

Market Progress Evaluation Report

EZ Sim: Billing Simulation for Small Commercial Facilities, No. 2

prepared by

Pacific Consulting Services

report #E00-063

October 2000



NORTHWEST ENERGY EFFICIENCY ALLIANCE

www.nwalliance.org

529 SW Third Avenue, Suite 600
Portland, Oregon 97204
telephone: 503.827.8416 • 800.411.0834
fax: 503.827.8437

**EZ SIM: BILLING SIMULATION FOR
SMALL COMMERCIAL FACILITIES
Market Progress Evaluation Report #2**

Final Report

by
Pacific Consulting Services
1320 Solano Avenue, Suite 203
Albany, CA 94706

prepared for
Northwest Energy Efficiency Alliance
Portland, Oregon

October, 2000

TABLE OF CONTENTS

Executive Summary	1
1. Introduction	6
2. Findings	13
Industry Experts	
EZSim Users	
3. Conclusions and Recommendations.....	26
Appendix A: Expert Survey Instrument	30
Appendix B: User Survey Instrument.....	34
Appendix C: Expert Data	41
Appendix D: User Data	44
Appendix E: Qualitative Forecast.....	52

LIST OF TABLES

1. EZSim Trainee Organizational Affiliation (as of May 2000).....	8
2. Alliance Sponsored Training (as of May 2000)	8
3. Features of EZSim that Caused Consideration—Active Users.....	20
4. Comparison Between EZSim and Competing Products—Active Users.....	22
5. Features of EZSim that Caused Consideration—Inactive Users	24
6. Comparison Between EZSim and Competing Products—Inactive Users	25

EXECUTIVE SUMMARY

Findings

Perceptions of EZ Sim's Primary Value

- Industry experts perceive EZ Sim's primary advantage is ease-of-use: non-engineers can effectively apply it.
- Both industry experts and users focus on applying EZ Sim as an auditing and diagnostic tool—post-installation uses such as verification are not popular.
- **Applicability to Small Commercial Buildings.** Experienced DOE2 practitioners claim they can audit small- to medium-sized commercial buildings with ease. For these expert users, EZ Sim's ease of use would present little advantage. However, for non-DOE2 users, EZ Sim is seen as a very effective way to address the small- to mid-sized building market.
- **Codes and Standards Verification.** Industry experts view EZ Sim as a useful tool in verifying performance but no more so than any other performance evaluation tool; no users noted using EZ Sim for this purpose.
- **Lack of Use.** Primarily, inactive users failed to apply EZ Sim (despite being trained in its use) because they did not view it as applicable to their projects or had other means of satisfying their data needs.

Suggested Improvements

- Industry experts and users called for improvements to the baseline adjustment (tuning) process. The process was seen as clever and intelligent but obtuse to non-engineers and a subject that requires special post-training support.

Suggested Marketing Focus

- EZ Sim users represent the energy management and conservation fields: primarily, users come from utility companies and consulting firms specializing in energy efficiency issues.
- Tools with appreciable market penetration enjoy the loyalty of those who have become well-practiced users. Although EZ Sim is widely acknowledged as a viable and credible

tool it is not likely to win converts who have invested time and expertise in adopting other tools.

- EZ Sim's best opportunities may lie with potential users who do not currently have expertise with other tools such as DOE2.
- Industry experts expressed the importance of linking EZ Sim to user's needs. For example, promote the secondary benefits offered by EZ Sim. If facilities managers' primary concern is tenant satisfaction, then show how EZ Sim can improve satisfaction among tenants by ensuring a well-run building with properly running HVAC systems.

EZ Sim Users

- Over twice as many active users than inactive users said they were initially most interested in EZ Sim's ability to diagnose problem buildings (70% versus 30%).
- Active EZ Sim users were more likely than inactive users to have had an understanding of EZ Sim's features before attending training class (60% versus 40%).
- Active users were more likely to have used energy simulation software than were inactive users (80% versus 60%).
- Half of active users reported EZ Sim to be more useful than they first expected, whereas only one inactive user reported the software to be more useful than expected.
- Active and inactive users reported strong satisfaction with Stellar's product support—average active user satisfaction was 3.7 out of 4, inactive user satisfaction was 3.3.
- The EZ Sim web page also received high marks but could be more effectively utilized. Few users have accessed it and many of their suggestions for product improvements either exist on the web site or could easily be added.

Conclusions

EZ Sim is widely acknowledged among industry experts, active users, and inactive users (those trained to use EZ Sim but not using it), as a viable and useful tool. The tool's affordability, ease-of-use, and readily accessible product support are cited by users as reasons for its success. EZ Sim has been adopted by approximately 20% of its market¹.

Sources used to develop this report see a larger market potential for EZ Sim beyond that defined by Stellar Processes. Some of the barriers to reaching this larger market are:

¹ Some 90 plus users to date out of 550 potential users as defined in 1998 Stellar report, "Stella Market Assessment Study."

1) **Product Bias and Momentum of Alternate Products.** Potential users who have committed time and expertise to master other building analysis and energy simulation tools do not perceive that EZ Sim offers enough benefits to warrant adopting this new tool. If a tool or group of tools satisfy the majority of their data needs, these users are not willing to adopt yet another tool. As described by Dave Robison of Stellar, the somewhat insular world of energy efficiency experts tends to suffer from "group think." The very complexity of some tools and the technical proficiency required to use them can bias users against what appears to be an overly simple tool capable of being used by non-engineers.

2) **Resistance within Potential Markets.** By all accounts, one of the largest untapped markets for EZ Sim is among building operations and maintenance professionals. However, the culture within this market, as characterized by those surveyed for this report, prevents them from seeing EZ Sim as beneficial. Time constraints, lack of interest in energy efficiency issues, focus on day-to-day functioning of building systems, and general antipathy toward analytical tools all create a unreceptive environment for EZ Sim's adoption. Due to time and resource constraints, this market was not targeted in EZ Sim's original marketing plan. However, research participants repeatedly suggested that this market represents a difficult but worthwhile "sell."

3) **Overlooked Markets.** The small- to mid-sized commercial building sector represents an overlooked market. Although the market exists and the means to address it is available this market continues to be overlooked by energy efficiency service providers. While the aggregate energy savings potential represented by this sector is undoubtedly huge, the per project savings are lower than for large, complex buildings. EZ Sim is widely recognized as an excellent tool with which to diagnose small- to mid-sized commercial buildings. This is due to its ease-of-use and the ability of non-engineers to apply it successfully (resulting in fast, affordable analysis). Although DOE2 experts can apply their complex tool to analyze the design of small-buildings in an economically viable way, such application requires advanced proficiency in DOE2 and, consequently, fewer providers are available. Because of its simplicity, EZ Sim has a competitive advantage when used on the smaller-building market. In addition, EZ Sim offers the potential to be used for verification purposes while other simulation tools will require metering or submetering to verify savings.

Recommendations

Based on the results of this study, four primary recommendations emerge as means of increasing EZ Sim's market penetration:

1) **Continue Efforts to “Legitimize” EZ Sim.** Although industry experts and those currently using EZ Sim widely acknowledge the tool's value, EZ Sim's apparent simplicity can lead to its dismissal as not being a “serious” tool—especially for those currently using complex modeling software. Stellar has been working to promote EZ Sim through securing interest by professional journals in publishing articles and reviews on EZ Sim. If successful, such efforts could start the groundwork for increasing EZ Sim acceptance among the rank and file engineers. Good word-of-mouth feedback from early adopters who are respected in the field, combined with a higher profile of EZ Sim in the industry press, could begin to signal the tool's general acceptance as being legitimate. Stellar has been working to interest a large nationwide ESCO to adopt EZ Sim as one of its primary tools. Such an arrangement would be an excellent way to begin widespread acceptance of EZ Sim within the engineering community.

2) **Promote Messages Specific to Market Audience.** Among EZ Sim's target market there are many needs represented by the differing disciplines. In addition, each group faces differing priorities. Seeking energy savings is seldom a primary driver for examining a building's performance.

For example, marketing EZ Sim by highlighting secondary benefits could capture the interest of non-engineers who do not value energy efficiency. By promoting EZ Sim as a tool that can improve understanding of building systems and how they work, help staff improve the way buildings run, reduce maintenance hassles, and improve tenant satisfaction, it may be more likely that building operations and maintenance staff could be convinced to adopt EZ Sim.

By first assessing the most important concerns within a market, EZ Sim could then be shown to address some of those issues, even if the association is somewhat indirect (e.g., more efficient HVAC system = more effective cooling and heating = more comfortable building). An example of this focus on the secondary benefits might be Stellar's relationship with Lane Community College. The college has introduced EZ Sim within its two-year energy management curriculum. Most students are non-engineers likely to go into facilities operation and management positions. According to one of the college's instructors, EZ Sim is presented to students as a tool for more effective building operations and not strictly an energy efficiency tool.

Additional examples of focusing the marketing message to the needs of potential users might be pushing EZ Sim in the utility market as a tool for addressing bill complaint issues; market EZ Sim to colleges and professional organizations as a tool to promote the understanding of how building systems work and interact; etc.

3) **Address Perceived Complexities of Tuning Process.** Both in previous market research and this current study, EZ Sim's tuning process was widely cited as an area needing improvement. Industry experts and users alike admire the logic of the tuning function as the method by which EZ Sim achieves such accuracy in modeling a building's energy use. However, the process is seen as complicated and unclear to non-engineers. Consistently, there are requests to make the logic behind the process more transparent and to offer post-training support regarding tuning principles and its application.

4)) **Promote Communication with Users and between Users.** The existing EZ Sim web site (www.EZ Sim.com) offers a rich variety of product information and support. Users can access an EZ Sim tutorial, a product demonstration, case studies highlighting real-world EZ Sim applications, pricing and ordering information, weather data, and product support options.

Many of the users' suggestions for changes or improvements can be grouped into the category of improved information-access. Despite Stellar's effort to develop the web site as a means of providing Stellar/user and user/user links, few users have accessed the site and many do not know it exists. Some of what users requested is currently available at the EZ Sim web site.

Regular promotion of the web site and increased frequency of updates would develop a fast, economical communication tool to support users and increase the likelihood for new users to successfully apply EZ Sim to their projects. Formalizing web use through an "EZ Sim users group" might serve to generate the level of input and participation necessary to make a web forum worthwhile.

