

Project _ Goal 2 Initiative 2a: Climate Action Plan_____

Start Date _8/15/2012_____

Client _Indiana State University_____

Program Manager _Dr. Jim Speer_____

Project Manager _Dr. Jim Speer_____

Thesis Statement _ The Climate Action Plan is a report developed by 60 faculty, staff, and students that documents ISU's sustainable history and lays out a plan for future sustainability projects at ISU to make us more economical and better stewards of the environment._____

Introduction/Background – What will you do?:

In September of 2007, ISU's 10th university president, Dr. Lloyd Benjamin III, solidified ISU's interest in becoming a sustainable campus by signing the American College & University Presidents Climate Commitment. Our 11th president, Dr. Dan Bradley, reinforced our commitment to sustainability and directed the Sustainability Team Members to explore a climate action plan. In Spring 2010, ISU completed its first Climate Action Plan through the work of 60 faculty, staff, and students. This action plan identified 86 individual recommendations to help ISU reach carbon neutrality by 2050. In Spring and Summer 2011, we completed our second Carbon Footprint Analysis and found that we are at 53% of our 1990 carbon emission levels. This is close to a 10% reduction in two years and shows that we are advancing towards our goal of carbon neutrality. One of the main recommendations that came out of the sustainability efforts is to incorporate all work to obtain carbon neutrality through our classes and course work. By doing so, ISU can involve students in our efforts to become carbon neutral and make campus a model for alternative energy technologies and sustainability projects.

With funding from the Strategic Plan for Fiscal Year 2011, ISU established an Office of Sustainability at ISU that promotes our current efforts towards sustainability and applies for grants to promote sustainability at ISU. These two efforts tie in well with goals 4 and 5 of the strategic plan. The main purpose of the Office of Sustainability was to engage our students in sustainability efforts on campus and to provide meaningful education that the students can use to improve living conditions around the world. This work will contribute to the benchmarks in goal 1 to increase enrollment and student success. Besides our contributions to benchmarks in goal 2, we are also working towards benchmarks in goal 4 to diversify revenue funds. In Spring 2012, we received funding through the Unbounded Possibilities Initiative to develop the Institute for Community Sustainability which has subsumed the Office of Sustainability. With this funding, we have an organization and staffing that focuses on Community sustainability. We are requesting funds here to promote on campus sustainability and to move our Climate Action Plan forward.

Proposal/Purpose/Justification – Why will you do it?:

Sustainability is one of the most important topics to many college age students today and has become a buzzword for many corporations as well. The basic definition of sustainability that has been adopted by the President's Sustainability Council is "to meet the needs of the present without compromising the ability of future generations to meet their own needs". This concept is simply good business practice and is the basic foundation for best practices at both colleges and businesses.

According to the Intergovernmental Panel on Climate Change (IPCC), the earth's temperature is increasing due to a combination of natural and anthropogenic causes so that average temperatures will

be from 6-8°C warmer (similar to the increase in temperature since the last ice age) than they are today by 2100 across the world (IPCC 2007, Solomon *et al.* 2007). Our landfills are ever growing landmarks that are now some of the larger geographic features in the area (such as outside of St. Louis, many times larger than Monk's Mound at Cahokia, the largest prehistoric structure in North America) and visible from space (New York's Freshkills landfill). According to geologic records of newly found petroleum deposits each year, we passed peak production of oil in the United States in the 1970s and worldwide in 2004 (Deffeyes 2009). This means that fuel prices and the cost of petroleum products (which are most of our modern day products and the basis for our agricultural system) will gradually rise as petroleum becomes scarcer. We have an exponentially growing human population and are already using more resources than can be sustained into the future. If we want our children to have anything close to the standard of living that we enjoy, we need to determine how to live sustainably within the earth's resources.

These dire issues also provide an opportunity to find new and innovative ways for our communities to become sustainable. Funds from the strategic plan are requested for the following goals:

1. Bring more alternative energy sources to campus. Specifically, we would like to invest in solar power and energy monitoring of our residence halls.
2. Work to organize sustainability efforts at ISU and to integrate sustainability into our curriculum.
3. Continue to have a strong Student Leadership Team that promotes the actions of the Climate Action Plan on campus.
4. Present findings from our sustainability efforts at national conferences.
5. Work with our students to make them aware of sustainability issues, to get them excited about green initiatives, and to better prepare them for a job market where green skills are a basic requirement in many workplaces.

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Petersen, J.E., Shunturov, V., Janda, K., Platt, G., and Weinberger, K. 2007. Dormitory residents reduce electricity consumption when exposed to real-time visual feedback and incentives. *International Journal of Sustainability in Higher Education*. 8(1): 16-33.

