# Harvesting Ambient Vibration

Team:Ecotopia

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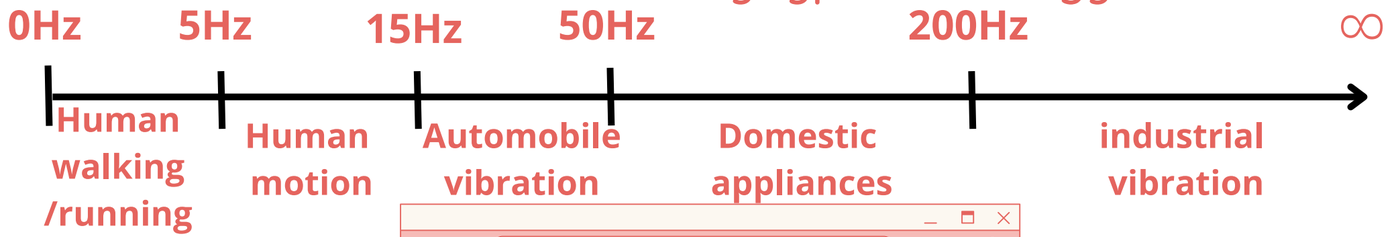
# Table of Contents

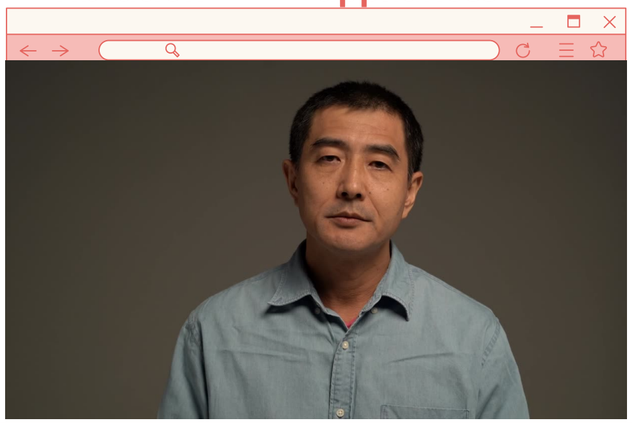
Topics Covered

# 1. The Problem?

- We thought of this as we were discussing about renewable energy and multiple sensors that can assist in harvesting energy.

- In our daily life we get involved in many activity which can indirectly be the source of many types of energy.



Video Viewer

1080px(W) 1920px(H)

# The amount of vibration created in Singapore

watch_this.mp4

## Walking/Running

The Average walking distance is 36 000 000 000 000 meters a day

## Industrial Workplace

About 75 Hz are being emitted out hourly from an average industrial worksite

New Tab

# The Solution

# 2. Our Solution

- We chose to use a vibration sensor which is also known as a piezoelectric transducer for its ability to change mechanical energy into electrical charge.

- This electrical charges can then be used in devices to drive LEDs and autonomous sensor networks or even a phone.

# 2. Our Solution

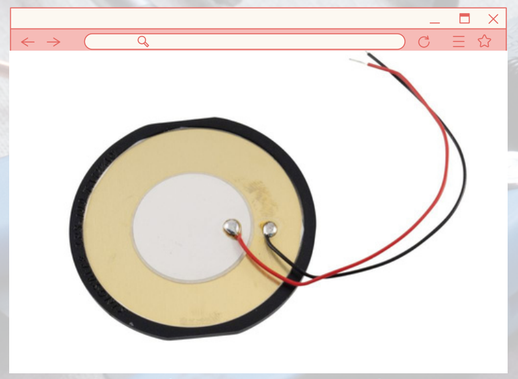
- Thus, the energy harvested by the piezoelectric transducer can be then be used for many applications/devices that require electricity to power

- In which calls for a more sustainable form of energy as we are able to harvest the ambient energy which is normally not being utilized and convert it into electricity.

