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EXECUTIVE SUMMARY

PROJECT OBJECTIVE AND SCOPE

The University of Chicago Green Restaurant Research Team (GRRT) is composed of 35 University of Chicago students enrolled in the Environment, Agriculture and Food: Economic and Policy Analysis courses in the Winter and Spring of 2012. The students worked closely with instructors, the Green Chicago Restaurant Coalition (GCRC), Green Seal and numerous industry advisors, in an effort to review the Green Seal GS-46 certification standard and make recommendations for new green restaurant standards for Chicago restaurants. The work presented in this report was conducted by the students as a class project. The class was supported by the Program of Global Environment at the University of Chicago.

Starting in January 2012, the GRRT conducted extensive research on existing green certification standards and restaurant practices, collected and analyzed data from local restaurants, and interviewed industry advisors, in order to come up with a set of recommendations for improving and adapting Green Seal's existing restaurant certification standard, GS-46 (GS-46), to focus locally, on Chicago restaurants. Chicago is intended as a case study or pilot for a nationally-recognized but locally tailored green restaurant certification.

With the GCRC and Green Seal as partners, the team was divided into research groups and conducted a full assessment of the existing GS-46 standard as well as related scholarly literature. In addition, the team designed, implemented and analyzed both a restaurant survey and a consumer survey, to further inform the recommendations.

This report is intended as a starting point of evaluation of Green Seal's GS-46 standard, to revise and craft a new Chicago-specific standard that is robust, accessible and locally relevant. The remainder of this executive summary and report will be presented by the GRRT student team.

Throughout this report, you will see references to the GRRT certification matrix, which is the template that was used to evaluate GS-46 practices. The completed sections of the matrix can be found on our website at <http://eaf.uchicago.edu/grrt>. All other resources for this final report can also be found at this website.

BRIEF METHODOLOGY OVERVIEW

We used a number of sources for our data: scholarly literature, original surveys, and interviews with restaurant owners, certifiers and consultants, service providers related to waste, energy, and water use, producers of food and restaurant suppliers, and local policy experts. Below is a more detailed account of our methodology.

A. Scholarly Literature-Based Research

Our findings are based on scholarly sources that were reviewed by our Information and Analysis group to assure data quality. These sources include the book *Greening Food and Beverage Services*, which is a Green Seal publication, and peer-reviewed journal articles that focused on both qualitative and quantitative data sourcing. Well-received, quality-checked articles were also used to provide sources for the certification matrix.

In addition to scholarly research conducted for development of the certification matrix, we used USDA data, Mintel reports, and National Restaurant Association (NRA) trends to illustrate quantitative results. For example, the USDA daily market price for organic and non-organic commodities was used to find the organic price premium of commodities in Chicago, which in turn helped the Food and Beverage group provide recommendations. Similarly, the consumer research group utilized the Mintel findings and NRA trends to provide a better understanding of the current restaurant and consumer trend landscape.

B. Original Surveys

The GRRT designed a restaurant survey for GCRC members to uncover information and experiences that could not be well understood through other research means. The survey topics ranged from the ease of implementing local and organic produce to the possibility of installing on-site renewable energy sources. The

survey provided a number of key takeaway results for each group to include in the GRRT certification matrix, which highlights green practices according to multiple criteria.

The GRRT also designed a consumer survey that aimed to determine local customers' opinions on green restaurants and their practices. The survey sampled Chicago residents who had dined out at least once in the past month. The survey focused on market segmentation, willingness-to-pay, attitudes and preferences, and green certification. This was important in identifying what practices matter most to consumers, as well as their level of awareness, which both played a role in the final GRRT recommendations.

C. Personal Interviews

Personal interviews conducted with restaurant owners, certifiers and consultants, other service providers and stakeholders helped all groups answer questions on a wide range of topics, from the environmental impact of renewables to the local sourcing of produce. GRRT members visited restaurants and farms, among other places, to learn as much as possible about subjects as diverse as rain barrels and local engagement. Having these insights aided groups in completing the certification matrix; they also incorporated local feedback into their final suggestions and recommendations.

MAJOR FINDINGS AND RECOMMENDATIONS

Based on our research and analysis, the GRRT has the following major findings and recommendations to share:

1. Seasonal Constraints but Strong Support for Obtaining “Local” Foods in Chicago

Chicago has a unique climate and geographic location that limit the options for obtaining “local” foods relative to places with longer growing seasons and more temperate climates. The city lies within the humid continental climate zone, and experiences four distinct seasons. Summers are hot and humid, with temperatures exceeding 90 °F (32 °C) at the peak of the season. Winters are cold, snowy, and windy, and temperatures often stay below freezing for an entire day, and occasionally drop below 0 °F (-18 °C) at night. Spring and fall are mild seasons with low humidity. Due to the extreme seasonality of Chicago’s climate, certain types of produce cannot be grown locally, while others have very short seasons. Meat, on the other hand can be sourced locally throughout the year. Chicago lies beside freshwater Lake Michigan, which provides a source of local seafood but without proximity to the coasts, no ocean fish would be considered local. A challenge in making recommendations for local food lies in the lack of consensus on the definition of “local”. The research identified several existing definitions, as well as definitions drawn from both local restaurant owners and consumers. In spite of the short growing season, there is clear evidence of a growing trend in the demand for local food in Chicago, by both restaurant owners and consumers. In addition, the availability of local food, as well as the ability to grow food on-site or in nearby gardens continues to increase. As the market for local food continues to evolve, certification can help facilitate its adoption. One caveat in recommending local food as a green restaurant certification practice lies in the lack of consensus on the environmental impacts of increasing local food production and distribution. Significant further research is recommended here.

2. Rainwater Management is Important in Chicago

Due to the climate in Chicago, proximity to Lake Michigan, combined storm and sewer system, and infrastructure, rainwater (or stormwater) management is of particular importance in Chicago. There are numerous programs, such as the City’s Sustainable Backyards Program designed to encourage private residents and businesses to adopt rain water management practices. While restaurants in the City have limited opportunity to manage landscapes, there are ways to manage rain water using green roofs, rain barrels and native plant landscaping in urban settings as well as additional opportunities in suburban locations. While water conservation is important in the Great Lakes region, the standards may not need to be as likely in as stringent as in other places like Florida or Texas where prolonged droughts and water shortages are present. In this case, we recommend continued focus on water conservation but augmented by rewards for innovative rain water management practices.

3. Renewable Energy can be Challenging but Energy Efficiency can be Increased

While renewable energy can have a significant and positive environmental impact and generate large social benefits, there is often little direct financial return to restaurants. However, costs can be offset with rebates and grants that are generally available with federal or state funding. On-site renewable installations are extremely challenging for restaurants due to space constraints but renewable energy credits are widely available. Energy efficiency on the other hand is readily available and additional requirements can be made for energy efficiency appliances and practices.

4. Compostable Disposable Products May Currently not be as Beneficial in Chicago

There is a growing use of compostable disposable products due to increased awareness and greater availability. However, since Chicago does not currently have a residential composting program or significant composting infrastructure like Seattle or San Francisco, post-consumer compostable products will likely end up in traditional waste streams. While the use of compostable products still has benefits due to biodegradability, the full value of the products is not being realized. In this case, it is for the moment recommended that the focus in Chicago be on recycled disposable products, while still offering some credit for compostable products in order to drive the demand for composting services. As composting infrastructure and availability continues to grow, the certification can continue to be modified to better fit Chicago-specific waste management practices.

5. Local Policy and Infrastructure Needed for Greening Chicago Restaurants

While Chicago has many policies designed to facilitate environmental improvements, other policies and regulations related to food service and waste management can limit opportunities for greening Chicago restaurants. For example, the lack of conservation-based water pricing structures and lack of composting infrastructure may not create strong financial incentives for water management or waste diversion for Chicago restaurants. There is progress in coordinating local policies with certain green restaurant operations, including energy efficiency grants and a new solid waste management program in Cook County. We expect new and innovative programs to continue to emerge as the City of Chicago continues to strive towards Mayor Emanuel's goal of becoming the "Greenest City in America." It is recommended that the GCRC and Green Seal continue to work with the City to integrate green restaurant certification into the City's developing sustainability and food plans. Further, it is recommended that a City-backed incentive program for green restaurant certification, rather than piecemeal individual green practices be created, similar to the existing green permit program for green buildings.

6. Comparatively High Cost and Effort to Implement GS-46

Compared to competitor standards, certification under Green Seal's GS-46 standard is more expensive and thus, harder for small restaurants to implement. Moreover, the extensive effort and time required of restaurant owners and operators makes the GS-46 certification process daunting to even the most enthusiastic participants. Results from the restaurant survey indicate a willingness to pay for the certification of under \$500.

7. Clarifications to GS-46 Needed

Based on our interviews and surveys with restaurant owners, we found that certain sections of the current Green Seal restaurant certification lack the needed clarity. For example, we recommend that Green Seal provide a clearer definition of "local" food and "Environmentally Preferable Products," and provide more detail on the difference between correct and incorrect data reporting in advance of receiving certification applications. From our research, it is clear that restaurant owners needed to devote significant time to apply for certification, even if they had already implemented a sufficient number of green practices. Simplifying the process can help offset some of the time costs which have been too burdensome for some restaurant owners.

8. Chicago Consumers Support Local Foods and Recycling Efforts

Our analysis of Chicago consumers shows that there is a small yet positive willingness to pay for many green restaurant practices. The positive willingness to pay is good news, but customers may not realize the benefits of dining at green restaurants and the long-term effects green restaurant practices can have upon our environment. In fact, Chicago follows nationwide trends which show green practices are a relatively insignificant concern of consumers in making dining choices. One area that stands out is the preference for locally-grown food and beverages. Our survey showed that Chicago consumers favored local food over organic food, showing some market response to local food even despite of the short growing seasons as described earlier. In fact, the preference for local food was apparent even for less environmentally-minded consumers, perhaps demonstrating community or social benefits from local food sourcing. Consumers also preferred green practices that they could carry out by themselves, such as recycling, rather than “behind the scenes” practices such as green building materials, which could be due to familiarity or understanding. Thus, we recommend that the GCRC and Green Seal continue to provide education and information about the outcomes of green restaurant practices, particularly locally. For example, tying a water conservation practice to Great Lakes stewardship, or demonstrating the reduction in carbon emissions associated with an energy efficiency practice could help consumers understand the results of green restaurant practices.

9. Information, Community Engagement and Incentives are Needed

Chicago is well known for food and restaurants both locally and nationally. In this case, we believe that the restaurant community has a strong opportunity to lead by example in creating awareness about sustainability and food issues. Restaurants in Chicago are engaged with the community and can affect citizen behavior through coordination of green practices with civic goals, outreach through community engagement and the provision of information on menus, websites and in restaurants. We recommend that a local certification reward restaurants for such programs through recognition of local engagement and education. Full chapters and resource lists are provided by our Local Engagement and Financing and Incentives teams.

The following sections of this final report provide recommendations from each of the GRRT research groups.

ACKNOWLEDGMENTS

We would like to thank the Program on Global Environment for developing this course, and both Public Policy Studies and Chicago Studies for research support. We also thank the Green Chicago Restaurant Coalition for approaching the University with the idea and working so closely with us throughout the project. Green Seal has been an invaluable partner and provided the framework for our analysis. The consumer survey was funded by the Program on Global Environment, Public Policy Studies, the GCRC and Green Seal.

All research and report production was conducted by undergraduate and graduate students as a course project at the University of Chicago. This report is available for review and comment but not to be published professionally nor shared without the permission of the Green Restaurant Research Team.

INTRODUCTION

MOTIVATION FOR PROJECT

According to the National Restaurant Association, Americans spend over 40% of their food budget, or approximately \$1,078 per person annually on food consumed away from home (National Restaurant Association). In Illinois, restaurants employ 12.9 million people comprising 9% of employment in Illinois. At the same time, the Green Restaurant Association (GRA) estimates that the restaurant industry consumes 1/3 of all energy in the retail sector and is five times more energy intensive than other retail, office and lodging industries and the average restaurant uses 300,000 gallons of water per year (Green Restaurant Association). The City of Chicago's 2010 Waste Characterization Study estimated that 12% of the city's waste comes from restaurants (Chicago Department of Environment, 2010). Due to their prominence in the average American lifestyle, restaurants are in a unique position to effect change, not only through implementation of green strategies in their daily operations, but also through education of their staff and customers, and potentially through involvement within their communities. Further, restaurants can significantly contribute to the City of Chicago's food and sustainability goals by greening operations and leading by example.

PROJECT DESCRIPTION

The GRRT is a course-based project originating in the Program on the Global Environment at the University of Chicago. In collaboration with GCRC, Green Seal, and several industry experts, our student team has worked for 6 months to develop recommendations for a robust and accessible certification standard specific to Chicago restaurants.

Students in the course, majoring in economics, environmental studies, public policy and business reviewed existing standards from Green Seal and the Green Restaurant Association, extensively researched best practices in each of the relevant areas, and conducted interviews with a number of industry experts. The team also outlined the legal and financial incentives and barriers for implementing both the most beneficial practices as well as the current changes required by each of the standards. The team also designed a restaurant survey and a consumer survey to gather data on current attitudes regarding sustainability measures and certification.

To facilitate our work, we divided the GRRT students up into research groups. These groups provided a framework for our research and serve as a basis for understanding the recommendations in this report. The following is a list of the final research groups:

1. Project Management
2. Furnishings/Energy/Water
3. Disposables/Waste/Pollution
4. Food & Beverage
5. Local Engagement
6. Information & Analysis
7. Consumer Research & Survey
8. Financing & Incentives

We anticipate that the GCRC will use our recommendations as a tool for its Guaranteed Green program, and further anticipate that Green Seal will review the recommendations to conduct the additional research needed to create a Chicago-specific version of their standard (GS-46).

METHODOLOGY

RESEARCH OF EXISTING LITERATURE

We conducted much of our researching using respected and established sources, such as scholarly literature and government agency research. Within each section, relevant citations are made within the text, and a comprehensive list of all works cited and other relevant sources is provided in the Bibliography section of the report.

INDIVIDUAL INTERVIEWS

To facilitate our understanding of the local restaurant landscape and range of green practices, we conducted individual interviews with local restaurants, farms, waste and pest-control companies and green certification organizations.

For green-certified restaurants or those with interest in green practices, we designed our interview questions to solicit their opinions of the existing green certification standards, their current green practices and initiatives, and the costs and benefits, financing opportunities and obstacles to adopting the practices. For instance, in our interview with the Green Restaurant Association (GRA) certified catering company Blue Plate, we asked the following questions:

1. How did you determine what kind of take-out containers/disposables to buy as an alternative to polystyrene (i.e. compostable, recycled-content)? Where do you purchase them?
2. What is the difference between environmentally preferable, bio-based and certified compostable take-out containers vs. containers that contain the maximum amount of recycled content feasible and are processed chlorine free?
3. How much more expensive were these environmentally preferable goods (as a percent increase of the price of polystyrene containers/conventional disposables)?
4. If possible, could you break these price comparisons down into the following categories? Sanitary paper products (i.e. restroom towels, napkins, bathroom tissue), food take-out containers, utensils & serving ware, and transport packaging & miscellaneous.
5. Are there any rebates or financing options for environmentally preferable containers? Do you think there is a strong financing need for disposables and take-out containers?

For those conducting the certification process, we designed our questions to inquire into the rationales behind the standards, ease of implementing the standards, availability of financing opportunities and subsidies, and benefits and obstacles of getting certified. All interview summaries are provided in Appendix I and the winter quarter report on our website.

SURVEYS

Restaurant Survey

Purpose:

The purpose of the survey was to gain statistical information to support the proposed GRRT Matrix. We initially used the restaurant survey and proposed revisions developed by the GRRT in the winter quarter course, but decided to rescale the survey to a shorter format. The survey was formatted to reflect the certification matrix and individual group input, and the length was adjusted to a goal of completion in under ten minutes. The questions were a combination of Yes/No/NA responses, open response, and a rating of 1-10. We wanted to obtain information regarding the difficulty of implementation for restaurants obtaining certification and determining the relative importance of barriers to entry such as financial cost, ease of implementation, etc. Our goal was to provide information that the research groups were unable to determine through academic research and which could then inform our recommendations for Green Seal.

Respondents:

The respondents were all members of the Green Chicago Restaurant Coalition (GCRC). As a result, we understand that the restaurants were biased towards seeking some form of green certification and were more likely to sacrifice time and money in order to obtain green initiatives. In addition, the restaurants that chose to respond to the survey were a self-selecting group with a total of twenty-six respondents. Although 17 out of 26 respondents hold no certification, their membership in the GCRC implies their increased willingness to engage in green activities and may skew their willingness to pay and sacrifice time to a higher response than restaurants with a lower desire to engage in green practices. However, the bias of this sample size also proved to be useful in providing an accurate view of the restaurants in Chicago that are most likely to consider obtaining Green Seal certification under a new program. These are the restaurants that would be on the tipping point of certification, and the ones Green Seal would be most likely to gain.

Methodology:

The GRRT's Survey group designed and administered a survey of GCRC members using SurveyMonkey. There were no financial incentives offered for completing the survey. Twenty-six members of the GCRC completed the survey, and none of the questions had all twenty-six respondents answer the question. The survey responses are confidential but summaries are available upon request.

Restaurant Survey Results and Analysis:

In general, local food sourcing, waste management and recycling were the most commonly instituted green practice areas noted by our respondents. Most results were intuitive (as percent of compliance increases, so does the difficulty of instituting). However, uncertainty still abounds. For example, 66.7% of respondents did not know how long it took for reduced energy bills to offset the additional costs for Energy Star appliances. And, of those who have instituted water saving practices, only 31.3% were certain that they obtained a decrease of at least 10% of their water usage and bills.

Food: We found that as the required percentage of local food sourcing increases, the difficulty of incorporating the practice increases as well. Organic food faces an increase in difficulty as well; however, the increase is exponential. Organic food is more expensive than local food to source. In addition, 77.2% of restaurants define local food as within 200 miles of the restaurant or less. This response helped shape our definition of the term "local," which can hopefully be clarified in Green Seal certification. Furthermore, 27.3% of restaurants grow some of their produce nearby. However, most restaurants do not grow produce nearby due to limited space.

Energy: We found that implementing 50-74% of Energy Star appliances in all restaurant appliances does not seem to be significantly more difficult than implementing 25-49% of Energy Star appliances. Energy efficient windows and energy tracking devices were ranked the most difficult green building practices to implement. The easiest implementation practices were better insulation and purchasing renewable energy credits. A surprising response was that only 40% of respondents know that it is possible to install on-site renewable energy sources, which illustrated a gap in information that could be clarified by Green Seal.

Waste: We found that only 25.1% of respondents have formal waste tracking systems (roughly 60% responded). Recycling is the easiest waste management system to implement and the difficulty level for composting was polarized between very easy and very difficult. Several of the chemical and pollution reduction practices were ranked as relatively easy.

Cost: We found that 40% of respondents are willing to spend more than \$5,000 (per annum) on green practices. Over 50% of respondents use cash on hand to finance green practices. Over 50% of respondents are willing to pay \$100-\$499 annually to a third party for green certification of their restaurant. Very few are willing to pay more.

Local Engagement and Certification: We found that 73.3% of restaurants use social media to engage with the community, as compared to the 33.3% that rely on traditional publicity relating to sustainability. Seventeen out of 26 respondents hold no certification, and of those who hold certification, 66.7% of respondents have obtained Green Restaurant Association (GRA) certification and 44.4% of respondents have obtained

Leadership in Energy and Environmental Design (LEED) certification. Lastly, the two largest perceived benefits of green certification are recognition as a green brand and creating a healthier environment.

Consumer Survey

Please refer to Appendix A for a rigorous explanation of our consumer survey methodology, analysis and findings. The results of our consumer research are also included near the end of this report under “Consumer Research Implications.” A summary of all results from the consumer survey results will be available on our website (<http://eaf.uchicago.edu>)

RESEARCH, ANALYSIS, AND IMPLICATIONS

The aim of the Certification Process group was to organize our research in a clear and standardized manner. To accomplish this, we created a certification matrix to rank different green practices. This template allowed us to rank each green practice across several key categories of efficacy and show how each one compared to others of a similar type in terms of costs and benefits. The complete matrix is at <http://eaf.uchicago.edu/grrt>.

TEMPLATE FOR CERTIFICATION MATRIX

Category	Sub-category	Practice	Positive Environmental Impact	Ease of Implementation	Initial Total Financial Cost	Financing Opportunities	Ongoing Financial Cost	Direct Financial Return	Indirect Financial Return	Social Benefits	Clarity of standard
			1, 2, or 3	1, 2, or 3	1, 2, or 3	1, 2, or 3	1, 2, or 3	1, 2, or 3	1, 2, or 3	1, 2, or 3	Clear or Unclear
Pollution	Cleaning (3.6.1 Mandatory – all levels)	Use cleaning concent rates and dilution control systems to minimize chemical use, when possible									

Our rankings are standardized on a 1 to 3 scale, with 1 being least desirable, and 3 being most favorable. We thought this would be easier to understand, and would make more sense intuitively, as it followed a simple rule of “bigger is better”. The table above specifies the real-world definition of each ranking per category.

	1	2	3
Positive environmental impact	Low	Medium	High
Ease of implementation	Difficult	Moderate	Easy
Initial financial cost	High	Medium	Low
Financing opportunities	None	Some	Many
Ongoing financial cost (per year)	High (\$200+)	Medium (\$100-200)	Low (\$0-100)
Direct financial return	<50% of initial financial cost	50%-100% of initial financial cost	>100% of initial financial cost
Indirect financial return	None	Some	Many
Social Benefits	None	Some	Many
Clarity of wording	Clear or unclear		

Since the goal of the GRRT project was to help create a better Green Seal restaurant standard, our approach was to analyze each practice specified in GS-46 through the use of our template, in order to identify good practices, areas for improvement, and opportunities for strategic emphasis to obtain maximum gain at minimal cost.

CATEGORY RATIONALE

Positive Environmental Impact determined how large a practice's overall environmental impact was. That is, to what degree did a practice reduce pollution and waste relative to normal operations? "Environmental impact" in this case means the conservation of a resource (energy, water), or the reduction of pollution and waste.

Ease of Implementation rated the non-financial ease in switching from conventional to green practices. A variety of factors were taken into consideration, including disruption of operations, availability of suppliers, and convenience for employees and customers.

Initial Financial Cost (relative to previous practice) measured the size of a practice's initial investment cost relative to the initial investment cost of a conventional practice. We focused on the difference between these two upfront costs to rank a green practice's initial financial cost as relatively large or small. This initial cost was also assessed as a percentage of the restaurant's operating costs, for better context in determining true financial burden.

Financing Opportunities ranked the availability of government grants or rebates that would help alleviate the costs of green initiatives if the particular practice requires financing or incentives.

Ongoing Financial Cost (per annum) weighed any required costs beyond a practice's initial cost, such as maintenance costs. We attempted to take into account things that might not be obvious, like replacement costs.

Direct Financial Return gauged the cost savings and benefits from the practice, such as savings from a lowered energy bill or reduced materials purchasing.

Indirect Financial Return sought to take into account any less immediate and less measurable returns that a restaurant would receive from adopting a practice. These might include increased customer patronage, higher willingness to pay, and publicity.

Social Benefits considered returns to society. In some cases, practices can have a significant and positive environmental impact on society (e.g. reduced pollution) but with little direct or indirect return to the restaurant. In economics terms, these are called externalities since the benefit or cost accrues to those not involved in implementing the practice.

Clarity of Wording evaluated the precision of the description of the green practice, taking into account definitions of pivotal phrases (such as "environmentally preferable") and the rigor of the language used (to prevent loopholes).

Local Engagement explained whether there was a component of the practice that would engage the Chicago community at large. This is important for incorporating local initiatives and civic goals into a Chicago certification.

FOOD AND BEVERAGE

INTRODUCTION

As the Food and Beverage group, our task was to review Section 3.1 (Responsible Food Purchases) of GS-46 and evaluate whether each requirement was appropriate and applicable to Chicago. This evaluation was done using scholarly literature, personal interviews with those involved in the Chicago food business, economic and statistical analysis, and surveys of both consumers and restaurants in Chicago. Using the results of these analyses, we again reviewed the provisions of GS-46 Section 3.1 and developed an individual recommendation for each one. The recommendations below represent our suggestions for modifying the Responsible Food Purchases provisions to make them most appropriate for the Chicago area. We provide detailed comments on local food versus non-local food in our discussion of Section 3.1.7 (Efficiently-Distributed Food), since the issues warrant specific call-out for any new Chicago-specific standard. Keep in mind that our recommendations are preliminary, and much more research is needed in the food and beverage area.

GS-46 SECTIONS 3.1.1 AND 3.1.9: TOTAL FOOD PURCHASES

While we accept the percentages for total food production prescribed in Sections 3.1.1 and 3.1.9 of GS-46, we suggest that alternative requirements might work better for the total food purchases provision. Unlike local food, organic food relies on the USDA standard. The National Organic Program established national guidelines for organic farms across the country. In GS-46, Green Seal currently requires varying percentages of organic or environmentally preferable food for total food purchases (Section 3.1.1): 25% for Bronze certification, 50% for Silver and 80% for Gold. Green Seal also gives half-credit to food that meets similar requirements (80% of organically produced, but not certified, food would count for 40% of the requirement). For Section 3.1.9, an optional provision with the same wording, the requirement is 80% for Silver, 95% for Gold, and there is no Bronze option.

Scholarly and policy-based research provides plenty of evidence that organic food and environmentally preferable food have a lower environmental impact than conventional food. In light of this, organic food should be encouraged; however, the emphasis on organic and sustainable food sourcing should be reconciled with certification recommendations for local food. While local food can also be organic and sustainably produced, it is not always the case, and sourcing organic-certified local food in Chicago can be challenging. According to the USDA, Illinois is one of the largest producers of organic grains, and there are many organic farms in the Midwest. Much of this production becomes impossible in the winter although restaurants have demand year-round. This shortage results in the importation of organic food from across the United States and other countries. Another aspect that challenges the Chicago organic movement is that many local farms are small scale and cannot afford organic certification, even if they are using mostly organic practices. Many farms, such as Slagel Farms, use sustainable practices and sell directly to restaurants but do not seek organic certification due to costs and limited return. These small, often family-run, farms employ environmentally sensitive techniques, but would not receive recognition for their sustainability efforts in the current GS-46 standard for organic foods. Recognizing that organic food is third-party certified and easier to verify, we recommend the development of a protocol for verification of local sustainably produced food, if it is to be further incorporated in the certification standards.

From the results of our two surveys, we discerned certain preferences among Chicagoans. In the consumer survey, Chicago residents responded that they were willing to pay more for local food than organic food. Additionally, respondents to the restaurant survey said it would be easier to buy higher percentages of local food than organic food. This was further corroborated by personal interviews, in which some restaurants expressed a preference for visiting the farm their food came from in order to examine the techniques for themselves. Due to the limited number of respondents to our survey, the availability of local food and the views of restaurateurs warrant further investigation. We have conducted some separate research on the benefits of local versus non-local foods, which we detail in Appendix G but more is needed. While local food does not yet have the economies of scale or market immersion of large-scale non-local food production, it is growing and in the interim, incorporating it into certification can promote the development of a local market. Since we are already experiencing a growing market for local foods, we expect it will continue to be easier to

implement and should continue to be updated in future versions of the certification to reflect market conditions and costs. Additionally, since there still lacks a clear definition of local food and significant research on its environmental impact, we recommend ongoing additional research in these areas for updates of the certification.

In terms of direct financial impact, organic food is more costly than conventional agriculture. Relying on the literature and our analysis of USDA data in Appendix H, organic food is on average 20% more expensive. While these numbers do not include the social cost of conventional agriculture, many restaurants might be limited on how much additional food costs they can sustain.

For Chicago restaurants, organic food might be feasible, and might even make up a substantial portion of total food purchases, but allowing local and sustainably produced foods into certification credit will provide needed flexibility in complying with the food sections of green restaurant certification.

GC-46 SECTION 3.1.3: RESPONSIBLE SEAFOOD PURCHASES

We have three preliminary recommendations for the modification of Section 3.1.3 of GS-46. First, for restaurant purchases, Marine Stewardship Council (MSC) certified products could be emphasized in addition to the Monterey Bay/Shedd Aquarium “Seafood Watch” rating system. Our second recommendation is to be less exclusionary towards restaurants that serve red and orange listed items. Finally, we recommend encouraging membership in local seafood education programs sponsored by organizations such as the Shedd Aquarium (Rite Bite program) and Alliance for the Great Lakes.

Our rationale for these recommendations comes from the following information. Restaurants can have a unique impact on seafood sustainability, since the majority of seafood is eaten outside of the home. Hence, restaurants play a large role in consumption of responsible seafood. By relying on seafood products certified by the MSC, traceability and quality control is ensured. Purchasing certified seafood helps prevent poor fishing methods by limiting demand for products caught in ways that are harmful to the environment as well as biodiversity. Mislabeling is also a significant issue. The MSC is able to certify fisheries, distributors, and restaurants to enforce safe practices and give consumers confidence in purchasing sustainable products. Using the MSC standard could be very useful in the Chicago area, as well as having a large positive environmental impact. However, having an all-or-nothing test limits the incentive for a restaurant to try to fulfill it, as having one seafood item on the “Avoid” list could disqualify them from green certification. A tiered system would allow many more restaurants to participate.

Regardless of the seafood purchases requirement in a new certification standard, education on seafood issues is very important. We recommend that certification acknowledges seafood education programs and community partnerships because the programs provide an effective way to educate restaurant owners, staff, and consumers about the importance of issues such as sustainable seafood harvesting and traceability. Further, GCRC and Green Seal can provide benefits to both restaurants and their partners through promotion and marketing of these community partnerships and outreach efforts.

GS-46 SECTION 3.1.4 RESPONSIBLE COFFEE PURCHASES; BEVERAGE PURCHASES GENERALLY

Based on our analysis of the requirement in Section 3.1.4 of GS-46, we believe the provision is appropriate, although consideration could be given for local coffee roasters and tea companies given the prevalence of companies in Chicago and to reduce environmental impacts from transportation distances. Nevertheless, we have some findings and recommendations related to the broader subject of beverage purchases, and will include those here. We believe that Green Seal should consider broadening Section 3.1.4 to cover responsible beverage purchases appropriately, should specifically address beverages under the optional Socially-Preferable Food Purchases provision (GS-46 Section 3.1.6) or a new provision.

Alcohol is mentioned in GS-46 only in regard to not serving cans or bottles of alcohol. We believe that some consideration ought to be given to the growing industry of organic and bio-dynamic alcohols, as well as the relative merit of domestic versus international alcohols. Green Seal could choose to encourage the purchasing of organic wines to help advance the market. However, in interviews with restaurant owners, we have not

found the sourcing of organic wines to be strongly supported. Another aspect of wine frequently discussed is the relative merits of drinking local, domestic, or international wines. To the extent that eating local food is potentially more sustainable from the perspective of travel distance, one would expect that drinking local wine might be similarly preferable as well. Our preliminary research, however, does not indicate that drinking domestic wines in Chicago is necessarily a more sustainable choice than international wines and recommend additional future research before emphasizing domestic wine in a certification.

In regards to beer, we have two main recommendations. First, that Green Seal encourage restaurants to serve locally-brewed beers by awarding credit towards a beverage requirement or option. Based on tour and visit with Goose Island, we learned that most of the energy used in the production of Goose Island's 312 Beer is in its actual production – as opposed to its transport and refrigeration – the distance travelled during delivery still has an environmental impact. By purchasing primarily from local breweries, Chicago restaurants can significantly reduce that transportation, and therefore reduce carbon emissions for the city. Anecdotally, we find that local breweries are strongly engaged with the community while most domestic breweries engage in water stewardship programs. Further incentive for water conservation could come from increased focus on beer in certification.

Our second preliminary recommendation for Green Seal in regards to beer is applicable to other types of beverages as well. We encourage Green Seal to investigate the environmental impact tradeoffs between restaurant purchases of beverages in aluminum cans and bottles, on the one hand, versus glass bottles, on the other hand. The issues are not clear-cut since aluminum is lighter than glass and, therefore, easier to transport, and aluminum cans generally are recycled at a higher rate than glass bottles, but, it takes more energy to extract aluminum from the ground and manufacture it (Triple Pundit). The type of beverages served at a restaurant is relevant too. For example, restaurants serving mainly “craft” beers may have fewer aluminum can beer options.

A burgeoning industry in sustainable alcohol appears focused on sustainable liquors. Although research on their environmental benefits is currently limited, sustainable liquors could still be encouraged as an optional standard, given that they require organic crops for their creation.

While sustainable beverages might hold a lot of potential for the future, much more research needs to be done. One useful study would be a life-cycle analysis of local beers. The total carbon emissions might be higher for local beer than for larger commercial beers (perhaps related to water usage, space issues, amount of ingredients used). The same might be true for organic alcohol and hard liquor. But, a determination will require more research. Also, once a market has grown for sustainable beverages, it would be useful to re-survey Chicago restaurants and consumers on their preferences. Without this additional information, it would be very hard to know whether restaurants could comply with a new sustainable beverage requirement. Perhaps to incentivize the growth of the market, Chicago restaurants could earn points for innovation by promoting sustainable beverages.

GS-46 SECTION 3.1.5: ANIMAL-BASED PURCHASES OR VEGETARIAN/VEGAN MENU

Section 3.1.5 of GS-46 specifies an optional requirement that expands on Section 3.1.2, which prescribes that either 50% (Silver) or 80% (Gold) of a restaurant's total animal-based food purchases be humanely raised, organic, environmentally preferable, or a combination thereof. Alternatively, a restaurant may instead qualify for Silver certification by completely removing red meat products from its menu, or for Gold certification by completely removing meat or animal-based products and implementing a strictly vegetarian/vegan menu. These suggested green practices appear to us to be generally fair and flexible in terms of implementation, and might even yield moderate financial return that would offset the relatively steep initial financial cost of a switch, as well as generate many social benefits; however, the vegetarian/vegan menu option takes an all-or-nothing approach to certification that we find to be too strict.

The positive environmental impact of removing meat or animal-based products from a menu is undeniable, as a restaurant would no longer be a participant in that market and its environmental issues. Research shows that “on average the complete life cycle environmental impact of non-vegetarian meals may be roughly a factor

1.5–2 higher than the effect of vegetarian meals in which meat has been replaced by vegetable protein” (Reijnders, Soret, 2003).

Given the relatively higher price of sustainably produced animal products compared to their conventionally raised counterparts, reducing the portion size and number of meat items on the menu would help combat their higher cost, making this a relatively frugal option for restaurants. The potential for indirect financial benefit, on the other hand, is moderate. More than 50 percent of people participating in a 2008 VRG poll ordered a dish without meat, poultry or fish sometimes, often, or always (Ginsberg), and nearly half of respondents in our consumer survey expect a restaurant with environmentally-friendly practices to be vegetarian/vegan friendly. Also, based on our assessment of consumer demand data and willingness to pay data, selling organic poultry dishes might even result in moderate financial return. In a case study assessing consumers’ willingness to pay for organic chicken, it was found that consumers are willing to pay a premium of 1.193\$/lb (34.8%) for the general organic label and 3.545 \$/lb (103.5%) for the USDA organic label (Van Loo, 2011). As for health benefits, even without meat, one can still maintain a balanced and nutritional diet through vegetarianism/veganism (Kovacs, 2003), and a recent study published in the Archives of Internal Medicine found that the risk of dying at an early age “rises in step with red-meat consumption” (Harding, 2012).

Ultimately, we recommend that this practice remain optional for restaurants seeking certification, because suggesting that a Chicago restaurant significantly meat or animal-based products is too demanding due to the prevalence of meat is in the eating habits of Chicago restaurant-goers (Mandala Research, 2011). Further, some restaurants may specialize in meat and can provide valuable education on sustainable meat production. We recommend, however, that Green Seal consider restructuring the tiered percentages here, similar to how it treats humanely-raised, organic, or environmentally-preferred food purchases.

GS-46 SECTION 3.1.6: SOCIALLY-PREFERABLE FOOD PURCHASES

Currently, Green Seal encourages the purchasing of “socially-preferable” food items as an optional component of its “Environmental Performance Requirements.” Specifically, it recommends purchasing “Fair Trade” and “Rainforest Alliance” certified goods. We did a preliminary evaluation of these certifications in the context of a Chicago-specific green restaurant certification but without additional information about specific purchases by restaurants cannot make strong recommendations aside from continuing to rely on third-party verified sources and developing a protocol for verification for sustainably produced local foods and beverages.

GS-46 SECTION 3.1.7: EFFICIENTLY-DISTRIBUTED FOOD AND LOCAL FOOD RECOMMENDATION

We believe that the optional requirement contained in Section 3.1.7 of GS-46 is fairly synonymous with a requirement for local food, and hence most of our analysis and recommendations will be centered around the advantages and disadvantages of local food purchasing.

Based on our research, restaurant use of local foods can be preferable to non-local foods from the standpoint of environmental impact and social benefits (Canals, et al. 2008), but this conclusion depends upon several aspects of the food supply chain – the growing, transportation and storage of local foods all affect the analysis (Sims et al. 2007)

Each farm’s specific management behavior appears to be a greater determinant of environmental impact than local vs. non-local (Sims et al. 2007). For example, there is no guarantee that local food is grown without environmentally-harmful fertilizers and pesticides (Canals et al.). Additionally, certain methods by which soil is prepared for farming can release large amounts of greenhouse gases – a direct negative impact on the environment, especially in terms of global warming (Sims et al. 2007) and yet local farms might be using these methods (Canals et al. 2008). A complete life-cycle analysis (LCA) is required for determining growing methods of a particular farmer were actually sustainable (Canals et al. 2008).

Because of this limitation in determining how food is grown, the most important factors when judging the environmental impacts of local food come from the methods used during transportation and storage. It is generally true that the lowest carbon footprints will be associated with eating local produce (Edwards-Jones). Food that must be transported long distances can cause many negative environmental impacts, including

global warming, abiotic depletion, and acidification (Sims et al. 2007). Studies show that while transport is the greatest contributor to environmental impacts, other activities that consume electricity, such as grading, packing and storage, are significant as well (Sims et al. 2007). Food that is shipped by airfreight is overwhelmingly worse in terms of carbon emission and energy usage than any other transport method (Sims et al. 2008). The magnitude of these negative impacts is strongly determined by the origin of the food (local, regional, or global) (Sims et al. 2007), pointing to the dominance of transport impacts in judgments of the eco-friendliness of local food. It seems that reducing the distance from producer to consumer is one of the most effective methods in greening the food trade (Sims et al. 2007).

However, it appears that local food is not always the best choice for the environment (Edwards-Jones 2010; Sims et al. 2007). For example, local food that has been collected from the farm using a motor vehicle can have comparable carbon footprints to non-local food (Edwards-Jones 2010). Storage appears to be the biggest determinant in deciding whether local food is the best choice (Edwards-Jones 2010). Also, when there is complete consumption of local food, much of this food must be stored so that it can be used out of season (Sims et al. 2007). Studies show that produce undergoing long periods of refrigeration have chemical changes and lose nutritional quality (Edwards-Jones 2010). If a local food system could provide high-quality freshly-harvested food throughout the year, then a local food diet might be better for consumers than a non-local food diet (Edwards-Jones 2010). Therefore, if the local food is harvested with low carbon emissions and is served fresh from harvest, then the social benefits include less air pollution (Canals et al. 2008) and more nutritional food content (Edwards-Jones 2010); if not, the assessment changes.

There are other social benefits associated with local food. Local farms are more likely to buy from local businesses, boosting the local economy (Hinrichs 2000), and supporting local produce indirectly allows them to purchase more from local businesses. And, if the local food comes from a direct agricultural marketing, like a farmers market, there are additional social benefits. These markets are a place for increased human connection and create a consistent social location for the community (Hinrichs 2000). Additionally, direct agricultural marketing contributes to the rural farm economy, local tourism, and small business development (Hinrichs 2000).

Based on the complexities around a comparison of local food versus non-local food, we recommend that Green Seal and GCRC further investigate the availability of environmentally-preferable foods and the practices of food producers that supply to Chicago restaurants, in order to determine the extent to which Chicago restaurants should be encouraged to buy local food.

Assuming agreement on some sort of preference for local food over non-local food, at least two issues come up: first, the appropriate definition of “local” and, second, whether and how to take into account seasonality. Regarding the definition of “local”, we recommend that Green Seal conduct additional research. Research shows that transportation accounts for approximately 11% of total greenhouse gas emissions within the entire food production process and that shipping food by air generates ten times as much greenhouse gas as transportation by shipping, and five times as much as shipping by truck (Bon Appetit Management). While there is no general consensus on how “local” is defined, the restaurant survey indicated that a 200-mile radius is feasible for Chicago restaurateurs. Illinois-specific programs such as the Illinois School Nutrition Association have defined local as “food produced in Illinois or any of the contiguous states”. Further research could focus on identifying regional agricultural zones, local food hubs, and the political and geographical dimensions of local food. In this regard, one recommendation is that Green Seal work with the Chicago Metropolitan Agency for Planning so that the certification aligns with their GO TO 2040 local food plan.

With respect to seasonality, we recommend that Green Seal consider creating different requirements for summer and winter, or a weighted seasonal average due to the unique geographic and climate constraints in Chicago. Another option is to put more emphasis on local produce in summer and on local meat in the winter. Based upon interviews with Chicago restaurants Frontera Grill, Girl and the Goat, Province and Uncommon Ground, a 50% target for locally grown produce seems obtainable during the summer growing months with a much lower target in the winter. On the other hand, Mintel Foodservice reported that there is a growing trend toward consumer demand for local food. They found that 57% of restaurant-goers were willing to pay 1-5 %

more for local produce (Mintel Group 2011). Menu items bearing the label “local” have increased 11% over the past year (Mintel Group 2011). Further, study conducted by Leopold Center concluded that the price of in-season food items is relatively similar for locally grown and imported produce. So while additional research is needed to determine the degree of local food sourcing that should be incorporated into the certification based on environmental impact or market push, we believe that local food has a social benefit from community engagement and awareness.

GS-46 SECTION 3.1.10: FOOD INNOVATION

For Section 3.1.10 of GS-46, there was nothing to analyze in terms of particular environmental or financial benefits, as the provision applies to novel eco-friendly ideas and initiatives created by restaurants. It is very suitable to have such an open standard, as it allows restaurants to get credit for special and unique environmentally friendly actions they have done that do not fit into any of the other categories. Helen Cameron’s rooftop garden at Uncommon Ground in Chicago is a perfect example of the type of innovation that deserves credit under Section 3.1.10. It does not fit into any of the other food provisions, and yet it has several important positive environmental and social impacts that support the policies underlying GS-46 as a whole. Specifically, the rooftop garden has a large positive environmental impact, as it reduces carbon emissions (from the produce that would have been transported if the restaurant did not grow it), uses environmentally-friendly energy and water systems (solar panels, drip irrigation, rain barrels, etc.), and avoids environmentally harmful practices like mechanical soil manipulation, creating packaging waste, and hazardous chemicals use (Cameron, 2011 Letter to the GRA). It has also been used to benefit the community, as the rooftop garden is used as a learning tool for schools, students, other like-minded restaurants, and the environmentally-conscious community as a whole (Cameron, 2011 Farm Report). Primarily, it helps raise awareness about the growing and purchasing of healthy, organic, local produce. Accruing all of these environmental benefits was not a simple task. It took a great deal of physical labor, time, planning, construction, and modification of the restaurant building to build the garden. The initial financial cost was extremely high, and the ongoing financial cost to maintain the garden is high as well. In 2011, the total cost of these necessities was \$28,235, while the rooftop garden generated products valued at only \$5,830 (Cameron, 2011 Farm Report), revealing that the restaurant was actually losing money on this innovation. The indirect financial returns did help offset this loss, but they were an incidental result of the innovation. Without Section 3.1.10 (or an equivalent provision), Uncommon Ground’s rooftop garden would not be considered relevant to the restaurant’s certification. Therefore, we recommend keeping Section 3.1.10 as a part of the certification program, to help incentivize such innovations.

We do not believe that Section 3.1.10 needs to be modified to be Chicago-specific as innovation should and will be driven by the local market. However, we suggest that Green Seal try to clarify how it will judge and accredit each different initiative. A standardized form that would allow a restaurant to present a case for why they should be recognized for their actions could make it easier to judge each initiative and provide transparency and clarity to restaurants. The standardized form would be a kind of structured appeal to receive recognition for environmentally friendly ideas and initiatives that the restaurants have invented and implemented. The following sections could be used to organize the form, for clarity and to give them a complete opportunity to argue their case: Positive Environmental Impact, Ease of Implementation, Initial Financial Cost, Ongoing Financial Cost (per year), Direct Financial Return (within 5 years), Indirect Financial Return, and Social Benefits. These are actually some of the very categories that we used to structure the GRRT Matrix. As an example, see the GRRT Matrix rating of Uncommon Ground’s rooftop organic garden.

FOOD GROUP PRELIMINARY RECOMMENDATIONS

Based on our review of the existing GS-46, numerous restaurant visits and interviews (see Appendix H), survey results from restaurants and consumers, and scholarly literature reviews, we have several preliminary recommendations.

1. Define “local” based on regional agricultural zones and scientific evidence of reduced environmental impact from producing and sourcing food from within this defined region. Allow flexibility for accessibility, proximity and distribution networks but maintain rigor of scientific results.

Rationale

There are many working definitions of local in the Chicago region. Restaurant owners perceive the distance to generally 200 miles while consumers include most bordering states. Other organizations like the USDA, Bon Appetit and Family Farmed have general guidelines for local and regional food. A well understood definition will be needed to comply with certification.

2. Recognize seasonal constraints to local food in Chicago

Rationale

Chicago will necessarily have a shorter growing season than other cities. The local food guidelines should be based on seasonality and availability as well as environmental impact (e.g. energy intensity of greenhouse to grow local food). Summer and Winter requirements should be significantly different for produce.

3. Allow flexibility in vegetarian, meat and seafood choices

Rationale

Meat is a preferred item in Chicago diets. In order for certification to appeal to steakhouses and other meat-oriented restaurants as well as vegetarian-centric restaurants, flexibility must be allowed in the requirement to provide vegetarian options. One possibility is to put less emphasis on vegetarian options and more on sustainably and humanely raised meat. In addition, to reconcile seafood purchases with the goal to reduce food miles, emphasis can be placed on Great Lakes fish with more flexibility in seafood rating options.

4. Recognize the growing trend in local beverage production

Rationale

If local food is to be emphasized in a new certification, consider the growing market for local beer, alcohol and locally-roasted coffee and tea. Wine on the other hand is not viable locally and should not likely be emphasized. As stated earlier, additional research is needed to evaluate the relative environmental impacts of producing beverages locally.

5. Consider the market for local food

Rationale

If the goal of the certification is to encourage adoption of green practices not already established as market norms, it is important to understand the market for local food. From our survey results, restaurant owners are already sourcing significant amounts of local food and consumers have identified local foods as a strongly preferred option. In the future, if the market is already providing local foods, the certification can be modified to shift the focus towards less market driven green practices.

6. Reinforce the importance of third-party verified labels

Rationale

Appendix G provides an overview of verified labels. Our consumer survey showed that consumers rely on labels for information regarding health and environment. It is also the case that using verified labels makes certification verification easier for both the certifying body and the certification applicant. However, given new trends in food are rapidly emerging, there are many unverified labels, which may or may not be truthful or fully informative.

For example, there is ample evidence of the reduced environmental impact of organic food production indicating a social benefit that should be encouraged. However, given the increased cost of producing certified organic food, most small scale local farms are not certified organic, even if those farms are using organic practices.

In this case, certification should rely on third-party verified labels if possible and a protocol should be developed to document acceptable options for local food purchasing and other unverified practices.

7. Conduct additional research on environmental impacts of local food production

Rationale

As stated earlier, it is safe to assume that local food sourcing reduces transportation distance and associated pollution. However, there is less known about the energy inputs and environmental impacts of increasing local agricultural production near urban centers with much greater population density. Further, the environmental impacts of distributing local foods in dense population centers must be researched.

DISPOSABLES

INTRODUCTION

GS-46 provisions related to disposable products focus primarily on paper and plastic goods, from menus, to printing practices, to take-out containers. This section presents recommendations for relevant practices based on the research contained within the Disposables, Waste & Pollution section of the GRRT Matrix (Appendix B). They are categorized into language recommendations, take-out container and disposables recommendations, and external printing recommendations.

LANGUAGE RECOMMENDATION

1. Clarify “environmentally-preferable” for disposable products.

Rationale

- Currently, GS-46 provides examples of “Environmentally-Preferable Products” in its Appendix A, which references Green Seal and EcoLogo as certification programs that restaurants can look to for green supplies. These options are limited and do not explain what it means for a product to be “environmentally-preferable.”
- There is potential for Green Seal to distinguish between recycled-content and compostable products (also see recommendation under “Take-out Containers and Disposables” below)

2. Expand the definition of environmentally preferable paper to include FSC-certified paper.

Rationale

- Paper can only be recycled 5-7 times; virgin fibers must be introduced to maintain a high quality grade.
- Current certification does not insure against the use of toxic chemicals in the papermaking process.
- Important to emphasize sustainability – to source from forests that plant trees at an equal or greater rate at which they are cut.
- Based upon comparative studies between the various paper certification processes, FSC (Forest Stewardship Council) has more stringent guidelines for environmental protection (Yale University, 2001). Paper manufacturers are also obliged to complete annual audits.

TAKE-OUT CONTAINERS AND DISPOSABLES RECOMMENDATION

1. Emphasize post-consumer recycled content containers vs. bio-based, compostable containers.

Rationale

- Replacing plastics with biodegradable/compostable containers has the largest potential for positive environmental impact. However, this potential is limited by a reliance on the consumer to ensure that bio-based products enter the appropriate waste management stream (composting) for the benefits to be actualized (Song et al., 2009).
- The value of biodegradable products is reduced if the waste is not composted, although sourcing from renewable rather than fossil fuel resources is an environmental benefit in and of itself.
- Since Chicago does not have a residential composting system or citywide composting infrastructure, certification should emphasize post-consumer recycled-content disposables.

EXTERNAL PRINTING RECOMMENDATION

1. For external printing, include the use of biochemical press washes as a standard practice.

Rationale

- The toxic chemicals in petroleum-based press washes are harmful to workers. They also cause ozone depletion and smog and infiltrate waste water systems (Institute for Local Self-Reliance, 1997).
- Current certification takes into account only waterless lithographic printing processes.
- While biochemical press washes are sold at a slightly higher price than commercial washes, less of the solvent is needed per application and disposal costs are lower since the product is not hazardous.

2. Specify what percentage of ink must be vegetable-based in order for it to be considered environmentally preferable.

Rationale

- A label does not guarantee that the ink is in fact 100% vegetable-based. To carry the SoySeal logo, inks need only be composed of 40% soybean oil for news print black ink, and 30% for news print color ink.
- There is no such thing as pure soy ink. It does not have the consistency to apply pigment to paper by itself, and needs an additive (typically petroleum).
- Recommend further research to determine how much of an effect a given percentage of vegetable-based ink has in lowering VOC emissions.
- Recommend consulting Consolidated Printing to discuss environmentally preferable printing practices (see appendix B).

WASTE

INTRODUCTION

Waste reduction and diversion are the main focus of the provisions pertaining to waste under GS-46. There are many ways in which a restaurant can go about reducing and diverting their waste. Some of the mandatory GS-46 practices, such as composting, solid waste recycling, and grease recycling, attribute to the overall goals of total waste diversion and reduction. While there is a positive environmental impact for taking part in these practices, there are some barriers that are currently holding back restaurants from implementing these practices in Chicago. Below we have outlined our recommendations and rationale for our recommendations that can help to make the GS-46 certification process a more feasible green certification for Chicago-based restaurants.

GREASE RECYCLING RECOMMENDATION

1. The wording of Section 3.4.6 of GS-46 should be improved. Currently, the mandatory practice is only listed as “grease recycling”. Instead, the provision should specify different types of grease - yellow grease, brown grease, animal fat etc.
2. The term “recycling” as mentioned in the section is vague, as different kinds of grease need to be treated differently. Rewording the recycling requirement to make it clearer would make it easier to implement. This would also prevent restaurants from ignoring animal fat and brown grease recycling.

