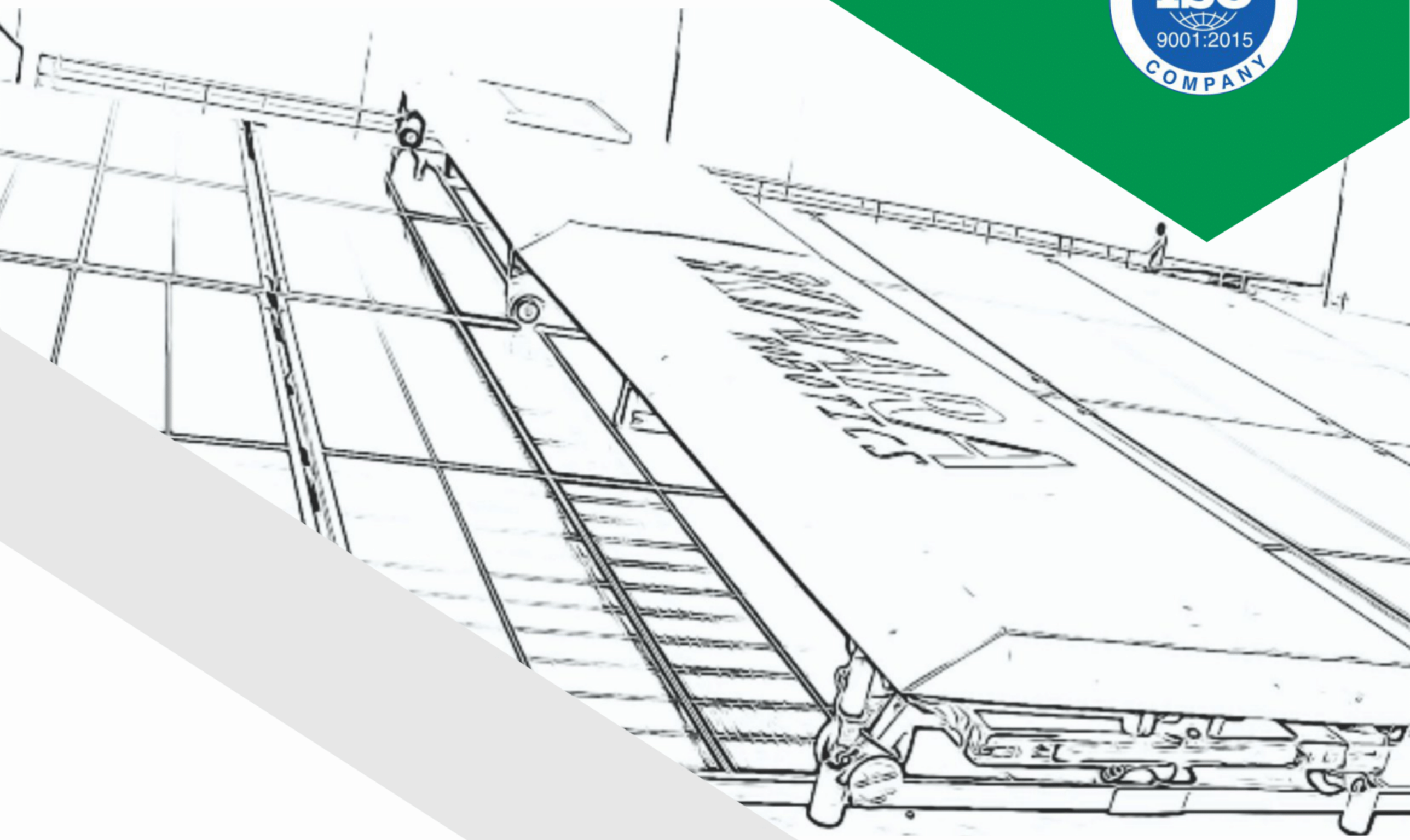


CERTIFIED ISO 9001:2015 COMPANY

Make Your Solar Better With

KIAARA®

ROBOTICS

BUILD INNOVATE INVENT
PATENT
INVENT INNOVATE BUILD

1 : 359382-001
2 : 202221024220

MAKE IN INDIA

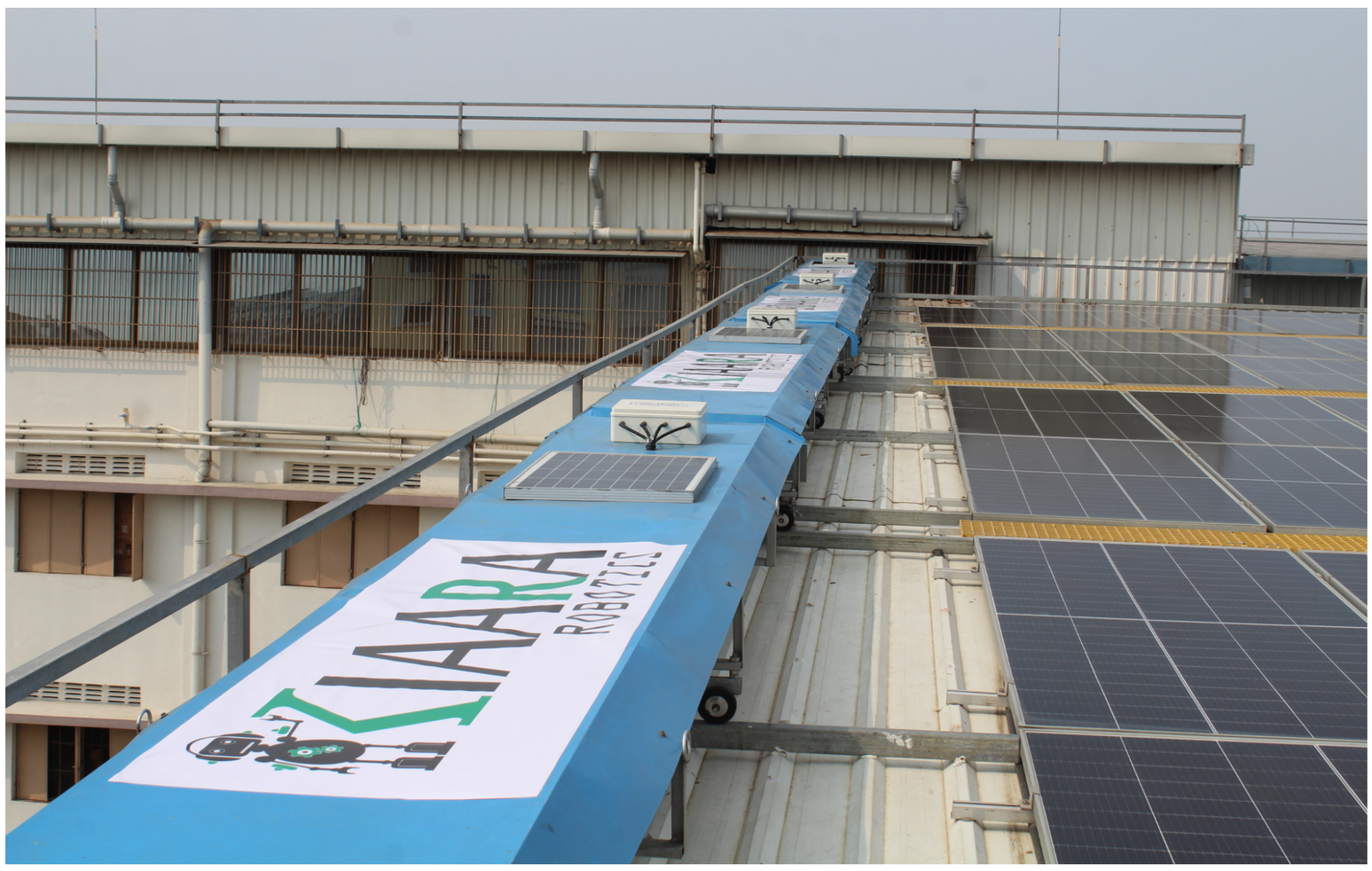
स्वच्छ भारत
एक कदम स्वच्छता की ओर

About Compnay

Kiaara Robotics is Located in Surat, India; We offer an Automatic Solar Panel Cleaning System. In other words, Kiaara Robotics provides a cloud-based, connected platform and a suite of automated solutions for smart management of solar plants.

