SMART SOLAR

FOR A BETTER FUTURE

Team - IOTive

INTRO

- IOT plays a vital role in nowdays. People may use the internet of things to live and work smarter, as well as acquire total control over their life.
- With all of these, the main problem arise is the power.
- Because of that, the world is now moving towards sustainable energy sources.
- Like that, Solar Energy is one of best and popular sustainable energy source.
- In this project, Solar Energy Consumption Through IOT is our main goal.

MOTIVE

- As Sri Lankans, we all experience a power crisis.
- This has made people to go towards sustainable energy sources like solar.
- But the problem is that, they are not energy efficient as well as cost effective.
- The main reason for that is found to be inefficiencies in the energy harvesting and use.

SOLUTIONS

- Mainly, inefficiencies are caused due to,

    1. AC to DC and DC to AC conversion
    2. Problems in the solar panels

Inefficiencies due to AC to DC and DC to AC conversion

- Inverter converts 12V DC to 230 AC.
- After that, again it is converted to 12V DC at some devices like TV s, computers etc.
- This is a significant wastage of power.

Solution

- What if we can switch our system between AC and DC according to the connected device and power source using IOT.

Problems in the solar panels

- Insufficient sunlight incident on the solar panels due to environmental factors like shading, dirt/dust, animal interference and technical factors.

Solution

- Solar panel fault detection and notification using IOT.

For that, our solution gives the ability to,

- Detect the exact solar panel(s) with faults.
- Minimize AC to DC and DC to AC conversion power loss.
- Transfer from the grid to the designed off-grid solar system in the house via mobile application when needed.
- Real time power monitoring with power management.

TECHNOLOGIES

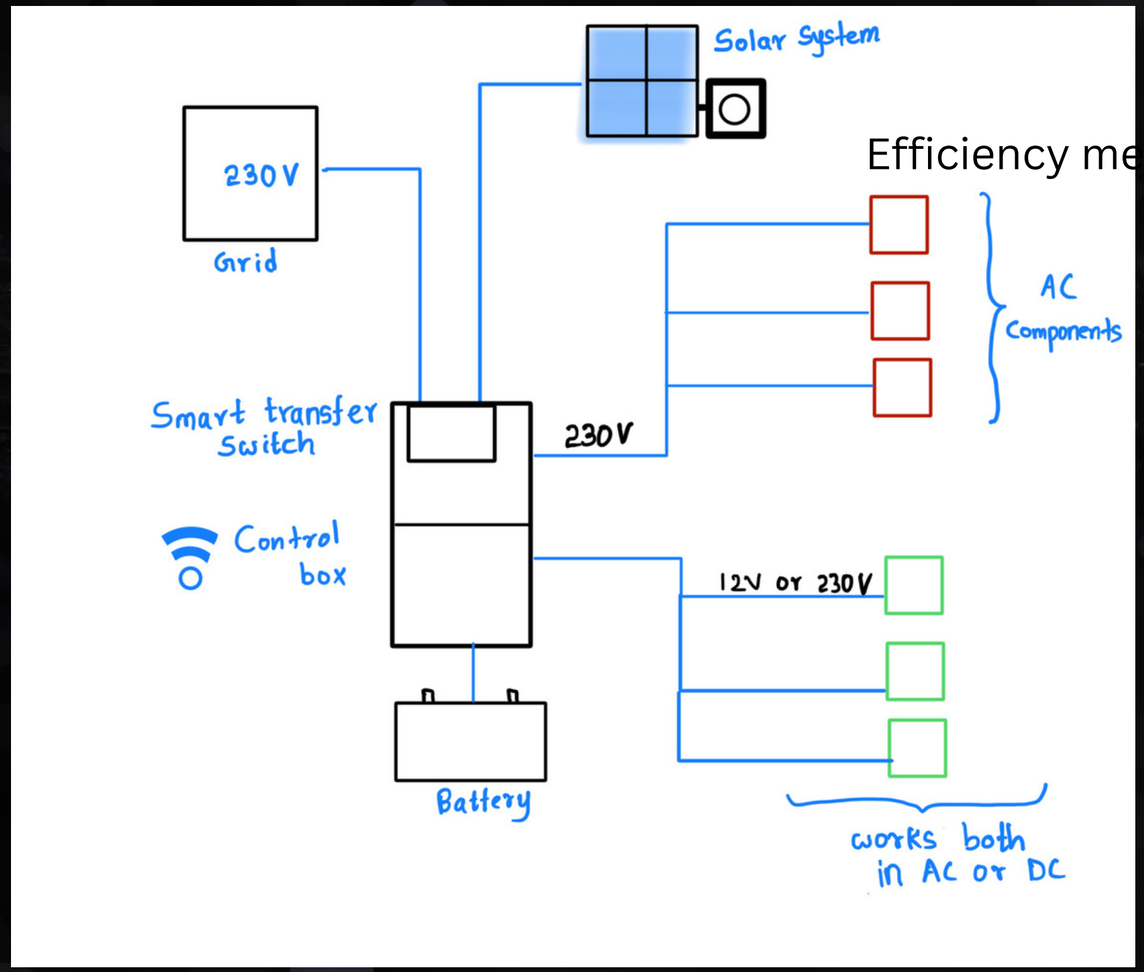
- Wi-Fi
- AWS
- Flutter
- Single sided PCB

PLAN

Control box

- Inverter
- Wi-Fi module
- Smart tranfer switch between Grid power and solar, controlled via mobile application.
- Smart battery charging controller

- Smart Efficiency meter is connected to each solar panel
- Control box is connected to the internet



- When considering existing house hold devices which are able to be operated using DC (like TV s, radios, bulbs...) are cannot be directly operated using DC.
- For that, it should do a slight change in the inner circuit of those devices.
- Because of that it is planned to first work with the lighting systems and go for the switches.

MARKETING

- Solar is renewable, abundant and free.
- Everyone pays an electricity bill, but investing in solar makes the bill zero.
- Even though there exists off grid solar systems what makes our product unique ?
  - Solar panel efficiency monitoring system user get updates via mobile app whether it is working at the rated efficiency compared to other neighboring solar panels.
  - There are automatic transfer switches where switches to solar power when there is no grid current .

- However if we want to switch to solar even though grid power is present, we have to manually switch to it.
- For that, our product consist of smart transfer switch where the consumer does not need to stay near the solar system to where it can be switched using a mobile application via internet.
- In order to have higher efficiency, we suggest appliance manufacturers to add the capability of switching to operate through DC power when needed.
- Then we can directly input DC to appliances without wasting AC to DC or DC to AC conversion power loss.
- So, no other solar system in market meets all these features.

MARKETING PLAN

- First we form a solar company and enter to the market.
- Also we promise that this system is cost effective than competitive products.
- How it is cost effective ?
  - Hybrid inverters has smart solar monitoring system which is quite expensive.
  - As a company our vision is to be the most successful and respected solar company in Sri-Lanka.

ENERGY SUSTAINABILITY

- When considering solar power, it is already a sustainable energy source.
- But aquiring and using solar power for 24 hours for house hold is not possible due various factors ike lack of sunlight and cost constraints.
- Because of that, it is needed to use the power from the grid as well.
- With our project, it makes the use of solar power more efficient and reduce the use of grid power making it usable for a longer future.