1 INTRODUCTION

Study Goals

In 1998 the Northwest Energy Efficiency Alliance (Alliance) joined Stellar Processes (Stellar) in marketing the EZ Sim building energy analysis software as a means of implementing the Billing Simulation for Small Commercial Facilities Venture. The primary goal was to increase the viability of privately funded energy efficiency projects by reducing the costs and uncertainties associated with delivering energy efficiency services and verifying their impacts. The primary means to this Alliance goal was to offer building owners, operators, and energy service providers information they need to make decisions about whether and how to change buildings to increase their efficiency—information provided by the application of EZ Sim.

The Alliance contracted with Pacific Consulting Services (PCS) to perform this study of the EZ Sim software tool's market. The study objectives are to identify what market hurdles remain that are slowing the adoption of EZ Sim software, learn what EZ Sim software users think of the product, and investigate how industry experts view EZ Sim.

In 1998, PCS performed an initial evaluation for the Alliance as part of the program implementation process. The PCS research focused on refining the estimate of baseline market potential for the software, establishing measures of potential commercial viability of the software, and evaluating how well the objectives of the original baseline survey were met. The study included interviews with 13 industry experts and potential or actual product users.

For this second study, we interviewed five industry experts, 10 active users of EZ Sim and 10 inactive users of EZ Sim (those who received training but who do not use EZ Sim). Interviewees represented utilities, consulting firms, and government agencies. The findings from these interviews are presented in Section 2.

Following are descriptions of EZ Sim software, a brief description of its development, marketing of the software, and the history of the Alliance's involvement.

What is EZ Sim?

EZ Sim is a spread-sheet based program that uses basic building parameter information combined with utility billing data (energy consumption) to develop simulations of commercial

building energy consumption. EZ Sim uses monthly average data (utility bills) instead of hourly data, making it simpler to use than other engineering models. The results provide a simplified engineering simulation of energy consumption in a building. The tool is intended for billing analysis and simulation to diagnose problems, estimate savings, and verify performance contracting.

EZ Sim evaluates utility bills, data about the building structure, information about how the building is used, and how many occupants it has. It then compares this data to similar buildings located in similar climate zones and provides an estimate of the building's energy consumption by end use and estimate of potential energy savings.

Users can change the engineering parameters to model the impact of changes in the building such as the installation of energy conservation measures or changes in building operation practices. EZ Sim is designed to provide a low-cost, quick scoping method to diagnose problems, examining energy consumption by end uses, and predict savings.

EZ Sim is intended to be used to:

- diagnose energy patterns and consumption
- calibrate savings estimates to agree with actual energy usage
- estimate facility's energy end uses
- verify equipment performance
- generate performance targets and compare against actual energy bills
- prospect for energy savings by calculating savings under differing scenarios

Intended Market

EZ Sim is targeted toward those in the energy management and conservation fields. Primarily, the potential market consists of ESCOs, energy consultants, utility representatives, government energy conservation managers, and facility operators.

To date, the majority of people who have attended EZ Sim training courses have represented utility companies (Table 1). This is probably more a reflection of the Alliance subsidy for utility staff training than a reflection of market-driven popularity within the utility sector. For example, Table 2 shows that EZ Sim training for 82% of the public utility staff was sponsored by the Alliance.

Table 1. EZ Sim Trainee Organizational Affiliation (as of May 2000)

Org Type	Utility Companies				Government	Total
	Public	Private	ESCO	Consultant		
Number	34	11	9	14	24	92
Percent	37%	12%	10%	15%	26%	100%

Table 2. Alliance Sponsored Training (as of May 2000)

Org Type	Utility Companies			Total
	Public	Private	Government	
Number	28	6	12	46
Percent of all trainees	82%	54%	50%	50%

EZ Sim Benefits

EZ Sim is not directly comparable to other building simulation software products. While it generates some data that is similar to the output of long-existing software such as DOE2, it performs its functions in a fundamentally different way. The basis for EZ Sim's calculations is the building's utility bills. Since EZ Sim uses actual energy bills and available information to indicate the patterns of energy use in a building no metered data collection is necessary other than assembling a record of utility bills. In addition, EZ Sim operates using simple weather data—actual daily average temperatures. EZ Sim users have access to actual weather data for many regions through the EZ Sim web site.

EZ Sim simulations are calibrated to each building. Once EZ Sim's simulation is matched to the building's utility bills, the model can provide reliable estimates of potential savings. This calibration process reveals how energy is used within the facility to help diagnose problem areas.

Simulation results are reported in a graphical presentation. The graphics and use of color make the findings easy to understand for users. The graphical output also allows for uncomplicated explanations of findings to non-technical audiences (e.g., customers, building owners, etc.).

Development of EZ Sim

Howard Reichmuth and Jim White developed the basic methodological approach that resulted in EZ Sim in 1995. It was used at Stellar as proprietary software for evaluation studies. Dave

Robison further developed the tool, creating a user-friendlier front end in 1997. Initially, the re-worked EZ Sim software was developed for use by utility staff in conjunction with a Conservation and Renewable Energy System (CARES) project. Then in 1998, The Alliance funded marketing and training efforts to offer EZ Sim region-wide through the Northwest states.

Product Improvements

There have been a number of improvements to the EZ Sim software. Stellar has kept the software up-to-date with the latest version of Microsoft's Excel spreadsheet program and also made improvements in response to users' needs. In the first year, the capabilities of EZ Sim were extended to more building types and climates and the software was adapted for partial use on the Internet.

In May of 2000, the available weather information from the EZ Sim web site was expanded to include current data for more than 250 U.S. locations. Also in May, Stellar announced distribution via e-mail for the first issue of EZ Sim users' newsletter. Upgrades in the latest EZ Sim version 6.0 software are:

- runs on Microsoft's Excel 2000
- increased precision for submetering-related tables
- improved ability to calculate for multiple fuels (purchased steam, chilled water)
- output provides list of design sizing options
- calculations allow for an expanded number of chiller types

Primary Marketing Targets

The original intended market focus was within the Pacific Northwest, approximating the territory covered by Alliances member utilities. All parties potentially impacted by building operations and energy conservation projects were thought to be potential targets for EZ Sim marketing: building owners, local utility representatives, third-party energy efficiency service providers, government energy efficiency program staff, etc. In addition, Stellar planned to identify appropriate market niches for EZ Sim as the data became available through market analyses.

Based on initial market characterization, Stellar predicted increased interest within the energy conservation field to address the small- to mid-sized commercial building sector. This was the

basis for expecting a growth market for EZ Sim. It was expected that competition within the ESCO/energy consulting service field and the diminishing savings potential represented by large, complex buildings (an increasing number of these have already been analyzed) would mean increased interest in the smaller building market. In addition, the growth of state and federal government programs requiring energy analysis for their facilities would represent a growth market for energy analysis projects.

Early in its development of a target market, Stellar recognized the importance of fully differentiating EZ Sim from its competitors. Although EZ Sim continues to receive wide-spread praise from within its market targets, accurately identifying how to best position the tool vis-à-vis users' needs continues to be a challenge.

Marketing Activities

Stellar developed a detailed marketing plan in 1998. The plan described the importance of establishing word-of-mouth support for EZ Sim given the size of the available budget. Testimonials from satisfied users were viewed as an important marketing tool given the generally technically minded characteristics of EZ Sim's general market (i.e., "prove it to me" engineers).

Stellar's plan had three primary elements:

- 1) Promote EZ Sim through article placement in technical and trade journals, the product's web site, and presentations at trade functions,
- 2) Ensure good word-of-mouth marketing by providing high-quality service to users and continuing to improve the software, and
- 3) Enter into strategic alliances with other organizations to expose a larger audience to EZ Sim's benefits.

Initially, the primary means of marketing EZ Sim was through the personal efforts of Dave Robison. In 1998 Robison began attending pertinent energy- and building-related industry events to promote EZ Sim. Robison has continued to attend such functions and also write and present technical papers at a variety of conferences where he discusses EZ Sim's capabilities. Robison used his extensive personal network to announce EZ Sim within the utility, ESCO, and engineering communities.

Early on, a bottleneck impeding market penetration was recognized. EZ Sim users have to be trained and training opportunities are limited. Stellar offers the training course either from its own offices in Portland, or at other locations when the number of people requesting training warrants. This dependence on relatively low-volume training results in limited penetration. The resources required to develop region- or nation-wide training opportunities have, so far, been considered to be excessive when measured against the likely growth in revenues from EZ Sim sales. Instead, Stellar began investigating an internet-based training system allowing users to learn the tool from remote locations. The viability of web-based training continues to be assessed.

Other marketing efforts include an EZ Sim web page and telephone product support. In addition to offering current users weather data, the web page is used to distribute a users' newsletter, a number of EZ Sim case studies, and tutorials in the use of EZ Sim.

Robison has secured the use of EZ Sim within a college energy management curriculum and is working with various government programs to secure recognition of EZ Sim as a viable tool. To date:

- EZ Sim has been adopted for use by a major ESCO
- Stellar joined Rebuild America as a business partner
- talks continue with energy-related government agencies such as Energy Star regarding adoption of EZ Sim.

The Alliance

In 1998, the Alliance joined with Stellar to promote the use of EZ Sim software in order to facilitate energy-efficiency gains in small commercial buildings. The Alliance funded marketing and training efforts to gain EZ Sim exposure in the Pacific Northwest. Specific attention was given to refining, market testing, and promoting the use of EZ Sim for small commercial facilities.

Over time, the goal of achieving higher market penetration for EZ Sim software has remained constant. However, the path outlined within the agreement between the Alliance and Stellar has changed as a result of market place experience.

Originally, the focus of the project was to investigate how EZ Sim could best be positioned to address the following market barriers which kept smaller commercial buildings from being targeted for energy efficiency improvements:

- difficulty of cost-effectively delivering performance-based services.
- general lack of confidence among building owners of the performance of energy efficiency measures and reluctance to use performance-based contracting.
- inability to economically measure and track energy performance over time of small commercial facilities.

Stellar's marketing plan outlined how EZ Sim could be positioned to address each of these barriers. Based on early program evaluation efforts Stellar modified its marketing plan to reflect improved intelligence of the market.