We specialise in designing and manufacturing automatic solar panel cleaning robots. Our state-of-the-art robots are designed to efficiently and effectively clean solar panels, ensuring that they are operating at their maximum potential.

Dirty solar panels can significantly decrease their efficiency, and manual cleaning can be time-consuming and costly. That's where our robots come in. They are equipped with advanced sensors and technology that allow them to navigate and clean solar panels with precision and ease.



Our robots are completely autonomous and require minimal human intervention.

They can be programmed to clean solar panels on a regular schedule, ensuring that your panels are always operating at their best.

In addition to their cleaning capabilities, our robots are also environmentally friendly. They use water-efficient cleaning methods and leave no chemical residue behind, making them a sustainable solution for maintaining the cleanliness of your solar panels.

We are committed to providing our customers with the best products and services. If you have any questions about our solar panel cleaning robots or would like to learn more, please don't hesitate to contact us. We look forward to helping you keep your solar panels operating at their best.

Why Automatic Cleaning System

Maintaining the cleanliness of solar panels is essential for optimal performance and safety. If you are not careful, you could end up damaging the panels that reduce their ability to absorb sunlight. Improper cleaning methods can result in damage to the panels, such as scratches or cracks, and can also lead to reduced efficiency due to dirt and debris getting stuck in the panels grooves or edges, also it can be tough to remove. Plus, be mindful of safety - if the panels are left too dirty, they may become slippery, posing a risk to those attempting to clean them. It is crucial to exercise caution and use appropriate techniques to ensure that the solar panels are thoroughly cleaned without causing any accidents or injuries.

BEFORE

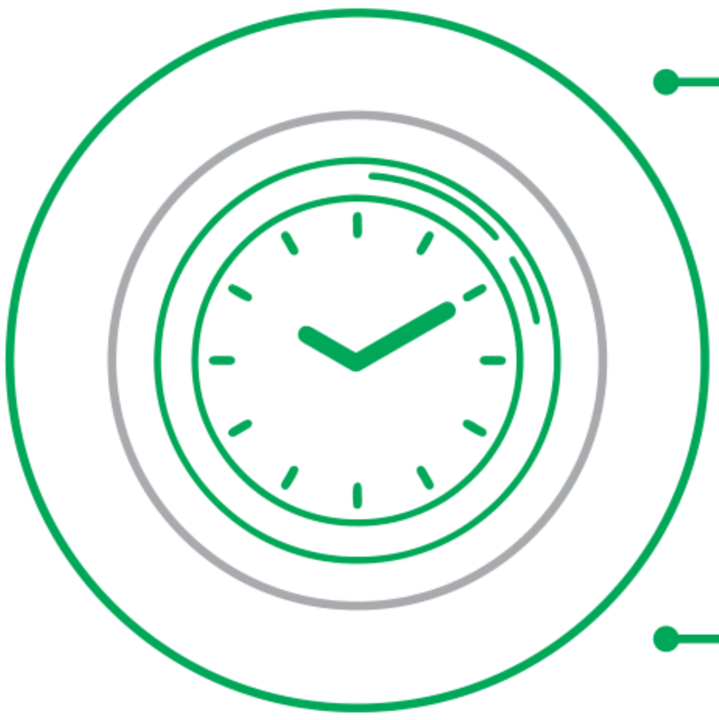
AFTER

By regularly giving necessary care and attention to solar panel, you can ensure that they
continue to operate at their highest capacity. Don't let these problems get in the way of keeping your solar system running smoothly - use the right techniques and caution when cleaning your panels to ensure they are performing at their best.

Automated cleaning systems is a mechanism that uses rotating brushes to sweep the surface of the panels and remove dirt and debris. Investing in an automatic solar panel cleaning system may seem costly at first, but it will provide a significant return on investment in the long run. Not only will it improve the efficiency of your solar panels, increasing the amount of energy they produce, but it will also extend their lifespan by protecting them from damage that can be caused by manual cleaning.

