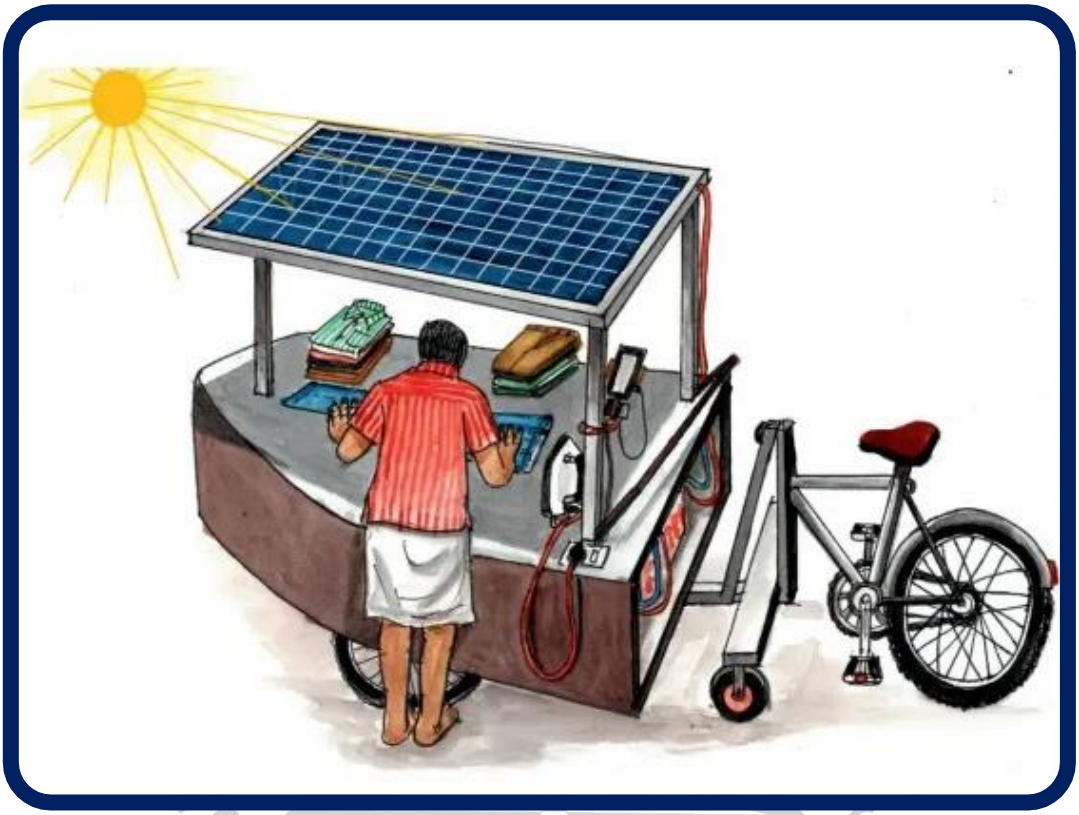
SOLAR IRON CART PROJECT



Student Involved in this Project

S.No	Name of the Students	Department	Year
1	Sathiyan S	EEE	4th Year
2	Stalin K	EEE	4th Year
3	Fahed S	EEE	4th Year
4	Bhuvanesh S	EEE	4th Year
5	Akram F	EEE	4th Year
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Faculty Incharge

Mr.C.Venkatesh AP/EEE

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1. Objectives

To create awareness on applications of Solar energy in the students and staff. To assemble the Solar Iron Cart inside the college campus by the MSAJCE students and staff .A mobile ironing cart which uses solar panels to power a steam iron box. It eliminates the need for coal for ironing bringing about a welcome shift towards clean energy.

