

University of Colorado Boulder

Student Recreation Center

Sustainable CU Re-Rev Grant Proposal

February 25, 2013



Project Description

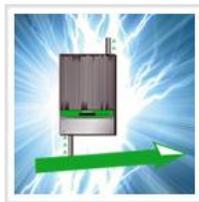
What exactly is a kilowatt hour? How much energy is that really? While University of Colorado Boulder campus has a strong history of building energy and water efficient buildings, there are very few opportunities for students to interact with the building and the energy it consumes...or creates. The equipment described in this proposal allows students users to not only contribute towards the creation of energy that fuels the Student Recreation Center, but also better understand how much energy is actually used by common cardiovascular equipment, and therefore other electronics they use in their daily lives. The ReRev™ equipment described below enhances understanding of energy use on campus and at home, while also encouraging them to contribute to reducing the campus carbon footprint. And hopefully after learning the answer to how much energy does it take to create one kilowatt hour, they will think twice about turning off lights or unplugging equipment.

The University of Colorado Student Recreation Center is currently undergoing a \$65 million dollar renovation and expansion. The project is on track to be a LEED Platinum building, and the estimated completion date is Spring 2014. The Recreation Department values sustainability, through operational changes, as well as educational opportunities to our membership. The department is in the process of creating a sustainability strategic plan and as part of this overall plan we are seeking \$33,540 from Sustainable CU to install a ReRev™ System in our cardiovascular room.

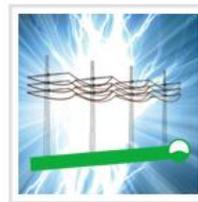
ReRev™ is a patent pending technology which converts an otherwise counter-productive heat into a usable form of renewable electricity. ReRev™ is an aftermarket product that retrofits ellipticals to make alternative energy in an engaging, safe, fun, carbon-neutral and healthy manner. Through Re-Rev, the kinetic motion of aerobic exercise is captured and converted into renewable energy that feeds back into the power grid. It is our goal to create a Green Zone just off the main entrance of the new Recreation Center. Please see attached drawing for more details. In this space we would like to showcase green fitness technology and to encourage our users to think about sustainable living and how their choices impact our environment. There will be a television display showing amount of energy created to date. We are still creating our sustainability strategic plan which will include a comprehensive marketing plan that will encompass all the Recreation Centers sustainability efforts as well as highlight the Re-Rev system, in addition to showing students that living a sustainable life often leads to living a healthier one.



HUMAN ENERGY
Kinetic energy from your workout is converted to DC (Direct Current) and sent to the ReRev System.



CURRENT CONVERTS
ReRev converts the DC current into AC (Alternating Current), the form of electricity used by homes and businesses.



RENEWABLE ENERGY
The electricity can then be used to power the building.

Since 2008, over 25 universities have installed the Re-Rev system. At rerev.com you can view a quick interview with a representative from the University of North Texas. The Recreation Department has contacted several of these universities and overall, universities have been very pleased with the system.

The general feedback is that this technology is a great marketing tool for encouraging sustainable behavior. The only negative criticism we have received is that the elliptical resistance is affected by the system. One can receive a great workout, but the resistance is not as good. The other drawback of this system is currently only two major manufactures can be hooked up to this system, Precor and Matrix, so this does limit equipment selection.

Student Involvement.

We have had numerous students reach out to us about doing a Re-Rev project. One to two times a year we receive an email from a student who has read an article about a recent Re-Rev installation and propose we do project here. Countless others are likely hoping for this equipment as well. The Environmental Center reports that they are regularly approached by students that would like to see this type of equipment in the Recreation Center. In addition, a couple of years ago we were approached by the RHA Sustainability Hall about doing this type of project at the Bear Creek Recreation Center. At that time the technology was really new so we wanted to see how it evolved.

Currently, each elliptical at the recreation center averages 900 hours of use a semester. In a recent equipment survey of 525 members, 25% indicated that ellipticals were their preferred piece of equipment. Increasing the strength and cardio space was the number one priority of students for the Buff up the Rec Project. With this being such an important priority for our students, we feel that showcasing green technology will engage the students and promote sustainable living. Each time a student walks into our building, they will see our Green Zone, reminding them about how choices have an impact. The Green Zone, as is shown in the attached map, will be located at the front of the building, an area with the most visibility and passerby traffic. Every time students come into the building they will be reminded of the many sustainability features of the building and their capacity to contribute to the electricity generation.

Students have demonstrated that they would like to see this equipment at the Recreation Center, and it will be linked with the most commonly used and desired piece of cardio equipment, but it provides an even greater benefit – engaging students that hadn't been exposed to hands-on learning about energy. This is a great kinesthetic learning tool that shows students exactly how much energy is really needed to power cardio equipment. It also shows them how much they create when working out. It connects real world action with the (for many) abstract concept of Wattage. This is the one tool on campus that allows students to not only learn about their energy output, but to also give it back to the operations of a building that they own. The numbers they view on the screen will be translated into numbers that are more understandable by the common user, i.e. light bulbs that could be lit, ipods or TVs that could be powered.

