



TEAM

LESWAT

PROJECT

PROPOSAL

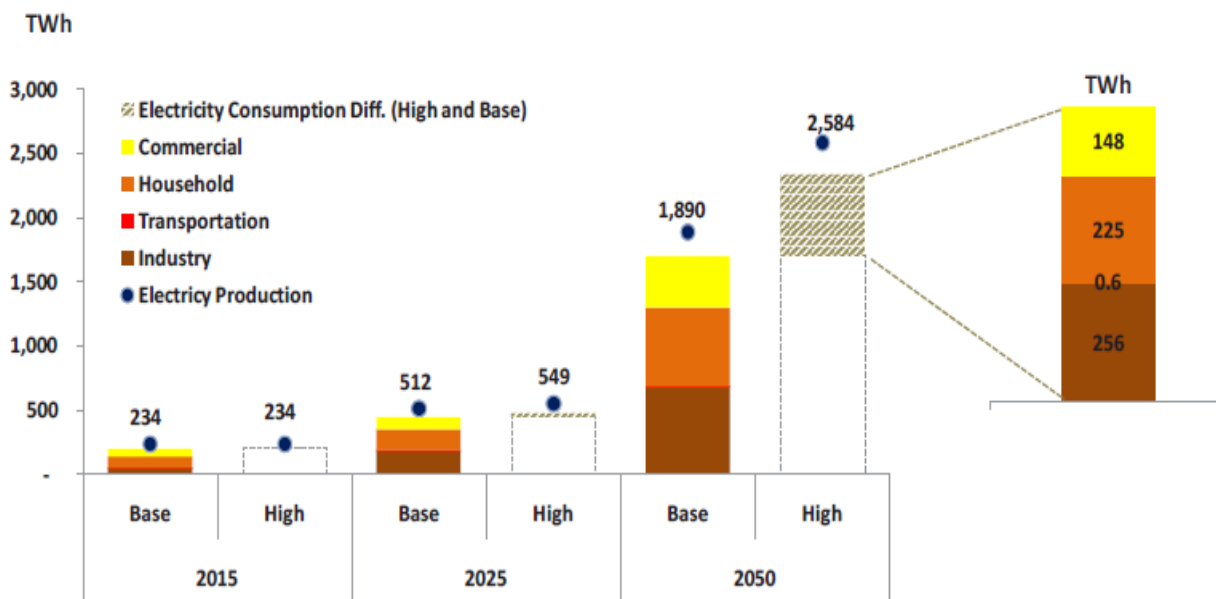


PROJECT
WEALTHY BY ENERGY
SAVING



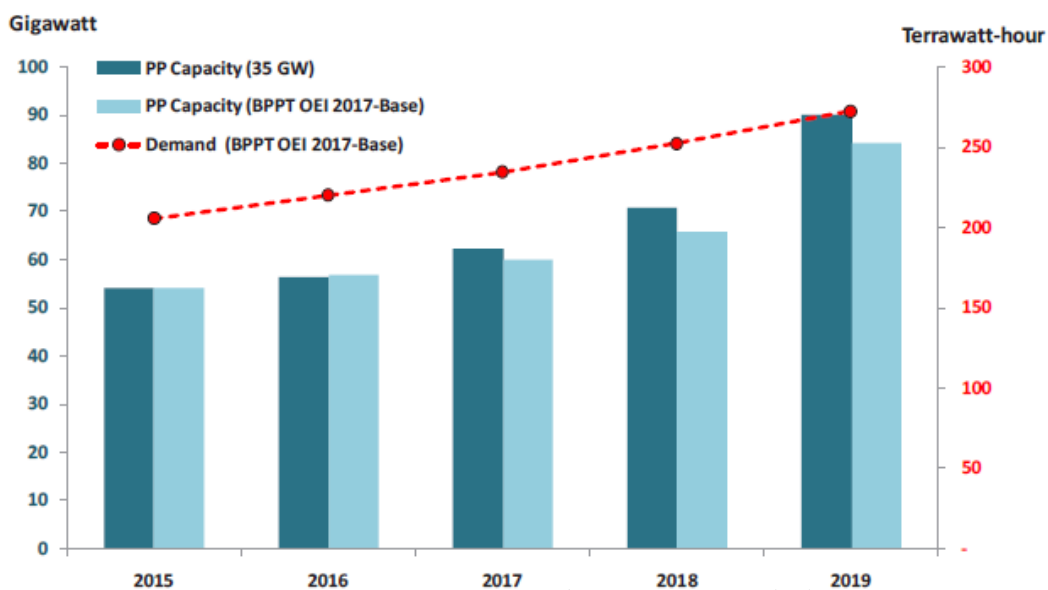
Background

At The United Nations Framework Convention on Climate Change or UNFCCC COP21 in Paris, 2015, Indonesia is committed to reducing its greenhouse gas (GHG) emissions at 2020 by 26% by own effort. One of the causes of large greenhouse gas emissions is due to the massive use of HVAC systems in the household and commercial sectors. This also