DECIDING HOW TO IMPLEMENT A SUSTAINABILITY INITIATIVE AT SHN ENGINEERING, A SMALL BUSINESS ENTERPRISE

By

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ABSTRACT

DECIDING HOW TO IMPLEMENT SUSTAINABILITY INITIATIVES AT SHN ENGINEERING, A SMALL BUSINESS ENTERPRISE

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The Marketing Coordinator of an established engineering and geosciences consulting firm convinced the firm's Principals that evaluating the company's sustainability practices, and writing a report documenting recommendations for improving sustainability, would be valuable. The sustainability report evaluated the firm's performance in three categories: its financial and management practices, its environmental benefits and impacts, and its social commitments to employees, shareholders, professional partners, and its communities. Although the Marketing Coordinator spent over nine months evaluating data and writing the sustainability report, she now finds that writing was the easy part, and that implementing any of the recommendations will be much more difficult. Rational reasons for ranking the recommendations were described, and can be communicated to the Principals. However, the Marketing Coordinator knows that decisions are frequently made on a very quick, unconscious, "gut" level, also called intuition or "thin slicing." Decision makers are often unaware that they have made decisions, and are discussing the issues to substantiate or rationalize their decisions. The Marketing Coordinator will need to consider the unconscious cognitive biases of the Principals, and communicate clearly and concisely, to gain the Principals' approvals to proceed.

ACKNOWLEDGEMENTS

The HSU Department of Business Administration and SHN Engineers & Geologists, Inc. have been equally supportive of my efforts, but writing necessitates thanking one before the other. I'll begin with the HSU faculty. Dr. Kate Lancaster, thank you for your utter and complete commitment to business sustainability. I particularly admire that your "other" specialty is the nuts-and-bolts of accounting and management finance, which demonstrates that descriptive concepts of sustainability and data-driven financial statements and spreadsheets go hand in hand. Dr. David Sleeth-Keppler, some of your marketing readings and class discussions shifted the context in which I now observe people's interactions. Also, your wry comedic timing and delivery is nearly perfect. To Drs. Carol Telesky, Michelle Lane, Michael Thomas, and Hari Singh, thank you for tolerating those of us who work during the day, and show up to class a bit less than fresh.

SHN Engineers & Geologists has been supportive during two of my major life transitions, first when I was a young engineer transitioning to being a mother, and now as I transition from an engineer focused on projects to one focused on company and community. To Jeff Nelson, SHN's CEO, thanks for being a leader who is on the look-out for change and how the company can best evolve and adapt to those changes. Mark Chaney, SHN's Marketing Director and Principal of the Redding office, helped me apply some of my academic book-learning to real-life consulting marketing. Both Jeff and Mark made substantial and valuable comments and corrections on the SHN Sustainability

Report. To state “this thesis could not have happened without their support” is no exaggeration. Brenda Sigler, SHN’s Chief Financial Officer, located and trusted me with files containing SHN’s waste, water, and energy use data, and answered my personnel policy questions. Mike Foget, Principal of Engineering in the Eureka office, and Greg Williston, Principal of Planning and Permitting also in the Eureka office, always showed interest and enthusiasm for my efforts. Finally, to Jack Selvage, the “S” in SHN, and Roland Johnson, SHN’s never-quite-retired Principal Geologist, thank you for hiring me the first time.

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INTRODUCTION

This case study investigates and reports on a small professional consulting company's decision to pursue a sustainability initiative. Sheri Woo, the company's marketing coordinator, believes that consciously and simultaneously considering the company's financial, environmental, and social strengths will increase the company's longevity and success. Company longevity is a topic of interest to upper management because the company is celebrating its 36th year in business, and is planning the succession of key staff as they retire within five years. "Sustainability" in this case study means not just environmental sustainability (for example, reducing waste and energy use and increasing water conservation), but also people/community sustainability (for example, creating an exciting, vibrant, and meaningful company culture that improves recruitment and retention).

Sheri approached the company's senior management with the idea of writing a sustainability report. She gave a presentation explaining what the benefits and potential disadvantages are to evaluating a company's sustainability, as defined and evaluated by the Global Reporting Institute's methods. Although some of the Principals may have been less than enthusiastic, no one was opposed to her idea. Sheri explained how much help and time she would need from others in the company, and they agreed that resources could be diverted to assist her. The company CEO, Jeff Nelson, and its Marketing Director, Mark Chaney, were particularly interested and supportive, which was critical because they are Sheri's direct supervisors.

After approximately nine months, and with assistance from many other company employees, Sheri had a draft of the sustainability report ready for review. The sustainability evaluations were not all positive, and Sheri's recommendations for addressing areas that could be improved ranged from easily and quickly accomplished to expensive and time consuming. Jeff and Mark reviewed the sustainability report and provided valuable comments and questions. They did not ask that Sheri revise or delete any of her recommendations. Sheri finalized the sustainability report (Exhibit 1).

Sheri's next decision point is "what next?" How can she best gain the support of most (if not all) of the Principals, and how can she convince them that the company should follow up on the sustainability report's recommendations?

Case Study Structure

The structure of this case study is based on "How to Write a Business Case Study" (University of Michigan Ross School of Business, 2013):

- Introduction, which identifies the protagonist (Sheri Woo) and other central characters, and provides the context of the situation (a company overview, sustainability initiatives of similarly sized companies, and the marketing coordinator's approach to decision making).
- Background on the company, industry, and competitors.
- Business issues and challenges, which provides information needed to describe, explain, and support decisions that the protagonist makes. This section describes

and ranks the sustainability recommendations that Sheri is trying to have the company adopt.

- Conclusion.

SHN Engineering & Geologists, Inc.

SHN Engineering & Geologists (SHN) is a California-certified small business enterprise[1] and fits all the criteria for a Federal small business, with approximately 85 employees, including civil and environmental engineers, geologists and geotechnical engineers, surveyors, permitting specialists and planners, biologists, and administrative support staff. SHN's vision statement is to be "the firm of choice in Northern California and Southern Oregon" and "through our actions… [to] enhance our communities and create a rewarding environment for our employees and shareholders." The original office, and the one with the most employees, is located in Eureka, California. Regional offices have opened in Redding and Willits, California, and in Coos Bay, Oregon, thus widening the company's original service area from the California North Coast to its current region of Northern California and Southern Oregon. SHN serves public and private clients; examples are the resources and energy industries; local, state, federal, and tribal governments; universities and schools; hospitals, and other public entities; non-profit organizations; and commercial developers.

[1] In California, a small business enterprise is defined as one that is independently owned and operated, is not dominant in its field, has its officers living in California, employs fewer than 100, and collects annual

The 2008 recession and the trend of mergers and acquisitions continue to affect SHN, presenting challenges and opportunities. The recession affected all of its clients, and many had to "pull back" on existing projects and delay the start of other projects. Competition became fierce as well, with larger engineering firms entering the market of "small jobs." More recently, competitor and partner firms similar in size to SHN have been acquired by much larger international firms. These acquisitions have made competing on a cost basis more challenging because large firms can decide to under-bid for strategic reasons. However, the acquisitions have created an opportunity to very clearly differentiate SHN as a regionally-owned small business, and implementing and marketing its sustainability efforts is another way to differentiate itself.

Sheri Woo is the company's new Marketing Coordinator. She reports directly to Mark Chaney, the Marketing Director. The marketing coordinator position is new, and Mark and Sheri have considerable freedom in defining what her responsibilities and priorities are. Redefining and enforcing SHN's brand is a broad goal that will be accomplished through creating new marketing materials, redesigning the company's website, and gathering data that describe the company's identity. Sheri is also a graduate student working towards a Master's degree in Business Administration, with an emphasis on strategic sustainability. She and Mark are curious to see if sustainability concepts should be incorporated into the company's brand, and how difficult that would be.

Sustainability Initiatives of Other Small Businesses

Numerous small businesses (in the European literature, often abbreviated as small- and medium-sized enterprises or SMEs[2]) have written sustainability reports, identified actions and measures to achieve sustainability, and become certified "green businesses." There are many procedures and frameworks available to guide businesses of any size. On a global scale, the Global Reporting Initiative (GRI) provides a "Reporter's Starter Kit", the "GRI Sustainability Reporting Framework", a "Let's Report" template, and guidelines (Global Reporting Initiative, undated). Others have provided guidance for using the GRI resources, targeted to SMEs (Tng 2010).

Guidance on a state level is available from a consortium (the California Air Resources Board, the University of California Berkeley's Renewable and Appropriate Energy Laboratory, and Next 10) that is under the umbrella organization called "CoolCalifornia.org". CoolCalifornia.org[3] writes that it "is THE new one-stop-shop for

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[2] Definitions of SMEs vary by industry and by country, but generally revenues and number of employees are factors. In the EU, a medium-sized business employs fewer than 250 employees, and creates "annual turnover" of less than 50 million euro. A small-sized business employs fewer than 50 people and has an annual turnover of less than 10 million euro (European Commission, 2014)

[3] Additional Cool California partners are the California Energy Commission; the Lawrence Berkeley Laboratory; numerous public agencies such as the California Public Utilities Commission, and the California Environmental Protection Agency; and advocacy and conservation groups such as California Public Interest Research Group, the California League of Conservation Voters, the Environmental Defense Fund, and many others.

all Californians—packed with quick, easy-to-use and reliable tools that all Californians need to save money and reduce their impact on the climate" (CoolCalifornia.org, undated). They also coordinate and select companies for the annual CoolCalifornia Small Business Awards, provide online calculators for a company's carbon footprint, and maintain a database of case studies of companies that are taking steps towards sustainability.

On a local level, sustainability guidance is available from Plan It Green Humboldt, an organization that incorporated as a non-profit in 2006. It plays numerous roles in the local sustainability community, including:

- sponsoring annual workshops and events to educate the public on sustainability
- in July 2014, hosting the Sustainable Living Skills Fair,
- publishing the "Green Business Directory", and
- encouraging businesses in the Directory to take the Green Business Pledge (Plan It Green Humboldt, 2014).

The pledge is a series of questions that can guide a company's awareness of measures it could take to improve its degree of sustainability. Company responses are posted online so businesses can see what other local firms are doing. Whether the company has taken the pledge is indicated in the Green Business Directory.

Some challenges occurring when a small business embarks on a sustainability initiative are obvious, such as sustainability measures that take time and effort away from

the core business. In a survey[4] of SMEs, 35% of respondents cited "initiatives interfere with other business processes" and "lack of information on how to implement" as challenges or barriers to a sustainability initiative (Russell, 2013). Other barriers cited included employee apathy, upstream supply chain vendors who were unable to support, and initiative was too expensive to implement (25% of respondents also cited these reasons). Implementation expense could be clarified as lack of planning, because sustainability measures can be phased, but the *perception* of this challenge is important to understand.

Balancing the challenges are benefits. One architectural firm was able to decrease overhead by reducing waste and improving its building's energy efficiency (Russell and Young, 2014). It improved communications between management and employees by providing a transparent billable hours system; each employee understands his or her connection to company profits. The company culture changed and employee attitudes improved to increase retention, and presumably, recruitment. Other benefits include presenting a more coherent company message, and increasing ties with the local community and economy (GRI 2012). The added value of a sustainability initiative was documented in a supply chain scenario, where SMEs vendors noted "gaining competitive advantage," experiencing greater leadership, increased importance of setting goals, and improving company reputation (Plugge and Wiemer, 2008).

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[4] The details of the survey, such as number of respondents and how they were selected, were not provided in the article. The author could have been reporting on a study performed by others, but this was not clear.

After a small company embarks on a sustainability initiative, what are its first primary actions? The CoolCalifornia data base provides 31 case studies of "business and professional companies" within California who have started implementing sustainability measures (Figure 1 and Exhibit 2) (CoolCalifornia.org, 2014). Most of the business and professional companies work first on recycling and decreasing waste. "Be a Green Biz" refers to implementing the CoolCalifornia program. Each company submitted a case study, which could be as early as 2009, when the first CoolCalifornia Small Business Awards were presented.

Given California's current and continuing drought, and the Governor's declaration of a drought emergency, saving water would likely be much higher on the list of sustainability actions than it appeared in 2014, when the database was last downloaded (Office of Governor Edmund G. Brown, 2014). Businesses' water use can decrease by one simple and low/no cost measure: becoming conservation aware (CoolCalifornia.org, 2014). Knowing how much water a business currently uses, and setting goals for reduction, is the first step. Finding and repairing leaks, and eliminating unnecessary outdoor watering, are next steps that cost a little more than conservation only. Longer term water conservation solutions include installing reuse and recycling systems, and conducting water use audits.

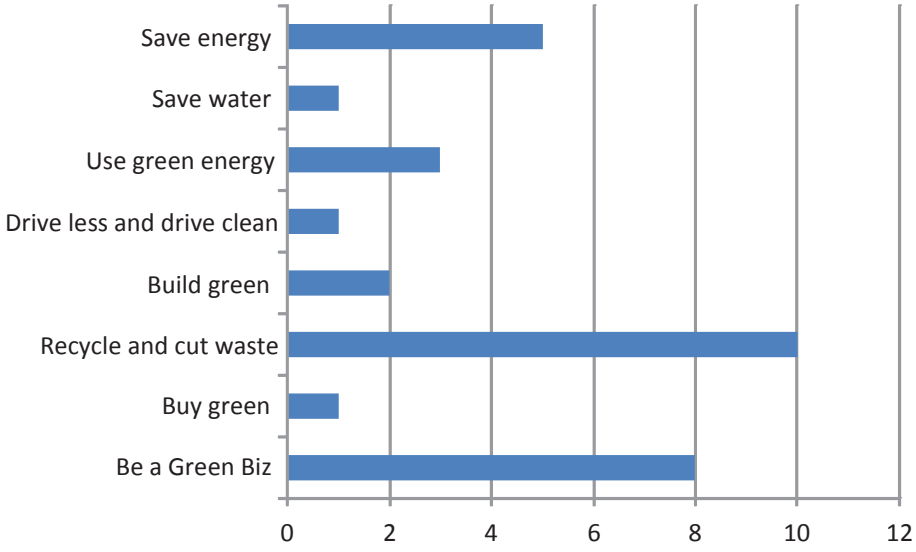

Figure 1. Distribution of first actions taken by small professional businesses that started a sustainability initiative. From the data base maintained by CoolCalifornia.org (see Appendix 2).

BACKGROUND ON THE COMPANY, INDUSTRY, AND COMPETITORS

This section provides a background and description of the company, and describes the company's business environment by describing the consulting engineering industry and the company's primary competitors.

Company Background and Business Model

SHN provides engineering and related services to communities in Northern California and Southern Oregon. The largest of its three California offices is in Eureka, with others in Redding and Willits. The fourth office is in Coos Bay, Oregon. The company has been in business since February 1979, and is privately owned. Its services areas are:

- Civil engineering
- Geosciences and materials testing
- Environmental services
- Surveying
- Planning and permitting
- Biological sciences

SHN is certified as a Small Business Enterprise in California, based on the number of its employees and its average annual revenue over three years. Due to its small size, employees "wear many hats" and have multiple roles within the company. The management positions within SHN are:

- Chief Executive Officer
- Chief Financial Officer
- Director of Business Development
- Principals
- Project Managers

SHN management has conducted strategic planning since the company began. A subset of the company was formed to plan and implement the 2012 strategic plan; this group is the Executive Leadership Team. The CEO is the chair of this team.

The Project Managers (PMs) are key in the daily operations of SHN, and the management structure is designed such that management's function is to support the PMs. Again, depending on the size and complexity of a project, the same person may fill more than one management role. For example, on a small residential foundation design, the PM could also be the Principal of Geosciences, and he could also do much of the work, with another PM, Principal or the CEO acting as his quality control. Only on larger projects (for example, design, permitting, and construction of a city water system) would each management position be filled by a specific person.

Industry and Competitors

To better understand the conditions in which SHN operates, a list of 28 competitors was compiled, and information on them was obtained from their websites (Exhibit 2). Information gathered included each company's:

- Core services

- Number of employees
- Ownership (publicly traded or privately held)
- Geographic locations of offices
- Non-core services
- Client types
- Interest in sustainability
- Use of the website for recruiting

In summary, the competition is formidable, but real and obvious differences exist among companies, allowing some market differentiation. About half of competitor companies are also small businesses; medium and large sized firms comprised one quarter each. The largest companies were the ones who are bringing sustainability services into their offerings and post corporate sustainability reports. One of the large and more diversified companies hired a Vice President of Energy and Sustainability in January 2015.

Almost every company's website had a specific page for recruiting new employees, and the extent of website recruiting effort did not depend on company size. Although a limited view of company culture can be gleaned from a website, these career pages were instructive. Some companies recognized the difficulty in maintaining a work/life balance; many described their company's and employees' commitments to service organizations. Many also described benefits such as further education and "best place to work" awards.

