Solar Decathlon – Show-Me Solar Team
Faculty Project Leaders:

Barbara Buffaloe, University of Missouri
   Department of Architectural Studies and MU Extension, Instructor and Extension Associate
Katie Grantham-Lough, Ph. D., Missouri University of Science & Technology
   Department of Interdisciplinary Engineering, Assistant Professor
Michael Goldschmidt, University of Missouri
   Department of Architectural Studies, Resident Instructor
Robert Stone, Ph. D., Missouri University of Science & Technology
   Department of Interdisciplinary Engineering, Associate Professor

Project Student Leaders:

Project Manager - Luke Sudkamp, Missouri University of Science & Technology
   Department of Architectural Engineering, junior
Director of Architecture - Paul Bilger, University of Missouri
   Department of Architectural Studies, junior
Director of Interior Design - Anna Fleischer, University of Missouri
   Department of Architectural Studies, junior
Director of Construction - Chris Krueger, Missouri University of Science & Technology
   Department of Architectural Engineering, senior
Co-Directors of Fundraising
   Heather Benson, University of Missouri
      Department of Architectural Studies, junior
   Anne Felts, University of Missouri
      Department of Architectural Studies, master's
   Adam Smith, Missouri University of Science & Technology
      Department of History, senior
Co-Director of Public Relations
   Renee Henry, University of Missouri
      Department of Architectural Studies, junior
   Ben Brannon, Missouri University of Science & Technology
      Department of Electrical Engineering, sophomore

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Ruth Brent Tofle, Ph. D., Chair, Department of Architectural Studies

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Jo Britt-Rankin, Ph.D., Associate Dean for HES Extension

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Marjorie Sable, Ph.D., Associate Dean for Research and Graduate Studies
Brief Description:
University of Missouri-Columbia (MU) and the Missouri University of Science & Technology (S&T) have composed the “Show-Me Solar Team.” This team is composed of undergraduate and graduate students with a goal to design and build the most attractive, effective, and energy-efficient solar-powered house for the 2009 Solar Decathlon. The Solar Decathlon, an international design competition, exists to educate the public on solar energy, energy efficiency, and the best in home design. While this effort is well over the budget available for the current funding opportunity, we have selected certain components for submission in this application.

Specifically, this effort includes architecture, interior design, architectural engineering, electrical engineering, civil engineering, history, and business disciplines across two campuses in a unique experience for all involved and utilizes technology and IT communications to make it happen. Most of the components of the project are done through computer and the virtual world. The students must rely on the ability to communicate via the internet for most decisions because only occasional face-to-face meetings take place. In addition, students on both campuses utilize computer programs related to their discipline and learn programs associated with other disciplines due to the multidisciplinary efforts required. For example, MU students often use Google Sketch-up to convey the architectural elements of the home. S&T students, new to Google Sketch-up, have found that with a tutorial by MU that they can better understand the dialogue going on between the teams on the design.

We believe that the Show-Me Solar team’s proposal for the Interdisciplinary Innovation Fund meets the requirements from the MU Information Technology Committee. The student-led team is working hard to make the University of Missouri system a leader in the next wave of home design through the use of innovative technology and strong relationships between disciplines. We look forward to working with the MUITC and hope that our combined effort will continue to foster interdisciplinary projects throughout the UM system. Please let us know if any further clarification is needed.
Goals and Objectives

The Show-Me Solar team has several goals and objectives for this international design competition. For this application, the overall project goal is to develop the framework for a sustained interdisciplinary solar decathlon team. This framework includes developing solid communications, enhancing attendance rates, and improved educational goals. Our communication goal is to have continuous communication throughout the process of the project so that every discipline’s needs are visible in the final design. This will be measured by our pre- and post-surveys of the project. We are also targeting a lofty attendance goal where 75% of team members are retained from start to finish of the project. This will be achieved by attendance being documented by the secretary and faculty advisors. In addition, the project will provide practical experience for learning and using two different software programs. This educational goal will be assessed with pre and post survey instruments evaluating their knowledge and usability of the software.

The Show-Me Solar team easily meets the following University of Missouri-Columbia Campus’ Goals:

1. Improving teaching and learning.
   a. This project fosters early relationships between architects and engineers. Historically, architects are trained to think top down, to synthesize a global solution, which may be later refined or abandoned in light of emerging information. Engineers are trained to analyze available data and to solve problems bottom up, following a more systematic process toward a single solution.
   b. The objective of this project is to expose students to related fields so that when they enter the construction industry they will have more balanced and broad-based skills. It also fosters camaraderie between the disciplines.