Project Budget

	<u>Total Project Budget</u>
ReRev Converter Box	\$12,000
Display and Marketing TV	\$4,000
10 Ellipticals	\$70,000
Dell PC	<u>\$850</u>
Total Cost	\$87,850

We are requesting funds to cover 42% of the project cost: \$36,540. The Student Recreation Center will match this with \$50,310, 58% of the estimated project cost.

The Recreation Center obtained a quote for the Ellipticals from the Precor Dealer and Re-Rev system directly from Re-Rev. The Television and Dell PC is based off of current market rates. The TV and PC will be used to display the total power converted and will provide marketing related to the project and sustainable living. Attached is a shot of the energy display.

Project Timeline, Scope, and Feasibility

The South West addition to our building is estimated to open December 2013. This portion of the recreation center will house the new strength and cardio spaces.

- a. The Re – Rev Converter box and cables, infrastructure, TV Display and PC would be installed between October and November 2013 as part of the construction. The Ellipticals would be installed and connected to the system in November 2013. The space would open to the public mid - December 2013.
- b. Scope - The installation would occur during construction, so that the contractors and the Re-Rev reps may complete the installation themselves. At the end of the installation, we would need the \$33,850 available in order to pay the invoices of the equipment.
- c. In talking with our project manager, the new construction is currently on time and set to open December 2013. Pending any major issues with construction delays, the infrastructure should be included with the construction and be on schedule.

Environmental Impact

By capturing the kinetic motion of aerobic exercise and converting into renewable energy that feeds back into the power grid, the energy consumption will be reduced. The Re-Rev system is estimated to save 6400 Watts per day, saving an estimated 112,640 kWh over the next five years. Along with the energy savings, the new system will be used as an education tool to our users about engaging in behaviors that promote sustainable living. Demand for personal viewing screens continues to rise. In a recent survey of 525 members 44% agreed or strongly agreed that having a personal television screen was important to them. When analyzing equipment use, equipment with an individual television sees

approximately 40% more use than equipment without. With this increase in demand, we have to find ways to offset the energy usage. Although it's not a huge amount of energy savings, every bit helps for obtaining LEED Platinum Standard.

The educational and marketing component is a huge part of this project. Students work out on a piece of equipment for 20 – 30 minutes, which allows for a captive audience. In the green zone we plan to have a television which displays Watts saved that day as well as for lifetime of the system. The Re-Rev project will be a part of our overall sustainability strategic plan, which will have a more comprehensive marketing component for the Recreation Center sustainability efforts.

Student Involvement

A couple of years ago we were approached by the RHA Sustainability Hall about doing a Re-rev project at the Bear Creek Recreation Center and 1 – 2 times a year we receive an email requesting we look into Re-rev after a student has seen a PR piece about a recent Re-Rev installation. Currently each elliptical at the recreation center averages 900 hours of use a semester. In our survey of 525 members, 25% indicated that ellipticals were their preferred piece of equipment. Increasing the strength and cardio space was the number one priority of students for the Buff up the Rec Project, and we feel showcasing and marketing green fitness technology will engage the students in the discussion and promote sustainable living. Every person that walks into our building will see our Green Zone.

Social Equity

The Re-Rev equipment is part of a larger sustainability strategic plan that would aid the campus in reducing our dependence on coal for electricity, a message that will be part of the creation of the Green Zone. Currently 75% of the electricity on campus comes from the burning of coal that causes many health complications for residents living near coal-fired plants, especially among children. We believe this is an important message that should be shared in all our electricity reduction efforts on campus. In the Green Zone where the Re-Rev equipment will be located, we will show the link between reducing our electricity usage at the Student Recreation Center and the reduction of our negative impact on these marginalized communities. In addition, by reducing our use of electricity we are also helping to mitigate our contribution to climate change, a global phenomenon that often has a greater impact on the poorest areas of the world. Students are constantly reminded of this in the media and in classes, but rarely learn about how they can contribute to the solution. The Green Zone will be dedicated to teaching users what they can do to reduce their impact, including using the ReRev equipment.

Innovation

As mentioned earlier, the concept of kilowatts can be very abstract for many people. The innovative aspect of this project is not necessarily the energy saved, but the opportunity for students to interact with the measurements of energy. The realization of how much movement is actually needed to create kilowatt hours will hopefully encourage students to conserve energy in the rest of their lives, on campus and at home.

