Eco-Cycling--Grade 9-12 First Place

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My community recently opened a new gym for its residents. When I went inside and was about began cycling, I could not find the power button on the machine. I thought maybe it had to be switched on via the plug on the wall; it was there that I noticed that the cycling equipment had no wire plugged into the wall for electricity. I thought the machine was faulty. Soon the instructor came and helped me with my difficulty. The machine ran on kinetic energy; when one pedaled, it would turn on and work. I found that very interesting and intelligent. When I was cycling, the machine showed me various types of information such as speed and RPM. One of them caught my eye: 'watts generated'. When I was cycling at a speed of twelve miles per hour, the machine displayed that I generated 60 watts of energy, which was enough to light a bulb. Even after I would stop pedaling, the machine would stay on for about thirty seconds. When I reached home I couldn't stop thinking about this bicycle.

During summers New Delhi gets very warm, with average temperatures of 42 to 48 degrees Celsius. Due to this, the air conditioning is required most of the time and that too set at temperatures below 22 degrees Celsius. This increases the energy consumption of each household and consumption will continue to increase as global warming grows.

In India, 67.94% of India's electricity comes from electricity producing coal power plants. When I went on to research more and more about this issue I found out that these power plants emit large quantities of air pollutants such as lead and arsenic. These chemicals infiltrate the water supplies, damage wildlife and are a major cause of lung diseases such as asthma and bronchitis. This is a significant problem for India and the world.

Electricity production from coal sources (kWh) in India has increased from 191 billion kWh in 2002 to over 700 billion kWh in 2011. This reflects that the need of using electricity is increasing more and more due to the rise in population and subsequent usage of electrical appliances. Coal is a non-renewable source of energy. As the quantity of coal on earth decreases, we need more efforts to find renewable and green sources of energy. The amount of coal left on earth will not be able to meet these growing needs of electricity.

This got me thinking of a solution to this problem. After many ideas and blueprints, I got the idea of an Eco cycle. Just like the cycle at the gym, an Eco cycle can create electricity by using kinetic energy. When one pedals, mechanical energy gets converted into electricity which gets collected into the transformer and then can be supplied to the homes. My idea is to use the laws of torque by using a big gear attached between the pedals and connected to a smaller gear which is one-fourth its size so that one whole pedal will be equivalent to four revolutions via the smaller gear. But my community design idea does not finish here for I feel why not get people of the community to contribute in electricity generation. If the Eco cycles are placed in a community to generate electricity then every household should be encouraged to do their bit and provide minimum hours of 'eco-cycling' as community service ; thereby generating heaps of electricity together. The cycle will have a display screen which at first takes your information as a username id and password then when you start cycling it keeps you informed by telling you how many watts you have generated and how much

time is left. After each session, it saves the household's data in the main database. The gears move with kinetic energy which provides energy to a motor that generates electricity. The electricity generated (by conversion of Kinetic energy to Mechanical energy and then finally Electrical energy) would be transported to a transformer and then the electricity would be distributed to each and every household taking part in this program.