The Alliance's established indicators of success for measuring EZ Sim's progress were:

- develop a market assessment and create a business plan
- provide training, a technical manual, and ongoing technical support
- produce case study examples of successful application of EZ Sim
- establish a strategic alliance with a large energy services company
- conduct targeted market research to determine the potential market acceptability of EZ Sim among assumed end-users

These indicators have been met by Stellar and the exit strategy—to create a stand-alone consulting service along with a publicly available tool—was enacted in 1999. Currently, there are no continuing financial agreements between the Alliance and Stellar.

2 FINDINGS

This PCS research effort included gathering original data through telephone surveys. Three groups were surveyed: industry experts, active EZ Sim users, and inactive EZ Sim users (trainees who are not using the software). A survey was written that would address these groups (see Appendices A and B). Because the reported findings are based on respondents' answers, their statements and opinions may not reflect an accurate understanding about the subject matter. However, such information is still valuable in that it reflects the market's understanding. The following sections describe the findings from each group of survey respondents.

Industry Experts

As part of our research, we interviewed five long-time members of the energy efficiency industry who are familiar with sophisticated building modeling and analysis. Each of the five industry experts was an engineer—four were from consulting firms and one was from a professional association. All industry experts had used energy simulation software tools and all were familiar with EZ Sim and its features. Four of the five had used EZ Sim. However, industry experts were chosen because of their experience in the industry and not because of a proven understanding of EZ Sim. Therefore, industry experts opinions and statements about EZ Sim's capabilities are their opinion only based on their own experiences.

Valued Features

When asked what they thought to be the primary advantage of EZ Sim over its competitors, four of the industry experts' responses related to EZ Sim's ease-of-use (one specifying that EZ Sim does not rely on the expertise of the user in order to provide useful results), one said EZ Sim was useful for performance contracting.

When asked to describe EZ Sim's most valuable feature, ease-of-use was again the top choice—four of five naming it so. One respondent said that EZ Sim's applicability to small commercial buildings was its most valuable feature. As one industry expert stated when asked to describe why EZ Sim's ease-of-use was so valuable to him, "For 80% of buildings, DOE2 is overkill. EZ Sim is more appropriate for the vast majority of the commercial market. That it can

be used by non-PEs is a real boon since the expense of DOE2 and its operators makes it unacceptable to most building owners."

Perceived Product Weaknesses

Industry expert respondents were also asked to identify the feature of EZ Sim that they view as most problematic. All respondents felt that EZ Sim was a good and useful product and only offered to identify "problem" areas because they were prompted to by the survey.

Two industry experts stated that EZ Sim's use of simple daily-averaged weather data was a problem. They both felt that because daily average temperatures fail to account for temperature extremes (the day's high and low temperatures are averaged) EZ Sim results based on such averaged might misrepresent the conditions the building truly has to deal with.

Another industry expert named EZ Sim's simplicity as causing an image problem. He said that because of its simplicity, EZ Sim is viewed with suspicion by an industry "fascinated by complexity." In his words, "Industry people are won over by the complexity of DOE2 and the belief that because it is complicated it must be the best. EZ Sim is very effective and simple to use, but its very simplicity can work against it."

The importance of proper training in the use of EZ Sim was cited by another industry expert as a pitfall. He said that EZ Sim's simplicity made it powerful but placed untrained users at risk of generating misleading results. If data were entered into EZ Sim incorrectly, the user would have to know enough to recognize out-of-bound results in order to question their original calculation.

The last industry expert comment was that EZ Sim suffers when applied to situations where multiple buildings with different construction and/or use characteristics have a single meter. The respondent was not aware that Stellar has specifically addressed this issue with a case study and has the results posted on the EZ Sim web site.

Perceived Advantages in EZ Sim's use of Weather Data

The issue of weather data was specifically addressed in a question which asked if EZ Sim's use of actual local weather data offers advantages in calculating energy consumption and savings rather than use of historical averages (long-time standard). While no one claimed there were any appreciable advantages, two industry experts specifically stated that EZ Sim's

use of average weather data resulted in sufficiently accurate calculations—due to the averaging of daily high and low temperatures².

Applicability to Small Commercial Buildings

Industry experts were asked if EZ Sim makes it plausible to analyze smaller buildings than would otherwise be possible with competing tools. Their responses were unanimous that EZ Sim was indeed better suited to small commercial buildings. As one respondent noted, "DOE2 is wonderful for huge, complex buildings. But for 80% of commercial buildings it is like using a canon to kill a fly. EZ Sim is much more appropriate given its ease-of-use and that it is so inexpensive to use."

It was noted that in the hands of experienced users, DOE2-derived tools are viable for small commercial buildings. However, this is dependent on the user's expertise and access to a wide variety of previous projects on which to base the new model (since generating a complete building-specific model would be far too expensive). The result is that only a subset of trained DOE2 users has the expertise and background data available to apply the tool in an economically competitive manner to the small- to mid-sized commercial building market: whereas, EZ Sim performs building simulation and calibration at the same time.

Codes and Standards Verification

Industry experts were asked if using EZ Sim would necessarily ensure that new construction projects are meeting local, state, and federal building codes and energy efficiency standards. While it was noted that EZ Sim could certainly be a useful tool in such efforts it would be no more likely to promote adherence than any other tool.

Suggested Marketing Focus

Industry experts were asked to suggest who they thought would be a good target for EZ Sim marketing. The general consensus was that existing tools have a hold on the market due to established practices and the investment of time and expertise on the part of the users. All the industry experts touted EZ Sim as a viable and credible tool. However, as one industry expert described it, those with DOE2 expertise are not likely to find enough benefits in EZ Sim to warrant their using the tool. Or so they think. Another industry expert said the key is to target those who would never be exposed to DOE2 and convince them that they would benefit from EZ Sim's use.

² It should be noted that Stellar has been conducting research to indicate the importance of using actual weather data—rather than historical averages.

No industry expert seemed to think that energy conservation benefits alone would interest an appreciable audience. The lack of interest in energy efficiency was summed up by one respondent, "In reality no one cares enough about energy efficiency to have the market demand EZ Sim's use. All the subsidies in the world won't get owners to care about efficiency."

Another industry expert touched on a similar issue—the importance of linking EZ Sim to user's needs. He suggested marketing EZ Sim to utility marketing managers as a value-added service to improve customer retention. He characterized the utility's benefit in using EZ Sim as increased customer satisfaction and an opportunity for positive interaction with customers (i.e., not a sales or survey call). Field reps would use EZ Sim as a contact tool—a means to provide a valuable reason to interact with commercial customers. They would present the EZ Sim-generated simulation of the customer's building. (Utility companies are likely to have much of the data required for an EZ Sim evaluation.) The creativity in this approach is in recognizing the secondary benefits resulting from EZ Sim's ease-of-use.

Other suggested targets for EZ Sim marketing were those practicing performance contracting, building commissioning agents, and building operations staff. It was noted by one industry expert that performance contracting requires service providers to gain owners' attention with probable energy savings and to do this quickly, without traditional "full-blown" modeling. He suggested EZ Sim could provide a "down 'n dirty" method for these service providers to identify savings opportunities.

The issue of building operations and maintenance staff was complex. Each time this category of potential EZ Sim user was suggested it was followed by a qualifying statement that, in the end, they would not be good candidates. Unanimously, industry experts felt that although maintenance and operations staff would benefit from using EZ Sim they would be unlikely to judge the benefits as justified. People in these positions were characterized as constantly under pressure to keep building tenants happy and constantly busy attending to "code red" issues. Energy conservation is a distant item on their priority lists. However, non-efficiency benefits could also result from the use of EZ Sim as an ongoing operations tool. Again, the opportunity would be to position EZ Sim as a means of ensuring tenant comfort and satisfaction as a result of smooth running HVAC and other systems.

Suggested Improvements

Industry expert respondents were asked what, if any, improvements they would suggest for EZ Sim. Two industry experts felt it important that EZ Sim not be marketed as a tool that could

replace traditional DOE2 analyses. Both felt that EZ Sim is an excellent troubleshooting tool to be used in conjunction with DOE2. The comments may reflect a lack of awareness within the industry regarding EZ Sim's capabilities (e.g., that is viewed as a simplistic tool without the reliability of a proven engineering tool). As one noted, "EZ Sim is a great way of scoping out problems but should only be thought of as a troubleshooting tool and not as something to use for detailed analysis."

One other suggested change was to simplify or clarify the baseline adjustment (tuning) process. Two industry experts said that understanding the tuning process was difficult for non-technical users. They called for Stellar to make both the elements of the process and the implications of any changes to these elements more clear. "Going back and forth between tuning buttons and detailed input can be confusing. Having specific examples of tuning available on line would be great as a tool for clarifying the relationship."³

Summary

Industry experts view EZ Sim is an excellent program that allows non-technical users an easy-to-use smart system that can characterize their buildings and produce quantified results. Even with unanimous consent that EZ Sim is a worthy tool, it has not caught the imagination of users as a "killer application". One industry expert said that if non-engineers are the intended users of EZ Sim then it should not have the look and feel of an engineer's tool and inputs should be readily understandable to lay users.

It was thought that proficient DOE2 users are not likely to adopt EZ Sim and therefore, making EZ Sim easily usable by non-engineers is important. In conjunction with this, positioning EZ Sim as a means of addressing non-efficiency issues would be a more effective way of ensuring potential users of its applicability to their needs.

EZ Sim Users

Over the past two years approximately 92 people have attended EZ Sim training courses. These daylong seminars are facilitated by Stellar Process and are designed to familiarize participants with EZ Sim software. Participants primarily represent utilities, consulting firms, and government agencies and range in skill from trained engineers experienced in designing complex mechanical systems to those with little technical background. Stellar actively promotes EZ Sim through marketing and training. The Alliance assists Stellar by sponsoring,

³ Such examples are available on the EZ Sim web site.

or paying the training fees, utility staff representing Alliance members. In the past two years, XX of the 92 total EZ Sim trainees have been sponsored in this way by the Alliance.