affects the increase in the consumption of large electrical energy. The graph below illustrates Indonesia's electrical energy needs in the base scenario and the high scenario.



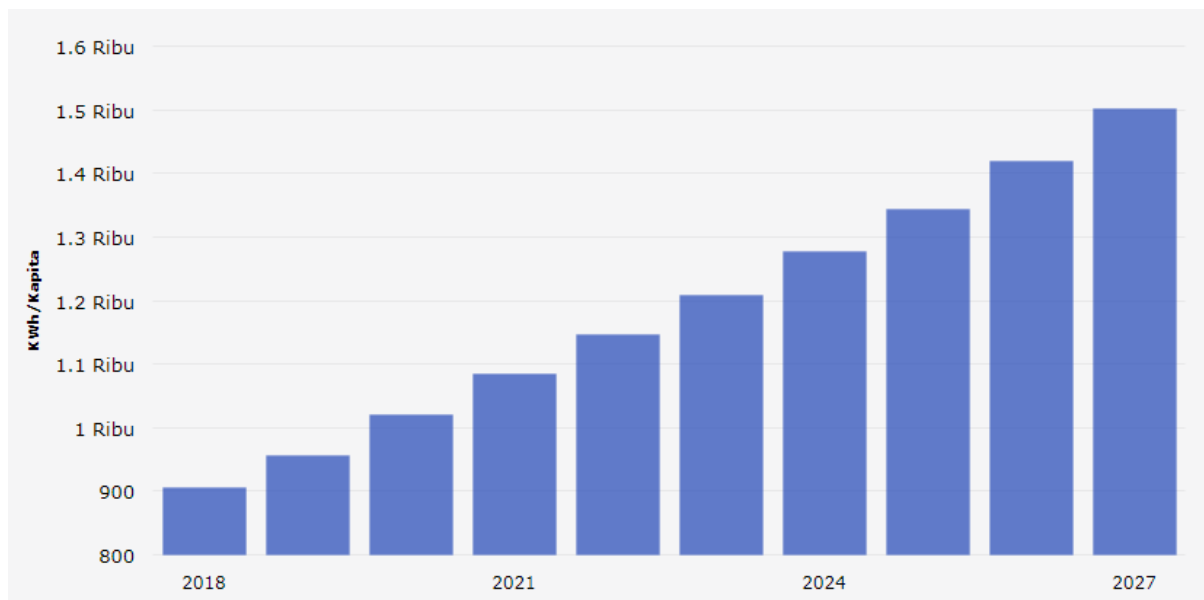
Source : Indonesia Energy Outlook 2017 - BPPT

The capacity of power plants in Indonesia for 2015-2019 can be seen below.



Source : Indonesia Energy Outlook 2017 - BPPT

An increase in electricity prices will occur throughout the year, the graph below illustrates its predictions.