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Work Plan – Action Steps –

How will you do it – brief work plan – please point to Benchmark Goals?

This last year, we have been successful in studying wind speeds around campus, locating a site for an energy producing wind turbine, and have awarded a contract with NRK to install the wind turbine this summer on the north side of Sycamore Towers. The energy output from the turbine will be

automatically reported on a website so that the ISU community can track its energy production. Our intention for this coming year is to add a solar array on campus that is also monitored on the web so that we can compare this energy production. The alternative energies will be working laboratories for the College of Technology as well as the College of Arts and Sciences. Students from classes in both colleges can study these devices to examine their efficiency and determine their utility in scaling up to solve broad-scale energy demands. The curricular efforts mesh well with Goal 2 Initiative 2: Applying the science of learning to the learning of science (SENCER program). Specifically, this work is adding to the benchmarks to increase the experiential learning opportunities in the foundational studies and major classes for all students on campus.

We have acquired a quote from Lucid Designs to install remote metering on our residence halls and to report this output on to a web platform. We plan have these residence halls monitored so that we can watch energy consumption in those areas, give real-time feedback to the students, and encourage our students to save energy for themselves and for campus. We have worked with Facilities Management to mesh with their plans for remote metering at ISU. They are developing an energy standard for the campus where all new buildings and renovations will be on a Johnson Controls Metasys system that can be remotely monitored by facilities management. The residence hall, however, and not included in this plan to remote meter campus. We are requesting funds to convert our current meters to the campus energy standard by using Johnson Controls units and to remote meter our electrical usage in the residence halls through a Lucid Designs Dashboard that will make our energy usage and reporting transparent and obvious to our stakeholders. This dashboard also enables us to seamlessly integrate with national energy conservation competitions to further motivate our students. The Compete for the Green competition saved the university \$22,000 in the first year of the competition. This last year, we broke even during the competition, but I believe much of the problem is related to external energy use as Lincoln Quad (which has a very high voltage line) showed a 14% energy increase during the competition which swamped any savings that were demonstrated by the other residence halls. We also need to work on presenting this energy conservation competition better to our students and the Lucid Designs Dashboard is a good way to present this information. All indications are that with real-time monitoring of energy use empowers students to save energy and money for the University. Also, research has found that students continue their sustainable practices that they have learned even after the competition has ended (Patersen *et al.* 2007).

Many sustainability projects are already very active on campus through the recycling center, grounds maintenance, and Sodexo food services. We plan to help coordinate and advertise the good work that is already being done around campus in sustainability.

Previously we have requested funds for a Climate Action Plan Student Leadership Team which has been a successful way to organize campus sustainability efforts. With the development of the Institute for Community Sustainability (ICS), that student work can be conducted through ICS and managed by their staff. The funds requested in this proposal are to develop continue to develop on-campus sustainability efforts, where the focus of ICS are community centered programs.

Princeton Review and Sierra Club maintain separate lists of Green Campus around the United States. We will work on filling out the paperwork to be listed as a green campus which will help to promote ISU and to bring in some of the top students around the county that are interested in sustainability. This will help to recruit and retain great students contributing to benchmarks in Goal 1.

The Earth Day Celebration was originally started by Dr. Rusty Gonser in Biology and was then taken over by Anita Gabbard who is the Associate Director for the Hulman Memorial Student Union. This event has been growing each year and has become one of ISU's larger festivals, but has not benefited from planned institutional support. This last year, ISU's Earth Day event was planned and implemented by the Office of Sustainability and we are applying for funding through this proposal to help support this event again next year.

Reporting and Deliverable Schedule – When?:

Fall 2012

ISU will be hosting the annual meeting for Our Green Valley Alliance for Sustainability at University Hall from November 9-10. This event will raise awareness of ISU's sustainability efforts on campus and within the community. We will have a poster competition as part of this event which will encourage our students to present their original research into sustainable practices and solutions.

Have the metering installed for the residence hall energy conservation monitoring program. Lucid Designs will build the web interface and have the hardware installed during the Fall semester.

Install a solar array on campus property and remote meter the array so that College of Technology and College of Arts and Sciences students can study the energy production from this array.

Implement a bicycle-lending program for students to use bicycles on campus. For this program, we would have to purchase bicycles and specific bike racks where students can swipe their ID card to check out and return the bicycles. This program would also track the students' 991 number along with their bicycle usage.

Spring 2013

Compete in the national energy conservation competition. This will show how ISU is doing compared to hundreds of other school around the nation and provide incentive for our students to conserve energy on campus, which will save the university money.

Refine the Climate Action Plan to focus on some achievable goals and next steps for ISU.

