

Sustainable Fitness: Providing a Plan for a Sustainable Fitness Center at Saint John's University

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Background: The Saint John's University fitness center is not as energy efficient as it could be. Technology is available now that allows human energy to be harvested from exercise machines. Companies such as SportsArt and Rerev have developed methods to convert energy expended on treadmills and elliptical machines into electricity. These two companies were evaluated to see which would be more economically viable for Saint John's. If new cardio machines that harvested human energy were to be installed, energy efficiency would increase, and the fitness center's carbon footprint and cost of operation would decrease. **Saint John's University can create a more sustainable fitness center that is energy efficient and fosters climate change awareness education through the purchase of cardiovascular exercise machines from the company SportsArt which utilizes its ECO-POWR technology.**

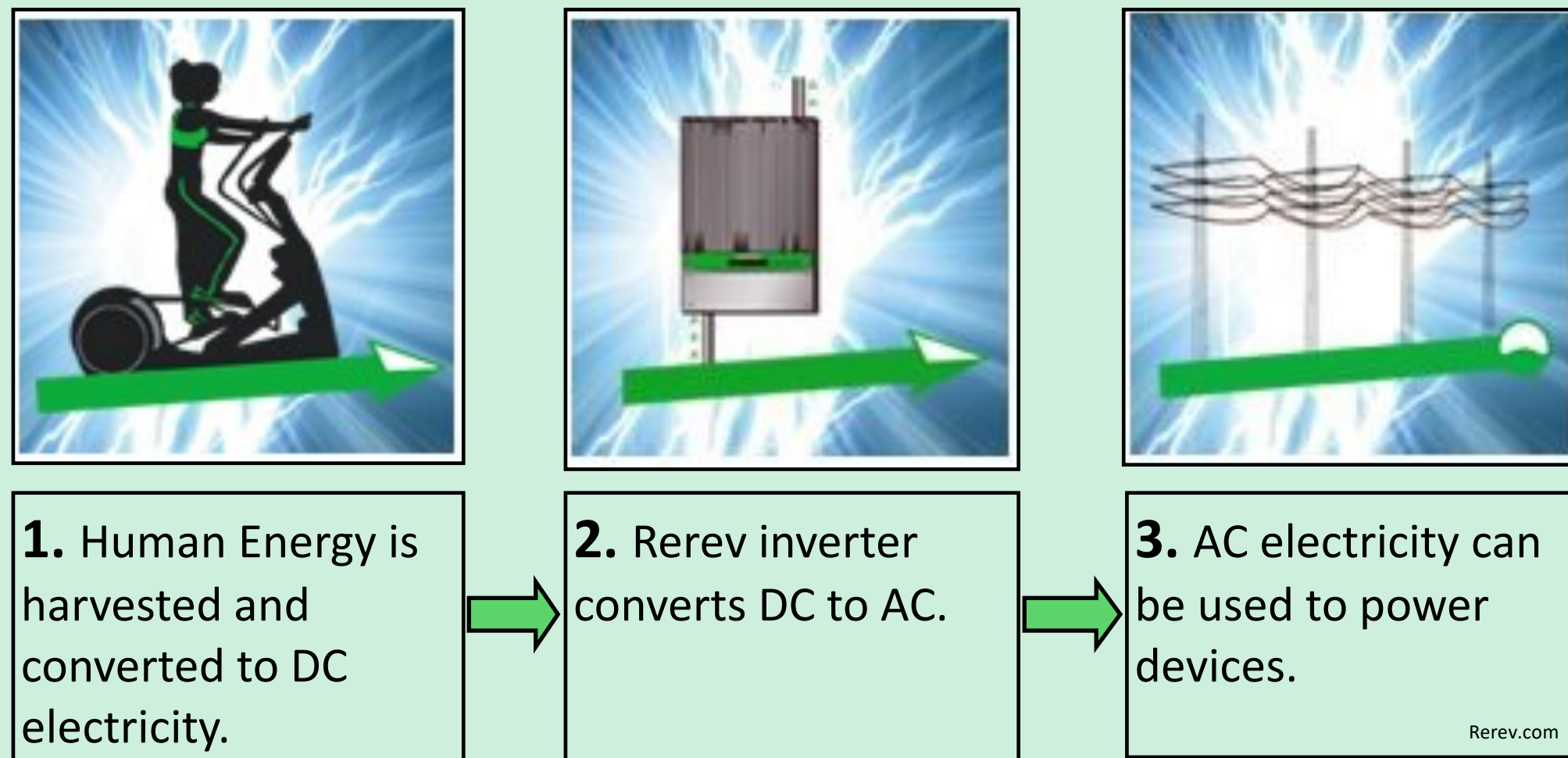


Figure 1: Precor EFX546i elliptical machine (A) and Woodway's Ecomill treadmill (B) are both equipped with Rerev's technology and harvest up to 100-150W of energy.

Methods: This research was conducted through interviews, literature review, and analyzing data from cardio machines' energy usage and Saint John's University Physical Plant.

- Literature reviewed from the Green Micro Gym, Sarah Lawrence University, University of Texas, and University of British Columbia to analyze how energy harvesting equipment was integrated into facilities.
- Interview conducted with SJU fitness center manager, Justin Rost
- Interview conducted with James Habinger, co-director of the Physical Plant Department.
- Price of each machine was found on websites from all three companies.
- Energy harvested from each machine was determined by company websites
- energy consumed by the T50 treadmill was found within the machine's manual.
- Total time students spend on the treadmill was estimated by Justin Rost.

Results:

Exercise Machines currently in Fitness Center:

Table 1 - This table shows the total cost of the machines from the company Matrix and roughly how much they cost Saint John's University each year.

Matrix Products	Price	Machines	Total Cost	Energy Consumed/Hr (Wh)	Hrs/Year Used	Cost/Year (Dollars)
T50 Treadmill	8,995	5	44,975	600	9,125	483.99
E5x Elliptical	6,995	6	41,970	0	10,950	0