# 2.The solution

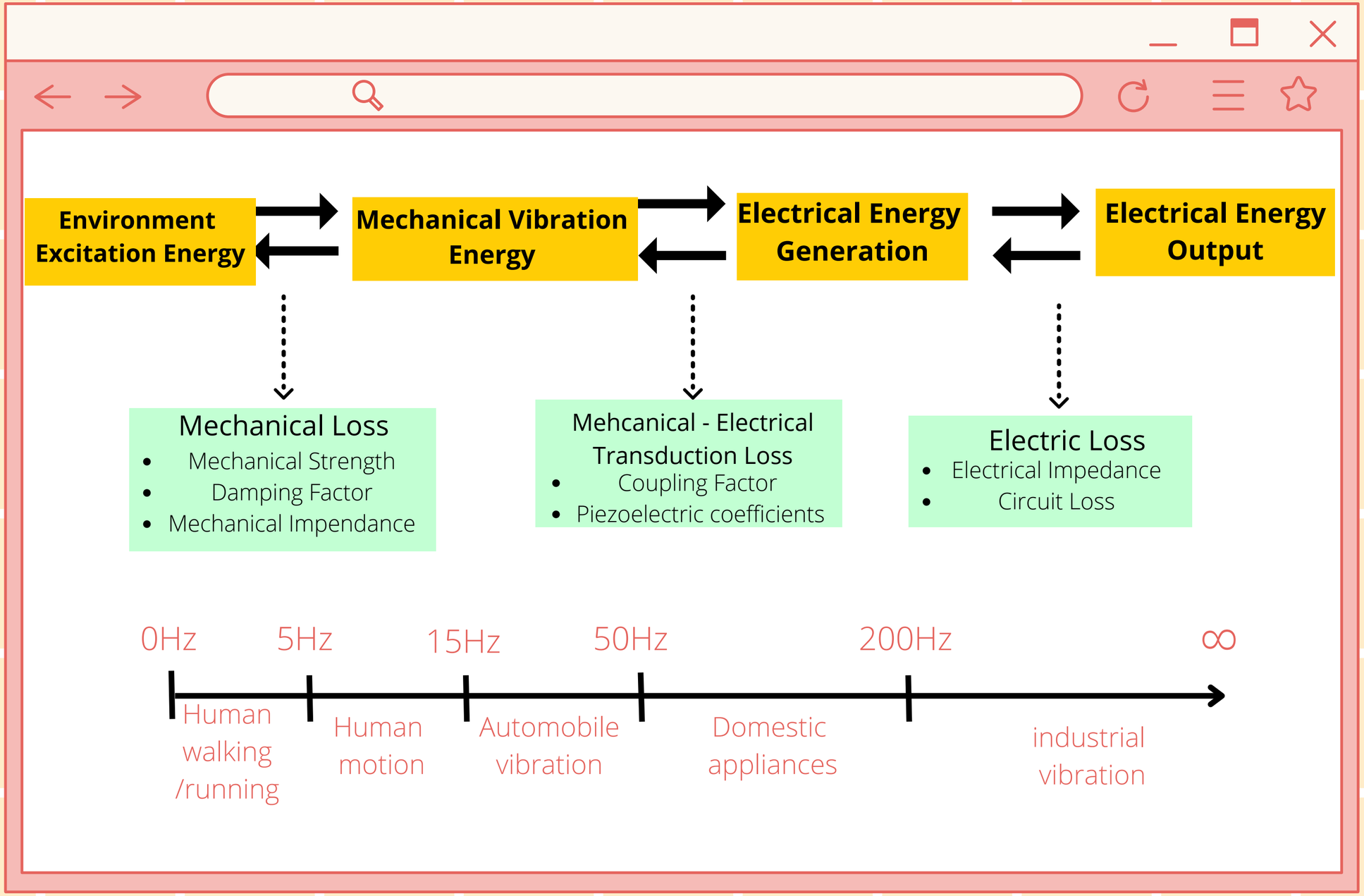
- These sensors use the Piezo effect, which measure changes in pressure, acceleration, temperature, strain or force by converting them to an electrical charge.

- This allows the **highest amount of vibration** to be received due to the sensitivity of the sensor.



Piezoelectric Transducer

Commercially available Piezoelectric Transducer(EH12)


Environment Excitation Energy
Mechanical Vibration Energy
Electrical Energy Generation
Electrical Energy Output
Mechanical Loss
Mechanical Strength
Damping Factor
Mechanical Impendance
Mehcanical - Electrical Transduction Loss
Coupling Factor
Piezoelectric coefficients
Electric Loss
Electrical Impedance
Circuit Loss
0Hz
5Hz
15Hz
50Hz
200Hz
∞
Human walking /running
Human motion
Automobile vibration
Domestic appliances
industrial vibration

# Target Market

Our Audience

# 3.Target Market

- Active Individuals/Outdoors man
- Auto mobile owners
- Industrial Machinery owners
- Environmentalist
- Public transport

# 3.Practical aspects

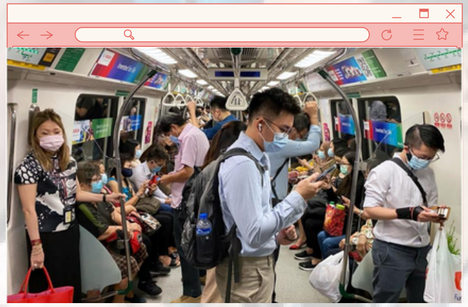
In both manufacturing and transportation we can install this device to the floors and seats & motors where the vibration are the most.Thus using this electricity and powering the lights or other devices in these area.Being beneficial for both commuters and the consumers.