2. Improving student access to learning materials.
   a. All team members will have access to the reference libraries of all the departments involved in the project.
   b. The students are encouraged to share materials between each other to foster stronger communication between the disciplines. This is encouraged by the faculty advisors throughout the life of the project. It is measured via documentation of the student correspondence and reports given to the faculty advisors.

3. Increasing student engagement.
   a. The Solar Decathlon is a large project. In order to make it a success the students have broken the project down into smaller committees made up of a mix of disciplines. Throughout the competition, students are given opportunities to lead aspects of the project. There are student project managers, directors of different disciplines, and heads of committees.

4. Supporting peer involvement and peer tutoring.
   a. Technology demands for the disciplines are evolving daily and faculty is not always able to keep up. Fortunately the students are keeping up on the changes and, as a result, they teach each other the new methods of using the computer for communicating the project.

5. Increasing retention.
   a. The Show-Me Solar team is keeping track of attendance at the meetings.

Goals and Objectives

a. The faculty has managed to incorporate tasks of the project into the curriculum for the different departments. The integration has produced greater excitement in coursework.

7. Encouraging student learning beyond the classroom.

a. Students receive real world knowledge by building the house they designed in Rolla, MO. Studio courses for the University of Missouri have never had students actually construct a house. This will be the first time the students will physically be building a project that they designed with their peers. Hired contractors and students of the Rolla Technical Institute will assist the students.

b. The finale for the design competition is re-constructing the house on the Washington Mall in Washington, DC using the skills learned from professionals in the building industry.
Description

The Solar Decathlon is an international student design competition that challenges students to design and build the most attractive, effective, and energy-efficient solar-powered house. The Show-Me Solar team is a collaborative effort within two schools of the University of Missouri System, the Missouri University of Science and Technology and the University of Missouri-Columbia. Our team is one of 20 international student teams competing in the 2009 Solar Decathlon. The project began in January 2008 and will conclude with the judging of the houses on the National Mall in Washington, D.C. in October 2009.

The theme for the Show-Me Solar house is “Expanding Horizons.” This theme will be carried throughout all aspects of the project. The two schools joined together with the goal to provide a real life scenario between architects and engineers. Each school specializes in one of these two areas, and this project allows the two to work together in the real world and in doing so, expands the horizons of the students. The overall goal for this proposal is to develop the framework for a sustainable interdisciplinary solar decathlon team. The multi-campus collaboration promotes enthusiastic student interaction not only with their own campus, but also with departments and organizations across both campus communities.

The greatest hurdle in this process is to maintain good communication amongst the team members so that the final project showcases the needs and wants of all disciplines. In order to achieve this goal, the students will use a combination of communication lines. Email, social networking sites, and video conferencing will be used on a daily basis. The most beneficial form of communication is still face-to-face meetings. The students will meet twice a month in each of the sister cities to explain what the different disciplines have been working on and to get informational feedback from their partners.

Students from the two campuses are working together to design a house entirely powered from the sun. The Missouri University of Science and Technology offers undergraduate and graduate students a number of opportunities in working with solar design through the undergraduate architectural engineering and interdisciplinary engineering programs. The University of Missouri-Columbia Department of Architectural Studies students will attempt to balance the functionality of the technical systems and ease of construction with subjective aesthetics, lighting and house environment integration. For the Decathlon, this includes keeping it small and simple and achieving a design that minimizes energy consumption and waste.

This project will give students valuable hands-on experience with project management and will increase their working knowledge in other areas of engineering, architecture, and construction techniques in this learning environment. This project will also promote involvement in a multi-campus activity for the team members while enhancing their understanding of the design and development applications of solar power. The competition also allows the team to bring their originality and creativity to the guidelines set forth by the U.S. Department of Energy for the Solar Decathlon. The goal of the project is to incorporate the most advanced technology of solar energy, solar cell efficiency and space efficiency while maintaining comfort and consumer appeal.
Management Plan

The Show-Me Solar team’s efforts will be channeled through the Department of Architectural Studies and the Department of Interdisciplinary Engineering in a manner that will completely incorporate this project into the MST and UMC curriculum. The faculty will assist students on the team in the process of analyzing problems, synthesizing solutions, and ensuring a successful outcome of the solar house competition. Students, led by two student project directors, will integrate the solar power-related research project findings into the house systems, complete the required tasks of reporting and design exploration, work in a geographically distributed team environment and share decision-making roles with the PI team. The importance of this opportunity is to enhance the students’ learning experience through direct, minds on/hands on participation.