A few companies listed their clients by name, but theirs were old-style websites and none of the newly designed and updated websites did. The large and small companies have similar client bases, which include public agencies of all sizes, private corporations of all sizes, hospitals, universities, energy development corporations, and other resource extraction firms. The smallest companies listed larger engineering firms as clients, having been sub-consultants. SHN's client base is similar to those listed by other firms.

BUSINESS ISSUES AND CHALLENGES: HOW TO IMPLEMENT SUSTAINABILITY RECOMMENDATIONS?

When performing the sustainability evaluation, Sheri gathered and reviewed existing company data, employee handbooks, and company policies. She reviewed the literature to locate benchmarks and goals for the financial, environmental, and social aspects of the business. Aspects were identified based on the Global Reporting Institute's guidelines for writing sustainability reports; they are economic, environmental, and social aspects (Appendix 1).

Under the economic aspects, external conditions affecting SHN's economy were evaluated. Global drivers include a talent shortage as Baby Boomers retire, and global climate change, which will increase the costs of doing business, but will also create opportunities. In the U.S., aging infrastructure is an external condition directly affecting consulting engineering firms. SHN's economic impacts on its communities include bringing "out of the area" money into its offices' communities, and of course, providing employment.

Energy consumption, waste generation and recycling, water use, and air emissions, were evaluated under the environmental aspects of SHN's sustainability report. SHN provides environmental services directly to its clients and communities through the projects they design and construct, for example, water treatment plants, safe roads and bridges, and remediated industrial sites.

Social aspects of the company were described by types of employment, company diversity, and other policies and data that indicate the company's culture. The company has a flexible work policy but has not yet developed a telecommuting or "work from home" program. One outstanding company characteristic is its commitment to community service, on the part of employees as individuals and as supported by the company.

In the sustainability report, nineteen recommendations were provided to increase sustainability within the three aspects of economics, environment, and social responsibility (Appendix 1). Of the nineteen recommendations, six were already in practice, and those were not ranked.

Existing Sustainability Practices at SHN

SHN's sustainability report identified six practices that SHN is already doing that support company sustainability. In order of presentation in the sustainability report, these six practices are:

- Recommendation 1. Continue strategic planning and scanning for trends that could be opportunities for the company and community.
- Recommendation 2. Continue financial management that has been leading to profit.
- Recommendation 10. Continue core business of civil and environmental services, and evaluate applicability of Envision certification to SHN's primary service areas.

- Recommendation 12. Continue policies and practices for identifying non-exempt and exempt employees.
- Recommendation 13. Continue existing health and safety programs, and consider whether the Company Safety Officer needs assistance.
- Recommendation 19. Continue support for employee licensing and certifications, and continue analyzing risks of projects that the company designs, implements, or constructs.

These recommendations were not ranked because the company is already performing them, and Sheri and Mark assume the company will continue to do so.

Potential Sustainability Initiatives for SHN

The following 13 recommendations are actions that SHN could take to increase its sustainability. Again, in order of presentation within the sustainability report, they are:

- Recommendation 3. Further document energy uses of the Coos Bay and Redding offices, and investigate whether other building tenants are likely to use more energy than that consumed for office work.
- Recommendation 4. Although testing lab concrete and soil recycling has been investigated in the past, consider reviewing its feasibility, given increased waste management fees.
- Recommendation 5. Discuss concerns with local computer business to see if alternatives are available that perform as well as their preferred brand.

- Recommendation 6. Present carpet tile alternative to Eureka building owner while negotiating carpet replacement.
- Recommendation 7. Partner with universities and regulatory agencies to identify ways to reduce waste generated during sample collection and testing.
- Recommendation 8. As the California drought worsens and as water rates increase, water use in all offices should be more clearly known; conduct further study of water usage.
- Recommendation 9. Determine CO2 emissions from employee commuting, and consider purchasing carbon credits from the Arcata Community Forest Barnum Tract to offset all or part of commuting emissions.
- Recommendation 11. Propose offering this sustainability reporting as a service to new and existing clients to the senior management and Executive Leadership Team.
- Recommendation 14. Remind or direct employees to the server location where all staff policies are saved, so that they are responsible for knowing what the policies are, as well as their supervisors.
- Recommendation 15. Consider investigating whether a work at home policy is desirable, given new communication technologies, and work at home policies of other companies
- Recommendation 16. Monitor gender and race distribution in science, technology, engineering and math (STEM) college majors and within the engineering industry, and periodically compare college, company, and industry

statistics. If comparisons indicate that women and minorities are significantly under-represented at SHN, prepare recruiting plans that address how representation could be increased.

- Recommendation 17. Consider reminding supervisors and managers to discuss perceptions of required non-billed labor with employees, and reminding employees to reflect on the nature of any non-billed labor.
- Recommendation 18. Consider whether an internally known employee review metric would motivate managers to perform the reviews, or would only add stress to reasons why timely reviews are not occurring.

Criteria for Ranking the Potential Sustainability Recommendations

The thirteen recommendations vary in the degree to which they require:

1. financial resources from company profit
2. specialized knowledge to accomplish
3. time to accomplish
4. immediate attention for best and clear return

Using these requirements as ranking criteria, Sheri ranked the recommendations to determine which ones might be implemented soon, and which may require a long range plan to implement.

Table 1. Selection Criteria for Prioritizing New Sustainability Recommendations.

1 = Low or Now, 2 = Medium, 3 = High or Future. Low Total indicates priority.

Recommendation	Financial resources	Specialized knowledge needed	Time to accom-plish	When to act	Total
14. Remind or direct employees to the server location where all staff policies are saved, so that they are responsible for knowing what the policies are, as well as their supervisors.	1	1	1	1	4
6. Present carpet tile alternative to Eureka building owner while negotiating carpet replacement.	1	2	1	1	5
17. Consider reminding supervisors and managers to discuss perceptions of required non-billed labor with employees, and reminding employees to reflect on the nature of any non-billed labor.	1	2	1	1	5
3. Further document energy uses of the Coos Bay and Redding offices, and investigate whether other building tenants are likely to use more energy than that consumed for office work.	2	1	1	2	6
5. Discuss concerns with local computer business to see if alternatives are available that perform as well as their preferred brand.	1	2	1	2	6
18. Consider whether an internally known employee	2	2	1	1	6

Recommendation	Financial resources	Specialized knowledge needed	Time to accom-plish	When to act	Total
review metric would motivate managers to perform the reviews, or would only add stress to reasons why timely reviews are not occurring.					
8. As the California drought worsens and as water rates increase, water use in all offices should be more clearly known. Further study of water usage is recommended.	2	2	2	1	7
11. Propose offering this sustainability reporting as a service to new and existing clients to the senior management and Executive Leadership Team.	1	3	1	2	7
4. Although concrete and soil recycling has been investigated in the past, consider reviewing its feasibility, given increased waste management fees.	2	2	2	2	8
9. Consider purchasing carbon offsets from the Arcata Community Forest Barnum Tract for all or part of commuting emissions.	3	2	1	2	8
16. Monitor gender and race distribution in science, technology, engineering and math (STEM) college majors and within the engineering industry, and periodically compare college, company, and industry statistics. If comparisons indicate that women and minorities are	2	3	2	1	8

Recommendation	Financial resources	Specialized knowledge needed	Time to accom-plish	When to act	Total
significantly under-represented at SHN, prepare recruiting plans that address how representation could be increased.					
15. Consider investigating whether revising the existing flex time policies is desirable, given new communication technologies, and work-at-home policies of other companies.	2	3	3	1	9
7. Partner with universities and regulatory agencies to identify ways to reduce waste generated during sample collection and testing.	3	3	3	2	11

The two highest ranking recommendations require deeper communication between employees and managers. Reminding employees of where and what staff policies are, and reflecting on the nature of billable hours and total hours worked, are conversations that could be stressful between any organization structured on time as the metric of sales. The next highest ranking recommendations, considering a carpet tile alternative and further documenting energy uses and conservation measures, will require more effort and time, but are equally urgent.

The Challenge: What Next?

Sheri now realizes that writing the sustainability report was actually the easy part! Her next challenge is "now what?" How can she avoid having the report's recommendations languish as bytes on the company server? What should she keep in mind as she tries to persuade the Principals to implement a sustainability plan? Sheri realizes that she must now "sell" the sustainability report to the Principals.

The business case for sustainability—that is, the positive feedback loop between economic, social, and environmental aspects of the company—is relatively clear in SHN's sustainability evaluation. Implementing Recommendations 6 and 3 (using carpet tiles and "fine tuning" energy uses) will have a direct positive effect on expenses in the short and long term. Less direct are Recommendations 14, 17, and 18 but Sheri can make the case that improving staff and supervisor communications and paying greater attention to employee performance will increase employee satisfaction and retention, which again has a long term positive effect on the company's "bottom line".

Analyzing how she should approach the Principals, Sheri reviews the marketing concepts of positioning and segmentation. The Principals are obviously individuals presenting a heterogeneous audience, but they are similar in numerous ways such as being extremely busy, and prioritizing the company's profitability and best interests. Sheri perceives that as a group, the Principals vary in their comfort level with change and their degree of cognitive overload; some are deeply involved in numerous projects that are extremely demanding of their time and energy. Sheri needs to convey the value of

the recommendations clearly and quickly. (In marketing parlance, she needs to "formulate the recommendations' value proposition for target segments".)

The value of implementing the sustainability report's recommendations is determined by whether the benefits are greater than the costs (Figure 2). Because implementation costs can be staged or phased depending on how the Principals distribute company profits, costs can be controlled to always be less than benefits, resulting in positive value. Increase in internal value improves employee commitment and creates a positive company culture. External value is also improved and enhances the company's brand and image.

Recent marketing and neuroscience literature provides evidence that people make decisions extremely quickly, based on emotion and senses, and only later find rational reasons to support their decisions (Kahneman, 2013; Gladwell, 2007). Rational reasons for implementing and phasing sustainability recommendations are provided in the sustainability report, but Sheri will also need to review and apply cognitive bias strategies and "thin slicing" for the best chances of persuading the Principals.

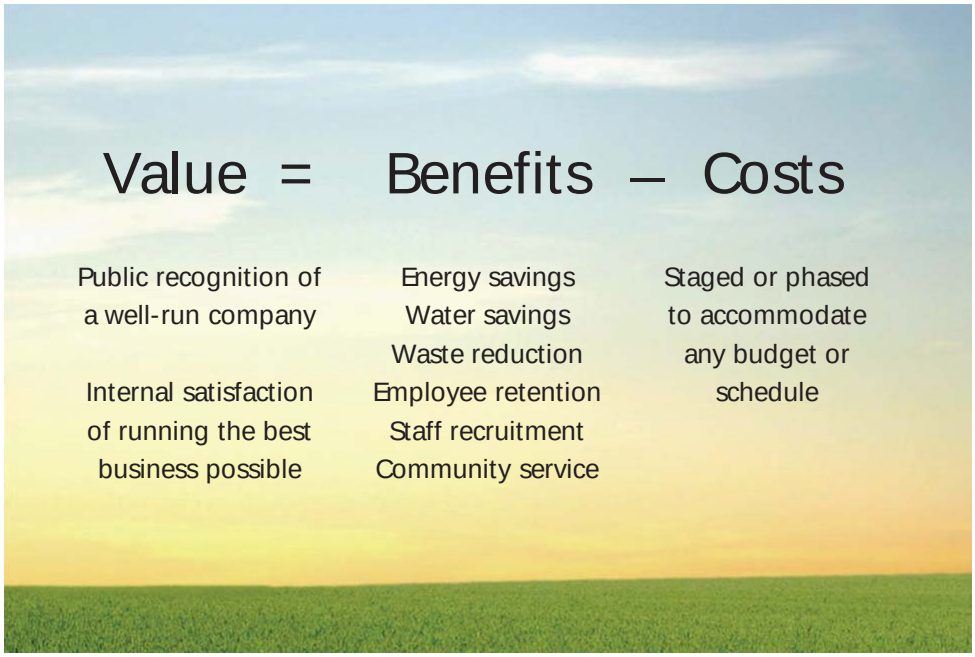

Figure 2. The value that SHN could generate by implementing the sustainability report's recommendations is positive, because costs can be managed by staging or phasing implementation.

CONCLUSION

Although the company's sustainability report took nine months to write, the Marketing Coordinator, Sheri, now understands that identifying recommendations was the "easy" part. The more daunting task is to persuade the Principals to expend resources to implement some of the sustainability recommendations. The sustainability report provides numerous rational reasons for adopting the sustainability recommendations, but her immediate challenge is to review and apply recent marketing and neuroscience literature to increase the likelihood of their adoption to the maximum extent possible.

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APPENDICES

APPENDIX 1.

SHN ENGINEERING & GEOLOGISTS SUSTAINABILITY REPORT 2015

LETTER FROM THE CHIEF EXECUTIVE OFFICER

At SHN Engineers & Geologists, our mission and vision statements announce the things that matter to us: enhancing our communities, creating rewarding environments for our employees and shareholders, being the firm of choice in northern California and southern Oregon, and delivering comprehensive and professional solutions to our clients' engineering and geologic problems. We are a small business enterprise with fewer than 85 employees, with offices in four locations, Coos Bay, Oregon; and Eureka, Redding, and Willits, California. Our business incorporated in 1979, and we are beginning our 36th year.

This Sustainability Report is the first for SHN, and I am gratified to learn that many of our "tried and true" business operations are considered sustainable actions. By being fiscally conservative, we have weathered the economic downturns following the "Black Monday" stock market crash of 1987, and the Great Recession of 2007-2008. By encouraging employees to branch out into new services, we have also been able to evolve with the changing local economy, as it went from primarily resource based, to a more diversified mix of professional services, education, energy, aquaculture, and small businesses.

Certainly we can improve in the environmental aspects of sustainability, and the California drought and the Governor's Executive Order for a 25% water use reduction

will likely compel us to do so. This sustainability report provides us with some benchmarks for water and energy use, and waste management and reduction.

A recent polling of employees found that over half are active in numerous and varied community service, professional, youth oriented, environmental, educational, and public safety organizations. SHN's culture of community involvement and professional excellence is the driver behind our longevity and sustainability, and we are committed to continuing our efforts.

< Jeff Nelson's signature >

K. Jeff Nelson, PE.

CEO of SHN Engineers & Geologists

May 2015

EXECUTIVE SUMMARY

A sustainability report is a document that describes a company's journey on its "triple bottom line" (TBL) path. TBL refers to a company's goals for three things, 1) its financial bottom line, 2) its people, which includes its employees, shareholders, clients, regulating governmental agencies, and community at large, and 3) its environment, which the company impacts both positively and negatively. This TBL concept is also known as the "3P" business management approach, referring to a company's profits, people, and planet. In 2012, Ernst & Young conducted a survey of 282 environmental strategy executives from 17 sectors, employed by companies generating revenues of $1 billion or more. They found that 62% of those companies publicly report environmental and social goals, and 59% actively measure progress towards those goals (Ernst & Young and GreenBiz, 2013). However, given its limited resources, how can a small business perform similar sustainability evaluations? How can a small company justify the expense to shareholders and employees?

The business case for small businesses evaluating company sustainability is that such an evaluation:

- Identifies risks that threaten a company's sustainability.
- Focuses management on employee motivation, retention, and recruitment.
- Defines the company's vision and strategy in sustainability as company longevity, and finds metrics to use as goals.

- Identifies the company to like-minded clients, organizations, and the community.
- Identifies how small companies can make steady change over time.

SHN Company Overview

SHN Engineers & Geologists (SHN) provides engineering, geologic, and related services to communities in Northern California and Southern Oregon. The largest of its three California offices is in Eureka, with others in Redding and Willits. The fourth office is in Coos Bay, Oregon. Its service areas are:

- Civil engineering
- Geosciences
- Environmental services
- Surveying
- Permitting and planning
- Materials testing

SHN has weathered financial and natural disasters over its 36 years in business, including 1987's "Black Monday" stock market crash, the 1992 Cape Mendocino earthquakes, the 2008 Great Recession, and the regional economic shift from primarily resource based, to a more diversified mix of professional services, education, energy, government, and small businesses. Being receptive to new ideas, its senior management supported a sustainability evaluation and report to be written.

Sustainability Evaluation Methods

Existing company data, handbooks, and policies were gathered and reviewed. The literature was reviewed to locate benchmarks and goals for the financial, environmental, and social aspects of the business. Aspects were identified based on the Global Reporting Institutes guidelines for writing sustainability reports. Recommendations were created and ranked.