Additionally, the system will save your company both time and money in maintenance costs, as the system operates automatically, freeing up your time for other important tasks and eliminating labor-intensive task which reduce risk injury. The high cost of the system is a small price to pay for the numerous benefits it will bring, including increased energy production, improved panel longevity, and the peace of mind that comes from knowing your panels are being kept in optimal condition. In the end, the cost savings from increased energy production and reduced maintenance costs will more than make up for the initial investment in the automatic cleaning system. Don't miss out on this opportunity to enhance your solar energy system and secure a more sustainable and efficient future.

Unique Solution

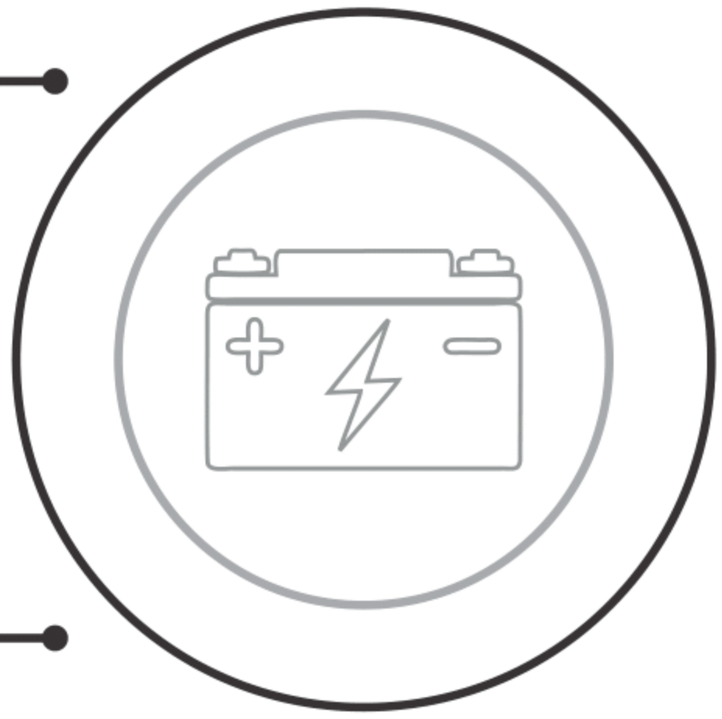


DAILY CLEANING

By default the robots get triggered for operation every day in the evening at 7 PM

SELF POWERED

Battery which will be charged by a solar panel installed on Robot

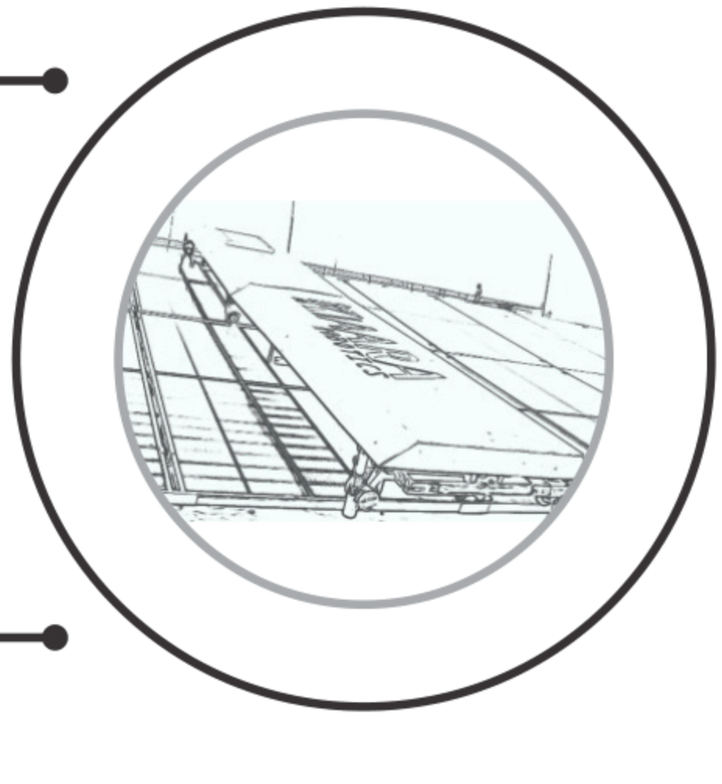


DRY CLEANING

90% effective dust removal without water

WITHOUT HUMAN INTERACTION

The Kiaara robots use an autonomous mechanism like daily working, uploading data on servers, automatic problem detection, and decision-making



