



FIG. 01 : Bicycle dynamo equipped with rechargeable batteries

HUMAN POWERED ENERGY GRID

We consume energy for every one of our tasks in our daily lives, from doing the laundry to communication with digital devices.

The load on our power grids

increase exponentially with our dependence on digital devices. In an effort to keep up with energy demand, we burn through our supply of fossil fuel at an alarming rate; it's assumed the solution for the depletion of fossil fuel reserves is nuclear power. In **Clean Energy Nation**, Martin Cheek and Dr. Gerald McEnerney, writes "this mounting industrialization of the world's nations, combined with a growing number of people on the planet, is creating an immense army of consumers, all of whom require energy to meet their modern lifestyle needs"

The problem is perceived as a big one, and therefore, for the solution to work it must also exist on the same level.

The problem becomes manageable when broken down into smaller chunks (fig. 02). To involve the average citizen in conservation efforts, we need to reframe the problem in understandable terms. How do we do that?

The aim of this project was to explore a fun, profitable solution to ensure widespread adoption. On the internet, many similar solutions could be found.

by :
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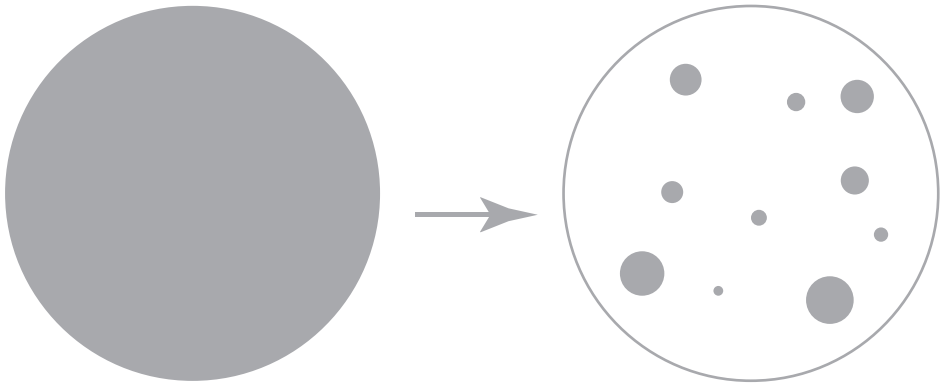


FIG. 02 : A solution is much more likely to be adopted if the problem is seen as manageable.

Many of these solutions made it no further than a computer drawing or the prototype phase; this might be due to an absence of consumer adoption and lack of engineering expertise to accomplish the vision.

Here's how we can solve this; if consumer adoption could be rewarded, the equipment easily engineered and costs readily shouldered by stakeholders in the energy industry (e.g. local government), such a concept could not only find adoption but thrive.

Here were the main questions which need answers:

1. What will encourage citizens to adopt an idea?
2. Why will this get support?
3. How is this economically viable?

To answer this question, I came up with a concept : **THE HUMAN POWERED ENERGY GRID.**

Proposed methodology

Human-powered products (source : Arjen Jansen Delft, University of Technology, Faculty of Industrial Design Engineering)

- are always and everywhere available, and have a long shelf life;
- reduce the cost of ownership of products (no battery costs on the long run and lower maintenance cost because battery replacement is not required);

- reduce a product's environmental impact over its life cycle;
- can be used in drawing attention to other environmental initiatives (e.g., the Dance Floor project, (Randag, 2007));
- and provide unique and innovative solutions. only find adoption but thrive.

THE HUMAN POWERED ENERGY GRID fulfills all of the above by providing

- 'Battery gyms' (fig. 03) run by local city councils and;
- Wearable batteries which store generated energy via photovoltaic cells or bicycle dynamos (fig. 01).