SHN's Sustainability Recommendations

Nineteen recommendations were created, of which six were already being performed by SHN. One example of the six includes continuing financial management and strategic planning that has been leading to profit. Of the 13 remaining recommendations, the company's Executive Leadership Team is invited to review and consider if, how, and when they may be implemented. Recommendations of note include:

Environmental (Planet) recommendations:

- Although concrete and soil recycling has been investigated in the past, consider reviewing its feasibility, given increased waste management fees. Partner with universities and regulatory agencies to identify ways to reduce waste generated during sample collection and testing.
- Consider purchasing carbon offsets from the Arcata Community Forest Barnum Tract for all or part of commuting emissions.

- Continue core business of civil engineering, geoscience, and environmental services, and evaluate applicability of Envision certification to SHN's primary service areas.
- Propose offering sustainability reporting service to new and existing clients to the Executive Leadership Team.

Social (People) recommendations:

- Remind or direct employees to the server location where all staff policies are saved, so that they are responsible for knowing what the policies are, as well as their supervisors.
- Consider investigating whether a work from home policy is desirable, given new communication technologies, and work-at-home policies of other companies.
- Consider whether an internally known employee review metric would motivate managers to perform the reviews.
- Continue analyzing risks of projects that the company designs, implements, or constructs.

SHN Meets Sustainable Company Criteria

In general, SHN meets four sustainable company criteria frequently cited in the literature, which are 1) sensitivity to change, 2) a well formed company culture and identity, 3) tolerance and decentralization of decision making, and 4) conservative financing. It is sensitive to environmental changes, and responds to changes by adapting

as well as possible. An example of this characteristic is its responses to loss of resource industry clients, as that industry has slowly divested itself from SHN's region. SHN has also recognized that it can improve and adapt to an environment of greater competition from larger corporations. SHN's company identity and culture is being refocused during new branding efforts that were advised during its strategic planning. SHN's tolerance and decentralization are exemplified by SHN's sponsoring of new professional directions, such as horizontal direction drilling or this sustainability report. Finally, its conservative financing (very low long term debt) has given it freedom to plan over long time periods.

INTRODUCTION

A sustainability report is a document that describes a company's journey on its "triple bottom line" (TBL) path. TBL refers to a company's goals for three things, 1) its financial bottom line (its net income, the "bottom line" on its income statement), 2) its people, which includes its employees, shareholders, clients, vendors, regulating governmental agencies, and community at large, and 3) its environment, which the company impacts both positively and negatively. This TBL concept is also known as the "3P" business management approach, referring to a company's profits, people, and planet. The sustainability approach to business management is becoming an accepted specialty area, with Masters in Business Administration specialty degrees offered from such prestigious universities as Cornell, UC Berkeley, Yale, MIT, North Carolina, Notre Dame, Carnegie Mellon, and George Washington (G. Gloeckler, 2013). Humboldt State University, with its national reputation in natural resources and renewable energy, also offers an MBA in Strategic Sustainability. In 2012, Ernst & Young conducted a survey of 282 environmental strategy executives from 17 sectors, employed by companies generating revenues of $1 billion or more. Their findings indicate that 62% of their companies publicly report their environmental and social goals, and 59% actively measure progress towards those goals, with direct reporting to the boards of directors (Ernst & Young and GreenBiz, 2013).

Is business management for sustainability and sustainability reporting limited to very large corporations? Due to their vast scale, a minute fraction of large revenues will sufficiently fund sustainability reporting and initiatives. For smaller companies with lesser revenues, sustainability actions and reporting will require a greater portion of profits, more time to reach goals, or both. This reality has been recognized by global and state organizations, who are trying to assist small- and medium-sized enterprises (SMEs) by providing guidance and recognition. Examples include:

- The Global Reporting Initiative's 2014 "Ready to Report? Introducing sustainability reporting for SMEs" (Global Reporting Initiative, 2013).
- The CoolCalifornia.org website and their Small Business Awards Program that recognizes small businesses that make notable achievements in reducing carbon emissions and environmental impacts (CoolCalifornia.org, 2015)

Given its limited resources, a small business must find compelling reasons to write a sustainability report, and to follow through on its recommendations (Table 1).

Table 1. The values of sustainability reporting (GRI 2014)

Sustainability reporting encourages a company to:	Sustainability reporting allows a company's clients, suppliers, and community to:
Define its vision and strategy for conducting its business in a sustainable manner.	Continue trusting and respecting the company, as the company discloses areas for improvement and acts upon them.
Measure, monitor, and change areas that increase or improve a company's sustainability.	Relate to the company on issues other than the company's core business, such as social and environmental issues.
Identify risks that threaten a company's sustainability.	Recognize the company as a leader in sustainability
Think about employee motivation, retention, and recruitment.	Understand that the company's financial position is sound, and under the leadership of management who is looking to the future.
Partner with like-minded organizations and companies.	
Attract companies and clients with similar values	

A sustainability report must include aspects of the company that are "material". Material aspects are "those that reflect the organization's significant economic, environmental and social impacts; or that substantively influence the assessments and decisions of stakeholders" (GRI, 2013). Although the GRI has published a complex and comprehensive process for determining material aspects for sustainability reporting, the scope for SHN's sustainability report does encompass economic, environmental, and social aspects, but limits its coverage in some aspects of each category, based on what is material to SHN (Table 2).

Table 2. Material Categories and Aspects for SHN

<table>
<tr><th colspan="3">Three Categories of Sustainability Reporting</th></tr>
<tr><th>Economic Aspects</th><th>Environmental Aspects</th><th>Social Aspects</th></tr>
<tr><td>Trends affecting all US businesses</td><td>Energy consumption</td><td>Types of employment</td></tr>
<tr><td>Environmental trends</td><td>Waste generation and reduction (recycling)</td><td>Health and safety for employees</td></tr>
<tr><td>General overview of financial position and economic performance</td><td>Water usage</td><td>Training and education</td></tr>
<tr><td rowspan="5">Economic services provided to stakeholders</td><td>Air emissions</td><td>Diversity</td></tr>
<tr><td rowspan="4">Environmental services provided to stakeholders</td><td>Forced or compulsory labor</td></tr>
<tr><td>Employee assessment</td></tr>
<tr><td>Product/service safety for clients and communities</td></tr>
<tr><td>Social services provided to stakeholders</td></tr>
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Scope of this Sustainability Report (SR)

This SR includes the above front matter and Introduction. The next sections describe the company's history, management structures, and business environment; also called the "Standard Disclosures" by the GRI, this information provides readers with an understanding of the firm and its place in its business setting. Information that falls under the material economic, environmental, and social categories of Table 2 is provided in three sections after SHN's Standard Disclosures. An evaluation of SHN's current sustainability practices will be described towards the end of the SR, with recommendations and their feasibility evaluated. An overall comparison of SHN with characteristics of other long-lived companies is the last evaluation of this report.

STANDARD DISCLOSURES IN SUSTAINABILITY REPORTING

SHN Organizational Profile

SHN provides engineering and related services to communities in Northern California and Southern Oregon (Figure 1). The largest of its three California offices is in Eureka, with others in Redding and Willits. The fourth office is in Coos Bay, Oregon. The company has been in business since February 1979. Its service areas are:

- Civil engineering
- Geosciences
- Environmental services
- Surveying
- Planning and permitting
- Materials testing

Figure 1. SHN is comprised of four offices in Southern Oregon and Northern California.

SHN is certified as a Small Business Enterprise by both the State of California and the Federal Small Business Administration, based on its number of employees and its average annual revenue over three years. Due to its small size, employees "wear many hats", and have multiple roles within company. The management positions within SHN are:

- Chief Executive Officer
- Chief Financial Officer
- Director of Business Development
- Principals
- Project Managers, one for each project
- Assistant Project Managers, if needed

SHN management has been proceeding with its most recent strategic planning process since 2012. A subset of the company was formed to plan and implement the strategic plan; this group is the Executive Leadership Team. The CEO is the chair of this team.

The company is privately held by a Shareholders Group; the Shareholders elect the Board of Directors. The Board of Directors sets company policies and hires the CEO. The Board also monitors the CEO's performance.

The Project Managers (PMs) are key in the daily operations of SHN, and the management structure is designed such that management's function is to support the PMs (Figure 2). Again, depending on the size and complexity of a project, the same person may fill more than one of the management roles. For example, on a small residential foundation design, the PM could also be the Principal of Geosciences, and he would also do much of the work, with another PM, Principal or the CEO acting as his quality

control. Only on larger projects (for example, design, permitting, and construction of a city water system) would each management position be filled by a specific person.

The PMs in turn depend on technical and administrative staff, and so SHN provides educational benefits and supports employee training. The technical nature of engineering, geology, and environmental planning requires continuous upgrading and maintenance of employee skills, which are documented by certifications that require coursework and testing. SHN typically pays for all routine technical training, including the employee's time spent at the training. These benefits apply to employees who have worked for over one year.

Values, Mission, and Strategic Planning

SHN's 2012 Strategic Plan states the company's Vision Statement and Mission Statement. The Plan covers three years (2012 to 2015) and identifies five goals. All of the goals have recognizable endpoints, and one (a profitability goal) is measured numerically. Actions steps were described, assigned, and scheduled so that each goal could be met. Recently, the Executive Leadership Team has set a task for identifying important future investments in service areas.

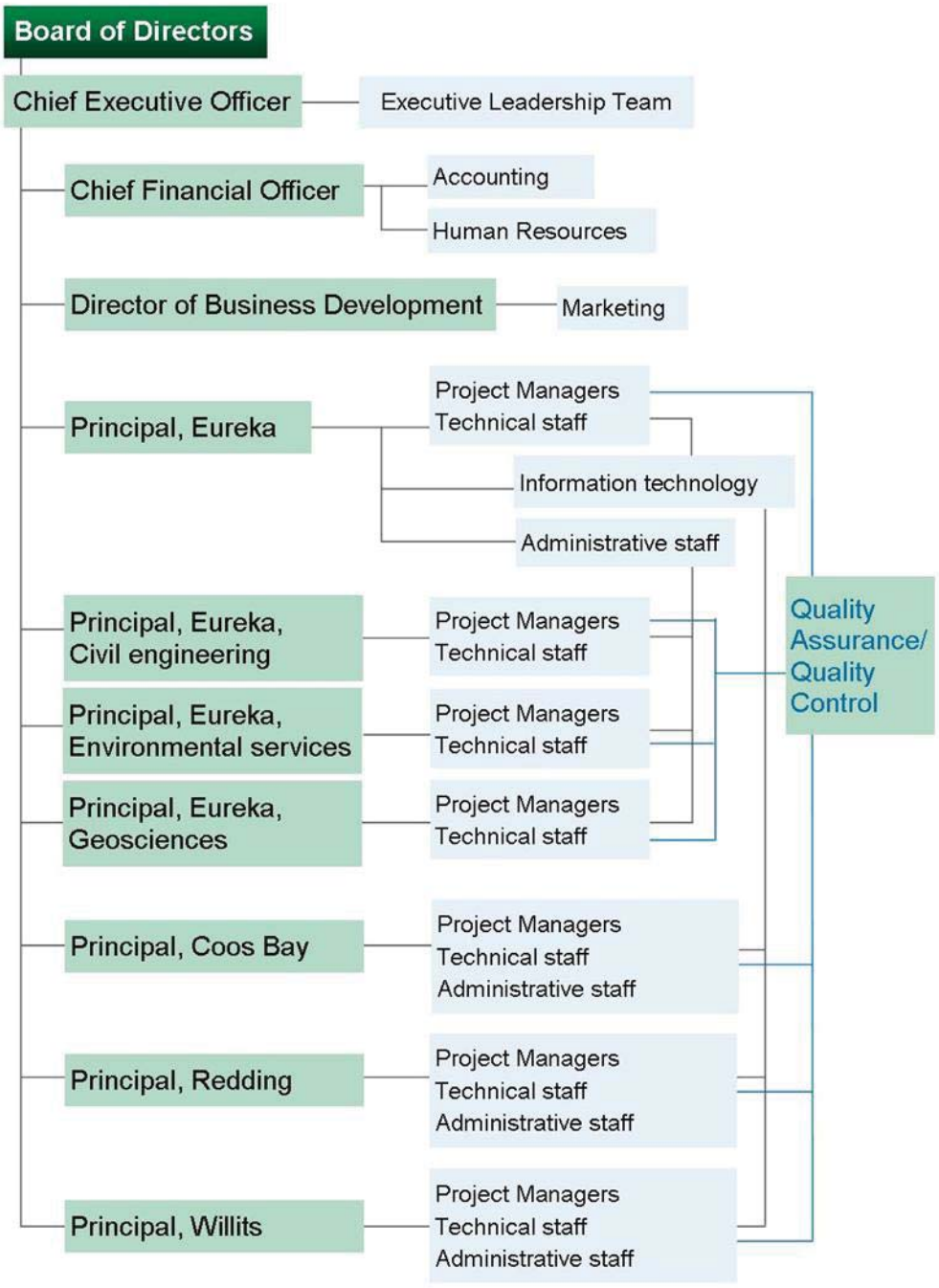

Figure 2. SHN is a hybrid vertical and matrix type of organization.

Competitors and clients

A list of 28 competitors was compiled, and information on them was obtained from their websites (Exhibit 1). Information gathered included each company's:

- Core services
- Number of employees
- Ownership (publicly traded or privately held)
- Geographic locations of offices
- Non-core services
- Client types
- Interest in sustainability
- Use of the website for recruiting

In summary, the competition is formidable, but real and obvious differences exist among companies, allowing some market differentiation. About half of competitor companies are also small businesses; medium and large sized firms comprised one quarter each. The largest companies were the ones who are bringing sustainability services into their offerings and posting corporate sustainability reports. One of the large and more diversified companies hired a Vice President of Energy and Sustainability in January 2015.

Almost every company's website had a specific page for recruiting new employees, and the extent of website recruiting effort did not depend on company size. Although a limited view of company culture can be gleaned from a website, these career pages were instructive. Some companies recognized the difficulty in maintaining a work/life balance; many described their company's and employees' commitments to service organizations. Many also described benefits such as further education and "best place to work" awards.

A few companies listed their clients by name, but theirs were old-style websites and none of the newly designed and updated websites did. The large and small companies have similar client bases, which include public agencies of all sizes, private corporations of all sizes, hospitals, universities, energy development corporations, timber and other resource extraction firms. The smallest companies listed larger ones as clients, having been sub-consultants. SHN's client base is essentially the same as those listed by other firms.

ECONOMIC ASPECTS

External conditions affecting SHN's economy

The scale of external conditions affecting SHN's economy ranges from global (for example, climate change) to local (for example, new construction trends by county). This section seeks to identify key external drivers that affect or will affect SHN's economy from global to local.

Global drivers

Since 1966, the World Future Society has been "applying anticipatory thinking to society" (World Future Society, undated). Some trends are obvious and well reported in mainstream media (for example, climate change, aging US population, interest in homeland security, health care and insurance concerns), but the World Future Society lists additional important trends (World Future Society, 2015). Global trends that may be particularly important to small engineering consulting firms such as SHN are noted in Table 3.

Table 3. Global drivers affecting small engineering firms (World Future Society, 2014)

Global drivers affecting small engineering firms	Potential mechanism of the driver's effect on small engineering firms
Talent shortage will grow as boomers retire, and younger workers fail to acquire "higher order competencies".	Engineering and related disciplines are definitely higher order competencies, and shortages will greatly affect small engineering consulting firms.
To pay retiree pensions, state and local governments will need to cut spending.	State and local governments are also responsible for infrastructure improvement, which is an important part of small engineering firms' workloads.
Energy demand will drive development of renewable energy.	Depending on the specialties within a small engineering company, this trend could be very economically advantageous.
Climate change will increase cost of doing business, but will also create opportunities.	Engineers will need to design new ways of planning, designing, and constructing that minimize carbon footprint and increase carbon sequestration.
Mega-fires in forests will be more frequent.	Direct effect on water supply and quality, and indirect effect on wood availability for building materials.
Drones will be tools for environmental management on a large scale.	Engineers who can adapt and apply new technology to their practices will remain relevant and will have a competitive edge over those who cannot.
Wealth inequality will increase potential for civil wars.	In the US, wealth inequality is unlikely to cause civil war but great amounts of non-circulating wealth are not efficient in an economic sense. For example, lesser taxes cannot fund infrastructure improvements that small engineering firms work on.

Drivers specific to the US

The US recession of 2007 to 2009 affected engineering and related services in ways similar to almost all other industries. However, science and engineering related jobs were more resilient than jobs in other industries, and unemployment rates for scientists and engineers were never as high as national averages (NSB, 2014). In 2014, a

survey of "hundreds" of engineering chief executive officers indicted that they are optimistic; they see strong signs of recovery in engineering employment, and are encouraged by their companies' performances (ACEC, 2014). These CEOs believe that the following engineering markets will continue to grow: land development, energy and power, and buildings and commercial. Markets that the CEOs believe are lagging are those associated with public funding, such as water and wastewater, and transportation.