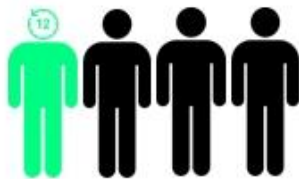
Source :Rencana Usaha Pengadaan Tenaga Listrik (RUPTL) PT PLN

Based on the above mentioned Indonesian commitments and also see the prediction of electricity demand and existing generating capacity, it is necessary to save the consumption of this electrical energy. One way is to control and monitor in the use of electricity so that consumptive behavior can be avoided.

Our Survey

Based on our research on 170 potential consumers, we found out that 25% of our respondent turn on their light longer than night time, which means there's wasteful electricity produced by our respondent. We also found that 30% of our respondent forget to turn off their lights at least 5 times in a month. This phenomenon also happen to other electricity devices, where consumers often forget to turn off their electricity devices after they finished using it. This shows us wasteful habit made by our potential consumers. 97% of our consument also believe that their electricity expense could be used more efficiently and they also want to make their electricity usage more efficiently.

1 of 4 people of our respondents use lamps for **longer than the nighttime** itself.



One of three people forget turning their lights off for at least **5 times** every month.



Currently, electricity usage in Indonesia used for daily needs where based on population census of Statistical Center Indonesia in 2010 there are 271 millions people in Indonesia. Based on data katadata.co.id electricity usage per capita in Indonesia could reach 1000 KWH for a year this number shows how big electricity need in Indonesia. In addition to that, based on data from Association of Internet Provider Indonesia says that there are 54,68% Indonesians who already used internet. What if this trend could be use to save more energy?



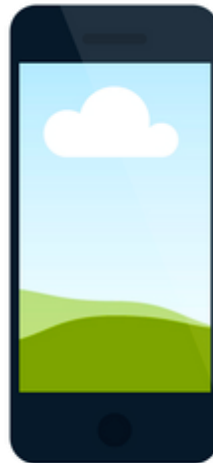
ENEMIZER AS SOLUTION

Enemizer (Energy Optimizer) is a product that has a purpose of helping people and industries to reduce, control, monitor, and advice energy usage through smartphone

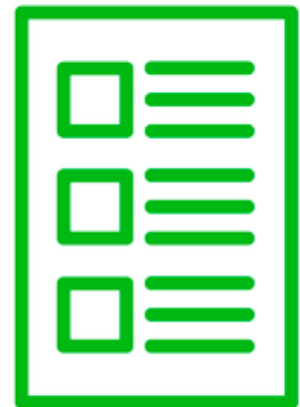


Save Electricity
(30%)