Video Viewer

1080px(W) 1920px(H)

The many ways we can use this devices ...

watch_this.mp4



# Competitors

Our Competition

# 4. Our Competitors

- Because we're focusing on other types of renewable energy sources. We have many competitors like TESLA, Ambient Photonics and many others.

- Our competitors would be those who also focus on generating electricity using other types of renewable energy sources such as Solar Energy, Geothermal Energy, Wind Energy, etc.

- The common disadvantages that renewable energy sources share in general is that their electricity generation is still not large enough as compared to a traditional electricity sources due to the low-efficiency levels as renewable energy technologies are still significantly new to the market.

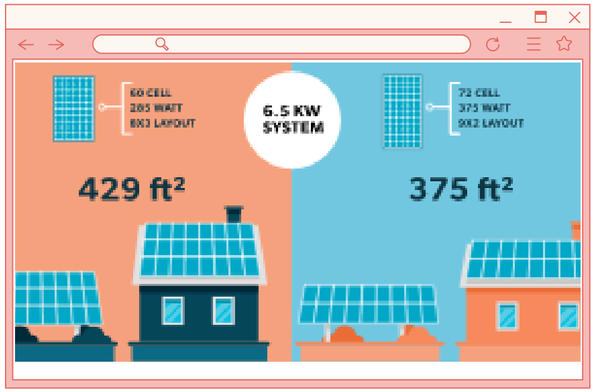
# 4. Our Competitors

- Common renewable energy harvesting methods such as **Solar Panels (solar energy)** and **Wind Turbines(Wind energy)** requires a lot of space to install as they require many large equipment. Compared to that, the advantage of our piezoelectric concept is that the transducers are significantly smaller as compared to them which makes it easier to install.

- Futhermore, lesser resources are needed in order to generate electricity as they only require vibrations which makes it easier and accessible for our users to utilize it. As compared to solar energy which require a lot of equipment and setting up which make it inaccessible for the general public, companies on a budget, etc.

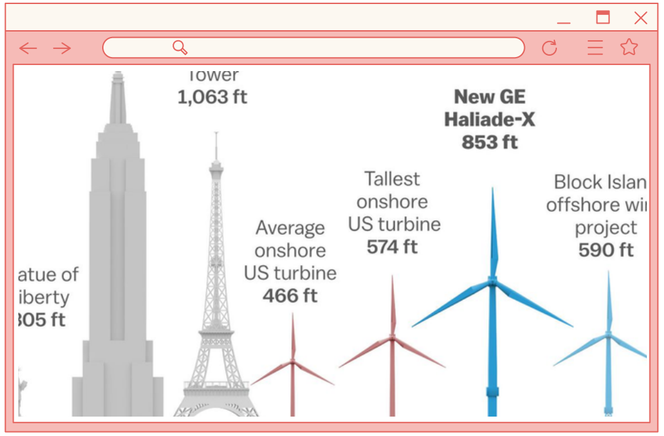
- Which could be a deciding factor for many companies that plan on utilizing a cleaner energy source. Therefore, we feel like those two factors are the main selling point of our product.

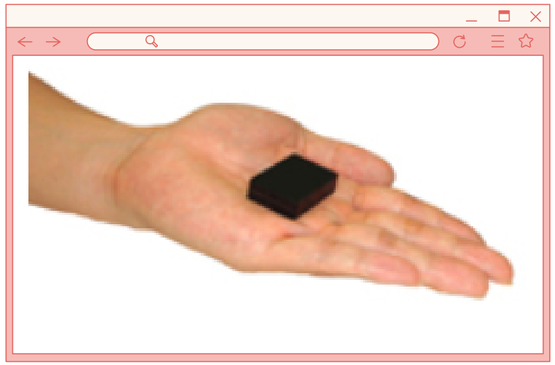
# Quick size comparison




Common Solar Panel size

Size comparison of Wind Turbines

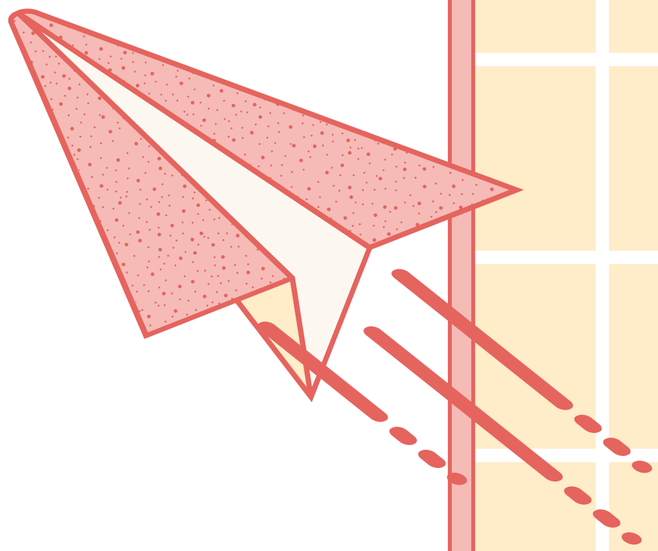


Commercially available Piezoelectric Transducer(EH12)