The American Society of Civil Engineers is promoting infrastructure improvement vigorously through an initiative called "Failure to Act Economic Studies" (ASCE, 2013). The goal of these studies is to quantify the economic consequences to Americans if infrastructure continues to deteriorate. While their models are likely to err on the side of overestimation, their analyses of how deteriorating infrastructure affects the American economy are sound. ASCE performed "Failure to Act" studies by sector: ground transportation, airports and waterways, water and wastewater, and electricity.

- Ground Transportation. Further deterioration of transportation affects American families and businesses by increasing the time and money spent on commuting, shipping products, providing services. The US economy will suffer when productivity decreases due to these greater expenses.
- Airports, Inland Waterways, and Marine Ports. Deterioration of these modes of transportation will have an even greater effect because they affect how the US competes with the rest of the world. Shipping delays and increased costs ultimately increases the costs of goods to global consumers.

- Water and Wastewater. Water rates will increase as current water systems become more inefficient. Energy costs for pumping and water treatment will continue to rise more than if systems are rebuilt to be efficient. Water leakage and water pollution decrease the volumes of water available, again increasing water rates.
- Electricity. Improvements in reliability, generation, and transmission/distribution will also increase US business competitiveness. However, if these improvements in electrical generation contribute to air pollution and carbon emissions, climate change and sea level rise will continue.

State and local drivers

The "California County-Level Economic Forecast 2013—2040" is a publication prepared by Caltrans and California Economic Forecast, an economic consulting firm (California Economic Forecast, 2013). The state outlook is described first, followed by a forecast for each county in alphabetical order. Highlights from the state outlook that directly affect engineering companies include:

- Numbers of new residential units will increase rapidly until approximately 2018—2019, with a gradual decline to 2040, to a level slightly more than that which occurred in 2013 and 2014.
- Job growth will be higher in the Bay Area than in Coastal Southern California.

- Employment in construction is anticipated to increase rapidly until approximately 2017—2018, with continued growth to 2040.
- "Vulnerable Counties" are those that have or will experience negative population growth, which is associated with less economic activity and thus slower or negative personal income and taxable sales growth. Vulnerable counties were identified, in order from most to least vulnerable from 2012 to 2040: Plumas (most vulnerable), Sierra, Alpine, Del Norte, Modoc, Inyo, Trinity, Tuolumne, Lassen, Mendocino, Siskiyou, and Amador.

SHN's California offices are in Humboldt, Shasta, and Mendocino counties, although projects are located throughout the northern part of the state, generally north of Sacramento. Economic indicators for their California offices' counties include industries creating jobs, population growth, and industrial and farm production (Table 4).

Table 4. Economic indicators for trends to 2040 for three California counties (California Economic Forecast, 2013).

	Humboldt, CA	Shasta, CA	Mendocino, CA
Industries with job creation	Transportation, utilities, wholesale and retail sales, leisure and hospitality, education, health care, professional services	Leisure and hospitality, wholesale and retail sales, education and health care	Manufacturing, wholesale and retail sales, education, health care, leisure and hospitality, mining and natural resources
Population growth	Increasing to 2018, then decreasing and becoming negative in 2025.	Increasing to 2018, then decreasing but still positive in 2035.	Increasing to 2018, then decreasing but still positive in 2035.
Industrial and farm production	Industrial production to increase steadily to 2040. Farming will increase but less quickly than industrial.	Industrial production to increase steadily to 2040. Farm production stagnant.	Industrial production to increase steadily to 2040. Farm production stagnant.

It is unclear if California Economic Forecast included two important state-wide and regional drivers in their analyses: the possibility of marijuana legalization and the continuance of the drought. These drivers could affect the economic indicators of far northern California counties.

A similar 35-year economic forecast could not be found for Oregon. The state does publish economic summaries that cover the past three to four years (Oregon Office of Economic Analysis, 2015). Its extended outlook describes conditions in 2019. It is bullish,

> "Total employment is expected to be the tenth strongest among all states…while manufacturing employment will be the second fastest in the country… Total personal income growth is expected to be 5.3 percent per year, the tenth fastest among all states."

This positive scenario is based on the state's labor supply and the current number of "start ups" or new businesses.

Like California, Oregon's growth will not be uniform across the state. Employment in Portland is strong, while the "second tier" cities (Bend, Corvalis, Eugene, Medford, and Salem) have taken three to four more years to begin recovery. "Nonmetro" areas have yet to show strong recovery. Currently, Bend has the highest employment growth (6%), which is greater than Portland's (approximately 2.75%). Rural coastal

cities, including Coos Bay, have a current employment growth of 2%; the lowest is in eastern rural cities, with approximately 0.8%.

General overview of financial position

SHN's CEO gives the employees a "state of the company" presentation, approximately once per year. In the meeting, he provides news and a financial update of the company. Financial data in this section are largely from the 2015 presentation, which reports on 2014.

The company's cash flow is very good, and debt is very low; nothing is owed on the company's line of credit, and the main long term debt is held by former shareholders.

SHN uses benchmarks published by PSMJ Resources, Inc., a consulting firm that surveys, collates, and publishes business performance statistics for architectural, engineering, and construction firms. However, the company recognizes that PSMJ's benchmarks are based primarily on large firms in urban areas, and do not fully represent conditions in rural northern California and southern Oregon. The financial benchmarks do provide some goals and frame of reference though.

In 2013-2014, PSMJ's annual survey included 198 firms. SHN's financial statistics are not provided here, but how the company compares with PSMJ's 2013 survey was evaluated (Table 5).

Table 5. SHN's 2013 financial performance in context of PSMJ's 2013 survey (PSMJ, 2013).

Benchmark statistic	SHN performance in context of PSMJ 2013 benchmarks of 198 firms
Net revenues per Full Time Equivalent (FTE)	3.3% less than the PSMJ median
Staff size change (computed from 2008 to 2014, which includes 2008-2009 recession)	Within the 10^{th} and 25^{th} percentile
Profit/FTE	Within the 50^{th} to 75^{th} percentile
Operating profit	Within 10^{th} to 25^{th} percentile
Days in process	Within the 10^{th} to 25^{th} percentile
Pro forma profit for 2015	Within 25^{th} to 50^{th} percentile

Risk management continues to be a theme affecting all business and project decisions. Use of standard and improved contract language is one way the company is improving its risk exposure.

Economic services provided to stakeholders

One primary economic service that SHN provides is bringing "out of area" money into its local communities. Clients that "spend locally" at SHN include state and federal agencies, energy companies, state universities, and an internationally known retaining wall company. Further, when local companies needing engineering services "shop locally" at SHN, they are creating economic value within their communities, as money circulates through the local economy. One estimate is that $1 spent locally is spent 6 to 15 times more before it leaves our local economy (in contrast to $1 spent at a national chain store, of which 80 cents leaves immediately) (Glickman, 1998).

SHN's internal stakeholders are its employees and shareholders. Within the company, SHN provides jobs and income to its employees and shareholders. Employees may elect to purchase group health insurance, with a portion of the premiums paid by SHN. Employees may also save for retirement in tax deferred accounts, in which SHN provides a matching contribution. A "cafeteria plan" of additional financial benefits is available; child or elder care expenses can be paid for from the plan, which is funded by employees' pre-tax wages. SHN also "invests" in its employees by supporting additional education and professional certifications.

SHN's external stakeholders are its clients, regulatory agencies, partners, and the communities it serves. Economic services provided to clients include assistance in obtaining grant funding for infrastructure projects, and decreasing lenders' risks when clients are financing potentially contaminated sites. Clients also realize an economic benefit when hiring SHN because they do not have to maintain their own engineering staff. Regulatory agencies also receive economic benefit in that clients frequently contract with SHN instead of waiting for agency assistance; thus SHN decreases agency staff workload. Partners include vendors, subcontractors, and prime consultants. Economic benefits to all of them are apparent, or else such partnerships would not occur.

Clients, employees, partners, agency staff, and shareholders are parts of the community served by SHN, and SHN's economic services to the community include providing a tax base, providing support for social assistance and service organizations, and purchasing from community suppliers and subcontractors.

As a privately held corporation, SHN need not make management decisions to bolster short-term profit that increases publicly traded stock price. SHN management has the capacity to base decisions on long range planning.

ENVIRONMENTAL ASPECTS

Energy consumption

Energy consumption data for 2014 were obtained for each of SHN's offices from the monthly utility bills. The Eureka, Willits, and Redding offices use both electricity and natural gas. The Coos Bay office uses only electricity. The Willits office was designed for 25 staff, but there are 11 working there currently. SHN does not own any of the buildings that house its offices.

Using the offices' floor areas, energy consumed per square foot (energy intensity) was estimated, on monthly and annual bases.

The California Energy Commission published annual energy intensities based on type, size, and use of buildings (CEC, 2006), after collecting energy use data from hundreds of thousands of commercial buildings in California. For small (less than 30,000 ft^2) office buildings, annual electric energy intensity is 13.10 kWh/ft^2 and natural gas energy intensity is 0.11 $therms/ft^2$. Geographic locations of the buildings were not considered in this publication, nor were the ages of the buildings. Therefore, energy use in a newer office building in Redding would be averaged with that of older building in Eureka, two places with much different climate and heating and air conditioning needs. If the office buildings in the data set are equally spread throughout the state's climate zones, averaging would not matter that much, however, it is unknown what the office location distributions were.

Comparing the energy intensities of the SHN offices with state wide averages, the Coos Bay office's electricity usage is higher than buildings of similar use and size, likely because they use electricity for heating instead on natural gas (Figure 3). For natural gas, the Eureka, Redding, and Willits offices use more than the CEC average (Figure 4). Numerous explanations are possible, including that the buildings are older and not designed for energy savings, and that employees are using more energy than average. However, the Coos Bay and Redding office buildings are shared with other tenants, and energy calculations are estimates for SHN's use, based on the square footage of the entire building, and not specific energy consumptions. The natural gas use in the Eureka office includes the materials lab, which is a use not included in CEC's average for small office buildings.

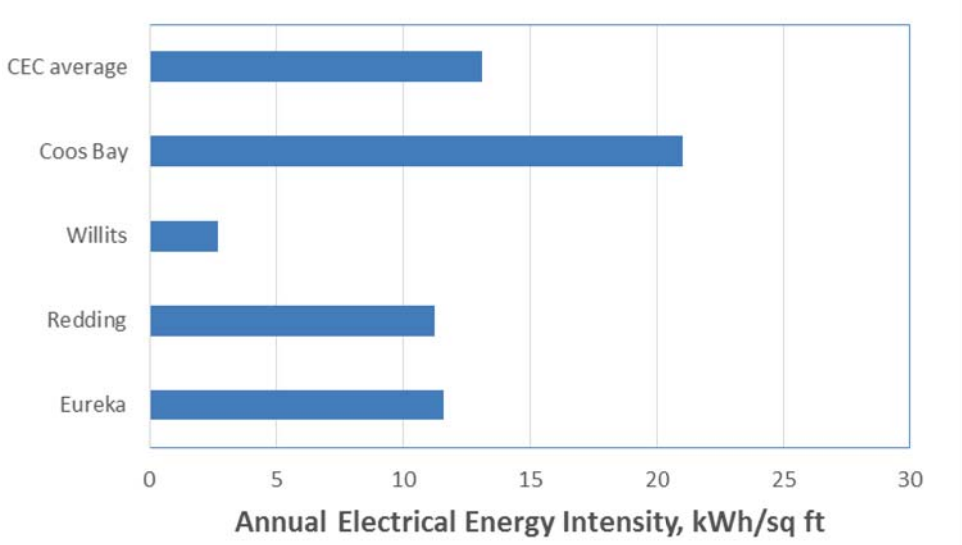

Figure 3. Based on annual electrical energy intensity, SHN's Coos Bay office uses more electricity than offices of similar size, as reported by the California Energy Commission (2006).

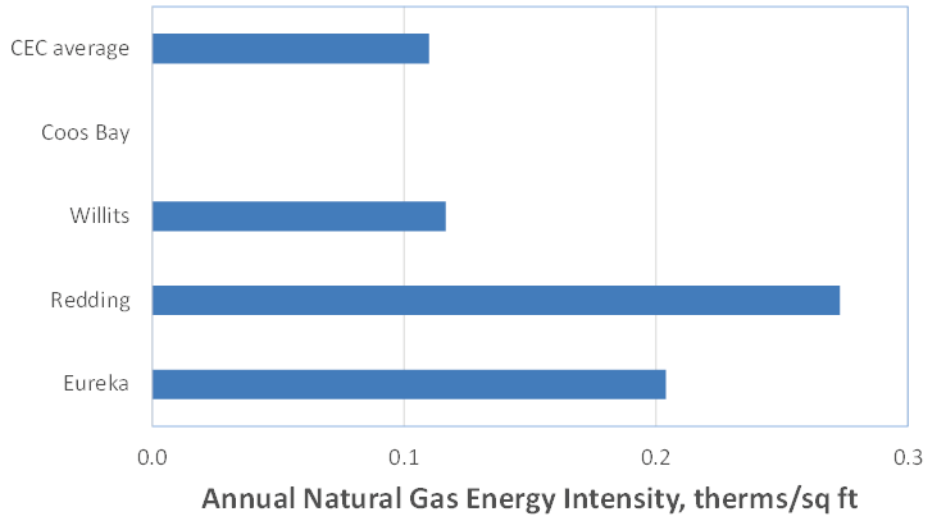

Figure 4. Based on annual natural gas energy intensity, SHN's Redding and Eureka offices use more natural gas than offices of similar size, as reported by the California Energy Commission (2006). However, the Redding office's use is estimated from usage of the entire building and natural gas is used for air conditioning, and the Eureka office's use include the materials lab. The Coos Bay office does not use natural gas.

Waste generation and recycling

Waste generation data quality was poor; the data likely overestimate waste generated but by how much is unknown. Bills from waste pickup and recycling companies were reviewed, but the pickup frequencies described on bills were not always the same as those described by office administrators. Also, the bills do not reflect whether a container is full or partially full. The best descriptions for waste generated and recycled, by office, are:

- **Eureka office.** The waste container is a 3 cubic yards (520 gallons) dumpster that is picked up once per week. Occasional and infrequent checks on the

dumpster indicate that its volume per pickup is variable, sometimes full but other times not. Materials lab waste is high in terms of volume and weight, most notably due to the concrete cylinders generated by concrete testing. The relative proportion of lab to office waste is unknown. Recycling is collected in a smaller dumpster, likely 2 cubic yards (347 gallons). It appears to be picked up weekly, but like the waste dumpster, whether it is full at pick up is not recorded. Yard waste is also unrecorded because it is disposed of by the landscaping service.

- **Redding office.** Because the office is rented space and part of a larger office building, waste and recycling are picked up as part of the office rental. All waste for the office complex is located in centralized pickup locations, and cannot be disaggregated by business. Estimates are 15 cubic feet of recycled paper, plastic, glass each month, and 7 cubic feet of trash each month. The Redding office has no materials lab and no landscaping of its own, and so generates only office waste.
- **Willits office.** The Willits office's waste data quality is the best of the four offices. This office generates approximately 63 gallons of waste per week (a 95-gallon container, 2/3 full). Its recycle generation is approximately 48 gallons per week (a 95-gallon container full, every two weeks). Yard waste is less than 48 gallons per week (a 95-gallon container, every two weeks that is rarely full).
- **Coos Bay office.** The waste management invoices describe a 95-gallon "cart" that is picked up every week. However, the actual container volume may be 72 gallons that is picked up once per week. Recycling generated is approximately

the same. Similar to the Redding office, there is no landscaping yard waste associated with the Coos Bay office because it is rental space in a larger building.

All offices periodically generate electronic waste, primarily computers and monitors, but also batteries and peripherals. Offices have separate containers and areas for storing this kind of waste before proper disposal, which occurs at designated drop areas at municipal landfills, or at electronic waste disposal events sponsored by cities and counties. There is no data for the volume of electronic waste generated.

The Eureka office carpet is the building's original carpet and is nearing its useful life. Although the building is leased, because SHN is the only occupant, any carpet replacement could be considered waste generated by SHN. SHN and the building's owners are currently negotiating carpet replacement, and a preliminary analysis suggests that recycled carpet tiles will be less expensive than new roll carpet (Exhibit 2).

Non-hazardous and hazardous solid waste is generated at project sites during hazardous materials investigations. Waste is generated as staff follow specific and industry-approved standard procedures for this type of work. For example, to collect soil samples, engineers will use:

- plastic gloves to prevent contamination and cross contamination from sample to sample
- bottled distilled water clean and rinse sample containers and collection tools
- re-sealable plastic bags to further protect and identify sample containers
- depending on toxicity and classification of possible contaminants, disposable plastic (Tyvek) suits, boot covers, and respirator cartridges

- large plastic garbage bags to contain the generated waste

Similarly, the materials lab testing generates solid waste from following specific and industry-approved standard methods. For example, concrete cylinders are tested to ensure adequate strength, but the plastic forms that keep the cylinders uniform are disposed, as are the concrete cylinders.