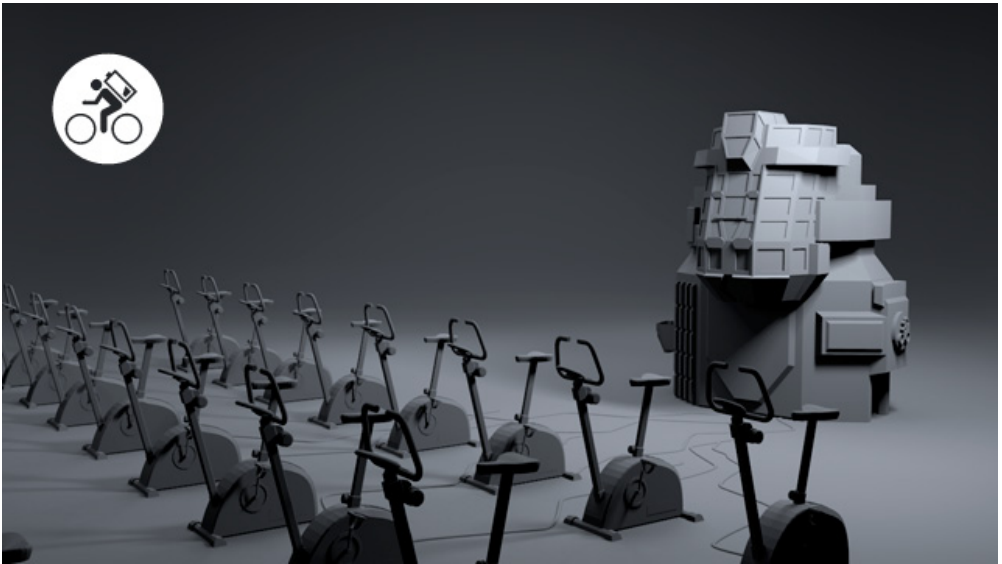


FIG. 03 : Human powered gym, with energy storage system

Battery Gyms

Imagine a gym where you are PAID to lose those extra pounds. Such technology already exists : <http://www.econvergence.net/>. The key to adoption is motivation; gyms patrons are paid for the energy they generate. The generated energy from battery gyms would be stored in a storage facility and diverted as need to the grid.

On average, a person on a stationary bike can produce 400W of energy per hour. In (fig. 04) we can see what that energy can do

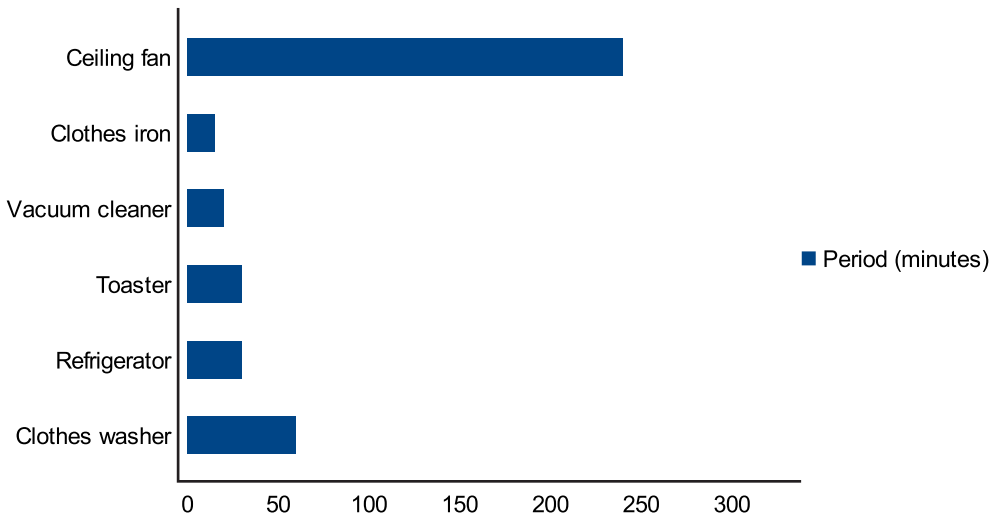
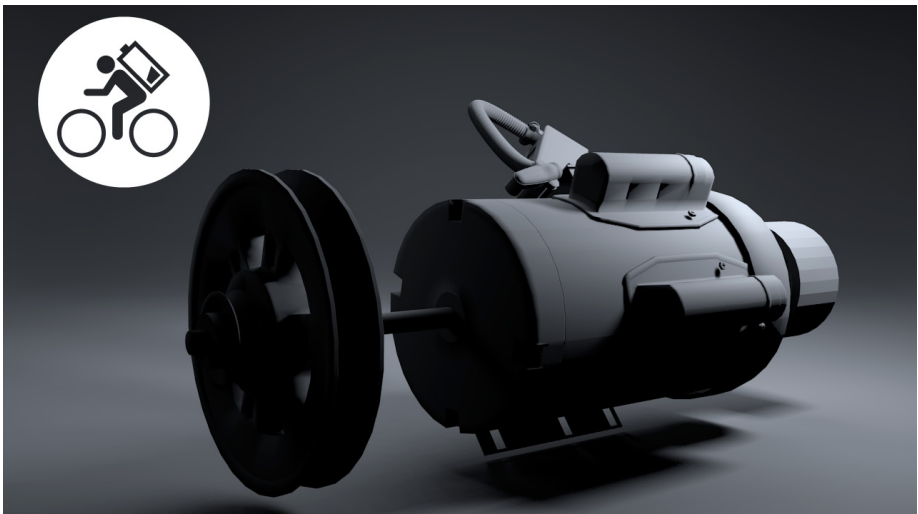


FIG. 04 : Amount of time home appliances can run on 400W

400 watts can

- power a desktop computer for an hour,
- clothes washer for 1 hour,
- a refrigerator for 1/2 an hour,
- a toaster for 1/2 hour,
- a vacuum cleaner for 20 minutes,
- an iron for 15 minutes,
- a ceiling fan for 4 hours.

Dynamo



Gamification

An app could be built to post worldwide scores of energy savings and also energy production.

Benefit

Battery gyms could be one part of the greater solution.

1. What will encourage citizens to adopt an idea?
Everyone gets to bake their cake and eat it. Gyms patrons are paid, lose weight and generate energy for their city.
2. Why will this get support?
It increases the sustainability of our cities.
3. How is this economically viable?
The necessary equipment and knowledge is readily available and cheap. Government sponsored battery gym facilities is an investment, and helps a city save money in the long run.

Where this project will be realized.

The town of Puchong in Selangor, Malaysia.