Rationale

- With regard to the kinds of grease produced by restaurants, they can be classified into three kinds: 1) Waste fryer oil, also known as yellow grease, 2) Tallow grease from cooking meat, such as bacon grease or lard, and 3) Interceptor or trap grease, otherwise known as brown grease. Research and the restaurant survey suggest that brown grease and animal fat are not recycled properly. Specifying the kind of grease could ensure that all kinds of grease are recycled.
- Many restaurants do not recycle brown grease or animal fats because of a lack of financial incentives. Since different kinds of grease need to be treated differently, specifying the particular “recycling” practice could be useful. Animal fat could be used as a protein enhancement for livestock and brown grease can be used in sewage treatment plants. These practices should be given attention because of their positive environmental impact and ease of implementation.
- Disposal costs for restaurants are quite high, so grease recycling can result in savings as well as have a positive environmental impact.

TOTAL WASTE AUDIT RECOMMENDATIONS

1. Explain in detail what restaurants have to do in order to execute a proper total waste audit under Section 3.4.2 of GS-46.
2. Make exemptions on tracking for restaurants that do not have control over their waste pickup.
3. Recommend companies for restaurants to hire to conduct their waste audits.

Rationale

- The total waste audit is a crucial step in waste reduction and diversion. Restaurants need to have accurate data on how much waste they are producing in order to accurately assess their waste reduction and diversion plans (Baldwin, 2012).
- Some restaurants in Chicago do not actually have control of their waste pickup services. They rent out space in buildings and the landlord takes care of their waste with the rest of the tenants' waste. This will make it difficult for them to track their waste.
- The total waste audit provisions in GS-46 are necessary, but they are also time consuming. The audits require accurate documentation and a lot of effort from the restaurant owner and staff. Green Seal should try to help restaurants perform the audits with minimal time and expense, by, for example, hiring affordable waste consultant companies.

TOTAL WASTE DIVERSION RECOMMENDATIONS

1. Need to account for the barriers restaurants will have to face in order to reach the waste diversion percentages that GS-46 currently asks for in Section 3.4.4 of GS-46 (Bronze = 40%, Silver = 70%, and Gold = 90%)
2. Need to take into consideration that some restaurants do not control their waste pickup.
3. Recommend Chicago-specific waste diversion requirements.

Rationale

- The amount of waste that restaurants are able to divert depends heavily on their locations and what is available to them. Some waste diversion practices may not be feasible to certain restaurants in certain cities and locations. This is an area in which city-specific requirements should be implemented.
- For restaurants that do not have control over their waste pickup, it will be difficult for them to divert their waste and they may not be able to meet the current GS-46 requirement.
- Despite the barriers, waste diversion is a category that needs to be stressed because it has a great environmental impact. Less waste being sent to landfills means less production of harmful greenhouse gases like CH₄, which have a global-warming potential 25 times greater than that of CO₂ (Lou & Nair, 2009).

TOTAL WASTE REDUCTION RECOMMENDATIONS

1. Clarify how much waste should be reduced and how frequently the reduction needs to take place to meet the requirements under GS-46.
2. Give recommendations for practices that restaurants can take part in to reduce their waste.

Rationale

- The current provision is vague, which is both beneficial and problematic in some ways. The vagueness allows for restaurants to find their own ways to reduce their waste. However, this could be a difficult task for many restaurants because they are not sure what exactly to do or they do not know how to reduce their waste.
- Giving restaurant owners a better idea of how to reduce waste and how much to reduce will give them a better chance of reducing their waste production.
- The easier and clearer this practice can be made the better. There are many things restaurants can implement in order to reduce their waste production. Waste reduction will benefit the environment and should be taken seriously. (Baldwin, 2012; Lou & Nair, 2009)

WASTE PLANNING/MONITORING RECOMMENDATION

1. Include explicit actions for restaurants to undertake as part of their waste reduction plan (e.g. requirements for employee training in best practices like efficient cutting techniques and waste segregation).

Rationale

- To ensure the successful implementation of a restaurant's sustainability plan there should be a standard checklist of planning and monitoring for restaurants to follow. Specific guidelines would be especially helpful, so that restaurant owners and employees are aware of best practices (e.g. skilled cutting techniques, FIFO (first in/first out), etc.) (Baldwin, 2012).
- While it's important to give restaurants the space to make internal decisions, some guidance in this area could be helpful in orienting the direction of the sustainability program. Monitoring is essential for gauging the overall success of the program (LeanPath).

PRE/POST-CONSUMER COMPOSTING RECOMMENDATIONS

1. Keep pre-consumer composting mandatory under the certification standard (high environmental impact).
2. Remain aware of the logistical difficulty and added cost of off-site composting in the Chicago region.
3. Post-consumer composting requires considerably more effort (waste segregation in the front of the house), so it might make more sense to reserve it for the Gold tier or as a bonus option.

Rationale

- Composting is a critical piece of any restaurant's sustainability plan because of the magnitude of its direct environmental impact. Restaurants (on average) produce anywhere from 4 to 20 tons of food waste each month (Data provided by Priscilla Hayes, Environmental Coordinator, Rutgers University, on Oct. 24, 2008).
- Composting this food waste instead of sending it to the landfill translates to 4 to 18 Metric Tons of Carbon Dioxide Equivalent that is reduced (EPA WARM Model).
- Lack of infrastructure is the main setback to large scale composting in in the Chicago area. The relative size and density of the city makes implementation of the more community-based approaches that have worked in other areas infeasible. While incentive programs at the state level (like F-SCRAP – see Appendix B) have subsidized businesses that increase the capacity for food waste composting in Illinois, there are standing legal barriers to composting in the City of Chicago.
- Private establishments are only permitted to compost up to 5 cubic yards of organic food scraps and yard waste at a time, and this compost is only permitted to be used on-site (City of Chicago 7-28-715). Larger composting facilities including Land & Lakes and The Resource Center offer food waste pick-up services, but they operate with a limited fleet of trucks. The higher tipping fees for food waste can often be prohibitive to restaurants. For more information on tipping fee policies see Appendix B.

WASTE PARTNERSHIP RECOMMENDATIONS

1. Include an option for local waste partnerships (composting or on-site waste conversion/processing) in order to help defray costs and foster local engagement.
2. A green restaurant standard for Chicago could consider these future benefits from waste partnerships and reward points to restaurants that initiate economies of scale through partnerships.

Rationale

- While restaurants have the impetus for food scrap composting, it is too costly for most individual restaurants to bear the brunt of these costs on their own, leading to stagnation in the market.
- In order to help build demand for composting infrastructure and food scrap hauling services, like-minded neighboring businesses can partner to split costs. This also helps to create more efficient routes and processing facilities for food scrap pick-ups (AEA Technology, 2007).
- This approach has worked well to create demand and lower costs in the vicinity of the Portland Airport (Rosenbloom). The eight-year net savings to the Port of Portland from this partnership have been \$5,671 (Forst). While this is not a particularly high return, the partnership has dramatically increased the volume of food waste processed, and as time goes on the financial return has been continuously increasing as the economy of scale grows (Forst).
- On-site waste conversion/processing machines suffer a similarly prohibitive cost barrier to restaurants (Schwab).
- These waste conversion/processing appliances typically have a moderate to high environmental impact (high for anaerobic digestion, moderate for food pulping) (Schwab). These practices could potentially benefit from local partnerships, but they might not garner the same widespread interest as composting.

POLLUTION

INTRODUCTION

Pollution reduction is a significant issue facing our society and environment. In regards to Chicago, the Climate Action Plan highlights the city's dedication to reducing emissions and creating a more inhabitable climate for the city. In this section, we will describe four main ways restaurants can decrease pollution: transportation, cooking emissions, cleaning products and pest management.

TRANSPORTATION RECOMMENDATIONS (VENDOR)

1. Revise mandatory vendor policy and code of conduct (GS-46 4.1.2.1 and 3.7.1.1)
2. Work with Family Farmed and the GCRC for development of (food) vendor policies for Chicago

Rationale

- Wording is somewhat ambiguous
- Having both practices together seems redundant
- Family Farmed and GCRC offer "Local Food Procurement Support". That is, Family Farmed should have a good general idea about food vendors in Chicago
- For detailed explanation and examples see Appendix B.

TRANSPORTATION RECOMMENDATIONS (CLIENT INCENTIVES)

1. Acknowledge restaurants for providing bicycle storage.

Rationale

- Bike racks are likely to reduce motor vehicle trips by 1-3%. (Litman, 2011)
- Bike racks are one of the most encouraging ways to get people to bike. This, in turn, produces social benefits such as increased physical activity and subsequent reductions in chronic diseases. (Nezelle, 2010, Bike 2015 Plan and Benefits of Biking: City of Chicago)
- Short distance travels are the worst for pollution because of the cold engine phenomenon (Black, 2011; Reitveld, 2000).
- If more individuals were encouraged to use alternative forms of transportation like bikes for short distance trips, this could lead to a total of 30 tons of VOC (volatile organic compounds) reductions per day (Black, 2011; Reitveld, 2000).
- The initial financial costs are not significant. In addition, the city's Congestion Mitigation and Air Quality (CMAQ) offers financing for bike racks (Chicago Bike Parking, 2008).
- The City of Chicago (Bike 2015 Plan) has a strong vision of making bicycling an integral part of daily life in Chicago. This recommendation would complement the local engagement component with the City of Chicago.

TRANSPORTATION RECOMMENDATIONS (RESTAURANT IMPLEMENTATIONS)

1. Make it mandatory for restaurants to have a non-idling policy. Signs should be posted where delivery trucks/cars would park.
2. Acknowledge restaurants for offering a subsidy to each employee for using public transportation.
3. Acknowledge restaurants for making (some or all) deliveries by foot or bike.

Rationale

- Reducing passenger vehicle idling by 5 minutes per day could reduce emissions by 1.89 tons (Shipchandler, Janssen & Miller, 2008).
- Implementation of non-idling signs is quite easy. The City of Chicago allows businesses to hang their own non-idling signs - as was done by the Shedd Aquarium (Bringham, 2012). In addition, a case study in Chicago showed that the financial cost only includes purchasing a sign, which is about 30 dollars per sign (Idling Reduction Programs).
- Switching from driving to public transit can reduce an individual's carbon emissions by about 4,800 pounds per year (Sustainable Transportation: Transit Chicago).
- Chicago Transit Authority has a Transit Benefit Fare Program that would allow restaurants to support the use of public transportation for employees, which costs little or nothing to provide.
- There is a direct and indirect financial return for restaurants that provide public transportation subsidization. There is a direct tax savings for employers (up to 10% of what employees spend on transit), and public transport subsidization can serve as a recruiting tool for restaurants (Transit Benefit Fare Program).
- A restaurant could avoid 15,600 pounds of CO₂ by having employees switch to biking. This calculation is made assuming that a car travels 25 mpg, gas costs \$4.50 per gallon, daily commute is 80 miles, commute occurs 5 days per week, biker's weight is 130 pounds and bike riding speed is 13 mph. (Savings Calculator for Computing by Bicycle vs Car)
- Restaurant would save over \$8,000 a year by not delivering by car. (Savings Calculator for Computing by Bicycle vs. Car)
- Biking/Walking deliveries should not become mandatory for the implementation is quite difficult. A restaurant needs to consider rerouting deliveries, getting a City of Chicago license for bike deliveries and possibly encountering different insurance payments. (Chicago Bike Laws)

COOKING EMISSIONS RECOMMENDATIONS

1. Clarify the “equivalent emissions control device” that would go with the chain-driven charbroiler.

Rationale

- The description given for such a device is vague; it might be difficult for restaurants to determine which and what kind of emissions control device is ideal or necessary.
- Not all emissions control devices act similarly: certain control devices only allow the release of a certain amount of PM10 and other volatile organic compounds. Clarifying the descriptor would clarify the standard that Green Seal sets for cooking emissions (Bay Area Air Quality Management District (BAAQMD)).
- The BAAQMD mandates that the emissions control device be registered and certified to a certain standard of emissivity. Green Seal could consider also creating a list or table of appropriate emissions control devices that meet its standards (maybe in an appendix (BAAQMD)).
- It may also be helpful to make a distinction between chain-driven charbroilers and under-fired charbroilers, because they do not emit at the same levels (BAAQMD).

2. Clarify the phrase “efficiently designed” when referring to ventilation hood features.

Rationale

- There are a whole host of features available to the ventilation hood, some of which are more expensive than others, and some of which provide more emissions reductions than others (Consortium for Energy Efficiency, 2010).
- Though there are some examples listed, the wording does not indicate whether a restaurant needs to select all of the features or just some of them. This should be clarified to avoid confusion.
- Although this is for the Silver level standard, the Gold level also claims to encompass Silver level features, which makes this important to all who want to implement this practice.
- It may be important to indicate financing opportunities or rebates in the standard itself.

CLEANING RECOMMENDATIONS (SECTION 3.6.1 OF GS-46)

1. The mandatory practice "use durable, reusable cloths and mops" should be strengthened by clarifying the word "durable" – for example, by specifying accepted materials or brands of mops and cloths.
2. Microfiber can be considered one example for the above practice pertaining to mops and cloths.
3. For the requirement of using concentrated cleaners and dilution systems, Green Seal should add "when possible" or some other feasibility qualifier (see rationale below).
4. The accepted labels for "environmentally-preferable" cleaners and hand soaps should be made more explicit, by either listing them within the provision or including a note indicating that more explanation can be found in the appendix to the standard.

Rationale

- There are no certified industry standards for "durable" mops and cloths. While most mops claim to be durable, one restaurant noted that it goes through a mop a week (J. Maimon, personal communication, April 26, 2012). A study by the EPA estimated 55 -500 uses for a cotton loop mop (EPA, 2002). Depending on the number of times used per day, a single mop might last no more than several weeks. While the cost of replacing mops and cloths is "negligible" (J. Maimon, personal communication, April 26, 2012), frequent replacement impacts the environment negatively. If the aim of the practice is to reduce waste from discarded cleaning materials, a clearer definition of "durable" should be included.
- Microfiber mops have a higher initial financial cost than cotton mops, but they also have higher financial, environmental, and social returns. In an EPA report based on a case study of microfiber mops at UC Davis hospital, microfiber mops cost three times as much as cotton mops (EPA, 2002). However, the washing lifetime of microfiber was 500-1000 times, compared to 55-200 of cotton mops, leading to 60% cost savings (EPA, 2002). The study found that switching to microfiber mops reduced chemical and water usage by 95% due to the higher absorbency of the microfiber (EPA, 2002). Bacterial reduction was 99% with microfiber cleaning compared to 30% with wet cotton mop cleaning (EPA, 2002). This led to a 20% labor savings per day (EPA, 2002). While the initial cost was high, the direct returns through chemical and water savings, labor savings, and savings related to durability make microfiber mops a worthy consideration for the GS-46 standard. Limitations of the EPA study come from the location of the case study. Hospitals use more water and chemicals than restaurants to prevent patient contamination. The high percentages of water, chemical and labor reduction may be lower in the restaurant industry. However, the results from the study indicate that the savings associated with microfiber may have relevance in the restaurant industry as well.
- While the flexibility of "when possible" makes the practice more attainable, the ambiguity may lead to confusion. "When possible" leads to the question of when a non-concentrated solution is allowed. Is it when the restaurant cannot find a supplier? When the restaurant does not find it financially feasible or favorable? It may be clearer if "when possible" is replaced with "exceptions will be considered, such as for X, Y, Z". While more research is needed to determine sufficient support for exceptions, a clearer wording can eliminate this ambiguity.
- The use of "environmentally-preferable" does avoid the endorsement of Green Seal's own label. However, listing the accepted labels (Green Seal and Ecologo) in the practice or in a footnote would make the practice more straightforward. Additionally, the endorsement of one's own brand is not explicit for this practice. When compared to the GRA, which gives more points for GRA certified cleaners than other labels, the Green Seal specification that requires either Green Seal or Ecologo certification is relatively fairer.

PEST MANAGEMENT RECOMMENDATION

1. Give extra credit to restaurants that implement Integrated Pest Management (IPM) and are serviced by a third-party verified pest management company (such as GreenShield, EcoWise, Green Pro).

Rationale

- According to the GRRT Restaurant Survey, IPM practices are easier to implement than other green pollution practices.
- Evidence suggests that IPM is comparable in effectiveness and cost to conventional pest management (Kogan, 1998), but reduces pesticide residuals significantly (Williams, 2005).
- Easy identification through third-party verification

FURNISHINGS

INTRODUCTION

Though the interior of a restaurant has a smaller environmental impact than the food, it is still a vital and often overlooked aspect of a restaurant's operation. Chairs, tables, carpets, paints - these elements, in addition to constituting the restaurant's aesthetic, contribute to a restaurant's overall environmental impact. Certain practices - some addressed within Green Seal's GS-46, some not- allow a restaurant to reduce its negative environmental impact while simultaneously saving money. The Furnishings research group reviewed GS-46 and developed the following recommendations on what could be improved or changed.

OPERATION OUT OF AN ENVIRONMENTALLY EFFICIENT BUILDING

1. Recognize Energy Star and LEED certification as an "automatic" amount of credit for GS-46 certification.
2. For educational and adoption purposes, explain the benefits of a "green" building that compensates for the increased cost per square foot.

Rationale

- Operation out of a "green" building will mean the restaurant should have already obtained at the very least some of GS-46's credits for other categories, especially energy and water. Treating this as a separate practice is inefficient - Green Seal should attempt to divide this practice up by "environmentally preferable" standards (i.e. Energy Star, LEED), noting the potential for overlap and rewarding a restaurant accordingly.
- According to research cited on the U.S. Green Building Council website, green buildings reduce energy costs, are better for employee and customer health, and have innumerable environmental benefits.

FORMALDEHYDE FREE FURNITURE

1. In order to be certified under GS-46, a restaurant must use formaldehyde-free furniture (per Section 3.7.6 of GS-46); this is a good practice that does not require changing.
2. List formaldehyde free retailers.
3. For educational and adoption purposes, explain to restaurant owners the benefits of using formaldehyde free furniture.

Rationale

- This is a good practice and is beneficial to both the staff and patrons. Formaldehyde in furniture can release hazardous toxins that pose health risks through the air, including toxins that have been linked to causing cancer.
- A list of retailers and producers that do not use formaldehyde in their furniture products would make this an easier practice for restaurant owners to take part in.
- The formaldehyde-free furniture will on average cost more than furniture that uses formaldehyde. Formaldehyde glue is often used in furniture construction when producers are compressing wood particles together.
- Formaldehyde from furniture has been found to be more hazardous compared to that in flooring. The use of floor heating systems heightens the amount of toxins released from the furniture (Kim).

ENVIRONMENTALLY PREFERABLE AND LOW-EMITTING CARPET RECOMMENDATIONS

1. The requirement contained in Section 3.7.6 of GS-46 should be clarified. It would be beneficial to clarify and provide examples environmentally-preferable or low-emitting carpet.
2. It would also be beneficial to maintain an updated resource list, perhaps through the GCRC environmentally preferable or low-emitting carpet suppliers to facilitate the implementation of this practice.

Rationale

- This is a good practice and is not very difficult for a restaurant owner to implement; it simply requires replacing or installing the environmentally preferable carpet.
- That being said, a restaurant owner may not know which carpets qualify. While retailers do explain if their carpets meet the requirement, it would be extremely beneficial to give a list of carpet providers that are approved by Green Seal.
- Environmentally preferable or low-emitting carpets create a safer environment for patrons and staff because they do not contain toxic glues and therefore do not release toxic gases (Meisel).
- They are easily disposed because many environmentally preferable carpets can be composted when thrown away instead of being put in landfills (Meisel).

PAINT RECOMMENDATIONS

1. Clarify the type of paints that should be used to meet Section 3.7.7 of GS-46.
2. Clarify the amount of volatile organic compounds (VOC) that is permitted.
3. For education and adoption purposes, explain the benefits of using low-VOC paint.
4. Create and maintain a list of low-VOC paints.

Rationale

- Use of environmentally preferable paint will create a safer environment by limiting the hazardous gases and volatile organic compounds that come from paints with high VOC levels that are not green certified (King County).
- VOCs can cause the formation of ozone and photochemical smog, which is harmful to human health (King County).
- Restaurant owners might not know the benefits of using environmentally preferable paints or which types of paints are environmentally preferable.
- This is a practice that is easy to implement, and low-VOC paint is not much more expensive on average compared to regular paint. The only obstacle to high levels of participation is the need to educate restaurant owners.

RECOMMENDATIONS FOR ADDITIONAL PRACTICES

We decided to incorporate practices from both the Green Restaurant Association (GRA) and Leadership in Energy and Environmental Design (LEED) certifications in the GRRT Matrix due to Green Seal's relatively limited treatment of furnishings practices. We recommend that Green Seal consider including in its standards practices related to "sustainable" furnishings & building materials, a definition that includes but is not limited to the use of:

- **Rapidly Renewable Materials & Resources**
Rapidly renewable materials are more sustainable than traditional materials- they can generally be produced over a much shorter time frame, and are in many cases more durable than their traditional counterparts.
- **Recycled Materials & Furnishings**
The use of recyclable content in furniture and furnishings has far less negative impact on the environment than the use of traditional components.
- **FSC Certified Wood**
Wood certified by the Forest Stewardship Council (FSC) comes only from responsibly managed forests. Restaurants that use FSC products don't contribute to destructive and ecologically damaging forestry practices.
- **Salvaged, Reused or Refurbished Materials and/or Furnishings**
The reuse of building materials and furnishings is environmentally preferable for two reasons: first, materials that would otherwise go to waste are utilized, and second, because it means less consumption of newly manufactured materials.
- **Locally Sourced Building Materials**
The use of locally produced building materials cuts down on emissions from transportation.

We found these practices to have a high positive environmental impact without imposing any additional cost (and in some cases potentially saving money), while having a moderate ease of implementation. Though the selection of furnishings made from these types of materials is generally more limited than those that exist on the market, the environmental benefits are such that restaurants that are truly dedicated to becoming "green" should not mind. Green Seal should consider rewarding restaurants that take the initiative to find and use sustainable furnishings and building materials, in order to encourage more restaurants to do so. These practices have been acknowledged in other standards with success, and we recommend their inclusion in Green Seal's as well.

ENERGY

INTRODUCTION

Of all the commercial sectors, food sales and services are the most energy intensive (Baldwin, pg 135). The restaurant industry in the U.S. is responsible for over one-third of energy usage of the entire retail sector (GRA). This means that improving restaurants' energy use can have a huge impact on both the environment and a restaurant's bottom line. Green Seal notes that "Utility costs constitute around 3.5 percent of restaurant sales, so if a restaurant cuts its energy costs by just 20 percent, profits could increase by 30 percent or more" (Baldwin, pg 135). If implemented correctly, many of these energy practices over time will pay for themselves and more while reducing the various types of pollution associated with standard electricity production.

The Energy research group was responsible for analyzing Green Seal's current GS-46 Energy Conservation and Management provisions (Section 3.2) in order to better understand the relative environmental impacts, costs, benefits, and challenges of implementing each specified practice. This was done by dividing the practices into the following sections: Energy Tracking, Renewable Energy Sources, Appliances, and Energy Conservation. First, we identify high and low return practices that could be made mandatory or dropped from the certification, respectively. Then, we note a few clarifications and areas of improvement for GS-46 in the recommendation sections for each energy subcategory.

There are several sections of the appendix that explain this research in greater depth (Appendix C).

HIGH-RETURN PRACTICES:

The following energy practices were identified based on their relatively large environmental impact and financial return within a reasonably short timespan compared to their initial cost. These are practices that should be emphasized in the certification and possibly made mandatory.

- Energy bill monitoring can be implemented through spreadsheets or calculators, such as Energy Star's Portfolio Manager, at no financial cost. Because this can be done at no cost, any amount of financial return is high by default. However, it is important to note that both financial return and environmental impact are indirect measures, because while changes and spikes in the energy bill can be tracked, it requires the implementation of some other practice to actually lead to a decrease in energy.
- A smart thermostat is very easy to implement with low to no initial financial cost. According to the EPA calculator, a smart thermostat has a payback period of under a year, leading to high direct financial return. According to the EPA and Department of Energy, compared to a manual thermostat, a smart thermostat will emit 30,000 pounds less of carbon dioxide over the course of a lifecycle. Installing occupancy sensors may be considered slightly difficult to implement, given the number of labor hours; however, it should not be necessary for a restaurant to shut down during this time. The initial financial cost might be greater than \$2,000; however, the payback period is under half a year. An EPA study shows that occupancy sensors can reduce energy waste by up to 68% and increase energy savings by up to 60%, which is why this is considered a relatively high returns practice.
- Buying renewable energy certificates (RECs) and buying electricity from renewable sources are very easy to implement with little to no initial financial cost. Though they have no direct future financial return, their environmental impact is quite significant in terms of creating demand for cleaner energy sources.
- Energy efficient lighting is easy to implement and can have a high financial return in addition to having a significant environmental impact. LED or CFL lights should be given preference over conventional lights.

LOW RETURN PRACTICES:

The following energy practice was identified based on its relatively low environmental/financial return compared to its implementation costs.

- A yearly energy audit has the same initial and ongoing financial cost, which are both high. According to Andrew Beauchamp at Green Seal, audits are costly and often complicated to implement. It is likely that the first energy audit will have the greatest return on savings, with each year thereafter generating a smaller percentage of savings due to diminishing marginal returns. The financial return depends on the amount of energy that can be saved, and despite significant variation among restaurants, this appears to be low overall.

EXPLANATIONS FOR CONFUSING OR UNEXPECTED PROVISIONS:

Some of the practices specified in Section 3.2 of GS-46 were difficult to understand or counter-intuitive, and therefore worth clarifying in order to make them more accessible and understandable. These include:

- When the expected percentage change in energy bill monitoring is described, it may be clearer to present these expected values as energy units rather than as percentage changes. Restaurant owners have expressed how difficult it is to calculate these percentages.
- For energy appliances, the specific appliances were not mentioned. Simply mentioning “Energy Star” appliances can be vague. We recommend classifying the appliances based on their use and assigning points based on their environmental impact.
- Ratings of initial cost, ongoing financial cost, and direct financial return for renewable energy certificates and electricity from renewable sources were based on low to no initial cost to start the practice but high ongoing financial cost due to per unit payment for kWhs or certificates. It was also assumed that electricity from renewable sources would not be cheaper than regular electricity (Appendix C).

STRENGTHS OF ENERGY PROVISIONS IN GS-46

One practice that the energy subgroup found to be exceptionally good was:

- Energy Innovation Section: The flexibility that this section (Section 3.2.16 of GS-46) gives to restaurants is very important given the difficulty of trying to incorporate every possible beneficial practice into the certification and the natural innovation that occurs within restaurants that understand their own situation best. As restaurant chefs and employees become more knowledgeable and environmentally aware, this optional category should encourage them to develop new ideas and strategies for becoming more sustainable. Our only concerns were providing guidance to a restaurant on ways to earn the optional points (“initiative supporting” one of three goals is vague) and how easy it is to judge initiatives on a case-by-case basis.

ENERGY TRACKING RECOMMENDATIONS

1. It might be important to require an energy audit by a company familiar with green practices before the completion of the certification process to ensure that practices have been properly implemented, and there are no other high return practices unfulfilled.
2. Green Seal may want to combine the section on occupancy sensors with the other lighting related practices.

Rationale

- Restaurants might have improperly implemented mandatory or optional practices.
- If there are practices with high return that have not been applied, it makes sense for the restaurant to adopt them to further green their practices and gain additional points.
- Using an auditor with some knowledge of the concept of green practices will help ensure the restaurant has correctly completed all feasible practices.
- It will be easier for a restaurant to have everything grouped into categories for tracking and documentation purposes.

RENEWABLE ENERGY RECOMMENDATIONS

1. Reduce emphasis on on-site solar photovoltaics and wind turbines.
2. Emphasize solar thermal over other on-site renewables.
3. Emphasize efficiency and energy conservation before renewable energy.
4. Put a greater emphasis on, and do more research about, RECs and electricity from renewable sources.
5. Consider how the 20% requirement in Section 3.2.13 of GS-46 will change as the Green Seal certification changes.

Rationale (see Appendix C for more information)

- The difficulty of implementation, lack of direct return from environmental benefits, and the long payback time of on-site solar PV and wind installations make them unattractive to restaurant owners. Since there are other renewable energy alternatives and energy efficiency and conservation options, this shouldn't be overemphasized.
- A case could be made that solar thermal is a better solution for on-site installations for restaurants. Its efficiency and restaurants' hot water demand make it very effective. Our environmental analysis also suggested that the environmental impact might also be greater than solar photovoltaics. Further research should consider how feasible and effective on-site solar thermal installation is and if it should be more directly encouraged.
- Reducing energy usage through efficiency improvements should come before renewable energy generation or use. Increased efficiency provides equal or more environmental benefits and reduces (instead of increases) restaurant costs after installation with installation costs that are not too high.
- We understand Green Seal has done research to better quantify the limitations of RECs. However, given that RECs are new and still developing, we suggest Green Seal reevaluate their inclusion in its certification. In addition, we argue that for the City of Chicago, RECs and electricity from renewable sources should be rewarded more since:
 - Both eliminate negative externalities of on-site installations in city settings
 - Both are easier for restaurants to implement
 - Both take advantage of returns to scale for larger installations
 - Both optimize natural resources better (sun/wind)
 - Buying these on a yearly basis is cheaper over a reasonable period of time
 - RECs minimize energy loss in transmission and give restaurants more supplier choices to minimize costs
 - Renewable electricity is regional so it has good consumer appeal

The negatives for RECs and renewable energy include:

- their high ongoing financial cost that eventually makes them more expensive than on-site renewables
- price volatility and uncertainty of prices in the developing renewable market
- RECs can have a consumer and local government backlash factor if environmental benefits aren't gained by those locally
- Renewable electricity does lose energy in transmission, which makes it less effective if the particular generation doesn't have increasing returns to scale.
- If a more differentiated tiered certification develops where RECs and electricity from renewable energy sources might be more flexible and accessible, creating different percentages for renewable energy use might be worth considering. For example, 20% of a restaurant's electricity could be generated on-site and it could choose to offset 30% more with RECs.

ENERGY APPLIANCE RECOMMENDATIONS

1. For Energy Efficient (Kitchen) Appliances, it may be important to look at each appliance individually instead of assigning percentages to an entire kitchen, as currently specified in Section 3.2.9 of GS-46.
2. Offer credit for energy efficient televisions, computers, printers and other office equipment.
3. Include energy efficient lighting as a mandatory requirement, because of ease of implementation, high financial return and high environmental impact.
4. Offer incentives for ducting, weather stripping, insulation and not using air conditioners.

Rationale

- Different appliances operate differently, affect the environment differently, and are priced differently (Energy Star).
- In addition, different restaurants have different configurations of appliances. If certain appliances are separated because they do not apply to all restaurants (such as charbroilers), why is this not the case for other appliances under GS-46?
- Percentages are an inappropriate way to organize the provisions on energy efficient appliances, given that appliances operate so differently and their effects can be quantified in more concrete ways.
- Currently, under “energy appliances” Green Seal only acknowledges HVAC and kitchen equipment. However, points should be offered for other energy efficient devices as well. These include office equipment such as computers, printers, and fax machines as well as LED televisions. The list of appliances for which Green Seal should offer credit is based on ease of implementation, financial costs, environmental impact and existing standards by the GRA. A list of specific appliances along with their initial financial cost, ongoing cost, environmental impact, ease of implementation, financial return, indirect financial return as well as their social benefits is provided in the GRRT Certification Matrix Energy Addendum on our website.
- Currently, there is no mention of trying to prevent air conditioners or using fans. However, these could have a substantial impact on the environment. These practices are harder to implement for existing restaurants but not very difficult for new ones.

ENERGY CONSERVATION RECOMMENDATIONS

1. For the expected achievement in EUI necessary for the Energy Conservation Performance standard, Green Seal should lay out the expected values in energy units rather than percentages.
2. For the Conservation Maintenance Checklist, Green Seal should provide more incentives for the restaurant owner to maintain the behavioral standards.

Rationale

- According to Helen Cameron of Uncommon Ground, percentages are extremely difficult to calculate for restaurant owners when dealing with energy.
- Putting energy values in other, more concrete and easily measured units would make it more accessible for restaurant owners to implement because it cuts out the possible confusion that could result from dealing with percentage calculations.
- Laying out the achievements in relation to the national average provided by Energy Star would also save a lot of time for the restaurant owners.
- According to Andrew Beauchamp of Green Seal, it is difficult to uphold these sorts of checklist standards because of the costs and complications involved in auditing. Perhaps Green Seal should reevaluate the effectiveness of this sort of “enforcement” structure of encouraging behavior.
- One of the problems might be the nature of auditing, which has lengthy periods between checkups and the problem of an auditor being unfamiliar with the restaurant.
- The checklist seems very general, and might encounter problems when applied to very specific restaurants or situations.

WATER

INTRODUCTION

Chicago is strategically positioned with access to Lake Michigan and the other Great Lakes, which collectively hold one-fifth of the Earth's fresh water. Although there is so much water nearby, it is our duty to care for this precious resource and ensure that it remains a healthy resource for future generations. The goal of this section is to promote water efficiency and conservation practices in the Chicago food service industry. The water sub-group examined the GS-46's standards concerning water use, and created a list of recommendations informed by our research. Our recommendations focus on tracking and managing water, water conservation, water recycling, and finally water innovation.

WATER MANAGEMENT PLAN, CHECKLIST, TRACKING RECOMMENDATIONS

1. The water management plan requirement in Section 3.3.1 of GS-46 should be defined more specifically. Furthermore, restaurants should be obligated to designate an employee in charge of documenting checklists and tracking water usage.
2. The water management plan requirement should be combined with the water conservation checklist requirement (Section 3.3.3) and the water use tracking requirement (Section 3.3.2).
3. Consider focusing on employee education (Section 4.3) as the vehicle for implementing water conservation goals, instead of utilizing a checklist requirement (Section 3.3.3).
4. Green Seal should consider partnering up with a local organization that will send outreach information on the EPA Energy Star Portfolio Manager to restaurants.

Rationale

- "The operation shall have a water management plan with goals and an action plan for water conservation to meet the goals, documented monitoring of progress against the goals, and an operating plan to support the goals." This management plan requirement, as stated in Section 3.3.1 of GS-46, is ambiguous with regard to assigning responsibility. Restaurants should be required to designate an employee in charge of these tasks (Amy Talbot, CMAP advisor).
- "Documented monitoring of progress" and "operating plan" are both phrases that can be characterized under what occurs in so far as utilizing a checklist and portfolio manager/excel spreadsheet. Combining all these requirements into one under the water management plan requirement will create clarity among obligations in the GS-46.
- Checklists are difficult to regulate and ensure legitimacy.
- It is difficult to uphold checklist standards because of the costs and complications involved in auditing to ensure accountability (Andrew Beauchamp of Green Seal).
- Employee education programs are inexpensive to implement because they can be incorporated into an employee's training period.
- Many restaurant owners are unaware that Energy Star's Portfolio Manager is completely free online. Outreach programs for green infrastructure have been very successful for municipal bodies (Amy Talbot, CMAP, personal communication).

WATER INNOVATION RECOMMENDATIONS

1. Keep this provision (Section 3.3.10 of GS-46) general in its wording in order to promote creative applications in the restaurant setting.
2. As greening a restaurant becomes more common, emphasize this particular option more.

Rationale

- The water innovation provision allows restaurants to receive credit for going above and beyond what is expected.
- Most other green standards do not include this type of provision, so it is a feasible way for Green Seal to differentiate itself as a certification entity.
- This provision has the potential to credit restaurants for creating partnerships with economies of scale (e.g. Restaurants on the same city block can implement green infrastructure changes together on the roofs and divert rain water into their landscapes or rain barrel for use in the future.).

KITCHEN WATER-EFFICIENCY RECOMMENDATIONS

1. Make the option of a 1.28 gpm or less spray valve a requirement for Silver and Bronze level certification, rather than an option, as currently provided in Section 3.3.6 of GS-46.
2. Make the option of a 1.5 gpm or less for kitchen faucet a requirement for Bronze Silver and Gold level certification, rather than an option, as currently provided in Section 3.3.6 of GS-46. Green Seal can keep the 2.2 gpm for kitchen faucets under Bronze level certification.
3. Specify what is meant by an “equivalent” dishwasher or ice maker.

Rationale

- Switching to a 1.28 gpm or less spray valve saves electricity and more than 50, 000 gallons of water per year. (Quick Fact on Pre-Rinse Spray Valves, 2010)
- Valves are very easy to replace and do not require hiring a plumber. (Quick Fact on Pre-Rinse Spray Valves, 2010)
- There is a grant program that provides free high-efficiency pre-rinse spray valves for businesses. (2011 CFS Incentives Guide)
- If a restaurant switches from a 2.0 gpm valve to a 1.28 gpm valve, it can save about \$1517.44 annually from reduced water and heating costs. (Water Calculator)
- Low Ongoing Financial Cost: Valves are easily cleaned. Restaurants do not need to purchase or pay for services to clean them. Also, valves have a lifespan of usually 5 years. (Covered product category: Pre-rinse spray valves, 2012) A 1.5 gpm kitchen faucet decreases water usage by 30%. (Conserving Water)
- It costs a restaurant \$2-5 dollars to install a different kitchen aerator. [H. Cameron, personal communication]
- Faucet and valve changes are the easiest practices for a restaurant to implement. (L. Lukas, personal communication, February, 6, 2012)
- Indirect Financial Return: 44% of consumers say they are likely to make a restaurant choice based on a restaurant’s efforts to conserve energy and water. Thus, highlighting a restaurant’s water saving efforts might expand its consumer base. (Green Seal)
- It would be helpful to specify what is meant by “equivalent” in the Appendix since a restaurant might be unsure if an equivalent necessarily needs to have the same water savings, energy savings or simply by how much (percentage) the appliance should be better in comparison to a standard appliance.

WATER CONTROLS RECOMMENDATION

1. Green Seal should reevaluate the effectiveness of sensor hand and kitchen sinks an option for points (per Section 3.3.7 of GS-46) in addition to other hands-free taps (electric or foot pedal operated).

Rationale

- A report which examined washroom water use for hand-washing and compared infrared sensor-operated faucets with “push top” (cycling) faucets and conventional swivel top faucets showed that infrared sensors on the faucets create water waste when compared to conventional fixtures. (Hills, Birks and McKenzie, 2002)
- Another study that included comparisons between manually operated faucets with sensor-activated faucets was published in 2002 by ASHRAE. While not the main focus of the study, titled “Field Test of a Photovoltaic Water Heater”, the study provided data needed for the comparisons to show that sensor-activated faucets create water waste when compared to conventional fixtures. (Fanney, Dougherty and Richardson, 2002)

WATER CONSERVATION PERFORMANCE RECOMMENDATION

1. Clarify what is meant by a “baseline improvement” in Section 3.3.8 of GS-46.
2. Include possible recommendations on how restaurants can continue improving water conservation performance, such as:
 - Attending Sustainable Backyard Workshops or join their mailing list.
 - Partnering with the Chicago Conservation Corps.
 - Partnering with the Chicago Climate Action Plan to help achieve their goals.

Rationale

- Although Section 3.3.8 references Section 3.3.2 on determining baseline water use, the water conservation test is still not entirely clear. Would improvement over baseline include cost savings or only a percentage improvement in performance? Cost savings would also be difficult to measure if the restaurant has shifted in size or increased in popularity during a specific time frame.
- Also restaurants have noted that they compare the appliances themselves rather than water bills because water bills don’t break down any of the water usage. The “30% water savings” can be the result of the appliance change itself rather than changes in water bills. (L. Lukas, personal communication, February, 6, 2012)
- Sustainable Backyard Workshops are offered by the City of Chicago to encourage water conservation, storm water management and waste reduction. Chicago’s Sustainable Backyard Program has a mailing list, teaches about water efficiency and provides information on discounted rain barrels. (Climate Action Plan)
- By working with the Chicago Conservation Corps, Green Seal can educate community leaders interested in creating green restaurants. Also, many green organizations have partnered with the Chicago Conservation Corps.
- The Chicago Climate Action Plan has an Energy Impact Program Illinois that offers recommendations to restaurants on how to become more environmentally friendly. They are also looking for organizations to link to their website and use their logos/text in their e-newsletters and printed communication tools (GS can encourage restaurants to do this). Also, they have a Green Ribbon Committee which looks for organizations to provide problem solving and thought partnerships.

WATER RECYCLING RECOMMENDATIONS

1. Do not require facility water recycling in addition to rainwater collection for the Gold level certification, as is currently specified in Section 3.3.9 of GS-46.
2. Consider recognizing other stormwater management initiatives supported by the City of Chicago. We recommend making stormwater management an OPTION and allowing restaurants to choose one of the following options to fulfill the requirement:
 - Downspout Disconnection
 - Natural Landscaping
 - Green Roofs
 - Rain Barrels or Cisterns
 - Green Alleys

Rationale

- **Ease of Implementation:** Recycling facility water is exceptionally challenging in Chicago. (Lukas, 2012)
- According to Amy Talbot of CMAP, citizens must obtain a variance from the Illinois Department of Public Health by a formal hearing with the State of Illinois.
- Since recycling is difficult, Green Seal might want to emphasize stormwater management methods.
- There are many local, regional and federal initiatives to facilitate projects such as rain barrels, rain gardens, green roofs, alleyways, and native landscaping in Chicago. There are many outreach sources, and education literature is distributed electronically to municipal and business entities.
- **Social Benefits:** Rainwater collection could reduce incidences of local flooding each year due to severe storms. The combined sewer system occasionally overflows during major storm events, causing sewage to discharge into a body of water, such as Lake Michigan or the Chicago River. Prevention of such flooding is important to minimize the cost of damages as well as to protect water quality for the community. (Anderson and Water Reuse Handbook)
- **Local Engagement:** The City of Chicago has a heavy emphasis on stormwater management. (Metropolitan Reclamation District and City of Chicago: Introduction to Green Design)
- **Local Engagement:** The list of possible ways to manage stormwater was provided by the City of Chicago. The City has an intricate analysis on how each method manages stormwater (City of Chicago: Green Design).
- **Environmental Benefit:** Stormwater runoff from developed land in the City of Chicago causes a number of problems when it is not effectively managed. Excess stormwater can cause basement and street flooding, as well as overflows to the Chicago River and back flows to Lake Michigan that result in beach closings. Where stormwater is discharged directly into waterways, such as the Chicago River, it degrades water quality. Since most runoff in the City is captured by combined sewers and routed to treatment plants, increased runoff raises the cost of wastewater pumping and treatment by the Metropolitan Water Reclamation District. (A Guide to Storm Water Best Management Practices)

LOCAL ENGAGEMENT

INTRODUCTION

The current GS-46 addresses some important aspects of local engagement, such as sourcing local food and researching local options for waste disposal. While we recommend retaining recognition for these practices, we have also dedicated a column in the GRRT Matrix to highlight additional practices that contain a local engagement component. We have also included less quantifiable practices that encompass community programs that support environmental education and awareness and offer a way for restaurants to work on multiple levels to promote general well-being: of the food system, the environment, the community, and the restaurant itself. Our research supports the need for a certification standard that acknowledges community engagement, both as a reward for restaurants currently engaged in these practices and as an incentive for those interested in pursuing outreach and consumer education opportunities. By providing more clarity and detail as to what “community engagement” means, Green Seal hopefully will encourage more restaurants to participate in these types of practices that, while they do not provide quantifiable returns, do generate immeasurable qualitative benefits that extend beyond the restaurant.

CURRENT LOCAL ENGAGEMENT CATEGORIES IN THE GS-46

GS-46 currently addresses local engagement through communication (Section 4.4) and educating the public (Section 4.5). The existing provisions also mandate employee education. However, our group is primarily focused on customer and community interfacing.

The results of our consumer survey validate the existing standards, with 42.8% of respondents finding out that restaurants are engaged in environmentally friendly practices from the dining experience itself, such as menu labeling (see Section 4.4). Thirty-three percent of respondents also found out about a restaurant’s environmentally friendly practices from the restaurant’s website, corroborating Section 4.5. While these figures show effort from the restaurants, there is a significant opportunity for restaurants to use local engagement initiatives to do more to educate and engage their communities.

IDENTIFYING ECO-FRIENDLY OPPORTUNITIES FOR LOCAL ENGAGEMENT

Throughout the course of research that included interviews, consumer surveys and scholarly research, we discovered that there is currently insufficient recognition for restaurants’ practices that generate some local benefit. We also found that a number of other practices under the certification matrix had a local engagement component, including practices for food, disposables, waste management, pollution reduction, furnishings, energy use, and water use. Consequently, we added a “Local Engagement Component” column to the GRRT Matrix. For each practice under the aforementioned certification areas, we indicate whether there is a local engagement component. In our comments we clarify and qualify the elements of the particular practice that incorporate a local impact, and we discuss what restaurants can do to drive the local market for these practices.

Furthermore, we incorporated additional rows in the matrix to delineate specific local engagement practices. These practices include using social media to reach the restaurant’s customer base, hosting educational and community events, engaging in customer interfacing, and using other forms of publicity. We have intentionally kept these categories very broad because we do not want to limit the scope of initiatives potentially recognized as local outreach projects for green certification purposes. Furthermore, our research indicates that providing recognition for local engagement practices will provide additional incentives for restaurants to pursue outreach and consumer education opportunities.

RECOMMENDATIONS

1. Incorporation of Chicago civic goals

The Local Engagement group recommends that Green Seal, through its Chicago-specific green restaurant certification, engage with the City of Chicago and community organizations to better align certification with civic goals. The city of Chicago has launched many local sustainability initiatives in the focus areas of food, energy, water, and community and neighborhood development, amongst others. Chicago is also fortunate to have a strong base of community organizations that target sustainability in these fields. A full list of these programs and their impact in the city is available in the Local Engagement Appendix (Appendix D). It is, however, important to note that many civic programs are in a transition period as these initiatives shift from being managed by Mayor Daley's to Mayor Emanuel's administration. In our interview with Jason Navota of the Chicago Metropolitan Agency for Planning's Green and Healthy Neighborhoods (GHN) Program, he reiterated that the decentralization of the city's sustainability initiatives has made implementing a unified, citywide green program challenging. Consequently, encouraging restaurants to engage with these local sustainability initiatives and to stimulate the market for green products and services in Chicago can create a more integrated approach. Below are a couple of examples of integrating Chicago civic goals:

Energy Practices:

The City of Chicago, through its sustainability goals, places great emphasis on implementing practices tied to renewable energy. Installing solar photovoltaic, solar water heaters, wind energy, and buying energy credits exemplify practices that restaurants can implement and which additionally fall within the city's Climate Action Plan goals.

Water Practices

As the City of Chicago places increasing emphasis on managing stormwater, restaurants can contribute to these goals by recycling water on-site, collecting rainwater, conserving water, and establishing a water management plan.

Furnishing Practices

Restaurants seeking to utilize locally sourced or salvaged building materials in renovation or construction can help direct demand towards businesses specializing in providing these environmentally friendly furnishings. Additionally, Green Seal could recognize restaurants operating out of LEED certified buildings. The LEED standard has already established a relationship with the City of Chicago through which LEED projects receive expedited building permits. Green Seal could help strengthen this partnership.

Food Practices

Green Seal standards could account for Chicago's location and the impact this holds on restaurants' ability to procure sustainable seafood (Section 3.1.3 of GS-46), efficiently-distributed food (Section 3.1.7), and seasonal food (Section 3.1.8). Furthermore, Green Seal could create a real push through its food innovation category (Section 3.1.10) and its support of local agriculture.

Disposables and Waste Practices

Green Seal could leverage the Green Restaurant movement to encourage the City of Chicago to implement a composting infrastructure for commercial entities. In turn, this would help restaurants increase their total waste diversions (3.4.4). Furthermore, Green Seal could build a robust network easing the implementation of grease recycling.

Transportation Practices

Green Seal's transportation practices offer yet another opportunity for restaurants to engage with their local community. By providing secure bike storage, for example, restaurants located in the Loop area could help expand the usage of Chicago's recently installed bicycle lanes.

2. Local Outreach: Community Events and Social Media

Our consumer survey suggests that diners regularly engage with restaurants through Facebook, a restaurant's not-for-profit foundation, and community outreach events. Despite this regular engagement, customers do not generally find out about restaurants' environmentally friendly practices from these avenues. Only 16.2% of respondents stated that they get this information from social media, and the percentages are much lower for community outreach events (5.1%) and for restaurant foundations (3.4%). Thus, this gap represents a great opportunity for restaurants to leverage already patronized initiatives for spreading green practice education and awareness.

Furthermore, if Green Seal wants to encourage its participating restaurants to engage actively through educational events, they could provide a list of resources. Organizations listed could include the following:

- The Edible Schoolyard Project (www.edibleschoolyard.org)
- Chefs Move! to Schools (<http://www.letsmove.gov/chefs-move-schools>)
- Pilot Light (www.pilotlightchefs.org)
- Common Threads (www.commonthreads.org)

3. Engage Through Schools

Engaging with the local community through schools could be a point of interest for restaurants. There are numerous platforms through which restaurants can work with Chicago's civic goals to make a difference in schools.

The Healthy School Campaign for Chicago Public Schools (Montgomery County MD Green Business Certification) defines two food-centric goals: first, focusing on proper nutrition and the implementation of wellness programs and second, encouraging healthy eating through the provision of local, sustainable food.

Restaurants have several options to engage with these schools and there are currently several restaurants working to make a difference in the community. They can contribute to these goals by:

- Catering nutritious food: If the restaurant is physically catering within the school, it can focus on providing more healthful options such as fresh fruits, locally grown vegetables, etc.
- Conducting educational seminars: Restaurants can engage within school communities by helping organize or deliver special programs and educational seminars aimed at promoting the benefits of nutritious eating or benefits of consuming locally grown food.
- Sponsoring Special Events: Restaurants can participate by sponsoring wellness programs.
- Menu Labeling: Restaurants can promote healthy eating by providing nutritional information about food on menus.
- Scholarships and Internships: Restaurants can provide scholarships to sustainability-focused educational institutions such as the Academy for Global Citizenship or those supported by the Frontera Foundation as mentioned by Jeff Maimon from Frontera Grill.

4. Assist Other Businesses

Restaurants can assist other businesses in becoming green as well. First, restaurants are in a unique position to drive demand for environmentally friendly practices and thus can motivate their suppliers to engage in green practices. Second, restaurants can inform, educate, and assist other businesses regarding GS-46 and the opportunities for partnering with restaurants to support green restaurant certification. Other green business certifications, such as the Montgomery County Green Business Certification Program, give credit to restaurants that partake in such peer encouragement. Such a standard is corroborated by the academic literature's causal peer effect, which shows that people are more likely to install sustainable appliances if their neighbors have done so (Bollinger & Gillingham, 2009).

FINANCING AND INCENTIVES

INTRODUCTION

The Finance research group evaluated the financing and incentive possibilities available to encourage restaurants to invest in green and sustainable technologies and other practices. These include local and national financing opportunities for seven main categories: energy, pollution and chemicals, disposables, waste, furnishings, water, and food and beverages. First, we give a breakdown of the needs for, and resources providing, financing and incentive support across these categories. This will be followed by general recommendations that result from our findings.

ENERGY

For a restaurant or other commercial establishment, investment in energy efficiency provides a significant number of points under the GRA or tier upgrades under Green Seal and can substantially decrease the restaurant's energy bills. As a result, investments in Energy Star appliances, energy retrofits, and other energy efficiency measures can provide substantial financial benefits to the restaurant. There are also significant social benefits that result from decreasing consumption of energy. Investing in Energy Star appliances and energy retrofits is very costly, and as a result financing options are necessary in order for this opportunity to be financially feasible for many restaurants. Fortunately, there are many financing options available. Included in the Financing and Incentives appendix (Appendix E) is a complete list of financing options for energy investments, including local and federal tax reimbursement programs, contracting programs that promote energy efficient investments, energy investment grants, and other resources for commercial energy users. These resources should be consulted by restaurants undergoing the certification process, as they can help to significantly reduce the costs of investments.

POLLUTION & CHEMICAL REDUCTION

The need for financing in pollution and chemical reduction initiatives is fairly minimal and is decreasing as technology progresses and the cost of creating more effective products decreases. Within pollution and chemical reduction, certain aspects are abundant in financing opportunities whereas others are lacking; transportation has many financing opportunities as restaurants are able to redeem up to \$13,500 in tax rebates for purchasing hybrid plug-in or electric vehicles and installing a charging station, but financing for green cleaning products, including microfiber mops and grease cleaners, is left up to restaurant alliances and traditional financing options. A combination of significant technological progress and low social benefit from green initiatives in pollution and chemical reduction has made this section a non-critical focus for financing alternatives.