Monitoring



Scheduling



Advice

ENEMIZER: prototype

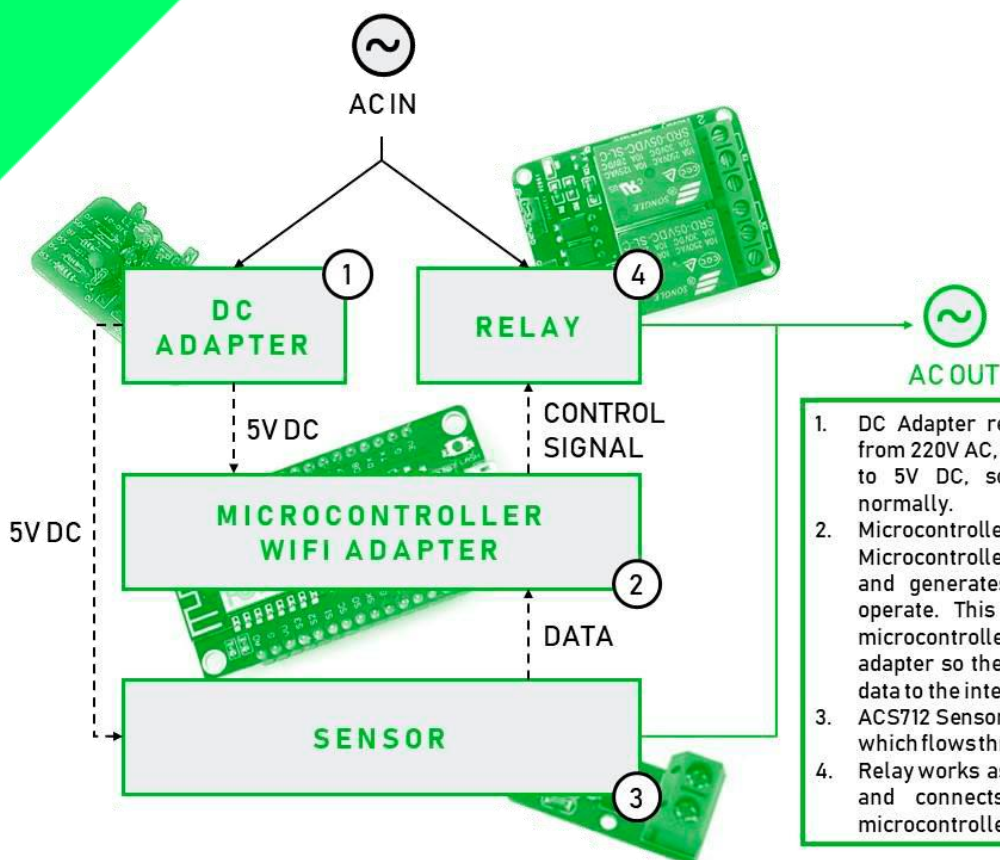
WHO COULD USE IT BEST?

We offer a **smart module** as our main product with a **smartphone application**.
Enemizer is **easy to install** and **operate**: one system, one app, one user experience.
Our app has the ability to track, monitor and control the electricity usage on our **smartphone**.

Our target customers are **households, residentials, families, students and professionals**. Enemizer are made specially for those who are too busy to manage their energy usage manually. Technically, the smart module, which will be linked to users home internet is the key object needed for the overall smart home services, which can be accessed anywhere and anytime via users smartphone as long as they connected to the internet.

