ What are the major market barriers to high-efficiency fenestration products?
- ➜ What can be done to decrease these market barriers?
- ➜ What are the strengths and weaknesses of the ENERGY STAR Fenestration Program?
- ➜ Are manufacturers labeling ENERGY STAR products?

Manufacturers were asked AHP questions in order to establish their preference ranking of energy efficiency compared to other factors in terms of marketability of windows. They were also asked to rank their perception of the importance of the various market barriers to the implementation of energy efficiency.

Effort was made to ensure that the second wave of interviews included manufacturers (and the same respondent, if possible) interviewed in the first round. D&R International, Ltd., provided the initial sample of manufacturers to which additional manufacturers' names were added.

Most of the largest manufacturers in the Northwest have now provided window sales data for 1998 and 1999 through the auspices of their trade organization, the American Architectural Manufacturers Association (AAMA). Results of manufacturer sales data are presented in detail in Chapter II, Market Characterization and Assessment.

Data Analysis

Market Trends

The focus of all manufacturers interviewed this year was on the single-family residential market. Most also mentioned some activity in the multi-

family/commercial market, and two mentioned manufactured homes. Furthermore, the majority of the respondents reported that most of their activity was in the new construction market. A smaller number had a substantial remodel market, and a couple focused on high-end custom projects and remodeling.

Manufacturers' perspectives of ENERGY STAR were found to differ by size and by type of manufacturer (windows versus skylights). Larger manufacturers and/or window manufacturers, compared to smaller and/or skylight manufacturers, tended to be earlier adopters of ENERGY STAR standards and technologies.[13]

The number of steps in the distribution chain from manufacturer to end consumer is shrinking. The historical pattern of the manufacturer selling to the distributor who sells to the retailer who sells to the end consumer is now shifting to the manufacturer selling directly to the big retailer who sells to the end consumer (contractors, home owners, etc.).

Cost has become a bigger issue this year. The cost of glass, vinyl, and aluminum has increased significantly this past year. Input material costs significantly affect sales and profits in the high-volume, low-margin window products industry.

Last year's trends in technological innovations conducive to increased energy efficiency continue. These include the increased availability and use of fiber glass window frames, a continued movement to vinyl frames, low –e high-technology window glass, and use of high-efficiency design (super-spacer, etc., more hardware and operating options).[14]

Respondents continue to believe that the Northwest is very energy conscious and more environmentally aware than other parts of the country. These effects are felt most in Oregon and Washington and, to a somewhat lesser extent, in Montana and Idaho (states with less stringent energy efficiency codes).

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[13] Half of the manufacturers interviewed in 2000 were categorized as large; about two-thirds manufactured windows and about one-third produced skylights only. Skylights proportionately make up a very small segment of the total window products market but their views, as were the views of smaller window manufacturers, were elicited to obtain more knowledge of the entire market.

[14] Aided by D&R's efforts to promulgate information and support of soft-spacer technology.

ENERGY STAR

In early 1999, all ten manufacturers had heard of the ENERGY STAR Program and almost all were either partners in the program and/or had signed the Memorandum of Understanding (MOU).

This year, 15 out of 16[15, 16] manufacturers interviewed indicated that they were aware of the Northwest ENERGY STAR Program; 14 indicated that they were Northwest or national Partners.[17] Another indicated that D&R had spoken to him and he that was interested in becoming a Partner, but he still needed to have his window product(s) certified by the National Fenestration Rating Council (NFRC). Only one manufacturer interviewed said that he had not been approached by ENERGY STAR.

Much of the growth in ENERGY STAR awareness appears to be due to the strong and consistent efforts of D&R International. Twelve manufacturers recalled having been contacted by D&R in the past six to twelve months and often in the last month or so, and they could name the specific person or persons with whom they spoke. Several could name the next meeting and/or activity planned in the program with D&R. The remaining four manufacturers, two of whom were national partners, said they had not had contact with D&R, but this may be a result of the limited knowledge of the respondent, as they had to work with the program implementor to become national partners.

Last year, manufacturers' responses were very positive regarding the potential for the ENERGY STAR program. This year, their responses were still extremely positive on the whole but tempered by actual experience. They provided detailed feedback on the program and issues and barriers faced in transforming the market to ENERGY STAR.

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15 A little confusion still exists in Idaho regarding the Department of Water Resources' role vis-à-vis ENERGY STAR, apparently due to their inclusion of ENERGY STAR windows in a state low interest loan program.)

16 Based on D&R information, twenty manufacturers have signed Northwest ENERGY STAR Partnership agreements.

17 Two manufacturers indicated that they were national (not Northwest) ENERGY STAR Partners. Only one skylight manufacturer said he was not involved in ENERGY STAR at all. This manufacturer had vigorously opposed the imposition of codes on skylights during the last code session due to testing and cost issues.

Manufacturers continue to strongly believe in the certification power of ENERGY STAR to consumers. They commented:

> *"ENERGY STAR is like the Good Housekeeping [certification seal] – do it or be left behind."*
>
> *"ENERGY STAR is an easy way to differentiate ourselves – [it] helps justify [our efforts] and add credibility."*
>
> *"We saw ENERGY STAR as an excellent marketing promotion. It gave us the ability to use a recognizable symbol to promote. ENERGY STAR is separate from the window [manufacturer's] side, so it carries strong credibility. It could be used to upsell as another advantage."*
>
> *"People are starting to ask for ENERGY STAR windows. It's not a tough sale like five-six years ago – now it's the norm."*

Manufacturers also spoke about the actual program implementation, positive and negative as follows:

> *"We get lots of information [on energy-efficient windows] – something almost every day either from AAMA or ENERGY STAR."*
>
> *"It had a rough start with a whole lot of questions and requirements for documentation on sales, etc., but it's much cleaner now. They understand what we can share now and not [share]."*
>
> *"We signed because we thought it was a good program, felt that it would bring credibility to the company and products, and hoped for additional sales. It's a beginning; they're trying, but it hasn't done anything for us. We're on the web page, but we haven't had a single inquiry. It needs more marketing to raise consumer education and awareness." (skylight manufacturer)*
>
> *"ENERGY STAR got a real slow start, but people are becoming more familiar with the logo from other things (appliances, etc.) We saw it as a benefit, even if only a small one. It works well for windows, but it needs more emphasis on skylights."*
>
> *"[ENERGY STAR] was initially pretty vague as to their expectations of us – ENERGY STAR gave us money, and we did our own approach. Then they came back with more specific ideas. They had*

good promotional ideas and dialogue. Some of the promotions, for example, the Mariner ball game, went over very well with dealers. Their focus is on dealer and builder education now. As a wholesale manufacturer, we believe that it's the consumer that needs to be educated. But I'm dependent on dealers to educate the homeowner."

"The program is good, very proactive. It has helped with money, helped us talk to people – [it's] almost too flexible. Sometimes it would be good to have had more direction."

"ENERGY STAR is structured so we can make of [the program] what we want. [D&R] is enthusiastic and will try different things. We're the only manufacturer with a year-long ENERGY STAR marketing plan. It gives more credibility, so we tout ENERGY STAR."

"ENERGY STAR is doing a pretty good job – but [the current strategy on Manufacturer Partners] might grow the big [manufacturers] to be bigger and sweep the small [manufacturers] aside as an effect. I don't think that they meant to do that – maybe there was a little too much money too quick and so some got it [and others didn't]. It has helped our relationships with our dealers more than our sales. Consumers don't recognize it yet – they just see windows."

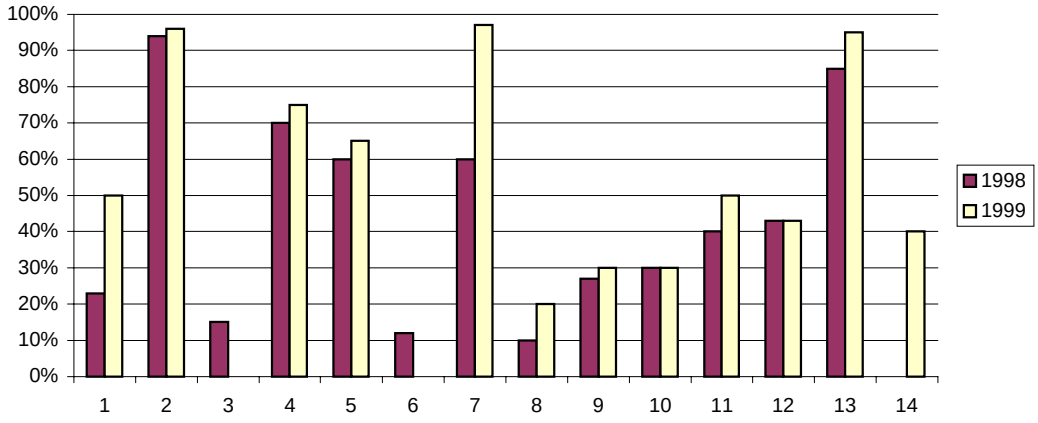
- ➜ On a regional basis, Manufacturers estimated the proportion of ENERGY STAR to total window product sales in the Northwest market were in the range of 45% - 50% on the whole.[18]
- ➜ Estimates of the national market share of high-efficiency windows were much lower – mostly in the 15%-30% range. Manufacturers believed, however, that national percentages of energy-efficient windows would also increase over time. The "earlybird" participation of Northwest manufacturers in the ENERGY STAR program should provide an advantage over manufacturers outside the Northwest for the next few years.
- ➜ In terms of their own company sales, manufacturers estimated last year that ENERGY STAR level window products made up an average of 46% with a range from 12%-100% of their total

[18] Individual estimates ranged from 5% - 85%. The above estimate is based on 45% average and a 50% median.

sales.[19] This year, manufacturers' estimates of ENERGY STAR window products to total window product sales with an average of 53% and a range of 20%-97%.

➜ Those window manufacturers whose sales are more in the remodel market believe that energy-efficient windows make up a much higher percentage of remodel sales than new homebuyer sales, chiefly due to the reluctance of builders to add anything to first costs of new homes.[20] These respondents also reported the highest percentage of ENERGY STAR window sales with several saying that it had become their standard window product (Figure III-1).

Figure III-1
ENERGY STAR as a Percent of Sales*



* Three respondents could not provide information for both years. One skylight respondent, not shown, reported no ENERGY STAR skylight sales. The remaining manufacturer refused to provide information.

Smaller manufacturers, whether windows or skylight manufacturers, show a pattern of lower penetrations of ENERGY STAR-level products, while the largest manufacturers tend to have higher penetrations of ENERGY STAR.

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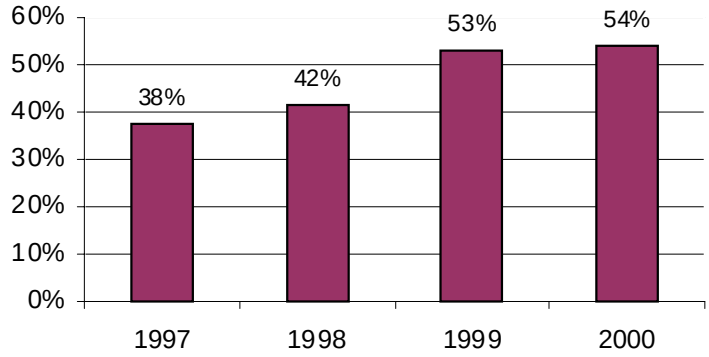
19 Respondents last year appeared somewhat confused at times by the term "high-efficiency" although the interviewer indicated it meant $U \leq 0.35$ for windows. Some respondents indicated that they thought $U \leq 0.40$ was the standard. 1999 respondents appeared to more clearly understand the ENERGY STAR high-efficiency definition.

20 One respondent estimated that 90% of new home windows were at code while some 50% of replacement windows were ENERGY STAR level. Another agreed that perhaps 50% of replacement windows were $U \leq 0.35$ but estimated that only some 30% of new home windows were ENERGY STAR level. A third estimated that 40% of ENERGY STAR level windows were for replacement windows but that 60% of new windows were ENERGY STAR.

When asked about their percentages of ENERGY STAR sales for 1997 – 1999 and projected sales for 2000, almost all manufacturers indicated steady patterns of increase (Figures III-2 and III-3). Although the estimates appear fairly reliable for 1998 forward, comparing them to other manufacturer's sales data, the 1997 estimate is based on fewer responses, and in the case of skylight manufacturers is biased by one large respondent. [21]

Figure III-2
ENERGY STAR as Percent of Total Sales by Manufacturer 1997 – 2000



When examined by type of manufacturer, a clear difference emerges in the timing of reported ENERGY STAR increases (Figure III-3). Window manufacturers report a large jump in percentage of ENERGY STAR windows in 1999, while the increase reported by skylight manufacturers is more gradual. This difference is linked in time to the rollout of the ENERGY STAR Program, which was primarily directed at window rather than skylight manufacturers.[22]

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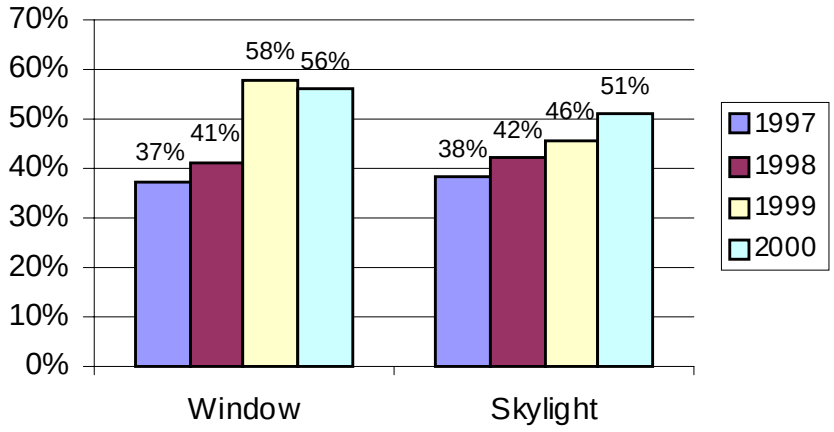
21 A third of respondents could not provide ENERGY STAR penetration data for 1997. Those who could tended to be manufacturers who had been involved in ENERGY STAR from its inception.

22 The projected decrease from 58% to 56% for window manufacturers for 2000 is attributable to one manufacturer who said its 1999 job mix reflected unusually larger jobs. Larger jobs tended to use ENERGY STAR products.

Figure III-3
ENERGY STAR as Percent of Total Sales by Type of Manufacturer 1997 – 2000



Last year, four manufacturers said that energy-efficient products made up a substantial amount (50% or more) of their window product sales and at least some manufacturers still appeared to define "energy efficient" as "code" level efficiency, which, depending on the state, can be anywhere from U ≤ 0.4 to 0.6. One year later, double the number (eight) of manufacturers said that ENERGY STAR level efficient products made up some 50%-99% of their products, and every respondent was familiar with the ENERGY STAR definition of energy efficiency. Energy codes and the positive effects of ENERGY STAR and associated window transformation efficiency program efforts were named as important market drivers in increasing the penetration of energy-efficient windows in the Northwest. Other key factors included the effect of the need to differentiate in an extremely competitive industry and technological advances enabling higher levels of energy efficiency.

Manufacturers continue to believe that market share of energy-efficient windows is strongly influenced by codes. Size and type of manufacturer made a difference in manufacturers' perspectives on whether it was hard to meet ENERGY STAR standards. The largest skylight manufacturer (a national presence) said it was not a problem to meet ENERGY STAR efficiency standards and that, in fact, all its products met them. This manufacturer believed that code standards should be raised significantly. In strong contrast, three smaller, regional skylight manufacturers said that overly stringent code requirements, and especially difficulties with NFRC skylight testing requirements, made it "almost impossible" to develop a

skylight that met ENERGY STAR standards.[23] They said that the costs of product development, NFRC testing, and capital investments to make high-efficiency window products act as significant barriers to small manufacturers.[24]

Manufacturers this year differed in their opinions as to whether the costs of energy-efficient windows have dropped or stayed the same. Their opinions were heavily affected by the general cost increases in input materials costs, as well as by the specific capital and certification costs of energy-efficient windows and skylights. They agreed that high-efficiency windows cost more to make than clear glass in general but that this differential was diminishing as the availability of technology and energy-efficient materials decreases labor costs and high-efficiency windows begin to replace clear glass windows as the market standard. The highest barrier appears to be the costs of conversion technology and testing but, once these are accomplished, labor costs drop. One manufacturer commented that the cost for early adapters was higher but that the preponderance of manufacturers who have adopted ENERGY STAR seemed to believe that it has enabled them to look like industry front-runners. One small company said that ENERGY STAR enabled him to look like a "big profile" company. The difference in perception of costs appears to be closely associated with the manufacturer's proportion of window products already converted to high efficiency.

Smaller regional manufacturers (particularly smaller skylight manufacturers) were still struggling with the costs versus the benefits of moving to ENERGY STAR. More smaller, regional manufacturers were interviewed this year, and this may have caused the issue of NFRC testing and membership and the costs of capital intensive technology to meet ENERGY STAR levels of efficiency to emerge. Skylight manufacturers said that skylights were the first window product dropped from a housing

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23 Skylight manufacturers say that the inclusion of the wood curb (flashing around the installation of the skylight) is counted for skylight testing, thus depressing the efficiency results of the product. For windows, on the other hand, they said that only the center of the window is tested, producing inequitable results that depress sales of skylights and make it almost impossible to meet high efficiency testing standards. Discussion with D&R indicates that both skylights and windows take into account the frame – what is in controversy appears to be what is defined as an integral part of the frame. In the Northwest, contractors commonly build the frame, as opposed to some other parts of the country where the curb is designed as an integral frame component.

24 One respondent estimated that each skylight product required $2,000 to $3,000 for NFRC testing and that the capital investment to upgrade his production lines would cost in the range of $200,000 to $400,000.

package when costs rose and/or builders were having difficulty meeting code energy efficiency levels. A few made the argument that the gained benefits of energy efficiency between those states with more stringent energy codes and ENERGY STAR are minimal, compared to the costs of tooling up to meet ENERGY STAR.[25]

Skylight manufacturers were more likely be among the few manufacturers that still appeared to rely on the code definition of "energy-efficient" as compared to the ENERGY STAR definition. They also differed from the windows' manufacturers in that they believed their "energy-efficient" products were much more likely to be installed in new rather than remodel construction. (Windows manufacturers, by contrast, stated that ENERGY STAR-level windows were much more likely to be installed in remodel applications.) Skylight manufacturers also said that replacement skylights, though much better in terms of energy efficiency than those they replaced, were not up to code levels in the majority of cases, let alone ENERGY STAR standards of energy efficiency.

Future directions for most large manufacturers included continued research, testing, technology changes, keeping up with and beating industry standards, new product installation approaches, and raising the energy-efficiency bar both in the region and in other plants outside. Twelve of the 16 manufacturers said that they would require no further key changes (e.g., production lines, etc.) in order for high-efficiency window products to become their standard lines. Most said they had already put in place the production line changes in the past few years and could essentially offer all products in energy-efficient versions as required.

The picture was different for smaller, regional manufacturers. The smaller companies repeatedly mentioned the costs of tooling up to meet efficiency standards as a very real barrier. They were not early adopters and were just now facing the costs of buying Intercept machines, new plastic molding dies, and adding PVC welders. These manufacturers said that getting a window certified for NFRC standards could easily cost several thousand dollars per product, as well as membership fees. It is interesting to note that manufacturers, as a group, said that high-efficiency window products received no additional markup. However, somewhat wistfully, a few mentioned that the "upselling" potential of high-efficiency window products should allow more potential margin but that consumers had to be informed of the long-term (lifecycle) benefits of ENERGY STAR.

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[25] Oregon, for example, has a windows code of U = 0.40.

Apart from technology and certification costs, manufacturers believed the next big decrease in the cost of high-efficiency window would be a result of growth of customer demand. Most believed that the strongest effect of ENERGY STAR in market transformation would be felt when end-use consumers became more aware and more educated as to the long-term benefits of ENERGY STAR over standard window efficiencies. Except for those few that had completely retooled to high-efficiency windows, they felt, that until this was achieved, high-efficiency windows would remain a specialized market.

Experience in Marketing ENERGY STAR

When asked what manufacturer's experience had been like in marketing high-efficiency window products this last year, a range of responses emerged. At one end of the continuum was a continued emphasis on first cost and competition:

> *"Dealers compete down to the nickel."*
>
> *"Builders decide that a window package for a house is a 'go or no go' on a difference of $5 per window."*
>
> *"We focus on making what people will buy, not trying to lead them."*
>
> *"As customers become more and more aware, we market energy efficiency a little more."*
>
> *"[It's] frustrating because of the slow pace of change – a few leaders focus on energy efficiency, but builders [generally] focus on first costs. The building industry is archaic in its emphasis on first costs. On the other side, you have the counter forces (the Alliance, codes, DOE) emphasizing the importance of energy efficiency."*

A not uncommon response by some manufacturers was that energy efficiency was just one of their selling points (others included quality, custom design, special characteristics).

> *"We've focused on the comfort and quality of ENERGY STAR, not so much on its energy efficiency. The media is marketing energy efficiency more to end users."*

"There's more marketing opportunity when energy efficiency is coupled with other attributes like increased durability."

"[You] have to talk [ENERGY STAR] up as a 'win-win.' The media exposure from home shows and television home improvement shows is helping to raise consumer awareness."

We also heard of manufacturers' frustration at not being able to control the dialogue occurring between dealers, retailers, and the end customer. They mentioned the problems of educating dealers and turnover of the retail people at the counter who talk directly to consumers, and that builders were slowly coming to recognize the benefits of ENERGY STAR as a marketing tool.

"I have to get technical information to dealers in our network but they don't have time to read – we need to convey it verbally – word of mouth is very effective."

"I can educate dealers on upselling ENERGY STAR, but the problem is that counter people receive training and then leave four months later."

At the other end of the range, we interviewed manufacturers focusing on the retrofit market who said that they had had no problems marketing ENERGY STAR windows and that they expected demand for ENERGY STAR window products to expand dramatically.

"Nothing magic – it's no problem to market [energy-efficient windows]. We do more promoting of ENERGY STAR than anyone else in the valley . . . . [I] wish we could promote it better. I don't think homeowners know much about ENERGY STAR.

"Consumer demand for ENERGY STAR windows is now building up 'back pressure,' . . . people are developing an awareness that will be expressed when they buy another house or upgrade."

"We haven't begun to tap the full opportunities of marketing energy-efficient windows. As codes adopt higher energy efficiency levels, the difference between minimum and superior [energy] performance is compressed. It will be harder for little Mom and Pop manufacturers to differentiate themselves but big company innovations will still trickle down. So don't stop – keep going!"

Across the board, the message was that consumers are interested and

receptive, but they don't understand the benefits of ENERGY STAR window products. Over and over, manufacturers asked to have more information conveyed to consumers in such a way so consumers can understand the lifecycle benefits of energy-efficient windows.

When manufacturers were asked whether they believed consumers would pay more for ENERGY STAR window products, eight out of nine manufacturers responding said that they would pay up to 5%-15% more.

When asked if they would have done anything differently had there not been the ENERGY STAR program, most respondents initially said that they had already utilized energy efficiency in their efforts to market products and wouldn't have changed anything in their usual approaches. However, as they continued to talk, their responses indicated that ENERGY STAR had positively affected manufacturers advertising and promotion of energy-efficient windows. The majority indicated that they had very "thin" marketing departments, often consisting of one or two people at most. They appreciated the additional training, promotional, and advertising efforts made possible by ENERGY STAR.

Manufacturers in general, and especially large and small ones, differently perceived and used ENERGY STAR marketing aid. One large manufacturer said that the additional ENERGY STAR financial aid made up only perhaps 2% of his total advertising budget but was very useful because his company was national in scope and had no specific budget for regional advertising. Another large manufacturer said that the "hassle" involved in providing documentation on sales was so much that, at one point, he had seriously considered cutting a check to send the money back to ENERGY STAR.[26]

Small manufacturers, in comparison, had little if any marketing budget. One said that he had hoarded ENERGY STAR labels, putting them only on windows that required labeling through the Idaho Department of Water Resources program because "stickers were so expensive and he didn't want to run out of them." During his comments, he began to reevaluate his strategy, wondering if he could get a new supply if he did use them on all his ENERGY STAR level windows.[27]

Eleven out of twelve Northwest ENERGY STAR Partners indicated that they

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[26] This issue has since been resolved.

[27] D&R indicated that a certain quantity of ENERGY STAR labels is provided to manufacturers free. They are then expected to purchase additional labels at their own cost.

were using ENERGY STAR labeling, either on product, brochures, samples, or catalogues.[28] Four said they put labels on 80%-100% of product. Another two said they would be labeling 100% of product in 2000. At the other end of the continuum, two said they were labeling only about 1% of product and an additional three said that they put ENERGY STAR labels and/or logos only throughout catalogues, on boxes, and on samples. Several manufacturers' comments indicated that they used ENERGY STAR labels to aid in educating their dealers. Only one said he was not using the ENERGY STAR label.

Manufacturers' responses to ENERGY STAR labeling were polarized – either extremely positive or somewhat negative. Negative comments included:

> *"The ENERGY STAR label sucks. I worked with it for two years, and I wish it was better – simpler and more accurate. Everything else in the ENERGY STAR platform has a 'go/no go' message. The three climate zone system for ENERGY STAR Windows is well-intentioned and gets more people into the game, but its confusing to end users. I would like to get rid of the map (on the label) and instead define ENERGY STAR as the top 15% of products in a locale-specific area e.g., show ENERGY STAR superimposed over a specific state, or alternatively provide an electronic film label that can be read on site with a hand-held reader."*
>
> *"It's confusing – I'd like to put the world with ENERGY STAR across it (on the label) without the map that confuses everyone. Consumers don't care about the climate zones and don't want to hear about them. We're using (the label) only on our samples, but we're eventually hoping to label all products. The label has to stay on when needed but be easy to remove."*
>
> *"The majority of our retrofit customers (builders/contractors) don't want any labels put directly on the windows. New home cleaning crews wash the labels off before the new homeowner ever sees them. I'd put it on samples and the brochure."*

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[28] One manufacturer indicated that he was not a Northwest Partner, although he had used ENERGY STAR labels and was on D&R's partner list. He is included, for purposes of the labeling question, as an ENERGY STAR Partner. Two manufacturers indicated that they were national, not Northwest ENERGY STAR partners. One manufacturer was not an ENERGY STAR partner.

"Skylight labels can't be seen from the ground, and homeowners don't want it left on the skylight where they can't reach it. [Skylights] are more of a specialty product. ENERGY STAR labels have to match with NFRC labels or it confuses the customer.

On the other end of the spectrum, manufacturers made positive comments regarding ENERGY STAR labels.

"It's great. It's unfortunate that some manufacturers have tried to exploit it with similar looking labels."

"It's hard to get the plant to label because it's an added step to label only those windows that meet ENERGY STAR standards. We're going to try for 100% labeling in 2000 and are already doing so in our Midwest plant."

"We use NFRC labels on the windows, with ENERGY STAR labels on all catalogues, boxes and brochures."

"We plan to incorporate ENERGY STAR into our own label and plan to tag all our windows."

"It's a recognized label."

"We don't advertise any more unless it's ENERGY STAR."

Future Directions/Recommendations

Manufacturers in this wave of interviews had strong opinions and specific recommendations for the ENERGY STAR program. They believe it is time for ENERGY STAR to emphasize educating the end consumer on the benefits of ENERGY STAR window products:

"It's hard to control the dialogue at the point of sale – need more demand from the end consumer to 'pull' ENERGY STAR demand up."

"We need to build consumer demand."

"The general public needs to be educated."

"The next step is building consumer demand because they don't see the benefit for the added cost."

"The general public is interested, but you need to let them know what they save off their heating bill."

"Just keep educating the consumer – the more the consumer is aware, the more responsive the builder will be."

Specific suggestions to raise ENERGY STAR awareness by consumers included:

"Utilities should ensure that their web sites provide information and linkages to ENERGY STAR window products, maybe with a question that consumers can respond to so they can be contacted by registered ENERGY STAR dealers."

"[We] would like to read more about ENERGY STAR in utility bill stuffers."

"ENERGY STAR promotional materials should be ones that consumers use everyday and keep close at hand."

"Kids should be educated as to the benefits of saving energy through ENERGY STAR windows (for example, 'Green Education')."

"The life-cycle cost of ENERGY STAR windows versus 'standard' windows should be emphasized."

In terms of structural suggestions in the window products industry, manufacturers made the following recommendations:

"We need 'box lunch' shows for dealers, utility companies, and single- and multi-family builders (especially those builders that build units that are the step before first-time home buying) that demonstrate the benefits of ENERGY STAR."

"ENERGY STAR should provide equal access to ENERGY STAR resources [to all manufacturers]. It should be marketed as ENERGY STAR and not as Manufacturer Partnerships so that manufacturers can compete on value and service and create higher overall demand."

Based on the responses given by smaller manufacturers (and a few larger ones), it appears that D&R may wish to consider providing support more tailored to the needs of smaller manufacturers, such as additional supplies of labels and/or advertising/promotional support.

Some manufacturers had problems with NFRC testing that "bled over" into concerns about ENERGY STAR:

> *"[I] think all windows should be tested instead of certified through the NFRC program because some manufacturers cheat on NFRC certification (maybe 1 out of every 10)."*
>
> *"Testing should be changed for skylights so as to not include the curb losses, as it's done with windows – in the middle of the pane."*

One manufacturer argued that the ENERGY STAR U factor should be lowered to U = 0.36 because the U 0.36 product can be made much more easily than the U ≤ 0.35 product.

Another window manufacturer made a strong argument that the emphasis of ENERGY STAR should be changed from new housing where codes are relatively adequate to remodeling where the incurred benefits are much higher. He argued that there's not much difference (perhaps 12.5%) between a window that meets Oregon energy code (U< 0.40) and an ENERGY STAR level of U< 0.35, but that there are literally millions of worn-out windows at U = 1.3 that, if replaced with ENERGY STAR, would improve energy efficiency 73%.[29]

Finally, one manufacturer emphasized the need to educate the mortgage and loan community about the benefits of ENERGY STAR. He believed that, once they were educated, it would be easier to convince them to amortize the benefits and costs of windows over the life of the mortgage or building. Expansion of this concept to include all ENERGY STAR products would result in considerable energy savings over the lifetime of a home.

Marketability of Windows: Importance of Energy Efficiency

Information on some of the market effects was obtained through indirect trade-off assessment. **quantec** used the Analytic Hierarchy Process (AHP) in order to quantify the relative importance of the different market barriers.

The AHP involves three basic elements:

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[29] Letter from William Stafford, LBL Windows to Mike Fruzzetti, D&R International, February 2, 2000.