DISPOSABLES

Financing options and incentives to aid restaurants in the purchase of environmentally preferable disposable products do not exist currently, according to our research. Although disposable products are not expensive per unit, restaurants often purchase high volumes of such products and, dependent on type of product and processing costs, the estimated 10% to 50% higher cost of green alternatives may be discouraging for some restaurants. Additionally, while alternative green disposable products provide social benefits, restaurants receive no financial gain. However, measures such as buying in bulk or participating in a co-op program can mitigate these costs. Rather than identifying financing options for environmentally preferable disposables, it might be more efficient to develop some sort of incentive program for the use of restaurant disposables. Other options include encouraging restaurants to offset the additional costs of these disposables by using funds saved from other green initiatives, for example those rendered by energy efficient appliances.

WASTE

The implementation of waste management and reduction practices demonstrates barriers due to initial financial costs. Implementing these waste practices requires significant changes in a restaurant's standard operations. As a consequence, the main cost of implementing green waste practices is the time spent, for example, establishing a waste management and reduction plan, conducting a waste audit, or tracking food donations.

Implementing these waste practices does offer financial returns, although these are not immediate and require the mobilization of a restaurant's resources. For example, conducting a pre-consumer waste reduction plan involves tracking waste. This could be done either by manually tracking waste in a logbook or renting equipment, such as the LeanPath waste tracking system, at the cost of \$200 a week. 2-4% of food purchases could then be reduced, resulting in a financial return offsetting the costs of monitoring food purchases. Another aspect to be considered is the impact of city policies. For example, the Cook County fees for composting are currently higher than landfill fees and thus a poor choice from a financial standpoint. On the other hand, diverting waste through composting holds numerous social benefits. Finally, certain waste practices, such as recycling grease, have low upfront financial costs (in this case \$25 barrels) but save restaurants fees (disposing of the grease). In conclusion, creating financing opportunities would help the implementation of green waste practices.

FURNISHINGS

Financing options for energy-saving building materials is plentiful due to the popularity of energy efficient building materials and the high initial costs of implementing these practices. Investments in permanent building materials such as energy saving windows requires that a restaurant own its individual space, but a restaurant that rents can also gain points by using eco-friendly paint and rugs and buying furniture built from salvaged materials. The costs of implementing less permanent practices are far lower, and as a result the financing options for such practices are minimal. The Energy Policy Act of 2005 addressed many financing issues for building materials and widened the field of financing options for businesses, which can be taken advantage of by restaurants seeking certification. The federal government also offers a flat 30% tax credit for energy-saving appliances and building materials, which is an option that would greatly subsidize the initial costs of transitioning from conventional to green furnishings.

WATER

Financing options for water conservation practices are plentiful in the City of Chicago. Stormwater runoff pollution and flooding have become pressing issues. Sewage and flooding from stormwater has recently convinced the Chicago City Council to raise the prices of water per 1,000 cubic feet. Fortunately, the Green Infrastructure and Clean Water Act has allowed for the implementation of over 40 federal government grants per year for stormwater and other green infrastructure work in Chicago. In terms of establishing a water management plan and checklist, financing is not needed. As for appliances, we assume that consumers would be unlikely to purchase costly appliances in order to fulfill certification criteria. However, Energy Star's website extensively outlines various financing options available among their many partners. Links to Energy Star partners can be found on the Energy Star home page.

FOOD & BEVERAGES

In general, the Food & Beverages provisions of GS-46 pose problems for Chicago restaurants seeking certification because many of the prescribed practices yield low-to-medium financial returns, despite relatively high initial costs, but ultimately have many social benefits related to consumer health and environmental impact. Sustainable food and beverage practices include devoting a certain percentage of total food purchases to procuring organic meat, dairy, and grains, as well as suggesting as an option that 50-75% of total food purchases are seasonal. Unlike for green furnishings and energy improvements, there really aren't many direct financing options for the procurement of sustainable foods and beverages for restaurants, although non-profit green-minded organizations like the Frontera Foundation may indirectly assist by promoting small organic farms in the Chicago area through capital development grants. Perhaps lowering the cost of production of local organic food products in this way could in turn make it less costly for Chicago restaurants to procure them from these local farms, but the returns will vary depending on consumer demand and willingness to pay for certain types of food.

CONSIDERING PRICING AND PRODUCT OFFERINGS

One of our key recommendations is that Green Seal should optimize its pricing structure based on demand from restaurants and its current product offering. In particular, Green Seal should consider the option of certification without the requirement of on-site audit. Of course, such an option would necessarily be contingent on the submission of careful and complete documentation. In addition, Green Seal should consider modifying

its audit requirement by outsourcing audit services to local consultants at a reduced cost to restaurants. Two final options would be charging a lower fee for restaurants that use their own consultants for audits or leveraging technology to allow for a remote auditing process. As the current pricing structure is based on the high cost of the certification process itself, this might open opportunities for more restaurants to pursue Green Seal certification.

RECOMMENDATIONS

There is undeniably a high need for financing in the area of restaurant energy use. According to our research, energy seems to be an area where many institutions have already begun developing innovative strategies for financing, be it through grants, rebates, loans, or tax incentives. Financing options for green building materials overlaps with those of energy. As a result, there are many tax incentives and financing programs for green building materials. Green Seal should direct restaurants towards financing energy options that reward green building materials if the restaurant owners have ownership of the property. Green Seal should provide restaurants with a list of the long-term savings of energy-saving building materials in comparison to the higher upfront cost to illustrate the long-term savings of using these materials.

In regards to financing options for other green practices, our recommendations vary. Financing options for green furnishings and minor green building materials are not needed, because the difference in pricing is too minimal to require loans. Green Seal should provide their clients with a list of the long term savings of energy-saving building materials in comparison to the higher upfront cost to illustrate the long-term savings of using these materials. With regards to water, the most difficult standards to oversee concern behavioral components (i.e. water management plan and checklist). Green Seal could consider working with local organizations to reduce operational costs. Similarly, green waste practices require audits and the implementation of behavioral change, which present significant operational costs. Financing recommendations for food vary by restaurant, due to menu, mission, and volume of food purchased. However, it may be beneficial to connect the GS-46 food standards to a more tailored approach that considers both suppliers and consumer demand.

In order to implement these many recommendations, we suggest that Green Seal develop a financing guide that directs restaurants to potential federal, state and local financing opportunities. This would increase awareness and add significant value to the existing certification process, as restaurants would be able to understand the existing landscape of resources. Such opportunities may reduce the cost of certification significantly, making it more financially feasible. In addition, Green Seal could consider developing a local engagement guide of what organizations or funding bodies (Federal/State grants, Green financing, CCLF, etc.) restaurants can turn to for financing appliances in particular (e.g. for stormwater management systems). Local and municipal governments seem to be initiating many new grant programs, so making restaurant owners aware would be very beneficial. Forming partnerships to reduce financial barriers and informing restaurants of the financing options available to them would increase a restaurant's ability to implement green practices.

CONSUMER RESEARCH IMPLICATIONS

SUMMARY AND RECOMMENDATIONS

The GRRT has conducted significant research about consumer preferences and behavior using a combination of scholarly research and original survey-based data collection. Please refer to Appendix A for a complete review of our consumer research methods and findings. Included here are our primary conclusions and recommendations.

Based on our Conjoint Analysis restaurants should consider the importance of local engagement with regards to green practices. In particular, our conjoint analysis shows that consumers value local food items more than organic food items. In particular, Green Seal should build in the local component into their certification to add value to certification for restaurants through increased revenue benefits.

Based on our Principal Component Regression Analysis restaurants engaged in green practices should target customers that are eco-conscious, in order to exploit the price premium that such consumers are willing to pay. However, contrary to popular belief, such restaurants should not proactively target frequent restaurant goers and food aficionados in order to pay a premium. In fact, such consumers may be less likely to pay a premium at restaurants engaged in green practices.

Based on our Factor Analysis it seems that certification has some effect on consumer awareness about the product. The inconvenience in understanding green practices makes it difficult for consumers to appropriately evaluate practices at restaurants. However, we were not able to find any significant results through our Principal Component analysis. This seems to imply that the overall effect of certification may be ambiguous. What seems certain, however, is the importance of awareness and marketing regarding green practices and overall certification. Thus, Green Seal should work to develop a certification program that considers the consumer-facing component of certification, and partner with organizations that directly interact with restaurant-goers (e.g., Yelp, OpenTable).

Based on our Overall Demographic Analysis restaurants engaged in green practices should continue to target specific demographic groups: namely consumers that are young, female, and affluent. Such demographic characteristics are strongly correlated with consumers' willingness to patronize and pay more at green restaurants.

CONCLUSIONS, RECOMMENDATIONS, AND NEXT STEPS

SUMMARY OF FINDINGS

The GRRT looked extensively into Chicago-specific factors, restaurant and consumer preferences and challenges in the GS-46 standard, all of which we have relayed in this report in an effort to help Green Seal create a better standard. By gathering research from Chicago consumers, we were able to discern on average how much restaurant-goers are willing to pay for green restaurants and discovered that Chicagoans care more about local food than organic food. Furthermore, we found multiple definitions of what constitutes “local,” so we recommend that Green Seal take great care in defining what local food and beverage means. While Green Seal rightly focuses on the huge environmental impact caused by meat, we found that Chicagoans generally eat more meat than consumers in other US cities, so perhaps Green Seal should reevaluate their meat requirements. Through our restaurant survey, we learned which green practices are the most feasible for Chicago green restaurants to implement. Additionally, Green Seal should educate restaurants about the benefits (financial and non-financial) of green certification because many of them are unaware of the positive returns many practices have.

We found that the practices described as “environmentally preferable” are too vague for restaurants to understand, and recommend clearer wording. In regards to which GS-46 practices are most favored, we found that, on the one hand, consumers care most about green practices that they can participate in or visibly see. On the other hand, restaurants find recycling and chemical and pollution reduction practices to be the easiest to implement.

Because GS-46 includes many practices that overlap with other green standards, we recommended that Green Seal review our comparisons between standards in order to minimize the work that restaurants have to do to achieve both certifications. This may encourage restaurants that are already certified in one standard to consider undergoing certification under GS-46 as well or, in the alternative, in the following year. Furthermore, we found that greater incentives for disposables and waste and local engagement practices would be useful in encouraging restaurants to implement practices in these categories. Finally, we recommend that restaurants be rewarded for innovative green ideas so that Chicago restaurants continually strive to make Chicago’s green restaurant environment better.

We have found that green restaurants are a significant and growing part of the Chicago landscape. Therefore, there is significant room for a Chicago-based green restaurant certification standard to impact the restaurant sector.

MAJOR FINDINGS AND RECOMMENDATIONS

As outlined in the Executive Summary and throughout the report, a summary of our main points is below.

1. Seasonal Constraints but Strong Support for Obtaining “Local” Foods in Chicago

We recommend evaluation of local food guidelines for certification. In order to do so, Green Seal must consider the climate and growing season for local food, as well as the definition of local food, which will differ by City. It is also important to consider the market forces at work in local food provision and consumer demand and recognize the role of certification in driving the market, if needed and if a positive environmental impact is demonstrated through additional research.

2. Rainwater Management is Important in Chicago

Given the environmental priorities in Chicago, management of storm and rain water is as important as water conservation. This should be given consideration to the extent that restaurants can affect rain water management and aligned with City programs and goals.

3. Renewable Energy can be Challenging but Energy Efficiency can be Increased

While renewable energy can have a significant and positive environmental impact and generate large social benefits, there is often little direct financial return to restaurants. However, costs can be offset with rebates and grants that are generally available with federal or state funding. On-site renewable installations are extremely challenging for restaurants due to space constraints but renewable energy credits are widely available. Energy efficiency on the other hand is readily available and additional requirements can be made for energy efficiency appliances and practices.

4. Compostable Disposable Products May Currently not be as Beneficial in Chicago

Given the current lack of consumer composting options, it is recommended that the focus in Chicago be on recycled disposable products, while still offering some credit for compostable products in order to drive the demand for composting services. As composting infrastructure and availability continues to grow, the certification can continue to be modified to better fit Chicago-specific waste management practices.

5. Local Policy and Infrastructure Needed for Greening Chicago Restaurants

It is recommended that the GCRC and Green Seal continue to work with the City to integrate green restaurant certification into the City's developing sustainability and food plans. Further, it is recommended that a City-backed incentive program for green restaurant certification, rather than piecemeal individual green practices be created, similar to the existing green permit program for green buildings.

6. Comparatively High Cost and Effort to Implement GS-46

Compared to competitor standards, certification under Green Seal's GS-46 standard is more expensive and thus, harder for small restaurants to implement. Results from the restaurant survey indicate a willingness to pay for the certification of under \$500.

7. Chicago Consumers Support Local Foods and Recycling Efforts

To engage consumers and create awareness around green practices, we recommend that the GCRC and Green Seal continue to provide education and information about the outcomes of green restaurant practices, particularly locally. For example, tying a water conservation practice to Great Lakes stewardship, or demonstrating the reduction in carbon emissions associated with an energy efficiency practice could help consumers understand the results of green restaurant practices.

8. Information, Community Engagement and Incentives are Needed

The restaurant community has a strong opportunity to lead by example in creating awareness about sustainability and food issues. Restaurants in Chicago are engaged with the community and can affect citizen behavior through coordination of green practices with civic goals, outreach through community engagement and the provision of information on menus, websites and in restaurants. We recommend that a local certification reward restaurants for such programs through recognition of local engagement and education.

GENERAL RECOMMENDATIONS FOR A LOCAL STANDARD

In particular, our research has led us to believe that any future Chicago-focused standard should display the following attributes:

- Have clearly-identified goals and targeted restaurant-types for the certification
- Minimize implementation and labor costs for restaurants
- Incorporate local climatic, geographic, legal, and community factors into the certification's requirements
- Award restaurant innovation for new green practices
- Pursue collaboration with outside expert organizations while drafting the certification standard's content and language
- Make all terminology and wording clear for a non-expert
- Exploit the potential of a tiered certification standard to provide product flexibility to a heterogeneous restaurant marketplace
- Accentuate the environmental, financial, and social benefits to restaurants of becoming green-certified
- Strive to educate consumers about green restaurant certification
- Form partnerships (e.g. with Yelp and/or OpenTable) to more effectively market Chicago-specific certification

These recommendations are the distillation of this much longer report, and we encourage Green Seal to investigate this entire report to understand more fully the reasoning behind these recommendations. Nonetheless, we believe these are the core qualities of a successful future Chicago-centric green restaurant standard.

NEXT STEPS

A few GRRT students will be interning for the Green Chicago Restaurant Coalition to testing the GRRT recommendations at several GCRC member restaurants. Working with these restaurants, interns will perform on-site evaluations, create a plan for the revised Green Seal certification standard, and provide assistance in the execution of the certification, including the documentation and reporting process. The internship program will hopefully allow Green Seal to identify ways to reduce the costs of certification in terms of both financial and time investment, by making the data reporting process more efficient and streamlined for the restaurants.

APPENDIX A: CONSUMER RESEARCH AND SURVEY IMPLEMENTATION

1. INFLUENCE OF GREEN RESTAURANT PRACTICES ON CONSUMER PATRONAGE AND WILLINGNESS-TO-PAY

INTRODUCTION

Green and sustainable practices are at the top of mind for restaurant owners. A National Restaurant Association survey of chefs showed that restaurants believed that the top 10 trends for the year would include locally sourced meats and seafood, locally grown produce, sustainability, hyper-local (e.g. restaurant gardens, do your own butchering), sustainable seafood, and farm/estate-branded ingredients. (National Restaurant Association 2011)

2. LITERATURE REVIEW AND HYPOTHESIS

The existing literature suggests that consumers also seem to value green and sustainable practices. A study by Lord, et al. found that most consumers agree that restaurants should engage in nutritionally sound and socially and environmentally responsible practices. (Lord, et. al 2004) Similarly, in a study by Schubert, et. al, 71% of respondents reported that they believe dining in “green” restaurants helps the environment and 70% believe that it is good for restaurants to protect the environment. (Schubert, et. al 2010) In a study focused on McDonald’s in Switzerland, 57% of customers responded that locally grown/raised food is better quality and 67% responded that they prefer locally owned restaurants with local products. (Vieregge, et. al 2010).

While the body of work about consumer responses to green restaurant practices is small, consumer research in related fields may be useful in informing our work on the restaurant industry. Studies of green practices in the food and grocery industry confirm and provide additional insight on the findings within the restaurant industry. Similar to the demographic findings above, Onozaka, et. al examined grocery shopping habits and found that consumers’ valuation of environmental goals are highly correlated with those consumers’ purchase decisions. The authors also concluded that while there is no particular way to target the entire potential market for sustainable foods in a “one size fits all” format, most green claims are valued positively by all the shopper groups, suggesting the potential to market products with these claims in some manner in all food retail venues (Onozaka, et. al, 2011).

Umberger, et. al investigated the demand for natural and regionally produced beef and found that consumers’ income, price sensitivity, and personal consumption motivations matter greatly in predicting consumer demand for regionally produced, natural beef. The authors found that social benefits of consumption (e.g. humane treatment of animals) have a positive effect, but are small in comparison to income and personal consumption motivations (e.g. quality and nutrition) (Umberger, et. al, 2009). A study by Costanigro, et. al on willingness to pay for local and organic apples found that shoppers’ willingness to pay for local apples was 5 times higher than for organic apples. Similar to Umberger, they found that the private benefits of apple consumption (e.g. taste/visual appeal, healthfulness/nutrition, convenience.) greatly outweighed the public benefits of apple consumption (e.g. environmental impact, social fairness, etc.) (Costanigro, et. al, 2011).

In a study of hotels, Kassinis, et. al examined the indirect link between unseen green practices and market performance. The authors found that higher levels of environmental management practices lead to higher levels of customer satisfaction, which lead to higher levels to customer loyalty, which lead to higher levels of market performance. The authors noted that environmental management practices can affect customer satisfaction in two ways: first, through “front office” or customer-facing interactions, and second, through heightened employee satisfaction, retention, and productivity. (Kassinis, et. al, 2003)

2.1 CONSUMER WILLINGNESS-TO-PAY

While consumers generally agree that green restaurant practices are beneficial to the environment, these beliefs do not seem to fully translate into increased patronage or willingness to pay. Dutta, et. al found that, of surveyed Americans, about 50% were willing to pay up to 3% more for “green practices” and only 15% were willing to pay more than 10%. (Dutta, et. al 2008) A study by Lord, et. al found that the likelihood of increased patronage due to green practices is highly variable and consumers are only willing to pay a modest increase in price for these factors – a 1-5% price increase on average. (Lord et. al, 2004) A Mintel market research report suggests that just more than half (57%) of respondents are willing to pay more for local and sustainable; however, the majority of those are only willing to pay 1-5% more. (Mintel 2011) Schubert found that 85% of respondents would pay more for “green” food but only 20% said they would pay more than 10% extra for “green” food. (Schubert, et. al 2010) Vieregge’s McDonalds study yielded the result that only 38% would pay more for local food from a locally owned restaurant and that, of those who would pay extra, most would pay up to 10% more. (Vieregge, et. al 2010).

Hypothesis 1: Consumers value green practices and are willing to pay a premium at restaurants that engage in green practices. However, the premium that consumers are willing to pay is low (less than 5%).

2.2 PREDICTING CONSUMER BEHAVIOR: ATTITUDES, SOCIAL NORMS, AND PAST BEHAVIOR

Ajzen’s Theory of Planned Behavior (TPB) is a psychological theory that provides a productive framework to structure consumer decisions regarding green practices (Ajzen 1991). According to the theory, intentions for a specific behavior is shaped by three considerations: (1) positive or negative evaluation of a specific behavior (*attitudes towards acts*) (2) beliefs about the expectations of others’ beliefs (*subjective norms*), and (3) perceived ease or difficulty at performing the behavior (*perceived behavioral control*). It is assumed that with actual control over a particular behavior, individuals would carry out their intentions, including paying for a good (Ajzen 1996). The diagram below details the theory:

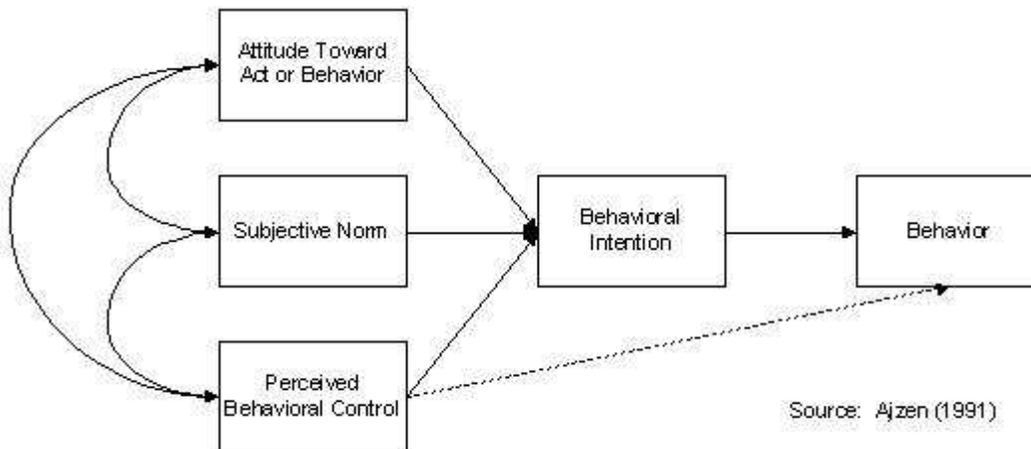


Figure 1

Ajzen and Driver (1992) tested the implications of the theory with regards to Willingness to Pay (WTP) and found that students determining WTP for a leisure activity, applied substantive considerations to WTP, including attitudes, subjective norms, and perceived behavior control.

Ajzen’s Theory of Planned Behavior has important implications for environmental economics and green restaurant practices. The TPB adds a paradigm linking attitude and behavior, which supplements economists’ understanding of preferences between alternatives (*i.e. organic vs. non-organic food*). The theory allows researchers to test the extent that behavior can be predicted by attitudes (*i.e. the effect of environmental concern on WTP*). As such, several contingent-valuation studies use this approach (Cooper, Poe, & Bateman, 2004; Kotchen & Reiling, 2000). With regard to public environmental goods or green restaurant practices, WTP is expected to increase with a more favorable attitude toward paying for such goods, with increasing

social pressure toward paying, and with an increasing perceived behavioral control regarding paying for such goods.

Hypothesis 2: Consumers' prior attitudes, social pressures, and behavioral control towards environmental issues are significant determinants of their patronage of green restaurants and their willingness to pay.

2.3 IMPORTANCE OF DEMOGRAPHIC CHARACTERISTICS

Consumer demographic attributes also play an important role in green restaurant patronage and willingness to pay. Several sources cite income as a significant factor that is positively correlated with willingness to pay for green practices (Dutta, et. al 2008; Hu et. al 2010; Mintel 2011). Level of education has also been found to lead to higher intentions of green restaurant patronage. (Hu, et. al 2010) Existing research also cites age as a factor that influences patronage and willingness to pay. Mintel's report identifies that younger consumers are more likely to be swayed by green restaurant practices and are willing to pay more than their older counterparts (Mintel 2011). Schubert, et. al note that those younger than 35 years old supported the use of organic foods more than their older counterparts. (Schubert, et. al 2010) On the other hand, Hu, et. al, find that, in Taiwan, people in the 41-50 and 51+ year old age groups have the highest intentions of patronage. (Hu, et. al 2010).

Hypothesis 3: Demographic characteristics influence consumers' behavior at restaurants. In particular, consumers that are younger, have a higher income, and higher levels of education are more likely to patronize green restaurants and pay a premium for green practices.

2.4 RELATIVE IMPORTANCE OF GREEN PRACTICES AT RESTAURANTS

Existing research has also examined what green values consumers find most important. Lord, et. al and Mintel both found that consumers especially value the use of recycling and recycled materials. (Jeong & Jang 2010; Lord, et. al 2004; Mintel 2011) Schubert et. al, found that customers ranked reducing energy and water waste first among important "green practices" and ranked "green" donation last. (Schubert, et. al, 2010) Interestingly, Jeong & Jang's study on Starbuck's found that consumers valued food-related practices (such as local and organic offerings) as least important, though valuations of food-related practices had the highest standard deviations, suggesting that in this particular area, consumer heterogeneity is particularly high. (Jeong& Jang 2010) This contradicts Mintel's findings that consumers rank local and organic ingredients just below recycling in importance. (Mintel 2011)

It is important to note that the existing research only examines which values consumers say are most important but does not link these values to increased patronage or willingness to pay, which, as seen above, is not always a connection to be taken for granted. The Mintel research report may shed some light on why green values do not have a particularly large impact on willingness to pay. The survey finds that menu selection, prices, and convenient location far outweigh green and sustainable attributes in restaurant selection. (Mintel 2011)

Hypothesis 4: Consumers value green practices that affect their dining experience the highest, i.e. local and organic foods, recycling. However, consumers' value of green practices is far outweighed by other restaurant characteristics like menu, price, and location.

2.5 ENVIRONMENTAL AWARENESS AND GREEN MARKETING

The existing literature shows that consumers with increased awareness, concern for, and involvement in green practices are more likely to be willing to pay for and patronize green restaurants. (Hu, et. al, 2010; Lord, et. al 2004). Past studies also highlighted the role that awareness and marketing play in the green restaurant industry. A study of customers of a McDonald's serving local food in Brig, Switzerland by Vieregge, et. al showed that consumers believe local foods are better and are willing to pay more for them, but 56% of customers did not know the restaurant was locally owned and 62% did not know the country of origin for the food. The study concluded that marketing efforts to reveal this characteristic of this McDonald's location would increase local and non-local patronage. (Vieregge, et. al, 2007) Jeong & Jang found similar results and concluded that customers' perceived green image of a restaurant are mainly affected by green advertisements rather than customers' perception of actual green practices in the restaurant. The authors also found that green customers can be divided into many smaller sub-sets of consumers with different demands for green practices. The more, they argued, a restaurant knows about its particular customers and to which sub-set they belong, the more it can tailor its green practices to please its customers. (Jeong & Jang, 2010)

Lord, et. al examined awareness of different environmental practices and found that awareness of nutritional, social and environmental practices is relatively high for low-search practices visible on the menu or in the public area of a restaurant but low for high-search practices lacking visible cues on the menu or in the public area of a restaurant. The study concluded that a perceived inconvenience of relevant information acquisition is what leads to these lower levels of awareness. (Lord, et. al, 2004)

Hypothesis 5: Awareness and marketing are key factors in determining consumer behavior at green restaurants. Consumers become aware of green practices through restaurant communications. Consumers that are aware of green practices at restaurants are more likely to patronize green restaurants and pay a price premium.

2.6 IMPACTS OF GREEN PRACTICES AND CERTIFICATION

We did not find any study that examines the effect of green certification within the restaurant industry. However, studies in adjacent industries can be used to proxy consumer behavior at green restaurants. In particular, the existing literature seems to support the idea that formal certification has positive effects on consumer choice and willingness to pay with the caveat that the type of certification matters. In a study on consumption of produce, Ward et. al showed that certifications by all types of agents (farm, retailer, independent third party, state government, and federal government) lead to increased purchasing with no price change and certification by a third party, the state government, and federal government lead to increased purchasing even with a 10% price increase. (Ward, et. al 2004) Similarly, a study by O'Brien and Teisl showed that consumers exhibited increased willingness to pay for certified forest products and that label appearance and information made a difference. (O'Brien & Teisl 2004). Pedersen and Neergaard, on the other hand, found through an examination of labeling in Europe, that the success of certification labels varied depending on the product and "brand" of the label. The authors also found that relevant symbolism of the label image as well as the perceived credibility of the labeling agency could lead to increased sales. (Pedersen & Neergaard 2006) An experiment conducted by Mohr and Webb show the similar result that corporate responsibility ratings have an impact on the evaluation of a company and on purchase intent. (Mohr and Webb 2005) Finally, a study on appliance purchasing carried out by Sammer and Wustenhagen found that European consumers were willing to pay a 30% premium for an 'A' rated washing machine over a 'C' rated machine. The authors also found that consumers were misinformed about energy consumption information and the label served as a way for the consumer to assess this factor. The authors concluded that, given the high premium, consumers saw the label as more than a measure of energy efficiency; the label was also a possible signal of other positive qualities. (Sammer and Wustenhagen 2006)

Hypothesis 6: Certification has a significant effect on consumer choice and willingness to pay. Formal certification should lead to increased consumer patronage and willingness to pay for green practices.

3. CONSUMER SURVEY METHODOLOGY AND ANALYSIS

3.1 SURVEY DESIGN

Our research aimed at conducting a descriptive study of Chicago-based consumers in terms of their perception of green practices and the impacts that green practices and green certification have on their patronage of restaurants and willingness to pay. To acquire the primary data, we developed a survey of Chicago-based consumers. We collected data over a three-day through an online panel using the survey-firm SurveyMonkey. An online panel was used in order to acquire a fairly representative sample in a short period of time.

3.2 SURVEY QUESTIONNAIRE

The survey questionnaire, which was adapted from our earlier studies, was divided into five parts. The first part measured dining characteristics, including types of restaurants patronized, frequency of patronage, and average amount of spending at restaurants per visit. The second part measured the environmental concern of consumers, their knowledge of environmental issues and green restaurant practices. The third part measured the behaviors of respondents toward the environment with five questions asking whether consumers engaged in particular green-friendly behaviors. The fourth part explored consumers' willingness to pay, through six questions used for a conjoint study, and specific questions to gauge the premium consumers expect and are willing to pay at restaurants engaged in green practices. The fifth part measured demographic characteristics of age, gender, education, and income. A pilot test was conducted with a small sample to test for the reliability of the instrument during Winter Quarter using a sample of n=91 respondents, some from the University of Chicago campus and others who were young professionals in urban cities.

3.3 DESCRIPTIVE CHARACTERISTICS

We sampled n=321 consumers from the Chicago area.

3.4 WILLINGNESS TO PAY

To gauge overall willingness to pay, we asked consumers to self-report the premium they would pay at a green restaurant. Specifically, we asked, "How much more are you willing to pay at a restaurant that engages in environmentally-friendly practices compared to a restaurant that does not?" We found, as the median response, that Chicago consumers are willing to pay 4 – 6% more for organic ingredients. We further segmented by various demographics.

Willingness to Pay by Demographic

	0%	1-6%	7-12%	> 13%
Gender				
Male	19%	48%	25%	8%
Female	13%	47%	27%	14%
Age				
18 – 29	8%	48%	23%	23%
30 – 44	11%	48%	27%	14%
45 – 60	18%	51%	25%	5%
>60	24%	39%	27%	10%
Income				
\$0 - \$24,999	11%	27%	6%	6%
\$25,000 - \$49,999	8%	25%	13%	5%
\$50,000 - \$74,999	11%	23%	13%	4%
\$75,000 - \$99,999	7%	23%	17%	3%
\$100,000 - \$124,999	10%	28%	8%	5%
\$125,000 or more	4%	20%	17%	8%
Education				
Less than high school degree	0%	8%	0%	0%
High school degree	14%	18%	4%	4%
Some college	13%	28%	13%	3%
Associate or bachelor degree	7%	33%	19%	8%
Graduate degree	8%	28%	21%	10%

Figure 2

Our results are consistent with the general academic literature (Hu 2010). The main difference is in education - Chicago consumers with a graduate degree tend to be more skewed on the higher end of higher willingness to pay. Furthermore when we look at our behavioral segmentations we found that consumers who are more engaged with environmental issues are more likely to have a higher willingness to pay.

3.5 FACTOR ANALYSIS

In order to initially understand the variation in the data, we conducted a factor analysis with six factors. Each factor groups variables that are highly correlated in order to explain the variation in the data. Using the “varimax” rotation, we set the analysis so that none of the factors were correlated with each other. Indeed, each factor explains variation in the data that is not explained by the other factors.

Plotting the first two factors, we can see that attitudes towards, knowledge of and behavior relating to “environmental practices” group together. All of these characteristics seem to load heavily on Factor 1. This follows from Azjen’s Theory of Planned Behavior. Attitudes, Knowledge and Behavior are interrelated factors that determine behavior.

In addition, the average amount spent on meals (indicated by the variables “Breakfast”, “Lunch”, and “Dinner”) loads high on Factor 2. This corresponds to basic microeconomic theory. Consumer decisions are subject to budget constraints, and those with lower incomes will tend to spend, on average, less when dining out. Finally, it is interesting to note that certain attitudes towards Restaurant Practices load very closely to each other, in particular Consumer Attitudes towards electricity and water conservation at restaurants and waste management.

If we examine the relationship between Factors 3 and 4, we see that variables relating to frequent restaurant goers are related to one another. We see that those that purchase food out often also tend to go often to fast food and fast casual restaurants. In addition, relating to certification and labeling tend to load together (i.e. “USDA Certification”, “Impact_GCR”, “Label_Trust”). This seems to confirm the theory behind Hypothesis 6. There tends to be a trust factor behind environmental purchases. This trust factor is relatively comparable across different products, be it USDA certification, restaurant labeling, or the impact of green certification at restaurants.

Finally, in the plot of Factors 5 and 6, we can see that there is grouping of variables that load heavily on Factor 5 that correspond to the traditional restaurant experience, i.e. menu, ambiance, and informed staff. It is important to note that these variables are not also grouped with other more environmental-related variables like organic or local food.

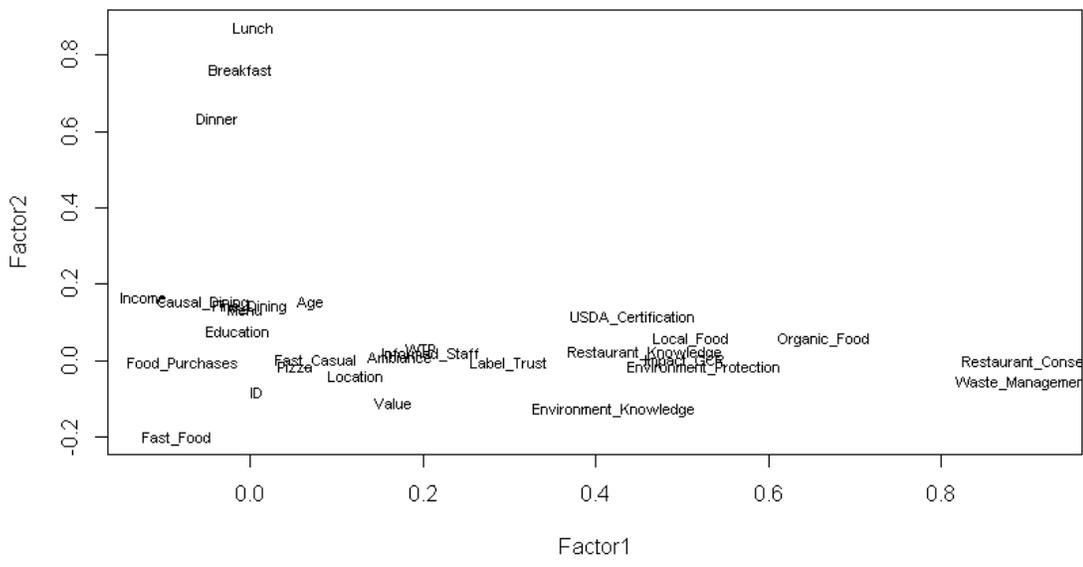


Figure 3

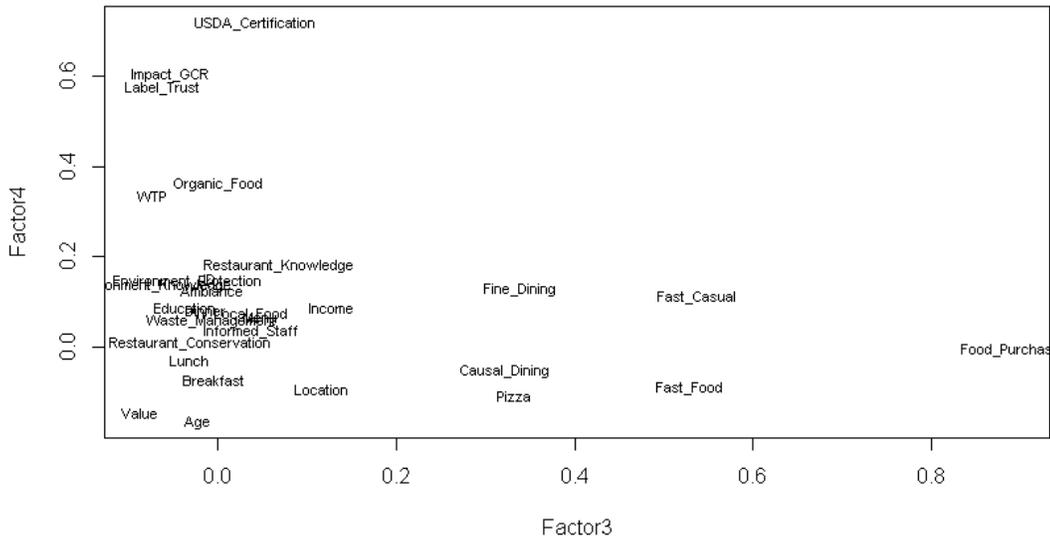


Figure 4

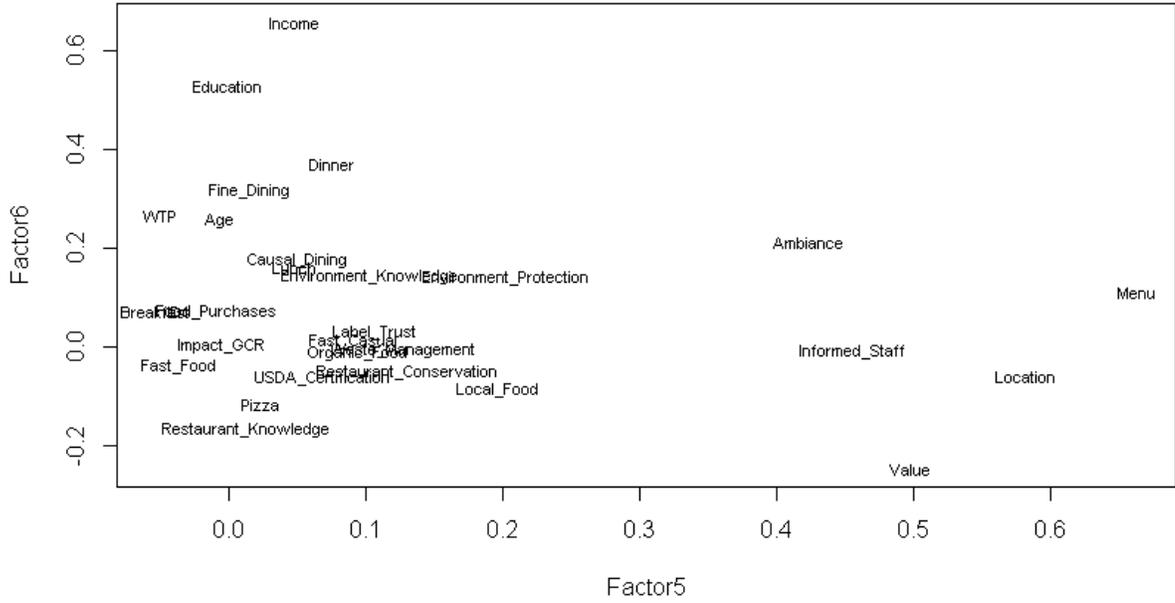


Figure 5

A table that explains the correlations between the factors and the variables are provided below. Each cell lies at the intersection between one variable and factor. For variables with high correlations, the relationship is shown through the table. In addition, the table explains that the six factors account for 42% of the total variation within the data.

Correlations between factors and variables						
	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
Organic_Food	0.66			0.36		
Local_Food	0.51					
Waste_Management	0.89					
Restaurant_Conservation	0.92					
Environment_Protection	0.53					
Breakfast		0.76				
Lunch		0.87				
Dinner		0.64				0.37
Fast_Food			0.53			
Fast_Casual			0.54			
Food_Purchases			0.89			
Impact_GCR	0.5			0.6		
USDA_Certification	0.44			0.72		
Label_Trust	0.3			0.57		
Menu					0.66	
Location					0.58	
Income						0.66
Education						0.53
ID						
Pizza			0.33			
Causal_Dining			0.32			
Fine_Dining			0.34			0.32
Informed_Staff					0.46	
Value					0.5	
Ambiance					0.42	
Environment_Knowledge	0.42					
Restaurant_Knowledge	0.46					
	5.63	2.27	2.95	2.25	2.62	1.88
	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
SS loadings	3.76	1.97	1.77	1.72	1.59	1.39
Proportion Var	0.13	0.07	0.06	0.06	0.05	0.05
Cumulative Var	0.13	0.2	0.26	0.32	0.37	0.42

Figure 6

3.6 PRINCIPAL COMPONENT ANALYSIS

In order to further uncover the drivers behind the variation in our survey data, we ran a principal component analysis on all the continuous variables in the dataset. We first normalized all the variables (mean=0 and standard deviation=1). Thus, each of the Principal Component scores corresponds to the correlation between the variable and the Principal Component. A rotated matrix of the Principal Component Scores is provided below.

Principal Component Scores						
	PC1	PC2	PC3	PC4	PC5	PC6
Fast_Food	(0.07814)	0.05541	(0.40970)	0.16535	(0.00102)	0.02569
Fast_Casual	0.06093	(0.07922)	(0.37941)	0.15919	(0.04352)	(0.02807)
Pizza	(0.01240)	0.01529	(0.33884)	0.04908	0.29058	(0.09866)
Causal_Dining	(0.02971)	(0.21129)	(0.26908)	0.05618	0.09831	0.08595
Fine_Dining	0.03852	(0.27334)	(0.20164)	0.14841	(0.01245)	0.02736
Food_Purchases	(0.04399)	(0.12296)	(0.48264)	0.19946	0.05456	(0.00458)
Breakfast	(0.01098)	(0.36725)	0.13155	(0.11541)	0.35586	(0.12240)
Lunch	0.01556	(0.41859)	0.13239	(0.13730)	0.27576	(0.11332)
Dinner	0.02561	(0.44691)	0.10910	(0.08995)	0.12707	(0.07447)
Menu	0.10267	(0.14503)	(0.14687)	(0.36975)	(0.25349)	(0.12119)
Informed_Staff	0.16042	(0.03171)	(0.12798)	(0.33749)	(0.06905)	(0.22085)
Value	0.10108	0.17613	(0.10293)	(0.42107)	(0.06839)	0.08426
Ambiance	0.16241	(0.12403)	(0.08393)	(0.23190)	(0.29221)	(0.17414)
Location	0.10970	0.01785	(0.28113)	(0.34789)	(0.12445)	0.08218
Organic_Food	0.34336	(0.00853)	0.02255	0.09557	0.08036	(0.10013)
Local_Food	0.25555	0.02505	(0.06492)	(0.10797)	0.18871	(0.09148)
Waste_Management	0.35478	0.08208	(0.02976)	(0.00583)	0.12984	0.09629
Restaurant_Conservation	0.35689	0.07892	(0.00698)	(0.04090)	0.17508	0.09386
Environment_Protection	0.28213	(0.01081)	(0.00787)	(0.01345)	(0.05361)	0.27505
Environment_Knowledge	0.23497	0.03607	0.03610	0.02559	(0.00652)	0.48201
Restaurant_Knowledge	0.23634	0.07417	(0.02529)	0.08008	0.28533	0.14005
WTP	0.14568	(0.12682)	0.13555	0.21689	(0.30443)	(0.08792)
Impact_GCR	0.30865	(0.00093)	0.09027	0.22972	(0.08672)	(0.13526)
USDA_Certification	0.30990	(0.05328)	0.03802	0.21049	(0.02660)	(0.19870)
Label_Trust	0.24398	(0.03370)	0.05298	0.18395	(0.17490)	(0.23052)
Age	0.00230	(0.17688)	0.05565	(0.12605)	0.14460	0.46692
Income	(0.01944)	(0.36389)	(0.04443)	0.06824	(0.27444)	0.16756
Education	0.01635	(0.27021)	0.05017	0.09335	(0.32532)	0.33293

Figure 7

In order to determine the number of principal components, we used two general rules of thumb. First, we examined the graph of the variances and the percentage of variation explained by each principal component. We determined that the variance tended to level off at around principal component 4 or 5. This corresponds to our initial factor analysis. We then appealed to the interpretability condition, namely that we wanted to keep the principal components that we could interpret, so that we could make inferential claims about our survey data. We were able to interpret 4 of our principal components.

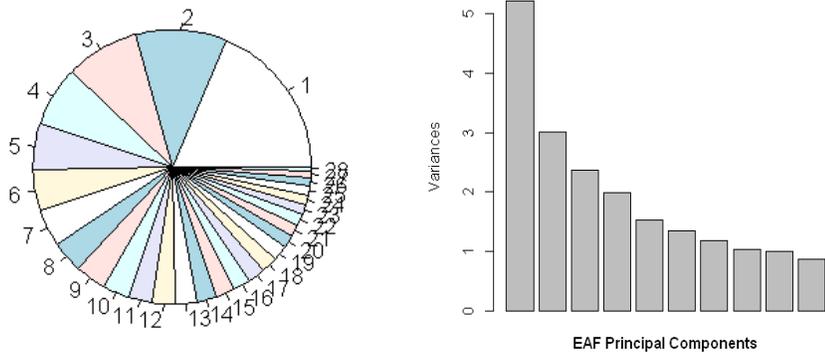


Figure 8

Principal Component 1 explains a significant amount of the variation (18%). Similar to Factor 1 of the Factor Analysis, Principal Component 1 loads heavily on attitudes, knowledge, and past behavior relating to green practices. We see that as the z-score of Principal Component 1 increases, there is an increase in ratings with regards to attitudes and knowledge toward the environment overall (i.e. Environmental Concern, Environmental Knowledge, and Restaurant Knowledge); attitudes relating to green practices at restaurants (i.e. Water and Electricity Conservation, Waste Management, and Organic Waste); and green-friendly consumer practices (i.e. Buying Environmental Products and Local Groceries). Overall, we can interpret Principal Component 1 as **eco-consciousness**.

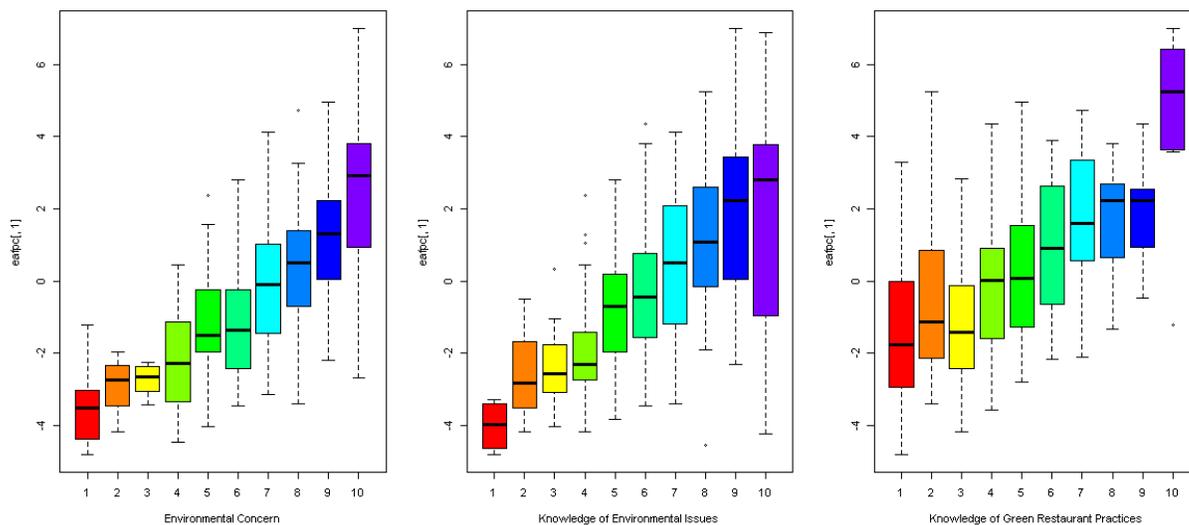


Figure 9

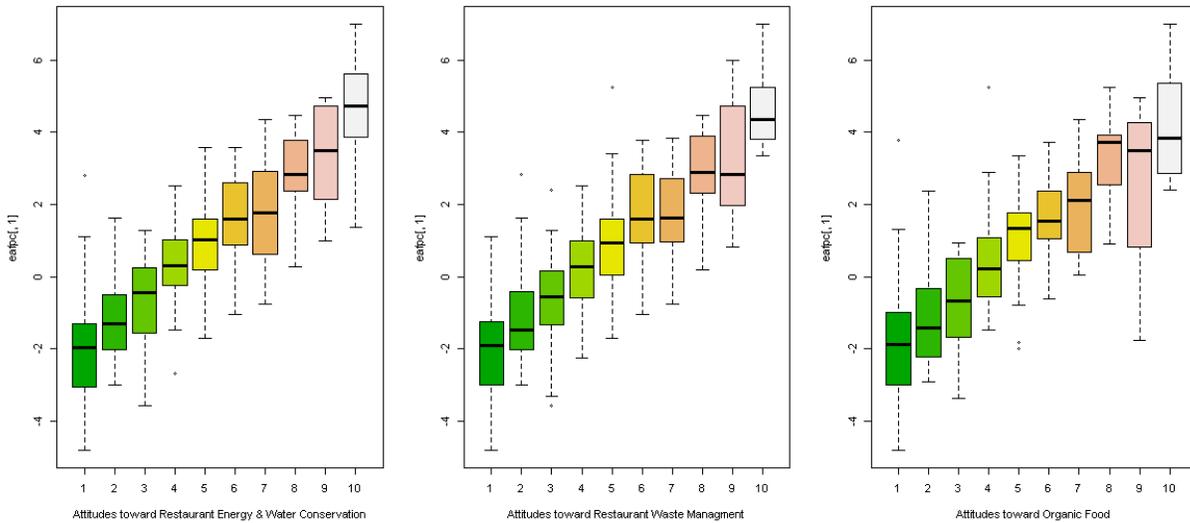


Figure 10

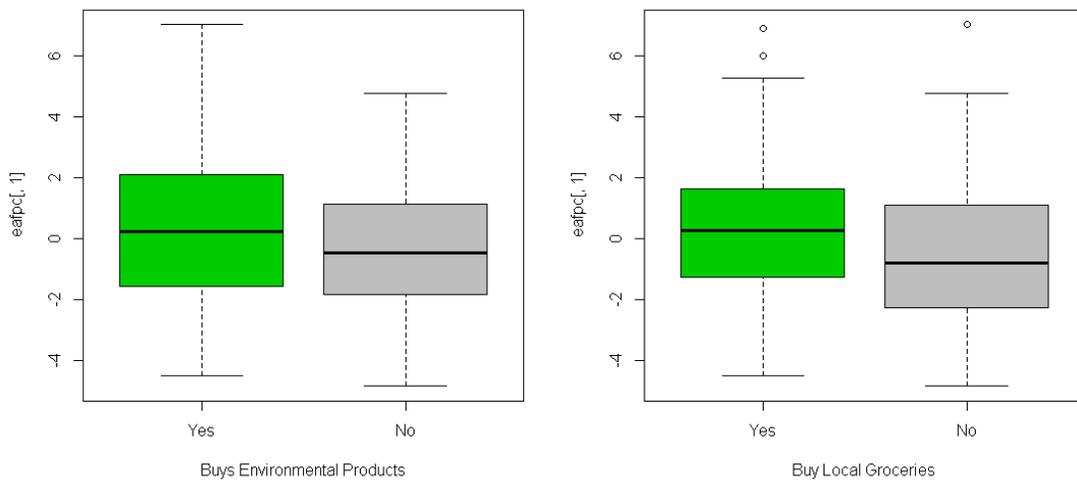


Figure 11

Principal Component 2 also explains a significant amount of the variation in the Survey Data (10%). Examining the loadings we see that average amount spent on meals and income are highly negative terms with regards to PC2. In addition, we see that more expensive food options (i.e. Casual and Fine Dining) load more negatively than cheaper alternatives (i.e. Fast Food). This seems to imply that Principal Component 2 explains **price-sensitivity**. Two box-plots of Principal Component 2 with respect to Income and Average Amount Spent at Dinner are provided below.

