

**Problem Domain: Social Impact**

**PEC  
HACKS**



**RENEWIFY**

EMPOWERING INDIA  
ENERGYZING TOMORROW

**TECHDECKS**

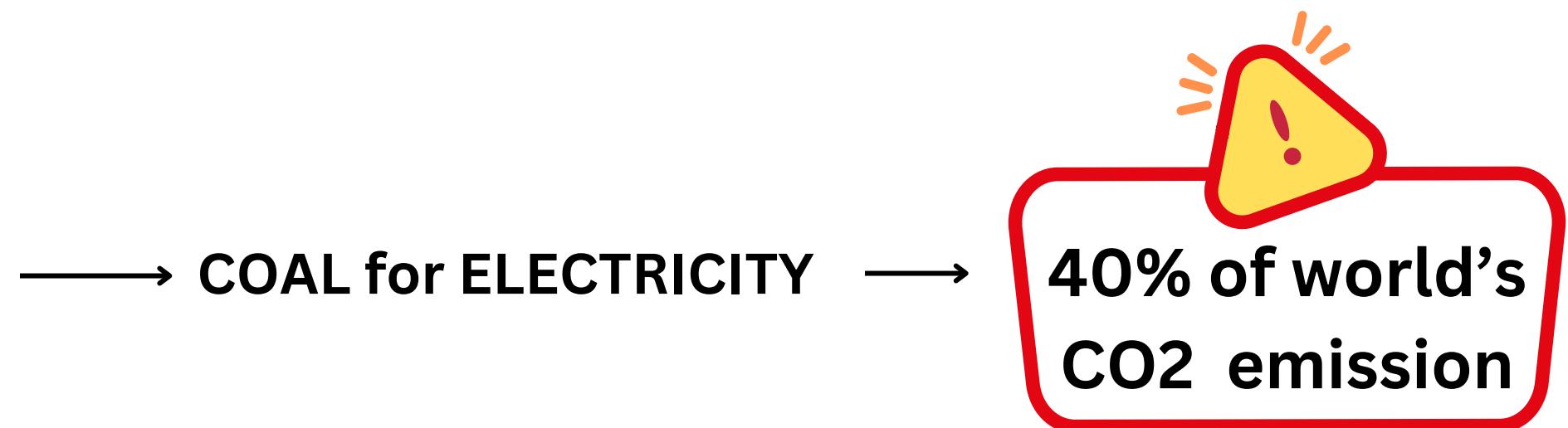
Rajalakshmi Engineering College

# Problem Statement

- In the history till 2024, coal accounted for approximately **77% of India's electricity generation**, marking a fourth consecutive year of growth in coal's share of power output.



Indian Structures

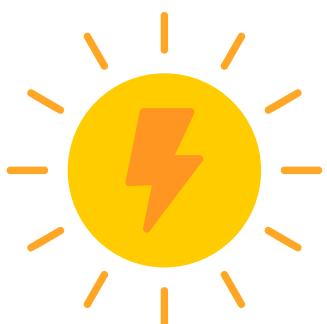
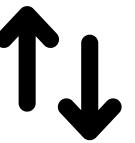


## EFFECTS:

- Air Pollution:** Emits harmful gases like carbon dioxide ( $\text{CO}_2$ ) and other greenhouse gases, causing global warming.
- Health Issues:** Contributes to respiratory diseases, lung cancer, and heart conditions.
- Climate Change:** Rising sea levels, and biodiversity loss.
- Economic Burden:** Health costs and environmental damage from coal emissions strain the economy.

**115,000 people** deaths annually due to pollution caused by coal electricity

## GLOBAL & INDIAN GOALS

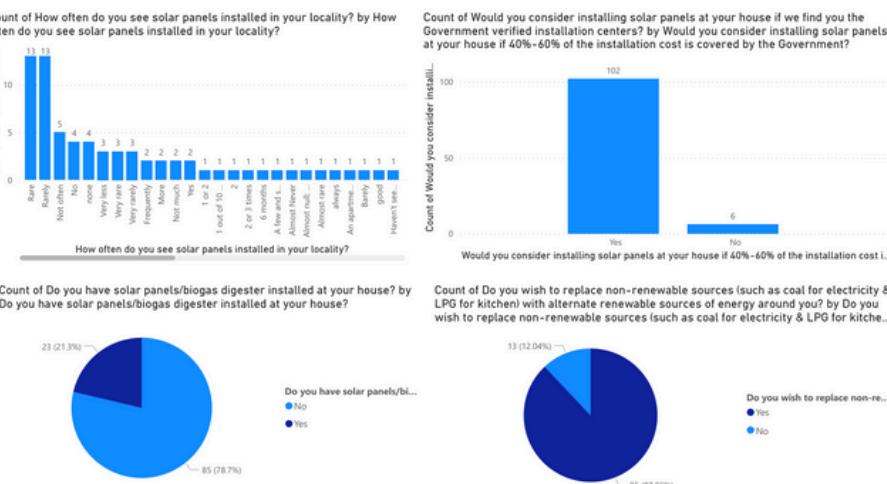


# Why not yet?

## PILOT SURVEY:

Conducted pilot survey to identify user problem and get feedback. <https://forms.gle/xQxUxaKNHnaH1cpp8>

- Analysed the problems
- Dashboard for visualisation and analysis.
- Found the status of awareness among people



## FIELD WORK:

Our team visited **Loom Solar solutions** in Ambattur, a **solar installation service provider**.

While interacting with them we came to know that their major problem is the **financial awareness and personalised compatible** for their users. They expect a report of all the personalised analysis.



**80%**

Aware of sources, lack easy adoption and management.