- ➜ Description of a complex multi-criteria problem with objective and/or subjective elements as a hierarchy
- ➜ Estimation of the relative weights for importance of various criteria (or subcriteria) on each level of the hierarchy
- ➜ Integration of the relative weights to evaluate the hierarchy with respect to the overall objective of the problem

AHP uses ratios as a measure of comparative judgments. Specifically, it uses pairwise comparisons to estimate the relative importance of specific criteria within each hierarchy level. The main results produced by the AHP include two sets of weights computed based on responses by each key actor:

1. Importance weights for the overall attributes (e.g., location, cost, energy efficiency, style, floor plan, and square footage)
2. Importance weights given to market barriers (i.e., lack of information, split incentives, bounded rationality, and availability of measures)

The difference between the average weights over time are one indication of the success of the market transformation efforts in changing awareness and behavior and in lowering the importance of certain market barriers.

Results

AHP rankings for 1999 were compared to rankings in 2000 to see if manufacturers' perceived importance of marketing and market barrier factors changed. Table III-2 presents the relative mean importance ratings on characteristics affecting the marketability of windows. Quality was rated highest in terms of overall importance with a mean ranking of 0.41. Price was second (0.23), appearance third (0.21), and energy efficiency fourth (0.15).

Table III-2
Window Marketability Characteristics:
Relative Mean Importance

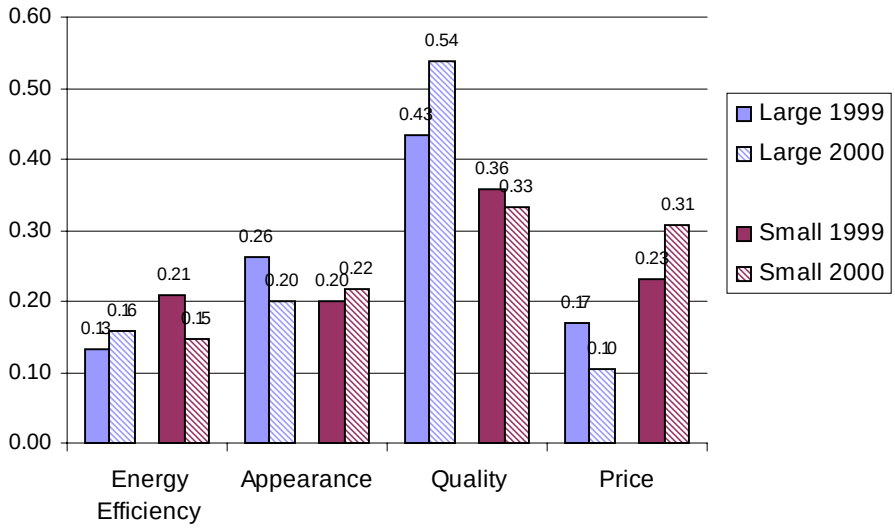
Group	Energy Efficiency		Appearance		Quality		Price	
	1999	2000	1999	2000	1999	2000	1999	2000
Overall	0.18	0.15	0.22	0.21	0.39	0.41	0.21	0.23
Size of Manufacturer								
Large	0.13	0.16	0.26	0.20	0.43	0.54	0.17	0.10
Small	0.21	0.15	0.20	0.22	0.36	0.33	0.23	0.31

When results for 1999 and 2000 were examined, the overall ranking of relative importance of marketing factors was consistent. However, when examined by size of manufacturer, differences emerged. Although quality remained the most important factor in marketing window products for both large and small manufacturers, it increased sharply in terms of importance for large manufacturers from 1999 to 2000 (0.43 to 0.54) while it decreased for small manufacturers (0.36 to 0.33).[30] Price and appearance dropped in importance for large manufacturers while energy efficiency increased (from 0.13 to 0.16). Large manufacturers, the main target of the ENERGY STAR Program, increased their ranking of energy efficiency from 1999 to 2000, indicating that the program was successful in changing perceptions of the importance of energy efficiency to these manufacturers.

In contrast to the findings for large manufacturers, small manufacturers reported that the importance of price increased over the period (from 0.23 to 0.31) while the relative importance of energy efficiency decreased (0.21 to 0.15). The latter finding may reflect the relatively larger impact on smaller manufacturers of costs of raw materials and converting to ENERGY STAR technologies. Figure III-3 shows the difference between large and small manufacturer's ratings of importance of marketability characteristics in 1999 and in 2000.

30 Size was determined by examining market share reported by D&R International in its Northwest ENERGY STAR ® Windows Program, 1999 Annual Report, January 20, 2000, and reviewing size groupings with D&R in subsequent interviews.

Figure III-3
Ratings of Window Marketability Characteristics



The analysis of market barriers is summarized in Table III-3. AHP computes an internal "inconsistency rating" for each respondent's scores. Responses for barrier ratings were found to have a high degree of inconsistency. Therefore, in order to interpret the relative rankings, we also considered the qualitative responses of manufacturers to questions concerning the barriers and their relative importance. Overall, "price" was rated the most important barrier at 0.48, a finding corroborated by manufacturer's comments. The second most important barrier remained information (0.34). Their comments revealed that manufacturers believe that lack of information continues to be a barrier to customers understanding the benefits of ENERGY STAR windows. Lack of availability is ranked last at 0.18.

Table III-3
Market Barriers: Relative Mean Importance

	Lack of Information		Price		Lack of Availability	
Group	**1999**	**2000**	**1999**	**2000**	**1999**	**2000**
Overall	0.29	0.34	0.60	0.48	0.11	0.18
Size of Manufacturer						
Large	0.25	0. 18	0.63	0.69	0.12	0.13
Small	0.32	0.44	0.57	0.35	0.11	0.22

When importance of market barriers is examined by size of manufacturer, price of energy-efficient window products continues to be the most important barrier for large manufacturers (rated at 0.69). Small manufacturers, however, now consider lack of information to be the most important barrier (0.44). Lack of availability has remained relatively constant for large manufacturers but has increased for small manufacturers. This latter finding may be due to small regional skylight manufacturers who lag window manufacturers in converting to ENERGY STAR efficiency technologies.

IV. Retailers and Wholesaler/ Distributors Survey

Window product retailers and wholesalers/distributors[31] play a crucial role in the windows market, influencing the perceptions and demand of builders and consumers as well as manufacturers' product lines. This chapter compares the results from this year's survey of retailers and wholesalers/distributors to last year's.

Methodology

The survey was designed to gather opinions from retailers and wholesalers/distributors ("dealers") who were ENERGY STAR Partners and those who were not. The sample was designed to include participants with a wide range of window sales in 1999. Information on two "big box" retailers was obtained from D&R. As a result, this study provides information on market share and ENERGY STAR market penetration for retailers, wholesalers, and distributors making 42%-45% of residential window product sales in the Northwest. The survey instrument was developed to address a number of questions, including:

- ➜ How important is high-efficiency fenestration to end customers (e.g., professional homebuilders, professional remodelers, and retail consumers)?
- ➜ Are retailers and wholesalers/distributors informed and aware of the benefits of ENERGY STAR window products?
- ➜ Where do retailers and wholesalers/distributors obtain information on window products?
- ➜ What is the current penetration rate of ENERGY STAR-level window products?
- ➜ Is the market penetration rate of ENERGY STAR-level window products increasing?

[31] Retailers sell products in relatively small quantities to consumers. Wholesalers sell products in large bulk or quantity, usually at a lower price than retailers. Distributors market and supply goods from manufacturers usually (but not always) under contract to retailers or large bulk purchasers.

Sample Design

This year's sample was based on last year's with updated information on ENERGY STAR Partners and supplemented by window directory listings.[32]

Quotas were developed using a proportional approach for the number of window retailers/wholesalers in Idaho, Montana, Oregon, and Washington based on the number of window dealers listed in the telephone directories for each state (Table IV-1). Efforts were made to include a wide range of respondents to reflect the regional population of window product dealers, including those focusing mostly on sales to builders and contractors and those with mostly retail sales.[33,34]

Table IV-1 shows the survey quotas completions, and refusals. **quantec** conducted a total of 49 surveys.[35]

Table IV-1
2000 Retailer/Wholesaler Quotas*

	ID	MT	OR	WA	Total
Quota	7	6	16	21	50
Completed**	7	6	15	21	49

* Respondents included 1 self-identified distributor as compared to 3 in the 1999 survey.

** Thirty-three percent of participants were interviewed both in 1999 and 2000.

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32 **quantec** attempted to complete interviews with the ENERGY STAR partners and last year's interviewees before contacting the sample from telephone directories. Telephone listings were screened to select those selling window products for installation in new homes or residential remodeling.

33 **quantec** was unable to contact two "big box" retailers for this report. However, based on interviews with Gary Curtis, Jim Russell, and Mike Fruzetti of D&R International, one has some 20% of the region's window sales and of that, about 50% may be reasonably estimated to be ENERGY STAR product. The second, with about 5% of regional sales, has a very low level of ENERGY STAR product but is working with an ENERGY STAR manufacturer partner to increase energy-efficient window product sales.

34 Results of this survey approach are indicative rather than representative of the total population of Northwest regional retailers and wholesalers/distributors.

35 Interviewers requested to speak to the employee or manager who made the decisions regarding windows.

Company Characteristics

Retailers and wholesalers/distributors of window products in the Northwest vary in terms of types, sizes, and buying and selling behaviors. Table IV-2 summarizes the retailer and wholesaler/distributor company characteristics based on location, type of sales, and source of window products.

Of the 49 surveys completed, eight (16%) were ENERGY STAR Partners (Table IV-2). Partners tended to be larger in terms of window sales, an expected outcome based on the Program's expressed strategy of partnering with larger, more influential retailers and wholesaler/distributors. The distribution of sales by state was much the same this year as last year with the majority of the respondents reporting window sales in Washington (59%), followed by Oregon (33%), Idaho (31%), and Montana (12%).

Although the majority of respondents offered both sales and installation in both years (70% in 1999 and 86% in 1998), more businesses were found to provide sales only (30%) this year than last (14%). Eighty-two percent of dealers selling mainly to retail consumers in 1999 also offered installation, compared to only 52% of those focusing on sales to professional homebuilders and contractors.[36] Results from the two surveys also show a different patterns of sales to large home builders. Many of these differences may be attributable to differences in respondents between the two years. In last year's survey, 42% of the companies interviewed sold windows to builders who build 20 or more homes per year; in this year's survey, 59% reported sales to builders who build 20 or more homes. In keeping with this trend, the number of companies who did not sell any windows to large builders decreased from 59% in 1998 to 41% in 1999.

Almost all respondents this year, as last year, purchased their windows directly from window manufacturers.[37]

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36 This year's survey added a question regarding whether the dealer offered sales and installation or sales only for professional versus retail sales.

37 Past discussions with D&R staff indicate that it is not unusual for a very large retailer to purchase windows from several manufacturers. It also is not unusual for manufacturers to sell directly to some retail stores, to large builders, and perhaps even smaller builders based on long-existing relationships.

Table IV-2
Retailer/Wholesaler Characteristics*

	Frequency		Percent	
	1998	1999	1998	1999
ENERGY STAR Partner				
Yes	10	8	20%	16%
No	39	41	80%	84%
Location of sales* **				
Idaho	13	15	27%	31%
Montana	6	6	12%	12%
Oregon	19	16	39%	33%
Washington	26	29	53%	59%
Services Offered **				
Sales and installation	42	40	86%	70%
Sales only	7	17	14%	30%
Sales to professionals**				
Sales and installation		12		52%
Sales only		11		48%
Sales to retail sales/home improvement**				
Sales and installation		28		82%
Sales only		6		18%
Sales to builders who build 20+ homes per year				
None	27	20	59%	41%
1%-50%	16	25	35%	51%
Over 50%	3	4	7%	8%
Source for window purchases				
Direct from manufacturer	48	47	98%	92%
From wholesaler/distributor	1	1	2%	2%
Other		1		2%

* Respondents' 1998 window sales represent 18%-21% of window sales to retailers/wholesalers/distributors reported by Northwest window manufacturers for the same time period. In 1999, respondents' window sales represented 17%-20% of window sales reported by manufacturers for the same period. Two "big box" retailers comprise another 25% of the market for 1999.

** In the 2000 survey, "services provided" was broken into "retail sales/home improvement" and "sales to professionals." Some interviewees reported that their company provides both services.

*** Percents sum to greater than 100% because respondents could report sales in more than one state as a function of markets spilling over state boundaries.

Respondents' reported sales for 1999 represent some 17%-20% of regional sales by Northwest window manufacturers to dealers.[38] When results are added for two "big box" retailers, this increases to 42%-45%. The array of types of retailers and wholesaler/distributors resulted in a wide range of annual window sales volume. As shown in Table IV-3, the respondents included many small companies, with sales of less than $100,000 (34% of respondents in 1998 and 24% of respondents in 1999). There were also a few large companies with sales of over $3,000,000 that dominated the total reported sales. For example, in 1999 two respondents reported 49% of the total sales for all respondents.

Table IV-3
Size of Company by Window Product Sales

	No. of Respondents		% of Respondents		% of Sales	
	1998	1999	1998	1999	1998	1999
Less than $100,000	12	9	34%	24%	2%	1%
$100,000 to $499,999	15	16	43%	43%	13%	8%
$500,000 to $999,999	3	1	9%	3%	9%	2%
$1,000,000 to $2,999,999	3	9	9%	24%	20%	40%
$3,000,000 and up	2	2	6%	5%	57%	49%
Total	**35***	**37**	**100%**	**100%**	**100%**	**100%**

* 35 of 49 respondents provided sales data for 1998; 37 of 49 respondents provided sales data for 1999.

Last year, for purposes of describing the composition of the sample, we divided respondents based on window sales into quintiles. When window sales for this year's survey are compared to last year's survey in terms of those same categories, we see that almost all respondents are in the top two brackets ($250,000 and up) for both years. This year, however, respondents' sales were more evenly split between the top two brackets of $275,001 – $800,000 and $800,001 and up (45% and 49%, respectively), while last year they clustered almost exclusively in the highest bracket

[38] Based on $40,074,000 in sales reported by respondents for 1999 divided by the percentage of estimated 1999 window sales made by Northwest window manufacturers to retailers and wholesalers/distributors. The denominator is based on multiplying numbers of Northwest manufacturer windows by D&R, Inc.'s estimate of $125-$144 per window times the estimated 60% of windows sold through retailers/wholesalers/ distributors by window manufacturers. For example, the lower end of the range (17%) is derived by dividing $40,074,000 by $231,996,355, the denominator, which is derived by 60%*2,685,143 * $125. Information from D&R indicates that another two "big box" retailers comprise 25% of residential market window sales for the Northwest.

(83%) (See Table IV-4). This is likely due to only one large distributor in this year's sample compared to three the prior year.

Table IV-4
Size of Company by Window Product Sales

Window Sales ($)	Percent of Sales		Total Sales	
	1998	1999	1998 (n=35)	1999 (n=37)
$50,000 or less	1%	0%	$177,872	$ 127,500
$50,001 to $150,000	2%	3%	$605,000	$ 1.242.500
$150,001 to $275,000	5%	3%	$1,452,936	$ 1,020,000
$275,001 to $800,000	10%	45%	$3,052,340	$ 17,925,000
$800,001 or more	83%	49%	$25,127,800	$ 19,760,000
			$30,415,948	**$ 40,074,000**

Sales to home builders as a percentage of total sales rose from 51% in 1998 to 62% in 1999 (Table IV-5 and Figure IV-1). As a result, the percentage of total windows sold to "Do-It-Yourself" purchasers decreased (15% in 1998 to 10% in 1999), as did professional remodeler purchases (34% to 28%). ENERGY STAR Partners, although representing only 16% of the sample, represented 65% of total window sales in 1999 (Table IV-5 and Figure IV-2).[39]

Table IV-5
Window Product Sales by Segment

	% of Sales	
	1998	1999
Purchaser of Windows		
Home builders	51%	62%
"Do-it-yourself" consumer	15%	10%
Professional remodeler	34%	28%
ENERGY STAR Partner		
Yes	58%	65%
No	42%	35%

ENERGY STAR Partners indicate that they made more sales to professional home builders (57%) and remodelers (24%) but had slightly less retail

[39] In 1998 ENERGY STAR Partners comprised 20% of respondents and 58% of total sales.

sales (6%) than did nonpartners (35%, 17%, and 10%, respectively) (Figure IV-2).

Figure IV-1
1999 Window Sales to Home Builders, Remodeler Contractors, and Retail Customers

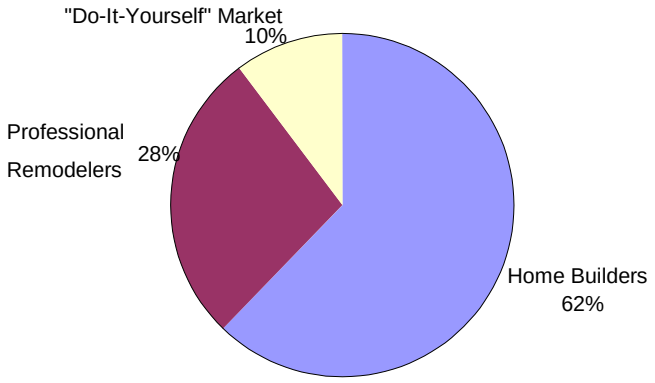
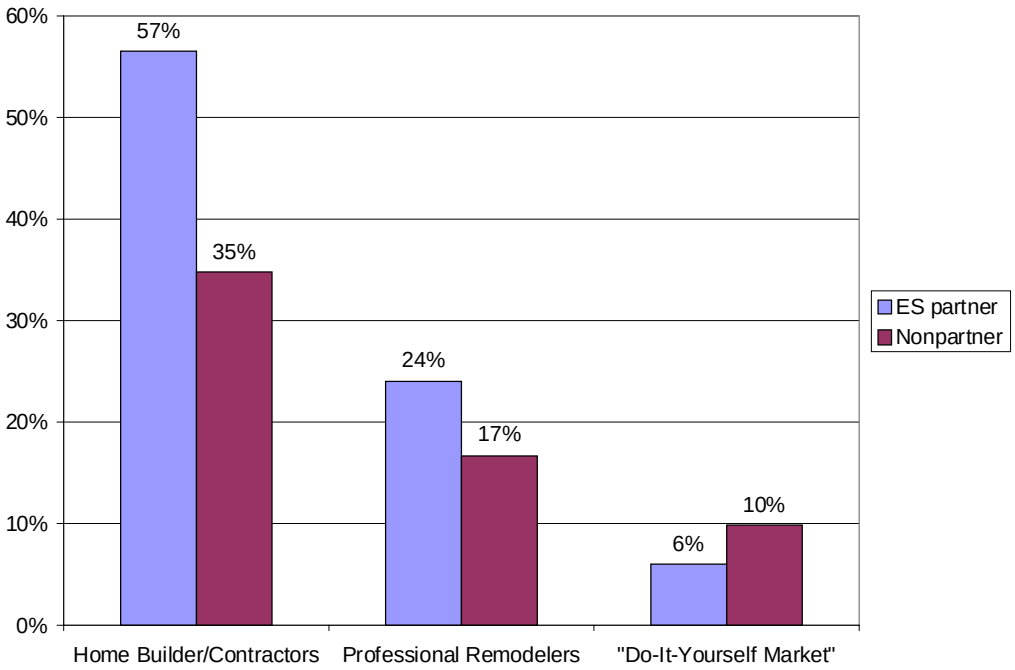
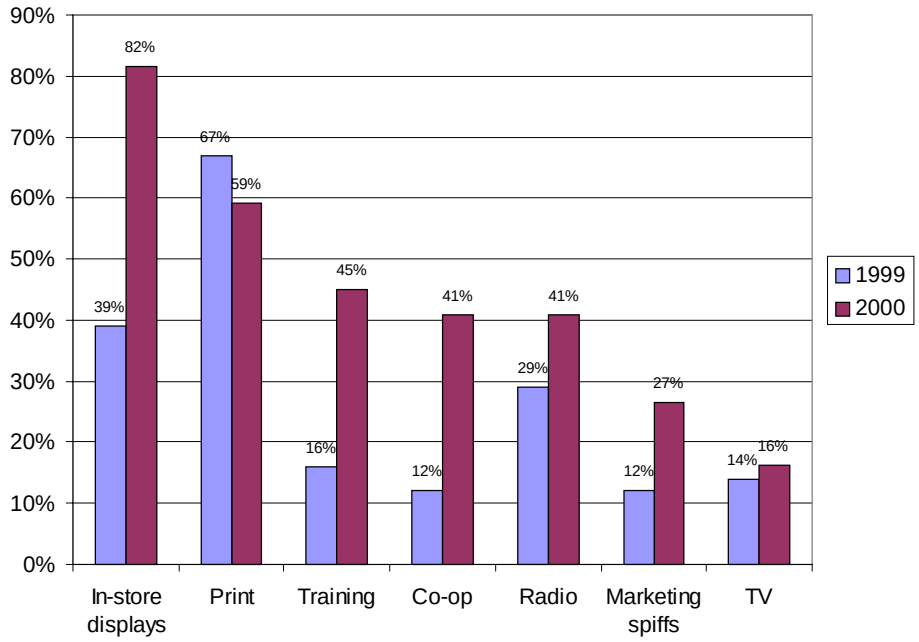


Figure IV-2
1999 Window Sales by ENERGY STAR Partnership



Retailers and wholesalers/distributors prefer to promote window products in varying ways, but overall, in this year's survey, they strongly favored in-store displays (82%) compared to last year's respondents (39%) (Figure IV-3). Respondents in both surveys favored print media as a promotional tool (67% last year and 59% this year). This year's respondents also preferred training (45%), co-operative advertising (41%), radio advertising (41%) and marketing spiffs (27%) more so than did respondents in last year's survey. ENERGY STAR promotional efforts emphasizing in-store displays appear to be in alignment with current retailer and wholesaler/distributor preferences.

Figure IV-3
Preferred Ways of Promoting Window Products



What are top selling window brands?

The most popular brands in terms of Northwest sales remain Milgard and Insulate, sold by 51% and 41% of respondents, respectively, in 1999.[40] Table IV-6 shows the percent of respondents, their average percent of sales, and their average percent of sales weighted by 1999 window sales. When brands are weighted by 1999 window sales, the relative market

[40] Some 51% and 47% of respondents said they sold Milgard and Insulate window products in 1998.

positions of the two brands reverse with Insulate having 20% of the market compared to 15% for Milgard.

Table IV-6
Top Window Brands (Sales and Stock)

Percent Respondents Selling Brand Name (Percent) (n=45)*	Average Percent of Sales/Stock	
	Unweighted (n=45)**	Weighted by Window Sales (n=35)***
Milgard (51%)	14%	15%
Insulate (41%)	11%	20%
Best Built (33%)	9%	6%
Summit (31%)	8%	1%
Marvin (29%)	8%	26%
Anderson (22%)	6%	2%
Alpine (16%)	5%	3%
LBL (12%)	3%	1%
EPI (10%)	3%	1%
McVay, Mercer (8.2% each) and Crystal, Peachtree, Viking, Western (6% each)	2% each	<1% each
Amsco, Loewen, Pella, Philips, Winterseal (4% each)	1% each	<1% each
All Weather, Aluma-Glass, Amerimax, Bear, Camlite, Capital/Mihome, CDI, Certainteed, Clawson, Crestline, Eagle, Empire, Gineauow, Hi Lite, Integrity, Koby & Koby, Lincoln, MRFG, Pacific, Pozzi, Replacement glass, Starline, ThermaLine, Vinyl Master, ware Windows, Weathervane, Window Products (2% each)	<1% each	<1% each, except Amerimax (5%), Eagle (4%), Integrity (4%), Starline (1%, Vinyl Master (6%)

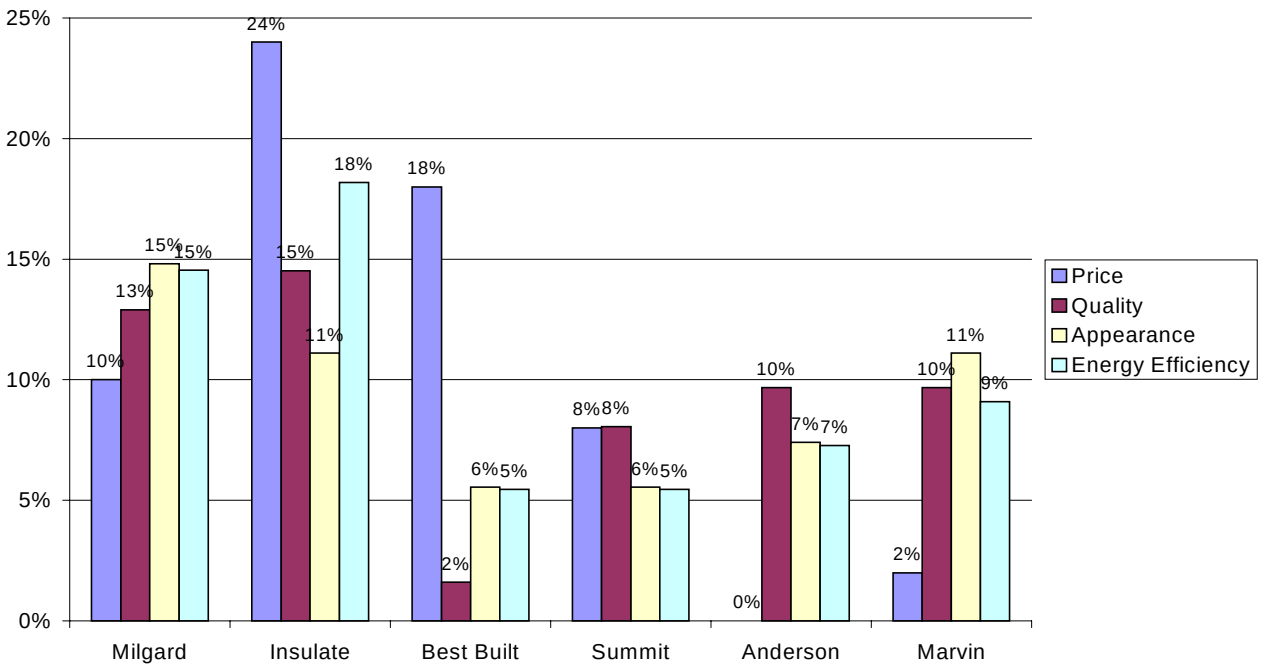
* Miscellaneous/unassigned = 11%

** Miscellaneous/unassigned = 2%

*** Miscellaneous/unassigned = 8%

Dealers were also asked which features were associated with a given window brand. Insulate was selected by 24% of respondents as the window most likely to sell on price. Milgard (15%) and Insulate (15%) tied as the windows most likely to sell on quality. Insulate (18%) and Best Built (18%) tied as the windows most likely to sell on energy efficiency.

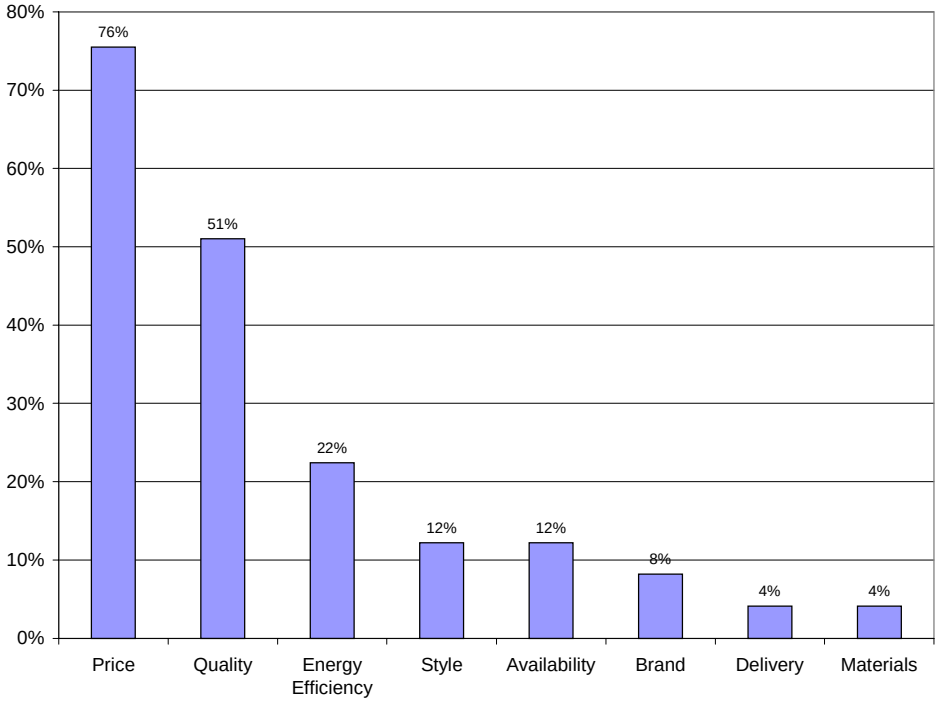
Figure IV-4
Brand of Window Sold Based on Features



Retailer Perceptions of Customer Interest in Efficient Fenestration

Most dealers (76%) continued to believe that price is the largest single factor in a customer's decision to purchase windows (compared to 84% last year). They also continue to place quality second (51% this year and 55% last year). However, energy efficiency (22% this and 20% last year) has replaced availability as the third highest-ranking factor when buying a window.

Figure IV-5
Factors Influencing Customers' Decisions to Buy Window Products



More than half of retailers and wholesalers continue to believe that their customers had a high demand for high-efficiency windows (Table IV-7). The remainder were evenly split between believing that customers had neutral or low demand for energy-efficient windows. Those who believed that customers had a high demand for energy-efficient windows commented that the high demand was a result of increased consumer awareness, energy cost savings, and increased comfort. The higher price of energy-efficient windows was the most common reason for those with neutral or low ratings.

Although, due to the small number of ENERGY STAR Partners in the sample, it is difficult to generalize from these results, last year ENERGY STAR Partners reported a slightly higher customer demand for high-efficiency windows than did nonpartners. This year, we see that both groups are equal in their ranking of customer demand (3.4). In both years, however, there was no statistical difference between the ENERGY STAR Partners and nonpartners. Although not statistically significant, this year more than half of nonpartners (56%) said customers have a high demand compared to 38% of Partners. Half of ENERGY STAR Partners said that customers have a neutral demand this year compared to only 18% of

nonpartners. However, only 13% of Partners, compared to 26% of nonpartners say that customer demand is low.

Table IV-7
Current Customer Demand for High-efficiency Windows*

Ranking of Customer Demand	All Respondents		ES Partner		Not Partners	
	1998	**1999**	**1998** (n=10)	**1999** (n=8)	**1998** (n=39)	**1999** (n=39)
Low Demand (1 or 2)	22%	23%	10%	13%	26%	26%
Neutral Demand (3)	27%	23%	30%	50%	26%	18%
High Demand (4 or 5)	51%	53%	60%	38%	49%	56%
Average Ranking	3.4	3.4	3.7	3.4	3.3	3.4

* Percentages may not add to 100% due to rounding.

Dealers were also generally positive about the benefits, affordability, and availability of high-efficiency windows (Table IV-8). Ninety-two percent of respondents continue to believe that high-efficiency windows provide a good value to customers. Dealers also do not believe that energy-efficient windows are hard to obtain (only 6% last year and 4% this year). Only price has increased as an issue; 41% of retailers interviewed stated that customers think energy-efficient windows are too expensive (compared to 31% for 1998).