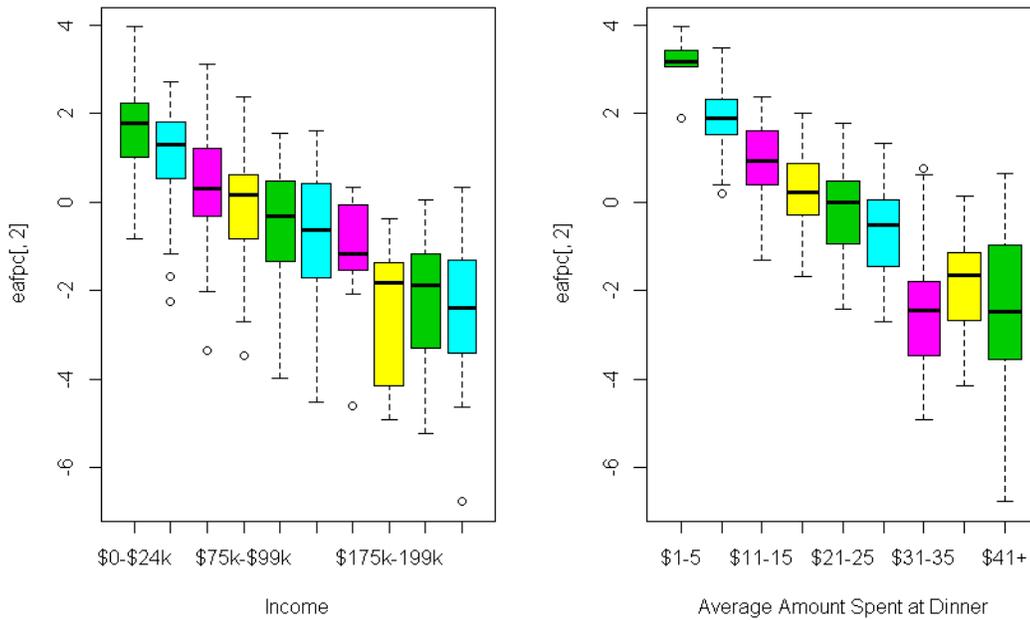


Figure 12
 Principal Component 3 seems to be linked to Frequency of Restaurant Visits. In particular, it seems that increased frequency of visiting restaurants and fast food restaurants yields a more negative value for Principal Component 3. Technically, Principal Component 3 corresponds to how *infrequently* a consumer visits a restaurant. However, it is much more intuitive to understand the data through **frequency of restaurant visits**. Thus, we plot (-Principal Component 3) on both Fast Food Visits and Restaurant Visits below.

Whereas the first three principal components seem to correspond highly with the Factor Analysis, Principal Component 4 seems to be related to Factor 5. The variables that load heavily on Principal Component 4 are linked to the traditional restaurant experience. For interpretative ease, we invert Principal Component 4 in the graph below, similar to our procedure for Principal Component 3. We can group the variables that are related to Principal Component 4 (i.e. menu, ambiance, informed staff), as a **“foodie factor”**.

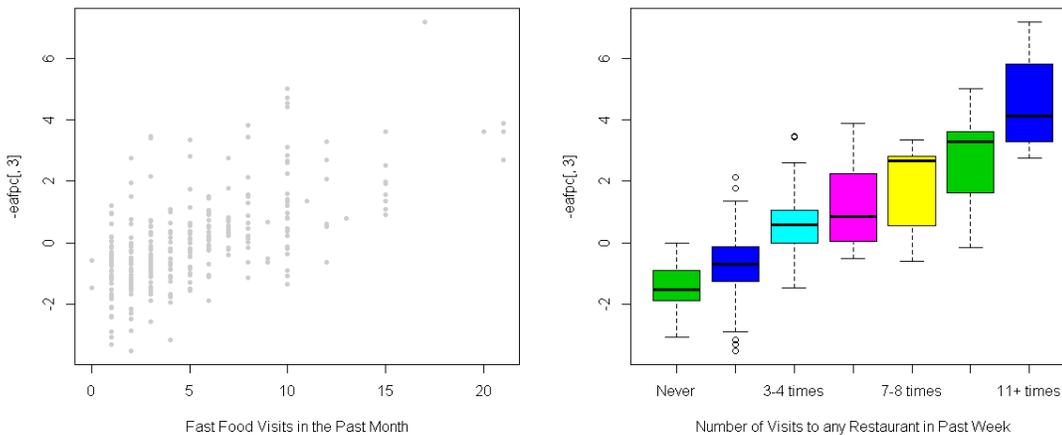


Figure 13

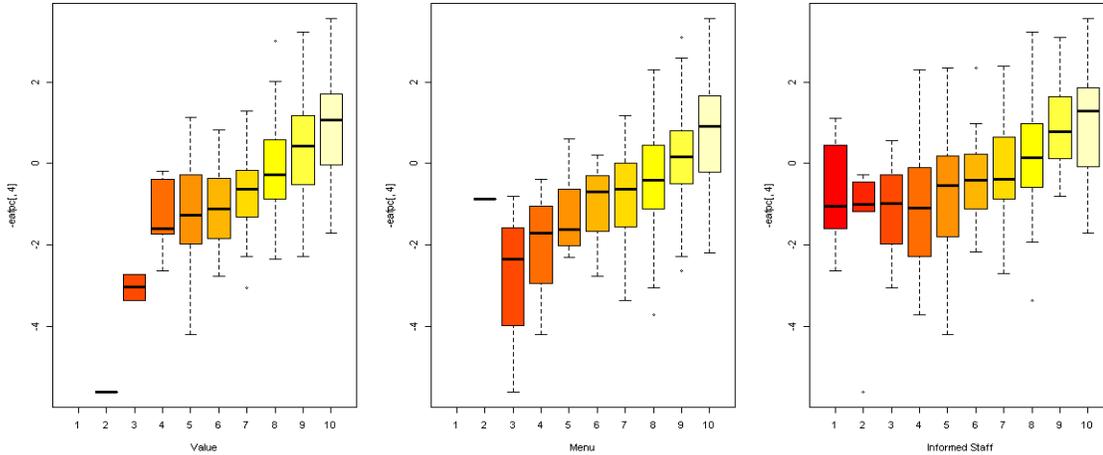


Figure 14

3.7 PRINCIPAL COMPONENT REGRESSION

After interpreting the first four Principal Components, we constructed two binary dependent variables:

- 1) **“Willing-to-Pay Some More”**, defined as consumers willing to pay >3% for green restaurants based on our key willingness-to-pay question (see *Section 3.4*)
- 2) **“Willing-to-Pay Much More”**, defined as consumers willing to pay >6% for green restaurants based on our willingness-to-pay question.

We ran a logistic regression of the Principal Components on both binary dependent variables. In particular, a basic plot of both variables on Principal Components 1 to 4 shows that there are significant differences in whether consumers are willing to pay more for restaurants with green practices, given their eco-consciousness, price-sensitivity, dine-out frequency, and foodie factor scores.

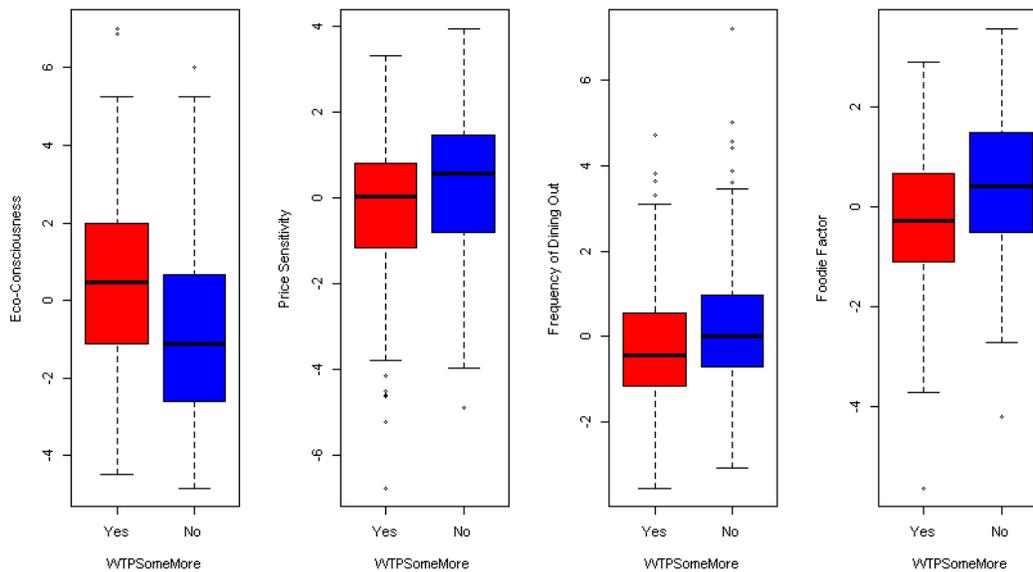


Figure 15

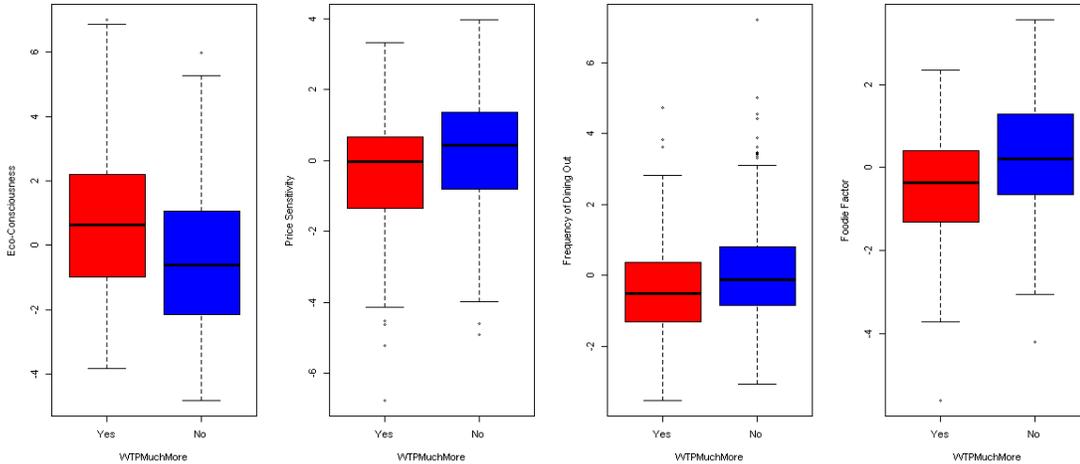


Figure 16

The regression output for Principal Components 1 to 4 on “Willing-to-Pay Some More” and “Willing-to-Pay Much More” is provided below:

Coefficients

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.562712	0.026003	21.64	< 2e-16 ***
eafpc[, 1]	0.055139	0.011887	4.639	5.36E-06 ***
eafpc[, 2]	-0.03433	0.016016	-2.144	0.0329 *
eafpc[, 3]	0.069658	0.019261	3.617	0.000353 ***
eafpc[, 4]	0.100342	0.019384	5.177	4.28E-07 ***
eafpc[, 1]:eafpc[, 2]	0.0108	0.006917	1.561	0.11956
eafpc[, 1]:eafpc[, 3]	0.000442	0.007936	0.056	0.955647
eafpc[, 1]:eafpc[, 4]	0.00848	0.008685	0.976	0.329706
eafpc[, 2]:eafpc[, 3]	-0.01353	0.009956	-1.359	0.175231
eafpc[, 3]:eafpc[, 4]	-0.00898	0.012078	-0.744	0.457701
eafpc[, 2]:eafpc[, 4]	-0.02078	0.012098	-1.718	0.086882 .

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 0.1994677)

Null deviance: 72.590 on 294 degrees of freedom

Residual deviance: 56.649 on 284 degrees of freedom

AIC: 374.39

Number of Fisher Scoring iterations: 2

Figure 17

All the Principal Components are significant at the $\alpha=0.05$. We can interpret these results as shifts in standard deviations of the scores relating to principal components leading to an increase in the log odds that a consumer is willing to pay more. For example, a one standard deviation shift in the eco-consciousness score of the consumer increases the log-odds of that consumer paying a premium of more than 3% by .055139. Thus a one-standard deviation shift in the eco-consciousness of a consumer increases the odds that the consumer is

willing to pay some more by 5% ($\exp(.055139)=1.05668748$). This result confirms Hypothesis 2, showing that attitudes, knowledge, and past behaviors relating to green practices positively influences a consumer's willingness to pay a premium at restaurants engaged in green practices.

Similarly, we see that a one standard deviation increase in the price-sensitivity score will decrease the odds that the consumer is willing to pay more than a 3% price premium by 3% ($\exp(-.03433)=0.96625$). This again corresponds to our basic economic intuition. The more price-sensitive consumers are less likely to pay any type of price-premium for they are limited by their budget constraints. Green practices at restaurants are no exception.

In order to understand the increase in standard deviation for the dine-out frequency and foodie factor scores, we again must invert the direction of the estimates. We see that a one standard deviation increase in the dine-out frequency score reduces the "willingness to pay some more" by 7% ($\exp(-.06965)=0.93271$). Similarly, a one-standard deviation increase in the foodie factor score reduces the willingness to pay some more by 10% ($\exp(-0.100342)=.904528$). Both of these results are surprising and also revealing. They seem to indicate that there is a very specific segment of restaurant-goers that are willing to pay a price premium at restaurants. This is not directly linked to either frequency of dining out or attitudes towards more traditional restaurant characteristics like menu and ambiance. In fact, there seems to be a negative relationship between dining out more and being more concerned with traditional restaurant characteristics and a consumer's willingness to pay more at green restaurants.

If we examine the output for the Principal Components onto a consumer's willingness to pay more than 6% we see that there are very similar results. This seems to indicate that there might not be that much of a difference in paying between 4-8% based on the four important sources of variation.

Coefficients				
	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.359322	0.025284	14.211	< 2e-16 ***
eafpc[, 1]	0.048175	0.011558	4.168	4.08E-05 ***
eafpc[, 2]	-0.04154	0.015573	-2.667	0.00809 **
eafpc[, 3]	0.050841	0.018728	2.715	0.00704 **
eafpc[, 4]	0.10287	0.018848	5.458	1.05E-07 ***
eafpc[, 1]:eafpc[, 2]	-0.00044	0.006726	-0.065	0.94816
eafpc[, 1]:eafpc[, 3]	0.000312	0.007717	0.04	0.9678
eafpc[, 1]:eafpc[, 4]	0.019993	0.008445	2.367	0.01858 *
eafpc[, 2]:eafpc[, 3]	-0.01198	0.009681	-1.238	0.21692
eafpc[, 3]:eafpc[, 4]	0.005862	0.011744	0.499	0.61807
eafpc[, 2]:eafpc[, 4]	-0.00783	0.011764	-0.666	0.50614

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 0.1885922)

Null deviance: 67.912 on 294 degrees of freedom

Residual deviance: 53.560 on 284 degrees of freedom

AIC: 357.85

Figure 18

Of course, we must acknowledge some limitations to the Principal Component Regression. First, we must acknowledge that though the four Principal Components explain a significant amount of the variation, they

collectively explain less than half of the overall variation (45%). Thus, other factors and latent drivers seem to drive much of the other variation in the survey data. Also, we should consider the interaction terms more closely. It seems that most of the interaction terms were not significant, so we have not interpreted the interaction terms. However, interpreting the interaction terms may yield significant results.

3.8 CONJOINT ANALYSIS

As part of our survey, we ran a conjoint analysis to determine WTP for 50% organic, 80% organic ingredients vs. convention ingredients, and locally sourced ingredients. Each participant was asked to perform seven random tasks from a total of 21 tasks where the combination of tasks was selected by orthogonal design.

Based on our conjoint analysis for entrees between \$15 and \$19, consumers are willing to pay a \$5.24 premium for local foods over non local options; a \$2.52 premium for an entrée with 80% organic ingredients as opposed to conventional ingredients; and a \$1.58 premium for an entrée with 50% organic ingredients. Chicago consumers care twice as much about local than organic ingredients. When splitting into our three clusters we see that consumers who are not engaged with environmental issues are not willing to pay a premium for organic but are still willing to pay a premium for local (but only a \$3.32 premium). Women have a higher willingness to pay for local and organic ingredients than men do.

Price Premiums						
Feature	Segment					
	All	Male	Female	Not Engaged in Environmental Issues	Highly Engaged	Engaged in Environment not Food Issues
50% Organic Ingredients	\$1.58	\$1.31	\$2.17	\$0.00	\$2.07	\$2.79
80% Organic Ingredients	\$2.52	\$1.94	\$3.77	\$0.00	\$3.93	\$4.47
Locally Sourced Ingredients	\$5.24	\$4.47	\$7.16	\$3.31	\$7.43	\$3.54

Notes:

[1] Price premiums for organic ingredients is the additional amount consumers are willing to pay to have organic ingredients as compared to conventional ingredients for an entrée priced between \$15 and \$20.

[2] Price premiums for locally sourced ingredients is the additional amount consumers are willing to pay to have organic ingredients as compared to conventional ingredients for an entrée priced between \$15 and \$20.

Source:

[1] Conjoint analysis from questions 12 - 18 of the consumer survey

Furthermore based on segmentation by income we find:

Price Premiums by Income

Feature	Income				
	\$0-\$24,999	\$25,000-\$49,999	\$50,000-\$74,999	\$75,000-\$99,999	\$100,000 or more
50% Organic Ingredients	\$1.31	\$1.13	\$1.87	\$1.72	\$1.87
80% Organic Ingredients	\$1.94	\$2.19	\$2.03	\$3.44	\$3.21
Locally Sourced Ingredients	\$2.72	\$1.95	\$4.46	\$10.56	\$7.73

Notes:

[1] Price premiums for organic ingredients is the additional amount consumers are willing to pay to have organic ingredients as compared to conventional ingredients for an entrée priced between \$15 and \$20.

[2] Price premiums for locally sourced ingredients is the additional amount consumers are willing to pay to have organic as compared to conventional ingredients for an entrée priced between \$15 and \$20.

[3] Local was a major driver in the \$75k - \$99k income segment and the price premiums may not be accurate due to a not large enough range of prices presented to this segment

Source:

[1] Conjoint analysis from questions 12 - 18 of the consumer survey.

Generally consumers are willing to pay more for local than organic features, with the exception of the \$25k segment.

And for age we find:

Price Premiums by Age

Feature	Age			
	18-29	30-44	45-60	> 60
50% Organic Ingredients	\$2.20	\$2.00	\$1.30	\$1.40
80% Organic Ingredients	\$4.19	\$4.51	\$1.44	\$1.75
Locally Sourced Ingredients	\$2.51	\$7.63	\$4.64	\$7.32

It is very interesting to note that Chicago consumers between 18 and 29 care more about organic ingredients than local ingredients. Note that the \$7 price premium might be unrealistically high due to the presentation of not enough price options.

In conclusion the conjoint indicates that most types of consumers care twice as much about locally sourced ingredients than organic ingredients. It is important to note the limitations of this analysis in that it is limited to entrees priced between \$15 and \$19. There also are other factors consumers consider when selecting entrees which we were not able to control for. While we have demonstrated that local and organic are significant factors, their effect on WTP might be very small as compared to other factors.

The USDA data and restaurant survey seem to indicate that the price premium for organic is about 20%, while our consumer survey indicates that not that many people are willing to pay more than 6%. The restaurant

survey indicates that the price premium for local options is 10%, while our consumer survey indicates that consumers are more willing to pay for local than organic. Therefore, it appears to be easier for restaurants to pass on increased costs due to the purchasing of local food than organic food.

4. CONCLUSIONS AND RECOMMENDATIONS

Based on our theoretical framework and empirical analysis we have the following recommendations:

- Based on our Conjoint Analysis: Restaurants should consider the importance of local engagement with regards to green practices. In particular, our conjoint analysis shows that consumers value local food items more than organic food items. In particular, Green Seal should build the local component into its green restaurant certification program to add value to certification for restaurants through increased revenue benefits.
- Based on our Principal Component Regression: Restaurants engaged in green practices should target customers that are eco-conscious, in order to exploit the price premium that such consumers are willing to pay. However, contrary to popular belief, such restaurants should not proactively target frequent restaurant goers and food aficionados in order to charge a premium. In fact, such consumers may be less likely to pay a premium at restaurants engaged in green practices.
- Based on our Factor Analysis: Certification has some effect on consumer awareness about the product. Increased inconvenience in understanding green practices makes it difficult for consumers to appropriately evaluate practices at restaurants. However, we were not able to find any significant results through our Principal Component analysis. This seems to imply that the overall effect of certification may be ambiguous. What seems certain, however, is the importance of awareness and marketing regarding green practices and overall certification. Thus, Green Seal should work to develop a certification program that considers the consumer-facing component of certification, and should partner with organizations that directly interact with restaurant-goers (i.e. Yelp, OpenTable).
- Based on our overall Demographic Analysis: Restaurants engaged in green practices should continue to target specific demographic groups: namely consumers that are young, female, and affluent. Such demographic characteristics are strongly correlated with consumers' willingness to patronize and pay more at green restaurants.

APPENDIX B: DISPOSABLES, WASTE, AND POLLUTION

Transportation – Vendors

We want to point out some issues regarding the practice required by Section 3.7.1.1 of GS-46 ("Vendor Preference"). This provision requires an operation to have a vendor policy that gives preference to vendors with certain characteristics, such as supplying environmentally-preferable products.

First, it is not clear in what form and over what timespan this preference has to be given. Questions that came up included, "Do restaurants have to change vendors as a requirement to get certified, or just within a certain timespan, or whenever they change a vendor any way?" If anything, we think that restaurants would have to change vendors immediately. However, this may not necessarily be feasible for restaurants since they might have existing contracts with vendors.

Second, the requirement to "provide environmentally-preferable products" seems redundant, in particular with regard to food purchases, since environmentally preferable food purchases are required at every certification level.

Third, it is not clear by what metric Green Seal evaluates whether this practice is implemented. For example, if there is one vendor which fulfills two requirements, another vendor which fulfills two or three other requirements and no other vendors are available, which one should be given preference in order to satisfy the requirement?

Fourth, it is stated that *preference* has to be given to those vendors. However, this does not necessarily imply that the restaurant uses the given options (or is required to, for that matter). That is, if the vendor offers, e.g., paperless ordering, and the restaurant does not make use of this option, there is no environmental benefit. Note that the ratings in the GRRT Matrix for this practice are based on the assumption that restaurants *will* make use of the options, since this is the most sensible reading of the provision, giving meaning to the terms "show evidence of practicing a vendor policy that includes" the described preference.

Furthermore, Section 4.1.2.1 (Vendor Code of Conduct) of GS-46 refers to GS-46 3.7.1.1. Both practices imply the same goal with similar means. Therefore, GS-46 4.1.2.1 should not be rated separately, since it is unclear how exactly these practices differ.

Both practices could be revised in order to clarify the purpose and what steps have to be taken. This could be done by emphasizing the purpose. For example, rather than requiring the option of paperless ordering within a policy or code of conduct provision, one could give extra credit to restaurants which order without paper, designed as a separate practice. This would remove the complexity of the current provision, since the answer to "Is this practice fulfilled?" is simply "yes" or "no". Also, this still encourages restaurants to implement the practice.

For discussion of feasibility of certain vendor practices, we recommend speaking to FamilyFarmed.org. Together with the GCRC, FamilyFarmed.org is working on a Local Procurement Support for Chicago. Unfortunately, we have not been able to speak with anyone at the organization. However, the staff should be knowledgeable when it comes to local vendors of food products.

Transportation – Clients

As part of our initial research, we looked at three main ways restaurants could support pollution reduction practices by customers. These restaurant practices included installing bike racks, installing an electric-car charging station and providing preferred parking for carpooling vehicles. The installation of an electric charging station and parking preference for carpooling vehicles were not part of the final recommendations for a few

First, we will address the practice of installing an electric-car charging station. An electric-car charging station does not necessarily encourage individuals to use electric cars; it is simply a convenience that a restaurant can provide to its customers who have electric vehicles. Keep in mind that not all electric-car charging stations provide environmental benefits. It all depends on the source used to charge electric vehicles (Will Electric Vehicles Really Reduce Pollution?). In addition, installation takes approximately 36 days and is quite costly (Matilla, 2009). The installation process depends on existing conduit and infrastructure. In some instances, installation can involve upgrades of electrical systems and destructions of sidewalk or walls. However, there are Illinois state grants that support the installation of electric-car charging stations (Illinois Incentives and Laws), and a restaurant can charge clients for electric car charging and parking (Matilla, 2009). Also, this practice would contribute to LEED certification for the restaurant/building (Plug-in Electric Vehicle Handbook). We recommend that Green Seal consider making this practice optional (not mandatory) due to the lack of a concrete environmental benefit.

Second, with regard to preferred parking for vehicles that carpool, our research showed that preferred parking for carpooling vehicles can reduce vehicle usage by 2-10% (Litman, 2011). However, a study in California noted that carpooling does not have a significant effect on emission reduction (Huer, 2004). There is also a lot of variability in terms of implementation. If a restaurant has a parking lot, then it is not difficult to place parking preference signs. However, if a restaurant does not have a parking lot, it is quite difficult to first build/buy parking space and then create preferred parking. There are also no financing opportunities or direct financial returns for a restaurant that creates parking preferences for carpooling vehicles. We recommend that Green Seal acknowledge the possibility of such a standard, but not necessarily make it mandatory for Chicago restaurants seeking green certification.

Transportation – Restaurant

GS-46 standards for fleet maintenance and vehicle use requirements are consistent with our research. Fleet maintenance reduces climate change and health problems related to pollution in the air, water and land (Gurjar, 2010). Also, stockpiles of waste like tires can generate safety and health issues (Used Tire Facts and Information).

Implementing the GS-46 vehicle use requirements in Section 3.7.9.1 has a significant environmental impact on greenhouse gas emissions, and also creates social benefits. By decreasing greenhouse gases, restaurants are able to help make the air cleaner and as a result decrease the amount of health issues related to pollution (Menard, 2008). Also, switching to alternative fuel vehicles decreases oil dependency and increases energy sustainability (Reduce Climate Change). Although there are several state and federal grant programs that support the purchasing of alternative fuel vehicles, it is not easy for restaurants to purchase new alternative-fuel vehicles. Thus, it is appropriate for the standard to only be mandatory for 30% of miles and only for the Gold level certification.

Cooking Emissions

The Bay Area Air Quality Management District (BAAQMD) standards are extremely strict for charbroilers, and the requirements include having an emissions control device that releases a maximum of 1.3 lbs of PM10 and 0.32 lbs of volatile organic compounds (VOCs) per 1000 lbs of beef. It must also be documented and registered with the BAAQMD. In addition, there must be cleaning and maintenance work done on it. The BAAQMD also makes a clear distinction between chain-driven charbroilers and under-fired charbroilers: the standards for restaurants with chain-driven charbroilers are based on 500 lbs of beef, while for those with under-fired charbroilers, 1000 lbs of beef (BAAQMD).

For ventilation hoods, there are a variety of options for installing them so that vague standards will not help restaurants that are not otherwise knowledgeable of the practice. A demand control ventilation system can cost from \$8,000 for 2 new hoods to \$28,000 for a retrofitting of 6 hoods. A basic installation of a ten foot hood with temperature sensors can cost as little as \$2,000, while a retrofit hood with a variable frequency drive can range from \$7,500-\$10,000, which demonstrates the variety of combinations between prices and options (CEE). For

financing opportunities, GreenVent provides a rebate of \$1400 for restaurants. Some utilities offer rebates, such as Pacific Gas and Electric (which offers \$300 for new hoods and \$350 for retrofits) – Green Seal should encourage restaurants to look into these options (GreenVent).

Pest Management

We have noticed that GS-46 currently does not acknowledge the implementation of Integrated Pest Management (IPM), which is clearly preferable over conventional pest management (Williams et al., 2005; Kogan, 1998). However, it might be complicated for a restaurant to prove proper implementation of IPM. The GRA's solution is to give credit if restaurants are serviced by a third-party certified pest management company. The third-party certification includes GreenShield, EcoWise, and GreenPro. This appears to be a feasible and easy solution for both Green Seal and the restaurants given that proof of implementation is simply the proof of service.

Waste

Composting:

The Food Waste Program at Portland International Airport has been quite successful and has diverted over 2,200 tons of food waste from landfills over the course of eight years (Forst). In order to help composting programs gain traction against traditional landfilling, some communities (including Portland) have imposed higher landfill tipping fees and lowered the tipping fees for composted food scraps and yard waste. The City of Portland has created incentives for composting by raising the landfill tipping fees (as shown in the table below), but this approach would likely be politically unpopular in Chicago. In the 2012 Cook County Solid Waste Management Plan Update, there has been a policy recommendation for lowering compost (food/yard waste) tipping fees below the current average landfill tipping fees of \$45/ton in Chicago. It is also mentioned that Independent Recycling (in Chicago) is due to start accepting food waste for composting, which should help increase the available infrastructure. Cook County is also looking into purchasing compost for construction projects from an out-of-state company. It would be more efficient if local composting facilities could sell their final product to the city, so that extra transportation costs and emissions would be avoided.

Table #1: (Data from Nate Forst, Port of Portland)

Landfill Tipping Fees in Portland, OR 7/2004-4/2012		Food Waste Tipping Fees in Portland, OR 7/2004-4/2012	
7/2004 - 12/2005	\$77.78	7/2004 - 9/2008	\$47.50
1/2006 - 6/2008	\$74.76	10/2008 - 7/2009	\$48.15
7/2008 - 7/2009	\$81.75	8/2009 - 7/2010	\$48.40
8/2009 - 11/2010	\$86.55	8/2010 - 10/2011	\$41.35
12/2010 - 7/2011	\$92.65	11/2011 - 4/2012	\$46.10
8/2011 - 4/2012	\$96.33	7/2004 - 9/2008	\$47.50

F-SCRAP

The F-SCRAP initiative (Food Scrap Composting Revitalization & Advancement Program) provides funding for organizations and businesses that increase the capacity for food waste composting in the State of Illinois. Qualifying purchases include food scrap collection containers and trucks, food scrap pulpers, digesters, in-vessel composting equipment, industrial windrow composting equipment, and compost packaging equipment (F-SCRAP). The initiative particularly encourages partnerships to form in order to help defray costs and build economies of scale. While this program is particularly geared towards farms to encourage composting of food scrap feedstock, any business or non-profit in Illinois is eligible to apply. The maximum grant award was capped at \$250,000 for 2012, and applicants must cover at least 10% of the total project expenses.

Consolidated Printing:

Consolidated Printing is a Chicago-based company established in 1973. It provides printing services that have zero impact on the environment. Marilyn Jones has won numerous environmental and printing awards, including the Governor's Pollution Prevention Award and William D. Schaeffer Environmental Award National Award.

Summary of key points from interview with Marilyn Jones:

Often people think of recycled paper and soy ink as end-all solutions. Ink and paper choice are just a small part of the issues related to printing. It is the chemicals used in the process of printing, and the chemicals released into the atmosphere that cause the most damage. These chemicals are hazardous not just to the environment, but also detrimental to human health. Press washes are a major contributor to pollutants.

Sustainability in the printing industry is far less developed compared to the restaurant industry, including efforts of the GCRC. The focus should be on purchasing paper from sustainably managed tree farms. These are for-profit forests owned by tree farmers. When the farmer cuts a tree, he or she grows another to replace it. While those new trees are growing, they clean the air. The process of recycling paper can only be repeated 5-6 times. Thereafter, the fibers become too weak and thus you need to introduce virgin fibers. This explains why recycling paper is not a complete, long-term solution.

Soy ink has petroleum in it. There is no such thing as pure soy ink. It does not have the consistency to apply pigment to paper by itself. It needs other substances to be mixed in it. And, soy is not the healthiest ingredient. As an alternative, a printing company might use natural pigments in its ink, as illustrated by Consolidated Printing. There are no heavy metals such as cadmium in its ink.

APPENDIX C: FURNISHINGS, ENERGY, AND WATER

It may be helpful for Green Seal to provide a list of potential financing opportunities for energy practices. The State of Illinois and City of Chicago offer a number of grants, incentives, and loans that are applicable to energy tracking, conservation, renewables, and appliances. Many of these programs are cross-collaborative and can be used to implement a wide variety of practices necessary to achieve green certification. Additionally, there are also special programs for small businesses. Energy related grants, loans, and incentives can be found through the DSIRE website.

For energy appliances, it was hard to find quantitative results for costs and benefits to restaurants due to a high degree of variation in the requirements of a restaurant. Restaurants vary based on ambience, seating capacity, cuisine, location, type etc. Therefore, we could not generalize the initial financial costs and returns for restaurants. However, the energy appliances section of the GRRT Matrix provides an idea of the costs and advantages based on per unit costs of appliances. It was hard to quantify the additional return derived from each Energy Star rated appliance, but we found articles that contained claims that Energy Star rated appliances cost 4%-5% more on average. In terms of returns, we found research that claimed that Energy Star rated appliances pay off in the long run through rebates, incentives and cost savings, but we could not find specifics for each appliance.

RENEWABLES APPENDIX

A. INTRODUCTION

In GS-46, renewable energy is mentioned in the Energy Conservation and Management Section specifically under Sections 3.2.3, 3.2.13, 3.2.15 and 3.2.16. Under Sections 3.2.3 and 3.2.15, onsite renewable energy production can be counted towards EUI reductions for achieving energy conservation criteria. These notably exclude Renewable Energy Credits (RECs), also referred to as Renewable Energy Certificates. It is unclear if “renewable energy directly used onsite” includes electricity purchased from renewable sources or not. Then 3.2.16 seems to be an open ended option to address innovations or initiatives relating to renewable energy, among other things. Lastly, Section 3.2.13 is an option that rewards a restaurant that either generates 20% of its energy using onsite renewable energy or purchases electricity from renewable energy sources through the 3rd party certifier Green-e Marketplace. This again explicitly excludes RECs.

This evaluation looks first at the benefits and costs of a restaurant reaching this 20% level in Section 3.2.13 of GS-46 using onsite renewable energy generation, which would also help them achieve the requirements for Sections 3.2.3 and 3.2.15. Next, this evaluation looks into the costs and benefits of RECs and electricity generated from renewable energy sources used to reach the 20% level as alternatives to onsite renewable energy generation.

This analysis uses information provided by Commonwealth Edison on annual electricity usage in their service area for eating places including full and limited service restaurants, dinner theaters, cafeterias, snack and nonalcoholic beverage bars, food service contractors, and caterers (Commonwealth Edison). The average annual electricity usage was 139,594 kWh and from this a 10%, 20%, and 50% level was considered (13959, 27919, and 69797 kWh respectively). This was done to help evaluate the practice for smaller and larger restaurants and to also take into consideration that energy use likely includes gas used in cooking, which would then require a higher electricity offset to reach a percentage threshold of total energy use. This analysis does not include gas in energy usage and would need to be adjusted accordingly. Five year direct financial return was generated in the same way for each onsite renewable by multiplying the estimated energy production requirements by a price of electricity of \$.084/kWh (“Electric Power Monthly”, 2012). No discounting is used in these estimations. Costs and benefits are not relative to or the difference from a ‘previous’ practice as appliances would be considered unless otherwise specified. [Note: Clarify prior sentence] For filling out the matrix, the 20% column was specifically used.

B. ONSITE SOLAR PHOTOVOLTAIC (PV) INSTALLATION

Given our estimated energy production requirements, a tool from the National Renewable Energy Laboratory was used to calculate the scale of solar installation required based on kW rating rounded up (NREL). From this the area required for the installation was estimated using a reasonable estimate of 7.5 square meters per kW (European Photovoltaic Industry Association). This already brings up a challenge in terms of available rooftop space for restaurants to make a sufficiently large installation possible. For initial cost, an estimate of \$6.6/Watt (\$6,600/kW) for the 12 and 24 kW installations and \$6.4/Watt for the 60 kW installation was used, though this might need to be adapted given prices are falling and this information is from 2010 (U.S. Department of Energy, 2011). It should also be noted that solar PV installations don't need to be installed all at once, which is not advisable for wind and solar thermal (SEHBAC Solar). From this a minimum rebate of 30% was used to represent the federal Business Energy Investment Tax Credit opportunity that is widely available for renewable energy projects (DSIRE 2011). A higher range estimate of 50% was used to represent a high range for what additional Illinois opportunities could achieve on top of the federal rebate. Further research should determine if this is a reasonable high range or not for discounts that can actually be obtained for a given installation. A list of these opportunities and also financing opportunities is provided in Appendix E. Lastly, ongoing financial costs for solar PV are noted to be minimal (Energy Saving Trust). In the most preferable scenario of having a 50% tax credit, the return on investment for the 24kW installation is estimated at about 34 years

SOLAR PV			
Percent Offset	10%	20%	50%
kWh Electricity Offset (kWh)	13,959	27,919	69,797
Rated kW required for installation (kW)	12	24	60
Estimate Array Size (square meters)	90	180	450
1 Year Direct Financial Return (\$)	1,172.56	2,345.20	5,862.95
5 Year Direct Financial Return (\$)	5,862.78	11,725.98	29,314.74
Initial Cost (\$)	79,200	158,400	384,000
After 30% Tax Credit (\$)	55,440	110,880	268,800
After 50% Tax Credit (\$)	39,600	79,200	192,000
Ongoing Financial Costs (\$)	minimal	minimal	minimal

C. ONSITE SMALL WIND TURBINE INSTALLATION

From our estimated energy production requirements per year, a calculation was made for the average kWh/hr required to generate that level of electricity in a year-long period. At this point, a high and low range estimate was made of the kW rating required to produce the given amount of energy per hour. This used a New Zealand government evaluation that claims that wind turbines produce between 10% and 40% of their kW rating every hour (Energy Efficiency and Conservation Authority). For example, a 1 kW turbine would produce between .1 and .4 kWh/hr. This could definitely be improved to include a more precise estimated range with more accurate research, but was not done so in this report. We did not find research for this medium-sized turbine range and faced challenges of either using rotor diameter or kW rating as the basis for energy production and cost estimation. From this kW requirement estimate of the high and low range of turbine efficiency, initial cost and ongoing year financial cost were estimated based on a \$6,040/kW initial cost estimate for small wind turbines (AWEA) and an estimate of 1% of initial cost required for yearly operating and maintenance costs (Sagrillo,

2002). In the most preferable scenario of 40% efficiency and a 50% tax credit, the return on investment for the 20% offset installation is estimated at about 13 years (considering operating and maintenance costs as well).

SMALL TURBINE WIND			
Percent Offset	10%	20%	50%
kWh Electricity Offset (kWh)	13,959.00	27,919.00	69,797.00
Turbine kWh/hr required (kWh/hr)	1.59	3.19	7.97
kW rating required high range (10%) (kW)	15.93	31.87	79.68
kW rating required low range (40%) (kW)	3.98	7.97	19.92
1 Year Direct Financial Return (\$)	1,172.56	2,345.20	5,862.95
5 Year Direct Financial Return (\$)	5,862.78	11,725.98	29,314.74
Initial Cost High (\$)	96,246.99	192,500.87	481,248.72
After 30% Tax Credit High (\$)	67,372.89	134,750.61	336,874.11
After 50% Tax Credit High (\$)	48,123.49	96,250.43	240,624.36
Initial Cost Low (\$)	24,061.75	48,125.22	120,312.18
After 30% Tax Credit Low (\$)	16,843.22	33,687.65	84,218.53
After 50% Tax Credit Low (\$)	12,030.87	24,062.61	60,156.09
Operating and Maintenance Costs High (\$)	962.47	1,925.01	4,812.49
Operating and Maintenance Costs Low (\$)	240.62	481.25	1,203.12

D. ONSITE SOLAR THERMAL INSTALLATION

Solar thermal technology has perhaps the highest potential for restaurant use in terms of energy savings. Solar thermal is noted to have an efficiency of about 70%, while solar PV's efficiency is about 17% (Environmental and Energy Study Institute). In addition, restaurants use a large amount of hot water at all times of the year. Unfortunately, the financial return, initial cost, and maintenance costs are difficult to quantify for restaurant applications and as a result, this is a critical area for further research.

Reasons for this difficulty include the following:

- The majority of research and information is directed towards residential applications that are often not applicable to larger scale restaurant applications.
- The amount of BTU's produced by the solar thermal collector is not equivalent to the amount of energy offset, which is based on when the energy is used and when the energy is produced.
- The variability of water tanks and their efficiency levels, energy sources, and energy prices complicate general estimations.

Information from North Carolina Public Power about large commercial solar thermal projects can be used as a very rough approximation of initial cost and direct financial return (North Carolina Public Power). Despite the sources limitations of assuming 70% offset initial cost, using a slightly larger scale, not specifically considering a restaurant application, using different geographic location, and using a lower price of electricity used, the yearly savings are significantly larger and the payback time significantly less than with the other two

technologies. This supports what was expected given the 70% efficiency of solar thermal, but more research should be done. In addition, our research indicated that maintenance costs are not particularly significant in terms of affecting return on investment, but yearly operating costs can be significant (North Carolina Public Power, U.S. Department of Energy 2011). Resources available relating to the returns and costs of solar thermal include a calculator in the tools section (Interactive Energy Calculators).

E. ENVIRONMENTAL BENEFIT FOR ONSITE RENEWABLES

Environmental impact is difficult to quantify due to all of its different aspects and their relative weighting in terms of importance. The approach here looked at the estimated emissions of Nitrogen Oxide, Sulfur Dioxide, and Carbon Dioxide from life cycle analyses (LCA) of the different renewable technologies and compared it to current electricity production emissions that would be offset. In some cases the time that it took to offset the energy needed to install and produce the product was also considered. More information can be found in the cited LCA literature for each renewable source for further analysis. Regional estimates of emissions rates of NO, SO₂, and CO₂ per MWh of electricity produced for the eGRID subregion RFC West (that includes parts of Northern Illinois, Indiana, Ohio, and West Virginia) were used once converted into mg/kWh or grams/kWh (U.S. EPA, 2011). Emissions for various types of solar photovoltaics were taken directly from the literature (Fthenakis, 2008). For solar thermal, kg estimates of pollutants were given and using given estimates of 1,833.33 kWh/year (6.6GJ/year) of energy produced and a 15-year useful life, the following estimates were created (Ardente, 2005). It should be noted that this assumes a solar insolation of 1,700kWh/m²/year (Fthenakis, 2008) for the solar PV results and around 1,800-2,000 kWh/m²/year (Granite Solar, 2008) for Palermo Italy for the solar thermal literature whereas Chicago is estimated to get between 1,277-1,460kWh/m²/year (ThoughtNet, 2011). This would dampen the accrued environmental effects over the lifetime of the panel.

Emission Comparison	CO ₂ (g/kWh)	NO (mg/kWh)	SO ₂ (mg/kWh)
Current Electricity Production	690	594	2676
Solar PV Low	25	80	160
Solar PV High	55	190	375
Solar Thermal	24	6.5	13.1

Despite this, the environmental effects should still be very large. For example, a solar PV installation that produces 28,000kWh (our 20% amount) per year at the higher solar insolation would offset at the least 17.8 metric tons of CO₂ each year. The literature for the solar thermal LCA notes that it offsets the total energy it took to produce the panel in less than 2 years, after which the panel has large net positive environmental effect for 13 years offsetting standard electricity use (Ardente 2005). We also note that the emissions of NO and SO₂ for solar PV installations is at least 12 times as high as that of solar thermal, which suggests a larger environmental impact for solar thermal.

An appropriate life cycle analysis for wind turbines greater than 1 kW and less than 100kW was more difficult to find. Energy intensity ratios and a few estimates for CO₂ emissions per kWh were found for wind turbines of this size mostly from Germany and Denmark in the 1990's (Lenzen, 2002). These results give CO₂ emissions estimates under 125 g/kWh for turbines rated at 100 kW and under. Also, considering energy intensity ratios for turbines from 5-55 kW that is most representative of our 20% reduction requirement range, we see that over 15-20 years the turbines all created 3 times the energy that was required to build the turbine and got as high as 20 (about 1 year to recoup energy spent producing and installing turbine). Considering that wind turbines have likely improved in the past decade, these numbers suggest that wind is comparable to solar PV and thermal in terms of environmental impact, though other measures like SO₂, NO, and heavy metal emissions should be considered as well.

F. EASE OF IMPLEMENTATION FOR ONSITE RENEWABLES

Implementation was ranked as very difficult for solar PV and wind energy for four reasons. First, it was noted above that the solar PV installation would require a significant amount of space that a restaurant might not have on its roof or property. This is even more of a problem for wind turbines, which usually cannot be installed on a rooftop and can require a significant amount of space. Some wind rebates even require an acre of space to qualify for government credits (Solar and Wind Energy Rebate Program, 2011). Second, many restaurants rent the space they use and do not own it, making expensive long term changes to the building less attractive or impossible. Third, city restrictions and regulations need to be adhered to and addressed throughout the process, which can often delay and complicate the installation process. From our survey of restaurants that are already more environmentally minded, 25% claimed they could not install a renewable energy source onsite and 35% didn't know if they could or not. Fourth, limitations of sunlight and wind blocked by other buildings might further complicate installation to meet typical production expectations. These topics need further investigation to more precisely determine how difficult installation of solar photovoltaics and wind turbines is for Chicago restaurants.

Solar thermal installations face many of the same difficulties as solar PV and wind installations, but it is possible that if they are more efficient they would require less space and therefore be easier to install. This should also be further researched. All of these technologies require a significant amount of time to install. Solar PV and solar thermal take from a few days to two weeks to install, while raising a wind turbine may only take a few days, but the preparation beforehand is more extensive.

G. INDIRECT FINANCIAL RETURN FOR ONSITE RENEWABLES

Indirect financial return of onsite renewables is difficult to determine. Based on our consumer survey results, energy/water conservation practices in general was ranked as one of the characteristics of a restaurant of lowest importance (question 4, GRRT consumer survey, 2012) and people who took the survey admitted that their knowledge of environmentally friendly restaurant practices was not high (question 7, GRRT consumer survey, 2012). This suggests a small willingness to pay or customer loyalty increase for specific practices in the energy and water category in general. However, onsite renewable energy installations are arguably something consumers are much more able to notice and understand the general implications of. This is in part because they are very visible, especially wind turbines, while many other practices in the energy and water category cannot be easily observed by, or advertised to, consumers. This suggests that there is possibly a more significant indirect financial return through willingness to pay specifically for onsite renewable energy sources that should be quantified with further research.

H. SOCIAL BENEFIT AND LOCAL ENGAGEMENT FOR ONSITE RENEWABLES

There are not many social benefits not already included under environmental impact. It is suggested that further research is done on possible positive and negative externalities of these renewable sources (that aren't environmental) in a city context. It makes sense, given the greater number of people, that the scale of these effects could possibly be quite large and therefore make onsite installation significantly more or less beneficial. An example might be obstructed views from wind turbines and reflected light from solar installations or visual aesthetics of wind turbines and educational opportunities.

It is also worth noting for both social benefit and local engagement that the City of Chicago and State of Illinois both have set renewable portfolio standards and are looking to increase renewable energy use in Illinois (DSIRE, 2011). This practice works in correlation with these goals, and it might be reasonable for the practice to then be more rewarded as a result. Restaurants might also be able to provide a local engagement opportunity by educating the community about renewable energy and the goals the state and city are trying to achieve. More information about energy use and its local elements is available in the Local Engagement section.

I. RENEWABLE ENERGY CREDITS (RECs) AND ELECTRICITY FROM RENEWABLE SOURCES

RECs and electricity purchased from renewable sources are other approaches to offset the negative impacts of electricity produced from fossil fuels. They also offer a way to make renewable energy markets larger and more efficient. RECs can be purchased through a 3rd party certifier like Green-e to verify quality and authenticity (U.S. EPA, 2008). A Chicago restaurant can also choose from what energy generation source their

electricity comes from once their current contract expires (George Malek, personal communication, U.S. EPA). These are not hard to do and do not have a significant initial cost. As a result, these should not need financing either. They were rated by restaurants in our restaurant survey as the easiest practices to implement compared to things like better insulation, smart thermometers, and LED lighting (GRRT restaurant survey, 2012). A list of a wide variety of options is provided by the U.S. Environmental Protection Agency for each state and can be found in the tools section in Appendix I.

Though sometimes electricity from renewable sources can be cheaper than regular electricity, this is not considered in this report and hence there is no direct financial return from either of these practices. Assuming that 1) there are no barriers or significant lack of information that stops people from pursuing these energy goods 2) that these as a whole are preferable to consumers than alternatives like coal, natural gas, and nuclear energy and 3) there is a relatively small supply of renewable energy produced that cannot easily expand, it would not make sense that it would sell below normal market electricity prices. Sometimes communities can achieve lower than normal prices, but this is usually only available on a municipal level and not a restaurant level (NREL, 2011, U.S. Department of Energy, 2012)

J. ANNUAL COST FOR RECs AND ELECTRICITY FROM RENEWABLE SOURCES

The cost of RECs is the price paid for the REC and for electricity from renewable sources is often measured in terms of the premium paid compared to standard electricity prices. One of the most difficult parts of the REC market is its complexity and volatility. There are many different types of renewable energy that sell at different rates, wind often being the cheapest and solar the most expensive (U.S. EPA). In addition, REC prices are often greatly influenced by legislation that creates involuntary markets for the credits and makes prices volatile and unpredictable in some cases (Monzumder, 2004). The course of federal or state regulations, among many supply and demand factors, influences the price of RECs, so a range of estimates from .25 to 3 cents/kWh are considered. The premium paid for electricity from renewable sources can be considered in a similar range (U.S. EPA, Bird, 2006). Prices for these resources that are available for Chicago consumers currently should be used to narrow this range. We see that the cost per year varies dramatically given the price/premium used.

Renewable Electricity/RECs			
Percent Offset	10%	20%	50%
kWh Electricity Offset (kWh)	13,959	27,919	69,797
Cost/Premiums (cents/kWh)	Annual Cost	Annual Cost	Annual Cost
0.25	34.90	69.80	174.49
0.5	69.80	139.60	348.99
1	139.59	279.19	697.97
1.5	209.39	418.79	1,046.96
2	279.18	558.38	1,395.94
2.5	348.98	697.98	1,744.93
3	418.77	837.57	2,093.91

K. ENVIRONMENTAL IMPACT FOR RECs AND ELECTRICITY FROM RENEWABLE SOURCES

The environmental impact of RECs and electricity from renewable sources is reasoned to be at least as large as, if not significantly larger than, that of onsite renewables. The main reasoning supporting this claim is that generators or renewable energy outside of city limits face less space restrictions and greater choice of regional

or national locations to optimize sunlight, wind, and other natural resources as seen in the following maps.

L. INDIRECT FINANCIAL RETURN AND SOCIAL IMPACT FOR RECs AND ELECTRICITY FROM RENEWABLE SOURCES.

The indirect financial return of buying RECs or sourcing electricity from renewable sources is estimated to be similar to that of onsite renewables without the tangible visible infrastructure to advertise and convince the consumer of the environmental impact. However, if RECs are not regionally sourced, this could create consumer backlash, since environmental benefits are not locally accrued (Holt, 2005, Monzumder, 2004). This is an area where more research should be done. In terms of social benefits, these two options have the advantage/disadvantage of removing the generation from the city itself. This would reduce externalities mentioned in the onsite section, whether they be positive or negative. While renewable energy-generated electricity would be mostly supplied from regional renewable sources, REC purchases are not restricted by distance. This often creates tension with local government because the beneficiaries of the renewable energy production are not the people in the city who pay for them, and it also complicates city and state initiatives to reduce pollution or increase renewable energy production (Holt, 2005). This might make RECs, and to a lesser extent electricity from renewable sources, less attractive in terms of local engagement and social benefit. In terms of social benefit, the opportunity cost of the land should also be considered. It could be argued that even though rooftop installation cost is higher and less energy efficient, the opportunity cost of using that space is less than that where a farm could be (Deodhar, 2011). These topics should be further researched.

M. COMPARISONS AND CONCLUSIONS

Here are the recommendations and thoughts that came from the above analysis of renewable energy sourcing for restaurants.