To learn of their experience with training and with their use of EZ Sim, both PCS and Stellar have conducted surveys of these participants. After each training course, Stellar conducts a written survey of attendees. The feedback offered by EZ Sim trainees indicates that they are happy with the course material. The quality of course instruction and of materials consistently receives high grades from attendees. At the time they finish their EZ Sim training most attendees expect to use the software to diagnose problem buildings and to focus on audit and site visits. They are least likely to use EZ Sim to provide performance predictions or verify vendor claims regarding equipment performance.

The findings from the PCS-administered surveys confirm these post-training findings. Both active and inactive EZ Sim trainees express high levels of satisfaction with the product and with Stellar. Even those who are no longer using EZ Sim express the view that the software is a useful tool that can assist in locating problem areas within building operation and/or highlight opportunities for improved efficiencies.

Based on Stellar's surveys and informal monitoring of trainees' use of EZ Sim, they estimate that 25% of those who go through training end up as active users of EZ Sim. Based on telephone calls made during research for this report, it is estimated that this figure could be as high as 40%.

Below are listed the findings from the PCS survey of both active users and inactive users of EZ Sim.

Active Users

During April and May of 2000, ten active users of EZ Sim were surveyed by telephone to learn how they used EZ Sim and what they thought of the product and the product support offered by Stellar. These users had all applied EZ Sim multiple times and considered it to be one of their current tools.

Characteristics

The ten active EZ Sim users represented a variety of organizations. Two were consultants (both of whom owned their businesses), two were government workers (both technical specialists helping make government buildings more efficient), and six were utility employees who worked in a variety of positions (building science specialist, mechanical systems

specialist, customer service representative, conservation manager, industrial sales engineer, and an energy analyst).

Sources of Information

Active users learned of EZ Sim through a variety of sources. The Alliance proved to be a popular information source. Users were asked to indicate where they first learned of EZ Sim (before registering for the training course). Four of the 10 active users did not remember how they first learned of EZ Sim. Three said they first learned of EZ Sim from the Alliance, two from colleagues, and one from the Oregon Municipal Energy and Conservation Agency.

Initial Expectations

To investigate their predisposition regarding EZ Sim and its potential application users were asked to agree, disagree, or neither agree nor disagree with three statements regarding their expectations before taking the EZ Sim training class. Results indicate that awareness of EZ Sim's basic features was high, as was the expectation that EZ Sim would be directly applicable to their jobs. Overall, EZ Sim met initial expectations. Six of the 10 agreed that they were aware of EZ Sim's basic features before the training class, two were not aware, and two did not remember. Nine of the 10 agreed that they took EZ Sim training with the expectation that they would use the software in their jobs, one said he had not been sure. Five agreed that EZ Sim proved to be more useful than they expected, four said they were either unsure or didn't know, and one said EZ Sim was less useful than expected.

Most active users also expressed a personal interest in learning EZ Sim. Only one agreed with the statement that taking EZ Sim training was more his boss's idea than his own. Nine disagreed with the statement.

Familiarity with energy simulation software was high among the active users—eight of the 10 had used a simulation-type software tool before being trained to use EZ Sim. Two had never used such a tool.

Reason for Initial Interest

When choosing the reason for their initial interest in using EZ Sim, the potential for diagnosing problem buildings was named seven times as a primary value by active users. EZ Sim's ease-of-use, ability to estimate energy end-uses, reliance on simple weather data, and ability to model different equipment scenarios were each chosen twice as primary values.

Active users were then asked if they were satisfied with the way in which EZ Sim performed each of the functions they selected as primary values. Eight said that they are satisfied with the way EZ Sim's performed these functions, two didn't know.

Table 3. Features of EZ Sim that Caused Consideration—Active Users

Primary Feature	Mentioned as 1st or 2 nd Choice
Diagnose problem buildings.	7
Easy-to-use	2
Estimate energy end-use	2
Use of actual energy consumption (utility bills)	2
Use of simple weather data	2
Model use of different equipment scenarios	1
Other	2

EZ Sim's Most Useful Benefit

Active users were asked to name the most useful benefit of EZ Sim, regardless of their initial expectations. No single area stood out as especially popular. Two respondents named EZ Sim's ease-of-use. Other benefits named once each as "most valuable" were: the tuning function, ability to model different equipment scenarios, estimating consumption by end use, diagnosing problem buildings, EZ Sim's small amount of required data inputs, and the ease of performance verification.

EZ Sim Experience

Over the previous six-month period, active users applied EZ Sim an average of 8.1 times (high of 24 times and low of 2). Users have applied it to a variety of building types during their projects. No single building type stood out. Three users apply EZ Sim primarily to small office buildings, two apply it most often to large office buildings: one user said multi-unit housing complexes and one said multi-unit commercial complexes, three simply said that they use EZ Sim on "commercial" buildings.

EZ Sim Application

Assuming that a quarter (Stellar's estimate) of the approximately 100 EZ Sim trainees are actively using the tool and that each of these active users applies EZ Sim to an average of eight buildings in a six month period (as noted above), it is possible to estimate that EZ Sim is applied to 400 buildings per year within the Alliance territory.

Market Opportunities

To assist Stellar's efforts in identifying new marketing opportunities, users were asked to identify other market players (not necessarily traditional users of simulation software) they viewed as potential users of EZ Sim. As with the responses of industry experts, users felt that building operators and maintenance staff could use EZ Sim but that they would not be a receptive audience. As one respondent said, "They (facilities operators) have a use for it but they'd have to be convinced of it." One user suggested that the operations/maintenance sector could be successfully marketed by setting up the initial simulation parameters for them. He described a scenario where an expert EZ Sim user (e.g., utility or government program rep) would facilitate the application of EZ Sim on a particular building and then instruct a building staff member in how to update the model.

Customer Satisfaction: Product Support

Active users are very satisfied with the product support they receive from Stellar. A few users went out of their way to specifically praise the expertise and speed with which Stellar solved their problems. On average, active users had contacted Stellar 4.1 times regarding product support for EZ Sim (high of 10, low of 2 contacts). Out of a possible 4.0 users rated their satisfaction with Stellar at 3.7.

When asked if there was anything they would change about Stellar's customer support of EZ Sim, eight said there was nothing, two gave suggestions. One suggestion was that Stellar offers users not only a solution to their problems but also indicate the process by which the solution was developed. In this way, the user felt that he would learn more⁴. The second suggestion was to start web-based users' group or newsgroup to promote information exchange between EZ Sim users.

The EZ Sim web page also received high marks although less than half of active users had accessed it. Four of the active users had gone to Stellar's EZ Sim web page an average of four times each (high of 10 low of 2 contacts). Out of a possible 4.0, users rated their satisfaction with the web page at 3.1.

When asked if there was anything they would change about Stellar's web services, no active user had a suggestion.

⁴ Stellar's case study examples are specifically written in such a way as to explain the process by which the model was developed.

Customer Satisfaction: Product Features

When asked to suggest ways in which EZ Sim could be improved, three active users said there was no need for change, one felt he had not used it enough to comment, six had suggestions.

Of the suggested improvements, four had to do with EZ Sim's ease-of-use. One active user called the tuning function "obtuse" and suggested that a more intuitive process be developed. Two users suggested not marketing EZ Sim as "easy to use." They felt that non-engineers or those not familiar with modeling software would be discouraged using EZ Sim without proper post-training support. The fourth suggestion was to create different user modes in order to facilitate use of EZ Sim by non-engineers. It was acknowledged that in the simpler modes EZ Sim might not be as accurate but it was felt that sacrificing a bit of accuracy was better than losing the user altogether.

One user commented that Stellar offers excellent customer assistance but that help is focused on solving specific problems at hand and not training the user to solve such problems on his or her own. The last commenter asked for a simplification in the process by which EZ Sim results can be applied to other similar building. He felt this could be a great time saving practice rather than starting "from scratch" when modeling a building with EZ Sim.

Table 4. Comparison Between EZ Sim and Competing Products—Active Users

Product Considered	Price	Ease-of-use	Precision	Product support
Superior				
EZ Sim	60%	80%	20%	20%
All products the same	0%	0%	50%	10%
EZ Sim's Competitors	0%	0%	0%	0%
Don't know	40%	20%	30%	70%

N=10

Inactive Users

During April and May of 2000, ten inactive users of EZ Sim were surveyed by telephone to learn why they were not using EZ Sim and what they thought of the product and the product support offered by Stellar. These users had all attended an EZ Sim training seminar but had not applied EZ Sim to any projects after training.

Characteristics

The ten inactive EZ Sim users represented three consultants and seven utility employees. Four of the utility employees work in some aspect of running conservation programs, the other three are involved in energy marketing or delivery issues.

Sources of Information

Three of the inactive users said they first learned of EZ Sim from the Alliance, two learned of it from colleagues, and two from Stellar Process. One learned about it from an advertisement, one from the EZ Sim web page; one did not remember the information source.

Initial Expectations

To investigate their predisposition regarding EZ Sim and its potential application users were asked to agree, disagree, or neither agree nor disagree with three statements regarding their expectations before taking the EZ Sim training class.

Four of the 10 agreed that they were aware of EZ Sim's basic features before the training class, six were not aware. Six of the 10 agreed that they took EZ Sim training with the expectation that they would use the software in their jobs, two said they had not been sure and one took the class knowing he wouldn't use the tool. One inactive user agreed with the statement that taking EZ Sim training was more his boss's idea than his own, nine disagreed with the statement.

Regarding EZ Sim's usefulness, seven inactive users said they neither agreed or disagreed that EZ Sim proved more useful than they initially expected. Two said they did not know and one agreed that EZ Sim proved more useful than he first anticipated.

Inactive users were not as likely to be familiar with energy simulation software as active users. Six of the 10 had never used a simulation-type software tool before being trained to use EZ Sim; four had used such a tool.

Reason for Initial Interest

When choosing the reason for their initial interest in using EZ Sim, three factors were each named three times: the ability to diagnose problem buildings; to model different equipment scenarios; and, EZ Sim's use of actual energy consumption.

Inactive users were then asked if they were satisfied with the way in which EZ Sim performed each of the functions they selected as primary values. Seven said they didn't know (understandable since the inactive users have not applied EZ Sim outside of training). Two

said they were satisfied with the way EZ Sim's performs the function they value and one said he was neither satisfied nor dissatisfied (for function of modeling different equipment scenarios).