Although not statistically valid due to the small numbers of ENERGY STAR Partners, comparisons between Partners and nonpartners show that 90% of both groups believed that energy-efficient windows provide a good value to the customer. The percent of Partners that believed they are hard to explain to customers dropped from 20% last year to 13% this year. The same is true for nonpartners; only 17% believed energy-efficient windows are hard to explain to customers this year compared to 36% last year. Although Partners are less likely than last year to say customers perceive high-efficiency windows as too expensive, the percent of nonpartners who said this was an issue increased from 28% to 41%. Neither group believed that ENERGY STAR windows are hard to get.

Table IV-8
Perceptions of High-efficiency Windows for Customers

	All respondents		ES partner		Not Partner	
	1998 (n=49)	**1999** (n=49)	**1998** (n=10)	**1999** (n=8)	**1998**(n=39)	**1999**(n=41)
Provide a good value to the customer	92%	92%	100%	100%	90%	90%
Are hard to explain to customers	33%	16%	20%	13%	36%	17%
Are too expensive from the customers' point of view	31%	41%	40%	38%	28%	41%
Are hard to get	6%	4%	0%	0%	8%	5%

As customers of retailers and wholesalers/distributors include both builders/remodeler contractors and end-use retail customers, it is useful to cross-check their perceptions of customer interest in energy-efficient windows against those of their customers.[41] **quantec**'s current survey of home builders indicates that builders remain extremely sensitive to price and fairly unaware of homebuyer's actual valuation of energy-efficient windows.[42, 43] The majority (81%) of new homebuyers responded that they were willing to pay the higher incremental cost of energy-efficient windows when queried. Remodel customers report only durability (90%) ranks as highly as energy efficiency (90%) in the purchase of replacement windows, far ahead of other factors, including price.

What is the level of awareness and information on ENERGY STAR?

Ninety-six percent of retailers and wholesalers/distributors of fenestration products are familiar with energy-efficiency ratings (U-values) for windows (Table IV-9). The percentage of dealers who had heard of ENERGY STAR rose from 67% of respondents last year to 73% this year. However, this leaves 27%, almost a third, who had not heard of ENERGY

41 Remodeler contractors may be more attuned to the needs of the individual remodel customers with whom they directly contract.

42 Our last Market Report found that builders of manufactured homes also indicate price as the most important factor in marketing manufactured homes. Their perceptions affect those of distributors who provide windows to the manufactured home industry.

43 Remodeler contractors may resemble, in terms of buying patterns, the end use homeowner more than large project builders. Also, to the extent that retailers and wholesaler/distributors may respond more directly to the perceptions of builders who work with them over time on many projects (as opposed to one-time retail homeowner sales), it is possible that they may be more influenced by their home builder customers.

STAR windows. Simple ENERGY STAR sales tools would aid in reaching this segment of dealers.

About half of dealers in both years said they carried ENERGY STAR window products. The relative percentages of dealers saying that customers have asked for ENERGY STAR windows, however, has also stayed relatively low. Last year only 16% of respondents said customers had asked for ENERGY STAR window products; this year, only 14%. This finding confirms results from the surveys indicating a very low awareness of ENERGY STAR window products, with only 21% of builders, 5% of new homeowners, and 1% of remodelers aware of ENERGY STAR windows.

Patterns of awareness and interest in ENERGY STAR products stayed much the same across both years, with a few exceptions. One was that nonpartners' awareness of ENERGY STAR increased, with more than 68% reporting that they had heard of ENERGY STAR this year compared to only 59% last year. The percent of nonpartners indicating that customers had asked for ENERGY STAR windows more than doubled (from 5% to 12%) since last year. However, only 25% of Partners this year indicated customers had asked for ENERGY STAR windows compared to 60% last year.

Table IV-9
Awareness and Interest in ENERGY STAR Fenestration Products

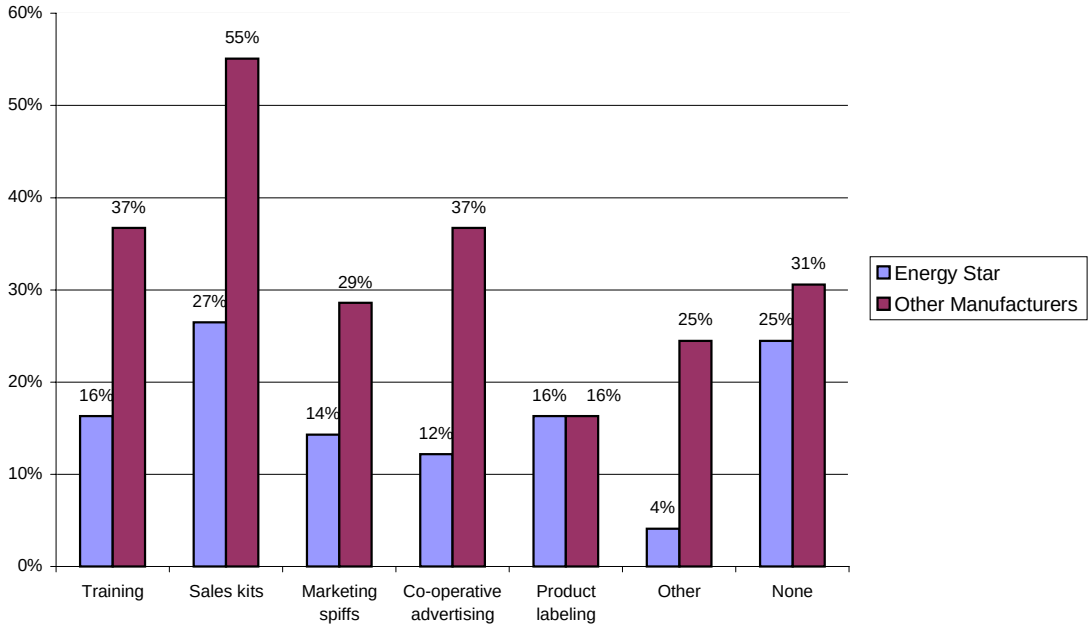
	All respondents		ES Partner		Not Partner	
	1998	**1999**	**1998** (n=10)	**1999** (n=8)	**1998** (n=39)	**1999** (n=41)
Familiar with U-value	96%	96%	100%	100%	95%	95%
Heard of ENERGY STAR	67%	73%	100%	100%	59%	68%
Carry ENERGY STAR fenestration products	53%	51%	100%	100%	41%	41%
Customers have asked for ENERGY STAR	16%	14%	60%	25%	5%	12%

Retailers and wholesalers/distributors reported that they continue to generally receive far more sales and promotional assistance from manufacturers for non-ENERGY STAR products than from the Program or manufacturers for ENERGY STAR products (Figure IV-6). For nearly all measures – training for sales personnel, sales kit materials, marketing or promotional spiffs, and cooperative advertising – manufacturers were more likely to have assisted retailers and wholesalers/distributors with non-ENERGY STAR products. As most Northwest window manufacturers

are now involved in ENERGY STAR, these findings may continue to illustrate a gap in communication between manufacturers and their retailers.

A possible explanation is that perhaps the respondents are simply more aware of long-established promotions for non-ENERGY STAR windows. An alternative explanation supported by findings from the windows manufacturer survey is that at least some ENERGY STAR manufacturers are still rolling out sales and promotional support for their ENERGY STAR products – they offer the product but do not emphasize it as a ENERGY STAR product in the marketing. This is supported by responses of retailers and wholesalers/distributors who were aware of ENERGY STAR windows.

Figure IV-6
Sales and Promotional Assistance:
ENERGY STAR (Program and Manufacturers) and Non- ENERGY STAR Manufacturers



ENERGY STAR Market Penetration

The retailers and wholesalers/distributors reported that many of the windows, doors, and skylights they sell exceed code minimum and are classified as high-efficiency (ENERGY STAR-level) products.

Retailers/wholesalers reported that, on average, 64% (up from 46% last year), of the windows they sell are ENERGY STAR level efficiency (a U-

factor of 0.35 or less). When this figure is weighted based on 1999 window sales, the market penetration for high-efficiency windows is 53%, compared to 40% last year. Similar analyses were conducted for glass doors and skylights. Unweighted market penetration was 57% (compared to last year's 42%) for ENERGY STAR glass patio doors and 74% (compared to last year's 36%) for ENERGY STAR skylights. When weighted by 1999 sales, ENERGY STAR door penetration was 49% and ENERGY STAR skylight penetration to 31%. These are substantial increases compared to last year's reported weighted penetration of 38% and 7% for doors and windows, respectively (Table IV-10).

Table IV-10
ENERGY STAR Market Penetration

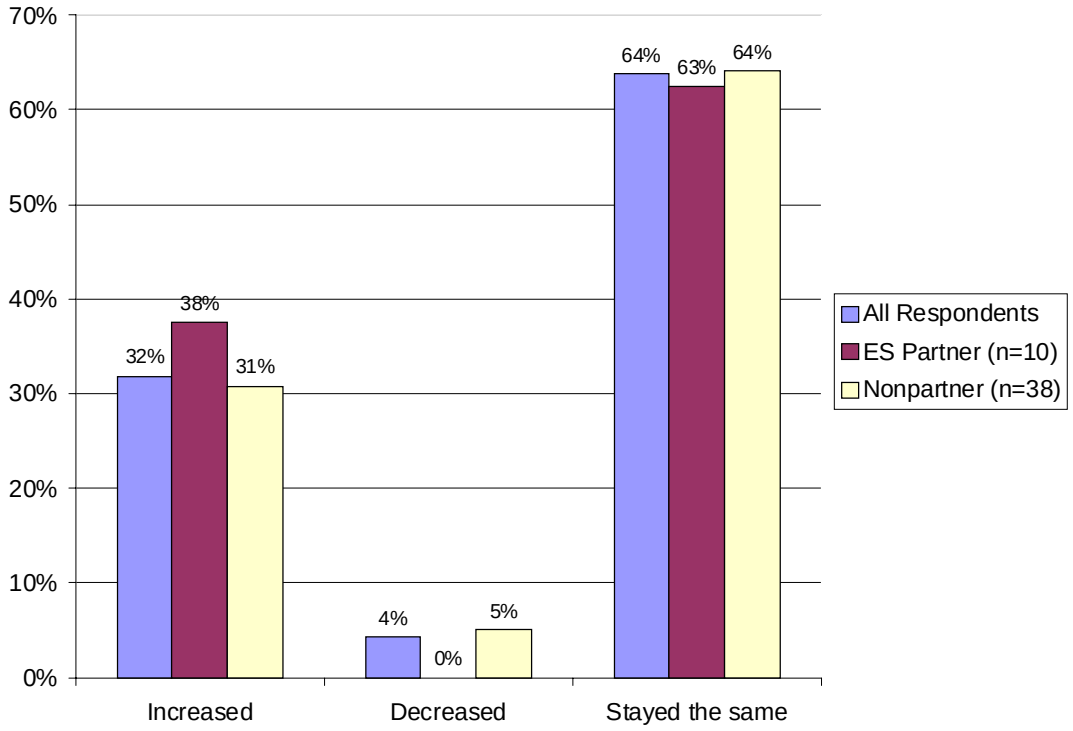
	Unweighted		Weighted by Sales	
	1998	1999	1998	1999
Windows	46%	64%	40%	53%
Glass doors	42%	57%	38%	49%
Skylights	36%	74%	7%	31%

What are the trends in ENERGY STAR window products?

Many respondents (32%), and more ENERGY STAR Partners (38%), continued to believe that sales of high-efficiency fenestration products had increased during 1999 (Figure IV-7). Very few – only 4% – believed that sales of ENERGY STAR efficiency level had decreased. These results were consistent among the ENERGY STAR partners and the other respondents.

When asked for the reasons for any change, the most common response was that customers had an increased awareness.

Figure IV-7
Trends In Sales of High-efficiency Window Products in 1999



AHP Analysis

Retailers and wholesalers/distributors, when asked the relative importance of energy efficiency, appearance, quality, and price in marketing windows, ranked quality first (0.33) and price close behind (0.30) in last year's survey (Table IV-11 and Figure IV-8). Appearance and energy efficiency followed in importance, with mean importance rankings of 0.19 and 0.18 respectively. These rankings remained largely the same in this year's survey, although energy efficiency increased slightly to rank more important than appearance, even though price also increased in importance. These findings indicate that, despite increased price pressure, energy efficiency is holding its own in the rankings and even increasing slightly. Dealers may be becoming more aware of the marketing benefits of energy efficiency.

Table IV-11
Window Marketability Characteristics: Relative Mean Importance

	1999 Survey	2000 Survey	Change %
Energy Efficiency	0.18	0.19	7%
Appearance	0.19	0.18	-3%
Quality	0.33	0.32	-5%
Price to purchaser	0.30	0.31	2%

Figure IV-8
Window Marketability Characteristics: Relative Mean Importance

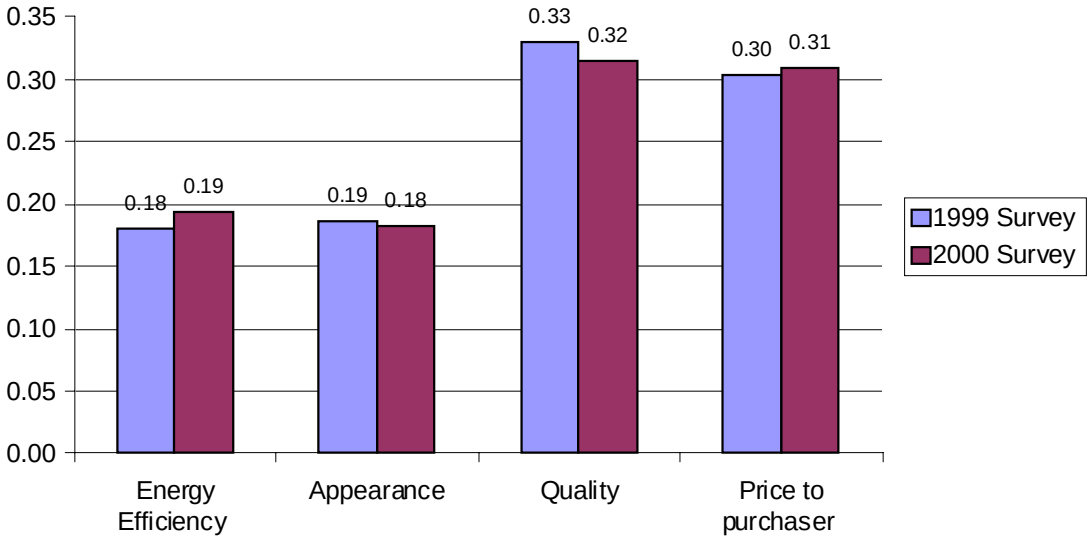
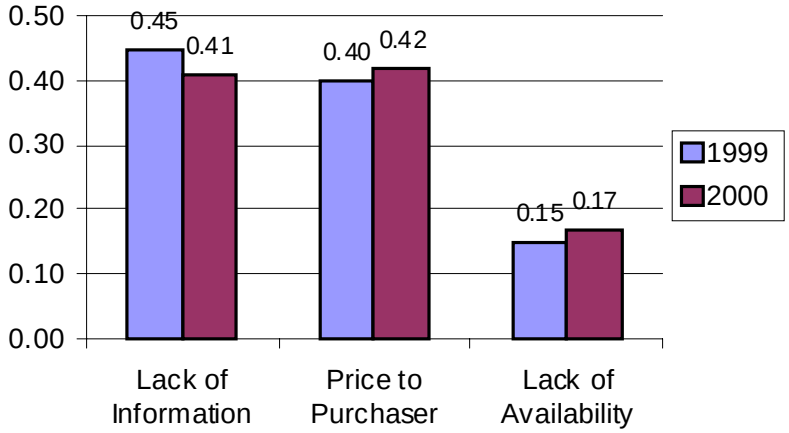


Table IV-12 shows the relative importance of market barriers. Lack of information has dropped in rated importance by 10% from last year (0.45) to this year (0.41), indicating that retailers and wholesalers/distributors see this barrier to energy-efficient windows diminishing. It is now ranked second, behind price (0.42), as a market barrier. Lack of availability (0.17) remains a distant third, although it has increased in importance as lack of information has decreased.

Table IV-12
Market Barriers: Relative Mean Importance

	1999 Survey	2000 Survey	Change %
Lack of information	0.45	0.41	-10%
Price to purchaser	0.40	0.42	5%
Lack of availability	0.15	0.17	15%

Figure IV-9
Market Barriers: Relative Mean Importance



When examined by size of dealer and ENERGY STAR Partnership status, the relative importance of barriers, with the exception of price, remain remarkably consistent across categories.

Although it remains the most important barrier, ENERGY STAR Partners (more so) and nonpartners both said that lack of information had decreased as a barrier to energy-efficient windows; however, price as a barrier increased.[44] This latter perception may be tied to general concerns about cost increases in the industry. Lack of availability stayed a distant third in importance for both groups.

[44] Partners' concern about price as a barrier rose more than that of nonpartners, perhaps due to their heavier investment in ENERGY STAR .

Table IV-13
Mean Importance Ratings for Market Barriers

Group	Lack of Information		Price to Purchaser		Lack of Availability	
	1998	1999	1998	1999	1998	1999
Overall	0.45	0.41	0.40	0.42	0.15	0.17
Size of 1998 Sales						
Sales above $1 million	0.50	0.45	0.39	0.37	0.12	0.18
$100,000 to $1 million	0.48	0.44	0.36	0.40	0.17	0.16
Sales below $100,000	0.37	0.46	0.49	0.40	0.14	0.13
ENERGY STAR Involvement						
Partner	0.49	0.43	0.37	0.42	0.14	0.15
Nonpartner	0.44	0.40	0.41	0.42	0.15	0.17

V. Builder Survey

Changes in Northwest builders' awareness and perceptions of energy-efficient window products and the ENERGY STAR Program were assessed by comparing results of the survey conducted in 2000 with that conducted in 1999.

Methodology

The builders' survey was developed to examine a number of issues, including:

- ➜ Building practices across the region – type of homes, where window product materials are obtained and from which manufacturers.
- ➜ Current incidence of high-efficiency window, skylight, and door products.
- ➜ Perceived importance of energy efficiency in general and energy-efficient windows in particular.
- ➜ Awareness of energy-efficient windows and their associated energy and non-energy benefits.
- ➜ Builders' importance rankings of various marketing factors (e.g., location, price, size of home, energy efficiency, etc).
- ➜ Builder's importance rankings of lack of information, price, and lack of availability of energy-efficient windows as market barriers.

Sample Design

For the 2000 survey we used last year's sample frame, supplemented by telephone listings of builders[45]

quantec interviewed a total of 70 builders across the four states. Across the region, as shown in Table V-1, quantec succeeded in reaching 54% of the original participants.

[45] Builder names were obtained from telephone directory listings, building associations, and business journals.

Table V-1
Builders Surveyed*

State	1999 Survey (total respondents)	2000 Survey (those in 1999 survey)	% Surveyed Both Years
Idaho	10	6	60%
Montana	7	3	43%
Oregon	20	12	60%
Washington	31	16	52%
Total	**68**	**37**	**54%**

* In addition to those surveyed, there were 9 refusals in 1999 and 15 refusals in 2000.

Efforts were made to obtain as representative a sample as possible by size of builder and state. Table V-1 shows that surveyed builders ranged in size from those constructing less than 20 to over 400 homes a year. All builders interviewed reported that they had constructed single-family dwellings and 30% (21) of builders had also built multi-family dwellings.

Figure V-1
Size of Builders

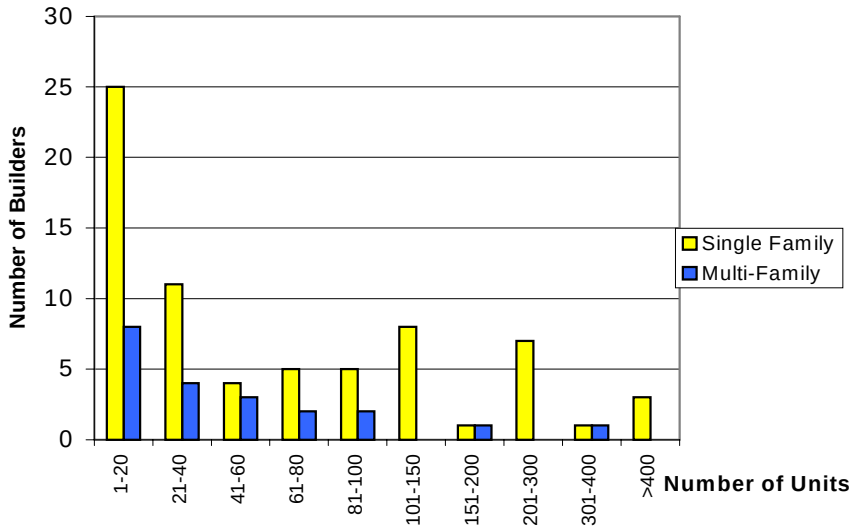


Table V-2 shows distribution of builders by state. Larger builders tended to be concentrated in Washington, where they had constructed 62% of homes during 1999.

Table V-2
Sample Distribution: State and Number of Homes

State	Builders Interviewed	Number of Units Built in 1999		
		Single-family	Multi-family	Total Units
Idaho	10 (14%)	1,030 (16%)	113 (9%)	1,143 (15%)
Montana	5 (7%)	58 (1%)	16 (1%)	74 (1%)
Oregon	21 (30%)	1,572 (24%)	132 (11%)	1,704 (22%)
Washington	34 (49%)	3,814 (59%)	976 (79%)	4,790 (62%)
Total	**70 (100%)**	**6,474 (100%)**	**1,237 (100%)**	**7,711 (100%)**

Comparison to Region

The 70 builders in the sample had built a total of 7,711 units – 6,474 single-family and 1,237 multi-family units (Table V-3). These units represented approximately 9.8% of the total units constructed in the Northwest in 1999.[46]

Table V-3
Percent of 1999 Housing Starts

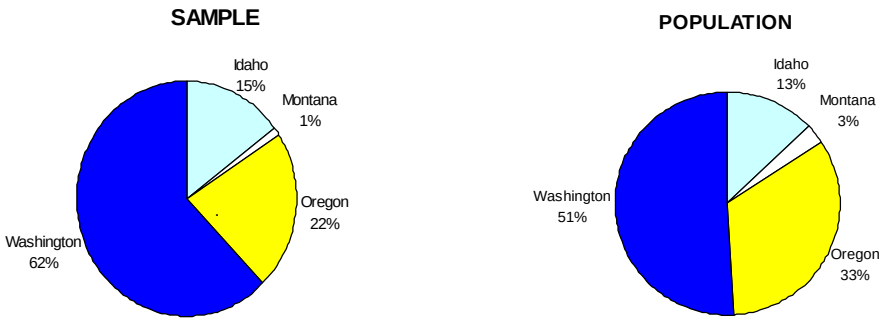
	1999 Housing Starts	Units in Sample	% Total
Single-family	57,100	6,474	11.3%
Multi-family	21,969	1,237	5.6%
Total	**79,069**	**7,711**	**9.8%**

The distribution of sample units by state closely matches the proportion of housing starts by state (Figure V-2).[47]

[46] Housing start statistics were provided by the Northwest Energy Efficiency Alliance and the Northwest Power Planning Council.

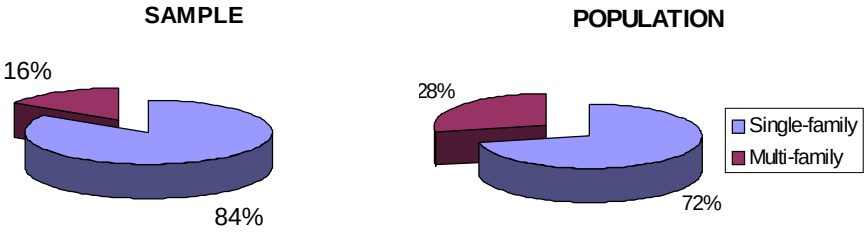
[47] Based on 1997 U.S. Bureau of Census housing start numbers available on an annual basis for states.

Figure V-2
Housing Starts: Representativeness of Sample to Population by State



The sample contained 16% multi-family homes while the population of housing starts had 28% (see Figure V-3 below).

Figure V-3
Comparison: Sampled Housing Units to Northwest Housing Starts by Type[48]



Data Collection

Surveys were conducted by **quantec** in March and April 2000. Up to five attempts were made to reach each builder, and callback times were arranged to work within the builders' schedules. Efforts were made to interview the person most knowledgeable about the type of windows that they installed.

[48] Northwest Energy Efficiency Alliance and Northwest Power Planning Council housing start estimates.

Data Analysis

The survey examined a number of questions concerning the use of energy-efficient fenestration products. Each of these questions is examined below.

Window Selection

Builders were asked to identify the manufacturers from whom they purchased windows (Table V-4). The manufacturer most mentioned by respondents this as well, as last year, was Milgard (41%).

Table V-4
Which window manufacturers make the windows you usually install?

	Frequency	% of Respondents
Milgard*	29	41%
Insulate*	13	19%
EPI*	11	16%
Summit*	10	14%
Alpine	8	11%
Phillips*	8	11%
Pella*	5	7%
Sierra Pacific	4	6%

*ENERGY STAR Partner

Builders were also asked where they purchased their windows. Fifty-one percent of the builders surveyed purchase their windows directly from a manufacturer, 37% from a distributor, and about 19% from lumberyards, similar to last year.[49]

Awareness of ENERGY STAR

Awareness of ENERGY STAR windows did not increase among builders surveyed this year compared to 1999. Twenty-one percent of builders this year (accounting for about 38% of the units constructed) reported that they had heard of ENERGY STAR windows, compared to 20% of builders sampled last year (Table V-5).

[49] Respondents could mention more then one location for purchasing windows. Last year, 50% of builders reported that they purchased windows directly from the manufacturer, 40% from a distributor.

Even among those 15 builders in the current study that were aware of ENERGY STAR windows, only three could identify any features to classify a window as ENERGY STAR. These three identified specific characteristics – double paned, low e-coating, and gas/argon filled – but did not mention U-factors. However, in a separate question, 90% of builders (63) said that they were familiar with the U-factor used to rate a window's thermal efficiency.[50]

Table V-5
Awareness of ENERGY STAR Windows

	1999 Survey	2000 Survey
Total Participants	68 (100%)	70 (100%)
Aware of ENERGY STAR	14 (20%)	15 (21%)
Identify ES Features	2	3
Don't know ES Features	12	12

Installation of Efficient Windows/Fenestration Products

Builders were asked to provide an estimate of the proportion of energy-efficient (U-factor ≤ 0.35) windows they installed.[51] As shown in Table V-6, builders estimated that 36% (2,721) of the 7,586 total units they constructed in 1999 were built with energy-efficient windows. For multi-family homes, builders estimated the market share at 38%, slightly higher than single-family homes (36%).

As demonstrated in Figure V-4 there was little reported change in overall market share for energy-efficient windows between the 1998 and the 1999 building periods. Although the overall market share stayed level (35-36%), estimates for market share for multi-family homes decreased from 44% to 38%,

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50 D&R has designed a window campaign to address this issue entitled, "The Best Window for U."

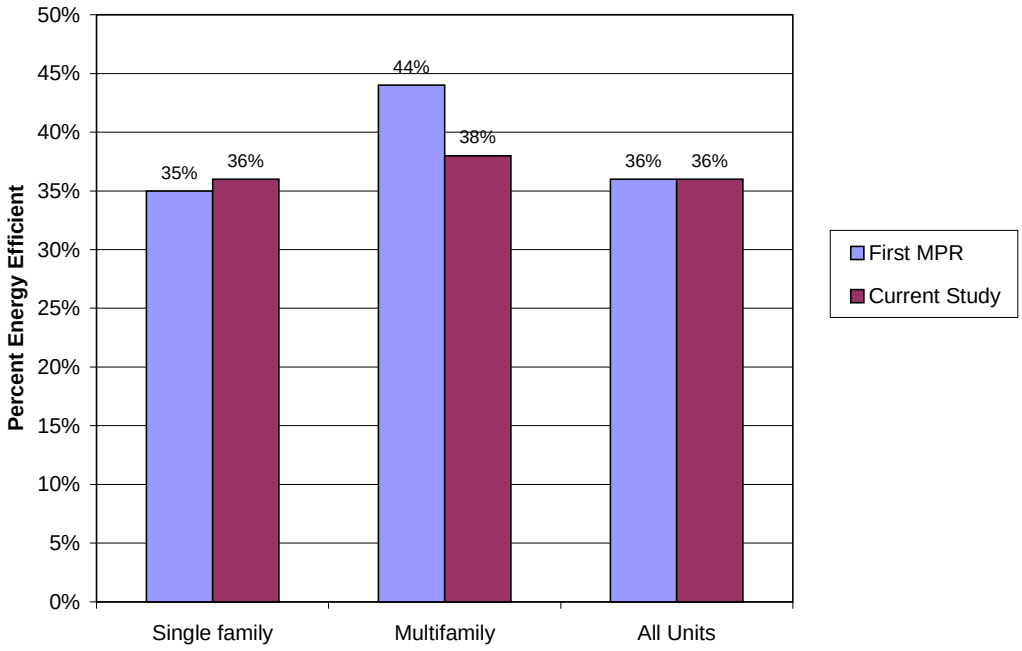
51 Respondents that were not familiar with the meaning of a U-factor were provided with an explanation of energy-efficient windows.

Table V-6
Estimated Market Share of Energy-Efficient Windows

Market Share	Single-Family	Multi-Family	Total
1999 Building Period	**36%**	**38%**	**36%**
Total No. Units*	6,349	1,237	7,586
U-Factor ≤ 0.35	2,258	463	2,721

* Based on respondents that could also provide energy-efficiency information.

Figure V-4
Estimated Market Share of Energy-Efficient Windows: 1998 and 1999



In addition to extracting information from builders about the energy efficiency of windows, the survey also sought information regarding glass doors and skylights. As shown in Table V-7, all 70 builders interviewed constructed at least one home with a sliding glass door, and glass doors were installed in 81% of the units constructed. Skylights were installed in only 32% of units built. Builders reported that 45% of glass doors and 37% of skylights were equivalent to ENERGY STAR efficiency levels.[52]

[52] Reported energy-efficient percentage for glass doors, which are typically installed in almost all homes in 1998, was 39%. Skylights, by comparison, were reported to be installed in only about a third of 1999 homes; therefore, the small numbers may make comparisons between years unreliable.

Table VII-7
Glass Doors and Skylights

	Glass Doors**		Skylights**	
	Builders	Units	Builders	Units
Total	70	7,711	69	7,611
Built with glass doors/skylights	70 (100%)	6,228 (81%)	55 (80%)	2,419 (32%)
Percent ENERGY STAR*	NA	45%	NA	37%

* U< 0.35 for glass doors and U< 0.45 for skylights.

** Based on those units with efficiency information

Interest in Efficient Windows

Builders reporting that energy-efficient windows made up less than 80% of the windows they installed were asked why they didn't install more energy-efficient windows.[53] The majority of these builders (84%) reported that energy-efficient windows cost too much. (Table V-8.)