Specifications

Make Your Solar Better With KIAARA® ROBOTICS

Characteristics	Description
Cleaning Period	Daily
standard cleaning time	The robots are automatically set to start working every evening at 6 PM.
Weight (kg)	50 - 60 Kg
Length x Width	<=8 meter x 0.56 meter
Signal Transmission	High-precision robot control using a wireless controller from a distance.
Communication	Wi-Fi connectivity for Real-time data alert.
Robot Speed	Adjustable up to 11 meter per minute
Cleaning Fiber	Nylon-fiber
Maximum Angle of Elevation	25 degrees
Power Source	50W Poly-Crystalline Solar Panel
Power Input	10 Ah Li-ion Battery which will be charged by a solar panel installed on Robot
Normal Operating Temperature	-20° to 75 °C
Battery running capacity	2 hours with a full charge
Load Distribution	The maximum weight of the robot is 50 kg, which is split among its six wheels for an average weight of 4.3 kg. The robot's symmetrical design ensures that the load is distributed equally.
Wind Load Analysis	Robots with cover can tolerate winds up to 15 m/s, or 54 km/h; uncovered robots may survive winds up to 98 km/h.

Economic Analysis

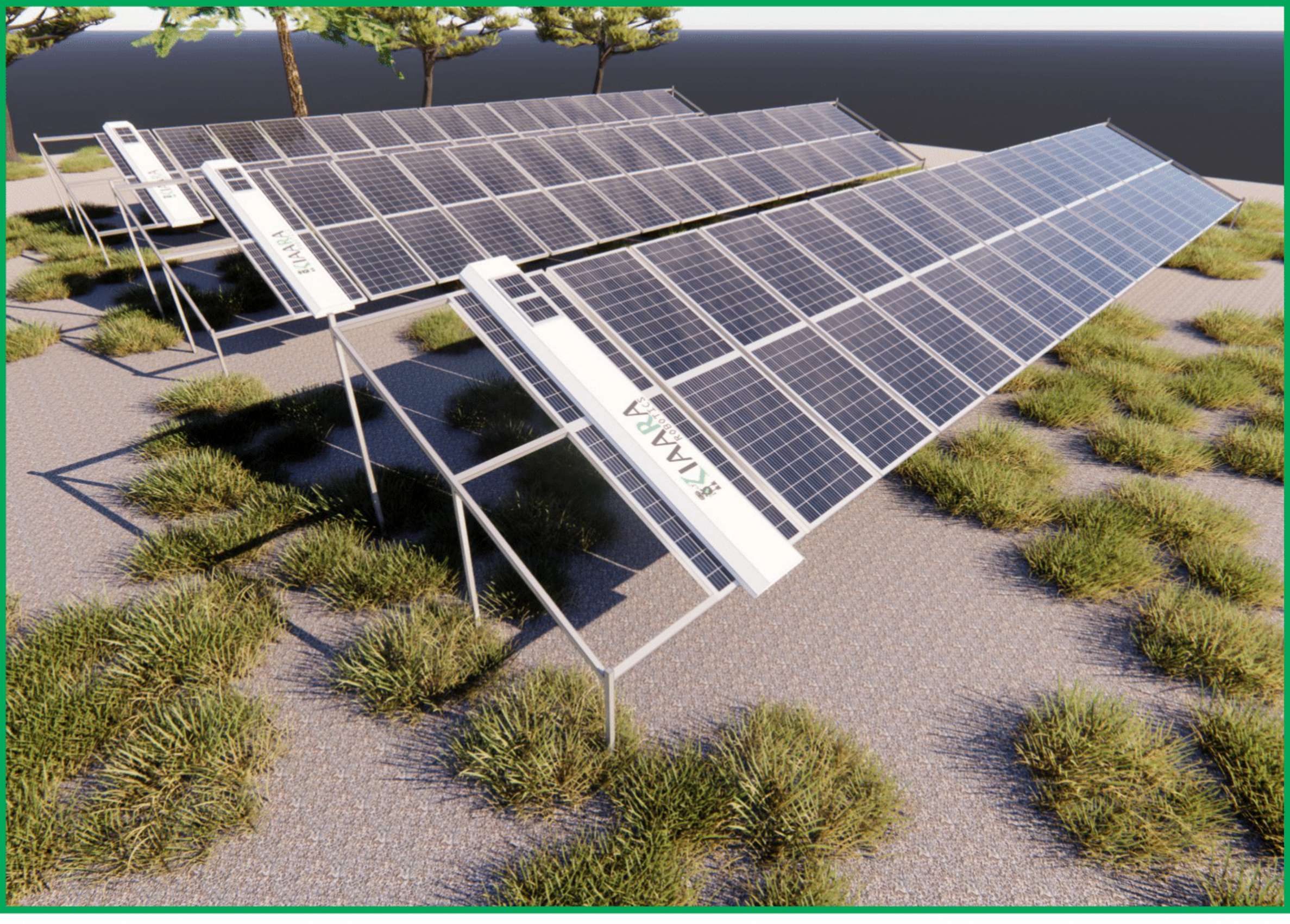
Water Consumption Calculation Without Automatic Cleaning System	
Water needed to clean one PV module	2 ltrs
Water supply per litre rate	0.17 INR
Water required for total 752 PV module cleaning	1504 ltrs
Monthly net water consumption (per month 4 cycle)	6016 ltrs
Monthly cost of Water consumption	1022 RS
Net water consuption in a year	72192 ltrs
Annual cost of Water consumption	**12272 INR**