Table 5. Features of EZ Sim that Caused Consideration—Inactive Users

Primary Feature	Mentioned as 1st or 2 nd Choice
Diagnose problem buildings.	3
Model use of different equipment scenarios	3
Use of actual energy consumption (utility bills)	3
Estimate energy end-use	2
Easy-to-use	1
Use of simple weather data	1
Other	2

EZ Sim's Most Useful Benefit

Inactive users were asked to name the most useful benefit of EZ Sim, regardless of their initial expectations. Only two users expressed an opinion (most of the inactive users had never used EZ Sim outside of training). One most valued EZ Sim's reliance on actual energy consumption information and the other valued its ability to model different equipment scenarios.

Reasons for Lack of Use

Inactive users were asked the reason for their not having applied EZ Sim despite being trained in its use. Four respondents said EZ Sim has not been applicable to any of their projects, they did not perceive that its application would benefit them. Following are other responses:

- calculating lighting and heating loads is too difficult for non-engineer
- the workgroup lacks interest in using a new tool and though EZ Sim would be applicable, the staff will not adopt it
- tasks can be fulfilled without using EZ Sim so it is not really needed
- EZ Sim requires energy bills and it is common that customers simply do not know where to find their bills within their own organization

Market Opportunities

To assist Stellar's efforts in identifying new marketing opportunities, inactive users were asked to identify other market players (not necessarily traditional users of simulation software) they viewed as potential users of EZ Sim. The following were suggestions:

- EZ Sim is most applicable to physical plant managers.
- It would be useful to building and facilities operators and/or managers, especially facilities engineers.

Customer Satisfaction: Product Support

Three inactive users said they had contacted Stellar for EZ Sim product support matters, an average of 1.9 contacts per user (high of 12 low of 0 contacts). One of the inactive users rated their satisfaction as 4.0 (out of a possible 4.0) and two rated their experience as 3.0.

None of the three inactive users said that they had recommendations for changes to Stellar customer support system.

Five of the inactive users had accessed Stellar's EZ Sim web page for an average of 1.3 times each (high of 4 low of 1). When asked to rate the level of satisfaction with EZ Sim's web page, three said they were satisfied with it and two did not know.

When asked if there was anything they would change about Stellar's web services, no inactive user made a suggestion.

Customer Satisfaction: Product Features

Due to their lack of experience with EZ Sim, only one inactive user had a suggestion to change the product. He suggested that the tuning process be made clearer. Specifically, he asked that the impacts of changes to a buildings' parameters be made more clear so that users could have a better understanding regarding the impact of making changes during the tuning process. He said it was difficult to understand the relative impact of each variable on the final calculations.

Table 6. Comparison Between EZ Sim and Competing Products—Inactive Users

Product Considered	Price	Ease-of-use	Precision	Product support
Superior				
EZ Sim	0%	40%	20%	0%
All products the same	0%	0%	10%	0%
EZ Sim's Competitors	0%	0%	0%	0%
Don't know	90%	50%	60%	80%
No response	10%	10%	10%	20%

N=10

3 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The spreadsheet based billing analysis software EZ Sim is widely acknowledged among industry experts, active users, and inactive users (those trained to use EZ Sim but not using it), as a viable and useful tool. The tool's affordability, ease-of-use, and readily accessible product support are cited by users as reasons for its success. Marketing by Stellar Processes (Stellar) and support by the Northwest Energy Efficiency Alliance (Alliance), EZ Sim has been adopted by approximately 20% of its market⁵.

EZ Sim receives high praise from industry experts and users among the audience targeted by Stellar's marketing plan (resource conservation managers, utility reps, facility managers, ESCOs). However, it is widely acknowledged among sources used to develop this report that a larger market potential exists for EZ Sim. Some of the barriers to reaching this larger market are:

1) **Product Bias and Momentum of Alternate Products.** Potential users who have committed time and expertise to master other building analysis and energy simulation tools do not perceive that EZ Sim offers enough benefits to warrant their adopting this new tool. If a tool or group of tools satisfy the majority of their data needs, these users are not willing to adopt yet another tool. As described by Dave Robison of Stellar, the somewhat insular world of energy efficiency experts tends to suffer from "group think." The very complexity of some tools and the technical proficiency required to use them can bias users against what appears to be an overly simple tool capable of being used by non-engineers.

2) **Resistance within Potential Markets.** By all accounts, one of the largest untapped markets for EZ Sim is among building operations and maintenance professionals. However, the culture within this market, as characterized by those surveyed for this report, prevents them from seeing EZ Sim as beneficial. Time constraints, lack of interest in energy efficiency issues, focus on day-to-day functioning of building systems, and general antipathy toward

⁵ Some 90 plus users to date out of 550 potential users as defined in 1998 Stellar report, "Stella Market Assessment Study."

analytical tools all create a unreceptive environment for EZ Sim's adoption. Due to time and resource constraints, this market was not targeted in EZ Sim's original marketing plan. However, research participants repeatedly suggested that this market represents a difficult but worthwhile "sell."

3) **Overlooked Markets.** The small- to mid-sized commercial building sector represents an overlooked market. Although the market exists and the means to address it is available this market continues to be overlooked by energy efficiency service providers. While the aggregate energy savings potential represented by this sector is undoubtedly huge, the per project savings are lower than for large, complex buildings. EZ Sim is widely recognized as an excellent tool with which to diagnose small- to mid-sized commercial buildings. This is due to its ease-of-use and the ability of non-engineers to apply it successfully (resulting in fast, affordable analysis). Although DOE2 experts can apply their complex tool to analyze the design of small-buildings in an economically viable way, such application requires advanced proficiency in DOE2 and, consequently, fewer providers are available. Because of its simplicity, EZ Sim has a competitive advantage when used on the smaller-building market, it. In addition, EZ Sim offers the potential to be used for verification purposes while other simulation tools will require metering or submetering to verify savings.

Recommendations

Based on the results of this study, four primary recommendations emerge as means of increasing EZ Sim's market penetration:

1) **Continue Efforts to "Legitimize" EZ Sim.** Although industry experts and those currently using EZ Sim widely acknowledge the tool's value, EZ Sim's apparent simplicity can lead to its dismissal as not being a "serious" tool—especially for those currently using complex modeling software. Stellar has been working to promote EZ Sim through securing interest by professional journals in publishing articles and reviews on EZ Sim. If successful, such efforts could start the groundwork for increasing EZ Sim acceptance among the rank and file engineers. Good word-of-mouth feedback from early adopters who are respected in the field, combined with a higher profile of EZ Sim in the industry press, could begin to signal the tool's general acceptance as being legitimate. Stellar has been working to interest a large nationwide ESCO to adopt EZ Sim as one of its primary tools. Such an arrangement would be an excellent way to begin widespread acceptance of EZ Sim within the engineering community.

2) **Promote Message Specific to Market Audience.** Among EZ Sim's target market there are many needs represented by the differing disciplines. In addition, each group faces differing

priorities. Seeking energy savings is seldom a primary driver for examining a building's performance.

For example, marketing EZ Sim by highlighting secondary benefits could capture the interest of non-engineers who do not value energy efficiency. By promoting EZ Sim as a tool that can improve understanding of building systems and how they work, help staff improve the way buildings run, reduce maintenance hassles, and improve tenant satisfaction, it may be more likely that building operations and maintenance staff could be convinced to adopt EZ Sim.

By first assessing the most important concerns within a market, EZ Sim could then be shown to address some of those issues, even if the association is somewhat indirect (e.g., more efficient HVAC system = more effective cooling and heating = more comfortable building). An example of this focus on the secondary benefits might be Stellar's relationship with Lane Community College. The college has introduced EZ Sim within its two-year energy management curriculum. Most students are non-engineers likely to go into facilities operation and management positions. According to one of the college's instructors, EZ Sim is presented to students as a tool for more effective building operations and not strictly an energy efficiency tool.

Additional examples of focusing the marketing message to the needs of potential users might be pushing EZ Sim in the utility market as a tool for addressing bill complaint issues; market EZ Sim to colleges and professional organizations as a tool to promote the understanding of how building systems work and interact; etc.

3) Address Perceived Complexities of Tuning Process. Both in previous market research and this current study, EZ Sim's tuning process was widely cited as an area needing improvement. Industry experts and users alike admire the logic of the tuning function as the method by which EZ Sim achieves such accuracy in modeling a building's energy use. However, the process is seen as complicated and unclear to non-engineers. Consistently, there are requests to make the logic behind the process more transparent and to offer post-training support regarding tuning principles and its application.

4) Promote Communication with Users and between Users. The existing EZ Sim web site (www.EZ-Sim.com) offers a rich variety of product information and support. Users can access an EZ Sim tutorial, a product demonstration, case studies highlighting real-world EZ Sim applications, pricing and ordering information, weather data, and product support options.

Many of the users' suggestions for changes or improvements can be grouped into the category of improved information-access. Despite Stellar's effort to develop the web site as a means of providing Stellar/user and user/user links, few users have accessed the site and many do not know it exists. Some of what users requested is currently available at the EZ Sim web site.

Regular promotion of the web site and increased frequency of updates would develop a fast, economical communication tool to support users and increase the likelihood for new users to successfully apply EZ Sim to their projects. Formalizing web use through an "EZ Sim users group" might serve to generate the level of input and participation necessary to make a web forum worthwhile.

APPENDIX A: EXPERT SURVEY INSTRUMENT

2000 EZ Sim Market Research Study “Industry Expert” Survey Guide

Interviewer: _____ Record _____

EZ Sim User tele _____

EZ Sim User
Name: _____

Call dispositions

1. Date: _____	Result: _____	Notes: _____
2. Date: _____	Result: _____	Notes: _____
3. Date: _____	Result: _____	Notes: _____
4. Date: _____	Result: _____	Notes: _____

Duration: _____ min.

Hello, my name is NAME.

Hello, my name is (NAME). I am calling you on behalf of the Northwest Energy Efficiency Alliance regarding EZ Sim billing simulation software. As part of the Alliance’s EZ Sim market research, we’re asking the input of people familiar with energy conservation issues, building modeling, building evaluation, or building operations.