Hold a larger Earth Day event in April 17th, 2013. This event has been growing over the past years and we hope that some institutional support for Earth Day will help to make this an even better event.

Budget – How Much will it cost?:

The entire budget that we are requesting for this year is \$130,000. The majority of the budget goes to specific campus sustainability projects such as a solar array, the bicycle program, storm water diversion, residence hall remote metering, and the Lucid Building Dashboard automated energy monitoring system for the residence halls.

Management Plan – Who (by name if possible) will do the work?:

Dr. Jim Speer is in charge of overseeing this initiative and with the work of the students has been the PI or co-PI on multiple grant applications to bring more funds to the University through sustainability efforts. Many of these Requests for Proposals have to show matching funds being spent by the campus, and the funds requested in this grant application to the strategic plan can constitute those matching funds.

The students and staff of the Institute for Community Sustainability will manage these funds and move these program forward. 73% of the budget for the institute is dedicated to staff and student salary and benefits. We plan to use that support system to help coordinate on-campus sustainability efforts and simply need funds from the Strategic Plan to move these on-campus initiatives forward.

Dr. Tom Steiger, Dr. Tom Derrick, Dr. Greg Bierly, and Dr. Eric Anderson have been working together with Dr. Jim Speer on grants to the National Science Foundation and through the Unbounded Possibilities to create the infrastructure needed on campus for the long-term promotion of sustainability on campus and in the community. This team will continue to work together on the sustainability minor and the Institute for Community Sustainability.

Steven Flowers was hired as a graduate student member on the Institute for Community Sustainability. He planned the Earth Day celebration last year and will organize it again in 2013. He is working with the Earth Day committee which has been functioning for the last three years to make this event a success.

We will be working facilities management staff such as Kevin Runion, Jim Jensen, Bryan Duncan, Steph Krull, Paul Reed, Sue Sluyter, Mark Pupilli, and Pat Teeters to implement sustainability efforts on campus. These key members of the ISU Staff have been moving sustainability forward at ISU for decades and are the main drivers for sustainability on campus. They have suggested many of the projects embedded in this proposal and we will be working closely with them to implement these projects.

Outcome Assessment & Future Testing – How Well did we do?

How will we know that we have moved us toward our benchmarks goals?

We are committed to applying for external funds to help fund sustainability on campus, which contributes to benchmarks in goal four to diversify revenue funds. We are making the increased expense to include web monitoring of all of the technology that we plan to purchase for alternative energies on campus so that we can keep an exact tally of the energy that was produced so that we can calculate time to pay-back on all of the equipment that we purchase. Sustainability is an integral part of our SENCER program at ISU, so this work contributes to the benchmarks in Goal 2 to increase experiential learning on campus. Also these courses are integrated into our foundational studies program as well as majors classes so students from all across campus are benefitting from these efforts.

Budget Narrative for Goal 2 Initiative 2a

Supplies/Expenses

We are requesting \$10,000 in supplies, advertising, and promotional items to encourage people to save energy and recycle on campus. We are requesting another \$10,000 to help with costs for campus meetings focused on sustainability and ISU's Earth Day Celebration

Travel Funds

Travel funds are requested so that faculty and students can travel to national conference to learn more about sustainability efforts going on at other institutions. Funds will also be used to travel to other local sustainability offices to talk to the people in charge of those centers and find out ways that ISU can work better at sustainability and bring more revenue to our institution. Funds will also be used for ISU faculty, staff, and students to present ISU's sustainability efforts at national venues.

Capital Equipment

The largest portion of this budget is the capital equipment that we are requesting. This year, we have been successful in bringing an energy producing wind turbine to campus (the turbine will be purchased during last fiscal year, but will probably be installed in July). With this proposal, we are requesting \$50,000 to add a 5.4 kW solar array that will also produce energy and tie into the grid. Both the solar array and the wind turbine will have automated energy monitors that will be accessible to the public through a website so that others can see our efforts to use alternative energy and students can collect data to analyze the efficiency of these tools. We will also use some of these funds to divert more rain water from the sewer system (a project suggested by Jim Jensen) and buy bicycles and install a bike lending system that would enable more students to bike on campus and to nearby locations.

We have also request \$50,000, which will be used to convert the residence halls to the campus energy standard of a Johnson Controls Metasys system and to create a Lucid Designs Building Dashboard to display energy use in the residence halls in real time. Facilities Management personnel agree that this is the first step to getting a handle on our energy use at ISU. They have recently developed this campus energy standard, but do not have plans to convert the residence halls to this system any time soon. These funds would enable this transition and upgrade the residence halls to the campus energy standard and allow remote metering of those buildings.