

Strategic Plan – Initiative Work Plan FY2014

Initiative Name: Goal 2 Initiative 2a: Climate Action Plan

Date: 5/31/2013

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Initiative # 2a **Initiative Chair(s)** Dr. James H. 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.

1. Introduction/Background – What?

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.

2. Proposal/Purpose/Justification – Why?

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. Sustainable solutions are

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likely to save the university more money each year through behavior change, conservation, and improved technology.

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.

Deffeyes, K. S. 2009. *Hubbert's Peak: The impending world oil shortage*. Princeton University Press. New Jersey, 232 pp.

IPCC, 2007: Summary for Policymakers. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

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.

Solomon, S., D. Qin, M. Manning, R.B. Alley, T. Berntsen, N.L. Bindoff, Z. Chen, A. Chidthaisong, J.M. Gregory, G.C. Hegerl, M. Heimann, B. Hewitson, B.J. Hoskins, F. Joos, J. Jouzel, V. Kattsov, U. Lohmann, T. Matsuno, M. Molina, N. Nicholls, J. Overpeck, G. Raga, V. Ramaswamy, J. Ren, M. Rusticucci, R. Somerville, T.F. Stocker, P. Whetton, R.A. Wood and D. Wratt, 2007: Technical Summary. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on*

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Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

3. Discussion of Past Years Results – Benchmark Successes?

(This section needs to be as long as is necessary to assess whether funding should be continued.)

The Institute for Community Sustainability in collaboration with the Climate Action Plan funds, took over the planning of Earth Day two years ago and the event has been growing every year. It now includes more than 40 vendors, takes over the grassy quad, and brings in approximately 1000 faculty, staff, students, and community members making it one of the more significant iconic events on campus. We have had great success with the Earth Day celebration and its reputation is growing which we hope will add to its success in the future. This year we included a bike ride from Memorial Stadium to ISU's campus that was hosted by the major. We had approximately 40 people participate in that bike ride.

We dedicated the wind turbine during a nice event on February 22nd. This first venture into alternative energy at ISU was a notable event. We took great care working with students to find the best location for the turbine and identifying a design that is both aesthetic and functional. Most people comment that it looks like a piece of art when they first see it. We have had problems with the manufacturer of the wind turbine and are now resolving those energy production issues. This will conclude a three year effort to bring alternative energy to ISU's campus. It acts as a symbol of sustainability and provides infrastructure that ISU students can study for years to come as well as producing energy to offset some of our utility costs.

We have been working throughout the year to develop a bike share program and these efforts are just starting to come together. We have developed a partnership with Student Health Services, the Recreation Center, and the Institute for Community Sustainability to start this bike share program. We will initially purchase 10 bicycles with Climate Action Plan funds (working on the purchase order currently) which will be available to students next semester. The Recreation Center will house, maintain, and check out the bicycles.

4. Work Plan, Next Fiscal Year – Action Steps – Process – How?

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 or continue to develop on-campus sustainability efforts, where the focus of ICS are community centered programs.

Now that we have completed the wind turbine installation on campus, the next experimental alternative energy system that we should pursue is active solar energy through the use of photovoltaic cells. 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

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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. We have had issues gathering good data on electrical use from the residence halls despite efforts over the past few years. 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).

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. We are applying for funding through this proposal to help support this event again next year.

5. Reporting and Deliverable Schedule – When?

Fall 2013

We have been working with Lucid Designs for two years. They donate their software for the Campus Conservation National each year, so we have used their system for a short time for each of the past two years. We have a hard time fully using their reporting capabilities because we have been restricted to infrequent measurements that takes the physical effort of ISU's electrical engineer to read the meters and then work of our interns to enter the data into the system. ISU is changing over to an electrical standard that includes remote metering on new buildings, but they do not have funds to do the residence halls any time soon. With the requested funds, we would plan to have the utilities in the residence halls remotely metered to provide real time feedback to student actions which seems to produce the best results in changing behavior to decide to conserve energy. Lucid Designs will build the web interface and have the hardware installed during the Fall semester.

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Send the solar array out for bid in August 2013 with an intent to have it installed by the end of December 2013. 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.

Provide sustainability events for local K-12 schools. Last year we conducted an Earth Day event at Meadows Elementary school which was very well received. The school's schedule was too busy to return this spring, so we discussed the possibility of holding an outdoor event at their school in the Fall to move away from the busy April Earth Day calendar.