IF CUSTOMER IS CONCERNED REGARDING LEGITIMACY OF SURVEY,

Please feel free to call Phil Degens of the Alliance at 503--827-8416 x271

1. What is your job title?
 - 1 _____
 - 99 DON'T KNOW

2. Briefly, what is it you do as "title?"
 - 1 _____
 - 99 DON'T KNOW

3. Have you used a simulation tool such as DOE2, Energy Calc, Trane Trace, etc?
 - 1 Yes
 - 2 No
 - 99 DON'T KNOW

4. Are you familiar with EZ Sim and how it works?
 - 1 Yes
 - 2 No
 - 99 DON'T KNOW

5. Have you personally ever used EZ Sim?
 - 1 Yes
 - 2 No
 - 99 DON'T KNOW

6. As you see it, what is the primary advantage of EZ Sim over its competitors?
 - 1 Able to use actual energy consumption from utility bills
 - 2 Ability to estimate energy by end-use
 - 3 Verify expected equipment performance
 - 4 Useful for performance contracting
 - 5 Useful for diagnosing problem buildings
 - 6 Useful for building commissioning
 - 7 It uses simple weather data
 - 8 Ease-of-use for building audits
 - 9 Ability to model different equipment-based scenarios
 - 88 Other _____

99 DON'T KNOW

7. What feature of EZ Sim do you consider the most valuable?

- 1 Able to use actual energy consumption from utility bills
- 2 Ability to estimate energy by end-use
- 3 Verify expected equipment performance
- 4 Useful for performance contracting
- 5 Useful for diagnosing problem buildings
- 6 Useful for building commissioning
- 7 It uses simple weather data
- 8 Ease-of-use for building audits
- 9 Ability to model different equipment-based scenarios
- 88 Other _____
- 99 DON'T KNOW

8. How is this valuable to you?

9. What feature of EZ Sim do you consider the most problematic?

- 1 Able to use actual energy consumption from utility bills
- 2 Ability to estimate energy by end-use
- 3 Verify expected equipment performance
- 4 Useful for performance contracting
- 5 Useful for diagnosing problem buildings
- 6 Useful for building commissioning
- 7 It uses simple weather data
- 8 Ease-of-use for building audits
- 9 Ability to model different equipment-based scenarios
- 88 Other _____
- 99 DON'T KNOW

10. How is this problematic to you?

11. What advantages, if any, do you think result from EZ Sim's use of actual local weather data to calculate energy consumption and savings rather than historical averages?

12. Does EZ Sim make it plausible to analyze smaller buildings than would otherwise be possible with competing tools such as DOE2?

- 1 Yes
 - 2 No
 - 99 DON'T KNOW
- _____

13. In your opinion, would EZ Sim be useful to ensure that new construction projects are meeting local, state, and federal building codes and energy efficiency standards?

- 1 Yes
 - 2 No
 - 99 DON'T KNOW
- _____

14. The current market for EZ Sim is considered to be:

- Utility Customer Service Reps
- Building managers
- Facilities managers
- Construction engineers
- Government auditors
- Architects
- ESCO auditors
- Energy Conservation Specialists

Who else do you think could use this tool who might not otherwise have access due to similar tools such as DOE2 due to high cost and advanced training requirements?

15. How could EZ Sim be improved so that it's more useful?

- 99 DON'T KNOW

(NOTES) _____

(THANK AND END) That was my last question. Thank you for your time.

APPENDIX B: USER SURVEY INSTRUMENT

2000 EZ Sim Market Research Study Active User and Inactive User

Interviewer: _____

Record _____

EZ Sim User tele _____

EZ Sim User
Name: _____

Call dispositions

1. Date: _____	Result: _____	Notes: _____
2. Date: _____	Result: _____	Notes: _____
3. Date: _____	Result: _____	Notes: _____
4. Date: _____	Result: _____	Notes: _____

Date completed: _____ Start time: _____ End time: _____ Duration: _____

Hello, my name is NAME.

Hello, my name is (NAME). I am calling you on behalf of the Northwest Energy Efficiency Alliance regarding EZ Sim billing simulation software. As part of the Alliance's EZ Sim market research, we're asking the input of users and trainees.

My records show that you were trained by Stellar Processes to use EZ Sim. Is this true?

(IF YES)

The Alliance is interested to learn your opinions regarding EZ Sim. Your responses will help Stellar Processes learn how their software and support services are being used and what users need from it. **Generally, this takes less than 10 minutes. Are you ready for my first question?**

(IF NO) When would it be better for me to call back? (RECORD APPT TIME)

(IF NO, CLAIMS NO TRAINING)

The EZ Sim software training was a day-long event where the software was demonstrated and students learned how to apply it to simulating energy use in commercial buildings. Do you recall attending such a training?

(IF NO, thank and end)

(IF YES) Your responses will help Stellar Processes learn how their software and support services are being used and what users need from it. **Generally, this takes less than 10 minutes. Are you ready for my first question?**

(IF NO) When would it be better for me to call back? (RECORD APPT TIME)

IF CUSTOMER IS CONCERNED REGARDING LEGITIMACY OF SURVEY,
Please feel free to call Phil Degens of the Alliance at 503--827-8416 x271

(Note: applicability codes in left column are "CU" for current EZ Sim user and "IU" for trainee who is not using EZ Sim.)

My first questions have to do with your background and experience with EZ Sim.

All 1 What is your job title?

- 1 _____
- 99 DON'T KNOW

All 2 How would describe your job function?

- 1 _____
- 99 DON'T KNOW

All 3 How did you first hear about EZ Sim?

- 1 Stellar Processes
- 2 Employer
- 3 Colleague
- 4 Trade Show
- 5 Advert/Brochure
- 88 OTHER
- 99 DON'T KNOW

All 4 Before using EZ Sim, had you previously used a simulation tool such as DOE2, Trane Trace, etc?

- 1 Yes
- 2 No
- 99 DON'T KNOW

All 5 I'm going to read a series of short statements. For each, please tell me whether you "agree," "neither agree nor disagree," or "disagree" with the statement.

- A I already understood EZ Sim's basic features before training
- B Before training, I fully expected that EZ Sim would be applicable to my **job**.
- C Being trained in EZ Sim was more my boss's idea than my own.
- D I have found EZ Sim to be more useful than I expected.

All 6 Initially, what features of EZ Sim made you consider using it? (READ)

- 1 Able to use actual energy consumption from utility bills
- 2 Ability to estimate energy by end-use
- 3 Verify expected equipment performance
- 4 Useful for performance contracting
- 5 Useful for diagnosing problem buildings
- 6 Useful for building commissioning
- 7 It uses simple weather data
- 8 Ease-of-use for building audits
- 9 Ability to model different equipment-based scenarios
- 88 Other _____
- 99 DON'T KNOW

All 7 Are you satisfied with the performance of these features?

1 FUNCTION _____ (1 through 9 above)

- 1 Yes
- 2 No
- 99 DON'T KNOW

2 FUNCTION _____ (1 through 9 above)

- 1 Yes
- 2 No
- 99 DON'T KNOW

All 8 In the last six months, and not including your training, on how many projects have you run EZ Sim simulations?

_____ (IF '0' GO TO Q10)

- 99 DON'T KNOW

IU 9 (IF Q8=0) What is the primary reason that you're not currently using EZ Sim?

1 _____

- 99 DON'T KNOW

GO TO Q14

CU 10 (IF Q8=•1) For what types of buildings have you primarily used EZ Sim?

- 1 Small Retail
- 2 Small Office
- 3 Strip-Mall Retail
- 4 Large Retail
- 5 Large Office
- 6 Multi-Bid Complex
- 7 Multi-Bid Housing
- 88 OTHER

CU 11 For what purposes do you use EZ Sim? (PROMPT IF NECESSAR)

- 1 High Bill Complaints
- 2 Screening projects to assess if visit is necessary
- 3 Prospecting for savings
- 4 As an adjunct to other software
- 5 Training tool for others
- 88 OTHER

CU 12 Regardless of your initial expectations, what proved to be the most useful benefit of EZ Sim?

- 1 Uses actual energy consumption from utility bills
- 2 Ability to estimate energy end-uses
- 3 Verify expected equipment performance
- 4 Useful for performance contracting
- 5 Useful for diagnosing problem buildings
- 6 Useful for building commissioning
- 7 Ease-of-use for building audits
- 8 It uses simple weather data
- 9 Ability to model different equipment-based scenarios
- 88 OTHER _____
- 99 DON'T KNOW

CU 13 How could EZ Sim be improved so that it's more useful to you?
(GO TO Q14)

99 DON'T KNOW

All 14 Approximately how many times have you contacted Stellar Processes by
phone or email for product support?

____ (IF "0" GO TO Q16)
99 DON'T KNOW

All 15 (IF Q14=•1) How satisfied were you with the level of support you
received? (READ)

- 5 Very satisfied
- 4 Satisfied
- 3 So-so
- 2 Dissatisfied
- 1 Very dissatisfied
- 99 DON'T KNOW

All 16. Approximately how many times have you visited Stellar Processes' EZ
Sim.com web site for product support?

____ (IF "0" AND Q14 = 0 GO TO Q19)
99 DON'T KNOW

All 17. (IF Q16=•1) How satisfied were you with the web page's ability to give you
the information you needed? (READ)

- 5 Very satisfied
- 4 Satisfied
- 3 So-so
- 2 Dissatisfied
- 1 Very dissatisfied
- 99 DON'T KNOW

- All 18. What changes would you suggest to improve telephone or email product support and/or the web page so that each is more useful to you?

Product Support: _____

99 DON'T KNOW

Web page: _____

99 DON'T KNOW

- All 19. In your opinion, how does EZ Sim compare to other building simulation software such as DOE2, or Trane Trace?

A Price 1 EZ Sim better

2 All the Same

3 EZ Sim Lags

99 DON'T KNOW

B Ease of use 1 EZ Sim better

2 All the Same

3 EZ Sim Lags

99 DON'T KNOW

C Precision 1 EZ Sim better

2 All the Same

3 EZ Sim Lags

99 DON'T KNOW

D Product support 1 EZ Sim better

2 All the Same

3 EZ Sim Lags

99 DON'T KNOW

- All 20. What types of people do you think could make effective use EZ Sim? Who would you recommend it to?

99 DON'T KNOW

(NOTES: _____)

(THANK AND END) That was my last question. Thank you for your time.