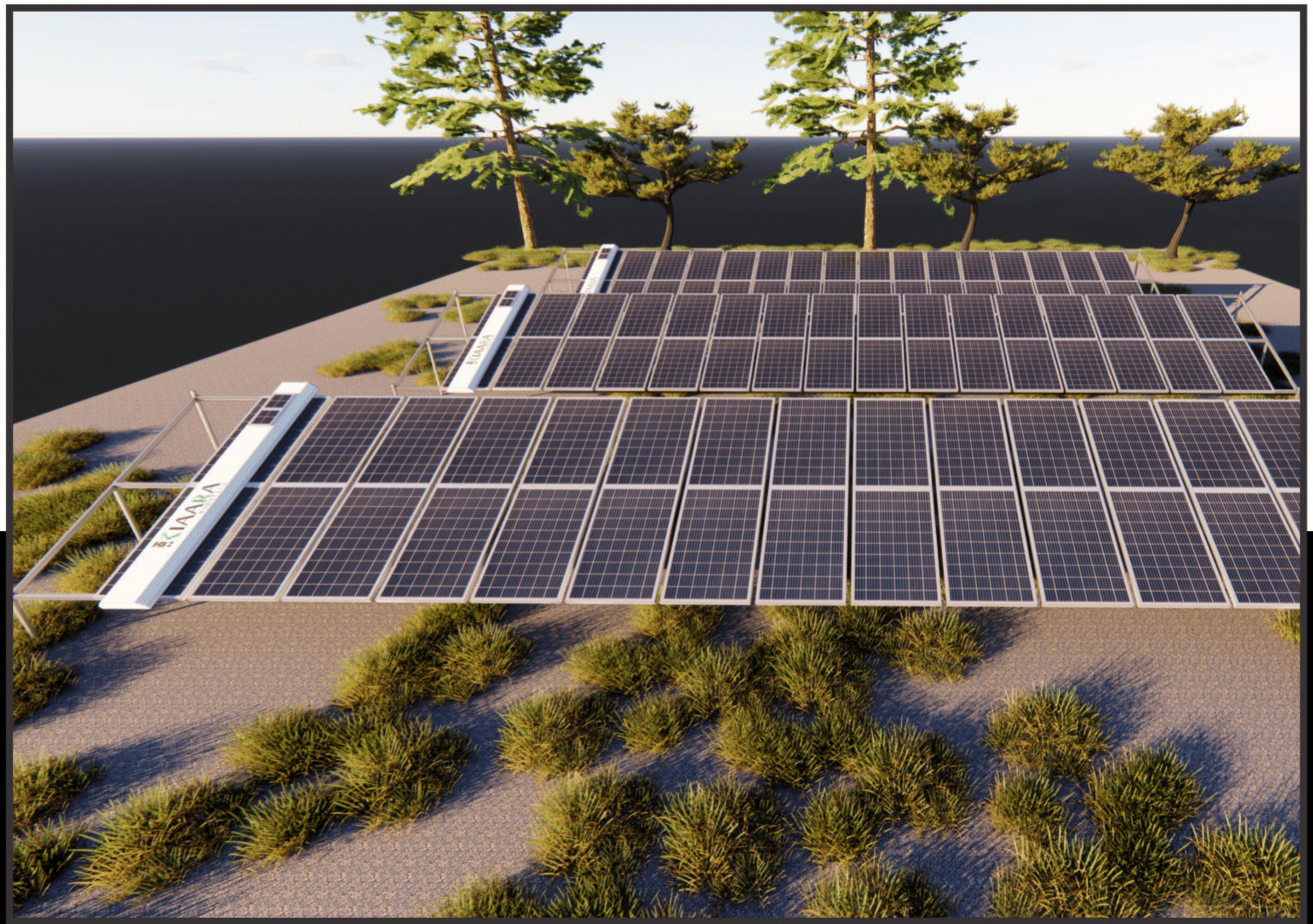
Manpower Analysis (without Automatic cleaning system)	
Cleaning time for 1 PV module	1 min
Daily working hours per person	6 hr
Worker require for entire plant (752 module) cleaning in 1 day	2 worker
Cleaning time for entire plant (752 module)	51 hrs
Manpower cost per cleaning	1000 INR
Manpower cost per month	4,000 INR
Manpower cost per annum	**48000 INR**

