

Sustainable Operations ACTION PLAN



SUSTAINABLE DESIGN

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OUR COMMITMENT

Miller|Hull has been designing environmentally sensitive buildings since the inception of the firm. As the sustainability movement has taken off in recent years, our firm has remained at the forefront, designing buildings that have explored innovative site and building systems to improve the performance of our built work. We believe that early collaboration with excellent consultants, working with an integrated design process, leads to the most successful and sustainable designs.

Miller|Hull believes there are great opportunities to develop solutions to our environmental problems. As architects we see our role in creating the solution is to imagine and plan for a better, healthier future for us and for our planet. We play our part in the solution by helping our clients imagine and realize their more sustainable future. The 2030 Commitment is a perfect framework to prove out our sustainable design

ambitions.

THE SUSTAINABILITY A-TEAM

Three partners and three staff members form our A-team in charge of tracking and advancing all sustainable efforts of the office. This includes individual project goals, overall project performance, as well as office operations & maintenance. The A-team members are:

Ron Rochon, Managing Partner & Sustainability Lead
Sian Roberts, Post-Occupancy & Building Evaluation Lead
Scott Wolf, Making The Business Case
Jim Hanford, Energy Efficiency Advisor
Caroline Kreiser, Strategy Advisor & LEED® Coordinator
James Radcliffe, Office Manager

SUSTAINABLE DESIGN GOALS

The office strives for each project to meet the 2030 Challenge goal in terms of energy use reduction. For projects currently in design in 2010 this means a target of at least 70% less energy use than the CBECS baseline. Our in-house energy efficiency advisor Jim Hanford tracks all projects with respect to both design goals and actual performance (see diagram next page). Jim is available for consultation on all projects regarding improving performance and reducing loads. He reports to the A-Team four times a year, and to the entire office once a year.

Our goal is to design all projects to meet the targets as established by the 2030 Commitment: "...all new buildings, developments and major renovations to be completed in 2010 shall meet a fossil fuel, GHG-emitting, energy consumption performance standard at least 60% below the CBECS baseline for the building type." A summary of the design goals for the coming years is as follows:

PROJECT COMPLETE	ENERGY USE REDUCTION TARGET
2015	70%
2020	80%
2025	90%
2030	100% - CARBON NEUTRAL!

Other sustainable design goals for **2015** include:

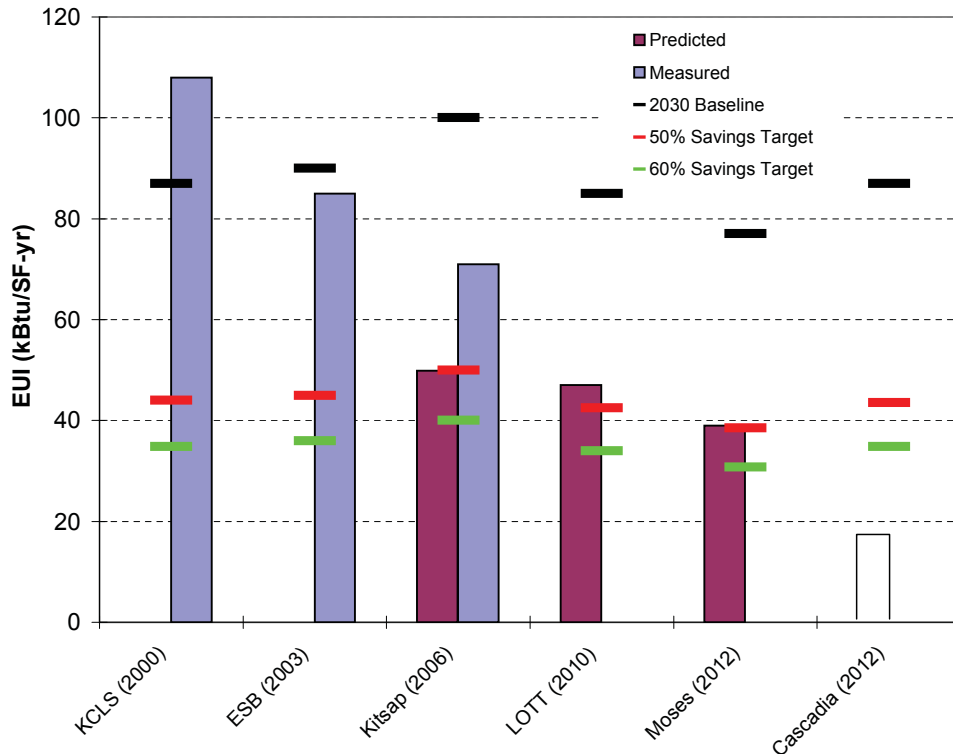
- Energy modeling on 75% of all non-residential projects
- Post-occupancy evaluations on 75% of all non-residential projects
- No red-listed materials on 50% of all projects
- Specify a minimum of 50% FSC certified wood on all projects
- Reduce water use by 35% over the LEED® v3 baseline on all projects
- Incorporate renewable energy features in 50% of all non-residential projects