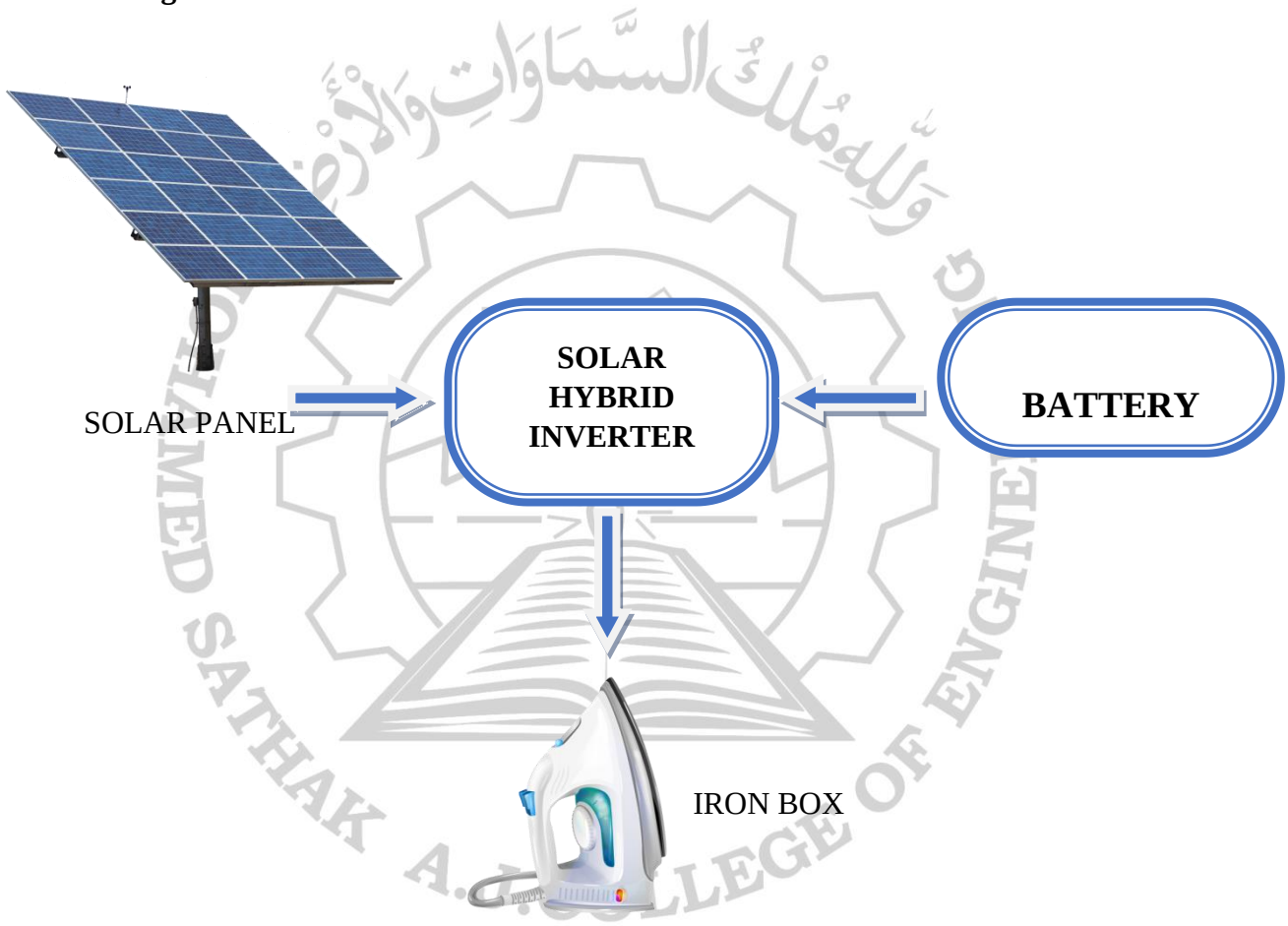
2. Introduction to Solar Iron Cart

Due to the technological advancement and population and explosion, the world's demand for energy has a rapid growth. So a renewable energy source that is cost-effective, reliable and everlasting must be opted to meet the future energy demands. There are many renewable energy sources out of which solar energy is free of cost. It is also suitable for long-term issues. Due to energy's high demand, the solar industry is developing all over the world. Many other energy sources like fossil fuel are expensive and also have limited applications. It has become a tool to sustain the underprivileged people's life. It also has a great part in developing in the economic status of various countries. Solar industry is the best energy source than other energy sources and a solution to meet the future energy demands as it has various benefits. The various benefits include capacity, cost-effectiveness, accessibility, availability and efficiency. India uses the solar power more than other renewable resources and India has high solar ionization. Solar energy is a renewable energy source, maintenance cost is low, diverse applications, and electricity bill gets reduced through its usage and it also helps in technology development. Solar energy has various residential applications which include solar heating for swimming pool, solar powered ventilation fans, solar house heating, solar water heater, charging batteries through solar power, solar powered pumps and so on. Adoption of renewable solar energy has various environmental advantages also. It reduces pollution, It is clean source, reduces the usage of water, helps to fight the climate change, reduces non-renewable energy dependence and improves health of humans in long-term.

The Ideology of solar powered iron cart was from the core idea of "The place where we live has an ironing cart and the man uses charcoal to heat the heavy cast-iron box for ironing. After ironing, the burnt charcoal is spread on the ground to cool and later thrown away along with garbage. Like this there are many number of ironing carts surround as, which also use charcoal and throw the burnt charcoal away along with garbage. It really gave us the idea to think about the number of ironing carts in India, the amount of charcoal burnt and the damage it does to the environment and Mother Nature. So, we researched for a viable solution and found that using solar power can effectively substitute the use of charcoal to heat

an iron box. Making use of renewable energy is the aim of innovation". It is estimated that there may be 10 million ironing carts in India and each burn about over 5 kg of charcoal every day. That's about 5 crore kg of charcoal burnt every day. Just imagine the resulting tree loss. "So, It is to design a mobile ironing cart with solar panels as its roof, which is connected to a battery, which will power the steam iron box for hours.

3. Block Diagram



4. Components Used

- JKM545M-72HL4-V MONOCRYSTALLINE PV MODULE
- 12V DC/800VA/MPPT SOLAR HYBRID INVERTER
- 12V -150AH SMF-VRLA Batteries for 30 KVA UPS
- 1000W Dry Iron Box with Soleplate