Table V-8
Reason for Not Installing More Energy-efficient Windows

	Frequency	Percent*
Installing less than 80% EE	**43**	**100%**
Cost too much	36	84%
Build to code/customers want code	6	14%
Not needed/no benefit	4	9%
Not readily available	3	7%
Lack of customer interest	3	7%
Entry level homes	2	5%
Other	4	9%

* Builders could give more than one response, so percentages do not sum to 100%.

All builders were asked about their perceptions of homebuyers' interest in energy-efficient windows. Forty-eight percent of builders thought homebuyers were somewhat or very interested in energy-efficient windows (Figure V-5). The remainder (52%) thought that buyers had either little or no interest.

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53 Although admittedly arbitrary, 80% was chosen as the cut-off to ensure that we were asking further questions of only those not installing ENERGY STAR as a general rule.

Figure V-5
Builders' Perception of Homebuyer Interest in Energy-Efficient Windows

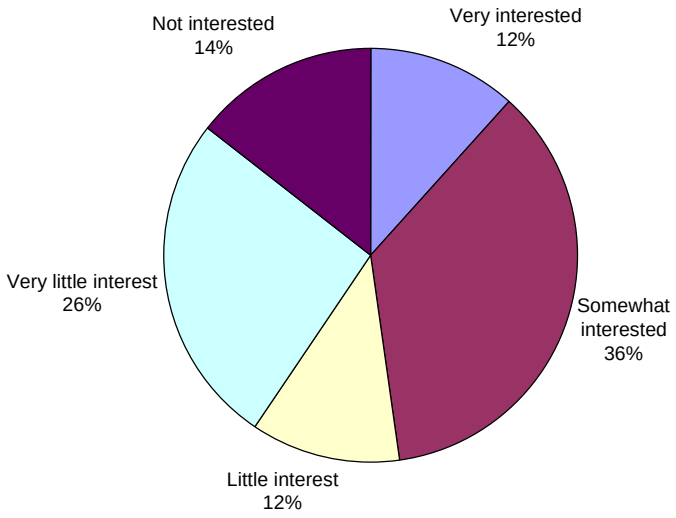


Table V-9
What do you see as the main advantages of energy-efficient windows to those who buy your homes?

Main Advantages	1999 Survey %	2000 Survey %
Save Money/Lower Utility Bills	65%	81%
Save Energy	9%	16%
Increased home comfort	21%	10%
Better insulation/Reduced drafts	10%	9%
Quality/Aesthetics/Value	0%	7%
Reduce Maintenance	0%	4%
Helps the Environment	1%	1%
Reduced noise / Quieter	1%	1%
Reduced Glare/Protect from sun	4%	1%
Reduced condensation	3%	1%
Other	0%	4%
Don't know	0%	1%
None	4%	4%

* Respondents could give more then one answer, so percentages sum to over 100%.

Builders in the 2000 survey were also asked what they saw as the main advantages of energy-efficient windows to homebuyers (Table V-9). The majority of builders (81%) responded that the main advantage was saving money/lowering utility bills, compared to 65% last year. The second most common response (16%) was saving energy.

Fewer builders responded that energy-efficient windows were of benefit to them in contrast to the benefits to homebuyers (Table V-10). Seventeen percent, this year and last, saw no advantage to them of energy-efficient windows. However, a higher percentage of builders this year than last report that energy-efficient windows are useful in advertising and promotion (37%), saving energy (17%), saving money/lower utility bills (13%), meeting code (13%), or providing increased home comfort, better insulation/reduced draftiness, and help the environment. However, the number of builders reporting that energy-efficient marketing advantages based on quality/aesthetics or selling homes/differentiating from competition dropped.[54] Builders continue to see the primary advantages of energy-efficient windows as benefiting the consumer by lowering utility bills and saving energy over time, rather than to themselves when they incur the costs of building a home. It appears that builders still do not understand the potential marketing advantages of energy-efficient windows.

[54] The last finding may be a result of the increasing market penetration of energy-efficient windows. When only a few builders market themselves on the basis of high-efficiency windows, they may be sharply differentiated from others; as the proportion of builders using ENERGY STAR windows climbs, however, energy-efficient windows may become less useful in differentiating builders in the marketplace.

Table V-10
What do you see as the main advantages of energy-efficient windows to you as a homebuilder?*

	1999 Survey %	2000 Survey %
Useful in Advertising, Promotion	20%	37%
Save energy	5%	17%
Quality/Aesthetics	26%	14%
Save money/Lower utility bills	5%	13%
Meeting code	8%	13%
Sells homes/differentiate from competition	20%	9%
Increased home comfort	0%	7%
Better insulation/Reduced draftiness	0%	6%
Helps the environment	0%	3%
Other	12%	7%
None	17%	17%

* Respondents could give more then one answer, so percentages sum to over 100%.

Marketability of Windows: Importance of Energy Efficiency

The AHP approach asks respondents to rank the importance of a series of pairs of factors in relation to one another. Mathematical modeling is then applied to develop each group's overall ranking of factors. The 1999 and 2000 AHP rankings were compared to assess whether builders' perceptions have changed as an indication of program success.

Table V-11 shows the comparison of window marketability characteristics – energy efficiency, selling price, location, style of home, floor plan, and square footage. Similar to last year, builders rate location, selling price, style of home, floor plan, and square footage as most important in marketing homes, with relative mean rankings ranging from 0.13 to 0.23. Although selling price has increased in importance and location has decreased in importance, these findings remain relatively unchanged overall. Although energy efficiency shows the largest increase (18%) from last year (0.05) to this year (0.06), it remains last-ranked in terms of builders' perceptions of importance in making homes more marketable.

Table V-11
Window Marketability Characteristics: Relative Mean Importance

	1999 Survey	2000 Survey	Change
Energy Efficiency	0.050	0.061	18%
Selling Price	0.190	0.226	16%
Location	0.232	0.230	-1%
Style of Home	0.185	0.174	-7%
Floor Plan	0.198	0.177	-12%
Square Footage	0.146	0.134	-9%

Table V-12 and Figure V-6 show the builders' rankings of the marketing importance of different types of energy-efficient measures – windows, space heat, appliances, insulation, lighting, and water heat. Among energy-efficient measures, windows are the most important. Further, their importance increased by 30%, from 0.15 to 0.21, surpassing other energy-efficient measures. Energy-efficient appliances and lighting also show an increase in builder's estimation of importance in marketing. Energy-efficient water heat was the only measure to show a substantial drop in marketing importance between the two surveys, possibly reflecting the market acceptance of high-efficiency water heaters as standard (and thus less useful to builders attempting to differentiate themselves in the market).

Table V-12
Energy-Efficient Measures: Relative Mean Importance

	1999 Survey	2000 Survey	Change
Windows	0.147	0.211	30%
Space Heat.	0.213	0.209	-2%
Appliances	0.095	0.142	33%
Insulation	0.176	0.168	-4%
Lighting	0.108	0.154	30%
Water Heat	0.260	0.116	-125%

Table V-13 and Figure V-7 show that builders' rankings of lack of information, price, and lack of availability as market barriers have not changed over time. Builders continue to perceive price of energy efficient windows to be the most important market barrier, with a mean ranking of about 0.50. Lack of information remains rated second in importance at

0.33, while lack of availability of energy efficient windows ranks a distant third (0.16).

Figure V-6
Energy-Efficient Measures: Relative Importance

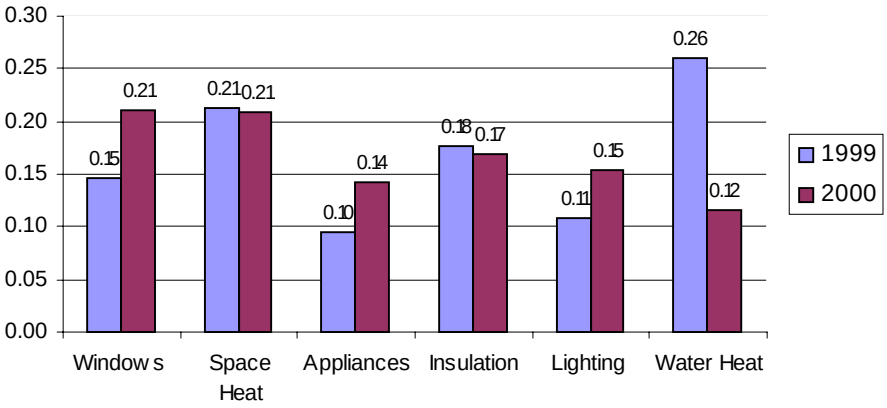
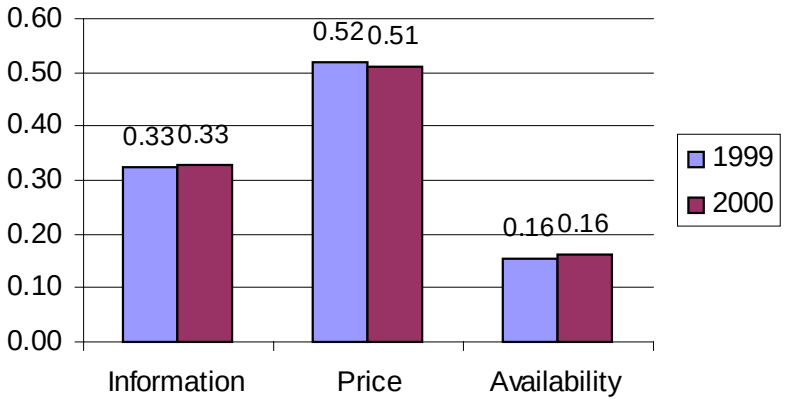


Table V-13
Market Barriers: Relative Mean Importance

	1999 Survey	2000 Survey	Change
Information	0.326	0.328	1%
Price	0.519	0.510	-2%
Availability	0.156	0.162	4%

Figure V-7
Market Barriers: Relative Importance



VI. Consumer Awareness: New Homebuyers

Consumer awareness is being examined in two separate markets: the new construction and the remodel markets. This chapter focuses on new homebuyers. Survey results are compared to those from the survey conducted last year.

Methodology

The survey instrument was developed to address a number of issues, including:

- ➜ How important is energy efficiency when shopping for a home?
- ➜ Where do consumers get information about energy efficiency?
- ➜ Are consumers aware of high-efficiency fenestration products?
- ➜ What advantages and disadvantages are associated with high-efficiency fenestration products?
- ➜ Was the new home furnished with high-efficiency fenestration products? Why or why not?

Sample Design

The sample size for 2000 was initially set at 90 for each home type, as it was in the 1999 survey. Quotas were then adjusted to reflect the proportion of new homes by type of home and location within the Alliance territory. A minimum of ten homes per stratum (home type/state) was set. (See Table VI-1.)

Table VI-1
Original New Homebuyer Quotas

	ID	MT	OR	WA	Region
Single-family	13	10	25	42	90
Manufactured	13	10	34	33	90
Multi-family	10	10	31	39	90

Recent samples of homes built in Oregon and Washington were purchased from Transamerica Intellitech, a real estate information company.[55] Idaho and Montana, however, being "nondisclosure" states,[56] created a problem for obtaining sample. We contacted county records offices, real estate agencies, title companies, local newspapers, and sampling companies, none of whom were able to provide the necessary data. PacifiCorp and Kootenai Electric Cooperative provided 1999 residential new connect data for Idaho.[57] Unfortunately, despite extensive efforts to obtain new connect data, we were unable to obtain them for Montana. Therefore, results of the 2000 survey cannot be readily generalized to Montana. Table VI-2 shows the adjusted new homebuyer quotas for this survey.

Table VI-2
Adjusted New Homebuyer Quotas (w/o Montana)

	ID	OR	WA	Region
Single-family	14	28	47	90
Manufactured	14	38	37	90
Multi-family	11	34	43	90
Total	**40**	**100**	**127**	**270**

Data Collection

Gilmore Research conducted a total of 271 homebuyer interviews in February 2000 (see Table VI-3). The survey instrument is included in the appendix.

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55 Transamerica Intellitech obtains its information for housing units built from county assessor offices. Substantial delays in reporting may cause the most recent sample data to be months behind actual building activity. The sample was pre-screened to remove duplicate sample units between this and last year's new homebuyer samples.

56 New homebuyer information cannot be released for solicitation (including surveys).

57 Kootenai's data were received as the survey finished and could not be utilized.

Table VI-3
New Homeowner Completed Surveys*

	ID	OR	WA	Total
Single-family	24	50	66	140
Manufactured	14	39	38	91
Multi-family	0	13	27	40
Refusals				51
Total Completed	**38**	**102**	**131**	**271**

* Survey quotas for Montana was first reallocated to remaining states within the same category of housing type, then if the sample was exhausted for that category, to single-family.

Table VI-4 shows the percentage of adjusted quotas met by state and dwelling type. The results were very good for single-family and manufactured homes, but we were unable to meet the multi-family strata quotas despite the fact that up to five attempts were made to reach all households. Overall, 44% of the regional multi-family quota was met (0% for Idaho, 38% for Oregon, and 62% for Washington). Remaining unmet multi-family were reassigned to single-family quotas. This resulted in greater numbers of single-family units in the sample for Idaho, Oregon, and Washington than originally desired. Manufactured quotas were either almost met (97% for Idaho) or slightly over-met (Oregon and Washington).[58]

Table VI-4
Percent of Adjusted New Homebuyer Quotas Met

	ID	OR	WA	Region
Single-family	166%	180%	141%	156%
Manufactured	97%	103%	104%	101%
Multi-family	0%	38%	62%	44%
Total Completed	95%	102%	103%	100%

Data Analysis

The survey examined a number of questions concerning energy efficiency and fenestration products. Each of these questions is examined below.

[58] Gilmore Research exhausted the Idaho sample before completing interviews with new manufactured homebuyers.

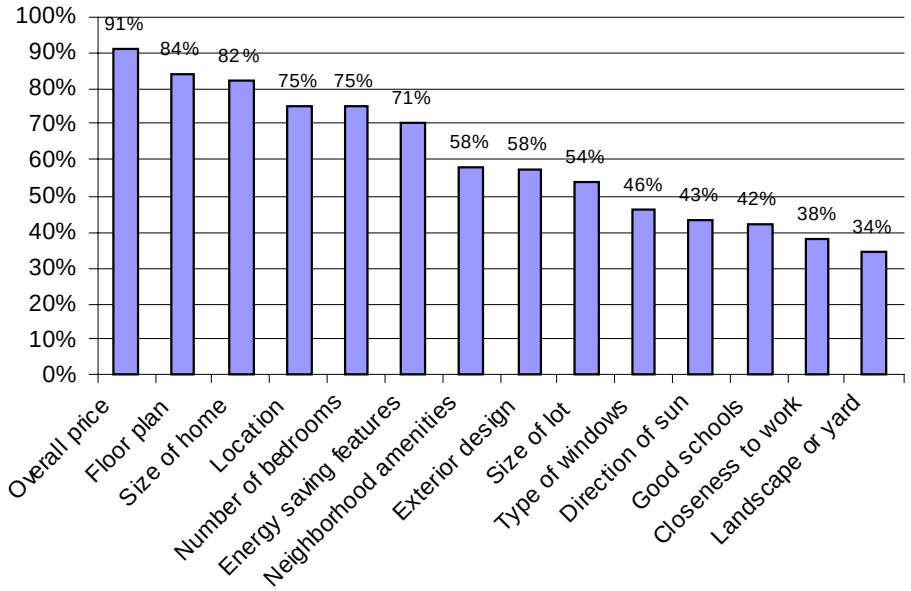
How important are windows and energy efficiency?

Respondents to the new homebuyer survey seemed to go against the grain of the popular credo "location, location, location" in terms of their new home purchasing decision. The most important factors that these home-buyers considered, in fact, were overall price (91% rated this as "somewhat" or "extremely" important), floor plan (84%), and size of home (82%) (Figure VI-1).

Respondents ranked energy saving features at 71% this year (compared to 78% last year), behind location (75%) and number of bedrooms (75%) but well above other factors, including exterior design, size of lot, neighborhood amenities, closeness to work, good schools, etc.

The type of windows was in the middle of the list of factors that the respondents considered when purchasing their new home, consistent with last year's findings. Fifty-six percent rated it as "somewhat" or "extremely" important in their new home purchasing decision compared to 65% last year.

Figure VI-1
Importance of Factors in Purchasing a New Home



The above rating of importance of energy efficiency in the new home purchasing decision produced results similar to that of a later question, which asked respondents if they are trying to reduce energy use in their home. Approximately 54% of the respondents indicated that they were doing something to reduce energy use, the most common areas being

space heating (76%) and lighting (50%) (Table VI-5). Only five respondents (3%) mentioned that they had weatherized their windows, indicating little if any change from last year's estimate (4%).

Table VI-5
What have you been doing to reduce energy use in your home?

	Frequency	% of Respondents*
Done None/nothing	**123**	**45.4%**
Done one or more of the following:	**147**	**54.4%**
Heating/thermostat/fireplace	111	75.5%
Lighting	74	50.3%
Clothes washer	17	11.6%
Dishwasher	12	8.2%
Water heater/save water	10	6.8%
Shower	9	6.1%
Changed fuel source/installed gas appliance/solar	8	5.4%
Close unused rooms/close doors	7	4.8%
Windows/energy-efficient windows	5	3.4%
Personal habits/wearing more clothes/teaching children/awareness	4	2.7%
Open/close blinds/drapes	3	2.0%
Air conditioning	2	1.4%
Electricity/turn of when not in use (TV, radio etc)	1	0.7%
Total respondents	**270**	**100.0%**

* Respondents could select more then one response, thus the total sums to over 100%.

Important Sources of Information on Windows

Figure VI-2 shows the relative percent of respondents who rated sources of information on windows either "somewhat" or "extremely" important. Relative rankings of various sources of information were similar to those found in last year's survey of homebuyers. Visiting model homes (52%), family members (35%), and builders (34%) were rated as the most important sources of information for new homebuyers in general. Rankings of family members and newspaper ads have increased in importance from last year. The importance of builders as a source of information to homebuyers in general had dropped from 42% in 1999 to 34% in 2000.

Figure VI-2
Importance of Sources of Information for New Homes

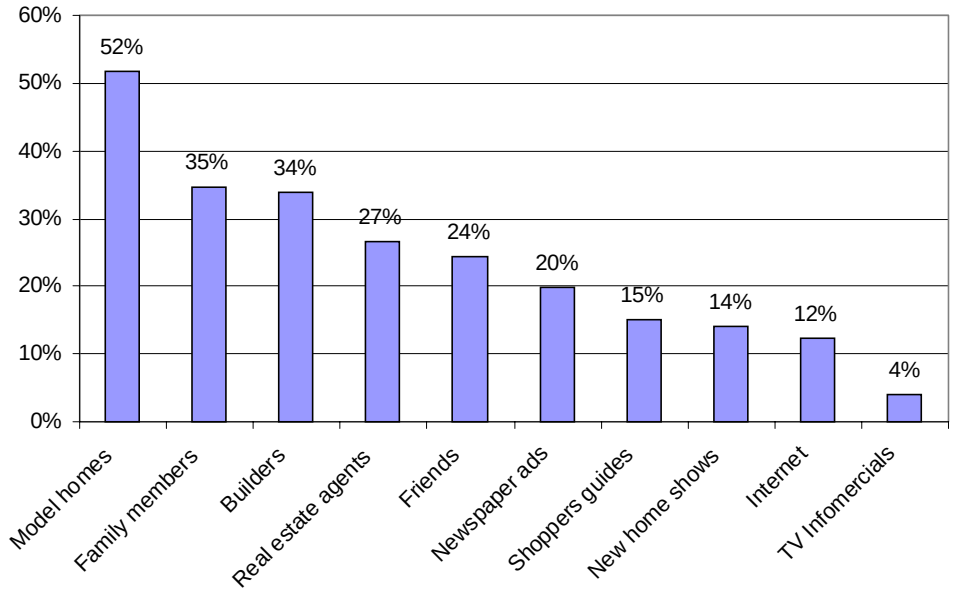
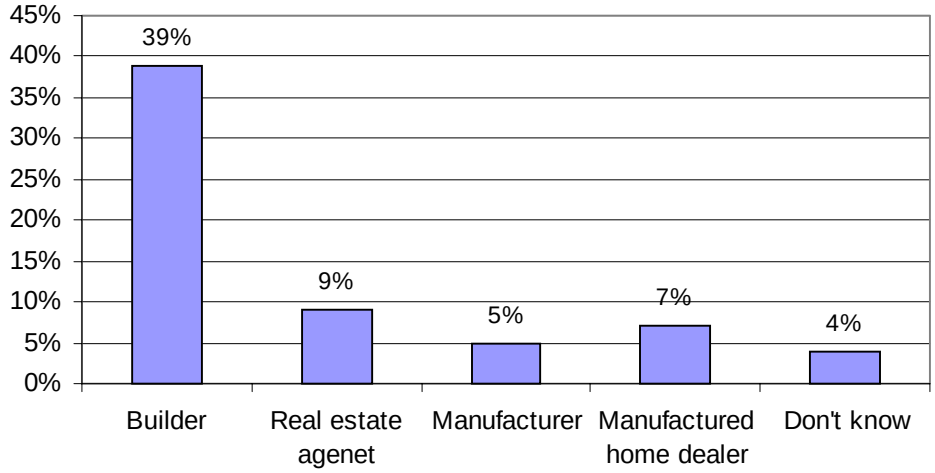


Figure VI-3
Provider of Information about Windows of New Home



Manufactured home dealers (with a mean ranking of 76%) were also very important source of information to purchasers of new manufactured homes.

Where Homebuyers Actually Get Information

Forty-two percent of homebuyers reported that they had not been given information on windows for their new home (Figure VI-3). Of those who did report receiving information, 39% indicated that the builder was the source, compared to only 9% for realtors, 7% for manufactured home dealers, and 5% for windows manufacturers.

Reflecting essentially the same response pattern as last year, 44% percent of all respondents, compared to 46% last year, said that the information provided about their windows concerned energy efficiency.

Are consumers aware of ENERGY STAR?

Almost a third (27%) of new homebuyers across Washington, Idaho, and Oregon were aware of the ENERGY STAR program for energy-efficient appliances and products, compared to 17% across all states (including Montana) last year. Awareness was highest in Oregon (28%) and Washington (29%), and lowest in Idaho (21%) (Table VI-6).

Table VI-6
Awareness of ENERGY STAR Program by State

	WA	ID	MT	OR	Total
1999 Survey *	16%	4%	0%	25%	17%
2000 Survey*	29%	21%	NA	28%	27%

* Eleven respondents who reported they were aware of the program but reported "Don't know" to further questions about the ENERGY STAR Program were recoded to "not aware."

Of those aware of the Program in this year's survey, the most common products mentioned were refrigerators (10%), computer monitors (10%), and washer/dryers (7%) (Table VI-7). Some 5% of all respondents were aware of ENERGY STAR windows/skylights, compared to 3% in 1999.

Table VI-7
Awareness of ENERGY STAR Products

	Frequency*	% of Total*
Aware of ENERGY STAR Products	**85**	**31.4%**
Refrigerators	28	10.3%
Computer monitors	27	10.0%
Washer/dryer	19	7.0%
Water heater	14	5.2%
Don't know of any products	11	4.1%
Dishwasher	12	4.4%
Furnace/heater	8	3.0%
Stoves/ranges	7	2.6%
Air conditioners	4	1.5%
Windows/skylights**	14	5.2%
CFL/lights	3	1.1%
Microwave	3	1.1%
Total	**271**	

* Respondents could give more then one response so totals add to more than 100%.

** Includes 11 respondents that were aware only after being aided.

What do consumers look for in fenestration products?

More respondents reported that they look for energy-efficient components in a window's construction (52%) more than energy efficiency in general (35%), appearance (36%), or features (23%). Of those mentioning energy-efficient construction, respondents often mentioned that they looked for specific features in windows such as double pane (27%), made of vinyl (14%), or tightly sealed/not drafty (10%) (Table VI-8).

Table VI-8
Most Important Features in the Windows of a New Home*

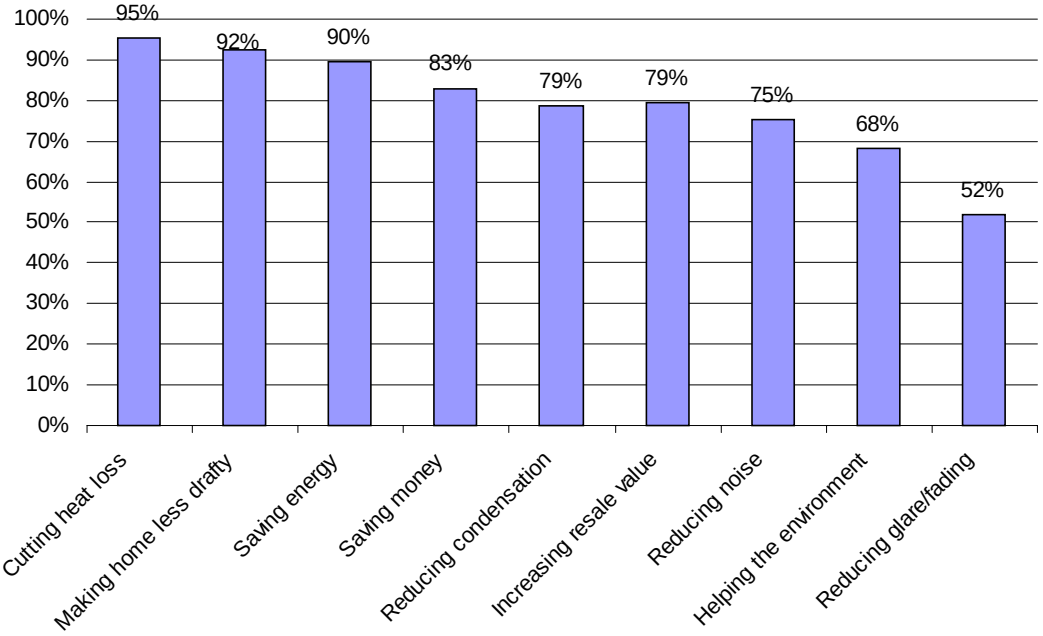
Feature	Frequency	Percent
Respondents analyzed	**271**	**100.0%**
Energy-efficient construction	**140**	**51.7%**
Double paned	72	26.6%
Tightly sealed/not drafty	26	9.6%
Made of vinyl	39	14.4%
Keep heat in and cold out	18	6.6%
Well insulated	13	4.8%
Triple paned	10	3.7%
Double glazed	1	0.4%
Energy efficient	**94**	**34.7%**
Energy efficient (general)	77	28.4%
Low e	13	4.8%
Argon filled	11	4.1%
Appearance	**97**	**35.8%**
Looks/appearance/style	55	20.3%
Size/big/lots of light	34	12.5%
Lots of windows	7	2.6%
Storm windows	7	2.6%
Thermal paned	6	2.2%
Location/view	13	4.8%
Durable	5	1.8%
Tinted/people can't see in	2	0.7%
Features	**62**	**23%**
Easy to open/operate	31	11.4%
Easy to clean	17	6.3%
Security locks	6	2.2%
Safety / able to escape in emergency	4	1.5%
Warranty	3	1.1%
Low maintenance	6	2.2%
Keep out noise	2	0.7%
Other	**17**	**6.3%**
Don't know/Refused	**27**	**10%**

* Respondents could select more than one response, thus the total sums to over 100%.

What advantages and disadvantages are associated with high-efficiency fenestration products?

All of the features of energy-efficient fenestration products were important to new homebuyers (Figure VI-4). The primary interest in energy-efficient windows was comfort: cutting down on heat loss (95%) and making the home less drafty (92%) were the most important items. Saving energy (90%) was also very important, as was saving money (83%). Other factors included reducing condensation and, increasing resale value (both at 79%), reducing noise (75%), helping the environment (68%), and reducing glare/fading (52%).

Figure VI-4
Importance of Features of Energy-Efficient Windows



Are consumers willing to pay for high-efficiency fenestration products?

In order to gauge the interest in paying the incremental cost of purchasing energy-efficient windows, the average cost per household was calculated as a function of the square footage (Table VI-9). In addition, we assumed three levels of incremental cost: argon gas only ($0.50/square foot), low e coating only ($1.65/square foot), and both argon gas and low e coating ($2.15/square foot). Total cost to the consumer was developed by first estimating the total square feet of glazing from the respondent's house size or percent of glazing and then multiplying that by the incremental cost of the higher efficiency glazing.

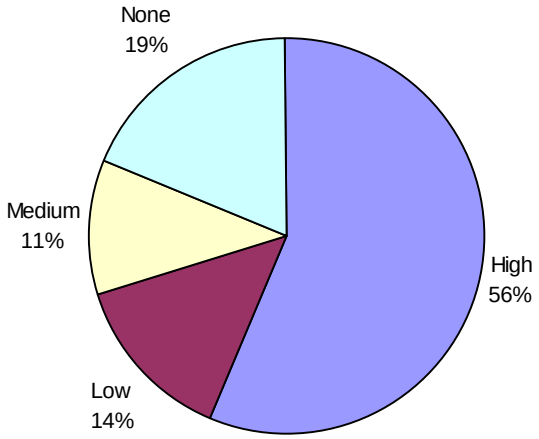
Table VI-9
Assumptions for Willingness to Pay Analysis

Square Feet of Glazing		
Single-family	Multi-family	
15% * Home Square footage	11.5% * Home Square footage	
Incremental Cost per Square Foot Glazing*		
Low	Medium	High
$0.50	$1.65	$2.15

* From "Pricing of Energy-efficient Windows in the Pacific Northwest," Washington State Energy Office. Glazing percent estimates were provided by the Alliance.

Respondents were asked if they would be willing to pay $1.65 more per square foot for energy-efficient windows. Those that said they would pay $1.65 were then asked if they would be willing to pay $2.15 more a square foot for energy-efficient windows. Those that had said they would not pay $1.65 were then asked if they would be willing to pay as much as $0.50 per square foot for energy-efficient windows. As shown in Figure VI-5, 81% of the respondents to the new homebuyer survey were willing to pay a higher price to have energy-efficient windows, the same as last year. Only 19% of the respondents were not interested in paying any additional cost for energy-efficient windows.

Figure VI-5
Willingness to Pay for Energy-Efficient Windows



What type of fenestration products are homes furnished with?

Approximately 38% of all respondents reported that their home had at least one skylight (Table VI-10). Very few respondents (8%), however, were able to identify the manufacturer of their skylight. Glass doors were also very common, as 62% of all homes had at least one. They were most common in single-family (76%) and multi-family homes (70%) and less likely to be installed in manufactured homes (37%). Ninety-six percent of windows were reported to be double or triple paned (91% were double-paned and 5% triple-paned). Some 78% were reported made of vinyl, similar to that found last year. In addition, 34% of the respondents were able to identify the manufacturer of the windows on their new home.