Power loss Analysis (without Automatic cleaning system)	
Percentage loss of Energy	12%
Average production per day (5 hour sunlight availability in a day)	800 KWH (Units)
Approx. Unit cost (Incase of direct sell to DISCOM)	7.5 Rs/ Unit
Loss of Units per day	96 KWH (Units)
Financial loss per day	720 INR
Financial loss per month	21600 INR
Financial loss per annum	**259200 INR**

Total = Water consumption cost + Manpower cost + Financial loss
= 12,272 + 96,000 + 3,24,000
= 4,32,272 INR/Year

Total Payback Period 3.5 years


KIAARA
ROBOTICS


KIAARA

Terms and Conditions Agreement

Read and understand this Conditions.

Please read and understand this catalog before purchasing the products. Please consult your Kiaara representative if you have any questions or comments.

Warranties.

(a) Exclusive Warranty : Kiaara's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Kiaara (or such other period expressed in writing by Kiaara). Kiaara disclaims all other warranties, express or implied.

(b) Exclusive Warranty : Kiaara Makes No Warranty For Semi-automatic Robotic System

Limitation on Liability

Kiaara Companies Shall Not Be Liable For Special, Indirect, Incidental, Or Consequential Damages, Loss Of Profits Or Production Or Commercial Loss In Any Way Connected With The Products, Whether Such Claim Is Based In Contract, Warranty, Negligence Or Strict Liability. Further, In No Event Shall Liability Of Kiaara Companies Exceed The Individual Price Of The Product On Which Liability Is Asserted

Suitability of Use.

Kiaara Companies Shall Not Be Responsible For Conformity With Any Standards, Codes Or Regulations Which Apply To The Combination Of The Product In The Buyer's Application Or Use Of The Product. At Buyer's Request, Kiaara Will Provide Applicable Third Party Certification Documents Identifying Ratings And Limitations Of Use Which Apply To The Product. This Information By Itself Is Not Sufficient For A Complete Determination Of The Suitability Of The Product In Combination With The End Product, Machine, System, Or Other Application Or Use. Buyer Shall Be Solely Responsible For Determining Appropriateness Of The Particular Product With Respect To Buyer's Application, Product Or System. Buyer Shall Take Application Responsibility In All Cases. Never Use The Product For An Application Involving Serious Risk To Life Or Property Or In Large Quantities Without Ensuring That The System As A Whole Has Been Designed To Address The Risks, And That The Omron Product(s) Is Properly Rated And Installed For The Intended Use Within The Overall Equipment Or System.

Programmable Products.

Kiaara Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data

Data presented in Kiaara Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Kiaara's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Kiaara's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Kiaara's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Kiaara Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

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