Conduct multiple training events for city and county employees throughout the Fall. We have spoken with Mayor Bennett and city planner Pat Martin. Both of these individuals have invited us to conduct sustainability training programs with the city to help education about the financial savings that the city could achieve through sustainable behavior.

Spring 2014

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

Earth Day has been growing every year and is now an anticipated event on campus. We continue to strive to grow attendance and the educational opportunities associated with our Earth Day celebration. To that end, we are likely partnering with the Center for Community Engagement to hold Earth Day in the morning of April 11th, 2014 and Donaghy Day in the afternoon that same day. These events will be joined by a lunch event that transitions participants from learning about sustainability issues to actively volunteering in town to improve our community.

6. Budget – How Much, a General Discussion of Funds Use?

The entire budget that we are requesting for this year is \$120,000. The majority of the budget goes to specific campus sustainability projects such as a solar array, residence hall remote metering, Lucid Building Dashboard automated energy monitoring system, Earth Day celebration, and smaller amounts for educational programs that use the expertise of ISU's faculty and staff. Because of the establishment and staffing of the Institute for Community Sustainability, we can request funds purely for programming and sustainability improvements on campus that will save the university funds in the long-run. The staffing for this project will be handled through the Institute.

7. Stakeholders and Management Plan – Who?

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

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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. Sixty nine percent 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.

Caroline Savage, Jana Pyle, Steven Flowers, and Meagan Monds have been hired as staff and graduate student interns for the Institute for Community Sustainability. These folks will be the ones that put these efforts into action. They also have a strong history now of planning and implementing ISU's Earth Day celebration.

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.

8. Outcome Assessment & Future Testing

(How will we know that we were successful?)

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.

We have clearly identified benchmarks that include student participation and money savings for the University that will be used to determine the impact that this initiative has on campus.

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9. Line Item Budget Discussion that tracks Budget Templates ...

(These sections also need to be as long as is necessary to articulate each of the budget line items.)

Earth Day Event \$7,000

Earth Day has been a successful event, but we need food and music to bring in students and to create a festive environment that faculty, staff, and students want to participate. This year, the food will also benefit Donaghy Day attendees because we will be providing a lunch at the end of the Earth Day celebrations and at the beginning of the Donaghy Day of service.

Earth Day Concert \$5,000

Last year, we had developed a consortium of interested parties to hold an iconic event which would be an evening concert on the day of our Earth Day celebration. This event is intended to be a major event that would interest a large portion of the student body, campus community, and community members as well. We would hold it as a free outdoor concert. We have started conversations with Dr. Tillery and Brooks Moore for the organization of this concert and we hope that with a longer lead time, we will be able to include all of the interested parties in this conversation to make this event a success.

K-12 Education \$1,000

Research has shown that many life-long skills are learned and solidified in grade school. We would like to be able to provide educational experiences for K-12 students that relate to environmental education. This work has been conducted in the past in collaboration with Science Education and the Bayh College of Education Elementary Education faculty and students.

City Employee Sustainability Training \$2,000

These funds would enable us to host sustainability training events for city employees that relate to the Sustainability Plan for the Wabash Valley that we are working on with Our Green Valley Alliance for Sustainability. These events would enable us to use the expertise of ISU personnel to provide training to the city.

Sustainability Speakers \$5,000

Indiana State University is part of the Indiana Green Campus Network which has started to collaborate to bring in nationally renowned speakers by providing multiple speaking engagements in Indiana. We are requesting funds to bring such a speaker to ISU that would be of great interest to ISU faculty, staff, and students. This

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speaker fee would enable us to engage a speaker for a longer period of time so that we could provide a public talk as well as private events with students and community members.

Solar Array \$50,000

ISU now has a wind turbine on campus that will be used in the Fall semester for energy production, third party evaluation of its operations with our classes, and as a symbol for sustainability at ISU. We hope to add to that a solar array for comparable energy production and study.

Residence Hall Remote Metering and Building Dashboard \$50,000

ISU is upgrading to a new electrical standard that includes remote metering of its buildings that will save ISU funds through closely monitored utilities that will enable facilities staff to recognize any leakage in the system and monitor energy use. The residence halls are not planned to be monitored in the next five years, so these funds will enable these very important facilities to be brought up to the ISU electrical standard and enable us to conduct energy conservation competitions with our students which have been demonstrated to be the best behavior modification effort on other campuses.