By **2020** we expect to have met the following goals:

- Perform energy modeling on 100% of our non-residential projects
- Perform post-occupancy evaluations on 100% of our non-residential projects
- No red-listed materials unless required by code
- Specify a minimum of 75% FSC certified wood on all projects
- Reduce water use by 65% over the LEED® v3 baseline on all projects
- Incorporate renewable energy features in 90% of all non-residential projects

The Materials Red List is a list of materials known to have ill effects on human health and the greater eco-system. It is defined by the Living Building Challenge.

**EUI Comparison - Past and Current Projects
Office/Administration Use**



GREEN BUILDING PROGRAMS

As of June 2010 seven of our projects have achieved LEED certifications: three - gold, two - silver, and two - certified. Currently, 76% of active, non-residential projects are registered for LEED® certification (17 of 21). Three of these are expected to achieve a Platinum level certification, five are targeting Gold. Two of our projects are pursuing the Living Building Challenge. One of these projects is in an urban setting, the other suburban/rural - posing very different challenges with respect to appropriate sustainable design strategies. We hope to use the experience with these two LBC projects to discuss advanced sustainable design goals with future clients.

YEAR	TARGET NO. OF NEW LBC PROJECTS
2015	+3
2020	+7
2025	+12
2030	50% of all projects

Our firm is a regular participant in local and national green building award programs. We are proud to have garnered recognition from groups including the AIA's COTE (both national and local), AIA Seattle's What Makes it Green, the Boston Society of Architects, Earth Day, BPA Architecture + Energy, and others. Since the inception of COTE in 1990 our office has been recognized with 5 TOP TEN awards.

We have also created an internal 'green hitlist' which tracks goals and accomplishments of projects internally, encouraging a focus on issues such as energy use reduction, water conservation and renewable energy generation.

*“The core of sustainable design lies in responding to the a spirit of place” writes David Miller in this book
“Toward a New Regionalism”*



THE DESIGN PROCESS

We firmly believe that collaboration and an integrated design process is essential to creating the best and most sustainable projects, and we are committed to managing our projects through a team-oriented process that accomplishes just that. Furthermore, systems integration is an important part of our design. We work closely with our engineers, space planners, landscape architects, lighting designers and related disciplines to create solutions with synergies. The key to this is a clear understanding of the big picture and the implications of each issue, and this is best accomplished working as an integrated team.

Our integrated design process is aided by several tools. We are using Building Integrated Modeling (BIM) software as a our tool of choice for design and documentation. The coordination capabilities of this software greatly enhance and streamline the integrated design process. Other technical tools at our disposal include:

- Ecotect for climate analysis, shading studies, and daylighting performance
- Rhinoceros & Grasshopper have provided a parametric modeling platform to explore iterations of photovoltaic panel placement
- The EPA Target Finder and the CBECS database to establish baselines and targets
- The Pharos database and ILBC website for materials research

We also work closely with our mechanical consultants during the development of ventilation design strategies and energy model creation.

Each client is encouraged to begin the project development with an eco-charrette, as early as possible in the design process. Ultimately, we plan to seamlessly incorporate the eco-charrette into a project-goals meeting, where sustainable design efforts are as integral as the building program.