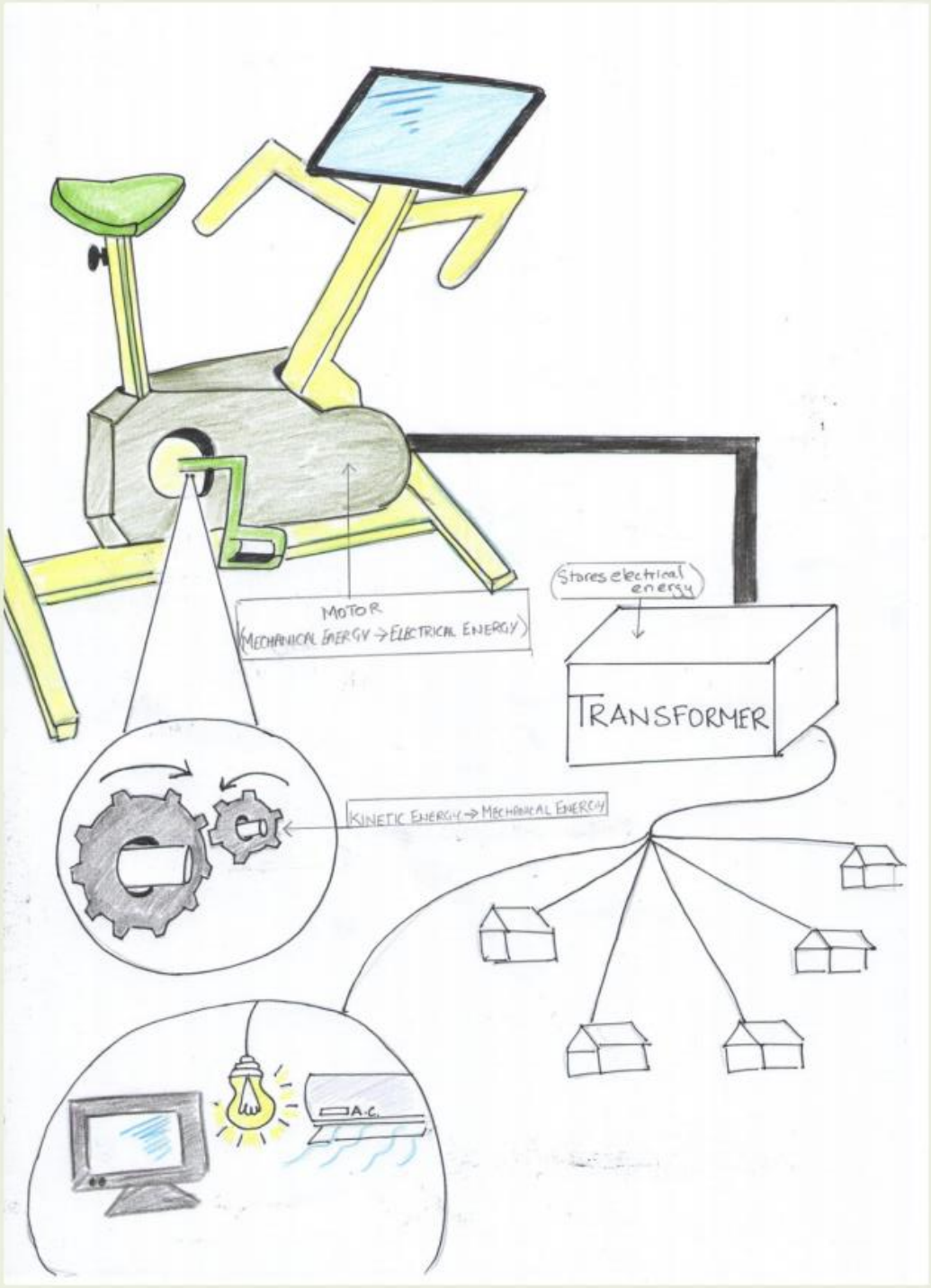
I kept on researching and got to know that the total electric power consumption in India was measured to be 835 billion kWh in 2011. After finding this out, I had a question in my mind, "Will the eco cycle actually be able to generate electricity for my whole community?"

I started calculating; my community has nine towers, each having 28 floors and four houses on each floor which was equivalent to 1008 homes. I checked that for one month, our house had consumed 70 thousand kWh; therefore the community needs approximately 70 million kWh of electricity, that too per month! The first thought that came into my mind was that our world was using too much electricity. The second thought was on how this program could fulfil the community's electrical needs. It is difficult for every household to generate approximately over 2 million kWh every day. But I have realized that even though the program cannot replace coal usage entirely it can serve as an important step towards saving coal reserves and making a portion of the electricity generation process eco-friendly. I found out that in one hour, one can generate 100 Wh (watt hours). I calculated that in one month, the community will save a humungous amount of 4032000 Wh. At the end of one year, the community would have generated 48384000 Wh. In addition, by saving coal, the community members also save money. Through tackling issues such as climate change and eco-friendly electricity, this program will also provide a solution for many other issues.

In urban India, the rate of obesity is increasing day by day, and exercise is needed to tackle this problem. The program of 'eco cycling' will inculcate a habit of regular exercise in each and every household of the community. Regular exercises make one active and lead a healthy lifestyle. It increases ones alertness, concentration and productivity. But the most important perk of exercising is that it decreases the chance of catching diseases. A routine without exercise can make one lethargic, inattentive and can affect his/her immune system as well.

Via this 'Eco-cycling' program we can not only affect the state of the earth but also the health of each and every household. We can decrease global warming and help in reduce pollution which affects us and the natural habitats of animals. It can also help us in saving money that is spent every month to pay off the electricity bills. In addition it will decrease the obesity rate and make exercise a daily routine for all, thus decreasing the chance of being susceptible to diseases. All in all it will make us healthy, wealthy and wise.

Why choose just one problem, when we can make a solution for all three, the 'Eco-cycle' program helps a community to be green, be healthy and be active.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