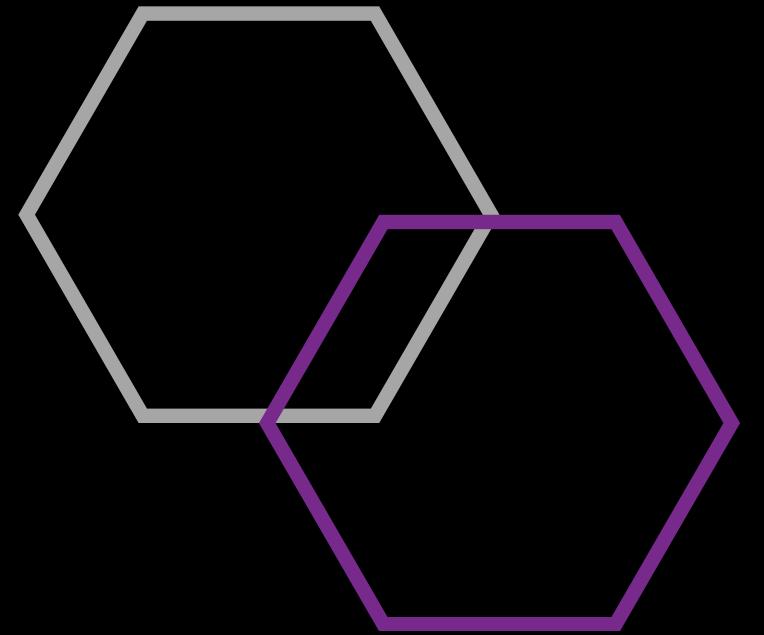


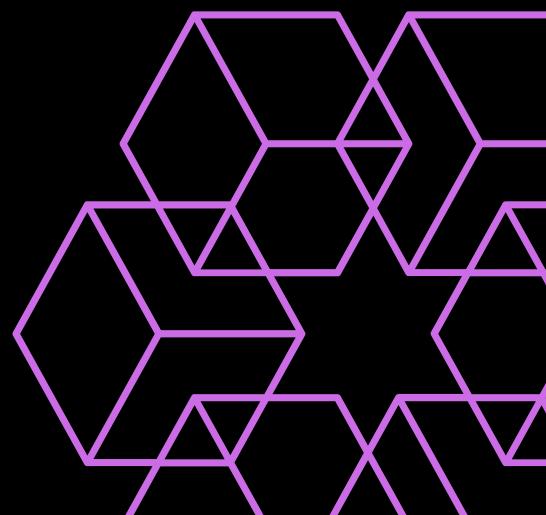
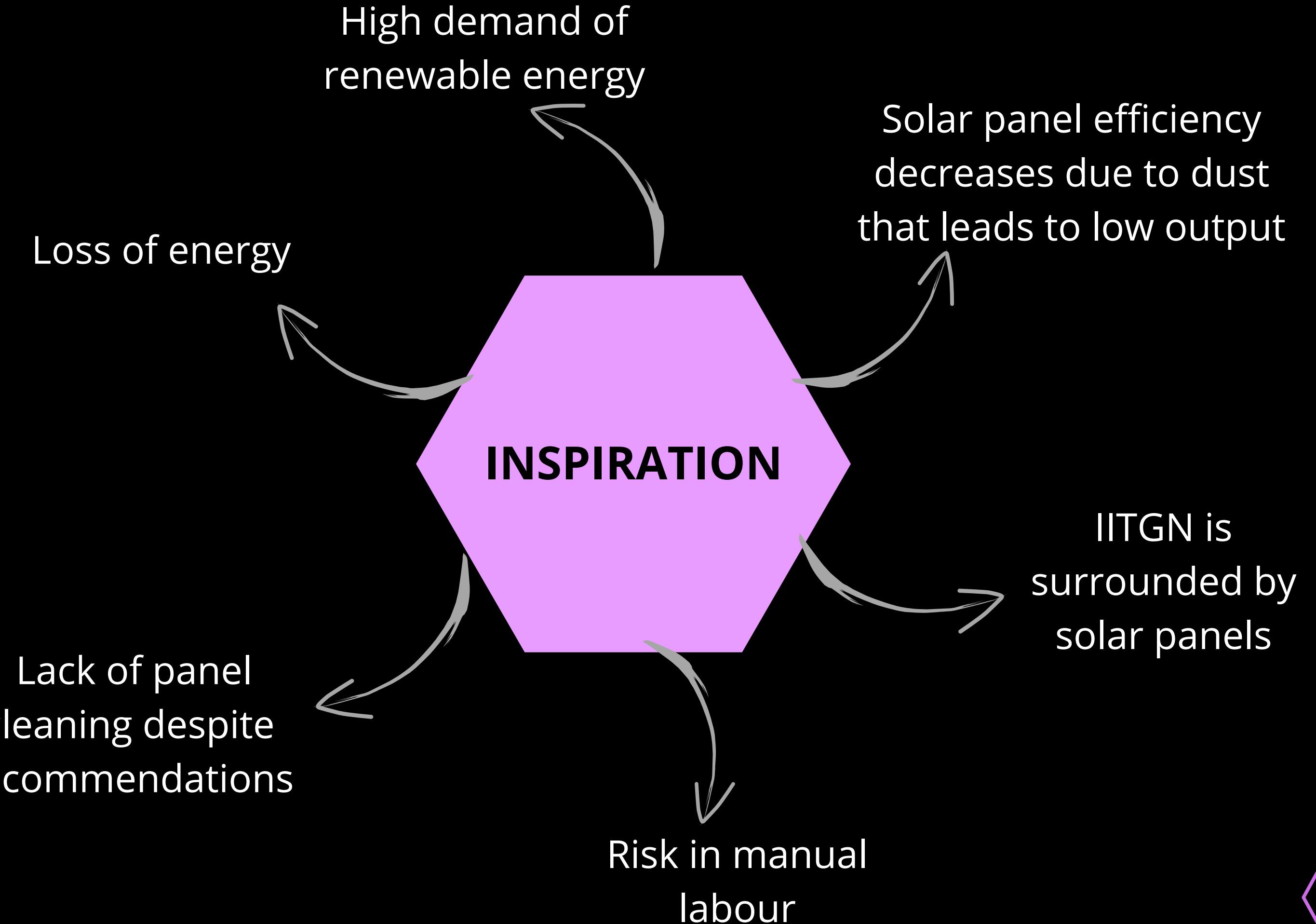
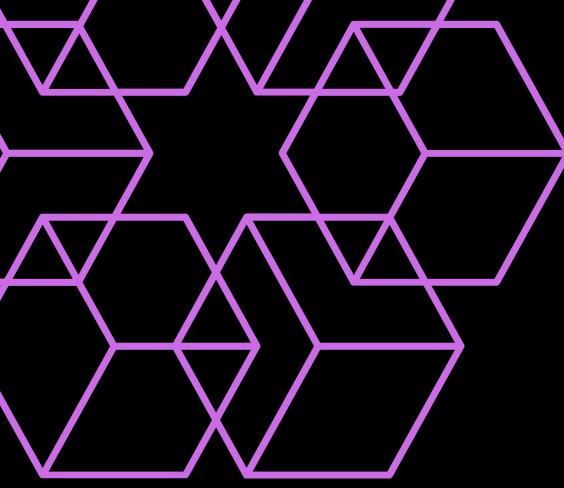
*Team  
Self-solar sweep*