At this first assessment, goals are determined for the sustainable strategies, and checked against a Sustainable Possibilities Matrix. The progress towards meeting these goals will periodically be reviewed and evaluated: each project undergoes a rigorous Quality Control procedure at the end of each design phase with a specific focus on sustainable strategies.

We participate regularly in the life cycle cost analysis process for our projects. In addition to life cycle cost we also look at carbon emissions costs and we coordinate continually with our mechanical consultant to find the optimum energy cost/value solution.

We have implemented a post-occupancy evaluation (POE) process to learn from our past projects and to help improve the performance of our future projects. The POE consists of two primary parts: one is a client interview about how well the building is meeting their functional needs. The second part is an analysis of available energy and water use data to determine how well the building is performing.

We use the POE process to compare goals to reality – what was achieved, what was not? We use it to obtain input and provide feedback to consultants on their performance. We use it to understand the degree to which sustainability principles are working, and to gather real data on building performance. Lastly, we use it to identify problem areas in our buildings and

assist in implementing remedies.

All of this is important to our pursuit of sustainable design strategies. Feedback from clients tells us how well our design process is working. More importantly, it tells us how well our integrated design approach has worked. Building operations and maintenance issues highlight areas where the design team may need to improve coordination. Analysis of the utility bills helps us to evaluate if buildings are performing as intended, and also how well our projects perform compared to others.

THE BUSINESS STRATEGY

Our Sustainable Business Strategy is pretty basic: We attempt to demonstrate to our clients that sustainable design is simply good design - from an environmental, social and economic perspective. This triple bottom line, which is well documented and increasingly accepted in the business community, serves to balance the various factors contributing to a sustainable project. We have found over the years, that most clients enter the sustainability discussion primarily through one of those three points. We have also found that, more importantly, keeping them interested in advancing the sustainability discussion requires objective and favorable data on the economic leg of the triple bottom line. The good news is that we are increasingly able to demonstrate the financial benefits of designing sustainably and we are also encouraged that the business community is increasingly valuing sustainability as a viable business strategy.

On all of our projects, we make every effort to work with our clients to deepen their knowledge base so that they can make more sustainable decisions in the design and planning of their facilities. These decisions must recognize the financial as well as the environmental and social benefits of various options, considering them in the context of the overall cost of ownership, instead of simply looking only at initial capital costs. Putting sustainability on the right side of the value equation for our clients has been a recent focus for the firm.

We strive to help our clients understand the market drivers that make sustainability an important component in their business model and to communicate those principles effectively so that we can better assist them in making the right decisions on their project.

We are currently in the process of developing tools to better describe “The Business Case for Sustainability” to our current and prospective clients. One of our Partners – Scott Wolf – is currently enrolled in the Presidio Graduate School’s Executive Education program which is providing a forum for researching this topic in greater detail and generating methods for communicating the information more effectively. We have been focusing on this topic within the firm for a number of years, but recognize that having a more thorough and refined knowledge of financial issues would help us to be more effective in convincing our clients to make better sustainable decisions that will have a positive impact on climate change throughout the design, construction and operations of their projects.

We have also made great strides in the past few years to green our own office and improve our internal business operations. We have worked with the Seattle Climate Partnership to analyze our firm-wide operations and carbon footprint and have made changes that result in being a Net-Zero Carbon office. A high percentage of our employees either walk, bike or take public transportation to work.

We also try to walk the walk and donate both time and money to causes and organizations that support environmental stewardship in our region. We participate in the 1% program (www.theonepercent.org) through which we donate 1% of our total annual labor hours to non-profits and other organizations that need to retain architectural services but don’t have the financial resources to do so. For more detail on our stewardship in the community, please refer to the end of this document.

STAFF TRAINING POLICIES

Today, 70% of our architectural staff members are LEED® AP’s (42 of 60). LEED® accreditation of technical staff is a key consideration in hiring and promotions. The office pays for LEED® exams and all staff has access to an education stipend (both time and money) each year to spend on seminars, conferences and lectures. After five years of employment each staff member is eligible for a travel stipend, which can be used for research in the field.