The majority of fitness equipment has been self-powered for years; however, demand for individual televisions continues to increase. The recreation center is always striving to find ways to meet our users

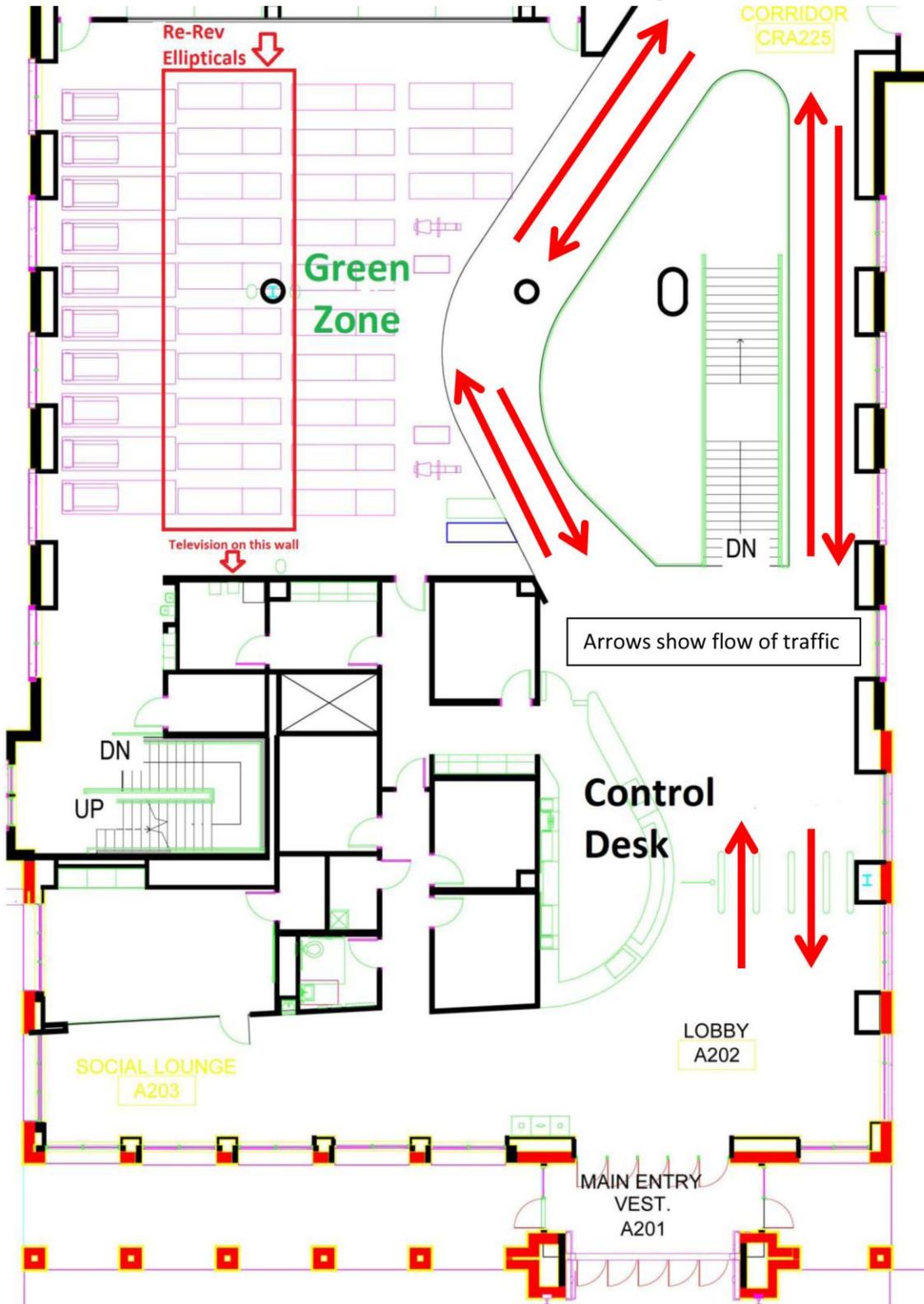
demand as well as reduce our electricity demand. While the technology to capture and convert energy from fitness equipment and put back into the grid has been around for about five years, there are only a handful of cutting-edge universities that have fully implemented a system like Re-Rev. We would like CU to be among the ranks making the logical connection between burning calories in working out to give kilowatts for the building operations. This is a growing sector and has huge potential to generate clean energy and offset energy consumption in an efficient manner. As demand for this type technology increases, like every sector, it will continue to become more efficient and cheaper.

Project Longevity

The recreation center is committed to keeping this project going. Our elliptical replacement cycle averages every 4 years. The Re-Rev interfaced boards can be transferred to new ellipticals by our maintenance staff and we are committed to purchasing equipment that is compatible with the system.

The Re-Rev's estimated lifecycle is 25 years.

Green Zone Layout



Energy Display - Screen Shot