# SELF-SOLAR SWEEP

Simpler Living,  
Brighter Future





# SOLVING A HUMANITARIAN PROBLEM

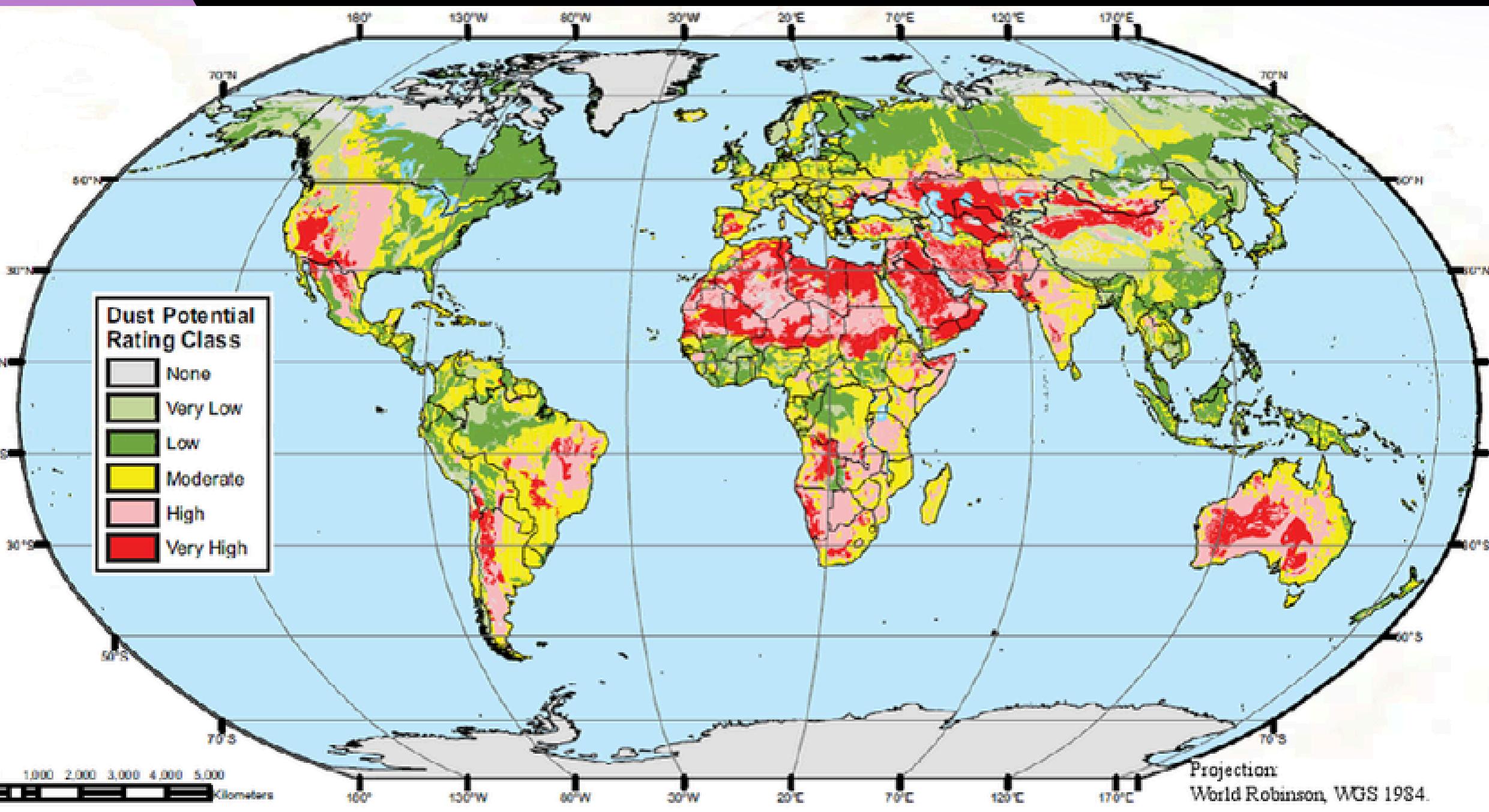


Manual labour employed in cleaning solar panels can pose risks of slips, electrical hazards, structural instability, and heat-related issues. Here at IIT Gandhinagar, we observe dangerous conditions for manual workers cleaning solar panels on a daily basis.