Table VI-10
Installed Base of Fenestration Products

	Single-family (n=140)	Manufactured (n=91)	Multi-family (n=40)	Total (n=271)
Have skylights	36%	37%	45%	38%
Type of Skylight*				
Flat	52%	12%	56%	39%
Domed	34%	68%	22%	43%
Curved	14%	21%	22%	18%
Aware of skylight manufacturer**	8%	9%	6%	8%
Number of glass doors				
At least one door	76%	37%	70%	62%
One **	46%	28%	63%	42%
Two**	21%	8%	5%	14%
Three or more**	4%	1%	3%	3%
Type of windows				
Aluminum**	9%	18%	20%	13%
Vinyl	82%	75%	70%	78%
Wood	7%	4%	10%	7%
Panes				
Single	3%	3%	5%	3%
Double/Triple	96%	96%	93%	96%
Low e windows	40%	51%	20%	41%
Argon-filled	34%	34%	15%	31%
Energy-efficient windows***	40%	51%	31%	46%
Aware of window manufacturer?	46%	17%	32%	34%
ENERGY STAR	1%	4%	0%	1%

* Percent based on respondents with skylights

** Percent computed within categories.

*** Percent reported as meeting specifications, plus percent reported as being beyond standards.

Forty-one percent of respondents said their windows were low-e; 31% reported argon-filled windows. Forty-six percent of homebuyers were estimated, based on self-reports, to have energy-efficient windows.[59]

The awareness of ENERGY STAR windows has not increased over the past year. Despite the fact that almost half of the new homebuyer respondents reported having energy-efficient windows, very few (1%) reported that they had ENERGY STAR windows, consistent with 1999 findings.

[59] This is lower than the 53% reported in 1999, probably reflecting the uncertainty of respondents' estimates about their window attributes.

VII. Consumer Awareness: *Remodelers*

In order to understand the decision-making process in the remodel market, a survey of 92 remodelers was conducted. The results were compared to those of the same survey conducted last year.

Methodology

The remodel survey was designed to collect the opinions of respondents that installed a new fenestration product in their home in the past two years. The survey instrument was developed to address a number of issues, including:

- ➜ How important is energy efficiency when shopping for windows?
- ➜ Where do remodel customers get information about energy efficiency?
- ➜ What advantages and disadvantages are associated with high-efficiency fenestration products?
- ➜ Did remodel customers choose high-efficiency fenestration products to replace existing window products? Why or why not?

Sample Design

The sample for the remodel survey was collected from two sources: the largest window contractor in the Portland metropolitan market provided **quantec** with the names of customers with window products installed in the past year, and Survey Sampling Incorporated (SSI) provided a database of remodelers.[60] Strata were defined by state as shown in Table VII-1. Data provided by the window contractor were used to obtain the majority of the Oregon customers surveyed.[61] Other states' customers were selected entirely from the SSI sample.

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[60] Duplicate listings, if any, were removed. Names were collected from a number of sources, including other questionnaires and warranty cards.

[61] Window contractor data was used to obtain 20 of the 25 Oregon customers.

Table VII-1
Remodel Quotas

Source	ID	MT	OR	WA	Total
Portland Area Contractor	0	0	20	0	20
SSI	20	20	5	25	70
Total	**20**	**20**	**25**	**25**	**90**

Data Collection

Gilmore Research conducted a total of 92 interviews in March 2000 with remodel customers that had any windows, glass doors, or skylights installed in their home in the past two years. The survey instrument is included in the appendix.

As can be seen by comparing Tables VII-1 and VII-2, total quotas by state were met or surpassed. There were no quotas by housing type. Most of the respondents (83 of 92, or 90%) were single-family homeowners.

Table VII-2
Remodel Completed Surveys

	ID	MT	OR	WA	Total
Single-family	17	20	23	23	83
Manufactured	3	1	2	2	6
Multi-family	- - -	- - -	1	- - -	2
Refusals					94
Total	**20**	**21**	**26**	**25**	**92**

Of the 92 respondents, 72 (73%) had installed more than one fenestration product. For example, of the 72 respondents that installed new windows, six also installed new glass doors and nine installed new skylights (Table VII-3). To focus the survey, we asked respondents to consider factors affecting the decision of one fenestration product only. We set quotas of ten skylights, ten glass doors, and 70 window installations.[62] As Table VII-3 shows, we either met or exceeded all quotas.

[62] Quotas were set to obtain some representation of glass doors and skylights but so as to ensure that most of responses would concern windows.

Table VII-3
Type of Fenestration Product Installed

Fenestration Product Installed	No. Respondents	Respondents Who Also Installed...		
		Windows	Glass Doors	Skylights
Windows	72	NA	6	9
Glass doors	10	10	NA	6
Skylights	10	0	0	NA

Data Analysis

How important is energy efficiency?

The primary reason for replacing windows this year was that they were old or broken (47%). Glass doors and skylights tended to be installed mostly as part of major remodels or additions (70% and 55% respectively). Remodelers did report, however, that energy efficiency was an important factor in many fenestration product installations (Figure VII-1). Thirty-eight percent of those installing new windows, 30% of those installing new doors, and 18% of those installing new skylights said they had done so for energy efficiency reasons.

Ninety percent of respondents ranked energy performance and durability as one of the top two factors influencing purchase of windows (Figure VII-2). Appearance was ranked as important by 75% of respondents, behind both energy performance and durability, as was price (68%) and warranty (61%). Color of frame (54%), framing material and recommendations (both ranked important by 45% of respondents) came next in importance. Brand name (33%), although higher than last year (25%), still trailed in importance.

Figure VII-1
Reason for Installing New Fenestration Products

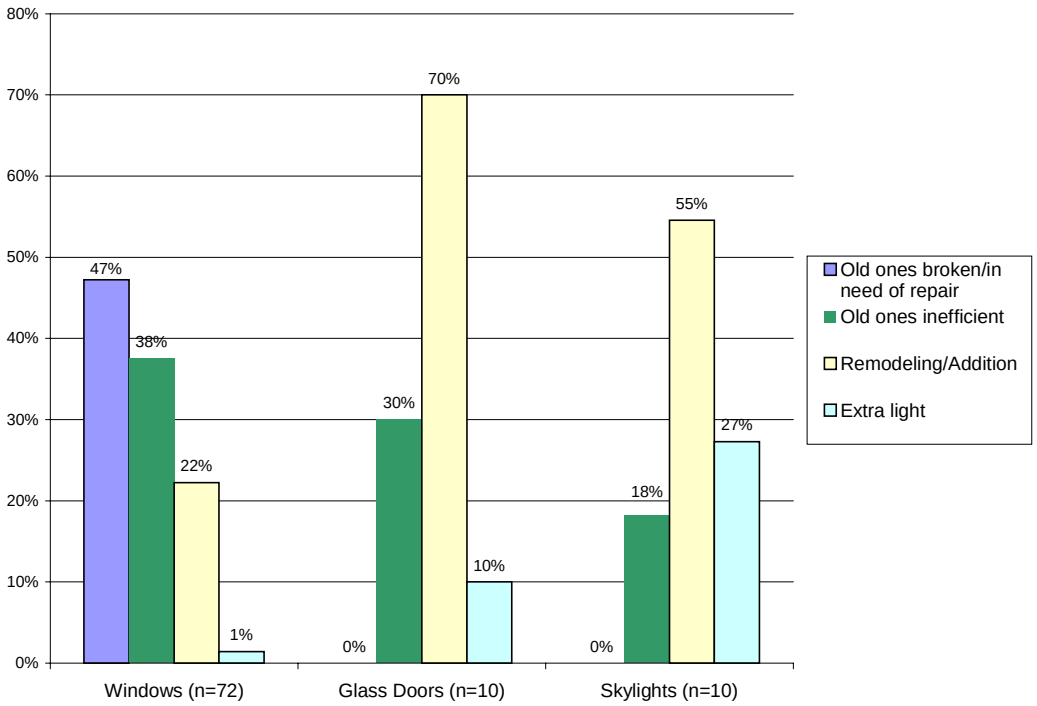
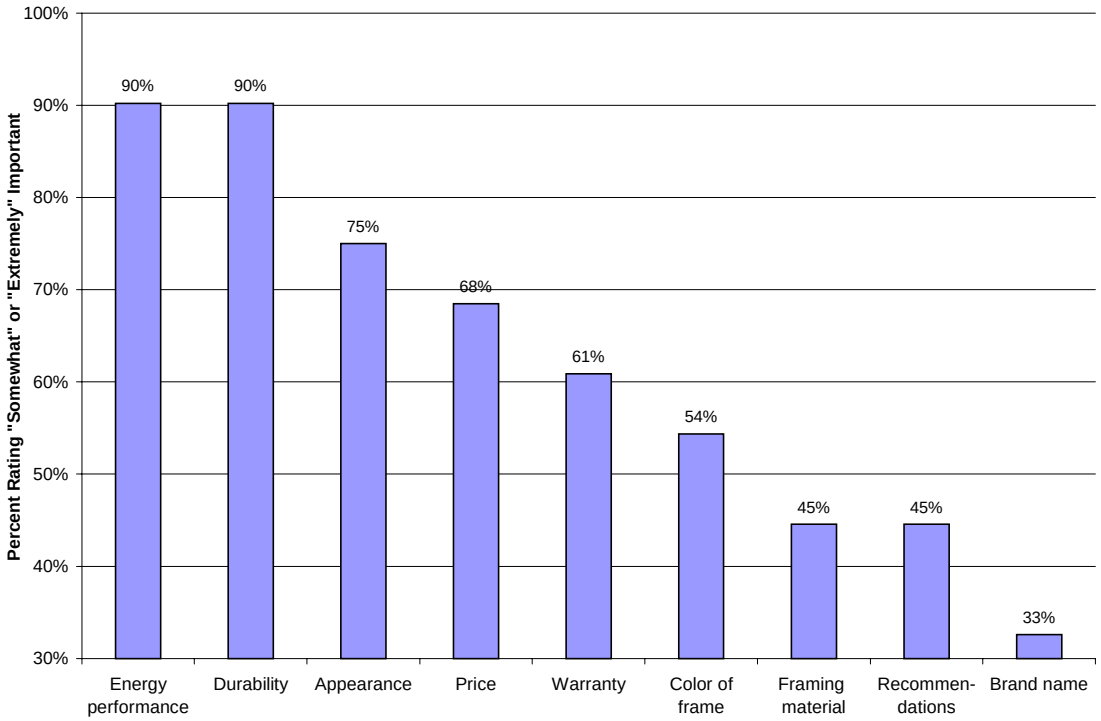


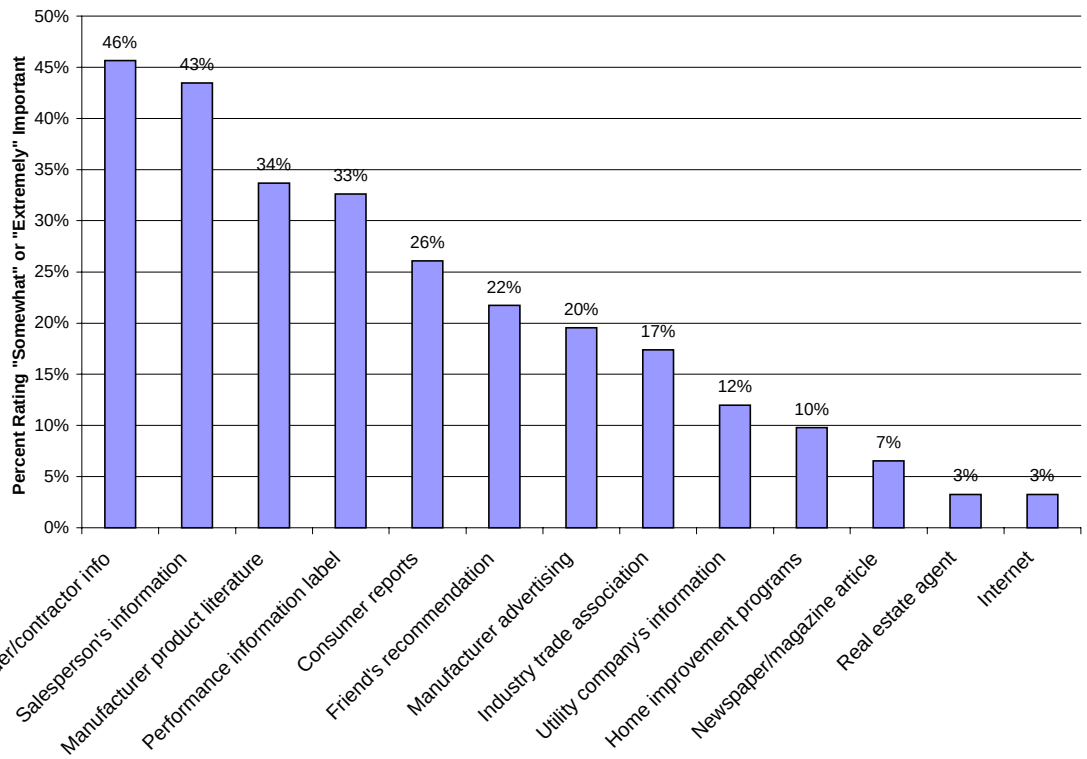
Figure VII-2
Importance of Factors in Purchasing New Windows/Glass Doors/Skylights



Where do purchasers of fenestration products get information?

Last year, like new homebuyers, remodelers did not openly embrace any one particular source of information about fenestration products. Only one source of information – builder/contractor information – was rated as "somewhat" or "extremely" important by at least half of the respondents at that time. Respondents to this year's survey named a number of sources of information for window products as somewhat or extremely important. Their ranking of the importance of builder/contractor information had dropped (46%, down from 58% last year) while the importance of salespersons' information had climbed (43%, up from 34% last year) (Figure VII-3). Manufacturer product literature (noted by 34% of respondents) and performance information label (33%) also emerged as important sources of information. The remaining factors include consumer reports, friend's recommendation, manufacturer advertising, and industry trade associations. Other sources were each mentioned by less than 15% of respondents.

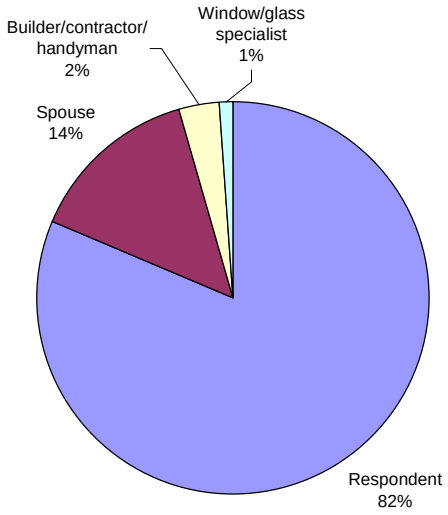
Figure VII-3
Importance of Sources of Information for Fenestration Products



Who selects and installs fenestration products?

A majority of respondents again reported that they or their spouses (96% compared to 81% in 1999) selected the type of fenestration product that they purchased (Figure VII-4).

Figure VII-4
Primary Decision-Maker in Selecting the Type of Fenestration Product



Remodel customers reported that they primarily had windows installed by three groups: themselves ("do-it-yourself"), windows/door/glass specialists, and builders/contractors/handyman (Figure VII-5). Of installations this year, the "do-it-yourself" market comprised 33% (up from 26% last year), the windows/doors/glass specialists installed 38% (compared to 37% last year), and the builders/ contractors/handyman installed 29% (down from 35% last year).

Where are fenestration products purchased?

More fenestration products are sold from specialty window and/or door stores than any other source. This proportion has increased this year with almost half (47%) of this year's respondents indicating that their window products were purchased at a specialty store compared to 35% last year (Figure VII-6). A big decrease, however, was seen in the percentage of respondents reporting that their window products were purchased at home improvement/lumberyards (27% last year down to 16% this year). Builder/contractor sources also decreased from 11% down to 7%, while manufacturer sales remained constant at approximately 20%.

Figure VII-5
Who Installed the Fenestration Product?

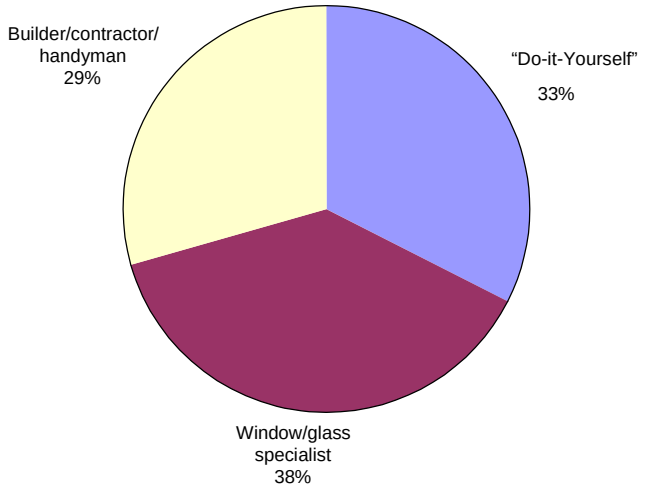
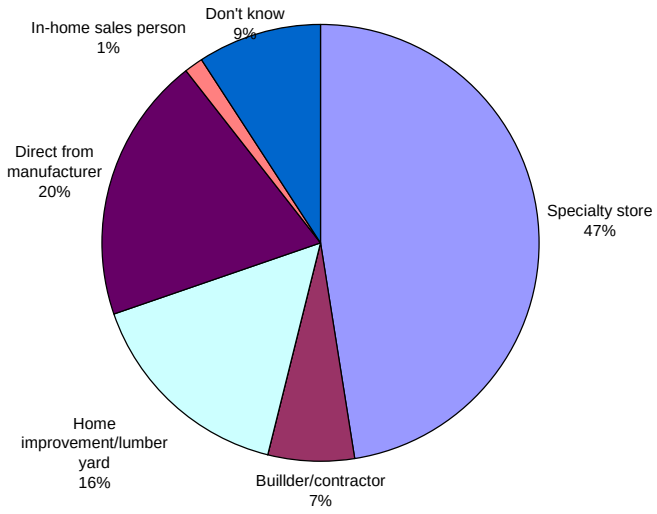


Figure VII-6
Type of Store where Fenestration Product Was Purchased



The source of fenestration products differed by who installed the window product(s). As shown in Table VII-4, two-thirds (67%) of the "do-it-yourself" market purchased their products from a home improvement store/lumberyard. When window/glass specialists or builder/contractors

were hired, 11% of respondents did not know where window products were obtained.

Table VII-4
Type of Store Product Purchased by Installer

Type of Store	Total (n=92)	Installer		
		"Do-It-Yourself" (n=30)	Window/glass specialist (n=35)	Builder/ contractor (n=27)
Window/door specialty	39%	23%	66%	22%
Builder/contractor	6%	3%	6%	7%
Home improvement center/lumberyard	30%	67%	3%	22%
Direct from manufacturer	16%	7%	14%	33%
In-home salesperson	1%	0%	0%	4%
Don't know	8%	0%	11%	11%
Total	**100%**	**100%**	**100%**	**100%***

* Subtotals do not add to column total due to rounding.

Are consumers aware of ENERGY STAR?

Twenty-four percent of the remodel respondents were aware of ENERGY STAR energy-efficient appliances and products this year compared to 16% last year. Twenty percent, almost three times as many as last year, were able to identify a specific ENERGY STAR product (Table VII-5). Respondents mentioned ENERGY STAR refrigerators, washer/dryers, dishwashers, furnace/heaters, etc. Only 1% of all remodel respondents were aware of ENERGY STAR windows/skylights compared to 4% in last year's survey.[63]

[63] The percentages cannot be assumed to differ significantly given the small number of respondents to this query.

Table VII-5
Awareness of ENERGY STAR Products

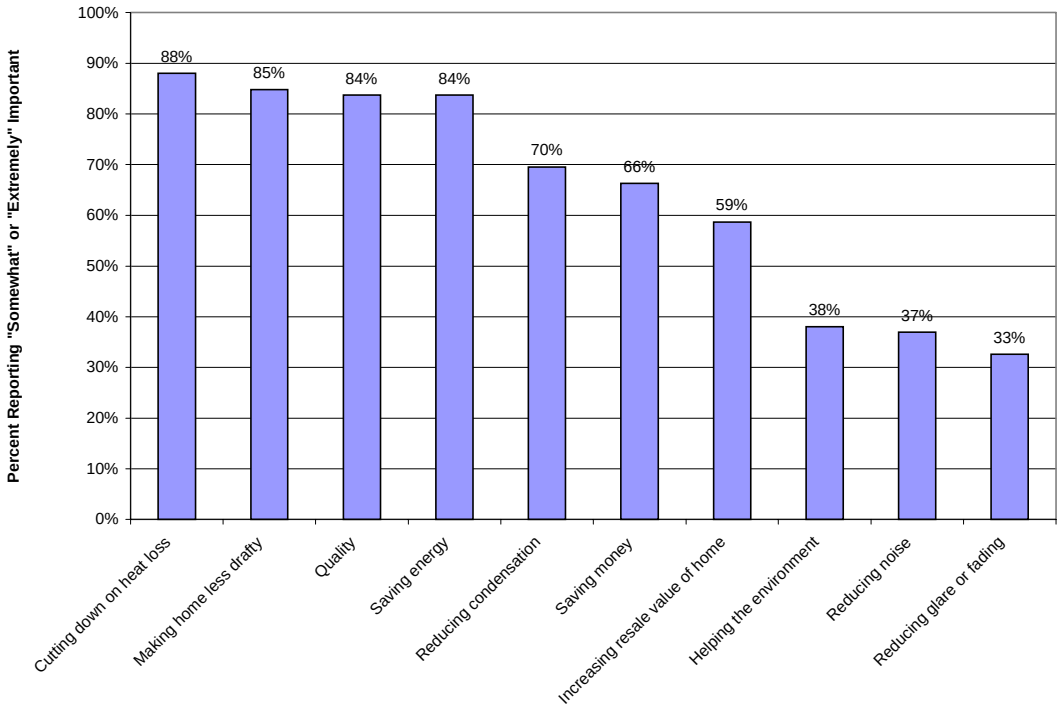
	Frequency*	% of Total*
Total Responding	22	24%
Don't know of any products	4	4%
Aware of any ENERGY STAR	18	20%
Refrigerators	6	7%
Washer/dryer	4	4%
Dishwasher	4	4%
Furnace/heater	3	3%
Computer monitor	2	2%
Windows/skylights	1	1%
Stove/oven/range	1	1%
Water heater	1	1%
Freezer	1	1%

* Respondents could give more then one response

Perceptions towards high-efficiency fenestration products

Features of energy-efficient fenestration products appealed to remodelers: the majority of the respondents rated cutting down on heat loss (88%), making the home less drafty (85%), quality (84%), and saving energy (84%), as "somewhat" or "extremely" important (Figure VII-7). Seventy percent of respondents named reducing condensation, saving money (66%), and increasing the resale value of their home (59%) as "somewhat" or "extremely" important. A third or more believed that helping the environment (38%), reducing noise (37%), and reducing glare of fading (33%) were "somewhat" or "extremely" important.

Figure VII-7
Importance of Features of Energy-Efficient Fenestration Products



What type of fenestration products are remodelers purchasing?

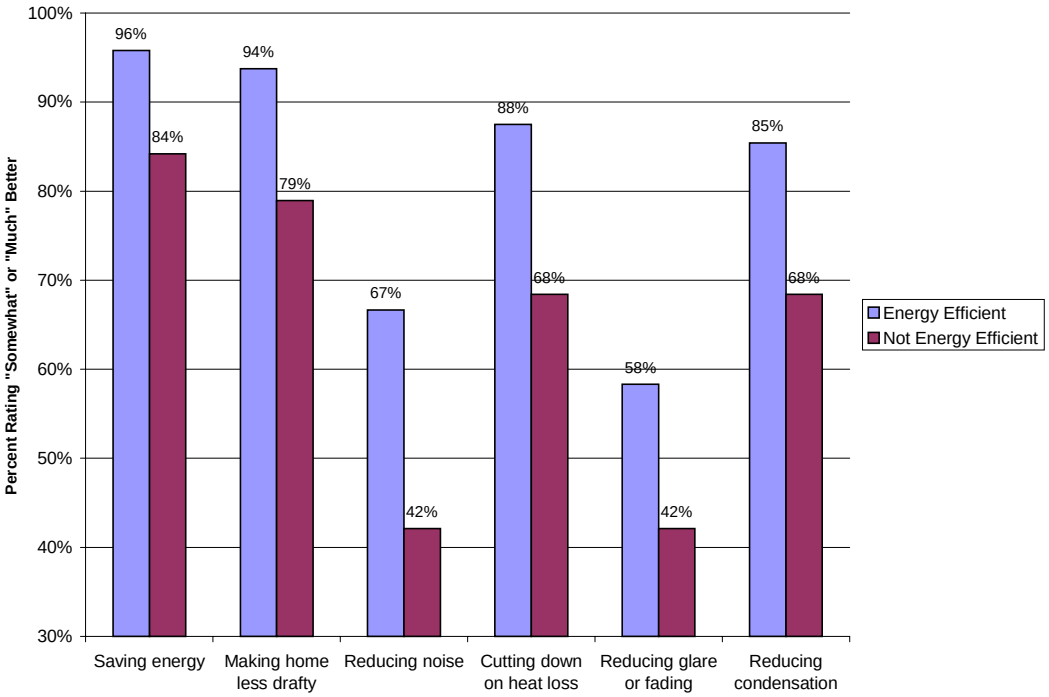
Like the new homebuyers, many remodelers indicated that they had purchased energy-efficient fenestration products; 64% reported that they had low e windows, similar to last year, while 51% reported that the products were argon filled (Table VII-6). In addition, respondents were asked directly if they felt their products were energy efficient, or "go beyond the normal building and manufacturing standards to meet the special requirements for energy efficiency;" 30% responded "yes." Once again, however, the lack of awareness of ENERGY STAR windows was distinctly evident. Despite the fact that many respondents reported having purchased energy-efficient fenestration products, only one respondent reported purchasing ENERGY STAR fenestration products (1%).

Table VII-6
Remodel Installed Fenestration Products

Products	Incidence
Average number installed	
Windows	6.8
Glass doors	1.6
Skylights	2.0
Low e windows	64%
Argon filled	51%
Beyond standards	30%
ENERGY STAR	1%

Those that reported purchasing energy-efficient fenestration products, however, did report that these new products performed substantially better than their previous products on all measures of energy efficiency/comfort, including saving energy, making the home less drafty, reducing noise, cutting down on heat loss, reducing glare and fading, and reducing condensation. (Figure VII-8.)

Figure VII-8
Comparison of New Versus Previous Fenestration Products, by Energy Efficiency

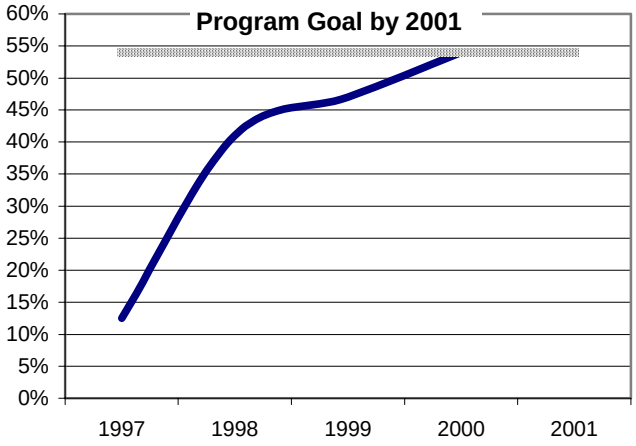


VIII. Conclusions & Recommendations

Market Share, Awareness, and Cost of ENERGY STAR Windows

The first goal of the ENERGY STAR Fenestration Program was to increase market share for high-efficiency fenestration products in the residential new construction and remodel market to 54% by 2001. Market share for ENERGY STAR windows in the Northwest has significantly increased since the inception of the Program, from the baseline of 10%-15% in 1997 to 41% for 1998, 47% for 1999, and now 54% for the last two quarters of available manufacturer sales data (Table VIII-1). Should this trend continue throughout 2000, the Program will have succeeded in meeting its market penetration goal a year ahead of time.

Figure VIII-1
Market Share of Energy High-Efficiency Fenestration Products

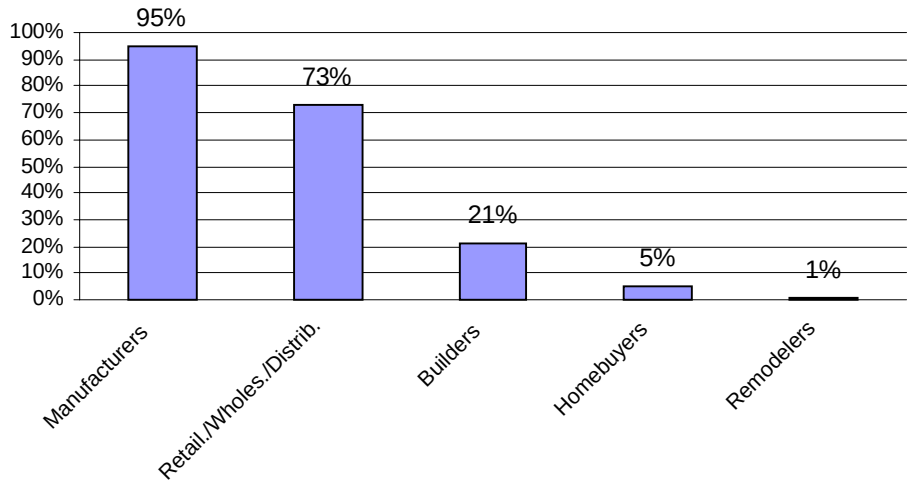


The second goal of the ENERGY STAR Fenestration Program was to decrease the lack of awareness of high-efficiency windows and their initial cost premiums that limit sales in the Northwest. Our research indicates that almost all window product manufacturers surveyed (94%) are now aware of ENERGY STAR and that most are active in the Northwest ENERGY STAR Fenestration Program. Advances in technology have reduced labor costs of energy-efficient windows, but manufacturers express the belief that the next big decrease in the cost of high-efficiency windows will

come only as a result of increased consumer demand. Seventy-three percent of retailers and wholesalers/distributors, up from 67% last year, are aware of the Program.

When it comes to end customers, however, awareness of ENERGY STAR windows decreases significantly. Retailers and wholesalers/distributors say that only 14% of their builder/remodel and retail customers have asked for ENERGY STAR windows. Only 21% of builders are aware of ENERGY STAR windows, almost the same (20%) as found a year ago. Furthermore, although new homebuyers and remodelers express a high level of interest in energy-efficient windows and their benefits, only 5% of new homebuyers and 1% of remodelers are aware that energy-efficient windows were a component of ENERGY STAR.

Figure VIII-2
Awareness Levels of ENERGY STAR Windows



Findings for window product manufacturers, retailers and wholesaler/ distributors, builders, and consumers (new homebuyers and remodelers) are summarized as follows.

Window Manufacturers

Sixteen window manufacturers were interviewed for this report. Residential market sales by these manufacturers are estimated to comprise 80% or more of windows sold in the Northwest during 1999.