**40%**

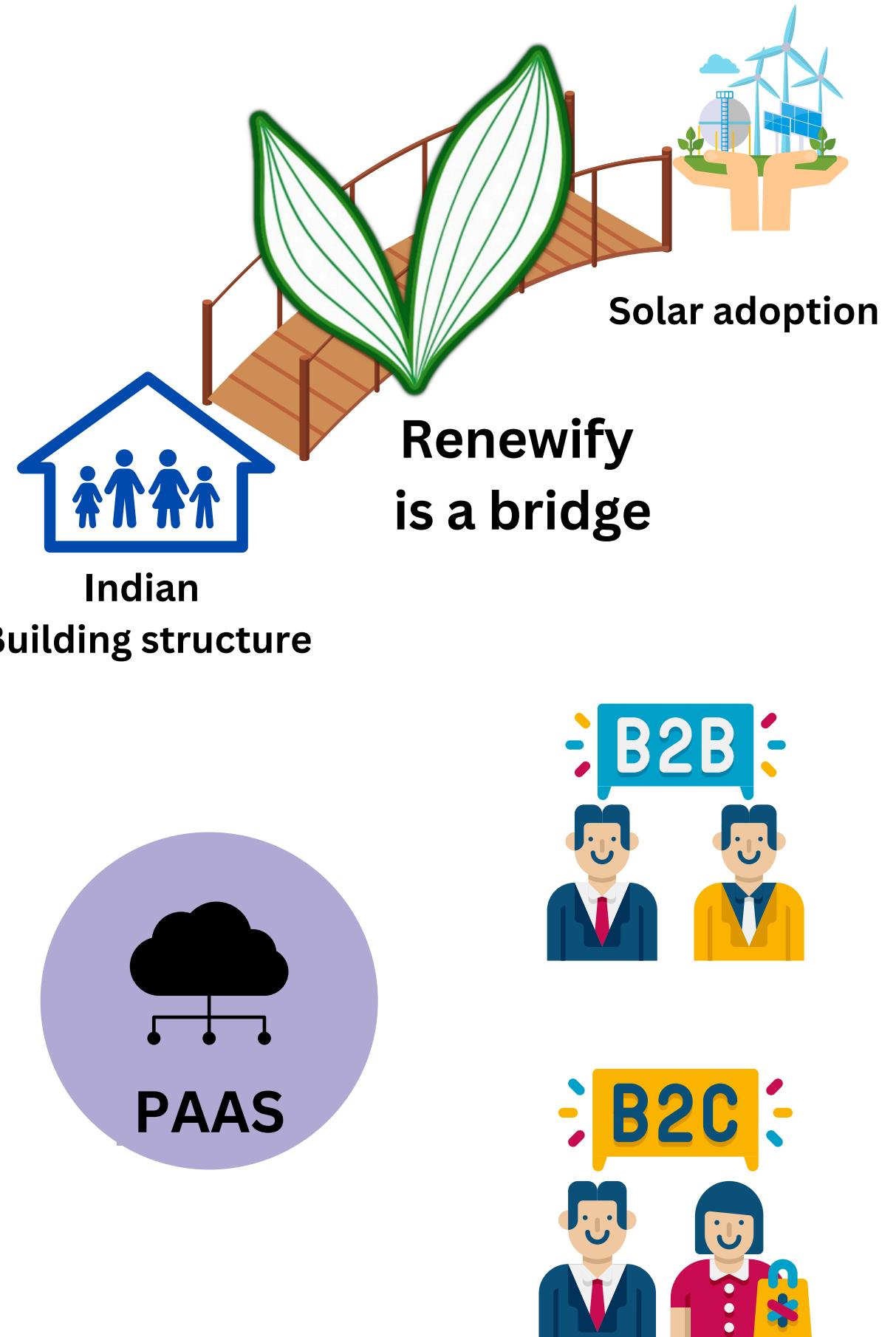
Potentials lack information platform for updates and tips

**65%**

Challenge to monitor & maintain energy consumption

# Solution

- Renewify is a **all-in-one** platform for adopting solar energy, from rooftop analysis to post-installation monitoring.
- It offers **personalized panel recommendations**, connects users with **government-verified installers**, and provides NOC assistance and financial guidance.
- Users can **monitor energy generation** in real-time and resolve issues through a **complaint management system**.
- The platform includes **Green Edge**, a **community forum** for maintenance guidelines and solar tech updates.
- It also offers access to **nearby stores** for emergency components and supplies.



# TECH STACK



## App dev:

Flutter



Dart



## Backend & Authentication:

**dj** Django **JWT**

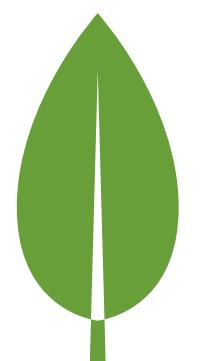
## IOT integration and Simulation



Proteus



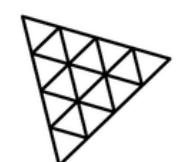
## Database:



MongoDB

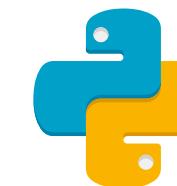


## Visualization Integration:



Three.js

## Optimisation technique:

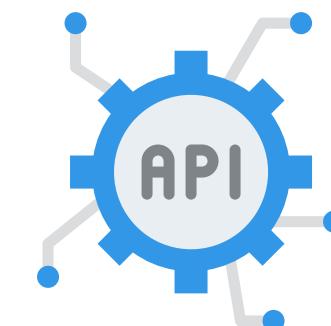


Python

## Deployment & Hosting:



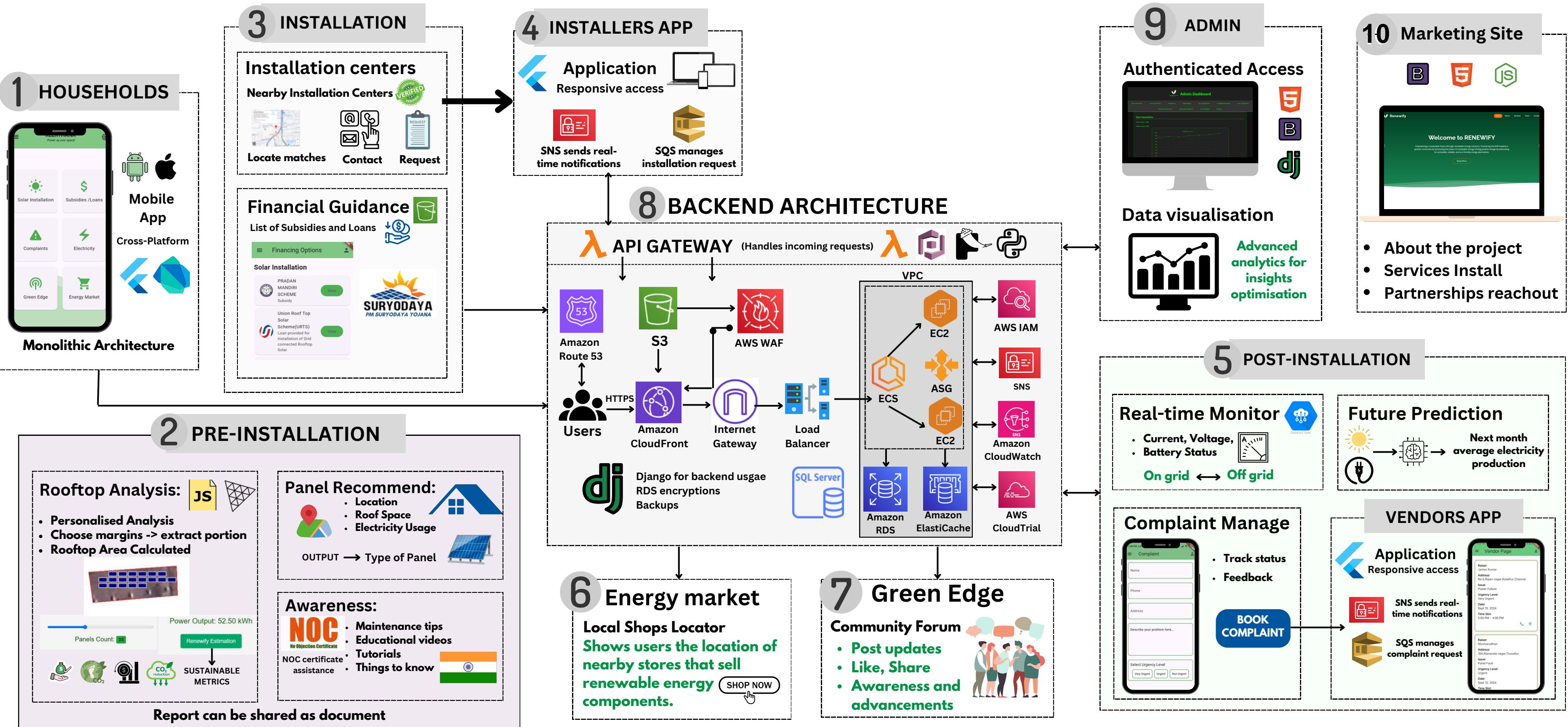
Amazon Web Services



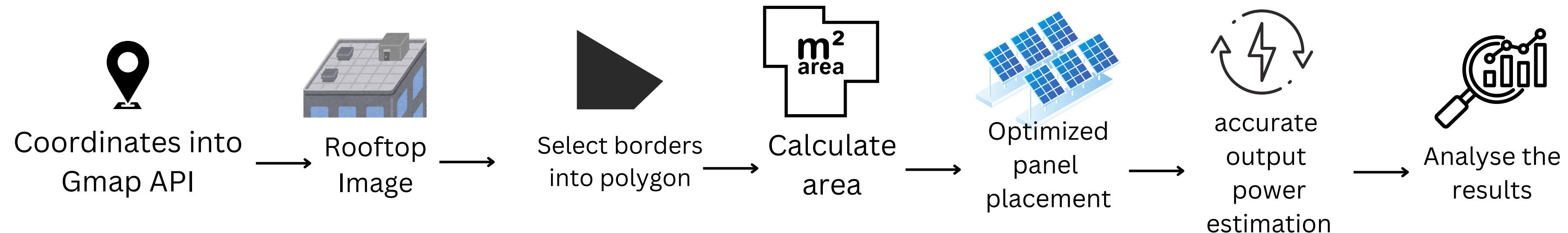
## APIs:

- Google maps API
- Weather API
- NASA Power API

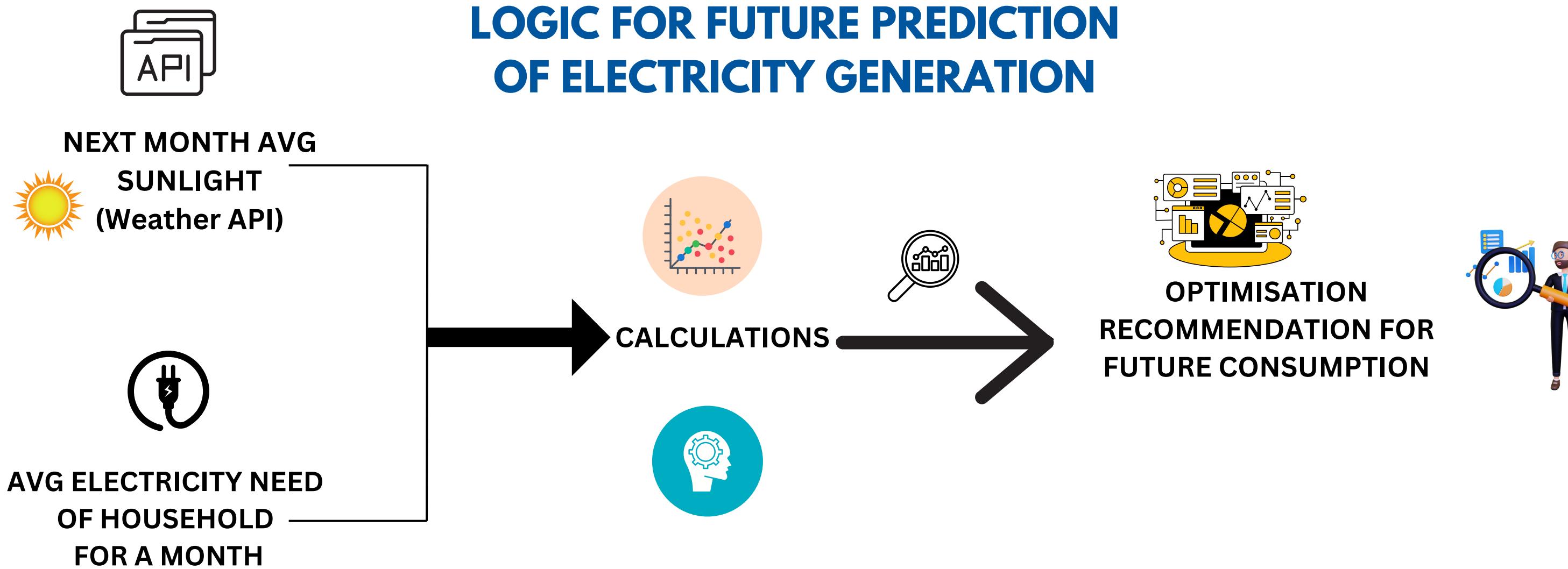
# ARCHITECTURE DIAGRAM



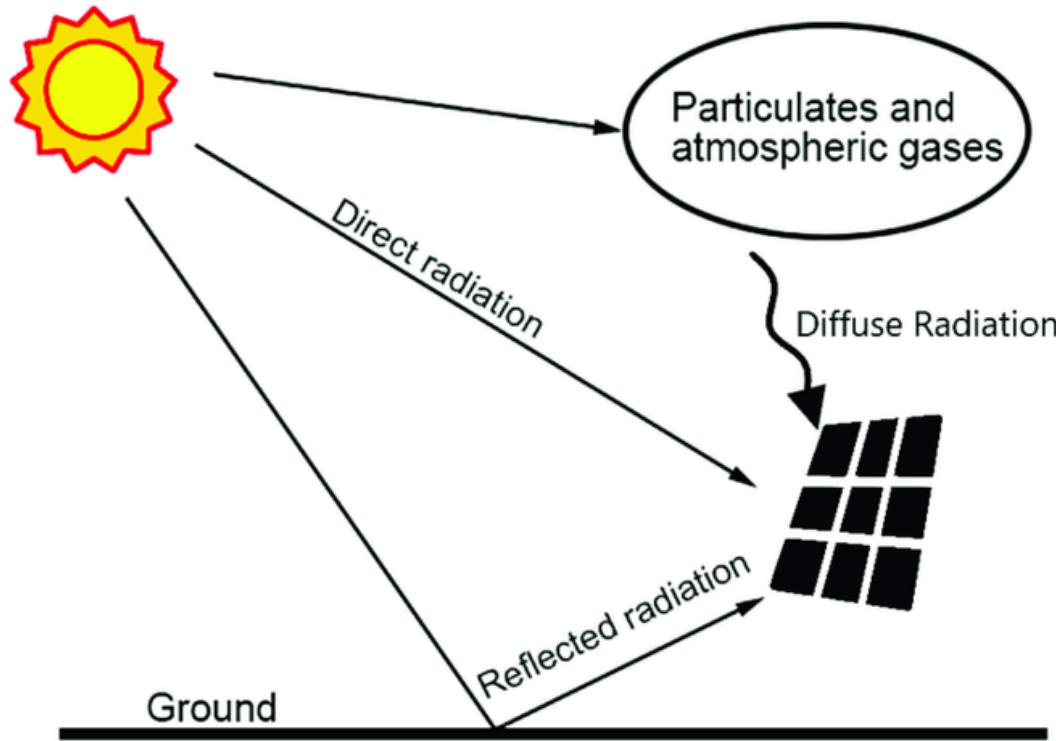
# ROOFTOP ANALYSIS METHODOLOGY FOR INDIA