1. *Onsite Solar Photovoltaics and Wind Turbines:* The issue here is to decide whether or not these practices are appropriately encouraged (or not encouraged) by GS-46. From our research, the difficulty of implementation, lack of direct return from environmental benefits, and the long payback time of these installations make them very unattractive to restaurant owners. In order to encourage restaurant owners to undertake these installations, the negatives externalities need to be reduced. Providing more incentives in the certification could help. However, as discussed more in later points, we recommend instead that these onsite installations should be less emphasized while still rewarding those who choose to make the investment. We believe that it is preferable to favor other more practical and efficient renewable energy and energy conservation practices.
2. *Solar Thermal compared to other Onsite Renewables:* Arguably, solar thermal is a better option for restaurants. A combination of off-site solar thermal not being feasible (since electricity is not produced), solar thermal being very efficient, and restaurants having a large demand for hot water year round make the onsite option more compelling than the other options. Our environmental analysis also seemed to suggest that the environmental impact was greater as well, compared to that of solar photovoltaics. Further research should consider how feasible and effective onsite solar thermal installation is and, if the assumptions made in this report are true, it should be emphasized more strongly in the certification as compared to the other renewables. The renewables should not be treated equally by default if some display significantly greater environmental benefits and better payback.
3. *Emphasize efficiency and energy conservation before renewable energy:* Reducing energy usage through efficiency improvements should take precedence over renewable energy generation or use. Efficiency improvements create equal or more environmental impact and reduce (instead of increase) restaurant costs after installation while installation costs are not large.
4. *Consider how the 20% requirement would change as the Green Seal certification changes:* An initial worry was that the 20% requirement threshold might discourage restaurants from making investments in larger, more efficient renewable installations that produce 50% or 100% of a restaurant's electricity. Given the difficulty of reaching this 20% threshold, the greater importance of energy conservation, and the rewards for renewable energy use in the energy conservation criteria, this issue does not seem particularly important. However, under a more differentiated, tiered certification in which RECs and electricity from renewable energy sources might provide flexibility and accessibility, it could be worthwhile to consider different percentages. For example, 20% of a restaurant's electricity could be generated onsite and the restaurant could choose to offset 30% more with RECs.

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5. *Put a greater emphasis and do more research on RECs and electricity from renewable sources:* Based on our research, the only challenges with RECs (which are not currently recognized under GS-46) are that they could create consumer/city backlash if they aren't getting environmental benefits from nationally sourced RECs, they pose greater costs in the long run, and the market for them might have larger risk and price volatility (Berry, 2002). We understand Green Seal has done extensive research to assess these and additional limitations of RECs. However, given that RECs are new and still developing, we suggest Green Seal reevaluate their inclusion in its certification.

In addition, we recommend that for the City of Chicago, RECs and electricity from renewable sources should receive more emphasis and possibly more reward since:

- both eliminate negative externalities of onsite installations in city settings
- both are incredibly easier for restaurants to implement
- both take advantage of returns to scale for larger installations
- both allow the location of energy generation to optimize natural resources better
- buying these on a yearly basis is cheaper over a reasonable period of time than onsite renewable installations despite onsite installations' financial return over time
- RECs minimize energy loss in transmission and give restaurants more supplier choices to minimize costs (Monzumder, 2004)
- RECs can in some cases reduce regional price volatility by expanding the market
- renewable electricity is regional so it has good consumer appeal

The negatives for RECs and renewable energy include:

- their high ongoing financial cost that eventually make them more expensive than onsite renewables
- price volatility and uncertainty of prices in the developing renewable market especially due to state and federal legislation requirements
- a potential consumer and local government backlash factor if environmental benefits aren't gained by those locally
- lost energy in transmission of renewable energy, which makes it less effective if the particular generation doesn't have increasing returns to scale.

N. INCENTIVES AND FINANCING OPPORTUNITIES FOR ONSITE RENEWABLES

The following is a list of programs and policies that can be taken advantage of when installing renewable energy of varying types to offset initial costs and provide financing opportunities:

- *New Options for Renewable Energy Financing* by Ellen Friedman (Friedman, n.d.)
- Federal Business Energy Investment Tax Credit: 30% of renewable project initial cost offset by the government (DSIRE, 2011)
- Illinois Clean Energy Community Foundation Grants (1999): Gives grants for projects that include clean-energy development (DSIRE, 2011).
- DCEO - Solar and Wind Energy Rebate Program: Illinois program that offers rebates on solar and wind systems of up to 30% with a cap at \$30,000 (Solar and Wind Energy Rebates, 2011). However, wind projects require an acre parcel of land.
- City Water Light and Power - Solar Rewards Program: Offers a \$1,500/kW discount for residential and commercial installations capped at \$15,000 (DSIRE, 2012)
- Renewable Energy Resources Trust Fund: Offers grants, loans, and incentives for renewables in the State of Illinois, extended through 2015 (DSIRE, 2012)
- Illinois Finance Authority (IFA) Renewable Energy and Energy Efficiency Project Financing: Issues tax exempt bonds and credit enhancements for renewable energy and energy efficiency projects among others (DSIRE, 2011)

Green Energy Loans: businesses seeking loans for renewable energy or energy efficiency projects can apply for rate reductions on their loans for the project (DSIRE, 2012)

APPENDIX D: LOCAL ENGAGEMENT

FOOD PROGRAMS

1. Illinois Local and Organic Food and Farm Task Force

http://www.agr.state.il.us/marketing/Mkt_ILOFFTaskForce.html The Illinois Food, Farm and Jobs Act of 2007 established the Illinois Local and Organic Food and Farm Task Force. The Task Force was tasked with developing a rather comprehensive policy plan with funding recommendations for broadening a state system for local and organic food. The plan was to also include an assessment of the current obstacles and had the overall goal of increasing locally grown and local organic production. Considerations included identifying possible land acquisition opportunities as well as determining farming training & development, technical support needed, and financial incentives. The plan also included aspects such as researching best practices and opportunities for the development of local food and organic food production in addition to provisions for educating the public. The bill will use state money to encourage organic, local, and otherwise sustainable farming practices. Education of both farmers and the public, land acquisition and reclamation, grants or other financial incentives for local and organic farming practices, and technological and physical infrastructure are all important focuses of this bill. In 2010, another Illinois Food, Farms, and Jobs Act was signed. The act provided provisions for creating a database of schools interested in purchasing locally grown fruits and vegetables in order to connect them to a database of farmers who provide locally grown produce with the overall goal of facilitating the purchase of locally grown produce and of helping schools eat more sustainably. The Illinois Local Food, Farms and Jobs Council is a legal committee which reports annually to the Illinois General Assembly and whose aim is “to build local food networks by forming and supporting teams in the public, private and civic sectors of the Illinois food system” through the formation and support of a team of experts on all levels. The end goal of this work is to make locally grown food available statewide. Nearly all of the \$48 billion Illinois spends on food leaves the state, and the economic goal of this group is to retain a larger share of this money. In 2010, the ILFFJC’s report summarized the economic, health, and emergency situation benefits derived from local food as well as outlined local food’s potential for improving food access and “building resilient communities” through food networks.

2. Rite Bite- Shedd

<http://www.sheddaquarium.org/3155.html> This program is run by the Shedd Aquarium since 1997. Because Shedd does not have a lot of funding, it relies on a lot of research from the Monterey Bay Aquarium’s Seafood Watch. Shedd partners with restaurants and culinary institutes to teach people about sustainable seafood. Being mid-west based, Shedd is not only focusing on sustainability, but also on the carbon footprint of importing the majority of Chicago’s fish. Shedd uses the Seafood Watch list of red, yellow and green list of sustainable fish. Shedd recommends that restaurants avoid all red listed fish in favor of the environmentally preferable fish on the other lists.

3. Building A Healthier Chicago

<http://www.healthierchicago.org/> Building a Healthier Chicago (BHC) is a collaborative of local and national stakeholders working to strengthen efforts to promote the health of Chicago residents and employees. BHC is working in concert with First Lady Michelle Obama’s Let’s Move! campaign to address childhood obesity. Through collaboration, BHC promotes and tracks the adoption of selected programs, practices, policies, and supportive environments throughout the worksites, schools, health care organizations, faith-based organizations, parks and neighborhoods of Chicago. BHC works with community organizations, academic institutions, health care professionals and government federal and local agencies to improve the health of all citizens. To make a significant impact on the health of all Chicagoans, BHC works to support its stakeholders broadly in increasing physical activity levels, improving healthy eating, and prevention, detection and control of high blood pressure.

4. Eat Local Live Healthy

http://www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable_Development/Publications/Eat_Local_Live_Healthy_Brochure/Eat_Local_Live_Healthy.pdf The “Eat Local Live Healthy” plan is a City of Chicago strategy to coordinate aspects of the local and regional food industry in ways that enhance public health and create food-related business opportunities. The strategy identifies food issues that, if restructured locally, could improve food quality, lower its cost and increase its availability for

consumers. It also presents examples of public and private sector cooperation that could provide new employment and sustainable development opportunities. Chicago's "Eat Local; Live Healthy" campaign has many suggested actions that the city can take to help make the city as a strong, sustainable hub. Among these recommendations, there are a few things that restaurants could help with. The first of these goals is education. There are many programs that the plan lists, including, for example, teaching school children about food/farming, teaching people about compost, teaching people to grow food.. Chicago restaurants could definitely do that through community outreach and public awareness advertisement. The second goal is increasing the amount of sustainable and organic produce in Chicago. The plan lists Chicago's buying power as a powerful tool in achieving this goal. Just in the area of seafood, a large majority of it is consumed outside the home. With Chicago restaurants driving the market behind sustainable food, the city could become more sustainable, more quickly. The restaurants could also work with individual programs to achieve this goal as well.

5. Good Food Festival and Conference

<http://goodfoodfestivals.com/> In 2012, Chicago held its 8th annual Good Food Festival and Conference. The three-day event opened with a day-long Financing Conference, which included speakers such as Jim Slama (Family Farmed), Mark Fick (Chicago Community Loan Fund), Trinita Logue (IFF), etc. Events during the Financing Conference included Success Stories from Farmers, Food Businesses, and the Community, Financing Fairs, and Sessions with Farm Funders and Investors, Food Business Funders and Investors, and Community Enterprise Funders and Investors. The next day featured a local Policy forum. Specifically, the forum focused on bringing good food to schools. Other topics included "Understanding Sustainable Meat Procurement," "Greening Your Business," and "Scaling Up Urban Agriculture." Finally, the third day culminated in the Good Food Festival. Events were grouped within four categories: Good Food for Thought, Preserve It!, Grow Your Own!, and Make Your Own!. This year's past program provides an extensive lists of individuals who could be good contacts:

http://goodfoodfestivals.com/wp-content/uploads/2011/07/031412_GFF_Print_Program_singlepg.pdf

ENERGY PROGRAMS

- 1. Energy Impact Illinois** <http://energyimpactillinois.org/business/> Energy Impact Illinois provides resources directly targeted at businesses and commercial energy users (in addition to residential and industrial users, though there are different segments of the website for each category of user). The Energy Impact Illinois website consolidates several resources aimed at helping businesses work on a comprehensive energy strategy to manage and ultimately decrease their overall consumption. This might prove a useful tool going forward, especially for identifying the most accessible ways for businesses to move toward more energy efficient practices.
- 2. Deregulation of Illinois Utilities** In January of 2007, electric utilities in the State of Illinois became deregulated. What this means is that instead of being forced to rely on one company to generate, transmit and distribute power, consumers now have a choice of many different companies. Consequently, consumers can now choose between different providers who have different environmental impacts. The consumer has the ability and the right to increase the amount of energy coming from green sources by choosing an electric supplier that uses only wind and/or solar generation rather than traditional sources. 12.8% of energy purchased is already at least partially green, with 0.6% being completely green. The reason that these numbers are not larger is that green power is more costly. For one energy provider, the normal variable rate plan is 7.7 cents per kwh and the green plan is 8.2 cents per kwh. The 12 month fixed rate plan goes from 6.7 cents per kwh for the normal plan and 7.3 cents per kwh for the green plan. Though these rates are for residential customers, it is not hard to imagine that rates for businesses would be similar. This could definitely be a burden in an industry where margins are tight. Additionally, since August of 2007, the IPAA (Illinois Power Agency Act) has mandated that by the year 2025, 25% of Illinois power will come from renewable sources. The Renewable Portfolio Standard (RPS) mandates this increase in renewables, and also mandates that the cost may not increase more than 0.5% increase annually due specifically to the use of these renewables. 18.75% of the 25% carved out for renewables will come from wind, while 6% of the

remaining 6.25% will come from solar. This measure will ensure that the State of Illinois moves toward more renewable energy sources and is a beneficial policy for the overall purposes of this project.

WATER PROGRAMS

- 1. Great Lakes Stewardship Initiative** <http://www.glstewardship.org/About.aspx> The Great Lakes Stewardship Initiative (GLSI) was launched in 2007 to develop knowledgeable and active stewards of the Great Lakes through hands-on learning in the community. Though the Initiative is based in Michigan, its programs have expanded across the Great Lakes region. The Great Lakes — Erie, Huron, Michigan, Ontario, and Superior — form the largest system of fresh surface water on Earth. Covering more than 94,000 square miles, the Great Lakes and their connecting waterways comprise about 90 percent of our nation's supply of fresh water. The organization was founded based on the recognition that the Great Lakes are central to the area's economy, influence weather, and provide residents with many recreational opportunities. Furthermore, its coastal habitats support a wide variety of plants and animals. The GLSI's regional hubs across Michigan help students and their teachers collaborate with local organizations to study and address important environmental issues in their communities. In the process, students learn academic content and practice the skills of problem solving and citizenship. The program's three key strategies include: - Place-based education (also known as community-based learning) - Sustained professional development - School and community partnerships
- 2. Mayor Emanuel's plans to change Chicago's water pricing structure** Water management are another important area of consideration for environmentally friendly restaurant practices. While electricity and natural gas are provided by the private sector under state regulation, most water is provided and treated by local governments in the State of Illinois. For instance, the City of Chicago treats much of the water drawn from Lake Michigan itself. As such, Chicago has on of the lowest water municipal rates relative to other cities throughout Illinois and the U.S. as a whole. Although Mayor Rahm recently announced a plan to double the water rate over the next 5 years, this will still leave Chicago's water rate relatively low. Commercial businesses are charged within ranges. If a business uses between a certain range of water, it is charged the same regardless of how much water is used within that range. Combined with a low water rate, this gives restaurants (and anyone else) little incentive to conserve water, as prices do not reflect the social costs. While most of Chicago is charged by volume of the building or land, water meters are required on all new buildings and on service done to existing buildings. Hence, while almost all restaurants will have a meter, it could be better utilized if the state charged commercial businesses per gallon instead of at a flat rate. On the state level, there is a Supreme Court decree which limits the amount of water Illinois can draw from Lake Michigan in a day (about 2.1 billion gallons), and water demand in the area is a growing problem as modeling indicates this will only be sufficient supply until 2030. Barriers to water reuse include concerns about water quality. In particular, health risks from pathogens and chemical contaminants are a concern, as are threats to ecosystems from nutrient loading and a number of chemical contaminants. There are no regulations for water reuse at the federal level. Instead there are a number of guidelines that encourage water reuse in certain situations, but are not enforceable. Meanwhile, Illinois has few regulations that directly address water reuse, and water quality standards in Illinois can indirectly discourage water reuse, especially in the Chicago Metropolitan area. Much of the Chicago area waterways are by definition relatively low quality water and, therefore, exempt from effluent disinfection requirements.

CHICAGO AND NEIGHBORHOOD DEVELOPMENT

1. Green and Healthy Neighborhoods Program

http://www.cmap.illinois.gov/moving-forward-in-detail/-/asset_publisher/Q4En/content/planning-for-green-and-healthy-chicago-neighborhoods?isMovingForward=1

Though Chicago is known for its diverse and vibrant neighborhoods, a few neighborhoods are faced with multiple challenges, including a crippled housing market, lack of employment opportunities, and many years of population decline. Englewood, Woodlawn, and Washington Park make up the priority areas of a new project called Green and Healthy Neighborhoods (GHN), which is intended to better target public and private investments in the most efficient and effective way. CMAP provides staff planning support through its Local Technical Assistance (LTA) program. Though this is a broad and diverse project, some of its objectives specifically address food concerns, including increasing food security in these communities, encouraging community gardening, and improving the local food economy.

2. Healthy Places: An Initiative of Healthy Chicago

<http://www.healthyplaceschicago.org/>

The mission of this organization is to “make Chicago a healthier place to live.” To do this, the organization addresses streets and parks, food, school and after school, and breastfeeding. The Food section of the program is most relevant to our research. Healthy Places recognizes obesity and diabetes as being at the forefront of the national public health crisis. The Food initiative has three subcategories: The Corner Store Initiative, Healthy Vending, and the Chicago Food Plan. The Healthy Places Corner Store Initiative supports community-based organizations to work with their local corner stores to overcome barriers to stocking healthy, fresh food. The Healthy Vending Challenge is working to make vending options healthier in Chicago. This citywide initiative will encourage city agencies and institutions as well as organizations across Chicago to adopt nutrition standards for the food and beverages they sell in vending machines. Finally, the Chicago Food Plan will help guide public and private efforts to build a healthier food culture in Chicago.

3. Chicago Conservation Corps (C3)

<http://chicagoconservationcorps.org/blog/about-this-weblog/>

The Chicago Conservation Corps (C3) is a project of the City of Chicago Department of Transportation. The C3 recruits, trains, and supports a network of volunteers who work together to improve the quality of life in Chicago’s neighborhoods and schools through environmental service projects. The Corps is divided into three categories: Environmental Leadership Training, Student Clubs, and Explorer Environmental Service in Chicago. The Environmental Leadership Training program teaches adults about conservation issues and techniques in community organizing. The program then supports participants in designing and implementing a conservation project in a neighborhood in Chicago. Through the Student Clubs program, CPS teachers of grades 8-12 can apply to start an environmental club at their school. Students in these clubs assess conservation practices in their schools, focusing on land use, waste management, air quality, energy conservation, water conservation and water quality issues. Based on the results of their assessments, Clubs then implement projects to meet the conservation needs identified. Finally, C3 Explorer Projects are one-time environmental volunteer opportunities for Chicagoans who want to improve the quality of life in their neighborhoods, but lack the time to commit to C3s Environmental Leadership Training Program.

4. Greencorps Chicago

http://www.cityofchicago.org/city/en/depts/cdot/provdrs/conservation_outreachgreenprograms/svcs/greencorps_chicago.html

Greencorps Chicago is a nonprofit organization that actively engages individuals and communities to improve the quality of life for Chicago residents. The organization provides green jobs training and works to strengthen and build community relationships through community gardening. Greencorps offers assistance to gardening groups that have gone through a basic certification process. Once certified, gardeners can participate in additional educational workshops that focus on community development, site development, and sustainability. Furthermore, Greencorps offers job training

programs for disadvantaged and hard-to-employ city residents in its green jobs training. Trainees receive practical field experience and technical training in a variety of environmentally related jobs while also enhancing academic, life, and professional skills. Trainees can then work with Greencorps' nonprofit partners and sister agencies on green projects. The program offers a number of environmental benefits to the city and its residents, including new and improved green spaces, home weatherization and energy efficiency improvements to low-income households, environmental remediation, recycling hazardous waste and electronics, and mitigation of greenhouse gases through tree planting and tree care.

5. Chicago Metropolitan Agency for Planning's "GO TO 2040 Report"

The Chicago Metropolitan Planning Commission produced an extensive report called "GO TO 2040" that contains specific recommendations for improving sustainability and minimizing energy usage (<http://www.cmap.illinois.gov/energy>). The report's emphasis on energy reduction is twofold; it aims to reduce greenhouse gas emissions and their negative effects on our economy and lifestyles and to help avoid potential shortages and the impacts of climate change. The project advocates the Chicago Region Retrofit Ramp-up (CR3), a program designed to nurture the market for retrofits, which can ultimately improve a building's energy efficiency by 30%. The average annual savings for a typical commercial user would be \$6,400. The plan claims this will "pay significant dividends" to the user, providing a clear incentive to conserve energy. The report also contains useful information about financing options and potential policies to facilitate financing of green investments. These local funding options include local revolving funds, Property Assessed Clean Energy (PACE), and energy performance contracting (a program with Energy Service Companies), among others. Finally, the City of Chicago Small Business Improvement Fund is a local grant program offers funding for small businesses or commercial entities to improve or upgrade their facilities.

6. Chicago Climate Action Plan → soon to become the "Sustainability Plan"

The Chicago Climate Action Plan (<http://www.chicagoclimateaction.org/>) lays out strategies to reduce the city's emissions as well as prepare for inevitable changes in the city's future climate. The 5 broad strategies of the Plan include energy efficient buildings, clean and renewable energy, improved transportation options, reduced waste and industrial pollution, and adaptation (learning to adapt to the changing climate). The goals of the Chicago Climate Action Plan seem very much in line with promoting green practices, especially by businesses such as restaurants. Additionally, the Chicago Climate Action Plan website provides information regarding numerous resources and programs pertaining to each of the five strategies.

7. Chicago Community Climate Action Toolkit

To create the Chicago Community Climate Action Toolkit (<http://climatechicago.fieldmuseum.org/>), the Field Museum worked with partner organizations in four Chicago neighborhoods—Pilsen, Forest Glen, South Chicago, and Bronzeville. Together, these organizations develop and carry out local climate action projects. Anthropologists and ecologists from the museum's division of Environment, Culture, and Conservation (ECCo) worked with community partner organizations to understand the region's climate action plans, identify community strengths and concerns related to these plans, and develop and implement local climate action projects. These projects aim to simultaneously implement the Chicago region's climate action plans and improve quality of life at the local scale, as well as influence broader networks and efforts for social and environmental change.

OTHER PROGRAMS

1. State of Illinois

<http://green.illinois.gov>

The State of Illinois maintains a website called green.illinois.gov, which gives information about the Green Governments Coordinating Council (GGCC). This council is responsible for the sustainability planning for the state. It also gives information about government programs that help support environmentally friendly efforts. The Illinois EPA also has established an environmental program that

sets forth proper handling of pesticides, herbicides, animal waste, and groundwater.

2. Chicago's Green Business Bureau

<http://www.gbb.org/>

This program is not specific to Chicago, though it serves as a certification seal in the marketplace to indicate to other partners that a business engages in green practices. The mission of the Green Business Bureau is to foster environmental awareness among businesses and promote business practices that are both environmentally responsible and commercially beneficial. The organization serves as a national third-party certifier for businesses that follow environmentally responsible practices. The Green Business Bureau is a trusted seal in the marketplace that says that a business' practices are green.

3. Frontera Farmer Foundation

The Frontera Farmer Foundation (<http://www.rickbayless.com/foundation/about.html>) provides grants ranging from \$400 to \$12,000 to local Chicago farms in support of local agriculture. The Foundation was started and continues to be overseen by Rick Bayless, owner of Frontera Grill.

LOCAL ENGAGEMENT THROUGH SCHOOLS

Engaging with the local community through schools should be a possibility restaurants consider in order to gain points for green certification. There are numerous platforms through which restaurants can work with Chicago's civic goals to make a difference in schools. Two important food-related goals as defined by the Healthy School Campaign[1] for Chicago Public Schools are:

1. A focus on proper nutrition and the implementation of wellness programs
2. Healthy eating through the provision of local, sustainable food.

Restaurants have several options to engage with these schools and there are currently several restaurants working to make a difference in the community.

Engagement with civic goals: Goal #1- Nutrition in Schools

Nutrition has become an important priority for Chicago Public Schools due to the obesity epidemic. Obesity is the number one risk factor for poor health in the United States. According to the Consortium to Lower Obesity in Chicago Children, in Illinois in 2009, 35% of children aged 10-19 were obese.[2] This explains the behavior of The Chicago board of Education partnering with community-based organizations to develop physical education and nutrition programs they hope to implement in each neighborhood.

Restaurants can contribute to these goals by:

1. Catering nutritiously: If the restaurant is physically catering within the school, it can focus on providing more healthful options such as fresh fruits, locally grown vegetables, etc.
2. Conducting educational seminars: Restaurants can engage within school communities by helping organize or deliver special programs and educational seminars aimed at the benefits of nutritious eating or benefits of consuming locally grown food.
3. Sponsoring Special Events: Restaurants can sponsor wellness programs
4. Menu Labeling: Restaurants can promote healthy eating by providing nutritional information about food on menus.
5. Scholarships and Internships: Restaurants can provide scholarships to green culinary institutions such as the Academy for Global Citizenship [3] or those supported by the Frontera Foundation, as mentioned by Jeff Maimon from Frontera Grill.

[1] <http://healthyschoolscampaign.typepad.com/files/local-school-wellness-policy.pdf>

[2] <http://www.clocc.net/coc/prevalence.html>

[3] <http://agcchicago.org/stewardship.php>

APPENDIX E: FINANCING AND INCENTIVES

ENERGY

There are a number of local and federal financing options for energy investments. These include:

- Federal Tax Credits for Consumer Energy Efficiency: Energy Star Appliances. Energy Star appliances cost more than standard models, though there is an eventual financial return because Energy Star Appliances have lower energy use, and thus generate lower energy bills. This federal tax credit pays the purchaser of Energy Star Appliances up to 30% of the cost of the appliances, with no upper limit, to defray the higher cost of the appliances.
- Property Assessed Clean Energy (PACE), a legislative program where municipal governments offer bonds to investors and then loan the money raised to consumers and businesses to use for an energy retrofit.
- Managed Energy Service Agreements (MESA) Financing is a system that works well for commercial entities that don't own their building. The system commits a landlord to pay a historical energy use for a fixed period of time and makes the energy-efficiency supplier responsible for paying the energy bill.
- Energy Performance Contracting, a program organized with an Energy Service Company (ESCO), which is a performance-based procurement method and financial mechanism. The program allows for building renewal and the resulting utility bill savings that result from reduced energy use will ultimately pay for the cost of the building renewal project. A "Guaranteed Energy Savings" Performance Contract includes language that obligates the contractor, a qualified Energy Services Company (ESCO), to pay the difference if at any time the savings fall short of the guarantee.
- The City of Chicago Small Business Improvement Fund is a local grant program offers funding for small businesses or commercial entities to improve or upgrade their facilities. It is important, however, to note that this is not specific to restaurants or green improvements. The fund includes provisions for certain energy efficiency upgrades in the form of new windows, roofs, floors, heating, ventilation, and air conditioning.
- Chicago Region Retrofit Ramp-up (CR3) is a project with CMAP, the intent of which is to bring together fragmented resources and initiatives under one umbrella to create a seamless metropolitan-wide retrofit program.
- Energy Impact Illinois provides resources directly targeted at businesses and commercial energy users to help them develop a comprehensive energy strategy to manage and ultimately decrease their overall consumption.
- The Energy Policy Act of 2005 (EPACT) offers businesses tax deductions for the costs of improving the energy efficiency of commercial buildings. The Emergency Economic Stabilization Act of 2008 extended provisions in EPACT. The website provides a tool to calculate the total tax savings and incentives under these acts.
- Since Illinois deregulated its utilities in 2007, consumers can now choose between different providers who have different environmental impacts. The consumer has the ability and the right to increase the amount of energy coming from green sources by choosing an electric supplier that uses only wind and/or solar generation rather than traditional sources.
- Under the Recovery Act, Program 1603 allows for Payments for Specified Energy Property in Lieu of Tax Credits to reimburse eligible applicants for a portion of the cost of installing specified energy property used in a trade or business or for the production of income.
- Midwest Energy allows for an on-bill service charge: Customers can repay their clean energy investment through a charge on their monthly utility bill. This eliminates the upfront cost to the consumer for clean energy improvements by financing all costs not covered through rebates.

FOOD

- According to recent research by C. Winter and S. Davis, consumers who are looking for alternatives to conventionally-sourced foods appear to be willing to pay the typical 10% to 40% price premium that organic products command.
- In an effort to quantify the costs of composting and recycling, the GRRT obtained estimates of comparative prices through interviews with representatives of various waste hauling companies. The

cost of recycling was found to be, on average, 50% less than traditional waste. The representatives also estimated the costs of composting to be anywhere from 25-75% costlier than the baseline option of trash collection. Exact pricing data was not available due to proprietary issues as well as the differences in waste between restaurants, but these estimates are close approximations.

FURNISHINGS

Note that many of the tax breaks and financing incentive programs overlap with the energy division, as implementing environmentally friendly building materials often results in long term energy savings.

- The U.S. Department of Energy, specifically The Office of Energy Efficiency and Renewable Energy, offers financial assistance for energy saving building programs. The financial assistance involves transfers of money, property, or services to a recipient so that the recipient can accomplish a public purpose authorized by federal statute. Last year the department gave out \$2.2 billion dollars in grants.
- Green Communities provides grants, financing, tax-credit equity, and technical assistance to developers who meet the criteria for affordable housing that promotes health, conserves energy and natural resources, and provides easy access to jobs, schools and services.
- Energy Star outlines the tax credits for energy saving appliances and building materials that is offered by the federal government. The tax credit is 30% of cost with no upper limit, which is a key financial incentive for implementing energy saving building materials.
- The Funders' Network exists to inspire, strengthen and expand funding and philanthropic leadership that yields environmentally sustainable, socially equitable and economically prosperous regions and communities.
- By supporting the building of affordable, efficient and healthy homes and the planting of community trees, the Home Depot Foundation is working to increase awareness of the connection between quality affordable housing, adequate natural spaces and trees to the overall health and success of our communities.
- The Tax Incentives Assistance Project (TIAP), sponsored by a coalition of public interest nonprofit groups, government agencies, and other organizations in the energy efficiency field, is designed to give consumers and businesses information they need to make use of the federal income tax incentives for energy efficient products and technologies passed by Congress as part of the Energy Policy Act of 2005 and subsequently amended several times.
 - <http://energytaxincentives.org/>
- In a presentation for the Forest Products Journal at Michigan State University, the PowerPoint outlines how the wood and furnishings industry affects the international foresting markets and discusses certified wood, which is a topic that has not been addressed in Green Seal certification. The presentation also discusses how the wood industry is poised to be severely affected by the biochemicals industry and provides issues that should be considered when furnishings are involved.
- In *Optimization model for the selection of materials using a LEED-based green building rating system in Colombia*, the authors discuss the problem of using LEED-certified building materials with a specific budget constraint and attempt to optimize the environmental impact with the limited budget of a restaurant. This article is particularly interesting and relevant because many small restaurants do not wish to complete GRA certification because of the cost, and this article shows the most cost-effective building materials. The research in this paper would be extremely helpful in guiding restaurants.

POLLUTION & CHEMICAL REDUCTION

In the Pollution & Chemical Reduction space, we found it convenient to research financing availability in four sub-groups: cleaning supplies, cooking emissions, pest management and transportation.

Cleaning Supplies: Financing for green cleaning products is left up to restaurant alliances. The federal government does not provide tax cuts or rebates for the purchase of green-certified chemicals. However, cooperative procurement contracts can lower the cost of green cleaning products. In one case, the Western States Contracting Alliance (WSCA) secured 45-50% off of retail list prices in a 2007 contract for five western states. Organizations such as the GCRC and Green Seal could look into discounts for its members/clients and provide an incentive for certification.

Cooking Emissions: There are no specific programs available, but some banks offer lower interest rates for green initiatives. Besides those, many government agencies offer tax incentives for using energy efficient products such as Energy Star-rated appliances.

Pest Management: Research has proven that an IPM program is equal or less costly than a conventional, calendar-based program. In addition, an IPM program reduces the total applications of pesticide and results in less pesticide residue in food than the conventional, calendar-based program. These findings benefit the restaurant because service from an IPM practitioner (typically called an exterminator) is less costly. However, not all cost savings are passed on to the restaurant, because the certification process for IPM practitioners is timely and costly. As a result, it is typically more costly for a restaurant to choose an exterminator that is EcoWise, Green Seal, or Green Pro certified. The cost to certify an IPM practitioner is estimated around \$5,000 - \$10,000 and varies according to the size of the provider.

Transportation: The breakeven point for purchasing a hybrid / electric vehicle, where the costs savings from reduced fuel consumption outweigh the higher initial price, usually occurs 5 – 8 years after purchase. In addition to these cost savings, the government offers incentives for alternative-fueled vehicles. Currently, the government offers tax rebates for plug-in hybrids and electric vehicles via a combination of local and national credits – up to \$7,500 at the federal level, a \$2,000 credit for installation of a charging station, and a range of state benefits from \$1,000 - \$5,000. Alternative-fueled vehicles are typically marketed alongside their estimated tax rebate from purchase. For the State of Illinois, residents are allowed up to a \$4,000 tax rebate and are eligible for the \$2,000 credit for installation of a charging station.

LOCAL FOOD

For in-season produce, competitive pricing between farmers' market and retail prices, see Pirog and McCann (2009).

DIRECT FINANCIAL INCENTIVES

- According to a study by the University of Nebraska, nearly three-fourths of the respondents agreed that buying locally grown food products can be profitable for food service establishments.[Note: Add citation]
- A producer might find that offering a product a restaurant cannot get anywhere else is a good way to build new markets.

FINANCIAL RETURNS

Producers receive a greater share of retail prices in local food supply chains than they do in mainstream chains, but the operational cost is much higher. Producer net revenue per unit in local chains ranges from about equal to more than seven times the price received in mainstream chains. However, in all direct market chains examined, producers assume responsibility for additional supply chain functions, such as processing, distribution, and marketing, to capture revenue that would otherwise accrue to a third party. These supply chain functions can be costly and often involve the operator's own unpaid labor.

Although farms in direct market supply chains retain nearly 100 percent of the retail price, costs incurred to bring their product to market total between 13 percent and 62 percent of the retail price.[Note: Add citation]

Transportation fuel use is more closely related to supply chain structure and size than to the distance food products travel. Products in local supply chains travel fewer miles from farms to consumers, but fuel use per unit of product in local chains can be greater than in the corresponding mainstream chains. In these cases, greater fuel efficiency per unit of product is achieved with larger loads and logistical efficiencies that outweigh longer distances.

AQUAPONICS: FINANCIAL RETURNS

The integration of the fish and plant production system (aquaponics) produces economic cost savings unavailable using either system alone. Shared cost savings come from spreading out operating costs (e.g., management, water, nutrients, and overhead charges) and capital costs (e.g., backup generator, used truck, and office equipment) over two systems. Net present values are positive for a wide range of discount rates. Internal rate of return analysis shows that for a total investment of \$244,720, this system can potentially provide a return of 12.5%. [Note: Add citation] The hydroponic system drives the potential profitability of the combined system with 67% of annual returns derived from plant production. Organic vine-ripened, pesticide-free produce and “fresh-daily” fish can bring premium prices, particularly during winter months in urban areas.

ANTIBIOTIC-FREE MEAT

“Sales of antibiotic-free meat, for instance, are up 25 percent to \$175 million in the past three years. Direct financial return: by purchasing more antibiotic-free meats, restaurants can gain additional revenue, because, according to our research, customers are more likely to purchase antibiotic-free meat. Indirect financial return: The sale of antibiotic-free products is part of a growing nationwide consumer trend of purchasing more organic products. 78 percent of U.S. families reported purchasing organic foods according to a study. Consumers are now, more than ever, aware of what they are putting into their bodies, and antibiotic-free products appear to be better for the health of the consumer, which is a clear social benefit..

APPENDIX F: CERTIFICATION

GREEN SEAL RESTAURANT-HOTEL STANDARD COMPARISON

There are a number of provisions that overlap between GS-46 (Green Seal's Standard for Restaurants & Food Service) GS-33 (Green Seal's Standard for Hotels and Lodging Properties). Giving restaurants in buildings or hotels that already meet the equivalent GS-33 standards credit for this certification would be one effective way of taking into account previous efforts and making the GS-46 certification process more seamless and attractive to restaurants.

Some of the individual GS-33 provisions that would be good candidates for incorporation into GS-46 are:

Practice	GS-33	GS-46
Recycling (no food)	2.1.1	3.4.8
Double-sided printing	2.1.3	3.7.4.1
Food donation	2.1.5	3.4.5
Minimize disposables	2.1.6	3.4.9
Energy-efficient lighting	2.2.2	3.2.10
Water limits	2.3.1	3.3.4
Preferable cleaning products	2.4.4	3.6.1
Purchasing policy	2.6.1	3.7.1
Preference to reusable packaging	2.6.6	3.7.1.1
Preference to responsible service suppliers (silver)	2.6.7	3.7.1.1
ENERGY STAR/LEED Building (gold)	2.8.2	3.2.12
Renewable Energy (gold)	2.8.3	3.2.13
Meets GS-42 Cleaning Standards (gold)	2.8.6	3.6

In addition to the incorporation of individual provisions themselves, incorporating some key features of the GS-33 standard into the GS-46 standard may prove to be beneficial. These include:

Fewer total standards. While maintaining rigor is important, GS-46 can appear too daunting and complex for restaurants. There are two times as many pages and ten times as many sections in GS-46.

- Options. Give restaurants the option to replace appliances when they break down or need to be replaced, as is given in GS-33, rather than present mandates, as are given in GS-46.
- Energy Star Leader Status. Take into account a building's status as an ENERGY STAR Leader under GS-46.

Furthermore, we recommend that Green Seal consider allowing restaurants to cut back on the paperwork they have to file for GS-46 certification, if they have already met GS-33 standards. Requiring less data reporting would make the certification process faster and less expensive for restaurant owners, while hopefully not sacrificing any of the rigor of the green restaurant certification.

GREEN SEAL-LEED 2009 COMMERCIAL INTERIORS COMPARISON

The GS-46 standard includes many practices that closely parallel practices from the LEED 2009 Commercial Interiors Rating System. Due to the standards' similarities, we recommend that Green Seal automatically award one of the given credit levels indicated in the table below to restaurants that have fulfilled the relevant LEED practices and can provide the necessary LEED documentation. In doing so, Green Seal would allow restaurants to forgo the redundant paperwork of re-certifying practices that have already been verified.

LEED 2009 Commercial Interiors Practices	GS-46 Practices
EA Prerequisite 3: Fundamental Refrigerant Management	3.2.7 Refrigerants - Mandatory.
EA Credit 1.1: Optimize Energy Performance—Lighting Power	3.2.10 Energy-Efficient Lighting - Option. [Silver/Gold]
EA Credit 1.4: Optimize Energy Performance—Equipment and Appliances	3.2.9 Energy-Efficient Appliances - Option. [Gold, with the exception of “Turn pilot light on only during equipment use.”]
EA Credit 3: Measurement and Verification	3.2.1 Energy Management Plan - Mandatory.
EA Credit 4: Green Power	3.2.13 Renewable Energy - Option. [Silver/Gold]
IEQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control	3.5.1 Smoking - Mandatory.
IEQ Credit 4.2: Low-Emitting Materials—Paints and Coatings	3.7.7 Paint – Mandatory.
IEQ Credit 4.3: Low-Emitting Materials- Flooring Systems & IEQ Credit 4.5 Low-Emitting Materials-Systems Furniture and Seating	3.7.6 Furnishings – Mandatory.
WE Prerequisite 1: Water Use Reduction	3.3.4 Water-Efficiency - Mandatory
WE Credit 1: Water Use Reduction	3.3.8 Water Conservation Performance - Option [Gold]
MR Prerequisite 1: Storage and Collection of Recyclables	3.4.8 Solid Waste Recycling - Mandatory
MR Credit 3.2: Materials Reuse—Furniture and Furnishings	3.4.20 Waste Innovation - Option [Silver/Gold]

The following is a list of the LEED-CI 2009 provisions cited, coupled with their Green Seal counterparts, for ease of comparison.

ENERGY & ATMOSPHERE (EA) PREREQUISITE 3: FUNDAMENTAL REFRIGERANT MANAGEMENT REQUIRED

Requirements

Zero use of chlorofluorocarbon (CFC)-based refrigerants in tenant heating, ventilating, air conditioning and refrigeration (HVAC&R) systems used within the LEED project scope of work.

Overlaps with

GS 46 3.2.7 Refrigerants - Mandatory.

All new and replacement equipment shall not use CFC-based refrigerants.

EA CREDIT 1.1: OPTIMIZE ENERGY PERFORMANCE—LIGHTING POWER

1–5 points

Requirements

Reduce connected lighting power density below that allowed by ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda1) using either the space-by-space method or by applying the whole building lighting power allowance to the entire tenant space.

The points earned for reducing lighting power density below the standard are as follows:

Lighting Power Density Reduction Below the Standard Points:

- 15% 1
- 20% 2
- 25% 3
- 30% 4
- 35% 5

Overlaps with

GS-46 3.2.10 Energy-Efficient Lighting - Option. The operation shall have:

SILVER/GOLD

Energy-efficient lighting (see Appendix D) shall be used in areas where lights are on for 4+ hours (e.g., exit signs, kitchen, seating area, restrooms, staff offices, etc.). Specialty light fixtures (e.g., display or accent lighting) may be exempt from this requirement if compatible options are not available. T-12 fluorescent lighting shall not be used.

EA CREDIT 1.4: OPTIMIZE ENERGY PERFORMANCE—EQUIPMENT AND APPLIANCES

1–4 points

Requirements

For all ENERGY STAR® eligible equipment and appliances installed as part of the tenant’s scope of work, achieve one of the following percentages (by rated power):

Percent Installed ENERGY STAR Qualified Equipment of ENERGY STAR Eligible Equipment

Points

- 70% 1
- 77% 2
- 84% 3
- 90% 4

This requirement applies to appliances, office equipment, electronics, and commercial food service equipment. Excluded are HVAC, lighting, and building envelope products.

Overlaps with

GS-46 Section 3.2.9 Energy-Efficient Appliances - Option.

The operation shall have:

SILVER: 20% of its energy-efficient qualified kitchen appliance options (see GRRT Energy Appliances matrix on website) as energy-efficient, including at least two used on most days of business; such as one energy-efficient appliance used during regular operation.

GOLD: 50% of its energy-efficient qualified kitchen appliance options (see GRRT Energy Appliances matrix on website) as energy-efficient, including at least four used on most days of business; such as two energy-efficient appliances used during regular operation, and

Turn pilot light on only during equipment use.

EA CREDIT 3: MEASUREMENT AND VERIFICATION

2–5 points

CASE 2. Projects 75% or More of the Total Building Area

OPTION 1

Develop and implement a measurement and verification (M&V) plan consistent with Option D: Calibrated Simulation (Savings Estimation Method 2) as specified in the International Performance Measurement &

Verification Protocol (IPMVP) Volume III: Concepts and Options for Determining Energy Savings in New Construction, April 2003.

The M&V period must cover at least 1 year of post-construction occupancy. Provide a process for corrective action if the results of the M&V plan indicate that energy savings are not being achieved.

OPTION 2

Develop and implement a measurement and verification (M&V) plan consistent with Option B: Energy Conservation Measure Isolation, as specified in the International Performance Measurement & Verification Protocol (IPMVP) Volume III: Concepts and Options for Determining Energy Savings in New Construction, April 2003.

The M&V period must cover at least 1 year of post-construction occupancy. Provide a process for corrective action if the results of the M&V plan indicate that energy savings are not being achieved.

Overlaps with

GS 46 3.2.1 Energy Management Plan

The operation shall have a documented energy management plan with goals for energy conservation, an action plan to meet the goals, documented monitoring of progress against the goals, and an operating plan to support the goals (including start-up and shutdown schedule for lights, equipment, and other energy-consuming items).

EA CREDIT 4: GREEN POWER

5 points

Requirements

OPTION 1

Engage in at least a 2-year renewable energy contract to provide at least 50% of the tenant's electricity from renewable sources, as defined by the Center for Resource Solutions' Green-e energy product certification requirements.

All purchases of green power must be based on the quantity of energy consumed, not the cost, as determined by the annual electricity consumption results of EA Credit 1, Optimize Energy Performance.

OPTION 2

Engage in at least a 2-year renewable energy contract to purchase at least 8 kilowatt hours per square foot per year from renewable electricity sources as defined by the Center for Resource Solutions (CRS) Green-e Energy's product certification requirements.

All purchases of green power must be based on the quantity of energy consumed, not the cost.

Overlaps with

GS-46 Section 3.2.13 Renewable Energy - Option.

SILVER/GOLD

The operation uses renewable energy, not including any renewable energy certificates, for at least 20% of its direct energy needs; alternatively, the operation is a member of the Center for Resource Solutions' Green-e Marketplace and using renewable energy, not including renewable energy certificates.

INDOOR ENVIRONMENTAL QUALITY (IEQ) PREREQUISITE 2: ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL

Required

Requirements

OPTION 1

Locate tenant space in a building that prohibits smoking by all occupants and users, within 25 feet of entries, outdoor air intakes and operable windows.

Overlaps with

GS-46 Section 3.5.1 Smoking

The operation shall not allow smoking at its facilities or within 25 feet of its entries, outdoor air intakes, or operable windows where regulations allow or where applies.

IEQ CREDIT 4.2: LOW-EMITTING MATERIALS—PAINTS AND COATINGS

1 point

Requirements

Paints and coatings used on the interior of the building (i.e. inside the weatherproofing system and applied on-site) must comply with the following criteria as applicable to the project scope:

- Architectural paints and coatings applied to interior walls and ceilings — must not exceed the volatile organic compound (VOC) content limits established in Green Seal Standard GS-11, Paints, 1st Edition, May 20, 1993.
- Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates must not exceed the VOC content limit of 250 g/L established in Green Seal Standard GS-03, Anti-Corrosive Paints, 2nd Edition, January 7, 1997.
- Clear wood finishes, floor coatings, stains, primers, sealers, and shellacs applied to interior elements: must not exceed the VOC content limits established for those coating types in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, effective January 1, 2004.

Overlaps with

GS-46 Section 3.7.7 Paint – Mandatory.

Paint used for architectural surfaces shall be environmentally-preferable (Appendix A).

IEQ CREDIT 4.3: LOW-EMITTING MATERIALS—FLOORING SYSTEMS

1 point

Requirements

OPTION 1

- All flooring must comply with the following as applicable to the project scope:
- All carpet installed in the building interior must meet the testing and product requirements of the Carpet and Rug Institute Green Label Plus¹ program.
- All carpet cushion installed in the building interior must meet the requirements of the Carpet and Rug Institute Green Label program.
- All carpet adhesive must have less than 50 g/L VOC.
- All hard surface flooring must meet the requirements of the FloorScore² standard (current as of the date of this rating system, or more stringent version) as shown with testing by an independent third-party.

Mineral-based finish flooring products such as tile, masonry, terrazzo, and cut stone without integral organic-based coatings and sealants and unfinished/untreated solid wood flooring qualify for credit without any IAQ testing requirements. However, associated site-applied adhesives, grouts, finishes and sealers must be compliant for a mineral-based or unfinished/untreated solid wood flooring system to qualify for credit.

Concrete, wood, bamboo, and cork floor finishes such as sealer, stain and finish must meet the requirements of South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, effective January 1, 2004.

- Tile setting adhesives and grout must meet South Coast Air Quality Management District (SCAQMD) Rule 1168. VOC limits correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.

Overlaps with

GS-46 Section 3.7.6 Furnishings – Mandatory.

Furnishings, such as tables, chairs, and carpet shall be durable products that can be repaired, when possible, and: When furniture is purchased it shall not contain added urea formaldehyde. Carpet shall be environmentally-preferable (see Appendix A) or low-emitting.

WATER EFFICIENCY (WE) PREREQUISITE 1: WATER USE REDUCTION

Required

Requirements

Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the tenant space (not including irrigation). Calculate the baseline according to the commercial and/or residential baselines outlined below. Calculations are based on estimated occupant usage and must include only the following fixtures and fixture fittings located within the tenant space: water closets, urinals, lavatory faucets, showers, kitchen sink faucets and pre-rinse spray valves.

Overlaps with

GS-46 Section 3.3.4 Water-Efficiency - Mandatory.

The operation shall have water fixtures that meet the specifications outlined below. Any existing toilets and urinals that exceed the required pressure or flow rates shall be on a schedule for replacement within two years. An exception is permitted if the plumbing infrastructure will not adequately function with lower flow rates.

2.2 gpm or less for kitchen faucet

0.5 gpm or less for lavatory faucet

1.6 gpf or less for toilets

WE CREDIT 1: WATER USE REDUCTION

6–11 points

Requirements

Employ strategies that in the aggregate use less water than the water use baseline calculated for the tenant space (not including irrigation). The minimum water savings percentage for each point threshold is as follows:

Overlaps with

3.3.8 Water Conservation Performance - Option.

Water conservation measures shall achieve:

GOLD: A 20% improvement from baseline (no less than one year ago, no greater than 3 years ago), as described in 3.3.2.

MR PREREQUISITE 1: STORAGE AND COLLECTION OF RECYCLABLES

Required

Requirements

Provide an easily accessible dedicated area or areas for the collection and storage of materials for recycling for the tenant space. Materials must include at a minimum paper, corrugated cardboard, glass, plastics, and metals.

Overlaps with

3.4.8 Solid Waste Recycling - Mandatory.

The operation shall research and document local solid waste recycling options. The operation shall maintain a recycling program for materials for which recycling is locally available and have clearly marked sorting mechanisms (e.g., bins) in areas waste is collected. Materials may include, but are not limited to, aluminum, plastic (1-5), steel, glass, cardboard, newspaper,

mixed paper, electronics, inkjet and toner cartridges, paint, batteries, and fluorescent lighting like CFLs.

MR CREDIT 3.2: MATERIALS REUSE—FURNITURE AND FURNISHINGS

1 point

Requirements

Use salvaged, refurbished or used furniture and furnishings for 30% of the total furniture and furnishings budget.

Overlaps with

GS-46 Section 3.4.20 Waste Innovation - Option.

SILVER GOLD

Initiative supporting one of the following objectives: 1) reduce discarded material, 2) reuse waste, or 3) recycle resources.

APPENDIX G: FOOD

Meat and Seafood: Standards and Labels

Third-Party Verified

- **Animal Welfare Approved (AWA):** The label "ensure[s] that cows, sheep, chickens, turkeys, geese, goats, bison and rabbits raised for meat, dairy or egg products are allowed to live natural lives that include physical and psychological well-being." ("Animal Welfare Approved," (n.d.)) Use of this label is verified by third party auditors. The standards for the label are publicly available (Animal Welfare Approved, (n.d.)) Also, this label was developed with broad public and industry input. The organization itself contracts the auditors and therefore ensures the consistency of the label's use (Animal Welfare Approved, 2012).
- **Organic:** "The USDA organic seal verifies that producers met animal health and welfare standards, did not use antibiotics or growth hormones, used 100% organic feed, and provided animals with access to the outdoors." (USDA AMS, 2012a). "Organic" labels for meat can only be certified by USDA accredited certifiers. A list of these certifiers can be found on the USDA website (USDA AMS, 2012b). The only accredited organization for Illinois is *Organic National & International Certifiers*.

Not Third-Party Verified

- **Antibiotic Free:** The USDA has banned this term for meat and poultry products, reasoning that it is "unapprovable". However, the labels "no antibiotics administered" and "raised without antibiotics" are allowed. Those labels imply that antibiotics were not used at any point in the animal's lifetime. However, there is no USDA verification process.
- **Free Range or Free Roaming:** The label is approved by the USDA for use on poultry only (not eggs). It is required that the birds have outdoor access. However, the time period is not regulated. The USDA even considers five minutes of open-air access each day sufficient for this label. There is no regulation for use on beef or eggs. [19,20]
- **No Hormones:** For poultry and pork, the use of hormones is prohibited by federal regulations. Therefore, the label cannot be used, unless it is additionally stated that "Federal regulations prohibit the use of hormones." For beef, the term may be allowed on the label of products "if sufficient documentation is provided to the Agency by the producer showing no hormones have been used in raising the animals." (USDA FSIS, 2011). The term "**hormone free**" is considered "unapprovable" by the USDA.
- **Natural:** The USDA defines meat or poultry as "natural" if it contains "no artificial ingredient or added color and is [...] processed in a manner that does not fundamentally alter the product." However, there is no official verification organization – manufacturers can be held accountable for making this claim. **No Additives:** This term is not defined by the FDA or the USDA. These agencies, however, define what "additives" are. The manufacturer may or may not refer to the FDA/USDA definition.
- **Cage-Free:** There is no regulation on what exactly this term means. It implies that hens are not kept in cages inside barns and warehouses. However, it does not suggest any outdoor access. There are no certifying organizations.