ENEMIZER: prototype

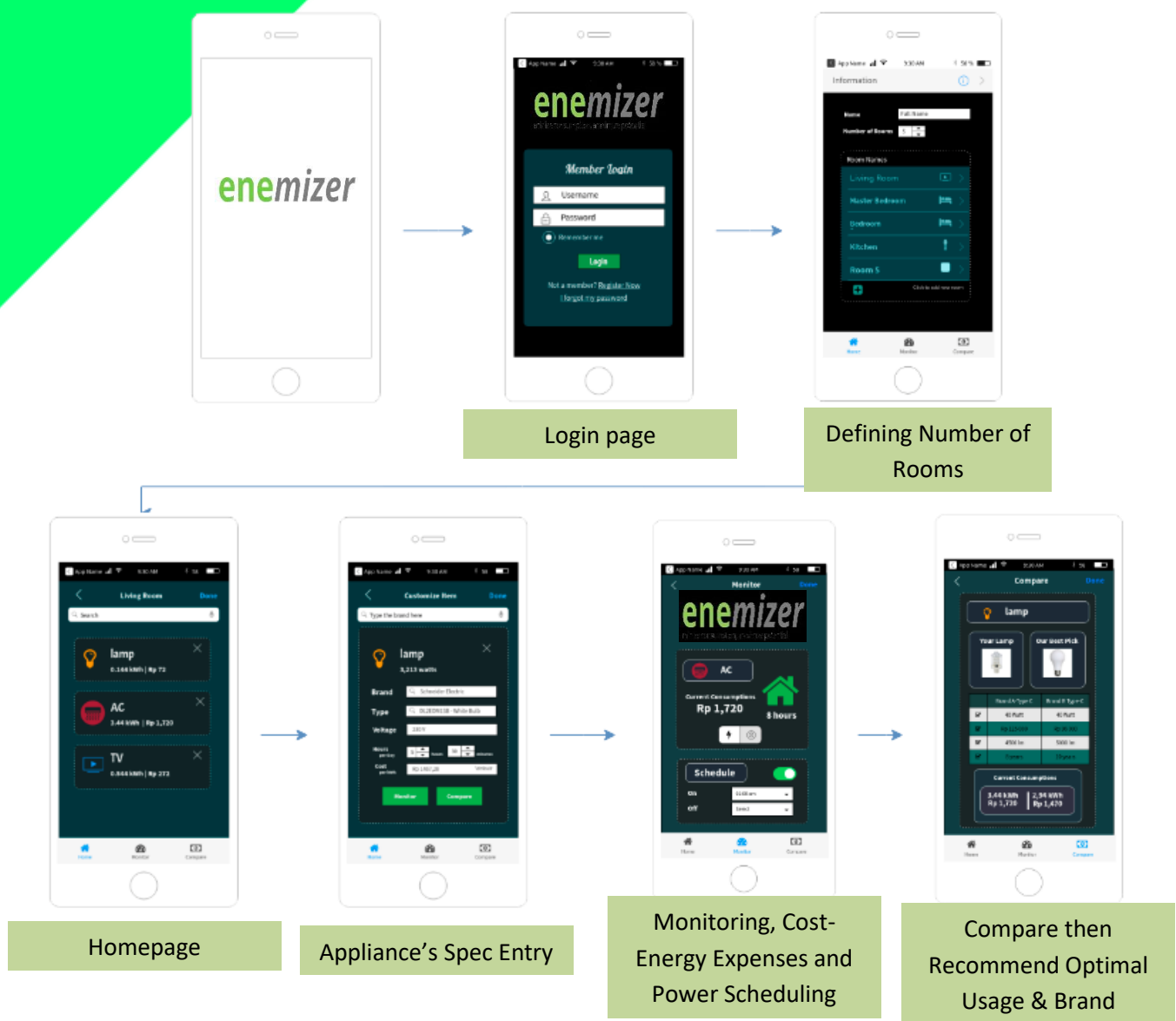
HOW DOES IT WORK?



1. DC Adapter regulates voltage used in this system from 220V AC, coming from the household electricity, to 5V DC, so other components could operate normally.
2. Microcontroller is the brain of the system. Microcontroller records the data given by the sensor and generates control signal so the relay could operate. This system uses NodeMCU v3 as the microcontroller, this microcontroller includes wi-fi adapter so the system could be controlled and send data to the internet.
3. ACS712 Sensor used by this system measures current which flows through the system.
4. Relay works as automatic switch in the system. It cuts and connects the electricity according to the microcontroller's command.