All staff are prompted for ideas on how to make the office and our projects ‘greener’ during annual performance evaluations. Several ideas such as kitchen composting, an office bike as well as cork and cell phone recycling have been implemented as a result of staff input. Occasionally we host a design charette with all staff, pondering bigger ideas such as a green roof for our office building, or a photovoltaic panel demonstration station.

The office supports our “Mixed Greens” committee which is responsible for arranging five lunch-time events a year which focus on sustainable design issues, as well as lessons learned. In previous years topics have included: our 2030 Commitment, The Living Building Challenge, Salvage & Deconstruction, Advanced Framing and tours of the green roof on our city hall as well as a tour of the local steam plant which is pioneering a new furnace using urban waste wood. These lunch-time events are eligible for AIA continuing education credit.



SUSTAINABLE OPERATIONS

OFFICE ENERGY USE

We have been tracking our energy use (as well as waste, paper use and travel) since 2007 as part of our participation in the Seattle Climate Partnership. These figures include some assumptions, as our building does not provide separate meters for each tenant. We use these totals to offset our carbon emissions via the Bonneville Environmental Foundation.

YEAR	ANNUAL ELECTRICITY USAGE
2007	311,897 kWh
2008	327,631 kWh
2009	320,545 kWh

The above chart shows our annual electrical consumption.

We have raised/lowered our thermostat set points to 72 degrees to reduce the heating and cooling needs. Almost all of incandescent light bulbs have been replaced with compact fluorescents. We are investigating ‘thin computing’ as a power saving alternative to desktop computing and anticipate moving in that direction by the end of 2010. We are going to talk to the building management about participating in the ‘green’ power program, which supports the development of renewable energy resources in the area.

OFFICE WATER USE

The hot water supply is constantly circulated to reduce water use. Currently, the four faucets in the bathroom and the single faucet in the kitchen are not the low-flow type faucets and neither shower is equipped with low-flow shower heads. We are working with building management to retrofit all faucets with flow reducers. The six toilets are neither low-flush nor dual-flush. Refurbishing the toilets would require a substantial remodel, and is currently not planned.

INDOOR AIR QUALITY

The tenant improvement plans at the time of our move-in, as well as currently, specified the use of low-VOC paints,

stains and glues. The filtration media on the air conditioning equipment is changed 4 times a year. We are currently developing a design for a small vertical green wall planted specifically to address air pollution such as might be generated by printing and photocopying equipment.

PROJECT SPECIFICATIONS & MATERIALS

We are in the process of updating our specifications to eliminate certain redlisted materials such as PVC, plated products, endangered wood species and others. At the same time, we are purging our materials library of these materials, and are advising manufacturer’s representatives that redlisted materials will be tagged as such. Project quality control reviews will include a materials review designed to highlight inappropriate materials if included.

STAFF TRANSPORTATION AND TRAVEL

Travel for out-of-state projects comprises the largest slice of our carbon emissions pie. We make an effort to combine trips, share rides and substitute teleconferencing as much as possible. We have reduced our office fleet by one car and increased the overall gas mileage from 17 mpg to 31 mpg over the past 3 years. Our office fleet for local travel now features two Toyota Prius, one Toyota Highlander Hybrid, and a bio-diesel Volkswagen. We also have an office bike for short (and casual) trips. Employee commuting is subsidized if mass transit is used. There is also a financial benefit for bicycling commuters, as well as showering facilities. There is no free automobile parking for employees and we are working to increase bike parking spaces.

YEAR	TRAVEL	COMMUTE	
2007	7,422 miles	2,095 miles	per employee
2008	14,542 miles	2,356 miles	per employee
2009	4,523 miles	2,459 miles	per employee

The above chart reflects business travel as well as miles commuted by employees.

As with our other carbon emissions, we offset miles traveled through the Bonneville Environmental Foundation.

OFFICE EQUIPMENT & SUPPLIES

Almost all of the equipment in the office has an Energy Star® rating. The remaining non-Energy Star® items will be replaced in the near future. New furnishings are fabricated from FSC® certified wood. Our office manager searches for the highest recycled content paper and plastic products, and orders reusable items where available.