The project managers or directors of each campus facilitate the meetings on their campus. Weekly meetings take place on Monday, Tuesday, and Thursday. Monday’s meeting is a teleconference between the two campuses. Every other week is a face-to-face meeting alternating between Rolla and Columbia. The student manager or director for that campus team leads the meeting of that location. The attendance of all the meetings is taken by the secretary, project manager, or faculty advisor.

Pre-surveys will be administered during the fall semester in 2008. Data responses from our post-surveys will be collected after the completion of the competition in Washington, D.C. (Fall 2009).

The timeline for the project is as follows:

- **June 2008**
  - Develop Design Development drawings for submission to the Department of Energy (DOE) and National Renewable Energy Laboratory (NREL)
  - Present proposal for funding to MUITC at June 18 meeting
  - Rolla engineering students will present prototype Solar Thermal Electric Panel (STEP) to summer Architecture and Interior Design students as practice for describing systems to non-engineering students. (Rolla, MO)

- **July 2008**
  - Summer Architecture and Interior Design students will present variety of solutions for interior of Solar Decathlon house as practice for describing design solutions to non-design students. (Columbia, MO)

- **August 2008**
  - Continued development of Construction Documents (on both campuses)
  - All team meeting in Rolla, MO
  - Continuing fundraising efforts by students

- **September 2008**
### Management Plan

- **Continued development of Construction Documents (on both campuses)**
- **All team meetings in Rolla, MO and Columbia, MO**
- **Continuing fundraising efforts by students**

<table>
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<tr>
<th>Month</th>
<th>Activities</th>
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<tr>
<td><strong>October 2008</strong></td>
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<td><strong>November 2008</strong></td>
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<td></td>
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<td><strong>December 2008</strong></td>
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<td></td>
<td>o Submit final construction documents to NREL and DOE</td>
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<td></td>
<td>o All team meetings in Rolla, MO and Columbia, MO</td>
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<td></td>
<td>o Continuing fundraising efforts by students</td>
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<td><strong>January 2009</strong></td>
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<td></td>
<td>o Present progress, outcomes, and an accounting of expenditures to the MUITC at their January meeting. (Columbia, MO)</td>
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<td>o Faculty and team attendance at Solar Decathlon Kick-off workshop in Virginia.</td>
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<td><strong>February 2009</strong></td>
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<td>o All team meetings in Rolla, MO for construction of the Show-Me Solar house</td>
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<td><strong>March 2009</strong></td>
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<td>o All team meetings in Rolla, MO for construction of the Show-Me Solar house</td>
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<td>o Continuing fundraising efforts by students</td>
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<td><strong>April 2009</strong></td>
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<td></td>
<td>o Present progress, outcomes, and an accounting of expenditures to the MUITC at their April meeting.</td>
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<td>o All team meetings in Rolla, MO for construction of the Show-Me Solar house</td>
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<td><strong>May 2009</strong></td>
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<td>o All team meetings in Rolla, MO for construction of the Show-Me Solar house</td>
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<td>o Continuing fundraising efforts by students</td>
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</table>
### Management Plan

- **June 2009**
  - All team meetings in Rolla, MO for construction of the Show-Me Solar house
  - Continuing fundraising efforts by students

- **July 2009**
  - Finished with construction
  - Testing of the systems (Rolla, MO)
  - Continuing fundraising efforts by students

- **August 2009**
  - Disassembly of the house (Rolla, MO)
  - Continuing fundraising efforts by students

- **September 2009**
  - Travel to Washington, D.C.

- **October 2009**
  - Competition in Washington, D.C.

- **November 2009**
  - Reassembly in Rolla, MO
  - Exit surveys completed

- **December 2009**
  - Reassembly in Rolla, MO
Our Solar Decathlon design project is an interdisciplinary project working across two campuses. Maintaining good communication throughout the project is going to be the most important factor in the success of the project. There are students from a variety of majors including architectural engineering, electrical engineering, civil engineering, interior design, architecture, and history. All collaborate on teams to achieve specific tasks. Within the team, committee assignments are given to each student. Interior Design students are placed on committees with engineers and they work collaboratively to solve both engineering and design issues. Committee members bring forth strengths from their given expertise and work together to find a solution that is both pleasing and workable within the project. There are students within Interior Design who consult on appliances, lighting, countertops, etc. Similarly, the engineers who are interested in solar panel design, radiant floor heating, construction, etc. bring their expertise to the project as well. By bringing together these different components, the Solar Decathlon team is experiencing dialogue that they will likely experience in the work place and that is likely to result in a more innovative project. The assessment plan for the proposed interdisciplinary undergraduate project includes continuous assessment of student communication, improved knowledge of computer software programs, and student retention. The qualitative and quantitative assessments range from pre and post testing and attendance rates.