## LOGIC FOR FUTURE PREDICTION OF ELECTRICITY GENERATION



# SOLAR IRRADIATIONS CALCULATION



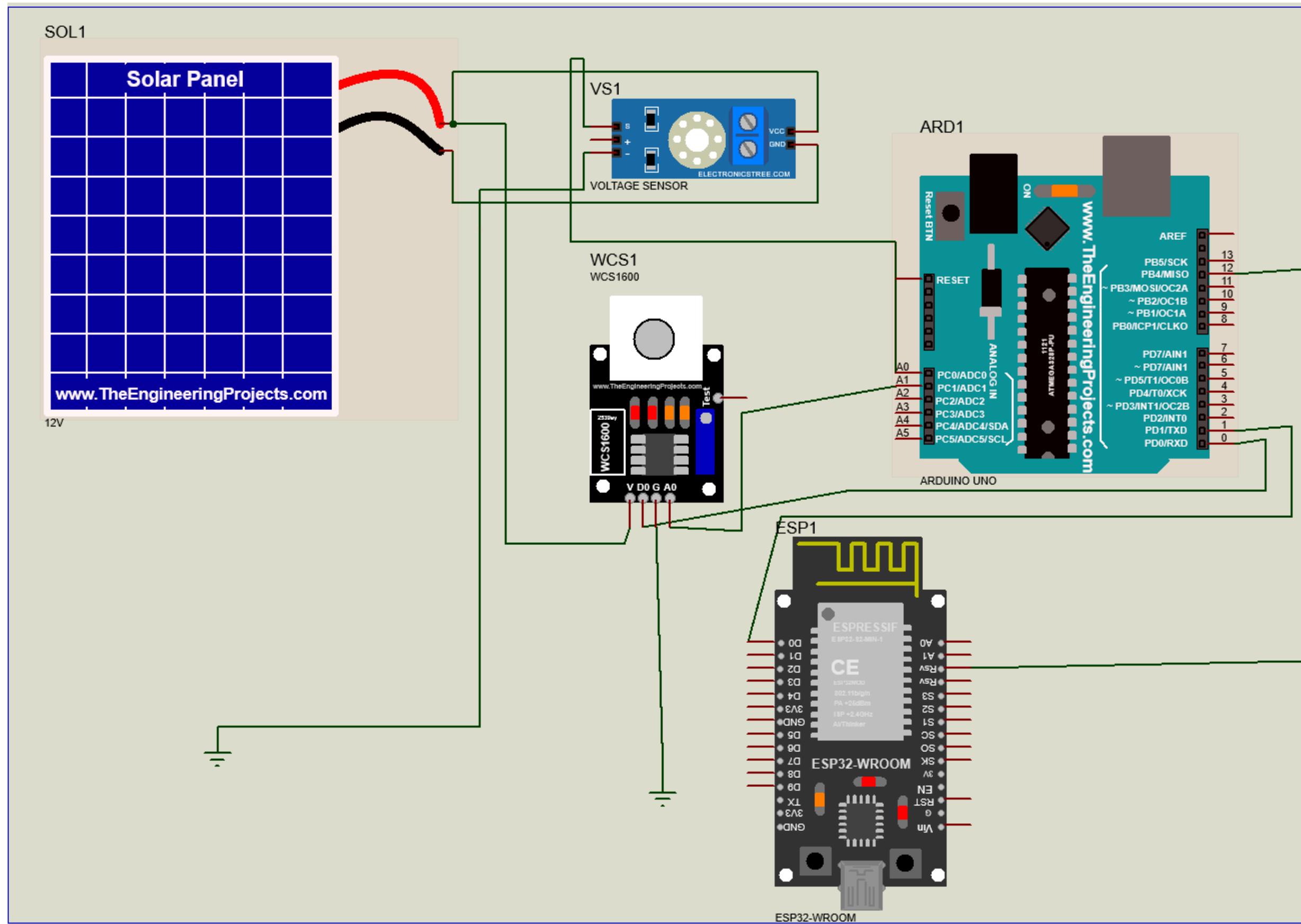
$$\text{Solar irradiation} = \text{Direct irradiation} + \text{Diffused irradiation} + \text{Reflected irradiation}$$

1. **Direct irradiation** = DNI \* Shadow\_factor \* Cloud\_cover \*  $\cos(\theta)$

2. **Diffuse irradiation** = DNI \* Cloud\_index \*  $((1 + \cos(\text{tilt\_angle}))/2)$

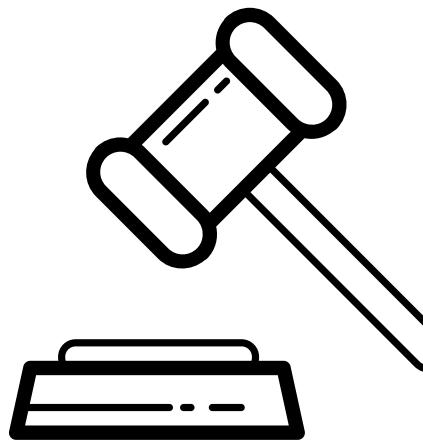
3. **Reflected irradiation** = (Albedo).[(DHI \* Shadow\_factor \* Cloud\_cover) +  
(DNI \* Cloud\_index)] \*  $((1 - \cos(\text{tilt\_angle}))/2)$

# ELECTRICITY GENERATION MEASUREMENT USING IOT



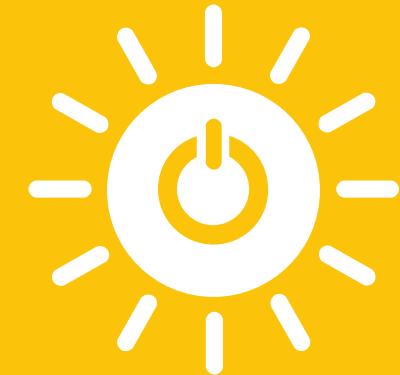
# LAWS THAT SUPPORT RENEWIFY:

- Electricity Act 2003
- National Electricity Policy, 2005
- Integrated Energy Policy, 2006
- Jawaharlal Nehru National Solar Mission (JNNSM), 2010
- Renewable Energy Certificates (RECs), 2011
- Energy Conservation Building Code (ECBC)