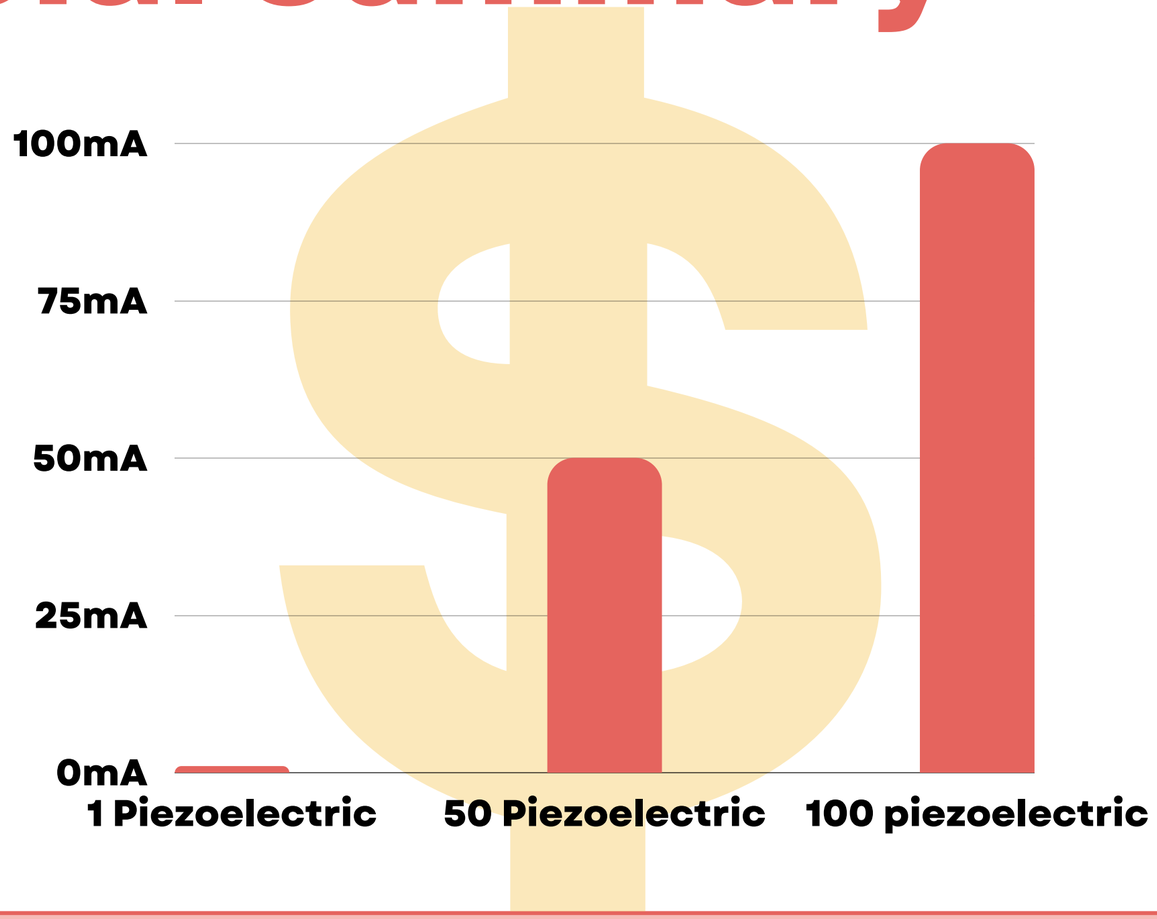
# Financial Summary

our products pricing and abilities



# Financial Summary

It costs around $10 for a single piezoelectric device. $1000 for the 100 piezo electric.




# Future Goals

Our 3Es

# Future Goals

**Expansion:** We hope to **expand** it throughout the neighboring countries due to their large industrial market, especially the countries with the most manufacturing lines.

**Exploration**: **Explore** in how we can make this more viable and less expansive and make it more efficient overtime.

**Equality:** Providing a much **effective** and **efficient** way of a cleaner energy with the Piezoelectric concept.


Thank you!

# Q&A TIME!