Energy Harvesting machines proposed to be in fitness center:

Table 2: This table shows the difference in total cost from the energy harvesting brands. (ECO-POWR, Rerev) This table demonstrates the difference in money saved per year between both brands if their equipment were to be implemented in the fitness center.

ReRev Products	Price	Machines	Total Cost (Dollars)	Energy Harvested/Hour (Wh)	Hrs/Year Used	Money Saved/Year (Dollars)
EFX546i Elliptical	2,797	6	16,782	100	10,950	38.72
Ecomill Treadmill	7,995	5	39,975	150	9,125	58.07
ECO-POWR Line						
G876 Elliptical	7,550	6	45,300	150	10,950	58.07
G690 Verde Treadmill	8,495	5	42,475	200	9,125	77.43

*Prices may fluctuate through negotiation and different vendors

Main Take-Aways:

- The fitness industry in the U.S must become more sustainable to combat climate change.
- The SJU fitness center is in need of new equipment and renovation/ replacement
- Saint John's University could potentially save \$619 per year in energy costs after getting rid of Matrix machines. This includes money saved from energy savings and energy harvested through new machines.
- Climate change awareness education will be improved throughout the university through the purchase of ECO-POWR machines.



Figure 2: The G670 Verde treadmill (A) is human powered and harvests up to 74% of human energy (200W). The G876 elliptical (B) also harvests 74% of human energy and is human powered.

Recommendations:

- SJU should build a new energy efficient fitness center with ECO-POWR cardio machines and market the new building as a "green gym"
- If a new fitness center cannot be built, ECO-POWR ellipticals and treadmills should replace the current machines in the fitness center.

Conclusion:

The best way that Saint John's University can create a more sustainable fitness center that is more energy efficient and fosters climate change awareness education is through the purchase of ECOPOWR line energy harvesting equipment and to build a new ecofriendly facility. Fitness centers around the nation have problems with sustainability. It should be all fitness center owners' goal to get energy harvesting equipment into their facilities. The initial cost for this equipment right now is expensive, yet the price of energy harvesting machines is not much more expensive than buying normal cardio equipment. Energy-harvesting exercise equipment is a great way to reduce emissions and become healthier at the same time.