ENEMIZER: prototype

THE APP'S WIREFRAME



ENEMIZER: prototype

PRODUCT EXPECTED SPECIFICATION

INPUT VOLTAGE	220V AC
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OPERATING POWER	12 Watt
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MAX INPUT/OUTPUT CURRENT	30 A
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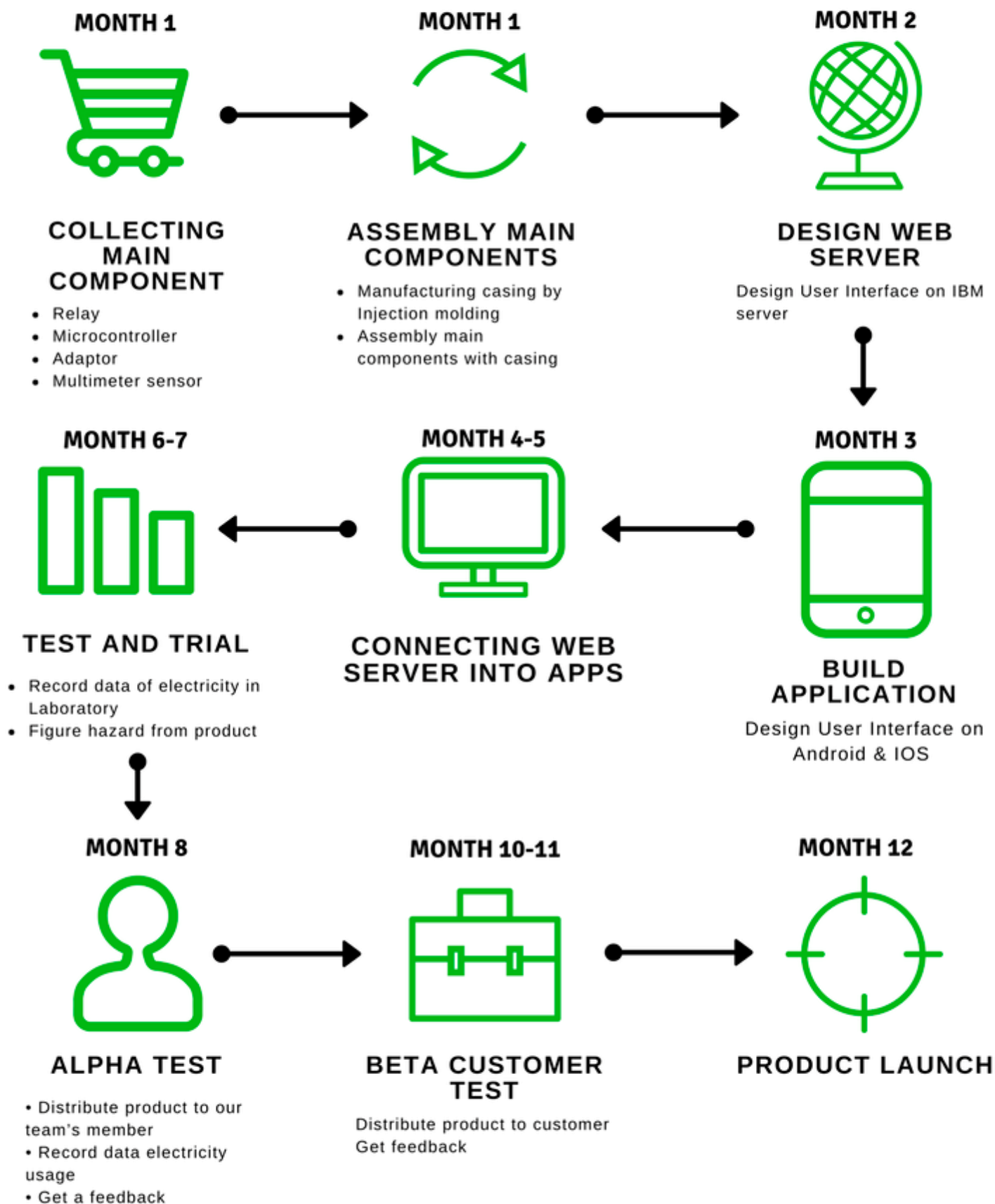
Cost & Benefit

Cost	Quantity	Price/Value	Total
Cost of Goods Sold			
Cable	1	0.95	SGD 0.95
Sensor	1	2.85	SGD 2.85
Relay	20	1.90	SGD 38.00
Micro Controller	1	5.70	SGD 5.70
Casing	1	0.29	SGD 0.29
Bolt	4	0.02	SGD 0.10
Server	1	Free (IBM)	SGD 0.00
Total			SGD 47.89

Benefit			
Electricity Savings	1 Month	Less 23% of Monthly Electricity Expense	Around SGD 15.60/ Month
Consumer's Convenience	-	Electricity Reminder	
		Electricity Control	
		Electricity Scheduling	

Our device could save around **SGD15.60** per months, imagine if this device could be produced massively which will make the cost of production much more cheaper and more electricity energy could be saved. In the end, they could save **4.6 MW** per year.

TIMELINE PROJECT



output.

Helping people reduce their electricity
cost

Making their electricity expenses
transparent

Easing their electronics control access

enemizer,

being more than just a useful energy assistant, aims to bring value of becoming **efficient** in the daily life for our users.