To vary from standard methods in order to reduce solid waste would invalidate samples and the data obtained from them.

Water usage

The Eureka office is the only one from which water consumption data were available. The Redding and Coos Bay offices' water usages are included utilities in the office space rental, and so are difficult to separate from other building tenants. However, neither the Redding nor Coos Bay offices currently have materials testing labs or extensive landscaping, so water use is likely minimal. The Eureka office's water use is seasonal, ranging from approximately 375 gallons per day in November to 1,450 gallons per day in June. Two water uses likely account for the seasonality, 1) water used for landscaping, and 2) water used in the materials lab, which is busier during the summer "construction season" months.

Water use estimates by industry sector have been published by The Pacific Institute (Glieck et al., 2003). They report water use in gallons per employee per day (GED), assuming a 225-day working year. For engineering offices, a GED of 113 gallons per employee per day was estimated. For the SHN Eureka office, and assuming

60 employees, a GED of 151 gallons per employee per day was estimated, which includes week-end landscaping irrigation. This seems reasonable because the Pacific Institute report did not assume that materials labs are part of engineering offices.

Air emissions

Air emissions from the company's operations could come from many and various sources, some direct and others indirect.

- Employees commuting to work: indirect but likely significant
- Employees driving company-owned vehicles to job sites: direct
- Electricity generated then consumed in offices by computers, servers, lights, heating and air conditioning: indirect but likely significant
- Suppliers and subcontractors: indirect but likely significant

To estimate air emissions due to commuting, an online and anonymous survey could be conducted (Exhibit 2). SHN employees could be asked how they get to work, how many miles they drive if by personal vehicle, their cars' mileages, and whether they could work at home one day per week. A spreadsheet model was created to estimate the employees' fuel used, converted to CO2 equivalents from an online emissions calculator (US EPA, 2014) (Table 6).

Table 6. Estimated air emissions from commuting

	All employees drive 5 days/wk for 50 weeks	**All employees drive 4 days/wk for 50 weeks**	**Work at home policy with 40% driving 4 days/week**
Gasoline used, gal per year	25,002	20,002	23,002
Carbon emissions in CO2 equivalents, metric tons	222	178	204
Number of homes using equivalent energy per year	20.3	16.2	18.7
Acres of forest needed to sequester equal amount per year	182	146	168

To test the spreadsheet, assumed values were entered. Assuming that each day 100 gallons are required for all employees for commuting, and that they commute 50 weeks per year, then their annual gasoline consumption is 25,002 gallons per year, driving 5 days per week. However, assuming that 40% of employees can do their work at home one day per week, then gasoline consumption drops to 23,002 gallons per year. Given these estimated values, air emissions due to commuting were estimated (Table 6).

Environmental services provided to stakeholders

As stated previously in the Economic services section above, SHN's stakeholders are its employees, shareholders, clients, regulatory agencies, partners, and community.

SHN provides environmental services directly to its clients and community, and indirectly provides these services to employees, shareholders, agencies, and partners in that they all live within the communities. Environmental services are provided to communities in many ways, including:

- The civil engineering group provides environmental services by providing clean drinking water, treating public wastewater through design of modern treatment systems, designing safe roadways and pedestrian paths, saving energy through designing more efficient pipe routes and buildings, and designing safe and earthquake resistant schools, hospitals, and other public and private structures.
- The environmental group provides environmental services by remediating old industrial sites, cleaning up contaminated groundwater, minimizing and even eliminating polluted storm water runoff, designing fish passage, and decreasing risks of hazardous materials discharges to water, air, and land.
- The geosciences group identifies potential land slide and seismic areas that could prove environmentally disastrous should they be developed inappropriately. They also remediate and stabilize land masses that would otherwise add sediment to streams and rivers, and that would threaten infrastructure (roads and utilities) and structures.
- The planning and permitting group analyzes projects to determine their potential environmental impact, provides assessments, and creates alternatives for reduced environmental impacts.

SOCIAL ASPECTS

Types of Employment

There are two broad categories of employees at SHN: non-exempt and exempt. The categories refer to employees who are exempt or not from the Fair Labor Standards Act. Those who are exempt are those who duties are executive, administrative, professional ("learned" or creative), or who are computer employees and performing outside sales (US Department of Labor, 2008). Exempt employees are likely paid by salary, with no or reduced overtime wages.

At SHN, non-exempt and exempt status is relatively straightforward. Based on US Department of Labor definitions, people in these positions are exempt:

- Chief Executive Officer
- Chief Financial Officer
- Director of Business Development
- Principals
- Licensed Professionals

Because civil engineering, geotechnical engineering, geology, and surveying are professional disciplines requiring state licenses to practice, passage from non-exempt to exempt generally occurs when an employee becomes licensed, which usually happens within two to five years of graduation with a Bachelors or Masters degree. Under the definition of "professional", those who require advanced knowledge "acquired by a

prolonged course of specialized intellectual instruction" are also exempt (US Department of Labor, 2008). At SHN, this may include environmental planners, industrial hygienists, biologists, and botanists.

Non-exempt employees are technical staff working under the direction of licensed professionals, and administrative staff who do not fit the "administrative" exemption because their duties do not include "independent judgment with respect to matters of significance" (US Department of Labor, 2008).

Most SHN employees are regular full-time employees, but a few are regular part-time employees who work less than 80 hours in a two-week period. Temporary part-time employees are hired occasionally, to provide specific expertise or to assist during periods of peak work load.

Employee health and safety

Employee health and safety is critical to SHN's values and mission; without care and attention to employee health and safety, SHN would not exist. Because employees are frequently working in construction and industrial settings, risks of injury are high and just one accident could irreparably ruin SHN's reputation, and then its business. Therefore, management spends significant effort and resources on its employee health and safety program, which includes:

- **Leadership at the top.** The Principal of the civil engineering service area is the company's current Health and Safety Officer. He sets the tone for SHN's safety

culture by communicating its importance, and how every employee must be aware and involved in the safety program.

- **Documented safety program.** The safety program's primary elements are regular in-office safety meetings, general safety training, issuance of personal protective equipment, a hazard communications program, on-site general and daily safety meetings, project-specific site safety plans, and an emergency action plan. The CEO, CFO, and the safety officer meet once per quarter to review the program and its results, and to implement any improvements. Safety is formalized in a Corporate Health and Safety Plan and an Injury and Illness Prevention Program. Less formal safety elements include the "safety minute" in weekly scheduling meetings.
- **Personal Protective Equipment (PPE).** SHN provides PPE, which includes "hard hats," respirators, safety vests, face shields, safety glasses (including prescription eye glasses if needed), goggles, hearing protection, gloves, and full "Tyvek" suits. A project's site safety plan documents what level of protection is necessary, and employee compliance is mandatory; willful disregard is sufficient for termination. All employees at any level of management are responsible for noting if site conditions change such that safety measures should be modified.
- **Compliance with state and federal laws and regulations.** The Occupational Safety and Health Administration (OSHA) is the federal agency that issues regulations for worker safety, but California and Oregon have OSHA-Approved State Plans. (OSHA, 2014). OSHA regulation coverage is extensive; examples of

coverage are regulations for trench shoring, "Workers' Right to Know" about hazardous chemicals in the work place, and protection against retaliation should an employee report violations ("Whistleblower Protection").

- **Hazard Communication Program.** Work place hazards are communicated via the above safety program channels, but specific to chemical hazards, SHN provides information and instruction on proper container labeling, how to read Materials Safety Data Sheets, training on the use of PPE, and training on what to do in case of exposure. Employees are trained and periodically re-trained.

Health and safety issues have become a greater concern for some of SHN's clients too. As consultants, SHN must also meet the client's standards of health and safety, which may be more stringent or cover different conditions than SHN's program.

In-office worker health and safety is also an important aspect of SHN's program. Repetitive injuries, lifting injuries, and sedentary conditions are risks of any office work. These issues are also included in OSHA regulations.

Employee mental and physical health affects company performance. Employees accrue vacation and holiday pay and are encouraged to use the "days off." A policy for losing accrued vacation pay is in place, such that employees no longer accrue vacation pay if their total accrued is beyond a specified amount. Sick leave is also an accrued benefit, but there is no limit on sick leave accrual. Besides being used when an employee is sick or going to medical appointments, the benefit can also be used to care for a sick family member.

SHN provides health insurance to those employees and their families who are eligible (eligibility depends on number of hours worked per week). SHN pays a portion of the premiums. A "cafeteria plan" is also available such that employees can contribute pre-tax funds to pay for their share of health insurance premiums, any uncovered medical expenses, and dependent (child or elder) care. Employee health is also supported by corporate membership discounts at health and fitness centers at the Eureka office.

Family-friendly policies and work/life balance

As a company that has been in business since 1979, its principals and staff have experienced marriages, births, graduations, life-threatening illnesses, retirements, and deaths. These events have shaped SHN's culture with respect to family-friendly policies and work/life balance. Support for families and work/life balance is exemplified by:

- **Paid holidays and vacation.** See above.
- **Family health insurance coverage.** See above.
- **Retirement benefits.** See "Economic services provided to stakeholders," above.
- **Cafeteria plan covering child and elder care expenses.** Employees who have child or elder care expenses can save pre-tax dollars into the cafeteria plan fund, and have these expenses paid directly.
- **Scholar Share savings plan for future college tuition.** To assist parents with the rising costs of college, SHN has provided a Scholar Share College Savings Plan that allows parents and grandparents a tax-advantaged way to save for their children's college education.

- **Family leave** in compliance with Federal Family and Medical Leave Act. The benefits of this act and its implementation are constantly changing. SHN administrative staff assist employees in determining how best to apply the benefits to their specific situations.
- **School visits policy.** SHN recognizes that parent involvement in schools sends a strong positive message to children, school staff, and school district administrators, and assists local communities in general. Volunteering at schools is supported by this policy.
- **Company sponsored service organization events**, such as blood drives and fundraising. Each office determines the organizations it chooses to support. Annual budgeting determines the extent to which SHN can offer financial support.

Flexible work schedule policy

SHN's core business hours are 7 a.m. to 6 p.m., Monday through Friday. Weekends are not considered part of the flexible work schedule. Regular, full-time employees who opt for a flexible work schedule establish set working hours within the core business hours with their supervisors.

Flexible work schedules are often confused with "work from home" or telecommuting, but there are significant differences. Working at home can be effective for the company and improve work/life balance for the employee, depending on the employee's specific duties and if certain parameters and policies are followed (and

enforced). As described under the air emissions section, a company could decrease its commuting carbon footprint by implementing a work from home policy.

Liability and effectiveness are two primary considerations in a telecommuting policy, and successful teleworkers must be supported by their managers, which may mean that extra work is placed on the manager, who must now manage people in the office, in the field, and at home. However, with electronic communications (email, text, and instant messaging such as Skype), information flow between employee and supervisor can be effective. If a company allows telecommuting, it generally provides the equipment and tools needed, such as a laptop, software, phone line, and internet connectivity.

The home workspace is considered an extension of the office, so the company continues to be liable for job-related accidents that occur at home, during work hours. Therefore, it is reasonable that the company has the right to make on-site visits with a 48-hour notice, to verify there are no hazards. Employees may be required to show photographs of their work area.

"Teleworking is not a substitute for dependent care" (Global Workplace Analytics, undated). Teleworkers are expected to have dependent care available at home, just as if they were working at the office.

Workers who are good candidates for working at home have jobs that do not require frequent and in-person communication (technical support, basic accounting, coding, telemarketing) (Bloom and Roberts 2015). Good candidates are high performers who are more productive in their quieter and less interruptive home

environments. Besides higher productivity, work from home benefits to the company are potentially lower employee turnover rates due to higher employee satisfaction.

Diversity

In a small company, descriptions of gender, race, job description, and pay are likely to infringe on an employee's privacy. Therefore, this section is necessarily brief and general.

In 2012, 14% of U.S. engineers were women, according to a Congressional Joint Economic Committee (Crawford, 2012). As of May 2015, 19% of SHN's licensed and professional engineers and geologists are women (Figure 5). One woman is currently in upper management at SHN, and two others are project managers. Two women have been in senior management in the past but are no longer with the company. As of May 2015, two Asian-American women are engineers, and one Latina is an environmental technician.

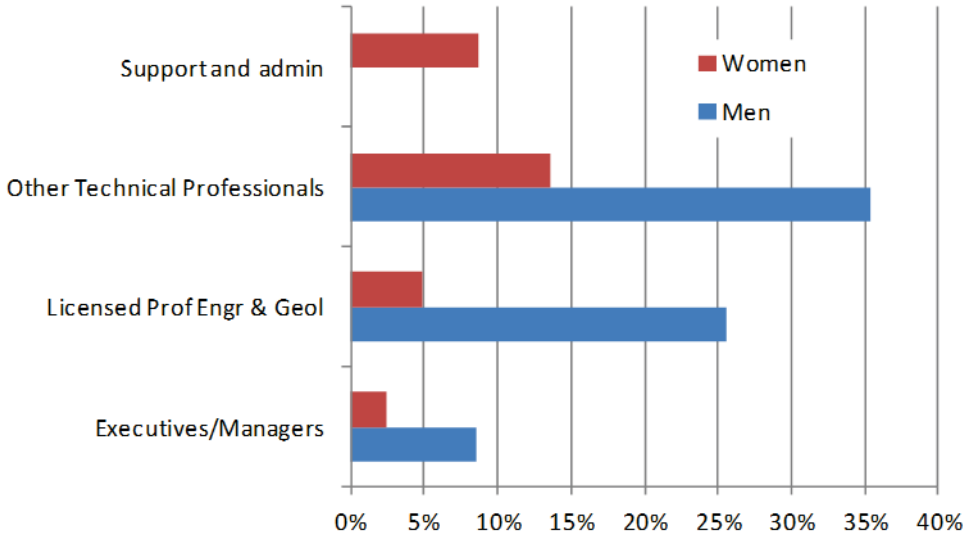

Figure 5. In 2012, 14% of engineers are women, according to a Congressional Joint Economic Committee (Crawford, 2012). At SHN, 19% of licensed professional engineers and geologists are women.

Forced or compulsory labor

All employment at SHN is "at will", meaning that employees may leave SHN with or without cause or notice, and SHN may discharge employees also without cause or notice. In practice, adequate advance notice is generally provided, with two weeks of notice the norm.

As defined and understood by the Global Reporting Initiative, SHN does not engage in any forced or compulsory labor of any kind.

However, a perception of forced labor may exist in any services firm that financially organizes itself on "billable hours." Obvious services firms organized like this are attorneys, accountants, financial planners, and consultants. "Billable hours" refer

to those hours that can be assigned and invoiced to a specific client. Company budgets assume billable ratio goals for each job position, and if goals are reached and expenses are as expected, the company should reach its profitability goals.

A perception of forced labor may exist when an employee believes he or she is expected to reach billable goals by working more hours than are recorded. Because project management is never perfect, estimated and actual project hours will never be exactly equal, but over time, actual billable hours should approximate those indicated in billable ratio goals. If billable goals are not reached, the manager and the employee have the responsibility to address the situation. If the employee and SHN management cannot address the situation satisfactorily, then either may discontinue the employment under "at will" policies.

Employee assessment and performance reviews

Performance evaluations are conducted in three ways, verbally, in writing via informal memo, and in writing via a formal evaluation. Verbal evaluations can occur at any time, and their primary purpose is to instruct the employee what things are being performed correctly and what other tasks can be improved on and how. Informal written evaluation memos are written versions of verbal evaluations.

The annual, formal performance review occurs approximately upon the employee's anniversary hire date. First the employee and supervisor meet and discuss the employee's achievements, goals, and how the employee and SHN can work together to reach those goals. The supervisor and employee fill out a written employee evaluation

form, and when its contents are agreed upon, each signs it. This form becomes part of the employee's personnel file.

Product and service safety

In California, engineers, geologists, and surveyors have professional certification and licensing history dating back to 1891, when the California Legislature established the State Surveyor General and licenses for land surveyors. The Board of Registration for civil engineers was established in 1929, following a 1928 dam failure in Los Angeles County that killed 450 people and caused millions of dollars of property damage (California State Department of Consumer Affairs, 2012). The dam failure was determined to have been caused by its being constructed on weak and faulted rock formations. For many years, geologists and geophysicists had their own professional licensing board, but in 2009 all duties of that board were transferred to The Board for Professional Engineers, Land Surveyors, and Geologists.

The Board provides license services to engineers, geologists, and surveyors, and provides consumer protection when such services are performed. The Board provides a formal and extensive complaint process, supporting consumers with consumer guides, and information on enforcement actions, licensing look ups, and small claims.