# SOLVING A GLOBAL PROBLEM

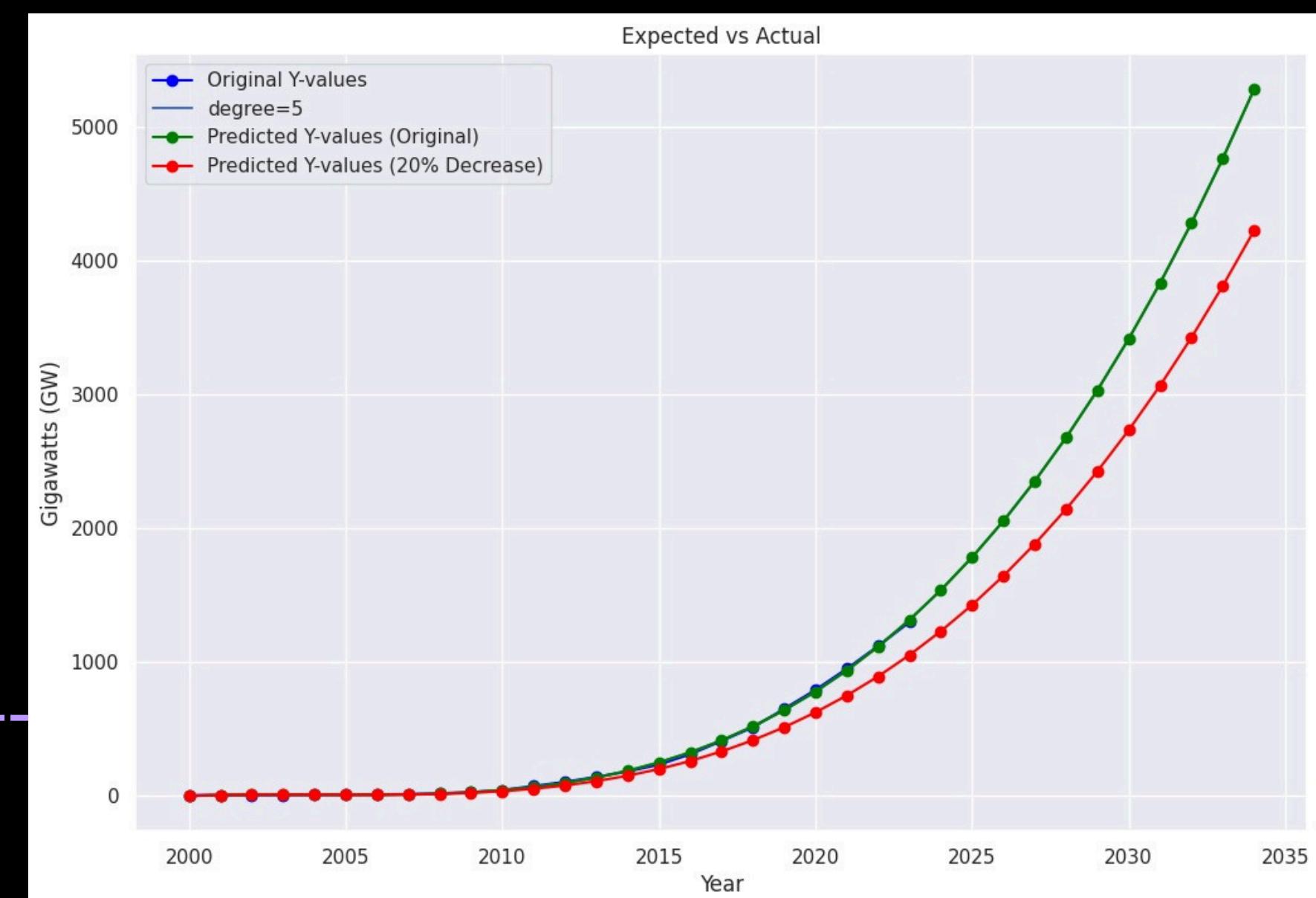