APPENDIX C: EXPERT DATA

	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
Org type	Consultant	Consultant	Consultant	Consultant	Consultant
2. Job Descrip.	Energy consultant	audit com bldgs, involved in energy studies	Building Commissioning Association	Involved in conservation projects at large commercial projects	large comm commissioning , Manage commissioning projects and savings verification effort
3. Used simul tools	y	Y	Y	Y	Y
3. Familiar with EZ Sim	y	Y	Y	Y	Y
4. Used EZ Sim	y	Y	N	Y	Y
5. Primary advant of EZ Sim	8	8	doesn't rely on expertise of operator. It can be used by non-engineers and result in meaningful data.	Useful for performance contracting	low cost and quick
6. Most valuable feature	8	8	that the information it requires to work can be understood and entered by non-engineers	8	It's ease of application to small commercial buildings
7. How valuable to you?	For 80% of buildings, DOE2 is massive overkill. EZ Sim is very appropriate for vast majority of the commercial market. That it can be used by non-PEs is a real boon since the expense of DOEs and its operators makes it unacceptable to most building owners.	Currently addressing federal sector (GSA buildings) and EZ Sim is a great way to quickly assess a buildings general state of operation	Not valuable directly, he doesn't use EZ Sim	No person value but it makes it easy to prospect for projects. User can run building quickly and show the owner results. Owner gets sense of the potential savings and user can get the thumbs up or down without spending lots of time on a full-blown model.	Although DOE2 can be used on small buildings in expedient manner (using templates to speed process), EZ Sim users don't need same level of expertise. EZ Sim can be used in off-the-shelf mode by non-engineers.

	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
Org type	Consultant	Consultant	Consultant	Consultant	Consultant
8. feature most problematic?	It's viewed as being too simple. Industry people are not broad-minded enough to see its significance.	not very useful when a number of buildings are run off one meter	The importance of proper training. Although it's relatively easy-to-use compared with competing products, it's very that users know what they're doing or the results EZ Sim provides can be way off.	It uses simple weather data	verification features are weak as a result of using avg daily temp for tuning. Tool should be based on high and low temps so temp spikes don't impair results.
9. How problem to you?	Industry people are won over by the complexity of DOE2 and the belief that because it is complicated it must be the best. EZ Sim is very effective and simple to use. But its very simplicity works against it.	Can't separate out buildings when more than one on a single meter. Especially a problem when multiple buildings have very different usage patterns.	Not problem	Weather data is based on average daily temp. This does not take into account spikes--highs and lows are removed. Thermal inertia is overlooked.	In trying to overlay project bill against actual bill it is important that temps used in calculating results are not masked by averaging. Extreme temps throw off calcs based on averages.
10. local weather advantage	NA	real world data is great--doesn't matter that it's average, in the end it doesn't throw anything off.	No	No	There are no advantages. In fact, it can be a liability as discussed above
11. Plausible to anal smaller bldgs w/ EZ Sim?	Yes, DOE2 is wonderful for huge, complex buildings. But for 80% of commercial buildings it is like using a canon to kill a fly. EZ Sim is much more appropriate given its ease-of-use and that it is so inexpensive to use.	Y, Wouldn't consider using DOE2 or MicroAccess on a smaller building. EZ Sim makes this whole segment of buildings accessible.	EZ Sim is better suited to small commercial building than DOE2.	Yes, although a skilled user of DOE2 can quickly analyze a small building (e.g., <25,000sq ft) this ability is based on experience and the required supply of existing projects from which to glean data. In the hands of the average engineer, EZ Sim is better	Y, good tool for small commercial

	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
Org type	Consultant	Consultant	Consultant	Consultant	Consultant
12. EZ Sim useful meeting bldg codes/regs	Yes, it could be used in M&V work as Dave has shown. However, there doesn't seem to be much interest in the market for this type of work.	Y, Reviewing energy study and plans to use EZ Sim as a reality check. Will run numbers with EZ Sim and see how "real" studies findings are.	Not necessarily. Using EZ Sim would not, by its use, have much of anything to do with this issue. In enforcing such standards yes, EZ Sim or any other such product could be an effective tool simply because it could provide data that would support someone's	No more or less useful than other software tools	DK
13. Who to market EZ Sim	Market to the commissioning industry. In the end, someone has to benefit by using EZ Sim. In reality no one cares enough about energy efficiency to have the market demand its use. All the subsidies in the world won't get owners to care about efficiency--it	Must find the people who can best utilize EZ Sim's benefits. Engineers using DOE2 and other such products won't find enough benefit to warrant EZ Sim's use. Must got to people who don't use simulation software	EZ Sim has great merit but is not appropriate for maintenance staff. Typically, they are not accepting of analysis work. They are hands on and are always short time. Efficiency issues are way way down on their list. Should be target utility staff. Sell to	EZ Sim should be aimed at niche of performance contracting. They need to get owners' attention to show probable energy savings and they don't have time or resources to do full-blown modeling. EZ Sim can be down 'n dirty way of identifying problems and show	Utility account reps could use it. Performance contracting staff could use it. Commissioning people would be a good target too.
14. How to improve EZ Sim	No need	Dave was very helpful in improving EZ Sim by modifying it to handle extreme weather conditions.	It's a great tool but needs to be used in the right way--to be viewed in the right way. Seeing it as a competitor to DOE2 is all wrong. It has its own set of pros and cons	It isn't a tool that should be compared to DOE2. It's a great way of scoping out problems but should only be thought of as a troubleshooting tool and not as something to use for detailed analysis.	Baseline adjustments are difficult to make. If building adds 25,000 square foot wing EZ Sim model can't be modified, it has to be recreated from scratch.

APPENDIX D: USER DATA

ACTIVE USERS

Resp. ID	Org type	2. Job Descrip.	3. Heard of EZ Sim	4. Used simul tools
CU1	Gov	Promote energy conservation in state and county buildings	DK	Y
CU2	Util	Educator for architects, builders, maintenance, building operators	Colleague	Y
CU3	Util	Residential building and just starting light industrial	NEEA	N
CU4	Util	Sell gas to commercial and industrial gas customers	DK	Y
CU5	Util	Work with both Res and Com customers on conservation projects	OMECA	Y
CU6	Util	Running energy efficiency studies on HVAC systems for Com buildings	NEEA	Y
CU7	Consult	Runs the company, day-to-day operations	DK	Y
CU8	Util	Commercial customers response to their needs, energy issues. ID energy efficiency approach	Colleague	Y
CU9	Gov	Worked with City Energy Office, technical assistance	DK	Y
CU10	Consult	Independent Energy Consulting on commercial buildings	NEEA	N

Resp. ID	Org type	5a. Knew EZ Sim basic features	5b. Expect to use EZ Sim	5c. Was boss's idea	5d. EZ Sim more useful than expected
CU1	Gov	dis	agree	dis	agree
CU2	Util	dis	agree	dis	dis
CU3	Util	agree	agree	dis	agree
CU4	Util	agree	agree	dis	neither
CU5	Util	agree	agree	dis	neither
CU6	Util	agree	agree	agree	agree
CU7	Consult	agree	agree	dis	agree
CU8	Util	neither	agree	dis	neither
CU9	Gov	neither	neither	dis	DK
CU10	Consult	agree	agree	dis	agree

6. Features that caused consideration of EZ Sim

Resp. ID	Org type	6.1. Use utility bills	6.2. Estimate energy end-use	6.5. Diag. prob bldgs.	6.6. Bldg commiss.	6.7. Simple weather data	6.8. Easy-to-use	6.9. Model use of different equip.
CU1	Gov			x		x	x	
CU2	Util	x		x				
CU3	Util			x				
CU4	Util			x				
CU5	Util		x					
CU6	Util							x
CU7	Consult						x	
CU8	Util		x					
CU9	Gov			x				
CU10	Consult	x		x				

6. Features that caused consideration of EZ Sim (continued)

Resp. ID	Org type	6.88. Other:
CU1	Gov	
CU2	Util	get handle on utility costs to streamline public housing mgmt
CU3	Util	analyze high bill complaints
CU4	Util	
CU5	Util	
CU6	Util	ability to tune a model using utility bills
CU7	Consult	weather, real-world data
CU8	Util	
CU9	Gov	
CU10	Consult	

Resp. ID	Org type	7a. Satisfied with function #	7b. Satisfied with function #	8. Number of EZ Sim uses	9. Why not using EZ Sim
CU1	Gov	5, Y	7, 8, Y	5	NA
CU2	Util	1, Y	88, Y	2	no interest on the part of end-users at public housing facilities. EZ-Sim would work just fine but no one wants to learn it
CU3	Util	5, Y	88, Y	3	NA
CU4	Util	5, Y		4	NA
CU5	Util	2, Y		6	NA
CU6	Util	9, Y	88, Y	24	NA
CU7	Consult	8, Y	88, Y	10	NA
CU8	Util	2, DK		4	NA
CU9	Gov	5, DK		15	NA
CU10	Consult	1, Y	5, Y	8	NA

Resp. ID	Org type	10. Type of Bldg	11. Purpose in using EZ Sim	12. Prove to be most useful
CU1	Gov	Multi-bldg complex	Prospecting savings	Ease-of-use
CU2	Util	Multi-unit housing	analyzing utility bills	
CU3	Util	Sml office	Bill complaints	Problem bldgs
CU4	Util	commercial	overall bldg analysis	Verify perform
CU5	Util	Sml retail	verify savings	Diff equip scenarios
CU6	Util	commercial	Prospecting savings	ability to tune the software to specifics of building
CU7	Consult	Lrg office	post-installation verification tool	Ease-of-use
CU8	Util	Sml office	Prospecting savings	Estimates by end us
CU9	Gov	Lrg office	real mix from simple audit to large-scale changes	small amount of data required to run EZ Sim is great!
CU10	Consult	commercial	NR	it is efficient to use, saving time and saving customers money