Qualification for licensing and certification requires a combination of extensive college education and work experience under the direction of another licensed professional. Once qualified, applicants may sit for a multiple-day exam. In California,

the pass rates of the licensing exams are generally low (Table 7). Pass rates for engineers in Oregon could not be found.

Table 7. Results of engineering, surveying, and geosciences licensing exams for California in Fall 2014

Licensed and Profession Discipline	Exam Pass Rate in Fall 2014, %
Civil engineering, principles and practice	44
Civil engineering, seismic principles	41
Civil engineering, engineering surveying	47
Land surveying, California-specific	26
Geologist, California-specific	51
Engineering geologist	23
Hydrogeologist	48

At SHN, all employees whose disciplines are certified by licensing or other certifications are encouraged to obtain that licensing. Some SHN technical professionals, particularly those in the biological services area, are not subject to state registration and licensing. However, even with those employees in the biological services, over 30% of SHN's professionals are licensed, providing product and service safety.

Social services provided to stakeholders

To its employees and shareholders, SHN provides a sense of identity, a framework for achievement, opportunities for friendship and support, and a sense of civic

pride associated with public and private projects. To its clients and partners, SHN provides a sense of teamwork and the satisfaction of knowing that they are supporting a small and local business, so their money stays within the local economy longer.

SHN's relationships with regulatory agencies are complicated because the conditions in which they work together vary; at times they are partners and at other times they are in opposition. SHN and regulatory agency staff are always in agreement on the goals of a project (for example, remediating a hazardous site, or obtaining the proper permits) but disagreement sometimes arise in process or degree. Social services provided to regulatory agencies include introducing new methods or concepts, and working together to meet and comply with environmental regulations.

SHN's social services provided to the community are also varied; some are sponsored by the company and others are provided by employees acting as individuals. Numerous employees are board members or officers of organizations such as:

- Chambers of commerce
- Professional organizations
- Hospitals
- Universities or colleges
- School districts
- Water and community services districts
- Service organizations, for example, Big Brothers and Big Sisters and Rotary International

SHN SUSTAINABILITY EVALUATION

As described in the Introduction, this sustainability report describes SHN's journey on its "triple bottom line" (TBL) path, where TBL refers to SHN's, 1) financial bottom line, 2) people, which includes its employees, shareholders, clients, partners, governmental agency regulators, and community at large, and 3) environment, which the company impacts both positively and negatively. This TBL concept is also known as the "3P" business management approach, referring to a company's profits, people, and planet. The proceeding sections describe the economic, environmental, and social aspects of SHN's operations and policies; the context in which SHN operates and any quantitative benchmarks were also described.

With this information, we can evaluate the company's operations with respect to company sustainability and longevity.

Evaluation of economic aspects and recommendations

Strategic planning

SHN senior management and the Executive Leadership Team are continuing strategic planning efforts, which will help identify trends and opportunities due to drivers on a global, national, state, and local scale. For example, sea level rise will affect coastal areas, especially if combined with high storm water flows; positioning staff to offer services in artificial water retention (retention basins, levees, or dams) or natural water

retention (wetlands) would be strategic, as would planning to relocate structures or highways. **Recommendation 1:** Continue strategic planning and scanning for trends that could be opportunities for the company and community.

Financial position

After weathering the recession of 2007 to 2009, SHN is creating value and profit for employees and shareholders again. Based on industry benchmarks and viewed within the context of business with northern California and southern Oregon, SHN is recovering and repositioning through strategic planning. **Recommendation 2:** Continue financial management and strategic planning that has been leading to profit.

Evaluation of environmental aspects and recommendations

Energy consumption

Electricity and natural gas use was estimated for all four offices. The Coos Bay office's electricity use is higher than the CEC benchmark for small offices, but a closer review of the electricity billings may indicate why. Similarly, the Eureka and Redding offices' natural gas uses are higher than the CEC benchmark. The Redding office's energy uses are estimated as a portion of the building's total usage, and energy uses by other tenants have not been documented. If there are offices with high energy consumption, an energy split based on office space rented should be reviewed. **Recommendation 3.** Further document energy uses of the Coos Bay and Redding offices, and investigate whether other building tenants are likely to use more energy than that consumed for office work.

Municipal solid waste generation and recycling

The Eureka office's materials lab generates significant solid waste that might be recyclable. **Recommendation 4.** Although concrete and soil recycling has been investigated in the past, consider reviewing its feasibility, given increased waste management fees.

Electronic waste recycling

All offices properly dispose of electronic waste. However, some technology companies are manufacturing products that 1) use "conflict free" metals, 2) can be sent back to the company for recycling, and 3) are designed for easy dismantling and materials separation. The Eureka office purchases many of its computers through a local technology service and retailer; the primary brand distributed by this local technology business uses less than 10% conflict free metals (Center for American Progress, 2015), but it does have a mail-back recycling program with free shipping. **Recommendation 5:** Discuss concerns with this local business to see if alternatives are available that perform as well as their preferred brand.

Carpeting in Eureka office

The Eureka office carpeting may be replaced soon, and sustainable alternatives are available that may be less expensive than traditional roll carpet. **Recommendation 6:** Present carpet tile alternative to building owner while negotiating carpet replacement.

Waste generated during standard procedures in field and testing lab

Significant waste is generated during standard procedures that cannot be changed without invalidating the results. Changes in standard procedures would require research and resources beyond a single company. **Recommendation 7:** Partner with universities and regulatory agencies to identify ways to reduce waste generated during sample collection and testing.

Water usage

Data quality for water uses in all offices was low. The water use benchmark is based on number of employees in an office setting and does not consider the materials lab at the Eureka office. **Recommendation 8:** As the California drought worsens and as water rates increase, water use in all offices should be more clearly known. Further study of water usage is recommended; possible water conservation actions are leak evaluation and repair, and installation of rainwater catchment and gray water systems.

Air emissions and carbon footprint

Estimates of gasoline consumed for commuting were converted to the company's carbon footprint in tons of CO2 equivalent per year. Although employee driving habits are typical of their regions, to offset their annual commuting carbon footprint, 182 acres of forest would be needed to sequester that year's carbon. Because an estimated 40% of employees could reduce commuting to four days per week, a telecommuting policy would decrease the sequestration offset to 168 acres of forest. **Recommendation 9:** Consider conducting an employee survey to collect actual data on commuting. To offset the carbon emissions from commuting, consider 1) work at home policies, and 2) purchasing carbon offsets from the Arcata Community Forest Barnum Tract for all or part of commuting emissions. Current price is $13.12 per metric ton (Terrapass 2014); at 222 metric tons emitted per year, carbon offset credits would cost approximately $2,912 per year, and would cover all offices' commuting, but not job-related travel.

Civil and environmental engineering projects

SHN's services have both positive and negative environmental impacts. For example, construction of a new wastewater treatment plant requires reinforced concrete and manufactured components such as pumps and piping; emissions are generated when earth moving and construction equipment build the plant. Benefits of a treatment plant are numerous though, including much improved water quality to the receiving water, and greater public health. Civil engineers are starting to systematically study and review such trade-offs in infrastructure design and construction, in a certification program called

Envision. **Recommendation 10:** Continue core business of civil and environmental engineering, and evaluate applicability of Envision certification to SHN's primary service areas.

Sustainability analyses as a new service offered

Sustainability evaluation of businesses (as demonstrated by this sustainability report) could be offered as another environmental service. **Recommendation 11:** Propose offering this service to new and existing clients to the senior management and Executive Leadership Team.

Evaluation of social aspects and recommendations

Types of employment

Identifying which employees are non-exempt and exempt is clear. As employees gain more experience and obtain licenses and certifications, the point at which they become exempt is fairly clear. **Recommendation 12:** Continue policies and practices for identifying non-exempt and exempt employees.

Health and safety

Employee health and safety is considered "mission critical" and has an important focus. Maintaining emphasis and importance is accomplished through the company's Health and Safety Program. Safety is currently measured and announced as "number of days

free of accidents" on the company's intranet. **Recommendation 13:** Continue existing health and safety programs, and consider whether the Company Safety Officer needs assistance.

Family-friendly policies and work/life balance

Benefits to assist employees with families are numerous, with some being state or federally mandated (such as the Federal Family and Medical Leave Act) and others being industry-wide standards (such as investment retirement plans). The Scholar Share college savings plan, and the policy establishing support of parents in their children's classrooms, are further evidence of the company's family-friendly policies. A flex-time policy has been established but may not be widely circulated or known among employees. **Recommendation 14:** Remind or direct employees to the server location where all staff policies are saved, so that they are responsible for knowing what the policies are, as well as their supervisors.

Telecommuting and working from home

A work from home policy, in addition to the flexible work policy, may be a benefit to the company (greater employee retention and attraction) and to some employees (greater work/life balance). **Recommendation 15:** Consider investigating whether a work from home policy is desirable from the standpoints of SHN and

employees, given new communication technologies, and work-at-home policies of other companies.

Diversity

As stated above, in a small company, descriptions of job positions, gender, race and pay would infringe on employees' privacy. Currently, SHN's percentage of women engineers and geologists (19%) is higher than the national average (14% in 2012). Due to the small staff size however, an increase or decrease of one woman professional employee changes SHN's diversity percentage by 5%. As of May 2015, one woman is anticipating her professional license within a few months, which would bring SHN's percentage of women professionals to 24%. **Recommendation 16:** Monitor gender and race distribution in science, technology, engineering and math (STEM) college majors and within the engineering industry, and periodically compare college, company, and industry statistics. If comparisons indicate that women and minorities are significantly under-represented at SHN, prepare recruiting plans that address how representation could be increased.

Forced and compulsory labor

There is no forced or compulsory labor as defined by the GRI. Perceptions of compulsory labor exist in any services firms that rely on billable hours for revenue, such as lawyers, accountants, and consultants. **Recommendation 17:** Consider reminding

supervisors and managers to discuss perceptions of required non-billed labor with employees, and reminding employees to reflect on the nature of any non-billed labor (is it training to increase skills or knowledge, or habitual and not reported?)

Employee assessment and performance

The policies for employee review and assessment are clear but the Executive Leadership Team has identified more timely reviews as an area of improvement. An internally known metric similar to the "days without an accident" metric might be additional motivation to perform employee assessments. One metric might be number of employees whose reviews are overdue by more than one month. Making a metric like this known signals to employees that senior management is aware and values staff, and signals to managers that their responsibility to staff is important enough to be monitored. **Recommendation 18:** Consider whether an internally known employee review metric would motivate managers to perform the reviews, or would only add stress to reasons why timely reviews are not occurring.

Product and service safety

Engineering and environmental services' safety relies on the industry's professional licensing, standards of practice, and general low risk approach to problems. SHN supports employee licensing and certifications. **Recommendation 19:** Continue

support for employee licensing and certifications, and continue analyzing risks of projects that the company designs, implements, or constructs.

General Recommendations from GRI (2014)

The Global Reporting Institute suggests these general recommendations be included in all sustainability reports:

- Continue measurement of key indicators. In SHN's case, they could be financial indicators, the employee assessment and review metric, and energy used and waste generated measurements.
- Plan to revise the sustainability report in a defined number of years, or earlier if the first year is more successful than anticipated. Decide on a reporting period and schedule.
- Obtain external validation of sustainability report through local, state, global entities or through non-profit organizations.
- Designate a contact person for sustainability issues.

Engage additional external stakeholders in future follow ups to the initial sustainability report.

FEASIBILITY OF SUSTAINABILITY RECOMMENDATIONS

Nineteen recommendations are described to increase SHN's sustainability and longevity; of these, six are recommendations that begin "Continue to…" indicating that SHN is already acting sustainably in those areas. The remaining thirteen recommendations vary in the degree to which they require:

1. financial resources from company profit
2. specialized knowledge to accomplish
3. time to accomplish
4. immediate attention for best and clear return

The feasibility of the thirteen recommendations will be determined in this section to plan which might be implemented, and when.

Characteristics and goals of long-lived and sustainable companies are well described in the sustainable business literature (for example, de Geus, 2002). The extent to which these nineteen recommendations assist SHN in achieving sustainable goals similar to those of other companies will also be described in this section.

Ranking of Sustainability Recommendations

Six of 19 recommendations are actions that SHN is already doing. For convenience, they are re-listed here:

- Recommendation 1. Continue strategic planning and scanning for trends that could be opportunities for the company and community.

- Recommendation 2. Continue financial management that has been leading to profit.
- Recommendation 10. Continue core business of civil and environmental engineering, and evaluate applicability of Envision certification to SHN's primary service areas.
- Recommendation 12. Continue policies and practices for identifying non-exempt and exempt employees.
- Recommendation 13. Continue existing health and safety programs, and consider whether the Company Safety Officer needs assistance.
- Recommendation 19. Continue support for employee licensing and certifications, and continue analyzing risks of projects that the company designs, implements, or constructs.

The feasibilities of the remaining 13 recommendations (Table 8) were evaluated using the four criteria listed in the previous section (Exhibit 4). Low scores indicate greater feasibility.

Table 8. Rankings of sustainability recommendations based on financial resources, specialized knowledge, time to accomplish, and when to act (Exhibit 4).

Rank	Sustainability recommendation number and description	Feasibility score
1	14. Remind or direct employees to the server location where all staff policies are saved, so that they are responsible for knowing what the policies are, as well as their supervisors.	4
2	6. Present carpet tile alternative to Eureka building owner while negotiating carpet replacement.	5
3	17. Consider reminding supervisors and managers to discuss perceptions of required non-billed labor with employees, and reminding employees to reflect on the nature of any non-billed labor.	5
4	3. Further document energy uses of the Coos Bay and Redding offices, and investigate whether other building tenants are likely to use more energy than that consumed for office work.	6
5	5. Discuss concerns with local computer business to see if alternatives are available that perform as well as their preferred brand.	6
6	18. Consider whether an internally known employee review metric would motivate managers to perform the reviews, or would only add stress to reasons why timely reviews are not occurring.	6
7	8. As the California drought worsens and as water rates increase, water use in all offices should be more clearly known; conduct further study of water usage.	7
8	11. Propose offering this sustainability reporting as a service to new and existing clients to the senior management and Executive Leadership Team.	7
9	4. Although testing lab concrete and soil recycling has been investigated in the past, consider reviewing its feasibility, given increased waste management fees.	8
10	9. Consider purchasing carbon credits from the Arcata Community Forest Barnum Tract to offset all or part of commuting emissions.	8

11	16. Monitor gender and race distribution in science, technology, engineering and math (STEM) college majors and within the engineering industry, and periodically compare college, company, and industry statistics. If comparisons indicate that women and minorities are significantly under-represented at SHN, prepare recruiting plans that address how representation could be increased.	8
12	15. Consider investigating whether a work at home policy is desirable, given new communication technologies, and work at home policies of other companies	9
13	7. Partner with universities and regulatory agencies to identify ways to reduce waste generated during sample collection and testing.	11

When ranking the sustainability recommendations, financial resources required to implement the recommendation were weighted equally with the other criteria. However, without company profitability, none of these recommendations would be relevant.

Characteristics of sustainable companies

A Google search on "sustainable companies" brings 205 million results in less than a half second. But in 1983 before internet research, a group of researchers at Shell decided to study corporate survival (de Geus, 2002). They found 30 companies in North America, Europe, and Japan that were between 100 and 700 years old, but found the average corporate life span was much shorter, usually "well below" 20 years (de Geus, 1997). A more statistically rigorous study was published in 1994, the well-known "Built to Last: Successful Habits of Visionary Companies" (Collins and Porras, 1994). The

Collins findings supported the Shell researchers' conclusions, which describe four characteristics of companies that outlast others. They are (de Geus, 2002):

- Sensitivity to the environment, and a company's ability to recognize change and adapt.
- Cohesion and identity, which refers to a company's ability to build a community and a corporate persona.
- Tolerance and decentralization, which are demonstrated when a company can build relationships with others inside and outside of the company, who hold different or new ideas.
- Conservative financing, which provides a company with the ability to control its own growth rate.

As described in SHN's standard disclosures, the company is entering its 36th year in business. Compared with the Shell researchers' four characteristics, SHN either has or is demonstrating all four. Its strategic planning process is its organized way to recognize and respond to changes in its economic, environmental, and social environments. The strategic planning process brought forward the need to guard against company "silos" as could happen with four offices (cohesion), and the need to define a unique company identity to stay competitive in the post-2008 recessionary environment. The company is refining its brand and identity by increasing its marketing efforts, through print materials, a fresh website, and in-person outreach to clients and the community. The company exhibits tolerance in allowing and supporting employees and managers as they work on non-core projects of interest (for example, horizontal directional drilling, using waste ash

as soil amendment, or writing a sustainability report). The fourth characteristic of sustainable companies, conservative financing, is also met by SHN; the company has very little long-term debt and is privately held.