# SDG GOALS

7 AFFORDABLE AND CLEAN ENERGY



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



17 PARTNERSHIPS FOR THE GOALS



# COMPETITIVE ANALYSIS



## ROOF TOP ANALYSIS

## POST INSTALLATION MONITORING

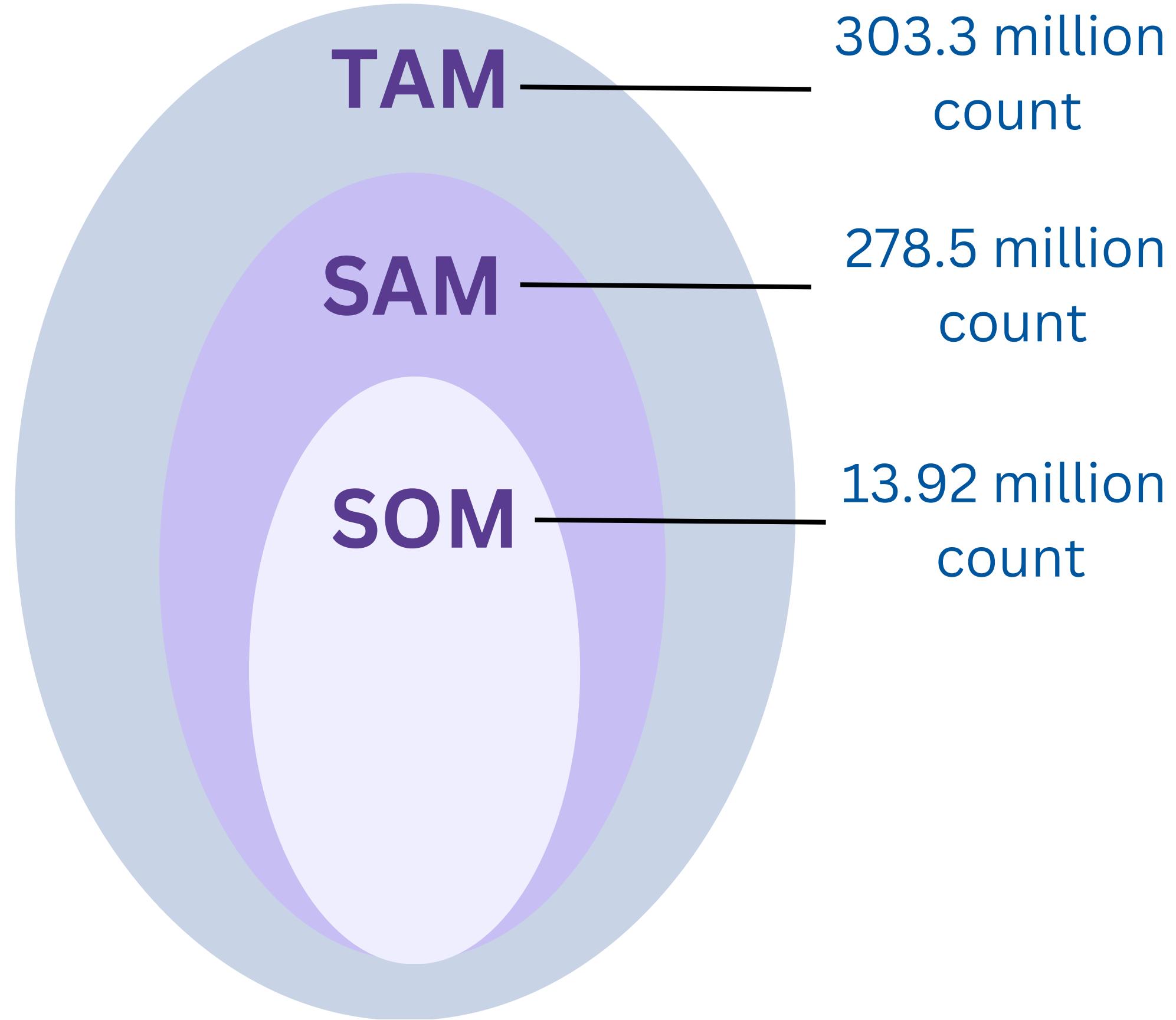
## FINANCIAL GUIDANCE

## COMMUNITY FORUM

## IMPACT ANALYSIS

✓	✗	✗	✗
✓	✓	✗	✓
✓	✗	✓	✓
✓	✗	✗	✗
✓	✗	✗	✓

# MARKET POTENTIAL



# WHY NOW?

- Rising Energy Costs
- Government Push for Renewables
- Energy Access & Security
- Climate Action Goals
- Technological Advancements

# BUSINESS MODEL CANVAS

## Key Partners

- Government-verified installation centers
- Vendors for complaint management
- Renewable energy equipment suppliers
- Financial institutions for providing loans.
- NGOs for awareness and information

## Cost Structure

- App development
- Marketing and advertising expenses.
- Operational costs for customer support and troubleshooting.
- Partnership fees or revenue sharing agreements.
- Cloud Hosting and Maintenance Cost

## Key Activities

- Developing and maintaining the app platform.
- Partnerships and collaboration.
- Providing customer support for installation and troubleshooting.

## Key Resources

- Application.
- Renewable Energy experts for guidance.
- Partnerships with installation centers and finance providers.
- Server.

## Value Propositions

- Empowering users to transition to renewable energy sources.
- Real-time energy monitoring and optimization of electricity.
- Providing access to financial resources for installation.
- Community Engagement and Resources
- Enabling efficient management of on grid and off grid conversion.

## Customer Segments

- Residential households
- Installation centers
- Financial Institutions
- Eco-conscious individuals

## Channels

- App for communication.
- Digital marketing channels
- Partnerships
- In-app communication channels

## Revenue Stream

### Freemium Model

- Ad Revenue ( video ads, banner ads, targeted ads)
- Sponsored Features (Sponsored content)

### Commission based model

- Commission Plans for services.
- In app purchases for customisation.
- Affiliate Marketing by partnering.

## Partnership Benefits

- Increased visibility to potential customers
- Partners provide discount for app users
- Credential profile
- Collaborative marketing campaigns.
- Increased Loan approvals
- Reputation enhancements for authorized centers.

# REVENUE MANAGEMENT SYSTEM

## INITIAL INVESTMENT

- App deployment (Database, API, team, hardware, maintenance) = 20 lakhs
- Promotion and Marketing = 30 lakhs
- Total initial investment cost needed = 50 lakhs

## MARKET POTENTIAL

- Council on Energy, Environment and Water (CEEW)
- Total no. of households not installed system = 25 crores
  - 1% of the count : initial customers count = 25 lakhs

## REVENUE STREAM:

- Installation centers : 5- 10% cost per installation
- Maintenance services : 10% of the maintenance cost
- Financial Institutions: Rs.10000 for a loan reference

## MARKET AND SALES STRATEGY

### RESIDENTIAL HOUSEHOLDS

- Advertising
- Search Engine Optimisation(SEO).
- Online sign-up mechanism
- Referral codes.