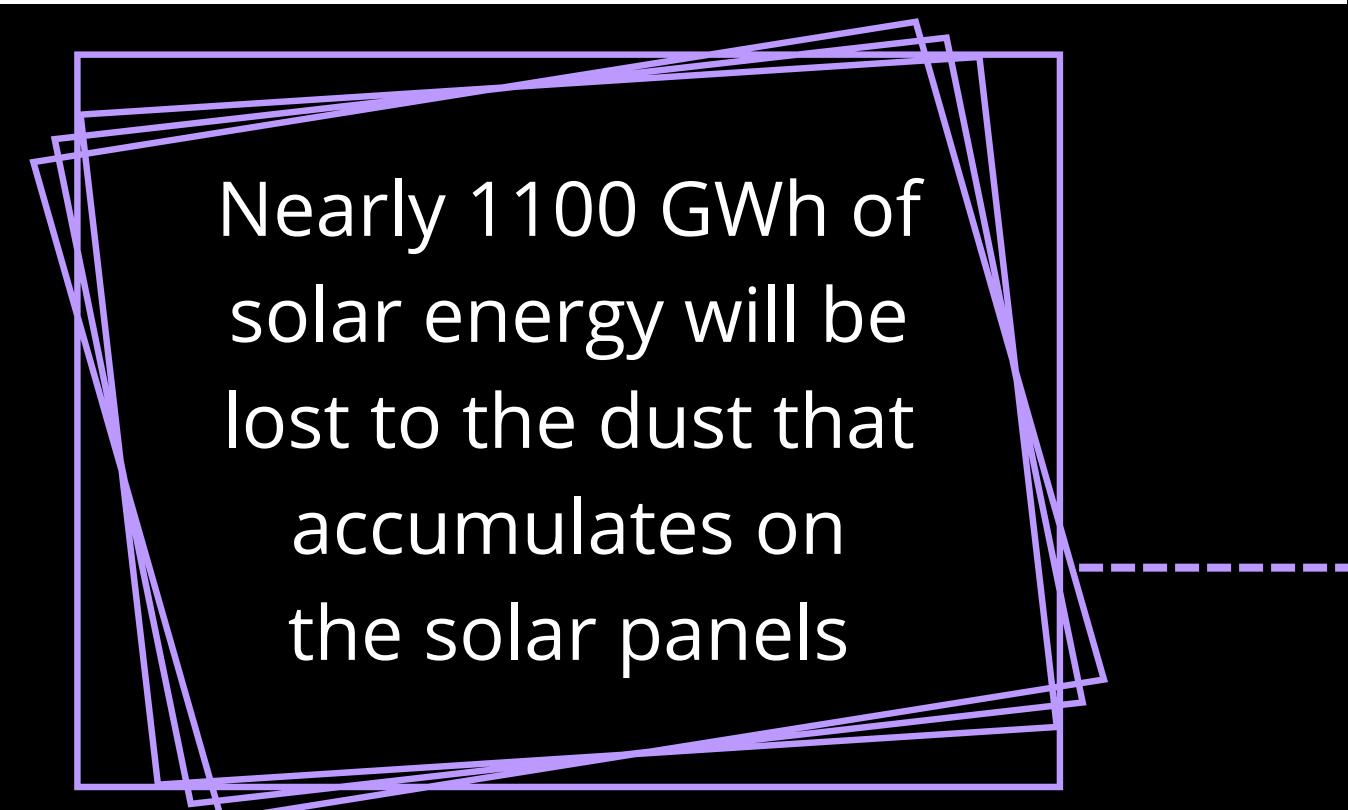
Accumulation of dust particles on solar panel blocks sunlight.