Cups, plates and other disposable kitchen ware is made of compostable materials with recycled content. We are in the process of changing all of our cleaning supplies to green products only. We will discuss the general building cleaning supplies with the building management to determine if a change towards more sustainable products is advised.

OFFICE PAPER USE

Paper use has been reduced significantly in just this past year. We are instituting electronic shop drawing review, and encourage electronic communications over paper correspondence. Double-sided printing is the office standard, and draft prints as well as old stationary is bound into scratch pads for reuse. As much as available, our paper stock contains recycled content. We are continually requesting updates on recycled content material from our printers.

YEAR	PAPER USAGE
2007	2.167 million sheets
2008	3.328 million sheets
2009	1.645 million sheets

The above chart show our annual supply of paper purchased.

WASTE & RECYCLING

In late 2008 we convinced our building management to sign



up for commercial compost pick-up service. The collection of compostables has reduced our trash volume considerably: we calculated that this effort removes one full boxcar from the daily trash-train a year. Other efforts to reduce trash include cork recycling (to a floor tile manufacturer) and cell-phone and rechargeable battery recycling (industry sponsored). We are investigating the options for CFL light bulb recycling.

YEAR	WASTE	RECYCLING	COMPOST
2007	13 tons	18 tons	
2008	14 tons	19 tons	
2009	10 tons	18 tons	2 tons

The above chart tracks our waste, and landfill reduction through recycling and composting.

CATERING GUIDELINES

Our office hosts two or more large lunch meetings a week, with about 25 to 40 people attending. The waste from these meetings used to be huge, with individual sandwich boxes, wrappers and plastic water bottles. To reduce the waste we have implemented the following requirements:

- Sandwich platters and salad bowls instead of individual lunch boxes
- Reduced and only compostable packaging
- No bottled water
- Provide drinks for 50% of expected attendance
- Provide 20% vegetarian fare (to be increased to 35%)
- Provide food from local and organic sources (as available)

We ask that meeting attendees bring their own cups and their own drinks (for example water from the filtered faucet).

Discussions about our sustainable goals with caterers as well as lunch presenters who have their own meal providers have created awareness that our firm insists upon reducing waste and is serious about environmental stewardship. Overall, the office energy and resource use is dependent on the number of employees and the Seattle Climate Partnership tool helps us reduce the overall use of energy and materials, travel and transportation, as well as waste generation into a tidy overall emissions number per employee.

YEAR	CO ₂ EMISSIONS PER EMPLOYEE
2007	2.5 metric tons
2008	4.0 metric tons
2009	2.0 metric tons

The above chart averages the CO₂ emissions per employee based on overall office operations.

STEWARDSHIP - COLUMBIA LAND TRUST

In order to expand our emphasis on sustainable environmental design, Miller|Hull established a stewardship project that reflects the same care we place on our built projects towards the conservation of land, water and wildlife in our surrounding habitats. Out of this was born the Miller|Hull Legacy Project. While there was never the intention of partnering with a single organization, a “natural” partnership evolved with Columbia

Land Trust that has led to six Miller|Hull Legacy Projects so far. Teams of volunteering employees have planted thousands of native trees, removed miles of scotchbroom and other invasives, and deconstructed barns in an effort to return the banks of the Columbia river to its natural state. So far, it has been six seasons of a highly rewarding partnership.

In addition to the Legacy Project, we support many other environmental causes with donations. This includes the Cascadia Green Building Council, What Makes It Green, the North American Association for Environmental Education, the Puget Soundkeeper Alliance, FutureWise and Climate Solutions - Network for the Good.

WALKING THE TALK

Our efforts to ‘green’ our existing office space have and continue to make a difference. Ultimately, we plan to upgrade to a truly sustainable office space by moving into the Cascadia Center for Design & Construction. This project is currently in design, and will achieve a Living Building Status. Though we have been very happy with our waterfront location for over 30 years, we are intrigued by the notion of practicing within a building that represents who we are and where we want to go.

July 2010

Tom, Sam, Seth, Jim, Caroline, James





MILLER HULL