Project goal: *Initiate the framework for a sustained interdisciplinary solar decathlon team.*

<table>
<thead>
<tr>
<th>Area of Study</th>
<th>Educational Objectives</th>
<th>Student Learning outcome</th>
<th>Instrument</th>
<th>Method of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Improve students’ communication between disciplines</td>
<td>a. What aspects from your discipline do you see as needing to be in the final design?</td>
<td>Pre/Post testing Note: See Appendix A</td>
<td>Qualitative: Identification of disciplines’ needs in the final project</td>
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<td>b. What aspects of other disciplines do you think need to be in the final design?</td>
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<td></td>
<td>Evaluate how communication evolves throughout the project</td>
<td>a. Where does the majority of your team communication take place?</td>
<td>Pre/Post testing Note: See Appendix B &amp; C</td>
<td>Quantitative: Measures of means of preferred means of communication</td>
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<tr>
<td>Software programs</td>
<td>Improve students’ knowledge of their own discipline’s software</td>
<td>a. Do you know any of the following software programs?</td>
<td>Pre/Post testing Note: See Appendix D &amp; E</td>
<td>Quantitative: Measures of improvement in knowledge of software programs</td>
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<tr>
<td></td>
<td>Improve students’ knowledge of other discipline’s software</td>
<td>a. Do you know any of the following software programs?</td>
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<tr>
<td>Attendance</td>
<td>Improve student’s involvement in interdisciplinary projects</td>
<td>Record attendance at all meetings.</td>
<td></td>
<td>Quantitative: Measures of attendance numbers and retention rate</td>
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</table>
The overall budget for the project is approximately $511,943, which can be seen in Appendix F. Most of the funding for this project is obtained through student fundraising. The main expenditures come from the construction of the house and the materials placed inside of it. The funds requested from the Interdisciplinary Innovations Fund ($21,093.40) will be applied to the business operations portion of our budget. Because most of the costs in this area go toward the team collaboration efforts, we feel this is the best area for the IFF to be applied.

The business operations expenses of the project involve meetings attended by all team members, as well as our innovative technology expenses. The project’s goal to foster and improve relationships between engineers and architects is tried by the logistics of bringing the teams together for face-to-face meetings. The team utilizes social networking sites, email, and a variety of other online software to communicate, but the most beneficial for fostering relationships is still the face-to-face meetings. We are asking the MUITC to consider facilitating this goal by funding Columbia students travel to Rolla for our monthly meetings there. We also ask for the assistance to provide lunch when Rolla students visit us in Columbia each month. To be honest, we have found providing food to be the easiest way to keep our retention rate high with student attendance at meetings. The Student Design Center and Laboratory in Rolla, MO has already provided the funding for Rolla students travel to Columbia every month as well as lunch for Columbia’s students when we visit Rolla monthly.

A large expense that the Show-Me Solar team will encounter this upcoming fiscal year is a mandatory workshop retreat with all of the international teams competing in the 2009 Solar Decathlon. The retreat involves at least 8 members of each team traveling to Virginia for 2 days in January 2009. The makeup of our attendees will be a mixture of faculty and students from both campuses. In the attached detail business operations budget we have included the per diem, hotel rooms, and estimated travel for our team’s attendees. Attending the retreat applies to our goal of encouraging learning outside of the classroom for the students.

The largest expense that the Show-Me Solar team is asking the MUITC to consider funding is for the purchase of two software programs for the Columbia students. The Department of Interdisciplinary Engineering in Rolla teaches their students the programs, Energy 10 and Maui Solar. To achieve our goal of practical experience in learning new software, we would like to purchase the above programs for Columbia students and have the Rolla students teach them. In doing this we also achieve the campus goal of encouraging peer tutoring.
Appendix A: Communication I pre-test

Solar Decathlon Pre-Communication Survey

Name

Department

We are doing this survey to evaluate the effectiveness of our current communication standard.

1. What aspects from your discipline are required to be in the final design?
   
   a. Please explain the importance of these aspects to the overall project?

2. What aspects from your discipline would you like to be in the final design?

   a. Please explain the importance of these aspects to the overall project?

3. What aspects from your discipline do not need to be in the final design?

   a. Please explain why these aspects do not need to be in the final design?