According to a study, dust is responsible for reducing efficiency by as much as **18% every month [1]**.





Prediction of solar power installations in next 10 years [2] by ML models



# EXISTING SOLUTIONS



## Small-scale solutions

**Manual Labour:** Cost-ineffective, high water wastage, and danger to life



## Large-scale solutions

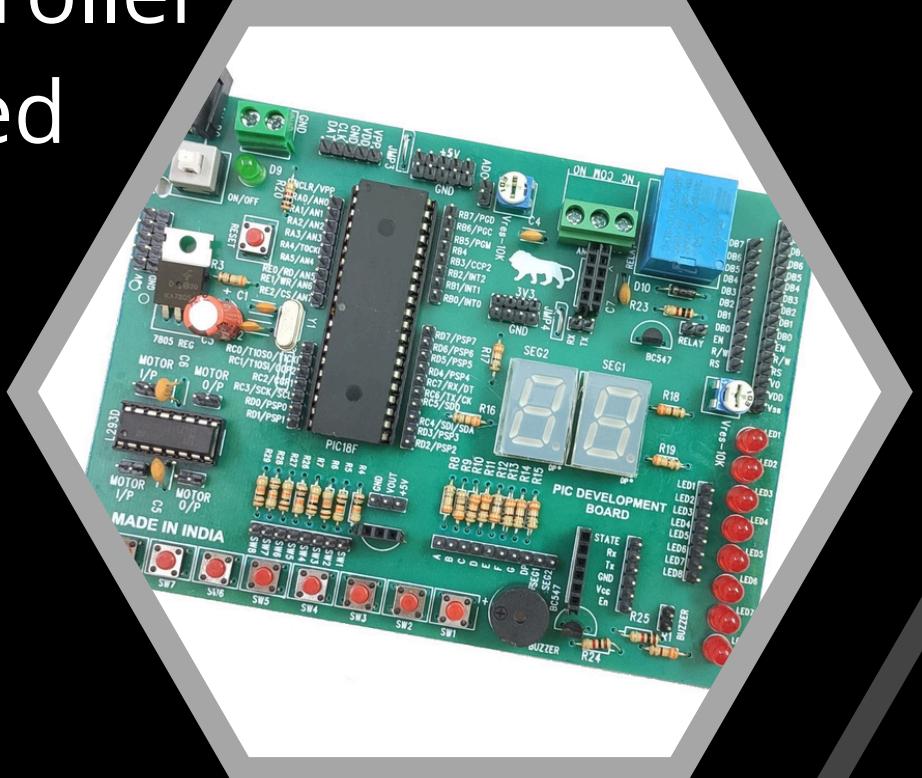
**Automated robotic devices [3]:** Highly expensive, difficult to operate, manual activation required