- ➜ Manufacturers continue to strongly believe in the certification power of ENERGY STAR to consumers. Last year, manufacturers' responses were very positive regarding the potential for the

ENERGY STAR Program. This year, their responses were still extremely positive on the whole but tempered by actual experience. They provided detailed feedback on the program as well as on issues and barriers faced in transforming the market to ENERGY STAR.

- ➜ This year, 15 out of 16 manufacturers interviewed indicated that they were aware of the Northwest ENERGY STAR Program; 14 indicated that they were Northwest or national Partners. Twenty manufacturers have now signed ENERGY STAR Partnership agreements and work with the Northwest Program.
- ➜ Larger/window manufacturers tended to be early adopters of ENERGY STAR standards and technologies. Smaller/skylight manufacturers tended to lag behind the innovation curve due to lack of information and lack of resources to invest in capital-intensive technology.
- ➜ Manufacturers indicated a steady pattern of annual increase in production of ENERGY STAR windows since 1997. ENERGY STAR efficiency-level product made up an average of 38% of interviewed manufacturers' residential product sales in 1997, 42% in 1998, and 53% in 1999.[64]
- ➜ Manufacturers estimated the proportion of ENERGY STAR to total window product sales in the Northwest market were in the range of 45% - 50% on the whole.[65]
- ➜ Manufacturers that target the remodel market believe that energy-efficient windows make up a much higher percentage of remodel sales than new homebuyer sales. This is chiefly due to the reluctance of builders to add anything to first costs of new homes. Manufacturers focusing on the remodel market reported the highest percentage of ENERGY STAR window sales, with several saying that it had become their standard window product.
- ➜ Manufacturers' estimates of the national market share of high-efficiency windows were much lower – mostly in the 15%-30% range. Almost all thought that the percentage of energy-efficiency windows would increase in the next five years.

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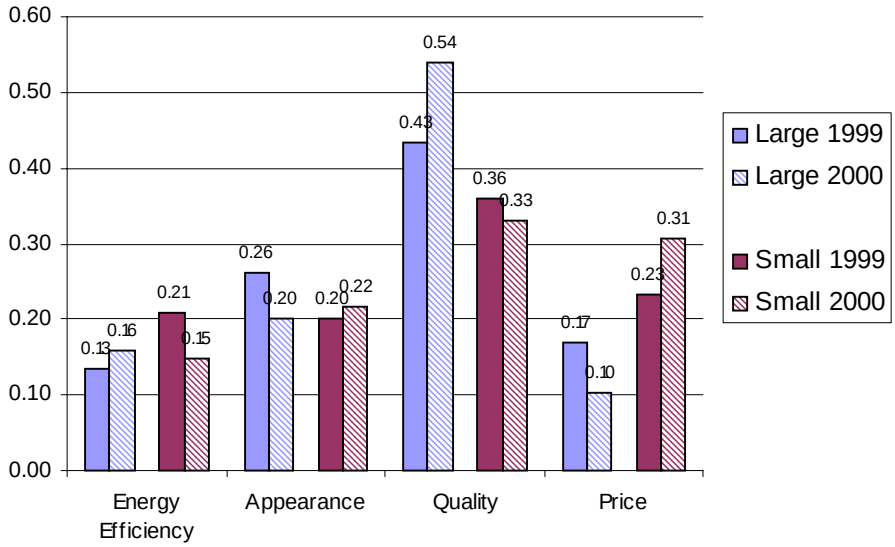
64 Manufacturer sample interview results indicate an average 54% ENERGY STAR penetration projected for 2000, the same as actual sales data reports for the last two quarters provided separately to D&R International by the largest Northwest manufacturers.

65 Individual estimates ranged from 5% - 85%. The above estimate is based on 45% average and a 50% median.

- When asked if they would require further changes (equipment, etc.) to make energy-efficient windows their standard product, 12 of the 16 manufacturers said they would require no further key changes.
- Manufacturers overall did not believe that energy-efficient windows had a different percentage mark-up on cost than did other windows.
- Manufacturers believed that the next big decrease in the cost of high-efficiency windows would be a result of growth in customer demand.
- Most believed that customers might be willing to pay anywhere from 10%-15% more for high-efficiency windows.
- Eleven out of 12 Northwest Partners indicated they were using labeling either on product, brochures, samples, or catalogues. Six said they put labels on 80%-100% of product now or intended to do so by the end of this year.
- Manufacturers continue to rank other factors (price, quality, appearance) as more important than energy efficiency in marketing windows. However, those large manufacturers targeted by the Program have slightly increased their ranking of the importance of energy efficiency relative to other marketing factors (Figure VIII-3).

Figure VIII-3
Ratings of Window Marketability Characteristics



➜ Manufacturers continued to rank price of energy-efficient windows as the highest market barrier, availability as second, with lack of information last.

Retailers and Wholesalers/Distributors

Forty-nine window retailers and wholesalers/distributors were interviewed for this report. Residential window sales by these respondents are estimated to comprise 17%-20% or more of windows sold in the Northwest during 1999. Information was also obtained from D&R for two "big box" retailers that comprise an additional 25% of the market. This report thus summarizes market share and penetration for 42%-45% of residential windows sold in 1999.

➜ Retailers and wholesalers/distributors continue to believe that price (76%) and quality (51%) are the most important factors in a customer's decision to purchase windows. Energy efficiency (22%), however, has replaced availability as the third most important factor in window purchases.

➜ More than half of retailers and wholesalers continue to believe that their customers have a high demand for high-efficiency windows. The rest were evenly split between saying customers had neutral or low demand, mostly due to the higher price of energy-efficient windows.

➜ Ninety-two percent of respondents continue to believe that high-efficiency windows provide a good value to customers. Only 16%, compared to 33% last year, say that energy-efficient windows are hard to explain to customers. Retailers, wholesalers, and distributors do not believe that energy-efficient windows are hard to obtain (only 6% last year and 4% this year). Only price has increased as an issue; 41% of retailers interviewed stated that customers think energy-efficient windows are too expensive compared to 31% the prior year.

➜ Seventy-three percent (compared to 67% last year) had heard of ENERGY STAR. Fifty-one percent of retailers and wholesalers/ distributors reported that they carried ENERGY STAR windows, but only 14% said that customers had asked for them.

➜ Retailers/wholesalers reported that, when weighted by sales, 53% of the windows they sell are ENERGY STAR-level efficiency (compared to 40% in last year's survey). ENERGY STAR market

penetration (weighted) was 49% for glass doors and 31% for skylights.

- ➜ When asked the relative importance of energy efficiency, appearance, quality, and price in marketing windows, respondents ranked quality first and price second in last year's survey. Appearance and energy efficiency followed. These rankings remained substantially unchanged since last year except that energy efficiency (0.19) edged out appearance (0.18).
- ➜ Lack of information has dropped in importance by 10% from last year (0.45) to this year (0.41), indicating that retailers and wholesalers/distributors see this barrier to energy-efficient windows diminishing. It is now ranked second, behind price (0.42), as a market barrier. Lack of availability remains a distant third (0.17), although it has increased in importance as lack of information decreased.

Builders

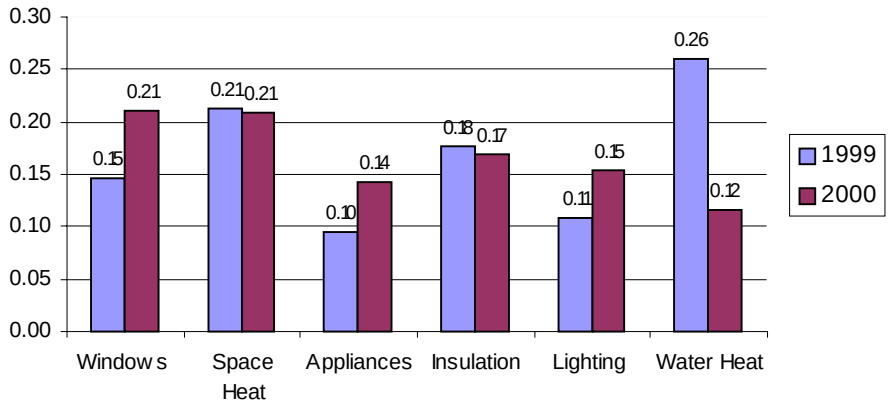
Seventy home builders were interviewed for this report. These builders are estimated to have built approximately 10% of the new homes (and new windows) in the Northwest during 1999.

- ➜ Awareness of ENERGY STAR windows did not increase among builders surveyed this year compared to those surveyed in 1999. Twenty-one percent of builders this year (accounting for about 38% of the units constructed) reported that they had heard of ENERGY STAR windows, almost the same as last year (20%). Of those, only a few could identify ENERGY STAR window features.
- ➜ Builders estimated that 36% of the total units they constructed in 1999 were built with energy-efficient windows, similar to that reported for 1998. Reports of multi-family homes built with ENERGY STAR windows decreased from 44% in 1998 to 38% in 1999.
- ➜ Builders who installed less than 80% energy-efficient windows in homes they constructed said they did so because of the cost of energy-efficient windows.
- ➜ Higher percentages of builders this year reported that energy-efficient windows were useful in advertising and promotion (37%) than last (20%). However, 17% in both the 1999 and 2000 surveys, they said that they saw no advantage to them in installing energy-efficient windows.

➜ Forty-eight percent of builders said homebuyers were somewhat or very interested in energy-efficient windows. The great majority (81%) of builders said that the main advantage of energy-efficient windows to homebuyers was saving money/lowering utility bills.

➜ Builders continue to rate location, selling price, style of home, floor plan, and square footage as most important in marketing homes, although energy efficiency has increased in importance since last year. However, among energy-efficient measures, builders rank windows as the most important marketing feature. Their relative ranking increased by 30%, surpassing other energy-efficient measures (including appliances, insulation, and lighting) (Figure VIII-3).

Figure VIII-3
Energy-Efficient Measures: Relative Importance



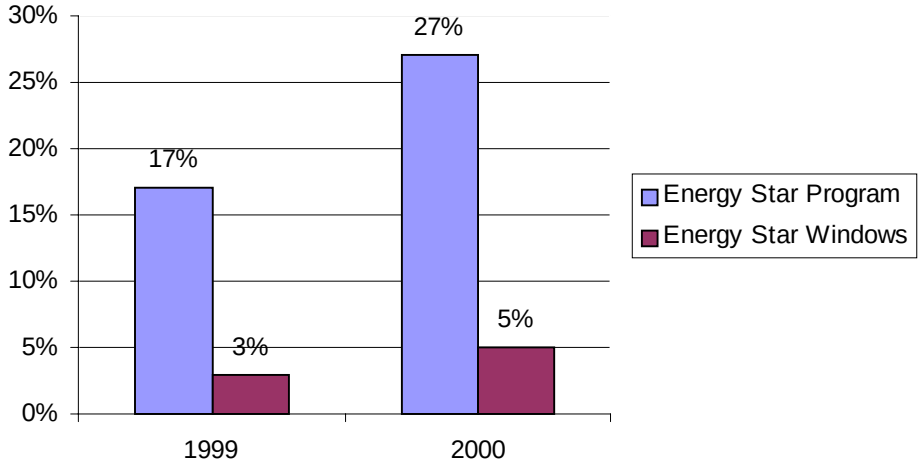
➜ Builders' rankings of lack of information, price, and lack of availability as market barriers have not changed over time. Builders continue to perceive price of energy-efficient windows to be the most important market barrier, with lack of information second in importance, and lack of availability of a distant third.

New Homebuyers

Two hundred and seventy-one new homebuyers were surveyed for this report across the Northwest.

➜ Almost a third (27%) of new homebuyers across Washington, Idaho, and Oregon were aware of ENERGY STAR energy-efficient appliances and products this year compared to 17% last year.[66] Awareness was highest in Oregon (28%) and Washington (29%), and lowest in Idaho (21%). However, this does not translate to awareness of energy-efficient windows (Figure VIII-4). Only 5% of new homeowners (compared to 3% last year) mentioned windows or skylights when asked to name ENERGY STAR products.

Figure VIII-4
Awareness of Homebuyers



➜ Homebuyers seemed to go against the grain of the popular credo "location, location, location" in terms of their new home purchasing decision. The most important factors that these homebuyers considered, in fact, were overall price (91% rated this as "somewhat" or "extremely" important), floor plan (84%), and size of home (82%). Respondents ranked energy-saving features at 71% this year (compared to 78% last year), behind location (75%) and number of bedrooms (75%), but well above other factors.

➜ Fifty-six percent rated type of windows as "somewhat" or "extremely" important in their new home purchasing decision. They reported that visiting model homes (52%), family members

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66 Although sample could be not be obtained for Montana for this survey, Montana respondents indicated no awareness (0%) of ENERGY STAR in last year's survey, making these results comparable.

(35%), and builders (34%) were the most important sources of information for new homebuyers in general; manufactured home dealers (with a mean ranking of 76%) were also very important source of information to purchasers of new manufactured homes.

- ➜ Forty-two percent of homebuyers reported that they had not been given information on windows for their new home. Of those who did report receiving information, 39% received it from the builder. When asked about the content of window information provided, however, only 44% (compared to 46% last year), said that the information concerned energy efficiency.
- ➜ New homebuyers ranked all features of energy-efficient windows as important, including cutting heat loss (95%), making the home less drafty (92%), saving energy (90%), and saving money (83%).
- ➜ Eighty-one percent of new homebuyers were willing to pay a higher price (from $0.50 to $2.15 per square foot) to have energy-efficient windows, consistent with last year's findings. Fifty-six percent were willing to pay as much as $2.15 per square foot more. Only 19% of the respondents were not interested in paying any additional cost for energy-efficient windows.
- ➜ Forty-six percent of homebuyers reported that they had energy-efficient windows.[67]

Remodelers

Ninety-two remodelers were surveyed for this report across the Northwest.

- ➜ Remodelers reported that they replaced windows primarily because they were old or broken (47%) but that glass doors and skylights tended to be installed mostly due to remodeling or additions (70% and 55%, respectively).
- ➜ Ninety percent of respondents ranked energy performance and durability as one of the top two factors influencing their purchase of windows, far ahead of other factors.

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[67] This finding should be taken with some caution as new homebuyers, based on their own reports, have less information on what constitutes an energy-efficient window than do, for example, window manufacturers, retailers/wholesalers/distributors, and even builders. Technologies have also changed; in 1998 argon was a common component of energy-efficient windows, but, by 1999, soft-spacer technology had evolved to the point where it was no longer necessary.

- ➜ Respondents to this year's survey named a number of sources of information for window products as "somewhat" or "extremely" important. Their ranking of the importance of builder/contractor information had dropped (46%, down from 58% last year) while the importance of salespersons' information had climbed (43%, up from 34% last year). Manufacturer product literature (34%) and performance information label (33%) also emerged as important sources of information noted by respondents.
- ➜ Ninety-six percent of remodelers reported that they or their spouses (compared to 81% in 1999) selected the type of fenestration product that they purchased. Thirty-three percent installed their own window products.
- ➜ Almost half (47%) of respondents indicated that they bought their window products at a window/glass specialty store, compared to only 35% last year.
- ➜ Twenty-four percent of remodelers were aware of the ENERGY STAR program for energy-efficient appliances and products, compared to only 16% the prior year. However, only 1% (compared to 5% last year) were aware of ENERGY STAR windows.
- ➜ They value the features of energy-efficient window products; the majority of respondents rated cutting down on heat loss (88%), making the home less drafty (85%), quality (84%), and saving energy (84%) as "somewhat" or "extremely" important.
- ➜ Sixty-four percent reported that they have installed low-e products, similar to last year, while 51% reported that their window products are argon-filled. However, the lack of awareness of ENERGY STAR windows was evident. Despite the reported level of energy-efficient windows, only one respondent reported purchasing ENERGY STAR products.

Market Drivers

Our research has identified a number of active or potential market drivers in the transformation of the Northwest windows market, including:

- ➜ Windows manufacturers' strong levels of participation in the ENERGY STAR Windows program (and other national and regional energy efficiency market transformation efforts)
- ➜ The naturally competitive nature of the fenestration industry

- ➜ Material and technology breakthroughs and service trends (e.g., more after-sale service) in windows manufacturing and related drops in the costs to produce energy-efficient windows
- ➜ A trend by manufacturers to position energy-efficient products in all or most of their product lines (with "energy efficient" being defined as U = 0.45 or better) coupled with general availability of ENERGY STAR-level window products across the region to retailers and wholesalers/distributors and their end customers
- ➜ Cumulative effects of building codes across the region (and expectations that this trend will continue)
- ➜ Increased awareness of energy efficiency in general (but not ENERGY STAR windows) by end consumers

Market Barriers

During the course of our evaluation efforts, we have identified specific market barriers to the transformation of the Northwest window market. They include:

- ➜ **Lack of awareness and information** on the benefits of energy-efficient windows, complicated by communication breakdowns between market actors. The breakdown in communicating the advantages of ENERGY STAR windows appears crucial at the homebuilding stage in which builders control many, if not most, window choices.
- ➜ **Higher first cost of energy-efficient windows** compared to other windows in a competitive marketplace. This barrier is evidenced throughout the extremely competitive windows market, with manufacturers, retailers/wholesalers/distributors, and builders competing on extremely small profit margins.
- ➜ **Split incentives** (i.e., those who incur the costs do not also reap the benefits) – This barrier remains particularly evident in the decisions of builders who incur the initially higher costs of energy-efficient windows yet do not reap the long-term benefits of them. Builders, in general, do not yet understand consumers' high valuation of the advantages of energy-efficient windows and the potential marketing advantages this may convey to them.
- ➜ **Bounded rationality** – Limiting the amount of information that can be meaningfully processed in order to make decisions. This remains a barrier from the retailer/wholesaler/distributor stage, through builders, down to end consumers. ENERGY STAR

provides a vehicle to simplify the complexity of this decision, but it has not yet been successfully conveyed to these actors.

- ➜ **Product inseparability** – The bundling of energy-efficient windows with a myriad of other housing components, including house style, location, price, neighborhood, etc., which must be consumed as a package or not at all. This may be eventually be alleviated by the national ENERGY STAR emphasis on energy-efficient appliances and whole-house energy efficiency.

Recommendations

In two previous Market Progress Evaluation Reports (July 23, 1999, and January 13, 2000), we have recommended that the ENERGY STAR Program:

- ➜ Continue to build customer demand for ENERGY STAR products at every level
- ➜ Provide extended marketing and training support to specific market actors

With the end of the ENERGY STAR Program in sight, the Alliance's attention must now necessarily refocus on what must be accomplished by the end of the program on December 31, 2000, and what steps should follow.

We believe that the importance of communication of ENERGY STAR benefits to and between specific market actors must continue to be emphasized. Retailers/wholesalers/distributors and manufactured home builders must be made aware of ENERGY STAR and must clearly understand the benefits to them so that they, in turn, can communicate its benefits to their customers. This level of the distribution chain is unique in that, for example, retailers/wholesalers/distributors deal with a number of different types of customers (homebuilders, professional remodelers, and homeowners), each of whom have a unique perspective and set of incentives. Emphasis of the marketing advantages of high-efficiency windows to each type of customers is key in raising the level of awareness of ENERGY STAR. For example, if builders understand the marketing advantages of ENERGY STAR windows, they will provide more information to consumers, who in turn will have more information with which to express their demand.

It is also time to focus on smaller window manufacturers, regional skylight manufacturers, manufactured home dealers, builders, and remodel

contractors. We understand that it may require considerable resources and that strategies may vary in terms of cost-effectiveness. However, we continue to see gaps in builder and consumer awareness and demand that cannot be met solely through current program strategies.

In this report, we specifically recommend the following steps to the Alliance regarding the ENERGY STAR Window Program.

- ➜ Program strategies for the remainder of the ENERGY STAR Program should include promotional and testing/technology conversion support for smaller window and skylight manufacturers who still face substantial technology and testing cost barriers to converting to ENERGY STAR standards.

We also recommend that the Alliance and the national ENERGY STAR effort pursue the following strategies in regard to ENERGY STAR products.

- ➜ Continued information and promotional efforts with retailer and wholesaler/distributors who are not yet aware of the advantages of ENERGY STAR.
- ➜ Low cost promotional, marketing and testing/technology support for smaller window and skylight manufacturers who still face substantial technology and testing cost barriers to converting to ENERGY STAR standards. One possibility is aggregator strategies in which smaller manufacturers can order smaller batches of marketing product at the same volume discounts as those enjoyed by larger manufacturers.
- ➜ Enhanced web site support by utilities providing information and contact names for information on ENERGY STAR windows and other products.
- ➜ Work with the mortgage/financing community to develop financing at more favorable rates for ENERGY STAR homes and products (including windows) based on their energy savings and durability benefits.
- ➜ Research on the effects of builders trading off window efficiencies against lessened efficiency standards, particularly in certain states and in manufactured housing.
- ➜ Campaigns to expand efforts with other regional and national energy efficiency groups to educate end consumers on the benefits of ENERGY STAR products, including windows. These should include an ENERGY STAR training strategy in product

sales and installation across product lines for retailers and wholesalers/distributors and builders.

Appendix A
Survey Instruments

Manufacturers

ID No. ____ENERGY STAR Partner _____

Windows Manufacturer: _____

Company Address: _____

Contact Name: _____

Title: _____

Phone: _____

Interviewer (Enter interviewer and name, date, and outcome for each attempt):

Attempt 1: _____

Attempt 2: _____

Attempt 3: _____

Attempt 4: _____

Attempt 5: _____

[IF NECESSARY SCHEDULE CALLBACK]

[*TO CONTACT*:]

Hello, I'm _____. I'm calling on behalf of the Northwest Energy Efficiency Alliance. Are you familiar with the Alliance?

If say no, "The Alliance is a nonprofit organization involved with energy efficiency programs that has been putting millions of Dollars into the energy-efficient windows market in the Northwest."

Now they would like to get the opinions of Northwest manufacturers regarding the energy-efficient windows market.

Do you have a few minutes to answer some questions? (If say no, "What would be a better time for you this week? Or next?")

Industry Trends Section

I'd like to start out by asking about general trends in the window products industry.

1. What are some of the big trends in the industry that will affect your company? (Probe) _____

   _____

2. Looking at the residential windows product market in the Northwest, what do you estimate the total market share is of high efficiency window products? (U factor 0.35 or better for windows and doors, and 0.45 or better for skylights)?

   (a) now ? _____%,

   (b) in 5 years? _____%

3. How about the national market for energy-efficient window products? What do you estimate the total market share is of high efficiency window products? (U factor 0.35 or better for windows and doors, and 0.45 or better for skylights)?

   (a) now ? _____%,

   (b) in 5 years? _____%

4. Have you seen any changes in the industry's cost of producing high-efficiency windows compared to standard windows? **(If costs have fallen) (lower input costs, higher volume, technology changes, other)**

   (a) Increased (don't read)

   (b) Decreased (don't read)

   (c) Stayed the Same (don't read)

   (d) Don't Know/Refused (don't read)

   (probe for increased, decreased, stayed same: **Why is that?**) _____

   _____

5. Are consumers in the Northwest now more willing to pay for high-efficiency window products than they used to be?

   (a) Yes (don't read)

   (b) No (don't read)

(c) Don't Know/Refused (don't read)

Why is that? _____

6. How much more do you think Northwest customers are willing to pay, in terms of percentage, for energy-efficient windows over the cost of standard windows?

_____% Comments: _____

_____

7. What do you think the standard markup is, in terms of percentage of cost, for energy-efficient window products in the Northwest?

_____% Comments: _____

_____

Company Section

ONLY MANUFACTURERS WHO HAVEN"T ANSWERED SURVEY BEFORE

8. How would you describe where your company fits into the general industry in terms of market niches (geographic, price range, type of housing -SF, MF, Manufactured) and the types of customers (direct to builders, manufactured, large retail outlets, small retail outlets, etc.)?

_____

_____

9. (ALL) Where do high-efficiency window products (windows and doors with a U Factor of 0.35 or better and skylights with a U factor of 0.45) fit into your product line? (product features, price and quality, low-end, middle, or high-end)

_____

_____

10. What do you estimate your company's percentage of energy-efficient windows (that is windows with a **U factor of 0.35 or better and skylights with a U factor of 0.45 or better) were (or will be) of your** total window sales for:

(a) _____% 1997

(b) _____% 1998

(c) _____% 1999

(d) _____% 2000

(If big change: probe for when and why change(s) happened) When/Why was that? _____

_____

11. What do you expect the percentage of energy-efficient windows (that is windows with a U factor of 0.35 or better and skylights with a U factor of 0.45 or better**) to <u>be five years from now?</u>**

(if yes or no: Why is that? Where will the demand come from? _____

_____

Market Barriers Section

12. Do you think there are any major market barriers to increasing production or sales of high-efficiency windows? (lack of information, actors, communications, technology constraints (argon), cost, standard practices, etc.)

(a) Yes (don't read)

(b) No (don't read)

(c) Maybe (don't read)

(d) Don't Know/Refused (don't read)

Comments _____

_____

13. (If yes or maybe) What do you think might solve, or at least help lower, these market barriers **(try to address each)**?

_____

_____

ENERGY STAR Section:

14. What's your experience been like in marketing high-efficiency window products? (**probe for successes, problems**)_____

_____

_____

15. Are high efficiency window products getting easier, harder, or about the same to market?

(a) Easier (don't read)

(b) Harder (don't read)

(c) About the same (don't read)

Comments: _____

_____

16. Have you had any outside assistance in marketing/promoting energy-efficient products?

(a) Yes
From whom? _____
How? _____

(b) No

ONLY IF NEW MANUFACTURER, E.G, NEW TO SURVEY OR IF SAID NOT AWARE LAST YEAR

17. Are you aware of the ENERGY STAR Fenestration Program?

(a) Yes

(b) No (Skip to Q 31)

(c) Don't Know/Refused (Skip to Q 31)

18. (If Q17 Yes) How did you hear of it? Comments _____

_____

19. Have you talked with anyone from the ENERGY STAR Fenestration Program in the past 6 months**?**

(a) Yes (Probe: Who?) _____

(b) No

(c) Don't Know/Refused

20. How would you describe the program and your experience with it?

_____

_____

21. Has it helped your sales of high efficiency windows?

(a) Yes

(b) No

(c) Don't Know/Refused

(If yes or no: probe: Why is that?) _____

_____

22. (if NEW RESPONDENT MOU, else skip to A.

23 Did you sign any agreement or contract with the ENERGY STAR Program?

(MOU, money contract, no/didn't want, wasn't offered) (If no or wasn't offered)

(a) Yes

(b) No (Skip to Q 26 after probe)

(c) Don't Know/Refused

(If yes or no: probe: Why is that?) _____

_____

SKIP TO Q. 30 IF NOT ENERGY STAR PARTNER

24. We have you listed as an ENERGY STAR Partner. What made you decide to sign? _____

_____

25. What do you feel you've gotten out of the partnership? (training, marketing SPIFs, etc)? _____

_____

26. What would you like to get out of the partnership? _____

_____

IF SIGNER OF MOU OR MONEY CONTRACT

27. What would you have done, if anything, regarding energy-efficient windows without the ENERGY STAR Fenestration program? _____

_____

28 (If signer of MOU or money contract). What have you done, if anything, regarding energy-efficient windows in addition to ENERGY STAR in marketing energy-efficient products? _____

_____

29. (if mention label) What has your experience been with the ENERGY STAR label? (Are labels understood by salespeople/builders/customers? Do they increase sales? Is the label hard to put on?)

Probe: Why is that? _____

_____

30. Is your company willing to use ENERGY STAR Labeling? **(already use, yes, no)**

(a) Yes Probe: Why is that? _____

____ % What percent of your energy-efficient products are now labeled ENERGY STAR?

(b) No

(c) Don't Know/Refused

31. What, if anything, would make the ENERGY STAR Fenestration program more effective? What should be the top priorities of the program? Is there anything that ought to be added, dropped, or changed? _____

_____

Future Directions Section

32. What do you think your company will be doing, if anything, in terms of window product efficiency over the next few years?

(a) **Yes**, will be doing something (don't read)

a1. increasing (don't read)

a2. decreasing (don't read)

(b) **No**, won't be changing (don't read)

(c) Don't Know/Refused (don't read)

If yes or no: probe: Why is that? _____

_____

33. On a practical level, are there key changes your company would need to make in order for high-efficiency windows/and or skylights to become your standard product lines? **(If yes)** What changes? **(cost inputs, production changes, marketing, etc.)** _____

_____

34. Our current estimate of ENERGY STAR qualifying energy-efficient windows is approximately 50% of the market. How does this compare to your experience?

_____

_____

35. Do you see this percent changing (increasing, decreasing, staying the same) over the next five years?

(a) increasing (don't read)

(b) decreasing (don't read)

(c) staying the same (don't read)

Comments: _____

_____

AHP Section

I'd like to finish by asking some questions about what you think are important.

36. Which of the following do you think is more important in marketing window products?

ENERGY EFFICIENCY OR STYLE ? **Or are they equal? ?** [IF EQUAL, SKIP TO NEXT PAIR]

IF ASK ABOUT APPEARANCE: INCLUDES OVERALL AESTHETIC APPEARANCE, COLOR, FRAME TYPE, OPERATING METHOD

Would that be "moderately," "strongly," "very strongly",, or "**extremely" more important?**

Which of the following is more important in marketing window products?

ENERGY EFFICIENCY OR QUALITY?

(if ask about Quality: includes warranty, reduced callbacks, reduced glare, reduced condensation, reduced noise, and reduced complaints). **Or are they equal?** [IF EQUAL, SKIP TO NEXT PAIR]

Would that be "moderately", "strongly", "very strongly", or "**extremely" more important?**

[REPEAT FOR REMAINING PAIRS]

Feature A	Feature B	A, B, or Equal	Scale M	S	VS	E
Energy efficiency	Appearance (aesthetics, color, frame type, operator type)	A B C	3	5	7	9
Energy efficiency	Quality	A B C	3	5	7	9
Energy efficiency	Price to purchaser	A B C	3	5	7	9
Appearance (aesthetics, color, frame type, operator type)	Quality	A B C	3	5	7	9
Quality	Price to Purchaser	A B C	3	5	7	9

(Note Comments) _____

_____

37. Some manufacturers feel that <u>energy efficiency is not important</u> in marketing window products. Which of the following do you think is a more important reason for this?

<u>LACK OF INFORMATION OR COST?</u> **Or are they equal?** [IF EQUAL, SKIP TO NEXT PAIR

Would that be "moderately," "strongly," "very strongly," or "**extremely" more important?**

Which of the following is more important in marketing windows products?