4. What aspects from other disciplines should be required in the final design?
Appendix B: Communication II pre-test

Solar Decathlon Pre-Communication Survey

Name

Department

We are doing this survey to evaluate the effectiveness of our current communication standard. What are the main means of communication for you?

**I currently receive most of my team correspondence via:**

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<tr>
<th>Face-to-face (One-on-one)</th>
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Solar Decathlon Post-Communication Survey

Name

Department

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</tr>
<tr>
<td>□ Neither Disagree or Agree</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</tr>
<tr>
<td>□ Agree</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>□ Strongly Agree</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
Appendix D: Software pre-test

**Solar Decathlon Software Knowledge Pre-Survey**

Name

Department

We are doing this survey to measure the software knowledge of team members.

**How familiar are you with the following software programs?**

<table>
<thead>
<tr>
<th>Program</th>
<th>No knowledge at all</th>
<th>A little knowledge</th>
<th>Average</th>
<th>Above average knowledge</th>
<th>Expert knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>AutoCAD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adobe Photoshop</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Adobe Professional</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adobe InDesign</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3dMax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Google SketchUp</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Website??</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maui Solar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microsoft Excel</td>
<td></td>
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<tr>
<td>Microsoft Word</td>
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<tr>
<td>Microsoft Publisher</td>
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</table>
Appendix E: Software post-test

Solar Decathlon Software Knowledge Post-Survey

Name
________________________________________

Department
________________________________________

We are doing this survey to measure the software knowledge of team members.

How familiar are you with the following software programs?

<table>
<thead>
<tr>
<th>Program</th>
<th>No knowledge at all</th>
<th>A little knowledge</th>
<th>Average</th>
<th>Above average knowledge</th>
<th>Expert knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>AutoCAD</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Adobe Photoshop</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Adobe Professional</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Adobe InDesign</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Revit</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3dMax</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Google SketchUp</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Website??</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Energy 10</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Maui Solar</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Microsoft Excel</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Microsoft Word</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Microsoft Publisher</td>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
### Appendix F: Project Budget

<table>
<thead>
<tr>
<th>Total Project Budget</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Design and Construction</td>
<td>369,900.00</td>
</tr>
<tr>
<td>Business Operations</td>
<td>21,093.00</td>
</tr>
<tr>
<td>Competition Logistics</td>
<td>73,650.00</td>
</tr>
<tr>
<td>Other business operations +</td>
<td>47,300.00</td>
</tr>
<tr>
<td>Incidentals</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>511,943.00</strong></td>
</tr>
</tbody>
</table>

#### Detailed Business Operations as applied to this funding request

<table>
<thead>
<tr>
<th>Detailed Business Operations as applied to this funding request</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>21,093.40</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td></td>
</tr>
<tr>
<td>Energy 10 and Maui Solar (20 units each)</td>
<td>10,525.00</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td>10,525.00</td>
</tr>
<tr>
<td><strong>All-team retreat (January 2009)</strong></td>
<td></td>
</tr>
<tr>
<td>Hotel ($113/rm/night x 2 rooms x 2 nights)</td>
<td>452.00</td>
</tr>
<tr>
<td>$42 per diem (8 attendees x 2 days)</td>
<td>672.00</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td>1,124.00</td>
</tr>
<tr>
<td><strong>Travel-PR/Conferences</strong></td>
<td></td>
</tr>
<tr>
<td>Outstate + Instate PR</td>
<td>2,000.00</td>
</tr>
<tr>
<td>Conferences</td>
<td></td>
</tr>
<tr>
<td>Decathlon 2009 Kick-Off (retreat in 01/09)</td>
<td>2,000.00</td>
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<tr>
<td>Learning Ops</td>
<td>250.00</td>
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<tr>
<td><strong>Sub-Total</strong></td>
<td>4,250.00</td>
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<tr>
<td><strong>Travel for team face-to-face</strong></td>
<td></td>
</tr>
<tr>
<td>All team meeting in Rolla</td>
<td></td>
</tr>
<tr>
<td>[(196 miles x 0.535) x 10 months] x 4 cars</td>
<td>4194.4</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td>4,194.40</td>
</tr>
<tr>
<td><strong>Business meeting expense</strong></td>
<td></td>
</tr>
<tr>
<td>All team meeting in Columbia</td>
<td></td>
</tr>
<tr>
<td>[6 pizzas from Shakespeares + (3) 2-litres pop = $100] x 10 months</td>
<td>1,000.00</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td>1,000.00</td>
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</tbody>
</table>