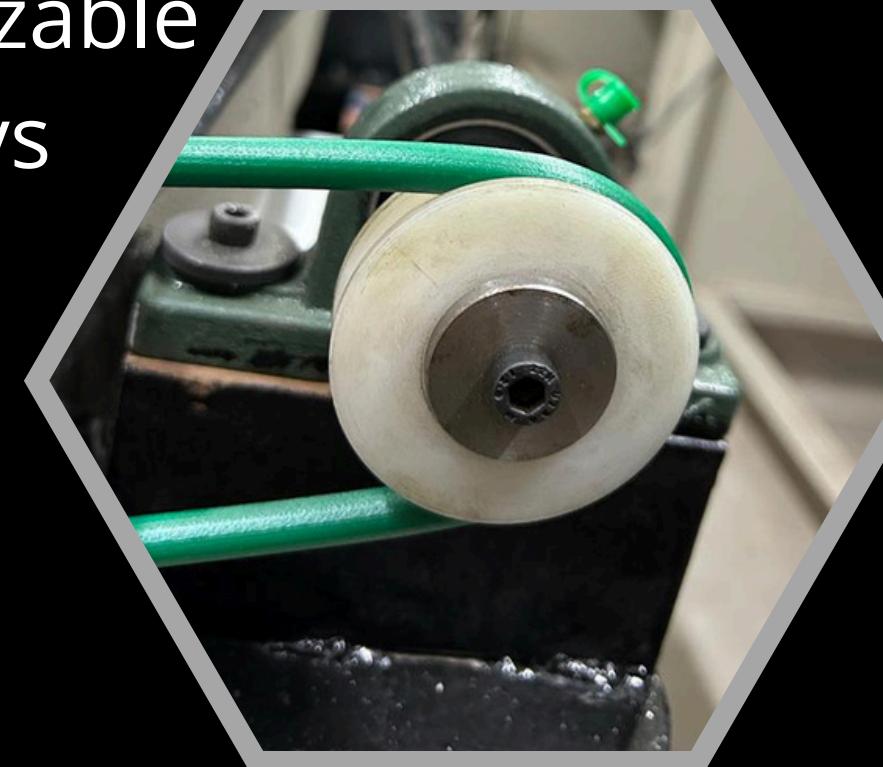
# OUR PROTOTYPE >>>



Microcontroller  
(Centralised  
Arduino)