CONCLUSION

The business case for sustainability evaluation and reporting has been likened to driving a car. If one drives a car looking only through the windshield (the financial reports), one will likely arrive at the destination if it is only a short time and short distance away. However, for greater distances over longer time periods, one must look at the car's temperature and fuel gauges, and road conditions (environmental aspects), and one must care for the passengers and look out for pedestrians (social aspects). If one ignores the environmental and social aspects of the business, it may be successful but only for the short term, and at the expense of natural resources and its community.

SHN has a history of operating as a sustainable company, as supported by its 36 years of operation, and by already implementing 6 of 19 sustainability recommendations that were identified in this report. The recession of 2008 changed its business environment, and it is evolving and strategically planning how to best meet increased competition from larger and out-of-the-area companies. The remaining 13 recommendations were ranked to allow SHN to implement them slowly and steadily. In addition, the GRI recommends the following for all small businesses:

- Continue measurement of key indicators. In SHN's case, they could be financial indicators, the employee assessment and review metric, and energy used and waste generated measurements.

- Plan to revise the sustainability report in a defined number of years; decide on a reporting period and schedule.
- Obtain external validation of the sustainability report through local, state, global entities or through non-profit organizations.
- Designate a contact person for sustainability issues.
- Engage additional external stakeholders in future follow ups to the initial sustainability report.

After these recommendations are discussed by SHN's Executive Leadership Team, an implementation plan should be written that includes a schedule and measurable goals to benchmark its achievement as a sustainable company.

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Exhibit 1. SHN Competitors

SHN Competitors

Company	Core services	Size	Client types	Locations	Publicly traded?	Website quality	Non-core services	Notes
Caltrop	construction services, proj mgt, public relations, telcom, engr design, civil (land dev, multi fam residential, renewable and sust energy), surveying		public agencies, transportation agencies	CA: (14 locations) Anaheim, Emeryville, Eureka, Fresno, Irvine, LA, Manteca, Redding, Sacramento, San Diego, San Luis Obispo, Santa Rosa, Westlake Village. Arizona, Florida, Hawaii, Nevada, Texas, Asia, Europe, United Arab Emirates	no or probably not	B	None obvious	renewable and sustainable energy examples sort of showed they don't really get what it commonly means. Fake people images?
CGI Technical Services	geotech, engr geo, materials testing	SBE	construction, cities, hospitals, other consultants, gravel operators, counties, architects, Forest Service, Coast Guard	Redding	no or probably not	C	None obvious	Safeway was an unusual client for them?
Dokken Engineering	structure, transit, hydraulic, roadways, enviro, const mgt	no info	no info	Folsom, San diego, Temecula	no or probably not	A	archaeologists, biologist, botanists, landscape arch	Community tab, youth, creek cleanup, etc. ESOP
Drake Haglan Associates	bridge, highway, roadway,planning, funding	no info	Caltrans, counties, cities	Sacramento	no or probably not	B+	no info	

SHN Competitors

Company	Core services	Size	Client types	Locations	Publicly traded?	Website quality	Non-core services	Notes
Enplan	Environmental and Geospatial Tech. Wetland delineation, section 404, CEQA, SWPPP, GIS, LIDAR. Orthoimagery	SBE (10+/-)	Other Consultants, GSA, DGS CMAS	Redding	no or probably not	A	None obvious	Fire Tracker online public service
Geocon	geotechnical, environmental, engir geo, constr mgt.	no info	no info	Bakersfield Palm Desert, Sacramento, Bay Area, LA, Orange County, San Diego, Fairfield, Riverside County	No, privately held	A	land conservation	website attn to design
GHD	water, energy and resources, environment, property and buildings, transportation, architecture	8500+	public and private	global, 4000+ employees in North America	yes	A	sustainability	offers GHD Business School
HDR	Architechure, mining, transportation, waste, oil and gas, industrial, power, water, development	9200+	all	225 around the world. 22 in CA, none north of Sacto. 4 in Oregon none on coast.	No, privately held	A	None obvious	Design 4 others, Engineers Without Borders, 2014 Sustainability and Corp Responsibility Report, HDR 501c(3) Foundation, Sust Return on Investment, Envision, ESOP
Kimley-Horn	aviation, energy, environmental, water, transportation, civil, wireless communications	1800 (in 2010)	all	14 in CA, others across US but none in Pac NW	No, employee owned	A	sustainability	2014 one of the 100 best companies to work. K-H Foundation

SHN Competitors

Company	Core services	Size	Client types	Locations	Publicly traded?	Website quality	Non-core services	Notes
LACO	engineering, buidling design, planning and permitting, geo and geotech, env science, surveying, materials testing, drilling		tribes, cities, Caltrans, counties, Danco, CR, special districts, school districts, PG&E, timber	Eureka, Ukiah, Santa Rosa	No	A	None obvious	Work-life balance (first thing listed under Benefits), family friendly
Mark Thomas	transportation, surveying, site development, infrastructure, municipal engineering	200	no info	San jose, Cupertino, Fresno, Irvine, Oakland, Salinas, San Mateo, Sacramento, Walnut Creek	privately held, emp owned	B lots of content, design old	none obvious	work life balance recognition, MT University, MT PM Academy, education reimbursement
Materials Testing Inc and subsidiary KC Engineering Co	Geotech engr, materials testing, env engr	SBE	no info	Redding, Vacaville	no or probably not	C-	None obvious	
MGE Engineering	civil, structural. Roads, bridges, tunnels, rail, walls, flood control, levees, sewer and water	no info	Army Corps, conservation districts, national forests, Caltrans	Sacramento, Oakland, LA	no or probably not	A	stream rehab, fish passage	
Michael Baker International	architecture, aviation, construction, energy, planning, water, transportation, "technology and intelligence"	no info	all	global but none north of Sacramento, none in OR	no, privately owned by DC Capital Partners	A	sustainability plan development	diversity program, veterans outreach,

SHN Competitors

Company	Core services	Size	Client types	Locations	Publicly traded?	Website quality	Non-core services	Notes
Morrison Structures	structural. Bridges, buildings, tanks, foundations	"small"	no info	Redding	no or probably not	C	None obvious	
North State Resources	enviro permitting and regulation, resource inventories, feasibility and constraints analyses, mit plans	10+/-	transportation and water res engr firms; telcom, utility, and energy companies; federal, state and local agencies; tribes, non-profits, developers	Redding, Sacramento, Chico, Mt Shasta	no or probably not	B-	None obvious	GSA, on call services
NV5	infrastructure, environmental, energy, program mgt, construction QA, geotech	no info	all	across US, 11 offices in CA, farthest north Bay Area and Sacramento, none in OR	yes	A	sustainability , LEED,	limited and local community service
Omni Means Engineers and Planners	transportation, civil, land development, landscape arch, survey, constr mgt	80+	public and private	Napa, Redding, Roseville, San Luis Obispo, Visalia, Walnut Creek	no or probably not	A		good recruiting page, award winning newsletters
Oscar Larson & Associates	engineering, planning, construction mgt	small	no info	Eureka, Crescent City	No	C	None obvious	projects in Russia, Kazakhstan
PACE Engineering	water, wastewater, survey, electrical engineering, structural, land development	30	cities, counties, special districts, developers, other engineers/consultants	Redding	No	B		no recruiting info on website,
Pacific Hydrologic	bridge hydraulic, scour, erosion, fluvial geomorph, flood/FEMA	1 main person	federal and local agencies, other consulting firms, PG&E, timber companies	Redding	no	B	none obvious	

SHN Competitors

Company	Core services	Size	Client types	Locations	Publicly traded?	Website quality	Non-core services	Notes
Quincy Engineering	transportation, bridge, surveying, construction mgt., water and wastewater	no info	Caltrans, ODOT, FHA, Central federal lands, Oregon OTIA III Bridge Program, cities and counties	CA: (4 lcoations), Roseville, Rancho Cordova, Walnut Creek, Pleasanton. Salem, OR	no or probably not	A	environmental planning and permitting. Climate change, sustainability	
Tabor Consultants	engineers and geologists	no info	no info	Sacramento, North Bay	no or probably not	B	"sister company Tabor Drilling"	
TRC Solutions	Energy, environmental, infrastructure	3200 tech people	all	100+ offices in US, 15 in Calif. Farthest north is Rancho Cordova, SF, East Bay	Yes	A	"sustainability advisory services", security and emergency preparedness	Active sust initiatives, various give back programs. Career page emphasis on quality of life, Earth better place to live.
TY Lin International Group	Architectural, construction, environmental, mechanical, planning, siesmic	multi-national	all	global, Asia and Americas	No, privately held	A	iconic structures	

Exhibit 2. Memo to Eureka Regional Manager re: Carpeting Alternatives

Memo to: Greg Williston, Eureka Regional Manager

From: Sheri Woo, PE, Marketing Coordinator

Date: December 9, 2014

Subject: Research and Recommendations for Using a Sustainable Carpet System

Summary: Interface's Shuffle carpet tile system is compared to conventional single-use carpeting. Based on sustainability, the products of Interface or other carpet manufacturers certified as following ISO 140-2010 are preferable. Information obtained so far indicates that the Shuffle carpet tile system may be comparable in price to conventional carpeting, if we also consider installation costs, length of installation time, and flexibility in phasing carpet replacement. Recommendations include: 1) pursue quotes and additional information on Interface's Shuffle carpet tile system, and on other companies that are copying Interface's model, 2) verify availability of Shuffle tiles for an office as large as ours, 3) verify timing and flexibility of installation and whether it can be less disruptive than conventional carpeting installation, and 4) perform short-term cost benefit analyses, say by calculating net present values, once more accurate floor covering bids are obtained for both single-use conventional carpet and Interface Shuffle carpet tiles. Long-term cost benefit calculations need not be performed. When using Interface Shuffle carpet tiles, the savings in energy, carbon emissions, and material wastes are clear.

Introduction

The purpose of this memo is to describe carpeting alternatives, evaluate their advantages and disadvantages, and provide recommendations. I understand that our office building needs new carpeting, but that we do not own the building. Simultaneously, we are negotiating a new lease with the building owner. Although there are numerous other considerations in a new lease agreement, new carpeting is an expensive capital improvement and could be one leverage point in the negotiations. Another consideration is the time required to replace carpeting, which disrupts our business, so obviously we would like the replacement to occur as quickly as possible.

Carpeting Alternatives

Two carpet alternatives were considered: 1) single-use commercial carpet that is similar to the existing carpeting, and 2) commercial grade carpet tiles that are sustainably manufactured and designed so they are recycled into new carpet tiles when they become worn. One well-known brand of sustainable

carpet tiles is Interface FLOR. Although there are other companies manufacturing carpeting to varying ISO "eco-friendly" standards, I focused on Interface because information was readily available.

One service that differentiates Interface carpet tiles from other sustainably manufactured carpet tiles is its Shuffle program. Tiles purchased under the Shuffle program are over-runs or remainders from custom-designed carpeting projects. Interface sorts and packages these tiles into seven color families or palettes, and the patchwork design is coherent, interesting, and aesthetically pleasing.

Shuffle tiles in Neutral Brown palette.

Shuffle tiles in Neutral Green palette.

Besides Interface's turning a potential waste material into a product, thus redirecting carpeting from landfills, the Shuffle system is much less expensive than Interface's custom carpet tile designs. Redwood Coast Energy Authority used the Shuffle system for their recent office remodel and are very forthcoming with information and costs.

	Interface Shuffle Program	**Conventional Single-Use Carpeting**
Materials	RCEA's costs for buying carpet tiles through the Shuffle service was \$15/yd^2 for 480 yd^2.	Range \$9 to \$12/yd^2 for 230 yd^2. Includes new carpet pad, tack bars, seaming and edge finish trim.
Installation cost and time	An installation estimate per square yard was not obtained. Installation was easy enough that RCEA staff did it themselves, after Alternative Building Center workers chalked guidelines on the floor. Carpet tiles do not require backing or a carpet pad, which is another cost and time savings. Greater potential for a phased carpet replacement schedule, creating less business disturbance.	\$11 to \$18/yd^2 for 230 yd^2. Includes all typical costs for removal of existing carpet, and subfloor squeak fixes. Time required: 33 hrs, but highly variable based on number of corners and carpet design.

	Interface Shuffle Program	Conventional Single-Use Carpeting
Other advantages and dis-advantages	Advantage: tiles that become stained or worn can be replaced individually. Disadvantage: in the Shuffle system, the carpet is not custom designed. If a uniform floor covering is desired, or if a specific look or design is needed, the Shuffle system will not be appropriate. To get enough tiles for their office, RCEA had to get three patterns within the same "neutral palette".	Advantage: a custom design may be affordable. Disadvantage: Contributing to carbon emissions as roll carpeting is manufactured, creating more waste that ultimately must be disposed in a landfill, and promoting a "business as usual" mentality in the company.
Source	Personal communication with Matthew Marshall (RCEA) and Hector at the Alternative Building Center in Eureka.	Homewyse. 2014. Cost of Commercial Carpet. http://www.homewyse.com/costs/cost_of_commercial_carpet.html

Recommendations

I recommend that we pursue quotes and additional information on Interface's Shuffle carpet tile system, and on other companies that are copying Interface's model. Important information to verify includes:

- Availability of Shuffle tiles for an office as large as ours.
- Timing and flexibility of installation and whether it can be less disruptive than conventional carpeting installation.

Short-term cost benefit analyses, say by calculating net present values, should be performed once more accurate floor covering bids are obtained for both single-use conventional carpet and Interface Shuffle carpet tiles. Long-term cost benefit calculations need not be performed. The savings in energy, carbon emissions, and material wastes are clear when using Interface Shuffle carpet tiles.

Exhibit 3. Energy, Water, Waste, and Air Emissions Data

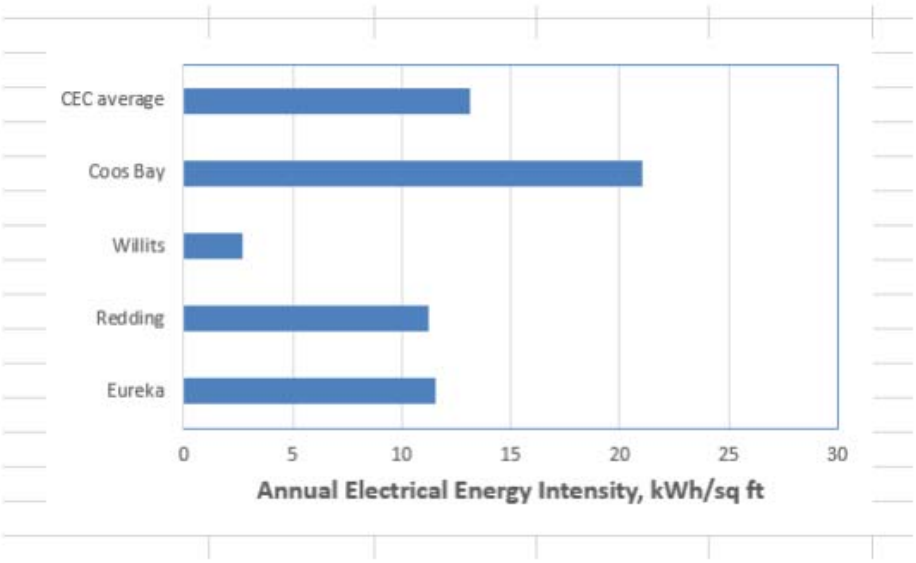
Eureka Office Energy Use		
	Natural Gas	Electricity
	Therms	kWh
Jan-14	661	11231
Feb-14	490	11830
Mar-14	334	10658
Apr-14	285	10406
May-14	162	11371
Jun-14	45	11074
Jul-14	30	11650
Aug-14	20	10544
Sep-14	20	11384
Oct-14	32	11732
Nov-14	68	10465
Dec-14	198	10726