5. Specifications

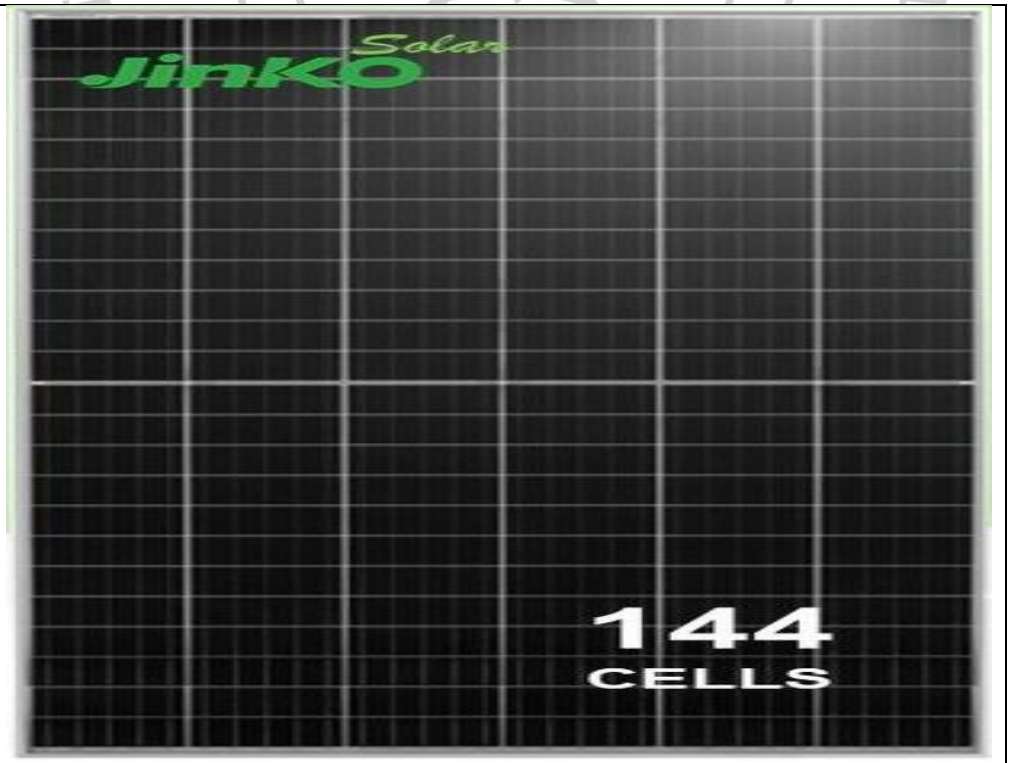
1. IRONCART SPECIFICATION

LOADING CAPACITY	320 KG
WHEEL TRACK	1024 mm
WHEEL BASE	1740 mm
TURNING RADIUS	2 Meters
LENGTH	2624 mm
BREADTH	1200 mm
HEIGHT	1064 mm
LOADING BAY DIMENSIONS	1200mm*1200mm

SOLAR IRON CART

2. SOLAR PANEL SPECIFICATION

CELL TYPE	P-type MONO-CRYSTALLINE
No.of CELLS	144 (6*24)
DIMENSIONS	2274*1134*35 mm
WEIGHT	28.9 kg
MODULE TYPE	JKM545M-72HL4-V
MAXIMUM POWER	545 Wp
MODULE EFFICIENCY	21.13%
OPERATING VOLTAGE	-40°C to +85°C



SOLAR PANEL

3. SOLAR HYBRID INVERTER

CAPACITY	2000VA,1600Watts
BATTERY VDC	24V DC
SOLAR CHARGER CAPACITY	40 A
SOLAR CHARGER TYPE	MPPT
SWITCHING BY	MOSFET
NOMINAL OUTPUT VOLTAGE	230 V AC
BATTERY TYPE	FLOOD TYPE LEAD ACID TUBULAR

SOLAR HYBRID INVERTER

4. IRON BOX SPECIFICATION

WATTAGE	1000 Watts
VOLTAGE	230 V
WEIGHT	789 Grams
DIMENSIONS	22.5*11*10.5 cm
MANUFACTURER	BAJAJ
MODEL NUMBER	440203

IRON BOX

5. BATTERY SPECIFICATION

BATTERY TYPE	Sealed Maintenance Free Valve Regulated Lead Acid
RATING	12V-150AH
DIMENSIONS	485*170*204 mm
WEIGHT	43.0 kg

9.

IRON BOX

5 Charging Specifications

- Power Rating of the Solar Panel Used : 540 W
- Power Rating of the Iron Box Used : 1200 W
- Power Rating of the Inverter Used : 1500 W

✓ Average Solar Energy Available time = 8hours/Day

✓ Average Watts generated in solar panel = (8*540) =4320 W/Day

The total number of hours the Iron Box can be used through the solar panel is

=4320/1200

=3.6 Hours/Day

i.e., while considering the practical losses which may happen in the system, we can conclude that the Iron Box can be used **upto 3 Hours/Day** while connected with the solar panel.

6. Advantages

- Solar energy is a renewable energy source which reduces carbon emissions.
- Solar energy can save electricity bill.
- Solar panels will have low maintenance cost.
- Solar energy can generate electricity in any climate.

7. Disadvantages

- The high initial cost of installing panels.
- Storage of solar energy is expensive.
- Solar doesn't work for every roof type.
- Solar panels are dependent of sun light

8. Conclusion and Future Scope

The solar-powered iron box was efficient in ironing the clothes and which will help homemakers & iron men to acquire crease-free clothes. Solar-powered iron box not only uses solar energy which is available in nature free of cost but also reduces the consumption of energy. The present study may initiate households in adopting solar devices for day to day activates and encouraging them to use new and renewable sources of energy to protect our environment. Developing our Solar cart into Electric vehicle is our future scope of our project.