Cable (customizable  
length) + pulleys



# WHAT COMES IN THE BOX?

Pump +  
Drip pipe



24 volt DC  
motor



Cleaning brush



# FEATURES & CHARACTERISTICS

Fully Solar powered

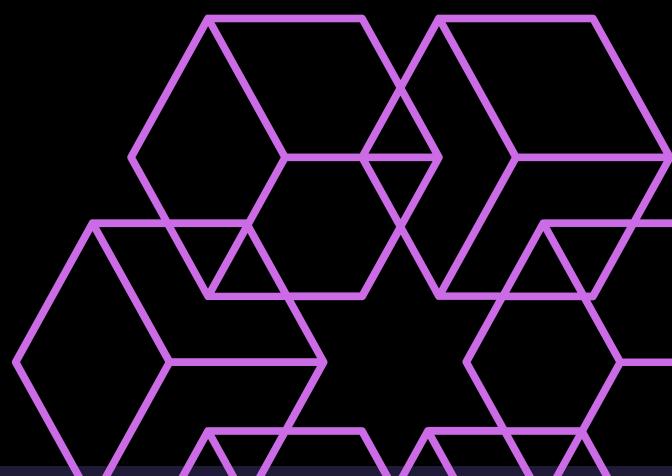
Smart Cleaning

Optimal cleaning cycle calculation

Sustainable

Easy Installation

Customizable brush



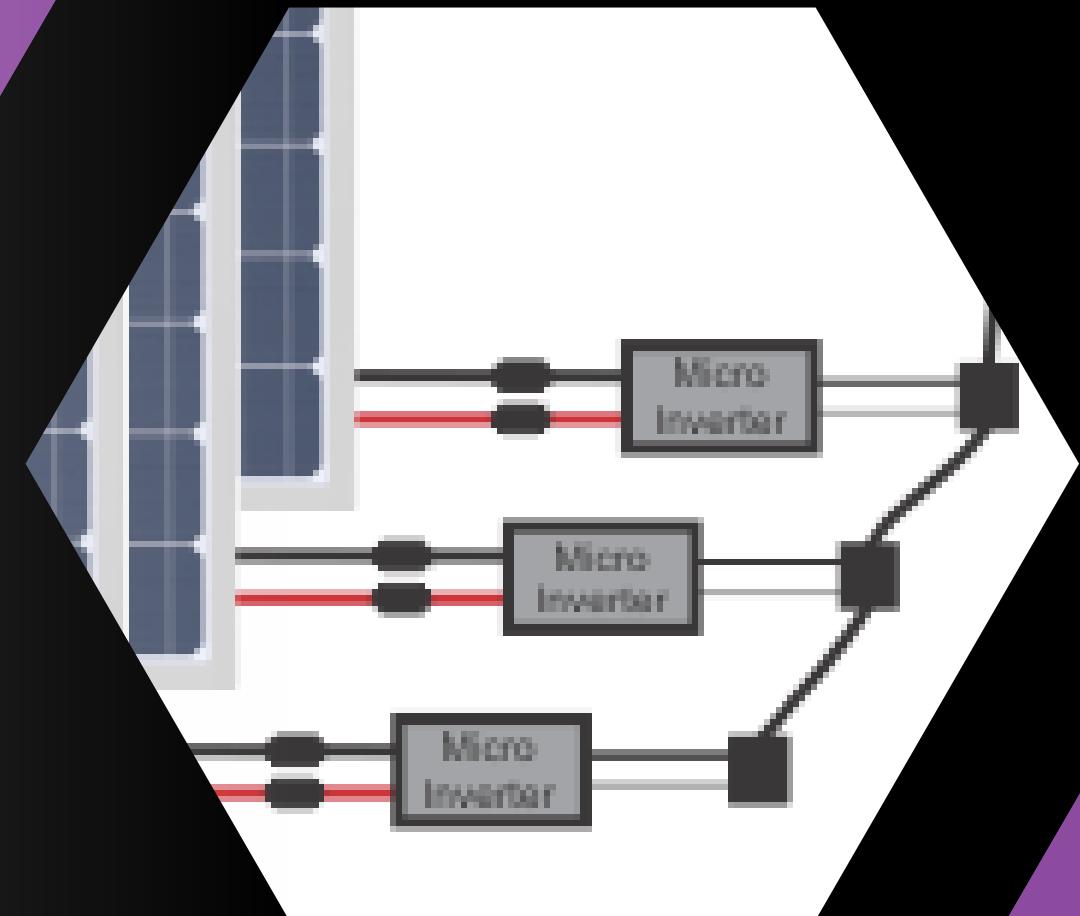


HOW WILL IT  
WORK  
IN REAL LIFE?



# REAL-WORLD MODEL

- Centralised Control system working in-sync
- Common water pump with water supply from mainline
- Customised cable length fit to panel size
- Closed loop power consumption



# BENEFITS



Energy production  
efficiency increase  
by 15-20%.

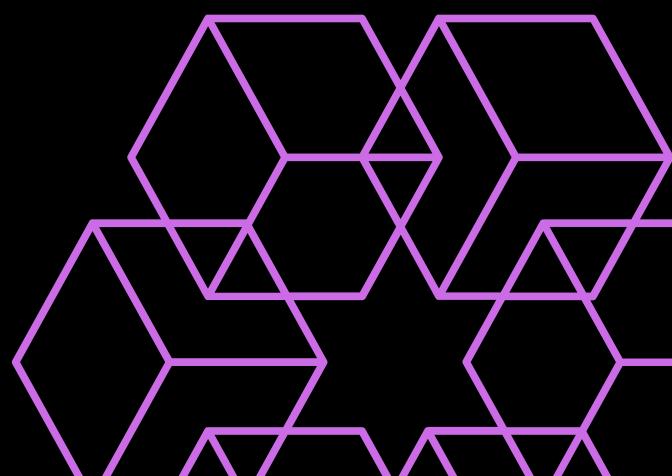
Cost  
savings

Environmental  
benefits

No human  
intervention  
in cleaning

Convenience

Improved  
performance





# FUTURE PROJECTIONS



# SCALES



INDUSTRIAL SCALE



DOMESTIC SCALE



MASS USAGE SCALE  
(SOLAR PARKS)



## MAINTENANCE

Our domestic solar panel cleaner requires minimal user maintenance, while cleaners for bigger systems demand more regular and extensive upkeep due to their larger scale and complexity.

## COST

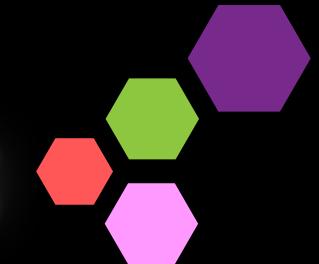
The solar panel cleaner developed by us for domestic applications is designed to be cost-effective and affordable for homeowners, while cleaners used in bigger systems may involve higher costs due to their larger size and complexity.

## AUTOMATION

The developed solar panel cleaner for domestic applications includes an automatic pulley system and brush, while cleaners used in bigger systems have advanced automation features tailored to larger installations.