Other

- **Grass Fed:** According to the USDA definition of "Grass Fed", ruminant animals are allowed to be fed "forage consisting of grass (annual and perennial), forbs (e.g., legumes, Brassica), browse, or cereal grain crops in the vegetative (pre-grain) state" (USDA AMS, 2008). Also, supplements can be used, as long as they are fully documented. This claim can be made *without* USDA verification. However, USDA verification is available. The label "USDA Process Verified" indicates this verification. Food Safety and Inspection Service (FSIS; prior to the new Agricultural Marketing Service (AMS) standards) approved claims *do not* guarantee the above-mentioned nutrition during the whole lifetime. Note that this definition only applies to ruminant animals. That is, it is not meaningful for pork, poultry, dairy and eggs ("Grass Fed (USDA)", n.d.). The regulation is publicly available (USDA AMS, 2008). **Animal Welfare Approved** provides a much stricter definition of grass fed: "[the animals] are fed 100 percent grass and

forage from weaning to slaughter, and are raised outside on pasture or range for the whole of their lives, except in cases of emergency or extreme weather." (Bassett, A., & Gunther, A., 2011)

Seafood

Third-Party Verified

- **Marine Stewardship Council:** This organization works with partners to transform the world's seafood markets and promote sustainable fishing practices. Its certification standards and seafood ecolabels are publicly available (Marine Stewardship Council, n.d.). However, there are several different certifying organizations that MSC works with [28], which creates a risk that certifiers use different approaches for evaluating fisheries. Therefore, the labels might not be consistently applied throughout the U.S ("Marine Stewardship Council," n.d.). A list of certification organizations can be found online (Accreditation Services International, n.d.).[Note: Based on the Quality & Consistency Project guidance, I think they have minimized inconsistencies, so I softened the language some. Someone might want to take a closer look at this.]
- **FishWise:** This is a sustainable seafood consultancy that promotes sustainable fishing practices. A color-code (green, yellow, red) indicates differentiation. Green is sustainable, yellow indicates some concerns, and red is unsustainably caught. Furthermore, "the location of the catch, the catch method, and the common name of the fish are also included on the label." ("FishWise," n.d.). The standards are publicly available (FishWise, "Assessment Methods," n.d.). The organization may contract third-party auditors, which are not listed (FishWise, "Traceability Support", n.d.).

Not Third-Party Verified

Organic: There is currently no certification for organic seafood by the USDA.

Other

- **Dolphin Safe:** This label is regulated by federal law (Dolphin Protection Consumer Information Act). It indicates that certain steps have been taken to reduce dolphin mortality rates when catching tuna. However, on-board verification is primarily required if the tuna is caught with purse sein nets in the Eastern Tropical Pacific Ocean. If other methods are used, or tuna is caught outside of this region, the label does not necessarily have to be verified ("Dolphin Safe", n.d.). Audits are conducted by the Tuna Tracking and Verification Program of the National Marine Fisheries Service (US Department of Commerce NOAA, n.d.).

Other Food Products

Third-Party Verified

- **Fair Trade:** This label includes processed food and beverages. Although the main goal is to promote fair wages, sustainably raising grains and vegetables without use of harmful pesticides is also encouraged. The standards are publicly available (Fair Trade USA, "Label Products," n.d.). Although FairTrade USA is the only FairTrade certifier in the US, the organization might send a third-party agency to audit the site (Fair Trade USA, "Audit Terms," n.d.). A list of these third-party agencies could not be found.
- **Rainforest Alliance:** This label includes certification for chocolate, fruits and beverages. It is "designed to promote tropical conservation and steer commercial agriculture practices in the tropics" ("Rainforest Alliance Certified", n.d.). The standards are publicly available (Rainforest Alliance, n.d.). The organization itself holds the audits and therefore ensures consistency of applying the label.
- **Protected Harvest:** This label verifies that crops have been raised with IPM (integrated pest management). There are independent inspectors to verify this label. The standards are publicly available (Protected Harvest, "Certification Standards," n.d.). The organization contracts third-party agencies for auditing and issuing (Protected Harvest, "Sustainable Certification," n.d.). However, a list of those agencies is not provided.
- **Bird Friendly:** Only coffee can carry the "bird friendly" label. "The goal of the program is to foster conditions on coffee plantations that provide good bird habitats" ("Bird Friendly", n.d.). A prerequisite for this label is USDA organic. The standards are publicly available (Smithsonian Institute, "Program

History," n.d.). A list of certification agencies can be found online (Smithsonian Institute, "Coffee Certification", n.d.).

Not Third-Party Certified

Not Available

APPENDIX H: INFORMATION AND ANALYSIS

The Information and Analysis team worked with three key sets of data to support the work of the other groups (particularly the food group). The Mintel Report has been covered by the Research team in their section, but the National Restaurant Association and USDA organic vs. Non-Organic pricing studies will be covered here.

Trends in Restaurant Practices

When we first discovered the National Restaurant Association’s trends report, we were hopeful that we could use some of the data they had collected to understand what type of establishments were most interested in green practices. Unfortunately, we could not obtain the raw data from the survey designers and could only draw cursory conclusions from their work. However, we do know that the survey was conducted online and taken by 1,791 chefs’ who are members of the American Culinary Federation. Out of the 250 choices chefs had, locally sourced meat/seafood and locally grown produce were ranked 1st and 2nd.

We did find it heartening that so many respondents to the NRA survey found green trends to be among the ‘hottest’ in the industry.

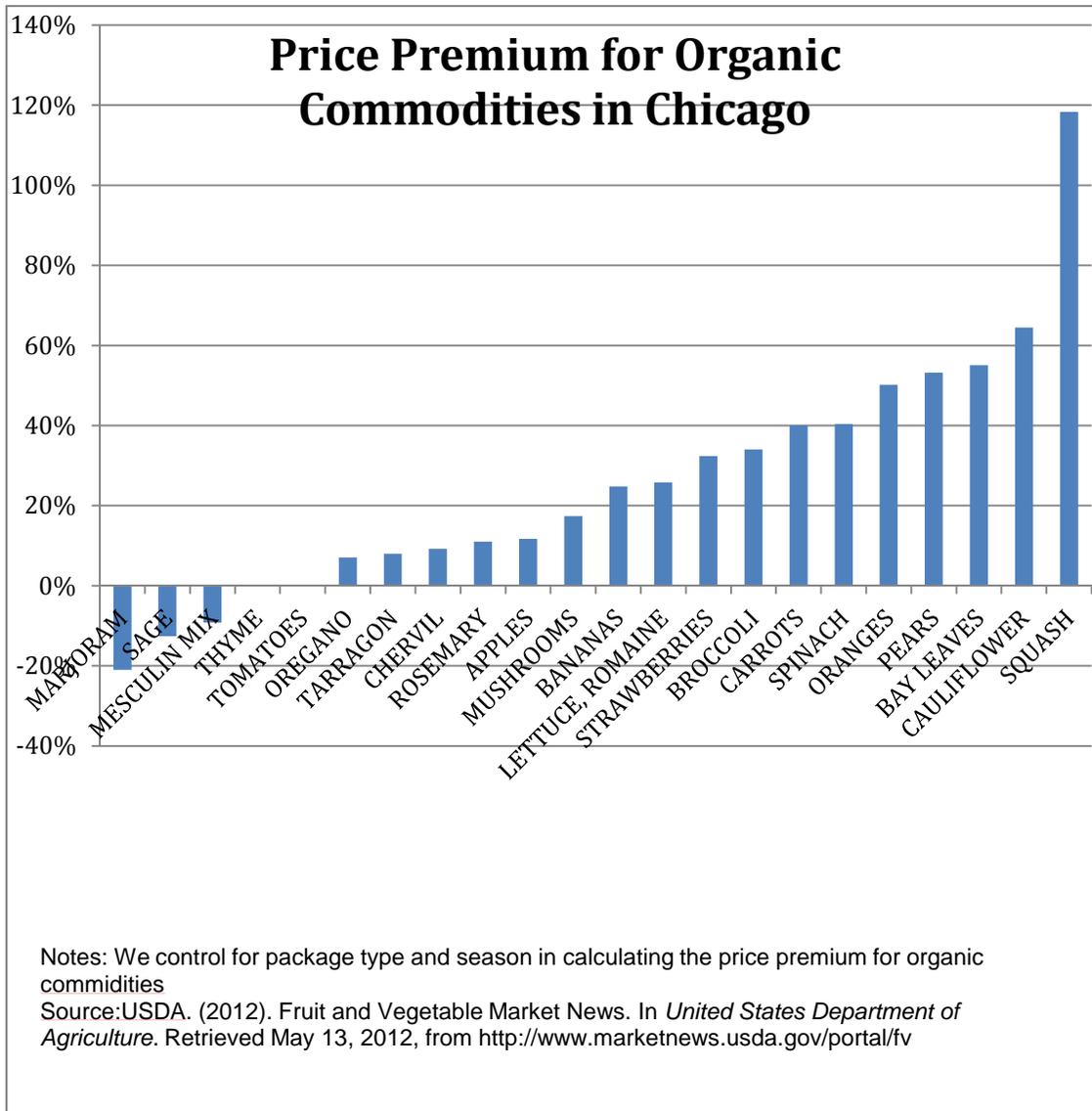


Organic Price Premiums

The USDA data was far more useful for our original analysis. From their database, we were able to draw on over 200,000 Chicago specific observations of organic and non-organic produce pricing. Commodities (such as apples, lettuce, carrots, etc.) are market price tracked by the USDA; these prices may not be retail or wholesale, but they do show the premium associated with organic vs. non-organic produce.

Since we were able to see the dates each observation was made, we could examine our results by season and specific produce type. Additionally we controlled for package type because each commodity could come in different size measurements such as bins and cartons. If one package type is significantly larger, it could affect

the price and skew results. Most interestingly, we found that some organic produce had either a negative or no premium over the non-organic variety. While we were unable to finish work on seasonality that would discuss overall which seasons have different organic price premiums, our findings should allow restaurants to cost effectively purchase organic produce without the high additional cost.



Mapping Green Restaurants and Farmer’s Markets

The Information and Analysis team using data from the Green Restaurant Association and the City of Chicago to create illustrative maps of licensed food service establishments, green certified restaurants and farmer’s markets in the City of Chicago. All maps and an overview of the methods can be found on our website at <http://eaf.uchicago.edu/grrt>.

APPENDIX I: INTERVIEWS

Disposables, Waste, & Pollution	Local Engagement
Chris Cano	Jeff Maimon
Marilyn Jones	Zina Murray
David Kusnierek	Jason Navota
Laura Lukas	Tours and Other
Perry Moss	Green Seal Skype Call
Food & Beverage	Shedd Aquarium Tour
Jen Eisen	“The Plant” Tour
Beth Gunzel	Uncommon Ground Tour
James Pirovano	Furnishings, Energy, & Water
Richard Wolff	George Malek
Information & Analysis	Amy Talbot
Amber Sharma	

DISPOSABLES, WASTE & POLLUTION

CHRIS CANO

Gainesville Compost (April 30, 2012)

Alex Murray

I spoke with Chris Cano of Gainesville Compost (Gainesville, FL) on April 30th. Seven months ago he started this organization, which functions dually as a composting collection service and a “CSA” (community supported agriculture) group. Employees on bicycles pick up the organic food waste from restaurants and transport it to designated composting sites throughout the city of Gainesville (some are located on restaurant property). Customers of the CSA then provide a down payment in order to receive compost to use in their gardens. The collection service was initially free, but a nominal fee is now charged in order to ensure the program’s growth. Since its inception, the program has diverted an estimated 15,000 lbs. of food waste from landfills. They are currently expanding their program to include dairy and meat products once they are properly equipped to handle these additional waste streams.

An integral part of the success of the organization is the effort to publicize the composting practices of their member restaurants and encourage local engagement. Chris Cano stated that the cross promotion between the organization and local businesses has helped to strengthen the green restaurant community and create excitement. Gainesville Compost publishes a monthly newsletter with composting tips and deals for local restaurants affiliated with their organization. To member restaurants, being a part of this network definitely provides an added value to their reputation in addition to the decrease in waste hauling bills.

In my opinion, a bicycle-based operation of this sort would not be practical or feasible in a city the size of Chicago (especially given the restrictions on commercial composting). It also should be noted that restaurants in Chicago must pay substantially more to have their organic waste picked up than the nominal fee that the Gainesville restaurants pay. To help balance this disparity, Chicago restaurants should be able to receive more recognition for their composting efforts, as it requires significant effort at all levels of operation and a sizeable financial commitment. If part of the local engagement recommendations could include some form of publicity for composting or preferential treatment (e.g. first pick of booths at Taste of Chicago), there would be more incentive to compost in the Chicago region from the restaurant perspective.

MARILYN JONES**Consolidated Printing (May 1, 2012)**

Stephanie Chiao

Here are Marilyn's Jones' opinions on various subjects we discussed:

The printing industry in general:

- So often people think of recycled paper and soy ink as the end of all solutions
- Ink and recycled paper are the least of problems concerning printing.
- It is the chemicals used in the process of printing, and the chemicals released into the atmosphere that cause the most damage.
- These chemicals are hazardous not just to the environment, but also detrimental to human health.
- Press washes are a major contributor to pollutants.
- Sustainability in the printing industry is inferior to that of the Green Restaurant coalition.

Purchasing environmentally preferable paper:

- The focus should be on purchasing paper from sustainably managed tree farms.
- These are for-profit forests owned by tree farmers. When the farmer cuts a tree, he or she grows another to replace it. While those new trees are growing, they clean the air.
- The process of recycling paper can only be repeated 5-6 times. Thereafter the fibers become too weak and thus you need to introduce virgin fibers. This explains why recycling paper is not a viable solution.

Misconceptions concerning the benefits of soy ink:

- Soy ink has petroleum in it. There is no such thing as pure soy ink. It does not have the consistency to apply pigment to paper by itself. It needs other substances to be mixed in. Soy is not the healthiest thing in the world.
- The ink that is used by Consolidated Printing has natural pigments in it. There are no heavy metals such as cadmium.

Advice for building out certification standards:

- A person cannot all of a sudden become green
- There needs to be a multi-leveled standard for those that are on their way to becoming green
- Certification must allow for on-going improvements.

Do you ever stop becoming green? No. Marilyn says that there was never an off-switch in her sustainable efforts.

DAVID KUSNIEREK**Batzner Pest Management**

Ben Hofer

About Batzner's services:

- Provides inspections of kitchens
- Gives reports/instructions on what actions to take
- Typically, kitchens are only clean on the surface, whereas Batzner's employees are trained to look more closely to typical sources of pests

Questions: What are the costs for your services? What are the factors that determine the costs?

- Depend on size of kitchen
- \$120-\$140 for monthly inspections for restaurants like Chilly's, Friday's, Hard Rock Café.
- If there are any issues, i.e. more than once a month -> higher cost
- GreenShield limits the number of products that can be used. That can make it harder to find a suitable product

Financial Returns

- Hard to put a number on it, but no pests -> no/less expenses for these issues

LAURA LUKAS
Blue Plate (May 8, 2012)
Grace Pai

Questions: How did you determine what kind of take-out containers/disposables to buy as an alternative to Styrofoam (i.e. compostable, recycled-content)? Where do you purchase them? Is there a brand of environmentally preferable products that is most commonly used by restaurants and foodservice providers in the Chicago area? Also, what is the difference between environmentally preferable, bio-based and certified compostable take-out containers vs. containers that contain the maximum amount of recycled content feasible and are processed chlorine free?

- We begin by talking with our distributors. If they are already carrying a green product, we'll start there because that is easier than trying to find a new distributor. Of course, if they don't meet our standards they won't be used. If the distributors aren't carrying what we're looking for, we then have a conversation with them about what we're looking for. Many distributors will then go out, talk to manufacturers, and see what they can start carrying. For us that may be because we are a large organization that uses many bulk items, but whatever the reason it is, they seem to listen and appreciate our demands.
- As far as what we're looking for, we start by looking at 3rd party certifications. If a product has a green certification, that the certification provided a vetting process that we can trust. As for types of materials, I guess you would say we aren't particularly picky. Different materials have different applications. A corn based material that can resemble plastic will be more applicable when transitioning your pop cups than a paper cup. I like items that are made of recycled content because its making use out of recycled materials and putting momentum behind recycling in general. However, plant based products are great as well when they are renewable and sustainably harvested because the products can then biodegrade and possibly even be used in a composting program. To me, maybe this isn't the right answer, I think they're all great and whatever suits the need for the particular disposable in question will work. You could have the battle of 'sourcing *sustainably* produced virgin materials v. using the energy to repurpose and reuse unsustainable materials' all day. One is creating more waste; the other is repurposing more toxic waste. In the end, I say it's all a step in the right direction.
- As for brands, I particularly think Eco Products has a great line, but that's out of personal preference of design. I've not really had bad experiences at all.

Questions: How much more expensive were these environmentally preferable goods (as a percent increase of the price of Styrofoam containers/conventional disposables)? If possible, could you break these price comparisons down into the following categories? Sanitary paper products (i.e. restroom towels, napkins, bathroom tissue), food take-out containers, utensils & serving ware, and transport packaging & misc.

- According to our facilities manager & disposables purchaser, the price was about 10% more. The items that had the least difference in price were bowls & napkins. The ones with the most were plates, cutlery and cups. (Keep in mind, as oil prices go up these differences change because plastic products are petroleum based which causes the non-sustainable items to cost more.)

Questions: Are there any rebates or financing options for environmentally preferable containers? Do you think there is a strong financing need for disposables and take-out containers?

- I don't know of any rebates. Obviously programs like the GCRC offer discounts to members. One simple tool I think could be useful to smaller chains is guidance towards reshaping of the disposable system in general could help as well like purchasing in bulk. This might be obvious, but if it's not something a company is already doing it could offset the new higher costs of disposables. Same goes for looking at what disposables they really need. Do they need a utensil pack for to go orders or could they provide only the needed pieces of silverware (that could take to go cutlery down from \$.11 to \$.06 or even \$.03 depending on the order)? Basic behavior changes to a company can save a ton of money. We bought staff reusable cups and didn't put out disposables anymore and that saved \$10,000 annually which helped fund stuff moving forward.

PERRY MOSS**Rubicon Global (April 27, 2012)***Matt Gallery*

Question: How does one go about doing a waste audit?

- What they will have to do is separate, weigh, and track their waste for a long enough period where you can get a realistic average amount of what is actually being produced.
- They will also have to document their audit for the certification processes. This can be very time consuming for restaurants to do a proper waste audit and in many cases they will have to hire someone to come in and do it for them because it requires having the staff on the same page.

Question: Green Seal requires total waste diversion percentages for restaurants to meet. How feasible is it for a restaurant to meet such requirements?

- This can be very difficult and is heavily contingent on geographical location. What one restaurant can do in one city or neighborhood is different from a restaurant in another location.
- It would not make economic sense for a restaurant to have to drive their waste an hour or so from their location to have it composted.
- It will not be feasible for every restaurant to compost or recycle, and it will be based on where the companies that offer these services are located.
- Putting general requirements such as percentages on how much waste is supposed to be diverted is going to leave a lot of restaurants out of being able to take part in the certification process.

Question: What other barriers might restaurants face with either auditing their waste or diverting their waste?

- In many cases it will be hard for restaurants to find out exactly where their waste is going. So they are going to have to find out where it is going and then find ways to keep it out of landfills.

Question: What are some simple practices restaurants can take part in to reduce waste?

- You can start by looking at the packaging. There are ways to reduce the pre-consumer waste that is produced from what is being purchased.
- Another way is through the use of grease filters. By using grease filter restaurants are able to recycle their grease two to three times and more importantly, when they are done using the grease we are able to sell it to bio-fuel producers.
- Training the staff on how to properly dispose of different items.

FOOD & BEVERAGE

JEN EISEN**Girl & the Goat (April 28, 2012)***Stephanie Chiao*

- The restaurant is not currently certified. Jen said that especially with the opening of Little Goat, they simply do not have the staffing or time to look into such matters.
- In summer, 85% of produce is purchased from local farmers
- During the winter, they try to pickle/can produce but face limitations due to storage space in Chicago
- Jen thinks it would be reasonable for a standard to require that a given percentage of produce is local. This percentage could either be financially or weight-based.
- Girl and the Goat does not believe in purchasing from farms within a certain radius from Chicago. The most important element for the restaurant is the quality of the good, and if a producer is unable to cope with the quantities demanded they may have to source somewhere further.
- They source from mainly family farms. Some of their vendors include Spence, and Slagel.

- There is a problem with processing poultry in Illinois. It is illegal to process poultry on the farm if the good is for re-sale, making it impossible to grow the business or start new ventures.
- To focus on vegetarian food would be a disservice to local farmers. The focus should be on sustainable, humanely raised meat.
- Salmon supplies come from Skuna Bay in Vancouver. The farm is glacier-fed, and only 1.5% of the population is fished.
- Girl and the Goat own their space
- In terms of furnishing, much can be done simply by restoring the old. The fireplace and table tops were all made from reused wood, or purchased from antique shops.
- They always visit the farms in person to ensure livestock have the option to roam freely, adequate sunlight, and are given feed with no GMOs
- A lot of waste comes from packaging, so they try as much as possible to reuse wine crates for example
- Out of the 30 beers offered, all but one are domestic
- They do not compost, but want to in the near future. Jen used the word “backtrack” to describe how they would have to retrain staff on where the bins are, and educate them on why composting is important. It is much easier for them to install composting at their new restaurant, Little Goat (across the road) as everything is new anyway.
- Jen said there seems to be a misconception about going green. People think that it is more expensive than it actually is. Higher costs in one area can be offset elsewhere (for example energy savings).
- She thinks that people in Chicago are willing to pay the higher costs for higher green standards
- It is really important at Girl and the Goat that servers are knowledgeable about the food. They have extensive pre-chef meetings whereby Stephanie will go through the ingredients in each dish and where they come from

BETH GUNZEL, employment training manager
Wood Street Farm (April 30, 2012)

Candice Luo

Question: Can you briefly talk about your farm?

- It is under the organization Growing Homes, which has four farm social enterprises, Wood Farm is one of them. We hire around 40 people yearly for two 14-week-long assignments. Their job scope ranges from farming to selling.

Questions: What types of produces are harvested in the farm? Are they seasonal?

- We have vegetables and grains. We run 10 months per year and use hoop houses to extend the production period. The products are seasonal. Like now, we have carrots.

Questions: Are your products green? Are they organic? How so?

- Yes they are. We hand grow all the produces. We never use pesticides or fertilizers.

Questions: What are the major cost components of your business? How do you fund your business? Is it profitable?

- We mostly pay salary, buy seeds and other inputs, transportation and some machineries. We receive 15% funding from USDA on employee training and other subsidies. Our own income can cover about 15% of the total expense.

Questions: What are some of the green practices you use besides hand-growing? How cost efficient are they?

- We follow the USDA standards: minimizing water wastage, composting, using hoop houses and minimal machineries. I cannot tell you about the cost-effectiveness though.

Question: What do you compost?

- The food leftovers and unsold, unstorageable products at end of season.

Question: What types of machines do you use/

- We use very basic machines such as tractors and vehicles for transportation.

Questions: Where do you sell your products? Are the buyers local? How about your suppliers?

- We sell to local farmer markets mostly in Illinois. For suppliers, we have suppliers nearby from Illinois, Michigan and Wisconsin.

Question: Besides being green and organic, do you know if there are other social benefits?

- The major social benefit we have is to create local employment and job training.

Question: Will your farm expand in the future?

- We will expand to about three times in size by 2013.

JAMES PIROVANO

FamilyFarmed.org

Matt McCracken

While trying to coordinate a meeting with Jim Slama of FamilyFarmed.org, James Pirovano was able to provide us with the FamilyFarmed.org definition of local:

"Regarding the definition of 'Local', FamilyFarmed.org doesn't have a stated definition. I've not heard of any national standard for 'local', and it seems to be different for everyone. You would be interested in a Local Beet blog from today about eating local, which mentions the book Plenty, A 100 Mile Diet. I like the definition stated in the blog... 'local is as far as it takes to get what you want.' <http://www.thelocalbeet.com/2012/04/27/a-few-day-left-in-april-to-commit-to-being-a-local-family-use-local-food/> So much of local in this region depends on what the product is and seasonality.

FamilyFarmed.org works with farmers regionally and there are many different markets we can steer growers to depending on their own definition of local and size of operation. Obviously, Chicago is a big market and local can mean product from IL and all surrounding states. Smaller food coops in rural areas, like Uncommon Ground in Champaign, would want to work with growers in their county to be considered local. The biggest problem with local food is that there just is not enough supply. Though IL is one of the largest agricultural states in the country, a very small percentage of that is fruit and vegetables for human consumption. Our work is focused on building supply of local food and working with local farmers to scale up their operations in sustainable ways, or to aggregate product from smaller growers to work with bigger buyers."

In my opinion, this seems to confirm that there is no consensus definition of local, which indicates that our survey approach of using 150 miles (while providing an option for restaurateurs to use their own definition, if they seem fit) is a reasonable one.

RICHARD WOLFF

Whole Foods Market (May 14, 2012)

Ben Hofer

Questions: Since there is no standard for defining the terms "local", "seasonal" and "sustainable", how does Whole Foods define these terms? If Whole Foods does not have a working definition for these terms, how would you personally define them? Also, it would be great, if you could come up with specific definitions for different food categories (meat, dairy, seafood, produce, grains; of course, "seasonal" does not apply to meat and dairy).

- I can only answer for meat, and from my point of view.
- Local for Chicago would be from Illinois, or a neighboring state.
- For sustainable, it is about a business model that is devoted to the wellbeing of the land, the animal and to the future success and growth of the rancher/farmer.
- For seasonal, it does happen on the meat side as well as other departments. For example, if you want to raise a step 5 chicken (<http://www.globalanimalpartnership.org/>) in the Midwest you would not be able to do that all year round with the winters. This is why we currently do not offer an item like this.

FURNISHINGS, ENERGY & WATER

GEORGE MALEK

ComEd

Erik James

How energy is purchased:

- Pay ComEd for the distribution and transmission costs (wires/transformers)
- Pay generator of electricity of your choice amount for the electricity commodity. This could be like a wind farm, nuclear, or coal electricity generation facility.
- Pay ComEd extra per kWh electricity used for energy efficiency upgrades and programs. So the pooled money can be used for various programs called for in legislation and for funding home improvements in efficiency
- Also one way ComEd deals with the issue of differentiating energy sources is having people buy from a certain contract plan that is a certain mix of energy sources, doesn't actually make sure the mix gets to their building necessarily

Cost of typical electricity plans and of renewable sources:

- He made the point that there are many different types of wind energy from many different providers that have different prices. The price of electricity fluctuates and varies between places you buy it from. So there is really no typical plan and no typical cost premium for switching to renewable that is easy to identify. Also, he mentioned how usually a contract is signed for a period of time with your provider but switching and choosing your energy provider and where your electricity comes from is not difficult once your contract has expired.

ComEd and the electricity market:

- ComEd (as mentioned above) is the distributor of electricity in the Northern third of Illinois. ComEd is one of three utilities owned by the company Exelon that owns electricity generation plants, but the two do not interact in their business.
- A person in Chicago can choose to source their electricity from the utility and Exelon or from a 3rd part provider like Integris or Constellation who often offer bundled rates. They broker electricity with retail arms attracting buyers in a competitive marketplace
- George shared an article about a case like this where an area in Evanston aggregated their electricity demand and signed a year-long contract if Constellation to buy electricity that was more environmentally preferable. He noted this is becoming a trend even for individual buyers

Measuring restaurant electricity usage:

- He sent me a few case studies of restaurant electricity usage to get ballpark estimates. He also might send some information from ComEd about the subject if appropriate.
- He discussed how often restaurant usage is considered in terms of peak demand (kW not kWh) and mentioned that a typical McDonald's in July (when energy use is often most intense) might peak at about 80 kW demand. This is important for considering onsite renewables as well and how much electricity you have to buy to supplement the amount generated

Onsite renewables and net metering:

- George mentioned that connecting a restaurant or building to the grid to produce its own electricity is not necessarily difficult other than in the electrical engineering or technical sense. In other words it is not of great cost or environmental impact
- He also explained how producing electricity than you use sends energy back to the grid. You aren't paid for this but in later months when you use more energy it will be subtracted from those bills
- Someone who consistently produces more than they produce won't be paid and could build up 'credit', but this should not be a concern for a restaurant as they can probably switch to become an independent electricity provider without too much trouble

After the interview, George was able to obtain information for us about average electricity usage for food service operations (SIC Code 5812) in the ComEd service area. Those below 1,000kWh per month have been eliminated and the Min is not a valuable number.

Annual Mean	139,594	kWh
Max	19,702,679	
Min	0	
Annual Total	1,936,163,374	Kwh
Number of Restaurants	13870	

<u>SIC Code</u>	<u>SIC Description</u>
5812	Eating Places (dinner theaters)
5812	Eating Places (full-service restaurants)
5812	Eating Places (limited-service restaurants)
5812	Eating Places (cafeterias)
5812	Eating Places (snack and nonalcoholic beverage bars)
5812	Eating Places (food service contractors)
5812	Eating Places (caterers)

AMY TALBOT
Chicago Metropolitan Agency for Planning (May 22, 2012)
John Anton

Question: It is now very difficult for restaurants to use grey water in their restaurants. Do you foresee this changing in the future and possibly become a trend?

- It is not impossible; need to obtain a variance from the state health department. Plumbing codes don't allow for rain water systems to be used indoors. You can petition to the state and they can say yes or no. However, it is a very lengthy process that no one will really go into it. Bill going through 44-W6 reformed plumbing code for rainwater and grey water. When it becomes a normal use, then it would be more of a restaurant encouraged practice.
- Grey water- risk... old building, totally separated system. Only if you're renovating it will be cost effective. Separate plumbing system would be way too costly. Even though rates are rising, restaurants would have to put a cost benefit of the grey water system to offset the cost of the rates.

Questions: Are rain barrels a growing trend in Chicago? Do you see a significant difference in implementation between rainwater use for irrigation and plumbing?

- Rain barrels are a growing trend. Allow for more programs for discounts. Healthier landscape, more water efficient plants too. Irrigation is allowed, plumbing is not allowed. Bill against it. Indoor- has to become treated. Irrigation- coming on to the roof and into the rain barrel. No use for it- no outdoor space.

Question: In regards to the Water 2050 Plan, will there be any significant changes that will affect restaurant water usage/appliances?

- Geared towards local government and utilities, not businesses or average citizens.
- Idea was to hit the decision makers. One thing: model water conservation ordinance.
- Chicago adopted: only can have EPA Energy Star Appliance.
- High efficiency spray valve. They can choose to adopt: existing model ordinance, no one has adopted it yet.
- CMAP doesn't have any control of anything local.

Questions: How does CMAP promote the usage of water efficient fixtures? Do they have any financial incentives or support programs?

- Bill ensured program: local communities could use spread the word about water conservation.
- Electronic versions have been distributed everywhere. Have been successful.
- Water Sense partner: outreach materials. We promote to these 30 communities.
- Retrofit, when we visit municipalities: give them a rain gauge or other things they can give away to promote water efficiency. Do this for the community. Give them away at the events. We promote to municipalities.
- We give a lot of presentations on water efficient fixtures. We also do a water conservation guide that can be found on the CMAP home page.
- Efficiency techniques: You see the savings immediately. A person doesn't have to use the bathroom differently when you change the toilet.
- Behavioral changes take longer, habits are hard to break. We want people to appreciate water resources. Sense of ownership and stewardship. Don't calculate outreach savings.
- Some component of outreach education. A restaurant: a table tip: water only available on request. Fifteen glasses and a dishwasher load. Behavior is so subjective.
- Checklist could be optional, part of curriculum. They will just forge it. You should make it voluntary. Unless there is some huge city fine you cannot control it. Promote sustainability is the obligation. There is no harm or shame in education or outreach. Having materials: outreach materials already made.
- Restaurants have a public image: they want to look sustainable.

Question: Is it practical for a restaurant to have a "[a] 20% improvement from baseline (no less than one year ago, no greater than 3 years ago)"?

- Yes, if you put money towards it. If it is an old restaurant. You have to update all your fixtures. Definitely possible to get a reduction: spray valve, dishwasher.
- Newer restaurant you will not see the difference. Depends on when it was built. If it hasn't been renovated in the last 40 years, sure it will increase baseline.

Question: What is the role of restaurants in educating their employees and the community about water conservation issues? Is it a restaurant's responsibility to inform their customer base about water conservation issues?

- Yes

Questions: Have you heard of Energy Star Portfolio Manager? If so, how effective and feasible is it for a small establishment to utilize?

- Statewide water energy survey. Analysis. Don't use results as a benchmark. Utility companies don't track. Businesses want to decrease their energy and water bills.
- Decrease hot water= less energy. Less hot water,-- might not see direct reduction of energy. This is why it is very important for energy companies.
- Pre-rinse spray valves and better dishwashers can save water and energy.

Question: Grey water is illegal to treat and recycle water safely. How does water recycling (grey water, storm water) rank in priorities in the GO TO 2040 Plan?

- Technology is there but the regulations are not there. Grey water is not cost effective. Maybe in the future it will be beneficial.
- Alliance for water efficiency. Might be helpful to look that up
- National level: swore that pre rinse spray valve was a go to.

INFORMATION & ANALYSIS

AMBER SHARMA

500 Gallons (April 9, 2012)

Camy Pearson

- 500 Gallons wants restaurants to use their site to find out viable tools/foods/practices/etc. for greening their business, and then used the tools/calculators to plug in particular restaurant's data/budget to figure out costs/benefits.
 - One method is just "shopping" around the home page, using specific interest selections to narrow results.
 - Another method is a more customized approach, where you enter all of the restaurant's data and the application specifically creates a plan for you based on your preferences.
- Question: Where does information come from?
 - Credible sources such as Foodwatch, EPA, DOE, USDA, Energy Star, Seafood Watch
- Restaurants can use site's marketing tools which allows them to track and present all of their environmental adjustments through social media
- Website also has tools to help increase efficiency of utilities
 - Track utilities costs
 - Can program reminders for maintenance tasks
- **FREE to use!**
 - But restaurant owners can buy products through the site (if they want to, not required) at better prices and in a way that will be documented.
- Not a certification program, just a flexible way to green business that can be specifically tailored to organizations (like the GRA or Green Seal)
 - Or, a restaurant could use the site for the certification process, which can be specified to reveal what modifications are needed for a particular certification that they want to earn, as a sort of easy prep-work to getting certified
- Anyone in the class can sign up and just play with it! It is really a great tool for every single group. There are properly researched and cited data, calculators for cost/benefit to restaurant, product comparisons, food purchasing recommendations, and much more!

LOCAL ENGAGEMENT

JEFF MAIMON

Frontera Grill (April 27, 2012)

Dustin Popiel

Question: How much food do you source "locally" in growing season versus off-season?

- Definition of Local: State border within approximately 100 miles (Wisconsin, Michigan, Indiana)
- 75% local in growing season, 25% local in off-season
- Winter very bland b/c four months of the same ingredients, whereas summer provides nice progression of ingredients as weather changes

Question: Any complications, esp. with regard to regulations for local farms?

- Yes, farms need a license to sell across state lines, or fined by health department
- Some restaurants, even green ones, are unaware of this and don't comply

Question: Where does Frontera stand with regard to local engagement?

- Local focus since day 1, approximately 25 years ago
 - **Local Engagement to Jeff primarily means sourcing food locally as opposed to actively engaging the community to increase green awareness, etc.**
 - Know supply and demand very well and have been using same suppliers for past 15 years

Question: Brief history of Frontera Foundation?

- 501(c)(3) non-profit funded by donations – online or on one "auction day"
 - Raised \$159,000 in one "auction day" last year

- Give grants to “Midwest, family farms” ranging from \$400 - \$12,000

Questions: How did the foundation start? Were other “local engagement” options considered?

- Cool anecdote: Rick Bayless visited Shooting Star Farms (“SSF”) and tasted best spinach ever. Rick wanted more, but SSF was at capacity. Rick said “I’ll give you money to continue to grow and supply me with this spinach.”
- From there, Rick et al. saw opportunity to do this with other local suppliers

Question: What about a conflict of interest with giving grant money to your suppliers?

- Very true – hard to get around this and get 501(c)(3) status. So had to make agreement to not source food from farmers that receive grants.

Question: Can you talk to us a little about Green City Market (“GCM”)? We understand you are a member of the board.

- GCM is the “first” Chicago farmers market – all local food with very strict local standards
- Competitors: Wicker Park Market, Logan Square Kitchen (not really competitors, but rather other proponents of local food in Chicago)
- Not cheap to source locally, but believe everyone should do it

Question: What other local engagement initiatives does Frontera partake in or create?

- Full Scholarship to 1 student at Kendall College per year
- Pilot Light – Rick considering “donating” time to this organization
 - Pilot Light is a collection of chefs that partner with CPS schools and cook lunches for schools for given period of time (**more research to come!**)
- Rick very active on Social Media – Twitter, etc.
 - Rick always tweeting about new ingredients, chefs, etc. that pique his interest – both raising awareness for green initiatives but also building brand
 - Rick refuses to believe Frontera is a tourist restaurant
- Farm Tours with employees – Rick and Co. travel to the farms that they source from and have picnics and get to examine new foods
- Put green labels on certain foods on Menu
 - However, some customers think Gunthorp chicken is a type of chicken rather than from local Gunthorp Farms.
 - As a result, tough to assess efficacy

ZINA MURRAY

Logan Square Kitchen (April 28, 2012)

Junli Song

Financing

- Logan Square Kitchen took 18 months to design and finance
- Began shortly before the banking meltdown → many problems with bank loans
- CCLF played a crucial role in keeping the financing afloat
 - The Chicago Community Loan Fund helps fund socially beneficial project.
- Gap loan with LSK (what is a gap loan? For example, if you need \$1,000,000 to set up your business, and the banks agree to loan you 70% - but you still need to come up with the remaining amount. Maybe you can come up with \$100,000 from your savings, but still need that additional \$200,000. This is where the gap loan comes in; it fills in the missing gap between what you have and what you need)
- Zina had an AMAZING experience with CCLF - they were wonderful and supportive, and actually expedited their loans when the bank loans were not coming through because of the financial crisis (apparently banks agreed to the loans, but then wouldn't write the checks)
- Question: Financing Difficulties?
- As Zina put it, there are financial struggles for anyone starting and running a business (mortgages, generating revenue, etc.)
- For bank loans, banks need to see profit coming from the tenants of the building; performance measures place a lot of pressure on business owners
- Question: Interactions with the City of Chicago?

- The city has not reached out to LSK - just the opposite. Zina says the City of Chicago has given LSK a lot of trouble, and is trying everything to shut them down! She has no idea why. For example, recently the Dept. of Health has been giving them trouble, and won't license her people. For more details, see her blog: <http://www.logansquarekitchen.com/blog>
- She supports Mayor Emanuel's sustainability campaign, but admits that she is doubtful it will create any changes anytime soon; she would rather focus on the changes she is creating within her own community
- Question: Energy and Waste efforts?
- Yes, LSK recycles grease. They have grease traps and recycling bins for grease. However, Zina wasn't sure what kind of grease.
- LSK generates very little grease, so it doesn't make sense for them to try and sell it themselves. They actually share a recycling bin with a neighbor, which is cleaned out once a year.
- Since they do not sell their grease, they allow another company to collect (and sell) it; this gives LSK free pick-up, and therefore free disposal of grease
- Wherever Energy Star has rated a category, LSK has Energy Star appliances (so 100% of eligible equipment is Energy Star)
- LSK also uses Green Seal certified chemicals (once again, everything that has been rated by GS is used)
- Note: in both cases, certain products/equipment have not been covered by Green Seal or Energy Star, and therefore there is no standard to fulfill (e.g. commercial size dishwashers)
- However, LSK still tried to maintain sustainability even in these cases; for example, the commercial size dishwasher uses hot water in place of chlorine for cleaning
- Incentives for Switching to Energy Efficient Appliances?
 - Consumers care; Zina believes that many of the clients coming to LSK already care about environmental issues, and those that didn't before start to become interested as they work here
 - Low utility bills, low water bills! This is achieved through good equipment AND practices:
 - Use 40% less water
 - Lighting uses 35% less energy
 - HVAC system is 35% more efficient
 - Refrigeration is 20-30% more efficient (requirement for Energy Star rating)
 - Sensors for exhaust hoods save energy
 - Shutting off refrigeration when not active
 - These were estimates given by Zina; more specific numbers at the website: <http://www.logansquarekitchen.com/sustainability/construction>
- Question: Speak about furnishings
- Gold level LEED certified
- Sustainable walls and floor in the kitchen; according to Zina, this was very hard to find!
- Kitchen floors are made from recycled castor beans
- Reception room: almost all the furniture was salvaged; for example, the doors were headed for the landfill, and the mirror was from a second-hand shop in the neighborhood
- Question: Speak about Food and Beverage
- There is always filtered water available, so that LSK can maintain a strict no bottled water policy
- When drink mixtures are brought in, LSK requests that they are in aluminum or glass containers (in order of preference), and no plastic containers
- Discourage the use of conventional soda, and encourage alternatives, for example seasonal drinks (e.g. strawberry water) or using honey syrup made with local honey
- Alcoholic beverages are left up to the clients' taste, however LSK does encourage sourcing from alcohol distilled in Chicago (e.g. Koval, Revolution Brewing, Death's Door Spirits)
- Zina points out the vast amount of craft beers available from Chicago
- Offers a list of organic and sustainable winery options; these are offered like "house wines" at LSK, and are also affordable for clients
- Question: Speak about Local Engagement
- Local engagement is LSK's raison d'etre; they are all about community and healing the neighborhood
- Two main ways they engage with the community:

- Showcasing Hospitality/Culinary Talent
- Hosting events for the public, where people get a chance to meet new food entrepreneurs and experience new products
- Pastry markets and pop-up restaurants offer the public a unique experience
- Gives exposure to small businesses and restaurants
- Lets restaurants test out reception in the area or to new dishes (e.g. a restaurant that will soon be opening might have a pop-up night)
- Enables chefs to experiment with culinary creations that they might not be able to offer at their restaurants
- Highlights local food and businesses
- Usually run with the help of volunteer staff → this is a great way for the public to participate in sustainability efforts, and to learn more and spread awareness
- Pop-up Lounge: Every Friday night in April, LSK hosts a pop-up lounge where visitors enjoy games and drinks
 - Showcases local bartenders, who can show off their creativity
 - Visitors learn about sustainability
- Engaging with Community Organizations
- LSK strives to support organizations by giving them more publicity and letting them use the space (sometimes for free!)
- Worked with and supported Dill Pickle Food Co-op - the only member-owned grocery store in Chicago
- Donating space to Purple Asparagus
- This group brought together the diverse people working with nutrition programs in the CPS
- Fundraising events
 - Fundraising movie nights for the Chicago Honey Co-op
 - Sold tickets and specialty food snacks in order to raise money for the Honey Co-op that had lost its retail space in Chicago
- Question: What does LSK look for in clients?
- Above all, culinary talent and compelling products, mixed with good business sense
- There are no requirements on local/organic food; small businesses are already subject to enough micromanaging without being imposed on more
- However, LSK does encourage sustainability in a few ways:
 - No Styrofoam allowed! This is especially relevant for baking businesses, who often buy eggs in Styrofoam containers
 - Clients are required to choose one thing every year to improve upon that supports sustainability (can be anything)
- Final Notes from Zina:
- Above all, Zina believes that just being in the building raises awareness of sustainability efforts. The fact that LSK accepts non-green businesses and contractors actually aids in spreading awareness because non-green businesses are getting exposed to sustainable practices when they come into LSK. The building is a crucial teaching tool.
- Sustainable events should be looked into by the GCRC and Green Seal; these are happening all over Chicago
- For example, the Green Chicago Wedding Alliance; Fig Catering is the most sustainable wedding event caterer

JASON NAVOTA

Chicago Metropolitan Agency for Planning's Green and Healthy Neighborhoods Program (May 10, 2012)

Jen McPhillips

- Robust outreach strategy providing in-depth outreach, this is a requirement of their grant
- Project planning committee forms the managing structure, and advisory committee from each neighborhood they work with; engage with these individuals on a regular basis. Where is project, and where is it going?

- Larger outreach and robust public engagement: public workshops/open forums; 5 or 6 throughout project, held in neighborhoods; email, flyers, through alderman (reflective of their strategy of direct engagement with the community).
- Three stages of project; first was mapping and planning, some engagement with public, and kick-off symposium; public engagement phase/strategy---meetings, workshops, tours of specific sub-areas of the project, help people network and meet each other; phase three after public meetings, there will be planning; planning to get buy-in before start actual projects
- The City of Chicago has other food plans- the food space plan
 - The city is working to turn open spaces into urban agriculture area, particularly community gardens
 - Community gardens and grocery stores (with fresh produce) can go in these empty lots
- Creating a land-use strategy:
 - Location of grocery stores/access to fresh foods
 - Sustainability: will be integrated into the land-use strategy for the Green and Healthy Neighborhoods Program. Emphasis on local food due to the efficiency of distribution.
 - For example, where does it make sense to concentrate commercial and retail spaces? These principles incorporate sustainability by nature
- Green infrastructure, storm water management, parks and open spaces: all issues on the sustainability policy agenda for Chicago
- Areas with food plans in the works:
 - Growing homes site at the Wood St. Farm
 - Goodness Greenness
 - Chicago is considering creating an urban agriculture district on the old, unused Englewood line
 - Commercial kitchen at the Washburn Institute → provides space at the culinary institute for local chefs
 - Theological institute at the University of Chicago has space for community kitchens
- Goal of CMAP: tie local food growth and development to preparation and job growth/training
- Food deserts: one of many factors that were considered when choosing the target areas of the Green and Healthy Neighborhoods Program (which includes Englewood, Woodlawn, and Washington Park
 - Also considered the decline in population, decline in employment, increase in vacancies when choosing these neighborhoods
- What is the best way for a program to engage with the community?
 - Going to the people---churches, neighborhood clubs, working with other community representatives (aldermen, police, religious leaders), holding meetings when people are actually available (on weekends)
- The problem with many city programs is the decentralization of bureaucracy: the chain of command is city policy enacted → intended implementation → staff-level implementation (in the department that handles the program)
- There's not always good communication between departments

TOURS AND OTHER

GREEN SEAL SKYPE CALL WITH ANDREW BEAUCHAMP (May 2, 2012)

Devyn Russell

- I. Join.me
 - a. 208-402-595
- II. Retail type restaurants to revise standards in cities like Chicago where winter makes year round local difficult
 - a. Public review period
 - i. Need to have a lot of information about the background on why we want to change that

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- ii. So we have a reasoning
 - iii. As much empirical data/evidence is great
 - b. Why is GS-46 so complicated?
 - i. Before GS-46 came out, GRA was the only thing out there
 - 1. It was basically operations/maintenance
 - 2. This is not a service type business
 - 3. After a review of restaurants doing a first life cycle study, it was found that food type/purchase had a big impact
 - 4. Couldn't just leave it out
 - ii. Food is a huge impact
 - 1. 20-25% impact for consumers
 - 2. 90-95% of restaurant impact is from the food
 - a. It just can't be an operations/maintenance
 - b. 15-20% of food impact is actual waste
 - i. It's not all about the food purchasing
 - 3. Pre-consumer waste is correctly disposed of
 - 4. Portion sizes
 - 5. Disposal costs for a restaurant is pretty high
 - a. Finding ways to lower those will help restaurants save money
 - iii. Doesn't have to be all organic
 - 1. Perhaps the standard could be softened
 - 2. Say a product is made of 95% products
 - iv. What are the low hanging fruit?
 - 1. Grocery store, what are the environmentally preferable things you can easily purchase?
 - a. Ex: eggs, milk
 - b. Say we do more like this and become flexible elsewhere
 - v. Data collection
 - 1. If you have to have an inventory of all your food purchasing for the last month, it can be a nightmare
 - vi. Green Seal & small/medium sized enterprises
 - 1. GS standard for cleaning services
 - 2. GS standard for hotels
 - a. Similar, but staffing significantly changes how GS-46 works
 - b. There are really only a few key people are involved in purchasing/managing restaurant
 - i. Could be 4/5 people who are in charge of 1) making sure they have the data and 2) making sure they meet all the criteria
 - 1. This is a lot of responsibility for a few people
 - ii. Possibly base criteria on how many employees are working at the restaurant
 - 3. When people have to make plans/policies, that's where certification breaks down
 - a. Want to focus more on achievement
- III. Case Study: Restaurant in Chicago that didn't get the standard done after working on it
 - a. Many restaurants/hotels say we're already doing all these things, it should be easy
 - i. People who think they're green don't actually meet all these standards
 - b. Fell into one person's hands
 - i. There was never any time
 - ii. Time is a big factor
 - c. Another challenge: some of the documentation
 - i. At least 3 months of invoices
 - ii. Some restaurants order things everyday
 - iii. Sometimes they can't even find it
 - iv. Particular hotel was pretty organized

- d. Also issues with restaurants having to speak with their vendors to change they ways to provide them with the products they need
 - e. Then forward to final reviewer
 - i. Then they're certified
- IV. Where did the ones with the challenges, where did they get stuck/leave off?
- a. One never really started
 - b. Other one never really got past food purchasing section
 - i. Submitted many invoices/spreadsheets
 - ii. It was a matter of time and a corporate decisions
- V. Jen
- a. Cost structure behind GRA and Green Seal. What goes into pricing of GS certification and why it's so much more expensive
 - i. GS takes into account the amount of work that goes into getting that restaurant certified
 - 1. Hours times wage plus a little overhead
 - 2. Takes a lot of time to look over documents
 - 3. Between gold, bronze, and other levels, takes different amounts of time
 - 4. Tier levels are a way of allowing accessibility into the certification system
 - a. With the Lower tiers, GS loses money to do the certification
 - 5. Don't make any profit
 - 6. Included in that is the cost of the audit
 - 7. Do you see any flexibility in the cost?
 - a. Bring down audit cost
 - i. If there are more restaurants looking to get certified, it'll bring down cost b/c they can have an auditor based in Chicago to do them
 - ii. Streamlining
 - 1. Have an online submission system where restaurant puts in time upfront and GS isn't hounding them and trying to organize their data
- VI. If there's a restaurant in a certified hotel, there's a separate process for certification
- a. Fixtures and cleaning products are already in place and they can share that
 - b. There is a discount if they're applying at the same time for certification
 - i. 20-30%
- VII. Robby: Many of the farms around Chicago don't have the money to be organic certified. What is your opinion on this?
- a. Other standards of ours, we have an attestation where farms can send GS information. Right now, couldn't do it with the standard as it's written, but GS could come up with a mechanism for attestation
 - i. Sabina: most restaurants are focused on local, sustainable farms rather than organic. Survey also reveals consumer focus on local
 - ii. Local has gotten to be 500 miles
 - 1. National standard and for _____
- VIII. Jen: Financing How-To Guide
- a. Energy rebates
 - b. The biggest one, local food/waste, tend to be funded locally
 - c. In terms of green seal knowing that, it'd be hard to figure out b/c green seal knowing b/c that's usually on a local scale
 - d. It'd be great to have a guide
- IX. Waste for restaurants who are in high rises/buildings
- a. Waste disposal is factored into their rent
 - b. Just goes into a larger dumpster for the while building
 - c. What do you say to them for the standard?
 - i. A big part it guaranteeing that things are going to the right stream
 - ii. Might be hard for them to figure out if they're decreasing waste, but they should still be required to ensure that they're waste is going into the right place

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- iii. More about waste diversion at that point rather than reduction
- X. Alex: Had trouble quantifying environmental impact. What resources do you guys have to deal with that?
- Best person to answer is Cheryl Baldwin (not there anymore)
 - There's a lot of apples/oranges and that's hard to quantify together
- XI. Matt: What kind of deliverables do you guys want? What could we give to you that is the most helpful?
- Go through, take the standard, go through criteria and give us your feedback on them. Give us your reasoning and questions you have in certain areas. Also, give us suggestions on how to change it and your reasoning behind it. And if you could match it up with sections of the standard, that'd be great
- XII. Sabina: We've been looking at a Local Engagement Piece. Trying to figure how to make it specific to Chicago and how it fits in with what already exists in the city. Do you have any comments or thoughts on that?
- Bay Area Green Certification Program
 - Montgomery County
 - Crooklyn Green
 - There are these local green business programs that give good examples of that. These are for general businesses, but they might offer good ideas and suggestions for moving forward. Bay Area has a restaurant
 - Could you envision a Green Seal Chicago based standard that does that right now?
 - Good idea, but kind of outside of our scope right now
- XIII. Andrew: As we've been putting this together,
- Should most of the reward go to picking the low hanging fruit or reaching the top of the tree? This concerns targeting different sized/type restaurants.
 - Comes back to OEM vs Food
 - A lot of the low hanging is OEM. Specifically, non food purchasing has a lot of options that are cost effective
 - Green Seal has always been that they'd rather tackle the harder standards
 - Things put in place follow this principle. The issue arises when we look at how to make the standard able to be adapted to everyone
 - Andrew: Emphasizing the tiers might get you a lot more traction in the marketplace
 - One the reasons they haven't tiered products, is that someone will come in at certain level and not reach for the higher standard
 - At this point, standard is not achievable and while there are some restaurants that have money/manpower for this, there's no payout for it
 - Point system such that they could do a lot of little things or a few big things
 - Playing around with points might be a way to incentivize
 - Wording of standards is sometimes ambiguous. How do you make sure restaurants know what you mean/are referring to?
 - Don't mean to be
 - Don't have an approved product list b/c it's a conflict of interest
 - How do you know a product is environmentally preferable if you haven't certified it?
 - Just has to meet certain criteria

Basically, it's a case-by-case basis. A lot of times, they can figure it out by looking at the product's (Material Safety Data Sheets) MSDS.