<u>LACK OF INFORMATION OR LACK OF AVAILABILITY?</u>

Or are they equal? [IF EQUAL, SKIP TO NEXT PAIR]

Would that be "moderately", "strongly", "very strongly", or "**extremely" more important?**

(If ask about Lack of Availability: means lack of products in market)

[REPEAT FOR REMAINING PAIRS]

Feature A	Feature B	A, B, or Equal	Scale M	S	VS	E
Lack of information	Price to purchaser	A B C	3	5	7	9
Lack of information	Lack of availability	A B C	3	5	7	9
Price to purchaser	Lack of availability	A B C	3	5	7	9
Lack of availability	Lack of information	A B C	3	5	7	9

(Note Comments) _____

_____

Thank Respondent

Retailer/Wholesaler/Distributor Survey

ID NO. ____ STATE (Address) _____
DISTRIBUTOR_____
ENERGY STAR Partner___ (check D&R list)

Company / Address:

Contact/Title 1._____

Contact/Title 2. _____

Phone Contact 1: ( ) _____ Phone Contact 2: ( ) _____

Interviewer (Enter interviewer and name, date, and outcome for each attempt):

Attempt 1: _____

Attempt 2:_____

Attempt 3: _____

Attempt 4: _____

Attempt 5: _____

[IF NECESSARY SCHEDULE CALLBACK]

[*TO PERSON WHO INITIALLY ANSWERS*:]

Hello, I'm _____. Who would be the person who makes supply decisions on residential windows products for building and remodeling?

[*TO CONTACT*:]

Hello, I'm _____. I'm calling on behalf of the Northwest Energy Efficiency Alliance. Are you familiar with the Alliance?

The Alliance is a nonprofit organization involved with energy efficiency programs that has been putting Millions of Dollars into the energy-efficient windows market in the Northwest.

Now they would like to get the opinions of retailers and wholesalers regarding the energy-efficient windows market.

Do you have a few minutes to answer some questions?

1. Which of the following best describes your company? Do you emphasize :

   1a. "Sales to Professionals"

   a. Selling and installing only window and/or door products?

   b. Selling and installing window and/or door products along with other building products?

   c. Selling but not installing building supplies including window and door products

   1b. or "Retail Sales"and Home Improvement?

   a.Selling and installing only window and/or door products?

   b. Selling and installing window and/or door products **along with other building products?**

   c. Selling but not installing window/and or door **products along with other home improvement/building products**?

   1c. (don't read) --Other (please describe):_____

2. About what percent of your window product sales are to home builders who build 20 or more housing units a year? ____%

3. Does your company purchase window products: [check as many as apply]

   a. Directly from the manufacturer
   b. From a wholesaler/distributor
   c. Other (describe)_____

4. I'll read a list of factors that might influence a customer's decision to buy window products? Which would you pick as the two most important? {read items and *check top two*}

   a. Price
   b. Quality
   c. Energy Efficiency
   d. Delivery (availability or terms)
   e. Style
   f. Brand
   g. Convenience/Location

h. Availability when needed

i. Materials

j. Other [don't read] (describe)_____

Tracking Data

5. What states does your company serve in the Northwest)? **(check, if a portion, describe)**

   a. ID

   b. MT

   c. OR

   d. WA

5a. (if they respond with more than one part of state i**dentify state or region or area**) _____

_____

6. How many windows) did your company sell in the Northwest in 1999, or what were your sales for residential windows (in dollars) for 1999 in the Northwest? [your answer is confidential] {**PROBE FOR BOTH** }

   1. (gave estimate)

      6a1. Number _____ **AND/<u>OR</u>**

      6a2. $_____Total Sales

      6a3. (probe) . Are we talking about just your site/store, or all company sites/stores in the Northwest?

      ____1. Respondent's Site/store

      ____2. All company sites/stores

   2. Don't Know

   3. Refused (Skip to Q. 8)

7. About how many dollars per sq. foot (or total per window) would that be, on average? **(PROBE FOR BOTH)**

   1. Gave Estimate

      a. $ Sq Ft_____ (OR)

      b. $_____PER WINDOW

      c. (probe) . Are we talking about just your site/store, or all company sites/stores in the Northwest?

      ____1. Respondent's Site/store

      ____2. All company sites/stores

   2. Don't Know_____

   3. Refused

8. Does this include (or how about) glass patio doors (doors more than half glass) or skylights?

a. Yes (PROBE FOR NUMBER AND $)

8a1. **How many doors**?. _____ and/or

8a2. **$_____ of doors?**

8a3. (probe) . Are we talking about just your site/store, or all company sites/stores in the Northwest?

____1. Respondent's Site/store

____2. All company sites/stores

8b1. **How many skylights**. _____ and/or

8b2. **$_____ of skylights?)**

8b3. (probe) . Are we talking about just your site/store, or all company sites/stores in the Northwest?

____1. Respondent's Site/store

____2. All company sites/stores

b. No

c. Don't Know

d. Refused

9. Could you please estimate of your total window sales, what percent of **your windows are bought by (TRY FOR SEPARATE PERCENTAGES of Home Builder Contractors and Professional Remodelers, but if they can't, keep the joint estimate and mark that it's for both by circling both)**

Percent of Category

_____% 9a**. Home Builder Contractors and?**

_____% 9b. **Professional Remodelers ?**

_____% 9c. "**Do-It-Yourselfers"?**

_____% 9d. [don't read] Respondent Sells to End User and Installs Windows for End User

_____% 9e. **Other** (please describe)_____

10. Are you familiar with the U-value used to rate a window's thermal efficiency?

a. Yes

b. No (say, "U-value indicates the rate of heat transmission through a window. Lower U values indicate higher energy efficiency.)

10a**.** **[MT or ID only]** Do you have an energy efficiency code for windows in your area?

a. Yes

b. No

11. **High efficiency windows** are defined as having a U factor of .35 or lower. About **what percent of the residential windows that you have for sale are at:**

a. (gives estimates)

11.a ____% (**SKIP IF NO CODE)** Code minimum -- that is, required by state law or building code agencies

11b. ____% High efficiency, or U = 0.35 or lower?

11b1. _____ % Of those high-efficiency windows, what percent are 0.30 or better?

11c. _____% (**SKIP IF NO CODE)** - Better than code, but not high efficiency? [Be sure to fill in]

b. (don't read) - Don't know [skip to Q. 14]

c. (don't read) – Refused [skip to Q. 14]

12. **<u>High efficiency glass doors</u>** are defined as having a U factor of .35 or lower. About what percent of the residential glass patio doors that you have for sale are at:

a. (Respondent gives estimates)

12a**. _____% (SKIP IF NO CODE)** Code minimum– that is, required by state law or building code agencies

12b. _____% High efficiency, or U = 0.35 or lower?

12c. _____% **(SKIP IF NO CODE)** Better than code, but not high efficiency

b. (don't read - Not Applicable/Don't sell them)

c. (don't read -- Don't know) [skip to Q.14]

d. (don't read – Refused) [skip to Q. 14

13. **<u>High efficiency skylights</u>** are defined as having a U factor of .45 or lower. About what percent of the residential skylights that you sell are at:

a. (Respondent gives estimates)

13a. _____% (SKIP IF NO CODE) Code minimum – that is, required by state law or building code agencies

13b. _____% High efficiency, or U = 0.45 or lower?

13c. _____% (**SKIP IF NO CODE)** Better than code but not high efficiency?

b. (don't read - Not Applicable/Don't sell them)

c. (don't read -- Don't know)

d. (don't read – Refused)

14. Which manufacturer's **windows** do you currently carry? About what percent of your window **sales or stock** [**either one, check and note below**] is that for each manufacturer?

a. Sales [check]

	(a)	***Manufacturer***	***Percent***
14a1.			
14a2.			
14a3.			
14a4.			
14a5.			
14a6.			

b. Stock [check]

	(b)	***Manufacturer***	***Percent***
14b1			
14b2.			
14b3			
14b4.			
14b5.			
14b6.			

c. Don't Know (don't read)

d. Refused (don't read)

15. Which window brands do you sell the most on the basis of:

a. Price? _____

b. Quality? _____

c. Appearance? _____

d. Energy Efficiency? _____

e. Other? [If mention]_____

16. What are the top three manufacturers, in terms of sales **of glass patio door** products, **that you currently carry? (top 3)**

a. Respondent gives names/percent (don't read)

Manufacturer	Percent
a1. _____	_____
a2. _____	_____
a3. _____	_____

b. Not Applicable/don't sell (don't read)

c. Don't know (don't read)

d. Refused (don't read)

17. What are the top three manufacturers, in terms of sales **of skylight** products, that you currently carry? (top 3)

a. (respondent gives names/percent)

Manufacturer	**Percent**
17a. _____	_____
17b. _____	_____
17c. _____	_____

b. Not Applicable/don't sell (don't read)

c. Don't know (don't read)

d. Refused (don't read)

18. What percent of your total window sales in the past 12 months were high efficiency windows? [if ask: windows less than or equal to U = .35] _____%

19. What percent of your total window sales for the next 12 months do you expect to be high efficiency windows? _____%

20. Has your company's **percentage of high efficiency window products sales** - that is, windows and doors that have a U factor less than or equal to .35, and skylights that have a U factor less than or equal to .45 -- increased, decreased, or stayed about the same in the last year (1999)?

a. Increased -- What do you attribute this to?

b. Decreased - What do you attribute this to?

c. Stayed about the same

d. Don't know (don't read)

e. Refused (don't read)

21. What are your company's preferred ways of promoting window products? **(read all quickly, check all that apply)**

a. Training for store personnel
b. In-store displays with posters and brochures
c. Co-op advertising
d. Marketing spiffs
e. Print (newspaper and magazine) media
f. Radio ads
g. Television ads
h. Other [don't read] (describe) _____
i. Don't know (don't read)
j. Refused (don't read)

22. **From the customer's perspective:** On a scale from 1 to 5 where 1 means none and 5 means very high, what number would you give customers' demand for high efficiency windows at this time?

1 2 3 4 5

Probe: Why is that? _____

23. Do you feel that high efficiency windows . . . (check all that apply)

23a. …Provide a good value to the customer?

a. Yes
b. No
c. Depends

23b ….Are hard to explain to customers (in terms of argon gas, low e, glazing levels, or labels)?

a. Yes (Probe: Why is that?): _____
b. No (Probe: Why is that?): _____

23c. ...Are too expensive from customers' point of view

a. Yes (Probe: Why is that?): _____
b. No (Probe: Why is that?): _____

23d. ... Are hard to get

a. Yes (Probe: Why is that?): _____
b. No (Probe: Why is that?): _____

23e. …Have any other issues or problems? (describe) _____

_____

24. Are there any other important trends in the windows market we should know about?

a. Yes (ask to describe): _____

b. No _____

ENERGY STAR

25. Have you heard of the ENERGY STAR label?

a. Yes

b. No (say: It's an energy efficiency trademark of the US EPA and DOE, SKIP to Q. 35))

26. (IF HEARD OF LABEL) Do you believe that recognition of the **ENERGY STAR label** has increased, decreased, or stayed about the same in the past year?

a. Increased

b. Decreased

c. Stayed about the same

d. Don't Know

27. (IF HEARD OF LABEL) On a 1 to 5 scale where 1 means very negative and 5 means very positive, how would you rate your experience with the **ENERGY STAR label?**

1 2 3 4 5

DK or R (skip to Q. 29)

28. Why is that (for Q. 27)? _____

_____

29. Does your Company carry ENERGY STAR windows, patio doors, or skylights?

a. Yes

b. No

c. Don't Know

30. Have customers asked for ENERGY STAR windows, patio doors, or skylights?

a. Yes

b. No

c. Don't Know

31. What manufacturers, if any, are promoting ENERGY STAR Window Products**? (if none, skip to Question 35)** _____

_____

31. Is **ENERGY STAR** providing any of the following to aid your sales and promotion of energy-efficient windows? (read and check all noted)

a. Training for sales personnel
b. Sales kit materials: posters, brochures, in-store materials
c. Marketing or promotional spiffs
d Co-op advertising (print, radio, or TV media)
e. Product labeling
f. Other (consumer or staff hotlines, etc.)
g. None

32. On a scale of 1 to 5, where 1 means no effect and 5 means a big effect, do you think these promotional activities have had an effect on **sales of** energy-efficient window products **to:**

a. **professional home builders**?

1 2 3 4 5 NA R

b. **professional remodeler contractors**?

1 2 3 4 5 NA R

c. **retail homeowner customers**?

1 2 3 4 5 NA R

33. Do you think that ENERGY STAR will help increase your market share of high efficiency window products?

a. Yes
b . No
c. Don't Know (skip to Q. 35)

34. Why is that? _____

35. What kind of efforts, if any, are **other manufacturers** (if asked – that's NON-ENERGY STAR) providing to aid your sales and promotion of energy-efficient windows? (read and check all noted)

a. Training for sales personnel
b. Sales kit materials: posters, brochures, in-store materials
c. Marketing or promotional spiffs

d. Co-op advertising (print, radio, or TV media)
e. Other (consumer or staff hotlines, etc.)
f. Product labeling
g. None

MARKET BARRIERS: AHP Section

I'd like to finish by asking a couple of questions about what you think are important.

36. Which of the following do you think is more important in marketing window products**?** (from Table)

"Feature (A) or Feature (B)? Or are they equal." (If equal, skip to next pair)

"Would that be "moderately", "strongly", "very strongly", or "extremely" more important?"

"**How about . . ."** (next pair from table):

Feature A	Feature B	A, B, or Equal	Scale M	S	VS	E
Energy efficiency	Appearance (aesthetics, color, frame type, operator type)	A B E	3	5	7	9
Energy efficiency	Quality	A B E	3	5	7	9
Energy efficiency	Price to purchaser	A B E	3	5	7	9
Appearance (aesthetics, color, frame type, operator type)	Quality	A B E	3	5	7	9

(Note Comments) _____

_____

37. Some companies feel that energy efficiency is not important in marketing window products. Which of the following do you think is a more important reason for this?

"Feature (A) or Feature (B)? Or are they equal." (If equal, skip to next pair)

“Would that be “moderately", “strongly”, “very strongly”, or “extremely” more important?”

“How about . . .” (next pair from table):

Feature A	Feature B	A, B, or Equal	Scale M	S	VS	E
Lack of information	Price to purchaser	A B E	3	5	7	9
Lack of information	Lack of availability	A B E	3	5	7	9
Price to purchaser	Lack of availability	A B E	3	5	7	9

(Note Comments) _____

_____

_____

Thank Respondent

Builder Survey

ID NO. ____ STATE (Address) _____ SF Buildiner_____
MF Builder _____ Both SF and MF Builder _____

Company / Address:

Contact/Title 1._____

Contact/Title 2. _____

Phone Contact 1: ( ) _____ Phone Contact 2: ( ) _____

Interviewer (Enter interviewer and name, date, and outcome for each attempt):

Attempt 1: _____

Attempt 2:_____

Attempt 3: _____

Attempt 4: _____

Attempt 5:

[IF NECESSARY SCHEDULE CALLBACK]

[TO PERSON WHO INITIALLY ANSWERS:]

Hello, I'm _____. Who would be the person who makes supply decisions on residential windows products for building and remodeling?

[TO CONTACT:]

Hello, I'm _____. I'm calling on behalf of the Northwest Energy Efficiency Alliance. Are you familiar with the Alliance?

The Alliance is a nonprofit organization involved with energy efficiency programs that has been putting Millions of Dollars into the energy-efficient windows market in the Northwest.

They want to know about the windows that builders are installing in their residential construction and how they make decisions. Do you have time for a few questions? (If asked: Your answers are confidential.)

Building Practices

1 About how many single family homes and duplexes did your company build, or start, in 1999? _____ [*ALWAYS TRY FOR SPECIFIC NUMBER - NOT RANGES*]

a. What percentage of these were spec homes (built without a specific buyer in mind?) _____%

b. What percentage of these were presale homes (pre-sale tract homes built as a model but sold before construction was finished)? _____%

c. What percentage of these were custom homes (presold before they were constructed) ? _____%

2. About how many multifamily units (projects with more than 2 units), including townhouses and condos, did your company build in 1999? _____[**GET *NUMBER OF UNITS, NOT PROJECTS***]

3. About what percentage **(TRY TO GET EXACT – NOT RANGE)** of the homes were electrically heated?

3a. Single family:__% (*if don't know, about how many* _____)

3b. Multifamily:___% *(if don't know, about how many* _____)

4. What cities/region, or state(s) do you generally build homes in? ___

_____

Window Section

5. Which window manufacturers make the windows you usually install ? **[*DON'T READ LIST; CIRCLE ALL THAT APPLY*]**

a. Anderson
b. Empire Pacific Industries (EPI)
c. Insulate
d. Jeld-Wen
e. Mercer
f. Milgard
g. Pella
h. Summit
i. Viking

j. Weathervane

k. Other (Ask for Name, spelling)_____

6. Where do you purchase most of your windows? **[*DON'T READ LIST; CIRCLE ALL THAT APPLY*]**

a. Direct from manufacturer

b. Hardware stores

c. Home centers (e.g., Home Depot, Homebase, Eagle)

d. Lumber yard

e. Distributor

f. Other (write name/type) _____

7. Have you heard of ENERGY STAR windows? ***(Circle one response)***

a. Yes
(IF YES) Where did you hear about them?
(examples: Other builders, lumberyard, advertisements)

_____

b. No (skip to Q9)

c. Don't know/Not sure (skip to Q9)

d. Refuse (skip to Q9)

8. Do you know the features a window must have to be classified as an ENERGY STAR window in the Northwest? **[*DON'T READ LIST; CIRCLE ALL THAT APPLY*]**

a. U-Factor less than or equal 0.35

b. Double pane

c. Low e-coating (special coating)

d. Gas/argon filled

e. Thermal break

f. Triple pane

g. Energy efficient (Unspecified)

h. Other (Specify) _____

i. Don't know

j. Refused

9. Are you familiar with the U-Factor used to rate a window's thermal efficiency?

a. Yes

b. No

c. Don't Know/Not Sure

d. Refused

U-Factor is a rating that shows the rate of energy transfer through windows. **A lower U-Factor means a higher energy efficiency.**

10. [MT or ID only] - Do you have an energy efficiency code for windows in your area?

    a. Yes (If yes, "Do you know what the code is in terms of U Factor?_____)

    b. No

11. For 1999, what percent of the windows you installed were

11a. More than U 0.35 (Less energy efficient) - ***IF MORE THAN 0, ASK* below questions]** _____%

What percent of these over U 0.35 (answers below should add to 100%) were:

a. wood _____%
b. vinyl _____%
c. metal _____%
d. other _____? (please describe:_____)

11b. U 0.35 or less (energy efficient) _____% [- IF say 0, Check by asking "So you didn't install any high efficiency windows in 1999?]

[IF did install some, ASK]

What percent of those less than or equal to U 0.35 (so below answers should add to 100%) were:

a. wood _____%
b. vinyl _____%
c. metal _____%
d. other _____%? (Describe_____)
e. Of those high-efficiency windows, what percent are 0.30 or better? _____% (just percent of above Q2)

11c. (SKIP IF NO CODE) - Better than code, but not high efficiency? _____% [Be sure to fill in]

11d. Don't know (don't read) - [Say, "Is there someone else available that might know?" *(Ask if you can talk to them, if not, get name and number)*

_____

11e. Refused (don't read) – [Say, Is there someone else who would know?"]
(Ask if you can talk to them, if not, get name and number)

_____

If install high efficiency windows in Q11.

12. Are these windows labeled as "ENERGY STAR?"

    a. Yes
    b. No

13. *(If install high efficiency windows in Q11.)* Do you make homebuyers aware that you offer ENERGY STAR Windows?

    a. Yes
    b. No (Go to Q. 15)

If install high efficiency windows in Q11.

14. How do you make homebuyers aware that you offer ENERGY STAR Windows? [DO NOT READ, CIRCLE RESPONSE, DO ask "Any Other"]

    a. Advertising
    b. Labeling
    c. Inform verbally
    d. Inform in writing
    e. (ASK) **Any Other?(Describe)**

    _____

IF INSTALL LESS THAN 80% energy-efficient windows in 4b

15. What, if anything, keeps you from installing more U 0.35 windows? [*CIRCLE ALL THAT APPLY*]

    a. Cost too much
    b. Not readily available
    c. Energy savings are not great
    d. Lack of customer interest
    e. Other (explain) _____
    f. Don't know, no reason

16. How interested are homebuyers in the energy efficiency of windows in new homes? Would you say…

    a. Very
    b. Somewhat
    c. Little
    d. Very little
    e. Not interested at all (*skip to Q18*)

f. Don't know (*DO NOT READ*)

IF AWARE OF ENERGY STAR WINDOWS in Q7

17. How much interest have you experienced from homebuyers for ENERGY STAR windows? Would you say…

a. A lot
b. Some
c. Little
d. Very little
e. None
f. [*DO NOT READ* Don't know]

18 What do you see as the main advantages of energy-efficient windows, if any, **to you as a builder?** [*DO NOT READ LIST; CIRCLE ALL THAT APPLY*]

a. Differentiates from competition
b. Quality reduces callbacks
c. Useful in advertising, promotion
d. Save energy
e. Helps the environment
f. Save money/lower utility bills
g. Increased home comfort
h. Reduced noise/quieter
i. Better insulation/reduced draftiness
j. Reduced glare or fading/protect interior from the sun
k. Reduce condensation
l. Other (Specify) _____
m. Don't know (Don't Read)
n. None

19. What do you see as the main advantages of energy-efficient windows if any, **to those who buy your homes?** [*DO NOT READ LIST; CIRCLE ALL THAT APPLY*]

a. Save energy
b. Helps the environment
c. Save money/lower utility bills
d. Increased home comfort
e. Reduced noise/quieter
f. Better insulation/reduced draftiness
g. Reduced glare or fading/protect interior from the sun

h. Reduce condensation

i. Other (Specify) _____

j. Don't know (Don't Read)

k. None

Glass Doors/Skylight Section

20. About how many homes with glass doors, patio or sliding doors, did you build in 1999? _____ [*NUMBER*]

21a. What percentage of those do you estimate were U .35 or lower?

_____% [*IF RESPOND "CODE"*] Code jurisdiction _____

21. About how many homes with skylights did you build in 1999? _____ [*NUMBER*]

21a. What percentage of those do you estimate were U .45 or lower? [*ENERGY STAR SKYLIGHTS ARE U .45 OR LOWER*]

_____% [*IF RESPOND "CODE"*] code jurisdiction ____

21x. What do you estimate the additional cost would be to install high efficiency U 0.35 windows and doors, and high-efficiency U 0.45 skylights into an average 2,000 sq. ft. house?

a. $_____

b. Don't Know / Refuse (Don't read) d

AHP Section

There are only three more questions. They ask you to compare the importance of things.

22. First, which of the following is more important in making a home marketable*: [READ FEATURE OR FEATURE*].
Or are they equal? [*IF EQUAL, SKIP to NEXT PAIR*]

Would that be "**moderately**," "**strongly**," "**very strongly**," or "**extremely**" more important?

[*READ NEXT PAIR, REPEAT*]

Feature A	Feature B	A, B, or Equal	Scale M	S	VS	E
Energy efficiency	Selling price	A B E	3	5	7	9
Energy efficiency	Location	A B E	3	5	7	9
Energy efficiency	Style of the home	A B E	3	5	7	9
Energy efficiency	Floor plan	A B E	3	5	7	9
Energy efficiency	Square footage	A B E	3	5	7	9
Selling price	Location	A B E	3	5	7	9
Style of home	Floor plan	A B E	3	5	7	9
Square footage	Selling price	A B E	3	5	7	9

The next to last question is:

23. Now assume that energy efficiency **is** important in making a home more marketable. Which is more important? [*READ FEATURE OR FEATURE*]?
Or are they equal? [*IF EQUAL, SKIP TO NEXT PAIR*]

Would that be "**moderately**," "**strongly**," "**very**," or "**extremely**" more important?

[*READ NEXT PAIR, REPEAT*]

	Feature B	A, B, or Equal			Scale M	S	VS	E
Efficient windows	Efficient space heating	A	B	E	3	5	7	9
Efficient windows	Efficient appliances	A	B	E	3	5	7	9
Efficient windows	Extra insulation	A	B	E	3	5	7	9
Efficient windows	Efficient lighting	A	B	E	3	5	7	9
Efficient windows	Efficient water heating	A	B	E	3	5	7	9
Efficient space heating	Efficient appliances	A	B	E	3	5	7	9
Extra insulation	Efficient appliances	A	B	E	3	5	7	9
Efficient appliances	Efficient lighting	A	B	E	3	5	7	9

This is the last question.

24. Some builders believe that energy efficiency is not important in making a home more marketable. Which do you think is a more important reason for this?: [*READ FIRST PAIR: FEATURE OR FEATURE*]?
Or are they equal? [*IF EQUAL, SKIP TO NEXT PAIR*]

Would that be "**moderately**," "**strongly**," "**very strongly**," or "**extremely**" more important?

[*READ NEXT PAIR, REPEAT*].

Feature A	Feature B	A, B, or Equal	Scale M	S	VS	E
Lack of info.	Cost	A B E	3	5	7	9
Lack of info	Lack of availability	A B E	3	5	7	9
Cost	Lack of availability	A B E	3	5	7	9

We really appreciate your time. We understand how busy you are. Thank you.

New Home Buyer Survey

12: **STATE**

STATE FROM SAMPLE
WASHINGTON ..... WA
OREGON ..... OR

```
Hello, my name is _____ from Gilmore Research Group calling
for the
Northwest Energy Efficiency Alliance.  We are conducting a study on
energy use
in the Northwest and are not selling anything.  May I please speak
with an
adult who was most involved in your home purchase decision ?

WHEN ON THE LINE, REINTRODUCE IF NEEDED: We're conducting a study on
home energy use in the Northwest and would like to include your
household's opinions.
                  Is now a good time to talk?

IF NEEDED: This study is being sponsored be The Northwest Energy
Alliance, a
consortium of NW utilities.  They are hoping to better understand
energy use and equipment. Your answers will be kept strictly
confidential and nobody will be contacting you later to sell you
anything.  This is not a sales call.
The survey will only take about 10 minutes.
                    @INT02
                    51 yes, continue
                    02 arrange callback
                    F1 to see all available codes
                    F7 for if needed statements
```

13: **INT02**

IF NOT AVAILABLE, ARRANGE CALL-BACK

14: **INT04**

First, I have a couple of questions about home construction. Have you had a home constructed within the last two years?

YES, Continue 51
NO - THANK AND TERMINATE ..... 60skip to /END
Don't know - THANK AND TERMINATE ..... 61skip to /END
Refused - THANK AND TERMINATE ..... 62skip to /END
10 INITIAL REFUSAL - SOFT ..... 10skip to /XIT10
13 INITIAL REFUSAL - HARD ..... 13skip to /END
50 NQ - MISCELLANEOUS ..... 50skip to /XIT50

15: **Q1A**

Was the construction for your..
current residence, ... 01
a vacation home, ... 02
or, a rental property? 03

Don't know 98
Refused 99

16: **INT06**

CONTINUE IF Q1A=1,2 ELSE STOP HERE TO THANK AND TERMINATE

17: **Q2**

Do you own or rent the home?
own 1
rent 2
Don't know 8
Refused 9

18: **INT08**

; CONTINUE IF OWN HOME - Otherwise thank and terminate

19: **Q3A**

READ 1-4

Is the home a...
manufactured or mobile home, ... 01
townhouse, condominium or triplex, ... 02
single family home or duplex, ... 03
Or, apartment? 04

Don't know 98
Refused 99

20: **INT12**

Continue if Q3A=01, 02 or 03 – Otherwise thank and term

21: **Q3B**

=> +1 if NOT Q3A=01;ASK IF MANUFACTURED HOME ONLY

Is the home a Super Good Cents manufactured home?
yes 1
no 2
Don't know 8
Refused 9

22: **Q3C**

Did you work with an architect, designer, or builder to choose the layout and interior of the home? In other words, was the home custom built?

Yes, custom built 1
No, not custom built 2
Made some modifications to design 3
Don't know 8
Refused 9

23: **Q4**

What's the approximate size of your home in square feet, not including any unheated garage or unfinished basement areas?

Don't know / Not sure 999998
Refused 999999

24: **XQ5**

Now, I'm going to read you a list of factors potential buyers consider when in the market to purchase a home. Please tell me how important each of the following factors were in your decision to purchase your new home. Use a scale of 1 to 5, where 1 means "not at all important" and 5 means "extremely important" or any number in between.

First what about....

continue 1

25: **Q5A**

Rotation => Q5N

Overall price? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? IF NEEDED: Whether anything about THE PRICE was a factor in your decision.

1 - Not at all important 1
2 2
3 3
4 4
5 - Extremely Important 5
Don't know 6
Refused 7
Not Applicable 8

26: **Q5B**

Location? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? IF NEEDED: Whether anything about LOCATION was a factor in your decision.

1 - Not at all important 1
2 2
3 3
4 4
5 - Extremely Important 5
Don't know 6
Refused 7
Not Applicable 8

27: **Q5C**

Exterior design? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about THE EXTERIOR DESIGN was a factor in your decision.

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

28: **Q5D**

Type of windows? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about THE TYPE OF WINDOWS was a factor in your decision.

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

29: **Q5E**

The direction the house faces the sun? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about THE DIRECTION was a factor in your decision.

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

30: **Q5F**

Neighborhood amenities? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about NEIGHBORHOOD AMENITIES was a factor in your decision

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

31: **Q5G**

Closeness to work? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about the CLOSENESS TO WORK was a factor in your decision

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

32: **Q5H**

Landscape or a yard? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about LANDSCAPE was a factor in your decision.

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

33: **Q5I**

Energy Saving Features? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about ENERGY SAVING FEATURES was a factor in your decision

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

34: **Q5J**

The Size of the Home? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about THE SIZE OF THE HOME was a factor in your decision

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

35: **Q5K**

Floor plan? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about FLOOR PLAN was a factor in your decision.

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

36: **Q5L**

The number of bedrooms? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about THE NUMBER OF BEDROOMS was important in your decision

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

37: **Q5M**

The size of lot? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about SIZE OF THE LOT was important in your decision.

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

38: **Q5N**

Being by good schools? (How important was this factor in your decision to purchase your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between? Whether anything about BEING BY GOOD SCHOOLS was important in your decision.

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

39: **Q6**

READ AND PAUSE FOR RESPONSE FOR EACH

Sometimes, when purchasing a new home, the homebuyer can pre-select certain features of a home. When purchasing your home, were you able to select the type of...

Appliances? 1
Insulation? 2
Heating system? 3
Windows? 4

Not able to select any features 5
Don't know 8
Refused 9

40: **XQ7**

There are a number of places to obtain information about homes when deciding to buy a home. Please tell me how important each of the following sources of information were to you while you were in the market for a new home. Again, use a scale of 1 to 5, where 1 means "not at all important" and 5 means "extremely important" or any number in between.