# ADDITIONAL ASPECTS

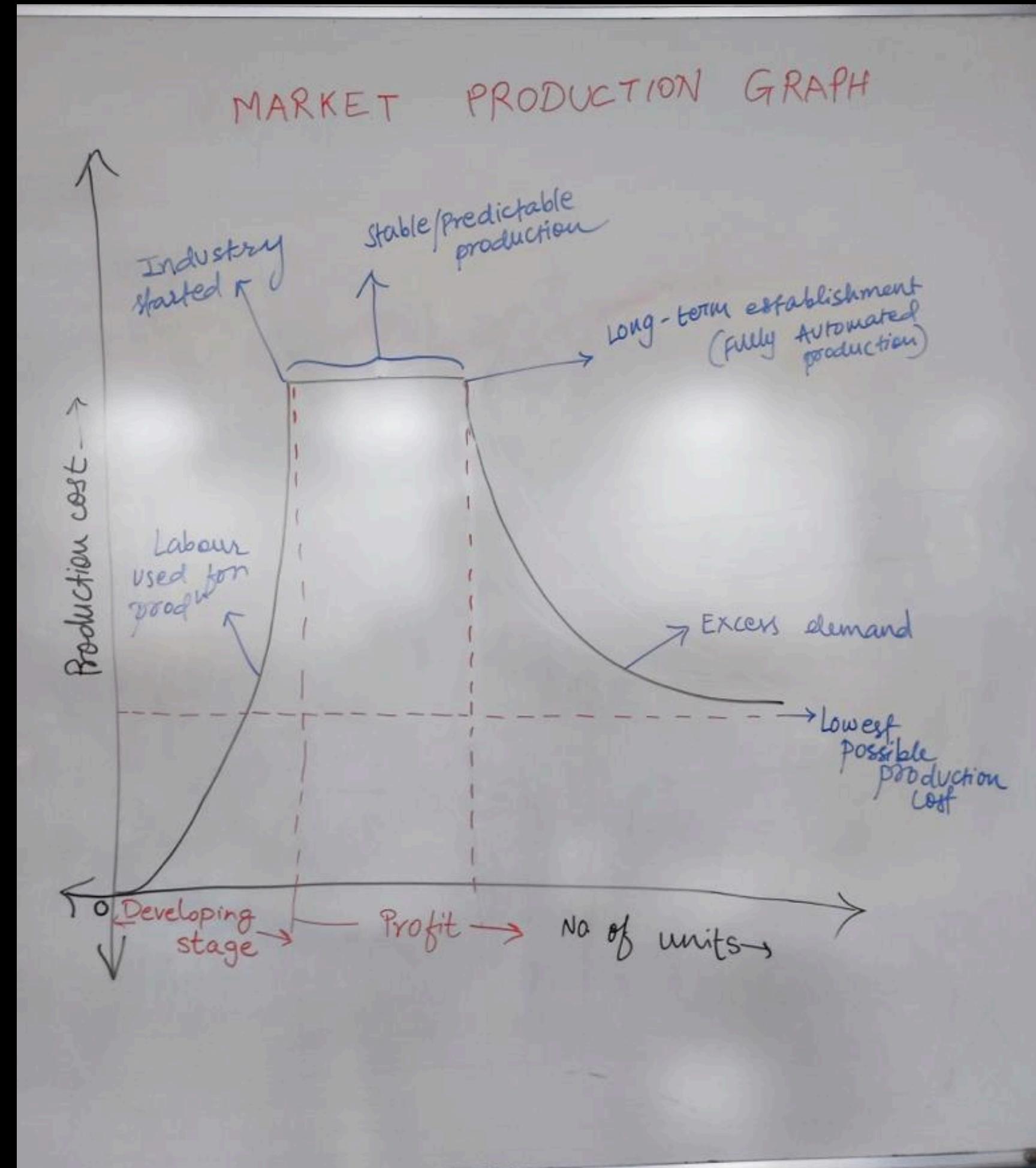
# Eisenhower Matrix



IDEAS \ FEATURES	Cost	Net power output	Easy to use	Longevity	Accuracy
<b>Self Cleaning Brush</b>	↑	↓	↑	↑	~
<b>Sensor based Efficiency detection</b>	↑	TBD	↑	↑	↑
<b>Weather-Based Model (+wifi)</b>	~	↓	↑	↑	↑

# Market production

Our production lies in the growth phase



THANK  
YOU

# REFERENCES

- [1] Hussain, A., Batra, A., & Pachauri, R. (2017). An experimental study on effect of dust on power loss in solar photovoltaic module. *Renewables: Wind, Water, and Solar*, 4(1), 1-13.  
<https://doi.org/10.1186/s40807-017-0043-y>
- [1] Environ. Sci. Technol. Lett. 2017, 4, 8, 339–344, Publication Date: June 15, 2017. Available: <https://pubs.acs.org/doi/10.1021/acs.estlett.7b00197>
- [2] [fi-powerweb.com](http://fi-powerweb.com). <http://fi-powerweb.com/Renewable-Energy.html>
- [3] N. Ronnaronglit and N. Maneerat, "A Cleaning Robot for Solar Panels," 2019 5th International Conference on Engineering, Applied Sciences and Technology (ICEAST), Luang Prabang, Laos, 2019, pp. 1-4, doi: 10.1109/ICEAST.2019.8802521.