SHEDD AQUARIUM TOUR WITH BROOKE HAVLIK (March 30, 2012)

Camy Pearson

- General Seafood Overview:
- Seafood is the most globally dependent source of food in world.
- 70% of seafood eaten outside of home.
 - *chefs have the power in the seafood market*
- 84% of our seafood is imported

- Because of the amount of imports we take in from “unregulated countries”, we need to be more socially responsible.
 - 10% of global seafood species have already collapsed
 - 75% of global fisheries overfishing
- 38% of all U.S. fisheries overfishing
- There are costs/negative externalities not factored into the market price of seafood.
- 1 in 5 of our imported fish are from illegal methods
- A lot of overfishing happens because it is easy to break rules in international waters.
 - Fishermen follow the rules of the country that they bought their license in international waters.
- Tuna, salmon, and shrimp are the most consumed seafood.
 - Possible marketing ploy: diversification from these main staples looks good on menu
- Each fish’s classification (green, yellow, red) is based on its biology and particular environment.
 - Example: fish with long lifespans, like orange roughly (130 years!) are on the red/avoid list because catching them really disrupts slow life cycle reproduction.
- Fishing is a low-margin line of work. Government gives some subsidies to fishermen, but not as many as for farmers.
- Sustainable Certification:
- Marine Stewardship Council is the accreditation group for sustainable fishing.
- Fisheries/restaurants that are certified by the MSC can put a blue label on their menus, advertising, etc.
 - 3rd party certifier used by MSC for initial assessment of fishery before they themselves go in to certify. This is an optional process.
 - McDonald’s actually has the MSC blue label!
 - Wholefood’s recently removed all of their red-listed items.
- Sustainability Issues:
- The question of how to regulate is still important.
 - Some use TCA (total catch allowance quotas)
 - Also size regulations (based on size, sex, and season)
 - As well regulating what types of fishing gear can be used.
- There are many types of fishing gear currently employed
 - “Bycatch” is the unintentional catch of marine life by fishing, leaving them dead, injured, or unused.
 - Pelagic Longline: better than nets, but can still have problems of nonselectivity because the line is left out for so long.
 - Troll and Poll: better than longline because you can check lines right away and throw back (line is not left out, fishermen must participate).
 - Harpoon: nice and selective, good way to avoid bycatch.
 - Bottom Trawl: ok if on sandy bottom, but if not it can really be destructive to the environment (like coral reefs). Possible to add a TED (turtle excluder device) to reduce bycatch significantly because it lets bigger fish/turtles/dolphins leave.
 - Dredge: similar to bottom trawl but for bottom-feeding shellfish, can also be habitat destructive.
 - Traps/Pot: for lobsters and crabs, nice and selective because it brings them in alive and can throw back.
 - Purse Seine: giant circle net that is gathered to take all that is in it: a ton of bycatch! Could use new technology like sound devices that scare away dolphins/sharks to keep them from becoming bycatch.
 - Gill Net: a little more selective, used on Lake Michigan by local Native Americans
 - Trap Net: brings fish in alive so fisherman can throw back if they don’t want it – good way to reduce bycatch!
- Agriculture/Fish farming also has many different techniques:
- Open System Aquaculture: fish kept in the actual ocean in cages/nets. 50% of global seafood supply is farmed. Does create a lot of waste: nutrients released and then eutrophication can create dead zones (giant masses of algae). Can also put species in non-native areas.
 - Mussel/clams are ok by this method though, 85% of all mussels/clams bought were grown on ropes

- It is also important to consider how the fish are fed when determining how eco-friendly they are to farm; bad if the farmed fish need to eat an overfished fish
- Closed System Aquaculture: contained inside of building, not in ocean; stops ocean contamination problem.
 - Can use aquaponics: combinations of fish and plants to regulate nutrients, still productively creates farmable habitat for fish.
- Chicago-specific Issues:
- Chef/restaurants get frustrated with figuring out how to buy fish based on sustainability because it is so complicated!
 - A focus of Food/Beverage is to make figuring this out (in terms of certification standards) much easier.
- Shaw's Crab House is the only MSC accredited restaurant in Chicago!
- Shedd has an education program that could be used to help restaurants with "information" marketing.
 - This information can be applied to server's knowledge, menu, and advertising.
 - It looks good when a restaurant owner/worker can actually answer where their fish comes from.
 - It also helps with explaining why some fish are red-listed that are important to the restaurant business.
 - examples: Chilean Sea Bass red-listed because there is only one fishery that is MSC certified!
- Could possibly market this to chefs as unique/interesting new additions.

"THE PLANT" TOUR

Lingyi Peng

Located in the Back of the Yards neighborhood
Very industrial

Waiting room

- Panels and models describing vision
- Unifying the community, gathering place
- Vendors sell to community members
- Ice skating rink in the yard of the Plant

Tour Introduction:

- Plant in early stages - need to use imagination
- Shut down in 2007, bought in 2010
- "Take a building in total disrepair and put businesses in it"
- Run by group of dedicated volunteers

3 parts:

1. Aquaponic and hydroponic system
 - aquaponic: fish produces waste, feeds plants, plants filters water
 2. Share kitchen - for small businesses to rent spaces and equipment
 3. Non-profit / education
 - Business incubator - resource for people wanting to start business
 - Education center, i.e. how to do vertical farming
- Hope to generate own electricity, "unplug ourselves from the city"
 - 1.5 million grant from the state and 0.5 million loan

Revenue

- Renters of space to farm or share kitchen
- Paid to take away grains (Plant will use grain to produce energy)

Waste

- Have been using everything - only 2 dumpsters of trash since 2010

1st Floor

-
- Future home of brewery, currently concentrate room

2nd floor

- Food grade floor and walls from meatpacking days - no bacteria can grow on it
- Meat smoker still in room
- Added new high efficiency windows
- Next room is going to be a bakery
 - Will reuse pipes to cool room
- Ham freezer will be used as vertical farming room
 - Railings for hooking meat will be reused to attach plants
 - Vertical farming will reuse 80% of water
 - No regulations for indoor farming
- Food share room
 - Equipment will be there for food trucks, small food businesses to rent

3rd Floor

- Room with aqua-farming - rented out by tenants
 - Tilapia tanks
- Smoking area (where meat used to be smoked) will be converted into lounge
 - But currently has bare, stripped down walls like the rest of the building

Rooftop farming

- Hydroponics - water pumped up through pipes and flows down. Plants in pipes
- Homemade compost
- Less saturated soil = lighter on roof

Basement

- Aquaponics - tilapia and arugula
- Only room that looks finished

Testing different wavelengths of light

HELEN CAMERON

Uncommon Ground Tour (April 13, 2012) *Camy Pearson*

- Food/Beverages
- Helen said that the heart and soul of greening restaurants is focusing on where the food comes from. (Need to figure out if it is: Sustainable, Organic, or Local)
- They try to source as much food locally as possible
- They are realistic about things that just can't be bought locally, won't buy local stuff that tastes bad or doesn't fit their restaurant scheme.
- They know most of the people they buy their food from, allows for long-lasting relationships between producer and restaurateur that offers economic benefits for both
 - (Local = 100 miles away or less)
 - Beef, pork, chicken, turkey, rabbits, ducks, etc. are all from local farms
- Using seasonal products only is important!
 - They are constantly adjusting their menu to follow seasonality. They alternate by changing 4 items on their day menu one week and 4 items on their dinner menu the next week.
 - Just a thought: these small alterations could be marketed to restaurateurs as a fresh/different/exciting type of menu that will attract consumers with its variety and make them come back to try something new. It's actually quite trendy with gourmet restaurants right now.
 - Get some produce from their very own rooftop farm, which grows rare fruits and vegetables for them to highlight in their menu.
- For seafood, stick as well as possible to MSC/Monterey Bay standards
 - If MSC certified, then you know for sure that is sustainable; sometimes producers or distributors are not so honest. Certification guarantees quality
 - Can even put the MSC seal on menu, good for marketing!
- Also focus on using foods that are better/safer/healthier for the consumer:
 - Trying to eliminate all products with high fructose corn syrup.

- Want no pesticides at any level of production (Used to use sugar made from beets but they discovered that the beets were treated with pesticides, so switched to all organic cane sugar.
- Buying food in bulk is generally better because it saves package waste.
 - No individual condiment packages
- Focus on sustainable beverages as well
 - All beers local, almost all liquors from Midwest
 - All organic coffee, almost all tea organic.
 - Only offers stevia as sweetener; no Sweet'n Low or Splenda with drinks
 - Helen said she is having a hard time with soda though, as consumers want a coke or diet coke a good portion of the time. Looking to get drinks sweetened by agave, but it must taste good. It also must be purchasable in bulk though, as individual bottles are not eco-friendly.
- Rooftop garden for growing fruits/vegetables/herbs
 - Uses cedar-wood boxes (no chemical treatments necessary)
 - Uses potting soil and microorganisms, which breaks down nutrients for the plants from organic fertilizers.
 - Does not give all produce, but does make about 800 lbs/year. This produce can be rare fruits and vegetables that are tailored to the chef's menu and that you usually cannot buy/eat almost anywhere (which can be marketed as exclusive and adventurous/exciting!)
- For farms to become organic, they must pass USDA standards, as well as any local/state standards. They can also go to an outside certifier (who does much more specific/detailed certifications than government usually).
 - They usually have to wait 3 years for soil to "clean out" or chemicals they used before.
- Great and unique concept: All the landscaping at the restaurant level (not in garden) seems to consist of edible plants: aka every plant that seems to be placed there for aesthetic reasons is actually also used for food too!
- Energy, Furnishings Waste
- Furniture, restaurant building materials, bar tables, lights all eco-friendly.
 - Recycled all scraps for tables to make other wood decorations (Zero waste!)
 - Switching from halogens to LED lights saved them \$300/400 a month (\$1,500 initial investment)
 - It's really easy to install low flow faucets. Small amount of cost for large amount of water (and possibly cost) saved
- Always looking to buy Energy Star rated appliances
 - \$3,000 dollars to install 6 hand-dryers in the two restaurants bathrooms led to \$1000 in savings per month for the restaurant!
 - Use eco-friendly insulation, programmable thermostats, LED televisions; printers, computers are all energy star and give points for certification
 - Helen said that the largest amount of the eco-friendly savings comes from reducing energy needs
 - A typical accreditation problem (and hence one we should look into) is getting points for things that you have signed a contract for, but either haven't received yet or have been using for a while
- Solar panels save \$8,000 a year for heating water. Initial investment was \$30,000, but they also received a 40% subsidy from the state government.
 - Solar thermal power is the most efficient way to generate power.
 - Renewable energy credits: Sometimes green power can be cheaper than brown power. Definitely cheaper than Chicago power (ComEd?)
- 10 % discount for people who bike to their restaurant! This is not really for our project... but useful information.
- They use eco-friendly cleaning products and waste disposal as much as possible.
 - Try to use Chlorine free paper products/cleaners and products with a high % of post-consumer waste
 - You have to compost to get GRA accreditation

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- They have to use non-environmentally friendly cleaning products once a week for a deep clean for sanitation needs, no eco-friendly ones that do the job. The rest of the week they use eco-friendly cleaners.
 - Sometimes it is hard for them to find credible/complete information on cleaning products. Can check GRA and Green Seal accreditation though.
 - Green company hired for pest control
 - Certification
 - Massive amount of paperwork for GRA certification
 - Must submit one month's worth of documentation of restaurants activities.
 - Helen said that it is a better and more economical way to go green through a slow overall transition.

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BIBLIOGRAPHY

- Alliance for Water Efficiency. Toilet fixtures introduction. (2010). In Alliance for Water Efficiency. Retrieved May, 2012, from:
http://allianceforwaterefficiency.org/toilet_fixtures.aspx
- AccuTemp. TAccuTemp and IRWD team up for water-saving restaurant retrofit program. (2007, December, 14). retrieved May 10 2012, from AccuTemp Web Site: http://www.accutemp.net/irwd_press.html
- Adler, P. R.; Harper, J. K.; Wade, E. M.; Takeda, F.; Summerfelt, S. 2000. Retrieved from:
<http://www.cabdirect.org/abstracts/20093214535.html;jsessionid=F05BBCEB053AD2DBD5EC4CBEC858BE24>
- AEA Technology. Department for Environment, Food and Rural Affairs, (2007).Economies of scale - waste management optimisation study by AEA technology - final report. Retrieved from Queen's Printer and Controller of HMSO
website:<http://archive.defra.gov.uk/environment/waste/localauth/partnerwork/documents/economies-scale.pdf>
- AGCChicago. (n.d.). *stewardship*. Retrieved April 29, 2012, from: <http://agcchicago.org/stewardship.php>
- Agyeman, Julian &Kollmuss, Anja (2002). Mind the Gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8 (3), 239-260.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human DecisionProcesses*, 50, 179-211.
- Ajzen, I., Brown, T. C.; Rosenthal, L. H. (1996). Information bias in contingent valuation: Effects ofpersonal relevance, quality of information, and motivational orientation. *Journal of Environmental Economics and Management*, 30, 43-57.
- Ameren Illinois. (2012). ActOnEnergy. In Ameren Energy. Retrieved May 13, 2012, from
<http://www.actonenergy.com/for-my-business/explore-incentives/leak-survey-and-repair>
- American Wind Energy Association (AWEA). 2011 U.S. small wind turbine market report: Year ending 2011 (n.d.). In *American Wind Energy Association*. Retrieved May 16, 2012, from
http://www.awea.org/learnabout/smallwind/upload/2011_GMR_SmallWind_1pager_revised-041012.pdf
- Anderson, J. (2003). The environmental benefits of water recycling and reuse. *Water Science and Technology: Water Supply*,3(4), 1-10.
- Anderson, M. T., Elkins, T., Klund, D., Lukens, C., Massur, K., Trissel, D., and Vannoni, B. (2009). What drives hybrid repair costs.*Audatex*. Retrieved April 8, 2012.
- Ando, A. W., &Freitas, L. P. (2011). Consumer demand for green stormwater management technology in an urban setting: The case of Chicago rain barrels. *Water Resources Research*, 47, 1-11.
- Arasu, K. T. (2011). End of cheap food era as grain prices stay high: Reuters poll. Retrieved 5/8/2012, from <http://www.reuters.com/article/2011/01/28/us-usa-grains>
- Ardente, F., Beccali, G., Cellura, M., & Lo Brano, V. (2005). Life cycle assessment of a solar thermal collector: Sensitivity analysis and environmental balances. *Renewable Energy*, 30(2), 109-130.

-
- Arizona Municipal Water Users Association. (2003, March). Facility Manager's Guide to Water Management . Retrieved May, 2012, from <http://www.dep.state.pa.us/dep/deputate/pollprev/Iso14001/Tools/Facility%20Environmental%20Issues%20Toolbox/WU%20Water%20Use/WU1,%20WU4,%20WU8%20Company%20Manager's%20Guide%20Water%20Mgmt.pdf>
- Assembly Services and Packaging, Inc. *Kitting Costs*. Retrieved April 27, 2012 from ASAP (Assembly Services and Packing, Inc.) website:<http://info.asapwi.com/tag/bulk-packaging/>
- Athavaley, A. (2009, October). Kicking formaldehyde out of bed. *Wall Street Journal*. Retrieved from: <http://online.wsj.com/article/SB10001424052748703816204574487412817324226.html>
- Athena Institute. (2012). ATHENA® Impact Estimator for Buildings. In Whole Building Design Guide: A Program of the National Institute of Building Sciences. Retrieved May 13, 2012, from http://www.wbdg.org/tools/athena_eie.php
- Attalla, Ahmad & Carrigan, Marylyn (2001). The Myth of the Ethical Consumer - do ethics matter in purchase behavior? *Journal of Consumer Marketing*, 18 (7), 560-577.
- ATIV Solutions, LLC. *Savings calculator for commuting by bicycle vs. car*. (n.d) Retrieved April 11 2012, from ATIV Solutions Web
Site:<https://secure40.securewebsession.com/econver.site.aplus.net/calculator/index.html>
- B. Havlik, Shedd Aquarium. Personal Communication, March 30, 2012
- Bacon, D. R. & J.A. Roberts. (1997). Exploring the subtle relationships between environmental concern and ecologically conscious consumer behavior. *Journal of Business Research*, 40, 79-89.
- Baldwin, C. (2012). *Greening Food and Beverage Services* (pp. 99-127). Lansing, Michigan: The American Hotel & Lodging Institute.
- Ball, Jeffrey. (2009, June 12). Paper or plastic? A new look at the bag scourge. *The Wall Street Journal*. Retrieved from <http://online.wsj.com/article/SB124473522987806581.html>.
- Batali, M. (2012). Seasonality and seafood. *Chicago Tribune*. Retrieved 4/30, 2012, from http://articles.chicagotribune.com/2012-04-11/features/sc-food-0406-mario-crabs-20120411_1_soft-shell-crabs-seafood-species-fish
- Batzner Pest Management, Inc. (n.d.). Retrieved April 27, 2012 from <http://www.batzner.com/>
- Bay Area Air Quality Management District. Commercial Cooking Operation (Charbroiler) Registration. (n.d.). Retrieved from <http://www.baaqmd.gov/Divisions/Engineering/Equipment-Registration/Charbroiler.aspx>
- Bay Area Air Quality Management District. BAAQMD Certified Charbroiler Equipment Table. (n.d.). Retrieved from: www.baaqmd.gov/~media/Files/Compliance%20and%20Enforcement/Wood%20Burning/certified_chain_catalyst_web.ashx
- Bermudez, S. (2011, April 1). Water-efficient toilets: The green way to flush. In College of Dupage. Retrieved May, 2012, from <http://dc.cod.edu/cgi/viewcontent.cgi?article=1352&context=essai>
- Berry, D. (2002). The market for tradable renewable energy credits. *Ecological Economics*, 42, 369-379.

-
- Biodiesel. (2012). Biodiesel Retailer Listings. Retrieved from:<http://www.biodiesel.org/using-biodiesel/finding-biodiesel/retail-locations/biodiesel-retailer-listings>
- Bird, L., & Brown, E. (2006, October 24). Trends in utility green pricing programs. National Renewable Energy Laboratory. Retrieved May 24, 2012, from <http://www.nrel.gov/docs/fy07osti/40777.pdf>
- BirdLife International. (2012). Social impacts of current biofuels. Retrieved from: http://www.birdlife.org/eu/EU_policy/Biofuels/eu_biofuels2b.html.
- Black, C., Collins, A., & Snell, M. (2011, June). *Encouraging walking: The case of journey-to-school trips in compact urban areas*. Urban Studies, 38(7), 1121-1141.
- Bollinger, B. & Gillingham, K. (2009). Peer effects and learning by doing in the diffusion of solar. Working Paper, Department of Agricultural and Resource Economics, University of California at Berkeley.
- Bowyer, J. (2008). *The Green Movement and the Forest Products Industry*. Presentation for the Forest Products Journal and Michigan State University. Retrieved from: http://www.for.msu.edu/fpsgreatlakes/Seminar/Seminar08/Presentations/Bowyerelansing_1.pdf
- Bridgespan group (2004). Fishery certification: summary of analysis and recommendations. Bridgespan Group, Boston.
- Brooks, M., A., Elster-Jones, J., & Lucas, K. (2005). *Promoting pro-environmental behavior: existing evidence to inform better policy making*. Department for Environmental and Rural Affairs, Centre for Sustainable Development, University of Westminster. Retrieved from: <http://www.thepep.org/ClearingHouse/docfiles/Promoting.Pro-environmental.Behaviour.pdf>
- Buchanan, D. (2011). Managing seafood butchering yields and food cost control. Retrieved 5/7, 2012, from <http://ezinearticles.com/?Managing-Seafood-Butchering-Yields-and-Food-Cost-Control&id=6158427>
- Building Energy Experts. (2010). Commercial Energy Audits. In Building Energy Experts. Retrieved May 13, 2012, from <http://www.buildingenergyexperts.com/commercial/energy-audits/>
- Building Technologies Program: tax incentives for commercial Buildings. (n.d.). *U.S. DOE Energy Efficiency and Renewable Energy (EERE) Home Page*. Retrieved April 12, 2012, from http://www1.eere.energy.gov/buildings/tax_commercial.html
- Bus, K., & Chandler, C. (2010). High Efficiency Toilets. In Hobart and William Smith Colleges. Retrieved May, 2012, from http://people.hws.edu/env301/PAC_Website/Water_Use_files/Web-HETs-1.pdf
- Business | Energy Impact Illinois: An Alliance to Help Illinois Businesses Lower Their Energy Costs . (n.d.). *Welcome to Energy Impact Illinois*. Retrieved April 24, 2012, from <http://energyimpactillinois.org/business/?reload=y>
- Buy Restaurant Equipment Depot. (n.d.) Retrieved from: <http://www.talismancompaniesllc.com/broiler-model/>.
- CA.gov. (2009, January 15). Building Maintenance - Lighting and Occupancy Sensors. In Green California. Retrieved May 13, 2012, from <http://www.green.ca.gov/EPP/building/sensors.htm>
- California Energy Commission's Public Interest Energy Research Program. (2008, September). Variable Speed Comes to the (Kitchen) 'Hood. Retrieved from <http://www.energy.ca.gov/2008publications/CEC-500-2008-068/CEC-500-2008-068-FS.PDF>

California Environmental Protection Agency: Air Resources Board. (1999, April 20). Restaurants, Chain-Driven Charbroilers. Retrieved from <http://www.arb.ca.gov/ssps/Restaur.pdf>

Cameron, H. Personal Communication, April 13, 2012

Campus Conservation Committee, CSU, Chico (n.d.). *Seeing Things From Both Sides: Double Sided Printing*. Retrieved May 8, 2012, Chico, California State University: <http://www.csuchico.edu/vpbf/sustainable/ccc/onlineversion - DoubleSidedPrintingPromotion.pdf>

Canals, L.M., S. J. Cowell, S. Sim and L. Basson (2007). Comparing domestic versus imported apples: A focus on energy use. *Environmental Science and Pollution Research* 14 (5), 338-344.

Canals, L. M., I., Edwards-Jones, G., Hounsome, N., Truninger, M., Koerber, G., Hounsome, B., Cross, P., York, E. H., Hospido, A., Plassmann, K., Harris, I. M., Edwards, R. T., Day, G. A. S., Tomos, A. D., Cowell, S. J., & Jones, D. L. (2008). Testing the assertion that 'local food is best': the challenges of an evidence-based approach. *Trends in Food Science & Technology* 19, 265-274.

Castro-Lacouture D., Sefair J., Florez L., Medaglia A. (2009). Optimization model for the selection of materials using a LEED-based green building rating system in Colombia. *Building and Environment*. 44 (6), 1162-1170.

Center for Disease Control. Menulabelling. (n.d.). *cdc*. Retrieved January 8, 2012, from: www.cdc.gov/obesity/downloads/MenuLabeling.pdf

CFL vs traditional lamps can result in savings >80%. Retrieved from: http://www.energystar.gov/index.cfm?c=small_business.sb_restaurants

Charbroilers in Eateries Face Controls. (2007, December 6). *Contra Costa Times*. Retrieved from: http://www.contracostatimes.com/news/ci_7649483?nclick_check=1

Chartrand, T. L. (2005). The role of conscious awareness in consumer behavior. *Journal of Consumer Psychology*, 15 (3), 203-210.

Chicago Bicycle Users Survey Report (2005). In *City of Chicago Department of Transportation*. Retrieved April 8, 2012, from: http://www.chicagobikes.org/pdf/cdot_bicycle_survey_draftfinal.pdf

Chicago Community Climate Action Toolkit. (n.d.). Retrieved from: <http://climatechicago.fieldmuseum.org/>

Chicago Conservation Corps Blog. (2012). Retrieved from: <http://chicagoconservationcorps.org/blog/about-this-weblog/>

Chicago Department of Environment. (2010). *Waste Characterization Study*. Chicago, IL. Retrieved from http://www.cityofchicago.org/dam/city/depts/doe/general/RecyclingAndWasteMgmt_PDFs/WasteAndDivers ionStudy/WasteCharacterizationReport.pdf

Chicago Department of Transportation. *Chicago bike laws*. (n.d) Retrieved April 12 2012, from Chicago Department of Transportation Web Site: <http://chicagobikes.org/bikelaws/?show=search&terms=messenger>

Chicago Department of Transportation. *Chicago bike parking*. (2008, August, 4). Retrieved May 20 2012, from Chicago Department of Transportation Web Site: <http://chicagobikes.org/bikeparking/faq.php#10>

Chicago Metropolitan Agency for Planning. (n.d.). *Chicago Retrofit Ramp-Up (CR3): Program Summary*. Retrieved from <http://www.acpha-cahm.org/forms/acpha/acphahandbook04.pdf>

Chicago Metropolitan Agency for Planning. (2011). CMAP Local Food Chapter Outline.

Chicago Metropolitan Agency for Planning. *Planning for Green and Healthy Chicago Neighborhoods*. (2012, May 21). Retrieved from: http://www.cmap.illinois.gov/moving-forward-in-detail/-/asset_publisher/Q4En/content/planning-for-green-and-healthy-chicago-neighborhoods?isMovingForward=1

Chicago Metropolitan Agency for Planning. Water 2050 Bill Insert Program. (n.d.). In Chicago Metropolitan Agency for Planning. Retrieved May, 2012, from: <http://www.cmap.illinois.gov/water-2050/bill-inserts>

Chicago Public Schools. (n.d.). *About CPS*. Retrieved May 1, 2012, from: www.cps.edu/About_CPS/Departments/Pages/SchoolNutritionandDistributionServices.aspx

Chicago Transit Authority. *Transit benefit fare program*. (n.d) Retrieved April 18 2012, from Chicago Transit Authority Web Site http://www.transitchicago.com/news_initiatives/transitbenefit.aspx

City of Chicago Department of Planning and Development, (2006). *Eat local & live healthy*. Retrieved from website: http://www.cityofchicago.org/dam/city/depts/zlup/Sustainable_Development/Publications/Eat_Local_Live_Healthy_Brochure/Eat_Local_Live_Healthy.pdf

City of Chicago. Green Alleys (2010). In City of Chicago. Retrieved May, 2012, from: http://www.cityofchicago.org/city/en/depts/cdot/provdrs/alley/svcs/green_alleys.html

City of Chicago. (2011). *Facilities-geographic boundaries: Boundaries-wards*. Retrieved from City of Chicago Data Portal website: <https://data.cityofchicago.org/Facilities-Geographic-Boundaries/Boundaries-Wards/bhcv-wqkf>

City of Chicago - Green Power Purchasing. (2011 , December 15). In *Database of State Incentives for Renewables and Efficiency (DSIRE)*. Retrieved May 21, 2011, from http://www.dsireusa.org/solar/incentives/incentive.cfm?Incentive_Code=IL05R&re=1&ee=1

City of Chicago. (2012). *Community economic development: Business licenses*. Retrieved from City of Chicago Data Portal website: <https://data.cityofchicago.org/Community-Economic-Development/BusinessLicenses/r5kz-chrr>

City of Chicago. Introduction to green design. (n.d) Retrieved May 12 2012, from City of Chicago Web Site: http://www.cityofchicago.org/city/en/depts/water/supp_info/conservation/green_design/introduction_to_greendesign.html

City of Chicago. Green design. (n.d) Retrieved May 12 2012, from City of Chicago Web Site: http://www.cityofchicago.org/city/en/depts/water/supp_info/conservation/green_design/introduction_to_greendesign.html

City of Chicago. Apply for a Small Business Improvement Fund (SBIF) Grant. (n.d.). *City of Chicago*. Retrieved March 12, 2012, from: http://www.cityofchicago.org/city/en/depts/dcd/provdrs/ec_dev/svcs/apply_for_a_smallbusinessimprovementfundgrant.html

City of Chicago. *Bike 2015 Plan* (2005, September 21). In City of Chicago. Retrieved May 20, 2012, from <http://www.bike2015plan.org/pdf/bike2015plan.pdf>

-
- City of Chicago. *Benefits of biking*. (n.d) Retrieved May 20 2012, from City of Chicago Web Site:http://www.cityofchicago.org/city/en/depts/cdot/supp_info/bicycling_-_benefitsofbiking.html
- City of Chicago Climate Action Plan. *What is the Chicago Climate Action Plan?*. (n.d.). Retrieved May 05, 2012 from: <http://www.chicagoclimateaction.org/>
- City of Chicago. Department of Environment. (2010). Rain barrels and why should I use one? (2010). Retrieved from: http://www.cityofchicago.org/city/en/depts/doe/supp_info/what_is_a_rain_barrelandwhyshouldiuseone.html
- City of Des Plaines. Water & Sewer Rate Study (2011, November 2). In City of Des Plaines. Retrieved May 3, 2012, from: <http://www.desplaines.org/documents/Finance/Forms/2011%20Des%20Plaines%20Water-Sewer%20Presentation.PDF>
- City of Wichita. Guide for Making an Industrial Revenue Bond Water Management Plan. (n.d.). City of Wichita. Retrieved May, 2012, from: http://www.wichita.gov/NR/rdonlyres/77D9CB6B-809F-499C-9BD0-3C907E3A0D5E/0/Water_Management_Plan_Guide_19d.pdf
- Clarke, P. (2009). 10 ways to reduce food costs. Food Margin. Retrieved 5/20, 2012, from:<http://foodmargin.com/2009/06/17/10-ways-to-reduce-food-cost/>
- Clay, J. (2004). *World agriculture and the environment: A commodity-by-commodity guide to impacts and practices*. Island Press, Washington, D.C.
- Clean Air Counts. Idling reduction programs (n.d.). In *Clean Air Counts*. Retrieved April 14, 2012, from: <http://ftp.cleanaircounts.org/idlingcase.pdf>
- CLOCC: Find Programs In your Community. (n.d.). *Welcome to CLOCC, the Consortium to Lower Obesity in Chicago Children*. Retrieved May 16, 2012, from http://www.clocc.net/find/results.lasso?scope=citywide&p_add_eating=x&prog_nature=Community
- Coalition for Resource Recovery. (2012). Wholesale Packaging. Retrieved May 20, 2012 from: http://thecorr.org/programs_wholesale_packaging.php.
- Colman, T., & Paster, P. (2007). Red, white, and “green”: The cost of carbon in the global wine trade. In Ginsburgh, V. American Association of Wine Economists Working Paper No. 9.
- Commercial Food Service Introduction (2010). In Alliance for Water Efficiency. Retrieved May, 2012, from: http://www.allianceforwaterefficiency.org/Commercial_Food_Service_Introduction.aspx
- Congestion mitigation and air quality improvement program*. (2011, September, 1). Retrieved April 20 2012, from U.S. Department of Transportation Federal Highway Administration Web Site:http://www.fhwa.dot.gov/environment/air_quality/cmaq/
- State of Connecticut. *List of potential PM2.5 control measures reviewed by CTDEP*. (n.d.). Retrieved from: http://www.ct.gov/dep/lib/dep/air/regulations/proposed_and_reports/pm25/appendix_4a.pdf
- Consortium for Energy Efficiency. (2010, October 5). Commercial Kitchen Ventilation. Retrieved from <http://www.cee1.org/com/com-kit/files/ProgramGuidanceDemandControlVentilation.pdf>
- Consumer price index, chicago-gary-kenosha, ILL.-IND.-WIS., CMSA – MARCH 2012 (2012). Retrieved 4/30, 2012, from <http://www.bls.gov/ro5/cpichi.pdf>

-
- Coomes, S. (2011). Partnerships between 'suits' and 'salts' inject new growth into seafood businesses. *Seafood Business*. Retrieved 5/7, 2012, from <http://www.seafoodbusiness.com/articledetail.aspx?>
- Cooper, P.; Poe, G. L.; Bateman, I. (2004). The structure of motivation for contingent values: A case study of lake water quality improvement. *Ecological Economics*, 50, 69-82.
- Costa, D. & Kahn, M. (2010) Energy conservation "nudges" and environmentalist ideology: evidence from a randomized residential electricity field experiment. National Bureau of Economic Research, Cambridge, MA.
- Costanigro, M., Thilmany, D., Kroll, S., Nurse, G. (2011) An in-store valuation of local and organic apples: The role of social desirability. *Agribusiness*, 27(4), 465-477.
- CoStar Group. CoStar Green Study. (n.d.). In CoStar Group: Real Estate Information. Retrieved 5/15/12, from <http://www.costar.com/uploadedFiles/Partners/CoStar-Green-Study.pdf>.
- Covered product category: Pre-rinse spray valves. (2012, February). Retrieved April 10 2012, from U.S. Department of Energy Web Site: http://www1.eere.energy.gov/femp/technologies/m/eep_low-flow_valves.html#dcecredit.
- Culver, A. et al. (2002). *Cleaning for Health: Products and Practices for a Safer Indoor Environment*. INFORM, Inc.
- de Boer, I. (2003). Environmental impact assessment of conventional and organic milk production. Animal Production Systems Group, Retrieved from: <http://www.sciencedirect.com/science/article/pii/S0301622602003226>
- Delmas, M., Deotrois-Blass, V., Shuster, K. (2008). CaegoVinegarden: How green is your wine? In Ginsburgh, V. American Association of Wine Economists Working Paper No. 14.
- The Delta Institute, The. U.S. Department of Energy, Cook County Energy Efficiency & Conservation Block Grant. (2012). *Cook County solid waste management plan: 2012 update*. Retrieved from: website: http://www.cookcountygov.com/taxonomy2/Environmental%20Control/cookswp_2012_as%20approved%20by%20county%20board.pdf
- Demand Media, Heather Topham Wood (n.d.). *Advantages & Disadvantages of Buying Bulk to Save on Unit Pricing*. Retrieved May 1, 2012 from: <http://smallbusiness.chron.com/advantages-disadvantages-buying-bulk-save-unit-pricing-20913.html>
- Deodhar, P. (2011, July 16). Multi-MW solar PV plants: More problem than solution. In *RenewableEnergyWorld.com*. Retrieved May 21, 2012, from <http://www.renewableenergyworld.com/rea/news/article/2011/07/multi-mw-size-solar-pv-plants-more-problem-than-solution>
- Department of Streets and Sanitation. City of Chicago, (2007). *Compost standards for chapter 11-4 permit exempt compost facilities rules and regulations* (Chapter 7-28). Retrieved from website: http://www.cityofchicago.org/dam/city/depts/doe/general/RecyclingAndWasteMgmt_PDFs/Composting/Ordinance92607_3.pdf
- Domicile Consulting. (2011). Our Services. In Domicile Consulting. Retrieved May 13, 2012, from <http://domicileconsulting.com/our-services/service-pricing>

-
- Donovon, L. (2011). Grease from Taste of Chicago to become biodiesel fuel. *Chicago Sun Times*. Retrieved from: <http://www.suntimes.com/news/transportation/6246227-418/used-oil-from-taste-to-be-turned-into-biodiesel-fuel.html>
- DSIRE. (2012). Ag invest - green energy loans (Illinois State Treasurer's Office Link Deposit Loan Program) . In Database of State Incentives for Renewables and Efficiency. Retrieved May 13, 2012, from: http://dsireusa.org/incentives/incentive.cfm?Incentive_Code=IL63F&re=1&ee=1
- DSIRE. (2012). City water light and power - solar rewards program. (2012, January 25). In *Database of State Incentives for Renewables and Efficiency (DSIRE)*. Retrieved May 21, 2012, from http://www.dsireusa.org/solar/incentives/incentive.cfm?Incentive_Code=IL77F&re=1&ee=1
- DSIRE. (2012). Illinois finance authority renewable energy and energy efficiency project financing. In Database of State Incentives for Renewables and Efficiency. Retrieved May 13, 2012, from: http://dsireusa.org/incentives/incentive.cfm?Incentive_Code=IL46F&re=1&ee=1
- DSIRE. (2012). Small business improvement fund. In Database of State Incentives for Renewables and Efficiency. Retrieved May 13, 2012, from: http://dsireusa.org/incentives/incentive.cfm?Incentive_Code=IL40F&re=1&ee=1
- DSIRE. (2011). Business energy investment tax credit (ITC). (2011, November 18). In *Database of State Incentives for Renewables and Efficiency (DSIRE)*. Retrieved May 21, 2012, from http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US02F
- DSIRE. (2011). Illinois clean energy community foundation grants. (2011, October 24). In *Database of State Incentives for Renewables and Efficiency (DSIRE)*. Retrieved May 21, 2012, from http://www.dsireusa.org/solar/incentives/incentive.cfm?Incentive_Code=IL06F&re=1&ee=1
- DSIRE (2011). Illinois finance authority renewable energy and energy efficiency project financing. (2011 , July 6). In *Database of State Incentives for Renewables and Efficiency (DSIRE)*. Retrieved May 21, 2011, from http://www.dsireusa.org/solar/incentives/incentive.cfm?Incentive_Code=IL46F&re=1&ee=1
- DSIRE (2011). Renewable energy resources trust fund. (2011 , September 6). In *Database of State Incentives for Renewables and Efficiency (DSIRE)*. Retrieved May 21, 2012, from http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=IL01R&re=1&ee=1
- DSIRE (2011). Renewable portfolio standard. (2011 , November 3). In *Database of State Incentives for Renewables and Efficiency (DSIRE)*. Retrieved May 21, 2012, from http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=IL04R
- DSIRE. (2011). Solar and wind energy rebate program. (2011, September 20). In *Database of State Incentives for Renewables and Efficiency (DSIRE)*. Retrieved May 21, 2012, from http://www.dsireusa.org/solar/incentives/incentive.cfm?Incentive_Code=IL05F&re=1&ee=1
- Duke University and the Environmental Defense Fund. (1995). *Paper Task Force Recommendations for Purchasing and Using Environmentally Preferable Paper*. Retrieved from: http://calculator.environmentalpaper.org/documents/813_PTFcomplete.pdf.
- Dunn, C. (2008, July 9). Paper bags or plastic bags? Everything you need to know. Retrieved from <http://www.treehugger.com/culture/paper-bags-or-plastic-bags-everything-you-need-to-know.html>
- Dutta, K., Umashankar, V., Choi, V., &H.G. Parsa (2008): A comparative study of consumers' green practice orientation in India and the United States: A Study from the restaurant industry, *Journal of Foodservice Business Research*, 11:3, 269-285.

-
- Ecobee. (2012). Solutions. In Ecobee. Retrieved May 13, 2012, from: <http://www.ecobee.com/solutions/business/>
- Ecology Action. (2007). Fryer to Fuel: Urban Biofuels Initiative Final Report: A Guide for Coordinating a Fryer to Fuel Collection Program in Combined Urban/Suburban Areas. Retrieved from: <http://www.epa.gov/region9/waste/biodiesel/docs/fryer-to-fuel-report.pdf>
- The Economist Intelligence Unit. (2009). *IT and sustainability: Bringing best practices to the business*. Retrieved from: <http://www.oracle.com/us/products/applications/green/056899.pdf>
- Eden Advanced Pest Technologies (n.d.). Integrated Pest Management. Retrieved April 27, 2012 from: <http://www.edenpest.com/commercial/integrated-pest-management>
- Edwards-Jones, G. (2010). Does eating local food reduce the environmental impact of food production and enhance consumer health? *Proceedings of the Nutrition Society*, 69(4), 582-591.
- EERE: financial opportunities . (n.d.). *U.S. DOE Energy Efficiency and Renewable Energy (EERE) home page*. Retrieved April 19, 2012, from <http://www1.eere.energy.gov/financing/>
- Eilperin, J. (2008, July 30). Can Chefs Cozy Up to Frozen Fish? The Washington Post.
- Elan, E. (2012, May 14). Eco-friendly packaging, sustainability practices explored. Retrieved May 20, 2012 from National Restaurant Association website: http://www.restaurant.org/nra_news_blog/2012/05/eco-friendly-packaging-sustainability-practices-explored.cfm?NL=NRA-01&Issue=NRA-01_20120515_NRA-01_398&YM_RID=%60email%60&YM_MID=%60mmid%60
- The Energy and Environmental Benefits of Office Furniture Remanufacturing. (May 2005). In National Center for Remanufacturing and Resource Recovery. Retrieved 5/15/12, from: <http://bifma.org/public/SusFurnStdArchive/Workgroups/WG1/Energy%20and%20Environmental%20Benefits%20of%20Remanufactured%20Furniture%201.pdf>
- Energy Efficiency and Conservation Authority. Small wind turbines (n.d.). In *New Zealand EECA Energywise*. Retrieved May 16, 2012, from <http://www.energywise.govt.nz/how-to-be-energy-efficient/generating-renewable-energy-at-home>
- Energy Future Coalition. Property Assessed Clean Energy (PACE). Retrieved from <http://www.energyfuturecoalition.org/files/webfmuploads/Jump%20Start%20Chicago%20Meeting%20Notes%20-%202007-12-11.pdf>
- Energy Impact Illinois*. (2012). Retrieved from: <http://energyimpactillinois.org/business/?reload=y>
- Energy Impact Illinois: an alliance for better buildings*. (n.d.). Retrieved from <http://www.cmap.illinois.gov/energy>
- Energy performance contracting. (n.d.). *Energy Performance Contracting*. Retrieved March 12, 2012, from <http://energyperformancecontracting.org/>
- Energy Saving Trust. Solar panels (PV) (n.d.). In *Energy Saving Trust*. Retrieved May 16, 2012, from <http://www.energysavingtrust.org.uk/Generate-your-own-energy/Solar-panels-PV#maintenance>
- Energy Star. (2007). Energy Use and Energy Efficiency Opportunities in Restaurants. In Energy Star. Retrieved May 13, 2012, from: http://www.energystar.gov/ia/business/small_business/restaurant_factsheet.pdf

-
- Energy Star. Focus on Energy: Commercial Sector. (2009, January). In Energy Star. Retrieved May, 2012, from:
http://www.energystar.gov/ia/partners/rep/ci_program_sponsors/downloads/Focus_on_Energy_Case_Study.pdf
- Energy Star. 2011 CFS Incentives Guide (2011). In Energy Star. Retrieved May 2, 2012, from
http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CKP&ion_id=req_box&tab=2
- Energy Star. (2011). Programmable Thermostats. In Energy Star. Retrieved May 13, 2012, from:
http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=TH
- Energy Star. Using On-Site Renewable Energy as the Next Step to Improving Energy Performance and Reducing Emissions. (2011, December). In Energy Star. Retrieved May, 2012, from:
http://www.energystar.gov/ia/business/retail/ES_JCPenney_Case_Study_508a.pdf
- Energy Star. Energy efficient mortgages. (n.d.). In Energy Star. Retrieved 5/15/12, from
http://www.energystar.gov/index.cfm?c=mortgages.energy_efficient_mortgages.
- Energy Star (n.d.) Impact of switching to energy star appliances. Retrieved from:
http://www.energystar.gov/index.cfm?c=small_business.sb_restaurants
- Energy Star. Federal tax credits for energy efficiency : energy star. (n.d.). *Home : ENERGY STAR*. Retrieved March 23, 2012, from http://www.energystar.gov/index.cfm?c=tax_credits.tx_index
- Energy Star. Find energy star products: Business and government. (n.d) Retrieved April 10 2012, from Energy Star Web Site: http://www.energystar.gov/index.cfm?c=products.pr_find_es_products
- Energy Star. (n.d.). Retrieved May 8, 2012, from
<http://energystar.supportportal.com/ics/support/kbAnswer.asp?deptID=23018&task=knowledge&questionID=14099>
- Energy Star. Portfolio Manager Overview. (n.d.). In Energy Star. Retrieved May, 2012, from:
http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager
- Energy360Solutions. (2009). Building Maintenance - Lighting and Occupancy Sensors. In Energy360 Solutions. Retrieved May 13, 2012, from:
http://www.energy360solutions.com/index.php/productsandservices/energy_audits_commercial
- Enterprise green communities: resources. (n.d.). *Enterprise*. Retrieved April 23, 2012, from
www.enterprisecommunity.com/solutions-and-innovation/enterprise-green-communities/resources
- Environmental impact of fishing. (2011). European Environment Agency. Retrieved 5/7, 2012, from:
<http://www.eionet.europa.eu/gemet/concept?cp=2834>
- Environmental Research Management.(2008) *Life Cycle Assessment of Tissue Products*. Retrieved from:
<http://www2.kimberly-clark.com/pdfs/LifeCycleAssessment.pdf>.
- Environmental and Energy Study Institute. Solar thermal energy for industrial uses. (2011, December). In *Environmental and Energy Study Institute*. Retrieved May 24, 2012, from
http://www.earthenergyinnovations.com/external?url=http://files.eesi.org/solar_thermal_120111.pdf
- Epicurious. Seasonal ingredient map. (3-21-2012). Epicurious.com Retrieved April 30, 2012 from:

<http://www.epicurious.com/articlesguides/seasonalcooking/farmtotable/seasonalingredientmap>

Ernst, M., & Woods, T. (2011). *Marketing Fresh Produce to Restaurants*. University of Kentucky Cooperative Extension Service. Retrieved from www.uky.edu/Ag/NewCrops/marketing/restaurants.pdf.

Espinoza T., Geiger C., Everson I. (2010). The real costs of institutional "Green" cleaning. San Francisco Department of Environment.

European Photovoltaic Industry Association. Solar PV technologies: Cells and modules (n.d.). In *European Photovoltaic Industry Association*. Retrieved May 16, 2012, from <http://www.epia.org/solar-PV/PV-technologies-cells-and-modules.html>

Everhart, A., & Lovitt, B. (2002). Selling fruits and vegetables. Iowa State University Extension Service. Retrieved 5/8, 2012, from <http://www.extension.iastate.edu/Publications/PM1887.pdf>

Fair Trade USA. About Fair Trade USA. Retrieved May 15, 2012. From: <http://www.fairtradeusa.org/about-fair-trade-usa>

Family and Consumer Sciences. Additional cost of energy star. Retrieved from: http://fcs.tamu.edu/housing/efficient_housing/equipment_and_appliances/energy_star_appliances.php

Fanney, H., Dougherty, B., & Richardson, J. O. (2002) Field test of a photovoltaic water heater. AHRAE Transactions, National Institute of Standards and Technology. Retrieved May 8, 2012, from <http://www.cuwcc.org/WorkArea/showcontent.aspx?id=2132>

Farm Direct (n.d.). Find Producers and Processors. Retrieved May 15, 2012 from: <http://www.illinoisfarmdirect.org/results.cfm>.

Federal Highway Administration. *Bicycle and pedestrian program*. (2012, May, 4). Retrieved April 12 2012, from Federal Highway Administration Web Site: http://www.fhwa.dot.gov/environment/bicycle_pedestrian/resources/data/benefits_research.cfm

Federal Trade Commission. *Saving money at the pump: Tips to stretch your gas dollar*. (2011, May). Retrieved April 27, 2012, from Federal Trade Commission Web Site: <http://www.ftc.gov/bcp/edu/pubs/consumer/alerts/alt064.pdf>

Florida International University. *Greenride carpool program*. (2011, August). Retrieved May 10 2012, from Florida International University Web Site: <http://parking.fiu.edu/greenride.htm>

Food Alliance (n.d.). Find Good Food. Retrieved May 15, 2012 from: <http://foodalliance.org/information-for/partner-search>.

Food Alliance. Find Good Food Search Window. Retrieved May 10, 2012, from: www.foodalliance.org/partnersearch

Food and Drug Association (2012) "FDA Takes Steps to Protect Public Health" [Press Release] Retrieved From: <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm299802.htm>

Food and Drug Association (2012) "FDA Takes Steps to Protect Public Health" [Press Release] Retrieved From: <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm299802.htm>

Food Service Technology Center. Pre-rinse spray valve/water cost calculator. (n.d) Retrieved May 25 2012, from Food Service Technology Center Web Site: <http://www.fishnick.com/savewater/tools/watercalculator/>

Food Service Warehouse. Retrieved May 3, 2012, from: <http://www.foodservicewarehouse.com/ifn-green/c12852.aspx>.

Foodservice Equipment Reports (2004, December 7). Retrieved from: <http://www.fermag.com/fortnightly/12.07.04/regulatory/home.htm>

Forst, N. (2012, May 2). Interview by A. Murray [Personal Interview]. Port of Portland: Waste practices.
Friedman, E. S. (n.d.). New options for renewable energy financing. In *Nixon Peabody LLP*. Retrieved May 16, 2012, from http://www.nixonpeabody.com/linked_media/publications/RenewableEnergy_ExecutiveCounsel_EllenFriedman.pdf

Fortune Fish Company. The Green Sheet. (n.d.). Fortune Fish: The Seafood Specialists - Midwest's Fresh & Frozen Seafood Distributor. Retrieved May 16, 2012, from: <http://www.fortunefishco.net/sustainability/the-green-sheet>

FSC Principles and Criteria for Forest Stewardship. (2002). In Forest Stewardship Council. Retrieved 5/15/12, from: http://www.fsc.org/fileadmin/web-data/public/document_center/international_FSC_policies/standards/FSC_STD_01_001_V4_0_EN_FSC_Principles_and_Criteria.pdf.

Fthenakis, V. M., Chul Kim, H., & Alsema, E. (2008). Emissions from Photovoltaic Life Cycles. *Environmental Science and Technology*, 42(6), 2168-2174.

Funders' Network. Mission & strategy. (n.d.). *Funders' Network*. Retrieved May 1, 2012, from: <http://www.fundersnetwork.org/about/mission>

Garcilaso, L. (2004). *Life Cycle Analysis of Paper and Plastic Bags*. Retrieved from Michigan Technological University Tech Alive Web site, Environmental Education Curriculum for the Michigan Department of Environmental Quality: http://tecalive.mtu.edu/meec_demoindex.htm

Gatersleben, B., Steg, L., & Velk, C. (2002). Measurement and determinants of environmentally significant consumer behavior. *Environment and Behavior*, 34 (3), 335-362.

Getter, K. L., Rowe, D. B., & Andresen, J. A. (2007, December 3). Quantifying the effect of slope on extensive green roof stormwater retention. *Ecological Engineering*, 31(4), 225-231.

Ginsberg, C (n.d.). The Market for Vegetarian Foods. The Vegetarian Resource Group. Retrieved May 10, 2012 from: <http://www.vrg.org/nutshell/market.htm#market>.

Global Equipment Company Inc (n.d.). *Storage & Shelving*. Retrieved May 8, 2012 from: <http://www.globalindustrial.com/c/storage/shelving?ref=t/SS/cat>

Godfrey, S., Labhasetwar, P., & Wate, S. (2009). Greywater reuse in residential schools in Madhya Pradesh, India—A case study of cost–benefit analysis. *Resources, Conservation and Recycling*, 53, 287-293.