First...

continue 1

41: **Q7A**

Rotation => Q7K

(How important were) MODEL HOMES? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important 1
2 2
3 3
4 4
5 - Extremely Important 5
Don't know 6
Refused 7
Not Applicable 8

42: **Q7B**

(How important were REAL ESTATE AGENTS? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important 1
2 2
3 3
4 4
5 - Extremely Important 5
Don't know 6
Refused 7
Not Applicable 8

43: **Q7C**

(How important were) BUILDERS? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

44: **Q7E**

(How important were) LOCAL NEWSPAPER ADS? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

45: **Q7D**

(How important were) SHOPPERS GUIDES FOR NEW HOMES? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

46: **Q7F**

(How important were) TELEVISION HOME "INFOMERCIALS"? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

47: **Q7G**

(How important were) FAMILY MEMBERS? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

48: **Q7H**

(How important were) FRIENDS? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

49: **Q7I**

(How important was) THE INTERNET? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

50: **Q7J**

(How important were) NEW HOME SHOWS? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

51: **Q7K**

ASK IF MANUFACTURED HOME ONLY

(How important were) MANUFACTURED HOME DEALERS? (as a source of information when you were in the market for your new home?) IF NEEDED: Would you say "1" not at all important, "5" extremely important, or some number in between?

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7
Not Applicable..... 8

52: **Q12**

Currently, have you been trying to reduce energy use in your home?

yes..... 1
no..... 2skip to Q13A
Don't know..... 8skip to Q13A
Refused..... 9skip to Q13A

53: **Q12A**

PROBE TO FIT AND CLARIFY

What have you been doing to reduce the amount of energy you use in your home?

Lighting..... 01
Heating / Thermostat..... 02
Air Conditioning..... 03
Insulation..... 04
Dishwasher..... 05
Clothes washer..... 06
Shower..... 07
Other (SPECIFY)..... 97
Don't know / not sure..... 98
Refused..... 99

54: **Q13A**

Does your home have any skylights?

yes..... 1
no..... 2skip to Q14
Don't know..... 8skip to Q14
Refused..... 9skip to Q14

55: **Q13B**

READ 1-3 MULTIPLE RESPONSE ALLOWED

What type of skylights do you have? Are they...

Flat,..... 1
Domed,..... 2
or, curved?..... 3

Don't know..... 8
Refused..... 9

56: **Q13C**

(DO NOT READ)

What brand of skylight do you have installed?

Alpine 01
Andersen 02
Eagle 03
Empire Pacific Industries (EPI) 04
Insulate 05
Jeld-Wen 06
Marvin 07
Mercer 08
Milgard 09
Pella 10
Summit 11
Viking 12
Weathervane 13
Other (SPECIFY) 97
No information provided 98
Don't know/Refused 99

57: **Q14**

Other than storm doors, does your home have glass doors? IF NECESSARY CLARIFY: This includes sliding glass doors.

yes 1
no ..... 2skip to Q15A
Don't know ..... 8skip to Q15A
Refused ..... 9skip to Q15A

58: **Q14A**

How many glass doors does your home have? IF D/K OR TOO MANY TO COUNT - PROBE: Would you say your home has more than 3?

one 1
two 2
three 3
four or more 4
Don't know 8
Refused 9

59: **Q15A**

READ LIST, ONE RESPONSE ONLY

Now thinking about the windows in your home, are most of your windows framed in...

Aluminum, ... 1
Vinyl, ... 2
Or, Wood? 3

Don't know 8
Refused 9

60: **Q15B**

Are the windows single, double, or triple paned?

Single 1
Double 2
Triple 3
Don't know 8
Refused 9

61: **Q15C**

Are the windows Low - e? [IF NECESSARY READ: "Low-e" stands for "Low-Emmisivity". Low-e is a coating that is applied to glass during the production process. It is more energy-efficient and can reduce the harmful effects of ultraviolet rays (sunlight) on fabics and other home decor. Low-e glass actually looks little darker and "different" than plain glass.]

Yes 1
No 2
Don't know 8
Refused 9

62: **Q15D**

Are the windows argon filled? [IF NECESSARY READ: Argon is an inert gas that is used to fill the cavity between window panes in order to improve a window's efficiency. Argon is less conductive than plain old air. You can't see it and it would be difficult for a person to look at their window and tell if it is argon filled.]

Yes 1
No 2
Don't know 8
Refused 9

63: **Q15E**

(DO NOT READ)

What brand of windows do you have installed?

Alpine 01
Andersen 02
Eagle 03
Empire Pacific Industries (EPI) 04
Insulate 05
Jeld-Wen 06
Marvin 07
Mercer 08
Milgard 09
Pella 10
Summit 11
Viking 12
Weathervane 13
Other (SPECIFY) 97
No information provided 98
Don't know/Refused 99

65: **Q15F**

DO NOT ASK IF KNOW WINDOWS ARE EFFICIENT

Do your windows go beyond normal building and manufacturing standards to meet the special requirements for energy efficiency? IF NEEDED: This is a special standard set by the Department of Energy.

Yes 1
No 2
Don't know 8
Refused 9

66: **Q16**

MULTIPLE ALLOWED

Did the real estate agent, builder or anyone else provide information about the windows in your home?

Real estate agent 01
Builder 02
Other (SPECIFY) 97
No information provided ..... 98skip to Q17
Don't know/Refused ..... 99skip to Q17

67: **Q16A**

Did they provide brochures, a verbal description or something else? IF BROCHURE / PAMPHLET, PROBE FOR MANUFACTURER OR BUILDER

Manufacturer brochure / pamphlet 01
Builder brochure / pamphlet 02
Verbal description 03
Other (SPECIFY) 97
No information provided 98
Don't know/Refused 99

68: **Q16B**

Did the information include anything about energy efficiency?

Yes 1
No 2
Don't know 8
Refused 9

69: **Q17**

When shopping for a new home, what are the most important features that you would look for in the windows of the home?

RECORD COMMENTS 01
Don't know 98
Refused 99

70: XQ18

There are several reasons why people install energy-efficient windows in a home. I'm going to read a list of reasons and please rate each on a scale of 1 to 5, where 1 is "not at all important," 5 is "extremely important" or any number in between.

How important is...

Continue 1

71: Q18A

(How important is..) Saving Money (As a reason for installing energy-efficient windows in your home?)

1 - Not at all important..... 1
2 2
3 3
4 4
5 - Extremely Important..... 5
Don't know..... 6
Refused 7

72: Q18B

(How important is..) Saving Energy (As a reason for installing energy-efficient windows in your home?)

1 - Not at all important..... 1
2 2
3 3
4 4
5 - Extremely Important..... 5
Don't know..... 6
Refused 7

73: Q18C

(How important is..) Helping the environment (As a reason for installing energy-efficient windows in your home?)

1 - Not at all important..... 1
2 2
3 3
4 4
5 - Extremely Important..... 5
Don't know..... 6
Refused 7

74: Q18D

(How important is..) Making your home less drafty (As a reason for installing energy-efficient windows in your home?)

1 - Not at all important..... 1
2 2
3 3
4 4
5 - Extremely Important..... 5
Don't know..... 6
Refused 7

75: **Q18E**

(How important is..) Reducing noise (As a reason for installing energy-efficient windows in your home?)

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7

76: **Q18F**

(How important is..) Cutting down on heat loss (As a reason for installing energy-efficient windows in your home?)

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7

77: **Q18G**

(How important is..) Reducing glare or fading (As a reason for installing energy-efficient windows in your home?)

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7

78: **Q18H**

(How important is..) Reducing condensation (As a reason for installing energy-efficient windows in your home?)

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7

79: **Q18I**

(How important is..) Increasing resale value of your home (As a reason for installing energy-efficient windows in your home?)

1 - Not at all important..... 1
2..... 2
3..... 3
4..... 4
5 - Extremely Important..... 5
Don't know..... 6
Refused..... 7

80: **Q19**

What other advantages do you see to having energy-efficient windows?

RECORD COMMENTS..... 01
Don't know..... 98
Refused..... 99

81: **Q20**

Have you heard about the ENERGY STAR program for energy-efficient appliances and products?

Yes..... 1
No..... 2skip to XFT
Don't know..... 8skip to XFT
Refused..... 9skip to XFT

82: **Q21**

DO NOT READ, ENTER ALL THAT APPLY

What does the ENERGY STAR symbol mean to you?

Energy efficiency / saving energy..... 01
Saving money..... 02
Conserving natural resources..... 03
Other (Specify)..... 04
Don't know..... 98
Refused..... 99

83: **Q22**

DO NOT READ

Do you know of any products or appliances that are currently included in the ENERGY STAR program? IF YES: Which ones can you think of?

No, do not know of any..... 00
Computer monitors..... 01
Windows / Skylights..... 02
Refrigerators..... 03
Washer / Dryer..... 04
Compact florescent light fixtures..... 05
Dishwasher..... 06
OTHER (SPECIFY)..... 97
Don't know..... 98
Refused..... 99

84: **Q22A**

DO NOT ASK IF Q22=02

Have you heard of ENERGY STAR Windows?
Yes 1
No ..... 2skip to XFT
Don't know / Refused ..... 9skip to XFT

85: **Q23A**

DO NOT READ

Do you know the features a window must have to be classified as an ENERGY STAR window in the Northwest? IF YES: What are the features that you know of? What other features?
No, do not know of any 00
U-factor less than or equal to 0.35 01
Double pane 02
Triple pane 03
Low e-coating (special coating) 04
Gas / argon filled 05
Energy efficient (Unspecified) 06
OTHER (SPECIFY) 97
Don't know 98
Refused 99

86: **Q23B**

Do you have ENERGY STAR windows in your home?
Yes ..... 1skip to Q26
No 2
Don't know/Not sure/Refused 9

90: **XQ24**

SKIP IF ALREADY HEARD OF (Q22A=1)

ENERGY STAR windows provide a number of advantages over traditional windows. They make the home quiter, provide better insulation, protect home interiors from the sun, reduce condensation, and can reduce home energy bills. These windows typically cost more than standard windows.
Continue 1

92: **Q24A1**

ASK ONLY SINGLE FAMILY HOUSEHOLD

When your home was built would you have been willing to pay <$1.65*15%*SQFT> more to have ENERGY STAR windows put in your home?
Yes 1
No ..... 2skip to Q24C
Don't know / Refused ..... 9skip to Q24C

94: **Q24A2**

ASK ONLY MULTIFAMILY HOUSEHOLD

When your home was built would you have been willing to pay <$1.65*11.5%*SQFT> more to have ENERGY STAR windows put in your home?

Yes 1
No ..... 2skip to Q24C
Don't know / Refused ..... 9skip to Q24C

96: **Q24B1**

ASK ONLY SINGLE FAMILY HOUSEHOLD

When your home was built would you have been willing to pay <$2.15*1%*SQFT> more to have ENERGY STAR windows put in your home?

Yes ..... 1skip to Q26
No ..... 2skip to Q26
Don't know / Refused ..... 9skip to Q26

98: **Q24B2**

ASK ONLY MULTI-FAMILY HOUSEHOLDS

When your home was built would you have been willing to pay <$2.15*11.5%*SQFT> more to have ENERGY STAR windows put in your home?

Yes ..... 1skip to Q26
No ..... 2skip to Q26
Don't know / Refused ..... 9skip to Q26

100: **Q24C1**

ASK ONLY SINGLE FAMILY HOUSEHOLD

When your home was built would you have been willing to pay <$.50*15%*SQFT> more to have ENERGY STAR windows put in your home?

Yes ..... 1skip to Q26
No 2
Don't know / Refused 9

102: **Q24C2**

When your home was built would you have been willing to pay <$.50*11.5*SQFT> more to have ENERGY STAR windows put in your home?

Yes ..... 1skip to Q26
No 2
Don't know / Refused 9

103: **Q25**

DO NOT READ LIST

What are the primary reasons you would not have been interested in putting ENERGY STAR windows in your home?

Too Expensive 01
Don't believe they work 02
Happy with the windows I have now 03
Other (Specify) 97
Don't know 98
Refused 99

104: **Q26**

READ 1-3 if NEEDED

I would just like to ask a few questions for classification purposes only. All information will be kept confidential. What type of fuel do you primarily use to heat your home?

Electric 01
Natural Gas 02
Heating Oil 03
---------- .....
Other (Specify) 97
Don't know 98
Refused 99

105: **Q27**

Does your home have central air conditioning?

Yes 1
No 2
Don't know / Refused 9

106: **Q28**

READ IF NEEDED

In your current home, what would you estimate your average monthly energy bill (electricity and gas) to be?

less than $50, ... 1
$50 - $99 2
$100 - $149 3
$150 - $199 4
$200 - $299 5
$300 + ... 6
---------- .....
Don't know / Refused 9

107: **Q29**

Including yourself, how many people live in your household for the majority of the year?

Don't know / Refused 99

108: **Q30**

Which of the following categories best describes how much you paid for your new house, including the land? Please stop me when I get to the appropriate category.

$50,000 or less, ... 1
$50,000 to $100,000 2
$100,001 to $150,000 3
$150,001 to $200,000 4
$200,001 to $250,000 5
$250,001 to $300,000 6
Or, Over $300,000? 7
---------- .....
Don't know / Refused 9

109: **Q31**

READ 1-3;

Which of the 3 following categories best describes your household's TOTAL income for 1998 BEFORE taxes?

less than $50,000 1
$50,000 to $100,000 2
over $100,000 3
---------- .....
Don't know / Refused 9

110: **GENDR**

DO NOT ASK!

RECORD GENDER

Male 1
Female 2

Thank you very much for your participating in our study.

Remodeler Survey

ID NO. ____ STATE (Address) _____ SF Builder_____
MF Builder _____ Both SF and MF Builder _____

Respondent Name._____

Phone: ( ) _____

Int. ID ___ ___ ___

Start time. _____Stop TimeTotal Time ___

[IF NECESSARY SCHEDULE CALLBACK]

Hello, my name is _____ from Gilmore Research Group calling for the Northwest Energy Efficiency Alliance. We are conducting a study on energy use in the Northwest and are not selling anything.

IF NEEDED: This study is being sponsored be The Northwest Energy Efficiency Alliance, a consortium of Northwest utilities. They are hoping to better understand energy use and equipment. Your answers will be kept strictly confidential and nobody will be contacting you later to sell you anything. The survey will only take about 10 minutes.

May I continue?

a. Yes, continue
b. Arrange callback

1. First, I have a couple of questions about your home. Have you had any windows, glass doors, or skylights installed in your home in the past two years? [*IF NECESSARY READ*: This includes doing the work yourself or hiring a contractor or builder]

   a. Yes
   b. No (*Thank and terminate*)
   c. Don't know (*Thank and terminate*)
   d. Refused (*Thank and terminate*)

1a. Are you the person in your home most familiar with the window/glass door/skylight installation?

a. Yes *[Continue]*
b. No [*Ask*: Can I please speak to the person most familiar with the installation?] [*SCHEDULE CALL BACK IF NECESSARY*]
c. Don't know [*Thank and terminate*]
d. Refused [*Thank and terminate*]

[IF NECESSARY CONTINUE WITH PERSON MOST FAMILIAR WITH INSTALLATION]

1b. (Probe) Was installation for windows, glass doors or skylights?

a. Windows
b. Glass doors [*INCLUDES SLIDING GLASS DOORS **BUT NOT** STORM DOORS*]
c. Skylights
d. None [*Thank and terminate*]
e. Don't know [*Thank and terminate*]
f. Refused [*Thank and terminate*]

2. Do you own or rent your home?

a. Own
b. Rent [*Thank and terminate*]
c. Don't know [*Thank and terminate*]
d. Refused [*Thank and terminate*]

IF NO WINDOWS GO TO Q5

4. How many windows did you install? _____

4A. Did the new windows replace existing windows, or were they part of an addition?

a. Replaced existing windows
b. Part of an addition
c. Added new window to existing wall [*DO NOT READ*] [*SKIP TO Q5, Q6 OR Q7*]
d. Don't know [*DO NOT READ*] [*SKIP TO Q5, Q6 OR Q7*]

IF REPLACED **ONLY** DOORS, GO TO 6B. IF REPLACED **ONLY** SKYLIGHTS,
GO TO 6C

4b. Were the windows they replaced single, double, or triple paned?

a. Single
b. Double
d. Triple
e. Don't know
f. Refused

IF NO GLASS DOORS INTALLED GO TO Q6

5. How many glass doors did you install? _____

5A. Did the new doors replace existing doors, or were they part of an addition?

a. Replaced existing doors
b. Part of an addition [*Skip toQ6 or Q7*]
c. Added new door to existing wall [*DO NOT READ*]
d. Don't know

[IF REPLACED EXISTING DOORS]

5B. Were the existing doors also glass doors?

a. Yes
b. No
c. Don't know

IF NO SKYLIGHTS, SKIP TO Q7

6. How many skylights did you install?_____

6A. Did the new skylights replace existing skylights, were they part of an addition, or were they placed in the existing ceiling?

a. Replaced existing skylights
b. Part of an addition
c. Added skylight to ceiling
d. Don't know
e. Refused

If you'll give me just a second, I need to find out which quota group you're assigned to.

IF DOORS ONLY **OR** DOORS AND ANOTHER PRODUCT, ASK THE WINDOWS/GLASS DOORS/SKYLIGHTS AS DOORS.

[IF SKYLIGHTS ONLY **OR** AFTER DOOR QUOTA IS FILLED, OR SKYLIGHTS AND ANOTHER PRODUCT, ASK THE WINDOWS/GLASS DOORS/SKYLIGHTS AS SKYLIGHTS.

[IF WINDOWS ONLY **OR** AFTER DOOR AND SKYLIGHT QUOTAS ARE FILLED
WINDOWS AND ANOTHER PRODUCT, ASK THE WINDOWS/GLASS DOORS/SKYLIGHTS AS WINDOWS.

CHECK QUOTA. PLACE APPROPRIATE REMINDER CARD IN FRONT OF MONITOR

7. Why did you choose to install new windows/glass doors/skylights? [*DO NOT READ*]

   a. Old ones broken/in need of repair
   b. Old ones inefficient
   c. Remodeling house
   d. Putting on an addition
   e. Other
      (Specify)_____
   f. Don't know [*Thank and terminate*]
   g. Refused [*Thank and terminate*]

8. Did you do the installation yourself, or did you hire someone else to do the work?

   a. Did the work yourself [*Skip to Q.10*]
   b. Hired someone else
   c. Both
   d. Don't know *[Thank and terminate]*
   e. Refused [Thank and terminate]

9. What type of person did you hire? Did you hire a…[*READ 1-4*]

   a. Windows specialist [FOR DOORS, READ AS GLASS SPECIALIST]
   b. Builder/contractor
   c. Handyman
   d. Neighbor/friend/family member

e. Other [*SPECIFY*]_____

f. Don't know

g. Refused

II. Sources of Information

10. Who was the PRIMARY decision maker in selecting the type of windows/glass doors/skylights you purchased? [*DO NOT READ LIST; CIRCLE **ONE** RESPONSE ONLY*]

a. Self

b. Spouse

c. Windows specialist

d. Builder/contractor

e. Handyman

f. Neighbor/friend/family member

g. Salesperson

h. Other
(Specify)_____

i. Don't know

11. Was there anyone else involved in the selection of the windows/glass doors/skylights? [*DO NOT READ LIST; CIRCLE **ALL** THAT APPLY*]

a. Self

b. Spouse

c. Windows specialist

d. Builder/contractor

e. Handyman

f. Neighbor/friend/family member

g. Salesperson

h. Other (Specify) _____

i. Don't know

12. Now, I'm going to read you a list of factors potential buyers consider when in the market to purchase new windows/glass doors/skylights.

Please tell me how important each of the following factors were in your decision to purchase your new windows/skylights/glass doors. Use a scale of 1 to 5, where 1 means "not at all important" and 5 means "extremely important" or any number in between. First, how important was…[*READ ITEM*]. Would you say 1 (not at all important), 5 (extremely important) or some number in between? [*ROTATE*]

[*CIRCLE NUMBER*]

Item	Not at all important 1	2	3	4	Extremely Important 5	Not Applicable 6	Don't Know 7	Refused 8
a. Appearance	1	2	3	4	5	6	7	8
b. Brand name	1	2	3	4	5	6	7	8
c. Color of the frame or sash	1	2	3	4	5	6	7	8
d. Durability	1	2	3	4	5	6	7	8
e. Energy performance	1	2	3	4	5	6	7	8
f. Framing material such as wood or vinyl	1	2	3	4	5	6	7	8
g. Price	1	2	3	4	5	6	7	8
h. Recommendations	1	2	3	4	5	6	7	8
i. Warranty	1	2	3	4	5	6	7	8

12A. How helpful to you was the following information in your window/glass door/skylight purchasing decision?

Please use a scale of 1 to 5, where 1 means "not at all helpful" and 5 means "extremely helpful." Also, please tell me if the item was not applicable.

How helpful was…[*READ ITEM*]. Would you say 1 (not at all helpful), 5 (extremely helpful), or some number in between? [*ROTATE*]

[*CIRCLE NUMBER*]

Item	Not at all helpful 1	2	3	4	Extremely helpful 5	Not Applicable 6	Don't Know 7	Refused 8
a. Builder/contractor information and/or recommendations	1	2	3	4	5	6	7	8
b. Consumer Reports	1	2	3	4	5	6	7	8
c. Friend's recommendation	1	2	3	4	5	6	7	8
d. Industry trade association	1	2	3	4	5	6	7	8
e. Internet sites	1	2	3	4	5	6	7	8
f. Home improvement programs (radio/TV)	1	2	3	4	5	6	7	8
g. Manufacturer advertising	1	2	3	4	5	6	7	8
h. Manufacturer product literature	1	2	3	4	5	6	7	8
i. Performance information label on the window [*IF RESPONSE IS 1 or 7, CIRCLE Q13 AND ASK Q13 AFTER LIST COMPLETED*]	1	2	3	4	5	6	7	8
j. Newspaper/magazine article	1	2	3	4	5	6	7	8
k. Real estate agent's information and/or recommendation	1	2	3	4	5	6	7	8
l. Salesperson's information and/or recommendation	1	2	3	4	5	6	7	8
m. Utility company's information and/or recommendation	1	2	3	4	5	6	7	8

IF NOT SHADED RESPONSE, GO TO Q14
For those who said performance label was not at all helpful or don't know (shaded area of table), ask:

12B. Do you remember seeing a label on the window/glass door/skylight that identified the performance of the product?

a. Yes

b. No [*Skip to Q14*]

c. Don't know [Skip to *Q14*]

d. Refused [Skip to *Q14*]

12C. What do you remember about the label and the information on the label?

_____

_____

13. In what type of store did you or the person who installed your window/glass door/skylight] purchase the windows/glass door/skylight for your project? [*DO NOT READ LIST; ENTER ONE RESPONSE ONLY*]

a. Window specialty store

b. Door specialty store

c. Builder/contractor

d. Home improvement center (e.g., Home Depot, Home Base, Eagle)

e. In-home salesperson

f. Lumberyard

g. Direct from manufacturer

h. Other (Specify) _____

i. Don't know

[IF SKYLIGHTS, SKIP TO Q.16]

III. Performance

14. [ASK FOR WINDOWS AND GLASS DOORS ONLY]

Are most of the windows/glass doors you purchased framed in…[*READ LIST; SELECT **ALL** THAT APPLY*]

a. Aluminum

b. Vinyl

c. Wood

e. Other (Specify) _____

f. Don't know

g. Refused

ASK FOR WINDOWS AND GLASS DOORS ONLY

15. Are the windows/glass doors double or triple paned?

a. Double
b. Triple
c. Don't know
d. Refused

ASK FOR ALL

16. Are the windows/glass doors/skylights Low – e?
[*IF NECESSARY READ*: "Low-e" stands for "Low-Emmisivity." Low-e is a coating that is applied to glass during the production process.]

a. Yes
b. No
c. Don't know
d. Refused

ASK FOR ALL

17. Are the windows/glass doors/skylights argon filled?
[*IF NECESSARY READ*: Argon is an inert gas that is used to fill the cavity between panes in order to improve a window's efficiency. You can't see it and it would be difficult for a person to look at their window and tell if it is argon filled.]

a. Yes
b. No
c. Don't know
d. Refused

IF YES TO BOTH Q16 AND Q17, GO TO 20B

18. Do your windows/glass doors/skylights go beyond normal building and manufacturing standards to meet the special requirements for energy efficiency? [*IF NEEDED*: This is a special standard set by the Department of Energy.]

a. Yes [Skip to Q20b]
b. No
c. Don't know

d. Refused

19. What were some of the factors that influenced your decision to purchase windows/glass doors/skylights that do not meet the special requirements for energy efficiency? [*DO NOT READ LIST; ENTER ALL THAT APPLY*]

a. Didn't choose windows/someone else chose them
b. Too expensive
c. Wasn't aware of them
d. Not available
e. Had windows/doors custom made
f. Other (Specify) _____
g. Don't know
h. Refused

20. There are several reasons why people install energy-efficient windows/glass doors/skylights in a home. I'm going to read a list of reasons. We'd like to know if these reasons may have influenced your decision to install energy-efficient windows/glass doors.

Please rate each on a scale of 1 to 5, where 1 is "not at all important," and 5 is "extremely important."

[*ASK ALL*]

First, how important was…[*READ ITEM*]. Would you say 1 (not at all important) 5 (extremely important), or some number in between? [*ROTATE*]

[*CIRCLE NUMBER*]

Item	Not at all important 1	2	3	4	Extremely important 5	Not Applicable 6	Don't Know 7	Refused 8
Saving money	1	2	3	4	5	6	7	8
Saving energy	1	2	3	4	5	6	7	8
Helping the environment	1	2	3	4	5	6	7	8
Making your home less drafty	1	2	3	4	5	6	7	8
Reducing noise	1	2	3	4	5	6	7	8
Cutting down on heat loss	1	2	3	4	5	6	7	8
Reducing glare or fading	1	2	3	4	5	6	7	8
Reducing condensation	1	2	3	4	5	6	7	8
Increasing the resale value of your home	1	2	3	4	5	6	7	8
Quality	1	2	3	4	5	6	7	8

21. What other advantages do you see to having energy efficient windows/glass doors/skylights? _____

22. [*READ*] Please excuse me. I know you've already answered this, but if you could refresh my memory… Were the window/door/skylights replacing existing fixtures, or were they new?

a. Existing

b. New (*Go to Q23*)

IF NOT A NEW INSTALLATION THEN ASK

22A. How do your new windows/glass doors/skylights compare to your previous windows/glass doors/skylights in terms of…[*READ ITEM*]?

Would you say they much better, somewhat better, the same, somewhat worse, or much worse? [*ROTATE]*

[*CIRCLE NUMBER*]

Item	Much worse 1	Somewhat worse 2	The same 3	Somewhat better 4	Much better 5	Not Applicable 6	Don't Know 7	Refused 8
a. Saving energy	1	2	3	4	5	6	7	8
b. Making your home less drafty	1	2	3	4	5	6	7	8
c. Reducing noise	1	2	3	4	5	6	7	8
d. Cutting down on heat loss	1	2	3	4	5	6	7	8
e. Reducing glare or fading	1	2	3	4	5	6	7	8
f. Reducing condensation	1	2	3	4	5	6	7	8

IV. ENERGY STAR

23. Have you heard about the ENERGY STAR program for energy-efficient appliances and products?

a. Yes
b. No *[Skip to Q31*]
c. Don't know [*Skip to Q31*]
d. Refused [*Skip to Q31*]

24. Do you know of any products or appliances that are currently included in the ENERGY STAR program?

IF YES: Which ones can you think of? [DO NOT READ LIST; CIRCLE ALL THAT APPLY]

a. No, do not know of any
b. Computer monitors
c. Windows/glass doors / Skylights [if mentioned, finish this list, then skip to Q27]
d. Refrigerators

e. Washer / Dryer
f. Compact florescent light fixtures
g. Dishwasher
h. Water heater
i. Furnace/heater
j. Other (SPECIFY) _____
k. Don't know
l. Refused

IF ENERGY STAR WINDOWS/GLASS DOORS/SKYLIGHTS ALREADY MENTIONED, SKIP TO **Q27**

25. Have you heard of ENERGY STAR Windows/glass doors/skylights?

a. Yes
b. No [S*kip to Q29*]
c. Don't know [S*kip to Q29*]
d. Refused [S*kip to Q29*]

26. Do you know the features a window must have to be classified as an ENERGY STAR window/glass door/skylight in the Northwest?

IF YES: What are the features that you know of? What other features?
[*DO NOT READ LIST. CIRCLE ALL MENTIONS*]

a. No, do not know of any
b. U-factor less than or equal to 0.35
c. U-factor less than or equal to 0.45
d. Double pane
e. Triple pane
f. Low e-coating (special coating)
g. Gas / argon filled
h. Energy efficient (Unspecified)
i. Other (Specify) _____
j. Don't know
k. Refused

27. Did you purchase an ENERGY STAR window/glass door/skylight for your home?

a. Yes
b. No [S*kip to Q29*]
c. Don't know [S*kip to Q29*]

d. Refused [S*kip to Q29*]

28. What was the primary reason you chose an ENERGY STAR window/glass door/skylight? [*DO NOT READ LIST; CIRCLE ALL THAT APPLY*]

a. Save money
b. Save energy
c. Help the environment
d. Make home less drafty
e. Reduce noise
f. Cut down on heat loss
g. Reduce glare or fading
h. Reduce condensation
i. Increase the resale value of home
j. Better quality
k. Other (Specify) _____
l. Don't know
m. Refused

IV. Demographics

29. I would just like to ask a few questions for classification purposes only. All information will be kept confidential. In approximately what year was your home built? _____

30. What is the approximate square footage of your home?

_____ Square feet

31. Is the home a **manufactured home**?

IF NO, CLARIFY: Then is your home a mobile home, townhouse, condominium or triplex, single family home or duplex, or apartment? [*CIRCLE ONE ONLY*]

a. Manufactured / Mobile home
b. townhouse, condominium or triplex
c. single family home or duplex
d. Or, apartment?
e. Other (Specify) _____
f. Don't know
g. Refused

32. What type of fuel do you primarily use to heat your home?

a. Electric
b. Natural Gas
c. Heating Oil
d. Propane
e. Wood
f. Other (Specify) _____
g. Don't know
h. Refused

33. Does your home have central air conditioning?

a. Yes
b. No
c. Don't know / Refused

34. In your current home, what would you estimate your average monthly energy bill (electricity and gas) to be? [*READ LIST IF NECESSARY*]

a. less than $50
b. $50 - $99
c. $100 - $149
d. $150 - $199
e. $200 - $299
f. $300 +
g. Don't know / Refused

35. Including yourself, how many people live in your household for the majority of the year? _____

36. Which of the following categories best describes how much you paid for your new house, including the land? Please stop me when I get to the appropriate category.

a. $50,000 or less
b. $50,000 to $100,000
c. $100,001 to $150,000
d. $150,001 to $200,000
e. $200,001 to $250,000
f. $250,001 to $300,000
g. Over $300,000
h. Don't know / Refused

37. Which of the 3 following categories best describes your household's TOTAL income for 1998 BEFORE taxes? [*READ LIST: CIRCLE ONE ONLY*]

a. less than $50,000
b. $50,000 to $100,000
c. over $100,000
d. Don't know / Refused

38. [RECORD GENDER] [DO NOT READ]

a. Male
b. Female

SAMPLE FROM CARD _____

Thank you very much for your participating in our study.

Final Report

Market Progress Evaluation Report for the ENERGY STAR® Fenestration Program

Prepared for:
Northwest Energy Efficiency Alliance

Prepared by:
quantec

August 1, 2000

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