ID	Org type	13. Changes to EZ Sim
CU1	Gov	It would be nice not to have to start from scratch for each building. Would like to use old EZ Sim models for different projects just changing the necessary parameters.
CU2	Util	No need for change
CU3	Util	As non-engineer, the operation of EZ Sim is a mystery. She's learned by messing with it but feels at a disadvantage to trained engineers. She doesn't agree that it is "easy to use."
CU4	Util	None
CU5	Util	Create different user modes so that the learning curve to get up to speed using the tool isn't so steep.
CU6	Util	Don't sell the tool as easy-to-use. If one isn't familiar with modeling software it's not easy to tune. It's a bit misleading to sell it as a simple tool.
CU7	Consult	Tuning function is obtuse. It's confusing to use and to interpret the results. This process could be made easier to understand and the results could be presented in a more intuitive way.
CU8	Util	haven't used it enough to say
CU9	Gov	No need for change
CU10	Consult	Change nature of product support. Stellar does an excellent job and is very responsive. But the help is focused on problem solving and not training. He needs more hand-ons training and not simply the answers to his questions without understanding how the

ID	Org type	14. Contacted Stellar	15. Satisfied with contact	16. Web site	17. Satisfied with web site
CU1	Gov	4	VS	0	NA
CU2	Util	2	VS	2	So-so
CU3	Util	5	VS	2	VS
CU4	Util	2	VS	0	NA
CU5	Util	4	VS	0	NA
CU6	Util	3	Sat	2	Sat
CU7	Consult	10	VS	10	VS
CU8	Util	3	VS	0	NA
CU9	Gov	4	VS	0	NA
CU10	Consult	4	Sat	0	NA

ID	Org type	18a. Changes to cust serv	18b. Changes to web
CU1	Gov	No	NA
CU2	Util	No	Can't remember what I was after but ended up calling Stellar--they're great.
CU3	Util	No	DK
CU4	Util	No	NA
CU5	Util	No	NA
CU6	Util	No	No
CU7	Consult	No	No
CU8	Util	Start a web-based users' group or newsgroup for exchange between EZ Sim users.	NA
CU9	Gov	None	NA
CU10	Consult	Offer option not only to answer question but work through how it was arrived at.	NA

ID	Org type	19a. Price	19b. Ease-of-use	19c. Precision	19d. Product support
CU1	Gov	EZ	EZ	EZ	EZ
CU2	Util	DK	EZ	DK	DK
CU3	Util	DK	DK	DK	DK
CU4	Util	EZ	EZ	EZ	DK
CU5	Util	EZ	EZ	All the same	DK
CU6	Util	EZ	EZ	All the same	All the same
CU7	Consult	EZ	EZ	All the same	EZ
CU8	Util	DK	EZ	All the same	DK
CU9	Gov	EZ	EZ	All the same	DK
CU10	Consult	DK	DK	DK	DK

ID	Org type	20. Who to mkt to
CU1	Gov	Attend Building Operators Seminars. This would be a good way of exposing EZ Sim to that audience of potential users. You should hook up with other orgs who are on the circuit giving presentations so that you could get exposure without the expense.
CU2	Util	architects would be prime target (modeling), facilities owners (large), building operators (track building operations)
CU3	Util	Dave has been very helpful. Cathy is looking forward to using EZ Sim more in the future. So far, it has been a real help in determining if a building has a problem. People call with high bill complaints and she can tell them whether there really is a problem
CU4	Util	NR
CU5	Util	Gear it toward people involved in new construction projects so that they could model different scenarios based on building operation and different equipment choices
CU6	Util	Facilities managers for larger buildings. These guys would have a use for it but they'd have to be convinced of it. Must make it easy-to-use for non-engineers. For example, Energy 10 is a product that has many defaults programmed
CU7	Consult	Target the design realm. The typical A&E operations don't have an energy efficiency awareness or background. EZ Sim could be very useful to them when first conceptualizing a project. When dealing with client the question comes up "how much will it cost to
CU8	Util	Facilities managers would be great source of users. However, these people have little time and they don't perceive they have a problem. To reach them, you'd have to get in the door with a fluent user of EZ Sim who can show the benefits and then model their

CU9	Gov	Focus on the people involved in verification. These people could find the results very useful.
CU10	Consult	NR

INACTIVE USERS

ID	Org type	2. Job Descrip.	3. Heard of EZ Sim	4. Used simul tools
IU1	Util	A bit of everything, manages DSM programs that are still alive, high bill complaints, key accounts.	Colleague	N
IU2	Util	Work with Com customers on energy delivery issues, evals, etc., power quality issues	Advert/brochure	N
IU3	Consult	Provide advise and research regarding sustainability, energy efficiency, on all types of construction	Stellar	Y
IU4	Util	Monitoring HUD staff and operations, trains staff	web	N
IU5	Util	Administrate the Montana Power Company commercial conservation programs	NEEA	Y
IU6	Consult	QC for customer reports (energy audits), some res mostly com	NEEA	N
IU7	Util	Energy efficiency for Com new construction	Stellar	Y
IU8	Consult	Direct contact with customer, rep, energy services	Colleague	N
IU9	Util	Marketing, customer service, no direct dealings with utility customers	NEEA	N
IU10	Util	Evaluation of new construction and conservation	DK	Y

ID	Org type	5a. Knew EZ Sim basic features	5b. Expect to use EZ Sim	5c. Was boss's idea	5d. EZ Sim more useful than expected
IU1	Util	dis	agree	dis	neither
IU2	Util	dis	dis	dis	neither
IU3	Consult	agree	agree	dis	neither
IU4	Util	agree	agree	dis	DK
IU5	Util	dis	agree	agree	neither
IU6	Consult	agree	neither	dis	agree
IU7	Util	dis	neither	dis	neither
IU8	Consult	agree	agree	dis	neither
IU9	Util	dis	neither	dis	DK
IU10	Util	dis	agree	dis	neither

6. Features that caused consideration of EZ Sim

ID	Org type	6.1. Use utility bills	6.2. Estimate energy end-use	6.5. Diag. prob bldgs.	6.7. Simple weather data	6.8. Easy-to-use	6.9. Model use of different equip.	6.88. Other:
IU1	Util			x				
IU2	Util					x	x	
IU3	Consult	x						applicability to existing buildings and takes into account architectural features in how it impacts energy use
IU4	Util							complete base load analysis in form staff could understand
IU5	Util	x	x	x	x		x	
IU6	Consult		x					
IU7	Util	x						
IU8	Consult						x	
IU9	Util							went to learn what EZ-Sim provided but never intended to use it. His customers use it.
IU10	Util			x				

ID	Org type	7a. Satisfied with function #	7b. Satisfied with function #	8. Number of EZ Sim uses	9. Why not using EZ Sim
IU1	Util	5, DK			Haven't found it necessary
IU2	Util	8, DK	9, DK	0	Hasn't had reason to use it. Most customer's needs are easily met without the detail available through EZ Sim
IU3	Consult	1, DK	88, DK	0	Haven't been too many projects on which it could be used. Also has tough time getting customers to provide their energy bills. They often don't have ready access to the records.
IU4	Util	88, DK		0	lack of interest by work group
IU5	Util	1, 2, 5, 7, Y	9, N	0	Due to program changes, I do not perform auditing services
IU6	Consult	2, DK		0	Xenergy decided not to use EZ Sim because it couldn't do what they had originally hoped (details in notes section)
IU7	Util	1, Y		1	Don't have opportunities to use it, current projects are not applicable
IU8	Consult	9, DK		0	Doesn't have engineering background in order to calculate lighting loads and heating loads
IU9	Util	NR		0	never intended to use it
IU10	Util	5, DK		0	Can fulfill tasks without using EZ Sim so it isn't needed

		19. EZ Sim versus competing products				
ID	Org type	19a. Price	19b. Ease-of-use	19c. Precision	19d. Product support	20. Who to mkt to
IU1	Util	NR	NR	NR	NR	NR
IU2	Util	DK	DK	DK	DK	NR
IU3	Consult	DK	EZ	EZ	DK	Most applicable to Physical plant managers. Also architects who serve as advisors on projects.
IU4	Util	DK	DK	DK	DK	NR
IU5	Util	DK	EZ	EZ	DK	DK
IU6	Consult	DK	DK	DK	DK	If it were more functional for cranking out large numbers of audits with results in laymans' terms it would be much more useful Xenergy
IU7	Util	DK	DK	DK	DK	Probably need to be bought up by a big organization that can use it in-house and build instantly high user base. Also try to market it to Association of Energy Engineers, try BOMA too. Call Washington state's General Administration
IU8	Consult	DK	DK	DK	NR	NR
IU9	Util	DK	EZ	All the same	DK	building and facilities operators/managers, especially facilities engineers, hook into BOMA training. Lane College, architects
IU10	Util	DK	EZ	DK	DK	NR

APPENDIX E: QUALITATIVE FORECAST

August 4, 2000

To: Andy Ekman
From: Phil Degens

Re: Qualitative Forecast of EZ Sim

I had a short interview with Dave Robison of Stellar Processes on August 4, 2000 regarding the future of EZ-Sim. Initial discussion focused on three questions:

1. What was the minimum number of EZ-Sim sales or customer base to keep selling the product?
2. What was the expected sales or customer base that would sustain ongoing marketing and development of the software product?
3. What would be an even higher but realistic level of market success?

The answer to the first was that EZ-Sim was an integral part of Stellar Processes' on-going consulting engineering business. Even if demand for EZ-Sim were reduced to zero Stellar would still continue to upgrade the software and product capabilities for in-house use. Therefore, even in a worst case scenario EZ-Sim would continue to be available and be updated.

The answer to the second was that Stellar proposed a sales goal of 300 units per year. My take on this target is that it is a reasonable and achievable number of sales given the large national market potential⁶. Income from this level of sales would allow for ongoing product development, marketing, promotion, and training activities.

The answer to the last question was that the range was too large to be meaningful. There were too many variables that would influence the success of EZ-Sim. If a prominent partner such as an ESCO, the EPA, or the Alliance to Save Energy decided to promote, distribute, or widely accept the use of EZ-Sim, the market penetration of EZ-Sim could rise dramatically. Also, favorable reviews or an unexpected increase in acceptance by the energy conservation community could also positively impact EZ-Sim's place in the market.

From the conversation it was clear that EZ-Sim is not going to disappear from the market any time soon. Also Stellar has plans to continue to incorporate many new features, such as use of hourly metered data and a web based version of the software.

⁶ Initial estimates of the regional market were 550. With the PNW being ~4% of the population the national market could be as large as 13,750.