Good Food Festivals. (2012). Retrieved from: <http://goodfoodfestivals.com/>

Gotschi, T., & Mills, K. (2008). Active transportation for America. In *Rails-To-Trails*

Graham, M., & Gardner, R. (2011). Making the most of seasonal bounty. *The Local Beet*. Retrieved 4/30, 2012, from <http://www.thelocalbeet.com/2011/09/07/making-the-most-of-the-seasonal-bounty/>

-
- Grain and soybean futures and options. (2004). Retrieved 5/8, 2012, from:http://agmarketing.extension.psu.edu/Commodity/PDFs/grainsoybean_future.pdf
- Granite Solar. Why solar in Spain? (2008). In *Granite Solar*. Retrieved May 24, 2012, from <http://www.graniteconsultants.com/whySpain.html>
- Great Lakes Environmental Research Laboratory. (2000). Illinois-Indiana Sea Grant. *Great Lakes Stewardship Initiative*. (n.d.). Retrieved from:<http://www.glstewardship.org/About.aspx>
- Green Business Bureau*. (n.d.). Retrieved from <http://www.gbb.org/>
- Green California. (Last updated 9 June 2008). Paper Products – Janitorial Paper Products. Retrieved from <http://www.green.ca.gov/EPP/Paper/janitorial.htm>.
- Green Restaurant Association. (2011). *Green Restaurants® 101*. Retrieved from: <http://dinegreen.weebly.com/>
- Green Restaurant Association. GRA point system. Retrieved from: <http://www.dinegreen.com>
- Green Restaurant Association. (2012). *Chicago certified green restaurants*. Retrieved from Green Restaurant Association website:http://dinegreen.com/customers/restaurant_guide2.asp?display=Cuisine&rest_state=&rest_metro=Chicago&rating
- Green Restaurant Association. Green Restaurant® 4.0. Retrieved May 5, 2012, from <http://dinegreen.com/restaurants/standards.asp>.
- Green Restaurant Research Team, University of Chicago (2012). "Winter Report 2012". Retrieved from: http://eaf.uchicago.edu/wp/wpcontent/uploads/2012/05/GRRT_WinterReport1.pdf.
- Green Seal (April 20, 2009). GS-46: Green Seal Standard for Restaurants and Food Services, 1st Edition. In Green Seal. Retrieved May 21, 2012, from:http://www.greenseal.org/Portals/0/Documents/Standards/GS-46/GS-46_Restaurants_and_Food_Services_Standard.pdf.
- Green Seal (October 8, 2008). *Proposed Environmental Standard for Restaurants and Food Service Operations (GS-46) - Background Document*. Retrieved April 27, 2012 from:<http://www.greenseal.org/>
- Green Seal. (2009, April 20). Green Seal Standard for Restaurants and Food Services. In Green Seal. Retrieved May 13, 2012, from: <http://www.greenseal.org/>
- Green Seal. "Why Certification?" *Green Seal Green Business Certification Why Certification?* Web. 29 Feb. 2012. <<http://www.greenseal.org/GreenBusiness/Certification/WhyCertification.aspx>>.
- Green Seal. Green Seal Green Business Standards. Retrieved from: <http://www.greenseal.org/GreenBusiness/Standards.aspx?vid=ViewStandardDetail&cid=0&sid=27>
- Green Vent. (n.d.). Restaurant Kitchens. Retrieved from: <http://greenventkitchen.com/restaurant.php>
- Greencorps Chicago*. (2012). City of Chicago. Retrieved from: http://www.cityofchicago.org/city/en/depts/cdot/provdrs/conservation_outreachgreenprograms/svcs/greencorps_chicago.html
- Gulbrandsen, L.H. (2005). Mark of sustainability? Challenges for fishery and forestry eco-labeling environment. *Marine Policy*. 47. 8–23.

-
- Gulbrandsen, L.H. (2006). Creating markets for eco-labelling: are consumers insignificant? *International Journal of Consumer Studies*, 30 (5), pp. 477–489.
- Gurjar, B. R. (2010). *Air Pollution: Health and Environmental Impacts*. Boca Raton, Florida: Taylor & Francis Group.
- H2Ouse. Toilet Benefits and Costs. (2009). In H2Ouse. Retrieved May, 2012, from: http://www.h2ouse.org/tour/details/element_action_contents.cfm?elementID=5812b5a5-e0be-4d14-a202c8dae8ce491f&actionID=7BFC2969-7BDB-4000-93556F98AAB057A4
- Hall, C. (2012). Direct marketing guide for producers of fruits, vegetables and other specialty products. Agricultural Extension Service, University of Tennessee. Retrieved 5/8, 2012, from: <http://agmarketing.extension.psu.edu/Retail/PDFs/PB1711.pdf>
- Halweil B. Wal-Mart to source fish “sustainably”. [1 May 2006; Accessed 30 April 2012]. World Watch.
- Hansen, B., Alrøe, H., Fjelsted & Kristensen, E. (2001) Approaches to assess the environmental impact of organic farming with particular regard to Denmark. *Agriculture, Ecosystems and Environment*, 83 (1-2), pp. 11-26.
- Harding, A. (March 13, 2012). Study: Too much red meat may shorten lifespan. CNN Health. Retrieved May 10, 2012 from: <http://www.cnn.com/2012/03/12/health/red-meat-shorten-lifespan/index.html>.
- Healthy Places. (2012). Retrieved from: <http://www.healthyplaceschicago.org/>
- Healthy Schools Campaign. (n.d.). Gomez. Retrieved April 22, 2012, from: http://healthyschoolscampaign.typepad.com/healthy_schools_campaign/quillermo_gomez/
- Healthy Schools Campaign. (n.d.). Local Schools . Retrieved April 23, 2012, from: <http://healthyschoolscampaign.typepad.com/files/local-school-wellness-policy.pdf>
- Healthier Chicago. *Building a healthier chicago*. (n.d.). Retrieved from <http://www.healthierchicago.org/>
- Henry, J. (2009, October 23). How to save money on car repairs. CBS. Retrieved May 8, 2012, from: http://www.cbsnews.com/2100-504343_162-5402890.html
- Hills, S., Birks, R., & McKenzie, B. (2002). The Millennium Dome “Watercycle” experiment: to evaluate water efficiency and customer perception at a recycling scheme for 6 million visitors. *Water Science and Technology*, 46(6-7):233-40.
- Hinrichs, C. C. (2000). Embeddedness and local food systems: notes on two types of direct agricultural market. *Journal of Rural Studies*, 16(3), 295-303.
- Ho, Mae-Wan, Gala, Rhea (September 21, 2005). *Food Miles and Sustainability: What’s behind the statistics and what should be done?* Retrieved May 8, 2012 from Institute of Science in Society: <http://www.issis.org.uk/FMAS.php>
- Holt, E., & Bird, L. (2005, January). Emerging markets for renewable energy certificates: Opportunities and challenges. In *National Renewable Energy Laboratory*. Retrieved May 21, 2012, from <http://apps3.eere.energy.gov/greenpower/resources/pdfs/37388.pdf>
- Home Depot Foundation. Grants. (n.d.). *Home Depot Foundation*. Retrieved May 2, 2012, from <http://www.homedepotfoundation.org/page/grants>

-
- Howard Smith Paper Group. (2009). Environment Information Sheet: Recycled Paper. Retrieved from: <http://www.hspg.com/assets/policies-certificates/standards-and-other/recycled-paper-info.pdf>.
- Hubbell, B. J. (2001, March 19). Evaluating the health benefits of air pollution reductions: Recent developments at the U.S. EPA. In *United States Environmental Protection Agency*. Retrieved April 2012, from: <http://www.epa.gov/ttnecas1/workingpapers/london.pdf>
- Hu, H., Parsa, H.G., Self, John (2010): The dynamics of green restaurant patronage." *Cornell Hospitality Quarterly*, 51:3, 344-362
- Huwer, U. (2004, January). Public transport and car-sharing—benefits and effects of combined services. *Transport Policy*, 11(1), 77-87.
- IANR News. Buying local produce can boost profits for chefs and growers, NU survey shows. (2003, September 5). *NU IANR News*. Retrieved May 3, 2012, from <http://ianrnews.unl.edu/static/0309050.shtml>
- Illinois Department of Commerce and Economic Opportunity. Bureau of Energy and Recycling, (2010). *Food scrap composting revitalization & advancement program (F-SCRAP)*. Retrieved from website: <http://www.commerce.state.il.us/NR/ronlyres/4DAC14D1-5363-4517-A27D-E0370DE596AE/0/CompostRFAFSCRAPFINAL111609.pdf>
- Illinois Environmental Protection Agency. *Used tire facts and information*. (n.d) Retrieved April 28 2012, from Illinois Environmental Protection Agency Web Site: <http://www.epa.state.il.us/land/tires/used-tires-facts-and-information.html>
- Illinois General Assembly. Plumbing Code of Standards. (2012, May 15). In 97th General Assembly. Retrieved May, 2012, from: <http://ilga.gov/legislation/BillStatus.asp?DocNum=4496&GAID=11&DocTypeID=HB&LegId=64151&SessionID=84&GA=97>
- The Illinois Section American Water Works Associate Water Efficiency Committee. Water-Energy Nexus Survey Summary Report (2012, March). In The Illinois Section American Water Works Association. Retrieved May, 2012, from: http://www.isawwa.org/resource/collection/82A33FB3-E26F-4EA1-932D-866A9E8E264A/FY12-0077_ISAWWA_SURVEY_REPORT_final.pdf
- Milwaukee Avenue Green Development Corridor. (n.d.). Retrieved April, 2012, from: http://logansquareh2o.org/?page_id=67
- Interactive energy calculators: Solar water heating calculator. (n.d.). In *www.infinitepower.org*. Retrieved May 24, 2012, from http://www.infinitepower.org/calc_water.htm
- International Food and Resource Policy Institute. Seasonality tool. International Food and Resource Policy Institute. Retrieved 5/20, 2012, from: <http://www.foodsecurityportal.org/seasonality-tool>
- Jacquet, J.L., & Pauly, D. (2008). Trade secrets: renaming and mislabeling of seafood. *Marine Policy*, 32, 309–318.
- Jeong, E. & SooCheong, J.. "Effects of restaurant green practices: Which practices are important and effective?" (June 8, 2010). Caesars Hospitality Research Summit. Paper 13.
- Kane, L.B. (2008, Oct.). Wax-Free Boxes: A “Less Bad” Solution? Presentation Whole Food Markets. Retrieved from: http://www.sustainablebizness.com/PkgForum_Boston08/LKane_AM_Bos08.pdf

-
- Kapur A., Baldwin, C., Swansaon, M., Wilberforce, N., McClenachan, G., & Rentschler, M. (2011). Comparative life cycle assessment of conventional and Green Seal-compliant industrial and institutional cleaning products. *The International Journal of Life Cycle Assessment*. 17(4), 377-387.
- Kassinis, G. I. & Soteriou, A. C. (2003). Greening the service profit chain: The impact of environmental management practices. *Production and Operations Management*, 12(3), 386-403.
- Keating, T., & Lawson, R. (2000, December). The Water Efficiency of Retrofit Dual Flush Toilets. In WaterSave. Retrieved May, 2012, from: <http://watersave.uk.net/Links/Dualflushreport.pdf>
- Kim, S. & Kim, H.-J. (2005), Comparison of formaldehyde emission from building finishing materials at various temperatures in under heating system; ONDOL. *Indoor Air*, 15: 317--325.
- King County, Environmental Purchasing Program. (2011). Environmentally Preferable Paint. In King County Department of Executive Services. Retrieved May 1, 2012 from: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CFQQFjAA&url=http%3A%2F%2Fwww.kingcounty.gov%2Foperations%2Fprocurement%2Fservices%2Fenvironmental_purchasing%2F~%2Fmedia%2Foperations%2Fprocurement%2Fdocuments%2FEP_Products_Paint.ashx&ei=yNbwT6zyNYeerAH3xZ2OAg&usg=AFQjCNGaXVEgYJJMsgF1mC9ZtFccpplDyw&sig2=1Zux6tTz6mMT7rV_rueMhQ.
- Knoblauch, J. A. (2009, July 2). Plastics not-so-fantastic: How the versatile material harms the environment and human health. *Scientific American*.
- Kogan, M. (1998). Integrated pest management: historical perspectives and contemporary developments. *Annual Review of Entomology*, 43, 243 - 270.
- Kotchen, M. J. & Reiling, S. D. (2000). Environmental attitudes, motivations, and contingent valuation of non-use values: A case study involving endangered species. *Ecological Economics*, 32, 93-107.
- Kovacs, B (March 3, 2009). Vegetarian and Vegan Diet. MedicineNet. Retrieved May 19, 2012 from: http://www.medicinenet.com/vegetarian_and_vegan_diet/page2.htm.
- Kowalski, C. (2012). Corn planting and harvest seasons. In About.com. Retrieved 5/8, 2012, from: <http://commodities.about.com/od/researchcommodities/a/corn-seasons.htm>
- Kreidler, S., Perry, L., & Ault, B. (2008). Improving campus sustainability: The authentic results from higher education on environmental sustainability, student engagement, and financial effectiveness. *Forum on Public Policy*. Retrieved from: <http://forumonpublicpolicy.com/summer08papers/archivesummer08/kreidler.ault.pdf>
- Kusnierek, David. (Batzner Pest Management, Inc.), personal communication, April 30, 2012.
- Lawinski, J. (2010, August 18). Restaurant adopt 'green' practices to help rein in customers and cut costs. *Nation's Restaurant News*. Retrieved April 8, 2012, from: <http://nrn.com/article/restaurants-adopt-green-practices-help-rein-customers-and-cut-costs>
- Laws. (n.d.). Links - Illinois Wind Working Group - Center for Renewable Energy. *Center for Renewable Energy - Illinois State University*. Retrieved April 22, 2012, from <http://renewableenergy.illinoisstate.edu/wind/links/>
- LeanPath. *Return on Investment*. LeanPath Food Waste Tracking System, Web. 17 Jan 2012. http://www.leanpath.com/res_main.shtml.

-
- Lenzen, M., & Munksgaard, J. (2002, June 25). Energy and CO2 life-cycle analyses of wind turbines—review and applications. *Renewable Energy*, 26, 339-362.
- Lesikar, B. (n.d.). Conventional septic tank/drain field. In Texas Agricultural Extension Service. Texas A&M University. Retrieved April 8, 2012, from: <http://theurbanrancher.tamu.edu/construction/conventionalseptictanks.pdf>
- Leventhal, M. (2011). Biodiesel a Win-Win for Environment and Economy. University of Illinois at Chicago. Retrieved from: <http://atlas.las.uic.edu/atlas/2011/12/biodiesel-a-win-win-for-environment-and-economy>
- Levy, L. (2012). Catch of the season. *Today's Chicago Woman*. Retrieved 5/7, 2012, from: <http://www.tcwmag.com/catch-of-the-season>
- Levy, S.B. (2001). Antibacterial household products: cause for concern. *Emerging Infectious Diseases*. 7(3 Supplement), 512-515.
- Li, Jinghan & Zepeda, Lydia (2006). Who Buys Local Food? *Journal of Food Distribution Research*, 37 (3), 1-11.
- Lighting Controls Council. (2001, October 24). Demand Reduction and Energy Savings Using Occupancy Sensors. In National Electrical Manufacturers Association. Retrieved May 13, 2012, from: <http://www.nema.org/energy/demandreduction.pdf>
- Litman, T. (2011a). Bicycling and transportation demand management. In *Evaluating Non-Motorized Transportation Benefits and Costs* (pp. 134-140). N.p.: Transportation Research Board. Retrieved April, 2012, from <http://www.vtpi.org/nmt-tdm.pdf>
- Litman, T. (2011b). Recommendations for improving LEED transportation and parking credit. In *Victoria Transport Policy Institute*. Retrieved April 14, 2012, from: http://www.vtpi.org/leed_rec.pdf
- Livable Communities. (n.d.). In Chicago Metropolitan Agency for Planning. Retrieved May, 2012, from: <http://www.cmap.illinois.gov/2040/consERVE-water-energy>
- Loopnet (n.d.). *Chicago Restaurants For Lease*. Retrieved May 8, from: http://www.loopnet.com/Illinois/Chicago_Restaurants-For-Lease/
- Lord, K.R., Parsa, H.G. & Putrevu, S. (2004) Environmental and social practices: Consumer attitude, awareness and willingness to pay. In: D. Scammon, M. Mason and R. Mayer (eds.) *Marketing and Public Policy: Research Reaching New Heights*. Salt Lake City, UT: American Marketing Association, pp. 25–28.
- Lou, X.F. & Nair, J., (2009). The impact of landfilling and composting on greenhouse gas emissions. *Bioresource Technology*, Volume 100, Issue 16.
- Low, S., Vogel, S. (2011). Direct and Intermediated Marketing of Local Foods in the United States. Economic Research Report Number 128. United States Department of Agriculture, Economic Research Service. Retrieved from: <http://foodfarmsjobs.org/wp-content/uploads/2011/12/ERSReport128.pdf>
- Low Impact Development. LID BMP fact sheet – cisterns/rain barrels. (2005, February 28). In Low Impact Development. Retrieved May, 2012, from: http://www.lowimpactdevelopment.org/ffxcty/7-1_rainbarrel_draft.pdf

-
- Lukas, L. (personal communication, February, 6, 2012).
- Luntz, T. Chicago schools try to trim childhood obesity (March 11, 2007). *Northwest Indiana Times*. Retrieved May 1, 2012, from: www.nwitimes.com/news/local/article_e967ae9a-5063-5c77-a7bc-503464207cf2.html
- MacFadden, T., & Vogel M.P. (1996). *PNEAC Fact Sheets and Case Studies: Lithographic Printing: Printing Inks*. Retrieved from <http://www.pneac.org/sheets/litho/inks.cfm>.
- Maibach, E. (1993). Social Marketing for the Environment: using information campaigns to promote environmental awareness and behavior change. *Health Promotion International*, 8 (3), 209-224.
- Mandala Research, LLC (2011). 2011 LivingSocial Dining Out Survey: Chicago. Retrieved May 22, 2012 from: http://livingsocial.com/press/LivingSocial_Dining_Out_Fact_Sheet_Chicago.pdf.
- Market and customer analysis (n.d.). In *Rocky Mountain Institute*. Retrieved April 14, 2012, from: <http://www.rmi.org/Content/Files/Infrastructure%20Lessons%20Learned.pdf>
- Marketing functions, markets, and food price formation. (1983). Stanford University. Retrieved 5/20, 2012, from: <http://www.stanford.edu/group/FRI/indonesia/documents/foodpolicy/chapt4.fm.html>
- Marshall. Model 412GT Straight Through Conveyorized Gas Broiler. (n.d.). Retrieved from: catalog.pectopah.ru/content.ashx?type=doc&id=4063.
- Massachusetts Water Resources Authority. Water-Efficient Appliances. (2008, April). In MWRA Online. Retrieved May, 2012, from: <http://www.mwra.state.ma.us/comsupport/conservation/appliances.htm>
- Mattila, M., & May, J. W. (2009, July). Plugging in: A stakeholder investment guide for public electric-vehicle charging infrastructure. In *Rocky Mountain Institute*. Retrieved May 8, 2012, from: <http://www.rmi.org/Content/Files/Plugging%20In%20A%20Stakeholder%20Investment%20Guide.pdf>
- Maxwell, S. (2006) "Half the water, twice the flush! Here's how to choose the best water-saving toilets (water wise)." *Mother Earth News*.
- McDonald J.D., Zielinska B., Fujita E.M., Sagebiel J.C., Chow J.C. & Watson J.G. (2003) Emissions from charbroiling and grilling of chicken and beef. *Journal of Air and Waste Management Association* 53(2):185-94.
- McDonell, D (2011, March, 22). Greywater reuse. Retrieved April 12 2012, from The Environment Writer Web Site: <http://www.environmentwriter.com/archives/tag/greywater>
- McKenzie-Mohr, D. (2000). Promoting Sustainable Behavior: an introduction to community-based social marketing. *Journal of Social Issues*, 56 (3), 543-554.
- McKenzie-Mohr, D. (2000). Fostering sustainable behavior through community-based social marketing. *American Psychologist*, 55(5), 531-537.
- Mealey, L. (2012). How to price your restaurant menu. About.com Guide. Retrieved 5/20, 2012, from: <http://restaurants.about.com/od/menu/a/foodcost.htm>
- Meisel, A. (2010). *LEED Materials: a resource guide to green building*. New York, NY: Princeton Architectural Press.
- Melink Corporation. (2006, July). Demand Control Ventilation for Commercial Kitchen Hoods. Retrieved from: <http://www.melinkcorp.com/pdf/Case->

- Melink Corporation. (n.d.). Kitchen Demand Ventilation Controls: Case Studies. Retrieved from: <http://www.melinkcorp.com/Products-and-Services/Kitchen-Ventilation-Controls/Case-Studies.aspx>
- Melink Corporation. (n.d.). Kitchen Demand Ventilation Controls: Intelli-hood® Frequently Asked Questions. Retrieved from: <http://www.melinkcorp.com/Products-and-Services/Kitchen-Ventilation-Controls/FAQ.aspx#faq1>
- Melink Corporation. (n.d.). Kitchen Demand Ventilation Controls: MelinkIntelli-Hood. Retrieved from: <http://www.melinkcorp.com/Products-and-Services/Kitchen-Ventilation-Controls/Melink-Intelli-Hood.aspx>
- Melink Corporation. (n.d.). North Shore Country Club: Finding Ways To Cut Energy. Retrieved from: <http://www.melinkcorp.com/pdf/Case-Studies/Case-Study-IH-North-Shore-Country-Club.pdf>
- Menard, M. (2008). *Alternative automobile fuels and their environmental impact* (Master's thesis, Louisiana State University). Retrieved April 8, 2012, from: http://www.lsu.edu/faculty/jwither/Essays/Global_Warming_Ecology/Menard_Essay.html
- Mentens, J., Raes, D., & Hermy, M. (2006, August 30). Green roofs as a tool for solving the rainwater runoff problem in the urbanized 21st century? *Landscape and Urban Planning*, 77(3), 217-226.
- MILCON Requirements and Standardization Integration. Dual Flush Toilets. (2010, October 31). In High Performance Technology Strategy Templates. Retrieved May, 2012, from: <http://mrsi.usace.army.mil/cos/TechNotes/05%20Fixtures%20Dual%20Flush%20Toilets%2010-31-10.pdf>
- Minnesota Department of Commerce. Can I have a wind turbine, please? (n.d.). In *Minnesota Department of Commerce*. Retrieved May 16, 2012, from <http://mn.gov/commerce/energy/images/Wind-Turbine-FAQ.pdf>
- Mintel Group Ltd. (2011). *Foodservice Green and Sustainability Initiatives - US*. Retrieved from: <https://docs.google.com/?tab=mo&authuser=0#folders/0B3DiNRk6wTdWV01uSzdsSE5RdEtnMGtIN3hzYXBxdw>
- Missouri Industrial Assessment Center. (2009, June 22). Energy Efficiency Webtool. In Missouri Industrial Assessment Center. Retrieved May 13, 2012, from: <http://iac.missouri.edu/webtool/TaskDocuments/lighting/sensors.html>
- Mitchell, C. (n.d.). *What is Bulk Purchasing?* Retrieved April 27, 2012 from Wisegeek website: <http://www.wisegeek.com/what-is-bulk-purchasing.htm>
- Mohr, L. & Webb, D. (2005). The effects of Corporate Social Responsibility and Price on Consumer Responses. *The Journal of Consumer Affairs*. 39(1) 121-147.
- Montgomery County Interagency Procurement Coordinating Committee. (2004). *Environmentally Preferable Products*. Retrieved from: http://www.montgomerycountymd.gov/content/DGS/PRO/ipcc/ipcc_epp.html#paper.
- Morris, M. (2011). Benefits of eating what's in season. Gaiam. Retrieved 5/20, 2012, from: <http://life.gaiam.com/article/benefits-eating-what-s-season>
- Mozumder, P., & Marathe, A. (2004). Gains from an integrated market for tradable renewable energy credits. *Ecological Economics*, 49, 259-272.

-
- National Highway Traffic Safety Administration. Draft Environmental Impact Statement (2011, November). In *National Highway Traffic Safety Administration*. Retrieved May 14, 2012, from: <http://www.nhtsa.gov/Laws+&+Regulations/CAFE+Fuel+Economy/Environmental+Impact+Statement+for+MYs+2017-2025+CAFE+Rulemaking>
- National Oceanic and Atmospheric Administration. Illinois-Indiana sea grant program: strategic plan 2001-2005. In NOAA website. Retrieved from: <http://www.glerl.noaa.gov/seagrant/FEE/ILINstrategicabstract.doc>
- National Renewable Energy Laboratory (NREL). NREL highlights 2010 utility green power leaders: New, innovative community programs support local power generation. (2011, May 9). In *National Renewable Energy Laboratory*. Retrieved May 24, 2012, from <http://www.nrel.gov/news/press/2011/1367.html>
- National Renewable Energy Laboratory (NREL). PV watts: A performance calculator for grid-connected PV systems (n.d.). In *Renewable Resource Data Center*. Retrieved May 16, 2012, from <http://rredc.nrel.gov/solar/calculators/PVWATTS/version1/US/Illinois/Chicago.html>
- Natural Resources Canada. *A guide to auto smart vehicle maintenance: Read the owner's manual*. (2011, July, 1). Retrieved 24 April 2012, from Natural Resources Canada Web Site: <http://oee.nrcan.gc.ca/transportation/personal/maintaining/14530>
- National Resources Defense Council. (2007). Food miles: How far your food travels has serious consequences for your health and the climate. Retrieved from: food-hub.org/files/resources/Food%20Miles.pdf.
- National Restaurant Association. *Illinois: Restaurant Industry at a Glance*. Retrieved from: <http://www.restaurant.org/>
- National Restaurant Association (2011). Chef Survey: What's Hot in 2011. Retrieved from: <http://www.restaurant.org/>
- National Restaurant Association. (2012). Chef Survey: What's Hot in 2012. Retrieved from: <http://www.restaurant.org/>
- Natural Resources Defense Council.(2009). A Shopper's Guide to Home Tissue Products. Retrieved from [http://www.nrdc.org/land/forests/issue.asp - towels](http://www.nrdc.org/land/forests/issue.asp-towels).
- North Carolina Public Power. Large commercial solar thermal projects. In *North Carolina Public Power*. Retrieved May 24, 2012, from http://www.ncpublicpower.com/Libraries/Solar_Energy_Studies/Large_Commercial_Case_Study.sflb.ashx
- Northeast Ohio Areawide Coordinating Agency. Final Report – PM2.5 SIP Recommendations. (n.d.), Retrieved from: www.noaca.org/finalpmsip07.pdf.
- Nezelle, A., Morton, B., Jerret, M., & Crawford-Brown, D. (2010, December). Short trips: An opportunity for reducing mobile-source emissions? *Transportation Research Part D: Transport and Environment* 15(8):451–457.
- O'Brien, K, & Teisl, M. (2004). "Eco-information and its effect on consumer values for environmentally certified forest products". *Journal of Forest Economics* 10,75-96.
- Office of Pesticide Programs. (Nov. 2011). *Integrated Pest Management In Buildings*. Retrieved April 27, 2012 from U.S. EPA website: http://www.epa.gov/pesticides/pestwise/publications/ipm/ipm_in_buildings.pdf

-
- Onozaka, Y., Nurse, G., & Thilmany-McFadden, D. (2011). Defining sustainable food market segments: Do motivations and values vary by shopping locale? *American Journal of Agricultural Economics*, 93(2), 583-589.
- Orange Water and Sewer Authority. Water-Saving Faucets and Aerators. (2010, October). In Orange Water and Sewer Authority. Retrieved May, 2012, from: http://www.owasa.org/client_resources/conservation/faucets%20and%20aerators%20oct%202010.pdf
- Oregon Department of Energy. (2004, August). Case Study: Standing Stone Brewing Co. In Oregon.gov. Retrieved May 13, 2012, from: <http://www.oregon.gov/ENERGY/CONS/BUS/docs/StandingStone.pdf>
- Organic.org (n.d.). What does "organic" mean? Retrieved May 18, 2012 from: <http://www.organic.org/home/faq>.
- Paper Task Force. (2002). Lifecycle environmental comparison: virgin Paper and recycled paper-based systems. Retrieved from: http://calculator.environmentalpaper.org/documents/1618_WP3.pdf
- Palmer Group. *Price list*. (2012, May, 17). Retrieved May 20 2012, from Palmer Group Web Site: http://www.bikeparking.com/pdf_files/pricelist.pdf
- Pedersen, Esben Rahbek; Neergaard, Peter (2006). "Caveat emptor – let the buyer beware! environmental labeling and the limitations of 'green' consumerism". *Business Strategy and the Environment*. 15(2006) 15-29
- Peterson, A., Steekel, A. (2002, April 23). San Joaquin Valley Unified Air Pollution Control District's Rule 4692, Commercial Charbroiling. U.S. Environmental Protection Agency. Retrieved from: [http://yosemite.epa.gov/r9/r9sips.nsf/AgencyProvision/B78351D3CB045D9D88256990007748AE/\\$file/SJVU+4692+TSD.htm?OpenElement](http://yosemite.epa.gov/r9/r9sips.nsf/AgencyProvision/B78351D3CB045D9D88256990007748AE/$file/SJVU+4692+TSD.htm?OpenElement).
- Piedmont Development Group. (2012). Commercial Energy Audit. In Piedmont Development Group. Retrieved May 13, 2012, from: <http://www.pdg-inc.net/energy-audits/commercial-energy-audit/>
- Pirog, R., & McCann, N. (2009). *Is local food more expensive? A consumer price perspective on local and non-local foods purchased in Iowa*. Retrieved from Leopold Center, Iowa State University website: <http://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2009-12-local-food-more-expensice-consumer-price-perspective-local-and-non-local-foods-purchased-iowa.pdf>
- Preshani, M. (July, 2007). Rapidly renewable materials. In *Green Alberta*. Retrieved 5/15/12, from: http://www.greenalberta.ca/downloads/Rapidly_Renewable_Materials.pdf.
- Public Building Commission of Chicago. Water Reuse Handbook (2011, August). In Public Building Commission of Chicago. Retrieved May 22, 2012, from: <http://www.pbcchicago.com/pdf/WaterReuse.pdf>
- R. Howes, The Marine Stewardship Council Programme. Personal Communication.
- Rails to Trails. *Conservancy*. Retrieved May 1, 2012, from: http://www.railstotrails.org/resources/documents/whatwedo/atfa/ATFA_20081020.pdf
- Reijnders, L. and Soret, S (2003). Quantification of the environmental of different dietary protein choices. *American Journal of Clinical Nutrition*. 78, 664S-668S.
- Reitveld, P. (2000). Non-motorized modes in transport systems: A multimodal chain perspective for the Netherlands. *Transportation Research Part D: Transport and Environment*, 5 (1): 31–36.

-
- Renewable Energy World. Partnership opens up solar thermal to REC markets. (2005, August 12). In *RenewableEnergyWorld.com*. Retrieved May 21, 2012, from <http://www.renewableenergyworld.com/rea/news/article/2005/08/partnership-opens-up-solar-thermal-to-rec-markets-35350>
- Restaurant and Catering Equipment. (n.d.). In Restaurant and Catering Equipment Blog. Retrieved from: <http://www.talismancompaniesllc.com/broiler-model/>.
- Restaurant Management. Restaurant marketing - restaurant promotion - restaurant branding. *Restaurant Management*. Web. 01 Mar. 2012. <http://www.restaurantreport.com/departments/biz_restaurant_marketing.html>.
- Rosenbloom, P; Bunn, S. (2005, August). Airport economizes on food residuals collection costs. *BioCycle*, 46(8), 24. Retrieved from <http://www.biocycle.net/2005/08/airport-economizes-on-food-residuals-collection-costs/>
- Rosenthal, El. (26 April 2008). The food chain: Environmental cost of shipping groceries around the world. *The New York Times*. Retrieved May 1, 2012 from The New York Times: http://www.nytimes.com/2008/04/26/business/worldbusiness/26food.html?_r=1&pagewanted=all
- Sagrillo, M. (2002, December). Small turbine column: Wind system operation and maintenance costs. *Windletter: The Monthly Newsletter of the American Wind Energy Association*, 21(12).
- Sammer, K. & Wustenhagen, R. (2006). "The influence of eco-labeling on consumer behavior – results of a discrete choice analysis for washing machines". *Business Strategy and the Environment* 15(2006) 185-199
- Sanchez, M. C., & Brown, R. E. (2008, June). Savings estimates for the United States Environmental Protection Agency's ENERGY STAR voluntary product labeling program. *Energy Policy*, 36(6), 2098-2108.
- Sands, K., & Chapman, T. (2003). Rain Barrels-Truth or Consequences. In EPA. Retrieved May, 2012, from: <http://www.sciencedirect.com.proxy.uchicago.edu/science/article/pii/S0169204605000496>
- Schubert, F. Kandampully, J.; Solnet, D. & Kralj, A. (2010): Exploring consumer perceptions of green restaurants in the US, *Tourism and Hospitality Research* 10:4, 286-300.
- Selfa, T. (2008). Envisioning agricultural sustainability from field to plate: Comparing producer and consumer attitudes and practices toward 'environmentally friendly' food and farming in Washington State, USA. *Journal of Rural Studies*, 24(3), 262-276.
- Seligman, D. (Director) (2011, July 12). Ygrene Energy Fund introduction to PACE financing, and Transcend Equity Development Corp. Introduction to MESA Financing. *Jump Start Chicago Meeting Notes*. Lecture conducted from PACE, Chicago.
- SEHBAC Solar. FAQs: Your questions answered. (n.d.). In *SEHBAC Solar Electricity and Hot Water*. Retrieved May 24, 2012, from <http://www.sehbacsolar.co.uk/faq.html>
- Shedd Aquarium. (2012). Retrieved from: <http://www.sheddaquarium.org/3155.html>
- Shipchandler, R., Janssen, J., & Miller, G. (2008). Estimating smog precursor emissions from idling vehicles in the Chicago Metropolitan Area. In Clean Air Counts. Retrieved April 8, 2012, from: <http://www.cleanaircounts.org/documents/Estimating%20Emissions%20from%20Idling%20Vehicles.pdf>
- Sidique, S., Frye, L., Phillips, T., Joshi, S. & Swinton, S. (2007). *Costs and Returns of Conversion to Two-sided Computer Printing at MSU*. Michigan State University. Retrieved from:

http://www.bespartangreen.msu.edu/content/documents/two_sided_printing_costs.pdf.

Simpson, B., Tazik, P., Miller, G., Randall, P. (1994). *Waste Reduction Evaluation of Soy-Based Ink at a Sheet-Fed Offset Printer*. U.S. Environmental Protection Agency. Retrieved from: <http://www.greenpressinitiative.org/documents/EPAinkStudy.pdf>.

Sims, B.M., Clift, R., & Cowell, S. J. (2007). The Relative Importance of Transport in Determining an Appropriate Sustainability Strategy for Food Sourcing. *International Journal of Life Cycle Assessment*, 12 (6), 422–431.

Smithereen Pest Management Services (n.d.). Retrieved April 27, 2012 from: <http://www.smithereen.com/>

Solar and Wind Energy Rebate Program. (2011, September 20). In *Database of State Incentives for Renewables and Efficiency (DSIRE)*. Retrieved May 21, 2012, from http://www.dsireusa.org/solar/incentives/incentive.cfm?Incentive_Code=IL05F&re=1&ee=1

Song, J.H. et al. (2009). Biodegradable and compostable alternatives to conventional plastics. *Philosophical Transactions of the Royal Society B*, 364, 2127-2139.

South Florida Management District. Quick facts on pre-rinse spray valves (2010, March). In South Florida Water Management District. Retrieved April, 2012, from: http://www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/spl_res_spray_valves.pdf

Southern Nevada Water Authority. Water upon request. (n.d) Retrieved April 20 2012, from Southern Nevada Water Authority Web Site: http://www.snwa.com/biz/programs_restaurants.html

State of Illinois Department of Agriculture, (2003). *Illinois local and organic food and farm task force*. Retrieved from website: http://www.agr.state.il.us/marketing/Mkt_ILOFFTaskForce.html

State of Illinois. *Green Illinois*. (n.d.). Retrieved from <http://www2.illinois.gov/gov/green/Pages/default.aspx>

State of Illinois. Model Ordinance . (n.d.). In Chicago Metropolitan Agency for Planning. Retrieved May, 2012, from: <http://www.cmap.illinois.gov/water-2050/model-ordinance>

State of New Mexico. A Water Conservation Guide for Commercial, Institutional and Industrial Users. (1999, July 31). In New Mexico Office of the State Engineer. Retrieved May, 2012, from: <http://www.ose.state.nm.us/water-info/conservation/pdf-manuals/cii-users-guide.pdf>

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, 29, 309-317.

Stewart, H., Hyman, J., Buzby, J., Frazao, E. & Carlson, A. (2011). How much do fruits and vegetables cost? United States Department of Agriculture, Economic Research Service. Retrieved 5/8, 2012, from: <http://www.ers.usda.gov/Publications/EIB71/EIB71.pdf>

The Sustainable Agriculture Network (2010). Sustainable Agriculture Standard Version 2. Retrieved from: <http://sanstandards.org/>

Sustainability and Resource Productivity Practice. (2011, October). Fishing for sustainability. *McKinsey Quarterly*. Retrieved from: https://www.mckinseyquarterly.com/Fishing_for_sustainability_2872

Sustainable Danville Area. Just say water: Restaurants helping to conserve water. (n.d) Retrieved April 20 2012, from Sustainable Danville Area Web Site: <http://sustainabledanville.wordpress.com/programs/just-say-water-restaurants-helping-to-conserve-water/>

-
- Sustainable Food Service. Restaurant water efficiency. (2009, November 10). In Sustainable Food Service. Retrieved May, 2012, from:
<http://www.sustainablefoodservice.com/blog/restaurant-water-efficiency/>
- Sustainable Transportation* (n.d) Retrieved April 18 2012, from Chicago Transit Authority Web Site:
<http://www.transitchicago.com/goinggreen/lowemissions.aspx#emissions>
- Symmons. Conserving Water (2009, April 23). In Symmons. Retrieved May 8, 2012, from:
http://www.symmons.com/~media/Files/Symmons/Press%20Room/Water%20Conservation/SymmonsLowFlowBrochure_revised42309.pdf
- T.J. Ward, B. Phillips (Eds.), *Seafood ecolabelling: principles and practice*, Wiley-Blackwell, Oxford, UK (2008), pp. 81–105.
- Taylor-Niemann, S. (July 18, 2011). Bulk pack for huge savings in display fulfillment and kitting costs. The City of Chicago Small Business Improvement Fund. Retrieved from:
http://www.cityofchicago.org/city/en/depts/dcd/provdrs/ec_dev/svcs/apply_for_a_smallbusinessimprovementfundgrant.html
- Town of Addison. Conserve water. (n.d) Retrieved April 18 2012, from Addison Web Site:
<http://www.addisontx.gov/departments/water/>
- Triple Pundit. "Are Aluminum Bottles Greener than Glass?" July 17, 2009. Retrieved from the Triple Pundit Website.
<http://www.triplepundit.com/2009/07/are-aluminum-bottles-greener-than-glass/>
- TroughtNet. Parabolic trough power plant market, economic assessment and deployment. (2011, June 9). In *National Renewable Energy Laboratory*. Retrieved May 24, 2012, from
http://www.nrel.gov/csp/troughnet/market_economic_assess.html
- Umberger, W. J., Thilmany McFadden, D., and Smith, A, R. (2009). Does altruism play a role in determining U.S. consumer preferences and willingness to pay for natural and regionally produced beef? *Agribusiness*, 25(2), 268-285.
- University of Illinois. A Minute with Crop Sciences Professor John Masiunas. (2010). University of Illinois at Urbana-Champaign. Retrieved 5/7, 2012, from <http://illinois.edu/lb/article/72/36565>
- U.S. Department of Energy (n.d.). Reduce climate change. Retrieved May 1, 2012 from:
<http://www.fueleconomy.gov/feg/climate.shtml>
- U.S. Department of Energy. *Save money*. (n.d) Retrieved April 18 2012, from U.S. Department of Energy Web Site:
<http://www.fueleconomy.gov/feg/savemoney.html>
- U.S. Department of Agriculture. (2012). Fruit and Vegetable Market News. In *United States Department of Agriculture*. Retrieved May 13, 2012, from:
<http://www.marketnews.usda.gov/portal/fv>
- U.S. Department of Agriculture. National Agricultural Statistics Service. (2012). Dairy Products 2011 Summary. Retrieved from:
www.usda.gov/nass/PUBS/TODAYRPT/daryan12.pdf.
- U.S. Department of Energy: Alternative Fuels and Advanced Vehicles Data Center (2011). Biodiesel Tax Exemption. Federal and State Incentive and Laws. Retrieved from:
<http://www.afdc.energy.gov/afdc/laws/law/IL/5697>.

-
- U.S. Department of Energy. Estimating a solar water heater system's cost (2011, February 9). In *U.S. Department of Energy: Energy Efficiency and Renewable Energy*. Retrieved May 16, 2012, from http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=12910
- U.S. Department of Energy. 2010 solar technologies market report. (2011, November). In *U.S. Department of Energy: Energy Efficiency and Renewable Energy*. pg 66. Retrieved May 21, 2012, from <http://www.nrel.gov/docs/fy12osti/51847.pdf>
- U.S. Department of Energy. *Illinois incentives and laws*. (2011, June, 15). Retrieved April 18 2012, from U.S. Department of Energy Web Site:<http://www.afdc.energy.gov/afdc/laws/laws/IL>
- U.S. Department of Energy. Renewable energy certificates (RECs): REC prices. (2012, January 25). In *U.S. Department of Energy: Energy Efficiency and Renewable Energy*. Retrieved May 17, 2012, from: <http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=5>
- U.S. Department of Energy. *Plug-in electric vehicle handbook* (2012, April). In Alternative Fuels & Advanced Vehicles Data Center. Retrieved April 8, 2012, from: <http://www.afdc.energy.gov/afdc/pdfs/51227.pdf>
- U.S. Department of Energy. Illinois communities opt for green power. (2012, May). In U.S. Department of Energy: *Energy Efficiency and Renewable Energy*. Retrieved May 24, 2012, from http://apps3.eere.energy.gov/greenpower/news/news_template.shtml?id=1733
- U.S. Department of Energy: Alternative Fuels and Advanced Vehicles Data Center. (2012). Biodiesel Benefits and Considerations. Retrieved from http://www.afdc.energy.gov/afdc/fuels/biodiesel_benefits.html.
- U.S. Department of Energy, Energy Information Administration Electric power monthly April 2012 (2012, April). In *U.S. Energy Information Administration*. Retrieved May 16, 2012, from <http://www.eia.gov/electricity/monthly/pdf/epm.pdf>
- U.S. Department of Energy. Solar water heaters (2011, February 9). In *U.S. Department of Energy: Energy Efficiency and Renewable Energy*. Retrieved May 16, 2012, from http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=12850
- U.S. Department of Energy. *Fuel economy*. (n.d) Retrieved April 12 2012, from U.S. Department of Energy Web Site:<http://www.fueleconomy.gov/feg/findacar.shtml>
- U.S. Department of Energy. Wind powering America: Utility-scale land-based 80-meter wind maps. (2012, April 16). In *U.S. Department of Energy: Energy Efficiency and Renewable Energy*. Retrieved May 24, 2012, from http://www.windpoweringamerica.gov/wind_maps.asp
- U.S. Department of Energy. *Reduce climate change*. (n.d) Retrieved April 18 2012, from U.S. Department of Energy Web Site:<http://www.fueleconomy.gov/feg/climate.shtml>
- U.S. Department of Energy. *Keeping your car in shape*. (n.d) Retrieved April 26 2012, from fueleconomy :<http://www.fueleconomy.gov/feg/maintain.shtml>
- U.S. Department of Energy. *Why is fuel economy important*. (n.d.) Retrieved April 26 2012, from U.S. Department of Energy Web Site: <http://www.fueleconomy.gov/feg/why.shtml>
- U.S. Department of Energy: Solution Center. On-bill repayment programs. (n.d.). *U.S. DOE Energy Efficiency and Renewable Energy (EERE) home page*. Retrieved April 21, 2012, from: <http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/onbillrepayment.html>

-
- U.S. Department of Labor. Alternative energy prices in the Chicago area. (2012, February). Retrieved May 25 2012, from Bureau of Labor Statistics Web Site: <http://www.bls.gov/ro5/aepchi.htm>
- U.S. Department of Treasury. 1603 Program: payments for specified energy property in lieu of tax credits . (n.d.). *Recovery Act*. Retrieved March 30, 2012, from www.treasury.gov/initiatives/recovery/Pages/1603.aspx
- U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery. (2001, Dec.). Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Tables and Figures for 2010. Retrieved from: <http://www.epa.gov/wastes/nonhaz/municipal/msw99.htm>.
- U.S. Environmental Protection Agency. (2002). Using Microfiber Mops in Hospitals. Retrieved from: <http://www.epa.gov/region09/waste/p2/projects/hospital/mops.pdf>
- U.S. Environmental Protection Agency. (2007, September). WaterSense® Labeled High-Efficiency Lavatory (Bathroom Sink) Faucet Specification. (2007, September). In EPA. Retrieved May, 2012, from: http://www.epa.gov/watersense/docs/ws_faq_faucet508.pdf
- U.S. Environmental Protection Agency. Using Recycled Industrial Materials in Buildings. (October 2008). Retrieved 5/15/12, from: <http://www.epa.gov/osw/consERVE/rrr/imr/pdfs/recy-bldg.pdf>.
- U.S. Environmental Protection Agency. EPA's green power partnership: Renewable energy certificates. (2008, July). In *U.S. Environmental Protection Agency*. Retrieved May 21, 2012, from http://www.epa.gov/greenpower/documents/gpp_basics-recs.pdf
- U.S. Environmental Protection Agency. (2009, September). Energy Efficiency as a Low-Cost Resource for Achieving Carbon Emissions Reductions. In U.S. Environmental Protection Agency. Retrieved May 13, 2012, from: http://www.epa.gov/cleanenergy/documents/suca/ee_and_carbon.pdf
- U.S. Environmental Protection Agency. (2010). Biodiesel: Technical Highlights. Fuels and Fuel Additives. Retrieved from: <http://www.epa.gov/oms/renewablefuels/420f09064.htm>.
- U.S. Environmental Protection Agency. Schwab, J; & Newman, C. (2010, June 22). *Food waste management cost calculator webinar*. U.S. Environmental Protection Agency. Retrieved from: <http://www.epa.gov/region5/waste/solidwaste/compost/pdfs/foodwaste-newman-201006-landfilldata.pdf>
- U.S. Environmental Protection Agency. (Last updated 2010). Greening your purchase of cleaning products: A guide for federal purchasers. Retrieved from: <http://www.epa.gov/epp/pubs/cleaning.htm#why>.
- U.S. Environmental Protection Agency. Water conservation. (2011, August, 16). retrieved May 10 2012, from United States Environmental Protection Agency Web Site: <http://www.epa.gov/greeningepa/water/index.htm>
- U.S. Environmental Protection Agency. How clean is the electricity I use? - Power profiler (2011, October 24). In *U.S. Environmental Protection Agency*. Retrieved May 16, 2012, from <http://www.epa.gov/cleanenergy/energy-and-you/how-clean.html>
- U.S. Environmental Protection Agency. (2012). Current List of SmartWay Transport Partners. Retrieved from: <http://www.epa.gov/smartway/partnerlists/partner-list.htm>.
- U.S. Environmental Protection Agency. (2012). General Overview of What's In America's Trash. Retrieved from: <http://www.epa.gov/osw/wydc/catbook/what.htm>
- U.S. Environmental Protection Agency. (n.d.). *Plastics*. Retrieved April 27, 2012 from:

<http://www.epa.gov/osw/consERVE/materials/plastics.htm>

U.S. Environmental Protection Agency. Green power locator (n.d.). In *U.S. Environmental Protection Agency*. Retrieved May 16, 2012, from <http://www.epa.gov/greenpower/pubs/glocator.htm>

Utah Division of Water Resources. Why you should conserve water. (n.d.) retrieved April 20 2012, from Utah's Division of Water Resources Web Site: <http://www.conservewater.utah.gov/WhyConserve/>

Van Loo, E., Vincenzina, C., Nagaya Jr., R., Meullenet, J. & Ricke, S (2011). Consumers' willingness to pay for organic chicken breast: Evidence from choice experiment. *Food Quality and Preference*, 22 (7): 603–613

Vehicle fuel conservation policy (2006, January 1). In *Orange County North Carolina*. Retrieved May 8, 2012, from:
<http://www.co.orange.nc.us/ercd/documents/Envir%20Responsibility%20&%20Conservation%20Policies/FuelPolicy.pdf>

Victoria Transport Policy Institute. (2011). Transportation Cost and Benefit Analysis II – Literature Review. Retrieved from:www.vtpi.org/tca/tca02.pdf.

Victoria Transportation Policy Institute, Litman, T. (November 24, 2011). *Smart Transportation Emission Reduction Strategies*. Retrieved May 1, 2012 from VTPI website: <http://www.vtpi.org/ster.pdf>

Victoria Transportation Policy Institute. (n.d.). *Factors Affecting Vehicle Energy Consumption, Emissions and Exposure*. Retrieved May 1, 2012 from VTPI's TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm59.htm>

Vieregge, M., Scanlon, N. & Huss, J. (2007). Marketing locally grown food in globally branded restaurants: Do customers care?" *Journal of Foodservice Business Research*, 10:2, 67-82.

Vincent, Jason, Personal Communication, May 3, 2012.

Ward, R., Hunnicutt, L., Keith, J. (2004). If you can't trust the farmer, who can you trust? The effect of certification types on purchases of organic produce. *International Food and Agribusiness Management Review* 7(1), 60-77.

Washington Post Company. Paper or Plastic? (2007). *The Washington Post*. Retrieved from:
<http://www.washingtonpost.com/wp-dyn/content/graphic/2007/10/03/GR2007100301385.html?referrer=emailink>

Water Harvesting Solutions. Case studies from water harvesting solutions. (n.d) Retrieved April 10 2012, from Water Harvesting Solutions Web Site: http://www.wahaso.com/case_studies.php

Water Resource Management. A Financial, Environmental and Social Evaluation of Domestic Water Management Options in the West Bank, Palestine. (2010, May). *Water Resource Management*, 24, 4445-4467. Retrieved May, 2012, from:
<http://search.proquest.com.proxy.uchicago.edu/docview/807509290/fulltextPDF?accountid=14657>

Webber, C. A., & Brown, R. E. (2000, December). Savings estimates for the Energy Star® voluntary labeling program. *Energy Policy*, 28(15), 1137-1149. Retrieved May, 2012, from:
<http://www.sciencedirect.com.proxy.uchicago.edu/science/article/pii/S0301421500000835>

Weber, C., Matthews, H. (2008, April 16). Food-Miles and the Relative Climate Impacts of Food Choices in the United States. *Environmental Science & Technology*, 42(10), 3508-13.

-
- Wilkins. Will electric vehicles really reduce pollution? (n.d.). In Wilkins (Ed.).N.p.: Ohio State University. Retrieved May 8, 2012, from <http://www.physics.ohiostate.edu/~wilkins/writing/Samples/policy/voytishlong.html>
- Williams, G., Linker, M., Waldvogel, M., Leidy, R., & Schal, C. (2005). Comparison of conventional and integrated pest management programs in public schools. *Journal of Economic Entomology*, 98, 1275 - 1283.
- Williams, K. (2008, June 2). Hybrid-only parking in Chicago lacks jump start. *Medill of Northwestern University*. Retrieved May 8, 2012, from: <http://news.medill.northwestern.edu/chicago/news.aspx?id=91961>
- Winebrake, J., He, D., & Wang, M. (2001). Fuel-cycle emissions for conventional and alternative fuel vehicles: An assessment of air toxics. *Research and Innovation Technology Library*, 1-87.
- Winter, C. and S. Davis. (2006). Organic Foods. *Journal of Food Science* 71(9), R117--R124.
- Wong, E.Y., Gohlke, J., Griffith, W.C., Farrow, S., & Faustman, E. (2004). Assessing the health benefits of air pollution reduction for children. *Environmental Health Perspectives*. 112(2), 226–232.
- Woodcock, J. (2009, December). Public health benefits of strategies to reduce greenhouse-gas emissions: urban land transport. *The Lancet*, 374(9705), 1930-1943.
- Yedla, S. (2010). Replication of urban innovations – prioritization of strategies for the replication of Dhaka’s community-based decentralized composting model. *Waste Management & Research*. 30 (1); 20-31.
- Zumwait, B. (2001). *Attracting Consumers with Locally Grown Products*. Institute of Agriculture and Natural Resources, University of Nebraska at Lincoln. Retrieved from: <http://ianrnews.unl.edu/static/0309050.shtml>