Responsible set of users through advertisement

### FINANCIAL INSTITUTIONS (PROVIDING LOANS FOR INSTALLATION)

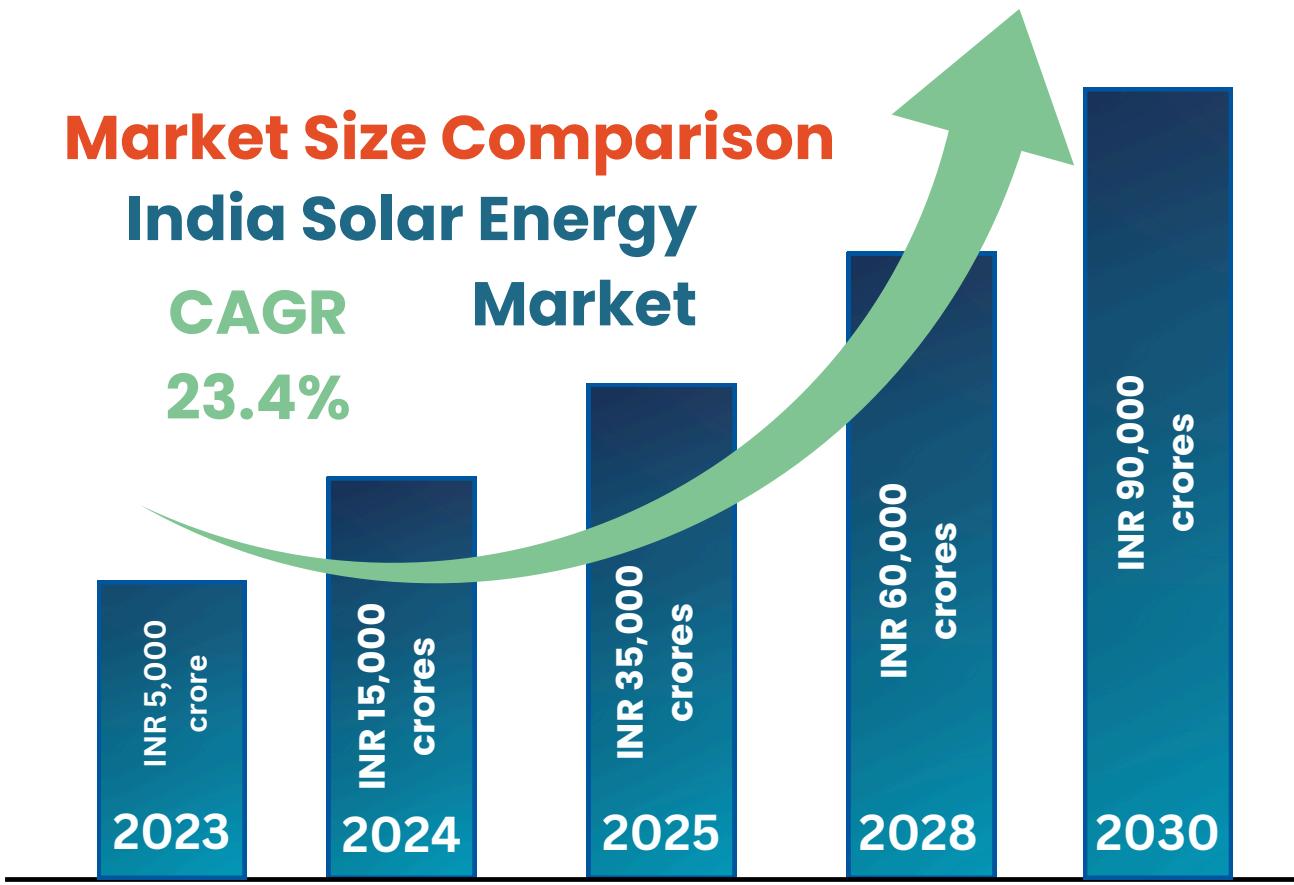
- Industry events like banking events.
- Partnership Proposals.
- Constant updates on new loans.

### INSTALLATION CENTERS

- vendor outreach
- Testimonials of users.
- B2B Partnership Agreement
- Training and support



# MARKET ANALYSIS



**Renewify would contribute 59.84% in the solar market in the period of 2024-2030.**



**Renewify contributes to 14.34 % CAGR based on the estimated market share growth**

## IMPACT GOAL

- Renewify could boost rooftop solar adoption by 20% annually, adding 2.28 GW by 2025.
- By adding 5 GW of solar yearly, Renewify supports India's coal reduction goal by 2030.
- Households using Renewify can save 40% on electricity bill annually.