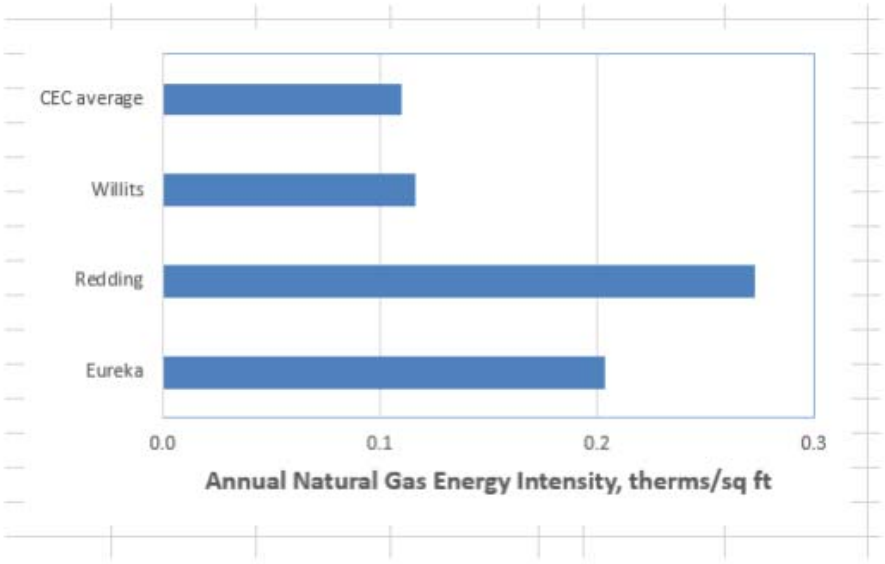
Willits Office Energy Use		
	Natural Gas	Electricity
	Therms	kWh
Jan-14	345	1835
Feb-14	277	1753
Mar-14	161	1886
Apr-14	117	1811
May-14	41	1919
Jun-14	7	2909
Jul-14	1	2885
Aug-14	0	1804
Sep-14	1	3003
Oct-14	1	2204
Nov-14	76	1752
Dec-14		

Redding Office Energy Use					
	Natural Gas	Natural Gas	Electricity	Electricity	Water
	Therms (bldg)	Therms (office)	kWh (bldg)	kWh (office)	
Jan-14	453	141.56	5680	1775	3
Feb-14	434	135.63	5520	1725	3
Mar-14	237	74.06	5520	1725	4
Apr-14	178	55.63	5840	1825	3
May-14	40	12.50	6160	1925	7
Jun-14	2	0.63	8240	2575	3
Jul-14	1	0.31	11200	3500	3
Aug-14	1	0.31	10080	3150	3
Sep-14	1	0.31	9680	3025	3
Oct-14	8	2.50	7600	2375	3
Nov-14	186	58.13	5440	1700	6
Dec-14	567	177.19	5600	1750	4

	A	B	C	D
1	Coos Bay Office Energy Use			
2		Natural Gas	Electricity	Water
3		Therms	kWh	
4	Jan-14		9480	
5	Feb-14		8000	
6	Mar-14		6560	
7	Apr-14		5640	
8	May-14			
9	Jun-14		4120	
10	Jul-14		3840	
11	Aug-14		3520	
12	Sep-14		3680	
13	Oct-14		3720	
14	Nov-14		4320	
15	Dec-14		6080	
16				
17				

2									
3	Assumptions	Area sq ft	Energy Intensity kWh/sq ft	Natural Gas therms/sq ft					
4	Eureka office	11500	13.1	0.11					
5	Willits office	8812	13.1	0.11					
6	Redding office	2413	13.1	0.11					
7	Coos Bay office	2800	13.1	0.11					
8			Goal = 13.1				Goal = 0.11		
9		**Energy Intensity, elec kWh/sq ft**				**Energy Intensity, natural gas therms/sq ft**			
10		Eureka	Redding	Willits	Coos Bay	Eureka	Redding	Willits	Coos Bay
11	Jan-14	0.9766	0.7356	0.2082	3.3857	0.0575	0.0587	0.0392	
12	Feb-14	1.0287	0.7149	0.1989	2.8571	0.0426	0.0562	0.0314	
13	Mar-14	0.9268	0.7149	0.2140	2.3429	0.0290	0.0307	0.0183	
14	Apr-14	0.9049	0.7563	0.2055	2.0143	0.0248	0.0231	0.0133	
15	May-14	0.9888	0.7978	0.2178	0.0000	0.0141	0.0052	0.0047	
16	Jun-14	0.9630	1.0671	0.3301	1.4714	0.0039	0.0003	0.0008	
17	Jul-14	1.0130	1.4505	0.3274	1.3714	0.0026	0.0001	0.0001	
18	Aug-14	0.9169	1.3054	0.2047	1.2571	0.0017	0.0001	0.0000	
19	Sep-14	0.9899	1.2536	0.3408	1.3143	0.0017	0.0001	0.0001	
20	Oct-14	1.0202	0.9843	0.2501	1.3286	0.0028	0.0010	0.0001	
21	Nov-14	0.9100	0.7045	0.1988	1.5429	0.0059	0.0241	0.0086	
22	Dec-14	0.9327	0.7252	0.0000	2.1714	0.0172	0.0734	0.0000	
23									
24	Annual	11.5714	11.2101	2.6964	21.0571	0.2039	0.2730	0.1165	
25									


CEC average
Coos Bay
Willits
Redding
Eureka
0
5
10
15
20
25
30
Annual Electrical Energy Intensity, kWh/sq ft


CEC average
Willits
Redding
Eureka
0.0
0.1
0.2
0.3
Annual Natural Gas Energy Intensity, therms/sq ft

Water data from SHN Offices

P33

	A	B	C	D	E	F	G
1	Water use SHN offices 2014, 100 cu ft						
2							
3	Number of Eureka employees			60			
4		Eureka 100 cu ft		cu ft	gallons	gallons per day	gallons per employee day
5	jan	19		1900	14212	458	7.6
6	feb	16		1600	11968	427	7.1
7	Mar	17		1700	12716	410	6.8
8	apr	30		3000	22440	748	12.5
9	may	41		4100	30668	989	16.5
10	jun	58		5800	43384	1446	24.1
11	july	60		6000	44880	1448	24.1
12	aug	38		3800	28424	917	15.3
13	sept	32		3200	23936	798	13.3
14	oct	27		2700	20196	651	10.9
15	nov	15		1500	11220	374	6.2
16	dec	17		1700	12716	410	6.8
17							151.3
18				total	276760		
19				based on 225-day year	1230		
20				gallons per employee day, GED	20.5		
21				GED Engineering office buildings	113		
22							
23							
24							
25							
26							
27							

http://www.pacinst.org/wp-content/uploads/sites/21/2013/02/appendix_e3.pdf

Commercial Water Use and Potential Savings: Appendix E *Page 1*

Carbon Footprint Estimates

32					gallons used, two ways	CO_2 equiv		homes energy per year	acres forest to sequester per year
33			drive 5 days per week		500	2.9	metric tons		
34			drive 4 days per week		400	2.3			
35									
36			annual 5 day/wk, gal per yr		25002	222		20.3	182
37			annual 4 day/wk, gal per yr		20002	178		16.2	146
38	% employees who can drive 4 days/wk								
39		0.4							
40	% employees who can drive 5 days/wk		with work at home		23002	204		18.7	168
41		0.6	policy						
42									
43									

Exhibit 4. Feasibility and Ranking of Sustainability Recommendations

J7

	A	B	C	D	E	F	G
2		1 = low or now, 2 = med, 3 = high or future. Low values indicate greater feasibility.					
3	Recommendations	Existing activity	Financial resources	Specialized knowledge	Time to accomplish	When to act	Score
4	14. Remind or direct employees to the server location where all staff policies are saved, so that they are responsible for knowing what the policies are, as well as their supervisors.		1	1	1	1	4
5	6. Present carpet tile alternative to Eureka building owner while negotiating carpet replacement.		1	2	1	1	5
6	17. Consider reminding supervisors and managers to discuss perceptions of required non-billed labor with employees, and reminding employees to reflect on the nature of any non-billed labor.		1	2	1	1	5
7	3. Further document energy uses of the Coos Bay and Redding offices, and investigate whether other building tenants are likely to use more energy than that consumed for office work.		2	1	1	2	6
8	5. Discuss concerns with local computer business to see if alternatives are available that perform as well as their preferred brand.		1	2	1	2	6
9	12. Continue policies and practices for identifying non-exempt and exempt employees.	X	1	3	1	1	6
10	18. Consider whether an internally known employee review metric would motivate managers to perform the reviews, or would only add stress to reasons why timely reviews are not occurring.		2	2	1	1	6
11	8. As the California drought worsens and as water rates increase, water use in all offices should be more clearly known. Further study of water usage is recommended.		2	2	2	1	7
12	11. Propose offering this sustainability reporting as a service to new and existing clients to the senior management and Executive Leadership Team.		1	3	1	2	7
13	1. Continue strategic planning and scanning for trends that could be opportunities for the company and community.	X	2	3	2	1	8
14	2. Continue financial management that has been leading to profit.	X	2	3	2	1	8
15	4. Although concrete and soil recycling has been investigated in the past, consider reviewing its feasibility, given increased waste management fees.		2	2	2	2	8
16	9. Consider purchasing carbon offsets from the Arcata Community Forest Barnum Tract for all or part of commuting emissions.		3	2	1	2	8
17	16. Consider whether an analysis of equal remuneration across gender and race is needed, or whether the company is so small that this level of analysis is unnecessary for reporting.		2	3	2	1	8
18	19. Continue support for employee licensing and certifications, and continue analyzing risks of projects that the company designs, implements, or constructs.	X	1	3	3	1	8
19	13. Continue existing health and safety programs, and consider whether the Company Safety Officer needs assistance.	X	2	3	3	1	9
20	15. Consider investigating whether revising the existing flex time policies is desirable, given new communication technologies, and work-at-home policies of other companies.		2	3	3	1	9
21	10. Continue core business of civil and environmental engineering, and pursue Envision certification for those engineers interested	X	3	3	3	1	10
22	7. Partner with universities and regulatory agencies to identify ways to reduce waste generated during sample collection and testing.		3	3	3	2	11
23							

APPENDIX 2. CASE STUDIES FROM COOLCALIFORNIA.ORG DATABASE

Appendix 2. Case studies from the CoolCalifornia.org database

Company Name	Type	Region	Action	Comments
MAK Design+Build, Inc.	Business or Professional Services	North Central Region	Be a Green Biz	MAK Design+Build, Inc. is an environmentally conscious business that emphasizes sustainable building practices. The steps MAK has taken to become green...Read Case Study »
iBank	Business or Professional Services	South Coast Region	Buy Green	iBank is a small, private company that has been paperless since 1999. One of iBank's primary business goals is to help reduce the usage of paper products...Read Case Study »
Bowman Design Group	Business or Professional Services	South Coast Region	Be a Green Biz	In just two years, Bowman Design Group not only met but shattered California's AB32...Read Case Study »
Meridian Pacific, Inc.	Business or Professional Services	North Central Region	Recycle and Cut Waste	One of 26 businesses in a building complex, Meridian Pacific, Inc. stands out as a leader in environmentally-friendly business practices. Read Case Study »
The Living Christmas Company	Business or Professional Services	South Coast Region	Be a Green Biz	Head tree-hugger and Christmas Caroler, Scott "Scotty Claus" Martin, was once ashamed by the discarded Christmas Trees that would line the streets after the holidays. Now, thanks to the...Read Case Study »
Blue Star Refreshments	Business or Professional Services	Bay Area	Be a Green Biz	Blue Star Refreshments is an office refreshment service provider located in Silicon Valley that has made the commitment to go green. They offer...Read Case Study »
Arya Cleaners	Business or Professional Services	South Coast Region	Be a Green Biz	Sassan Rahimzadeh set out to create one of the most technologically advanced and environmentally sustainable dry cleaning services around. He succeeded when he opened the doors of...Read Case Study »

Rent-A-Green Box	Business or Professional Services	South Coast Region	Build Green	Rent-A-Green Box is a multifaceted fast growing company with green on the brain. Spencer Brown, who embraced the green philosophy, knew that...Read Case Study »
Resource Solutions Group	Business or Professional Services	Bay Area	Drive Less and Drive Clean	Resource Solutions Group (RSG) is a result-oriented environmental consulting firm specializing in the design, management and implementation of programs that...Read Case Study »
Blue Oak Energy	Business or Professional Services	North Central Region	Build Green	Blue Oak Energy is in the business of being green. Dedicated to providing high quality service to customers nationwide, Blue Oak Energy excels in...Read Case Study »
Hesperian Cleaners	Business or Professional Services	Bay Area	Be a Green Biz	Concerned by the potential health hazards associated with the use of perchloroethylene (PERC), a traditional dry cleaning chemical, Hesperian Cleaners...Read Case Study »
Zan Media	Business or Professional Services	Bay Area	Be a Green Biz	Zan Media, San Francisco Bay Area film and video production specialists, caught the green buzz when producing their recent documentary on the California wine...Read Case Study »
Recon Recycling, LLC	Business or Professional Services	South Coast Region	Recycle and Cut Waste	Recon Recycling, LLC is located in the Barrio Logan community of San Diego. Recon Recycling provides waste diversion and customized recycling programs...Read Case Study »
Sapphos Environmental, Inc.	Business or Professional Services	Inland Deserts Region	Use Green Energy	As an environmental consulting firm, Sapphos Environmental, Inc. has adopted a “walk the talk” philosophy. They have undertaken efforts to implement...Read Case Study »
Norton's Green Cleaners	Business or Professional Services	South Coast Region	Save Water	Norton’s Green Cleaners is leading the way in alternative dry cleaning methods by reducing their chemical waste and installing energy efficient upgrades. Norton’s Green Cleaners opened in 1971 as...Read Case Study »
Citadel	Business or	South	Use	Citadel Environmental, an eco-friendly health

Environmental Services Inc.	Professional Services	Coast Region	Green Energy	and safety firm, is green inside and out. Not only is a sustainable lifestyle promoted, but its...Read Case Study »
Audio Visual Consultants	Business or Professional Services	Bay Area	Recycle and Cut Waste	Audio Visual (AV) Consultants is a Certified Green Business in Alameda County specializing in video production and editing. AV Consultants is reducing...Read Case Study »
Fresh Air Yard Care	Business or Professional Services	North Central Region	Save Energy	Fresh Air Yard Care endeavors to reduce greenhouse gas emissions by providing yard care maintenance using only hand powered, electric and propane...Read Case Study »
Three Squares, Inc.	Business or Professional Services	South Coast Region	Recycle and Cut Waste	Three Squares Inc. (TSI) is leading the way as a sustainable business force that maintains balance between the people, economic growth and...Read Case Study »
Atlas Disposal Industries	Business or Professional Services	Northern Region	Recycle and Cut Waste	Atlas Disposal Industries was founded on the principles of sustainability. People, planet and prosperity are the three principles that define the way...Read Case Study »
Weston Miles Architects	Business or Professional Services	Bay Area	Be a Green Biz	Weston Miles Architects, Inc. (WMA) is an award-winning landscape and architecture business that practices innovative and sustainable building...Read Case Study »
Cibola Systems Corporation	Business or Professional Services	South Coast Region	Save Energy	Cibola Systems is an audiovisual design firm specializing in creating business meeting environments while integrating AV technologies that inspire team...Read Case Study »
Light and Motion Industries	Business or Professional Services	Central Region	Recycle and Cut Waste	Light and Motion Industries, Inc. is a manufacturing company located in a converted building on Monterey's famous Cannery Row. They design, market, and manufacture two product lines: high...Read Case Study »
Waste Less Living	Business or Professional	South Coast	Recycle and Cut	Waste Less Living is an environmental consulting firm with a passion for waste diversion and composting. Located in Pasadena, California,

	Services	Region	Waste	Waste Less...Read Case Study »
Conejo Awards	Business or Professional Services	South Coast Region	Save Energy	Conejo Awards transformed their office in to an eco-friendly work space with smart purchases, helpful employees and dedication to helping the environment...Read Case Study »
Choice Lunch	Business or Professional Services	Bay Area	Recycle and Cut Waste	Choice Lunch, a school lunch delivery service, is dedicated to providing school-age children with healthy, sustainable and delicious meals. Meals are...Read Case Study »
Codexis, Inc.	Business or Professional Services	Northern Region	Recycle and Cut Waste	Codexis, Inc. is a bio-fuel, pharmaceutical and chemical engineering firm that is transforming their Redwood City headquarters in an effort to increase waste...Read Case Study »
Conejo Awards	Business or Professional Services	Inland Deserts Region	Recycle and Cut Waste	As the first business to be certified “green” by the City of Thousand Oaks, Conejo Awards is considered a leader in green innovation. Conejo Awards, an...Read Case Study »
El Primero Boutique B&B Hotel	Business or Professional Services	South Coast Region	Use Green Energy	Located in the city of Chula Vista, El Primero Boutique B&B Hotel offers guests a unique experience at an environmentally-friendly hotel. The El...Read Case Study »
Nortra-Cables, Inc.	Business or Professional Services	Bay Area	Save Energy	Nortra-Cables, Inc. offers custom cable and wire harness design, prototyping and manufacturing services for medical, computer, communications,...Read Case Study »
Ohana Pet Hospital	Business or Professional Services	South Coast Region	Save Energy	Opened in December 2012, Ohana Pet Hospital is a full-service veterinary clinic that is committed to environmental sustainability and serves as a role...Read Case Study »

http://www.coolcalifornia.org/small-business

http://www.coolcalifornia.org/article/be-a-green-biz

http://www.coolcalifornia.org/california-green-business-programs