# Roadmap App Process

Jan 2nd Week  
Requirement analysis  
and sprint planning



Jan 3rd Week  
Design and business plan



Jan 4th week - Feb 2nd week

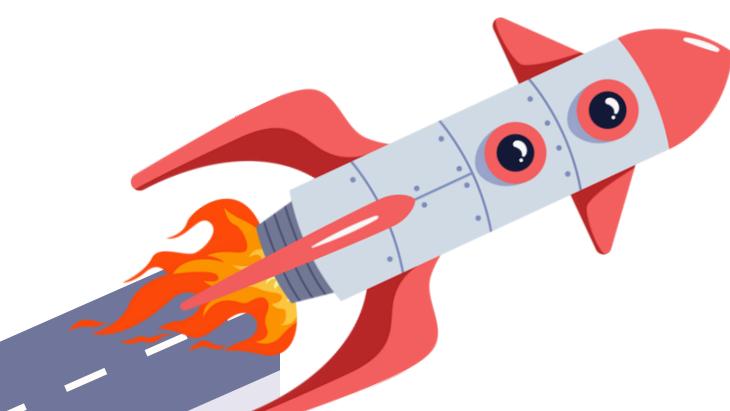
Product Development Phase



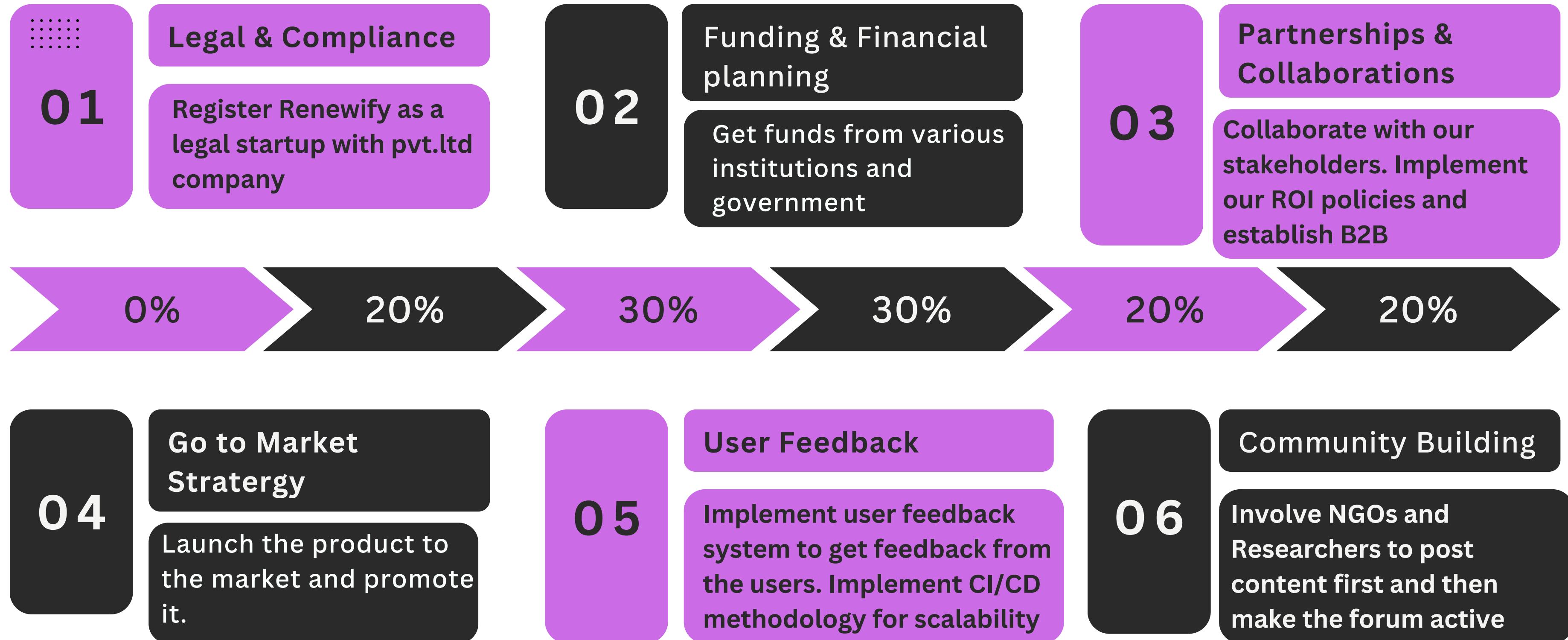
Feb 3rd Week  
Survey and user testing



Feb 4th week  
Deployment and Bug fixes



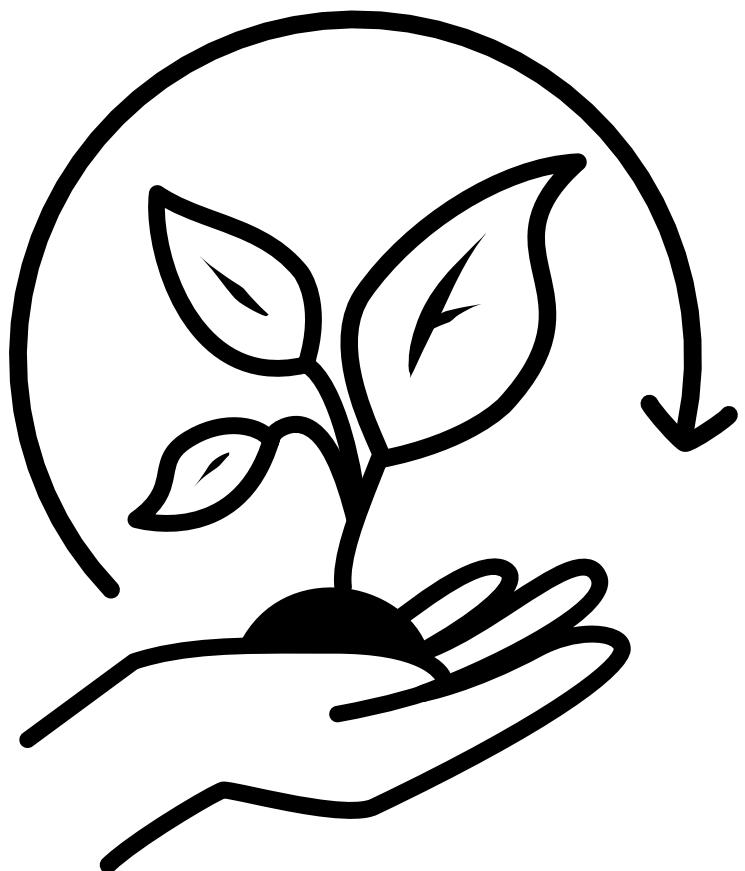
# FUTURE PLANNING TIMELINE



# *Let's move towards a vision in making India*

- *self reliant*
- *energy-independent*
- *sustainable*

# **THANK YOU FOR THE WONDERFUL OPPORTUNITY!**



**Let's create a more sustainable world  
by harnessing the power of renewable  
energy and empowering communities  
to lead the way towards a brighter  
future.**