BRIGHT
SPARKS

SIH 2023

POWERBYTE

A ENERGY SOLUTION

BY Bright Sparks

PSID: : 1299

Problem Statement Title : Developing an AI-powered energy management system for industrial commercial facilities to optimize energy consumption.

Team Name : Bright Sparks

Team Leader Name : Rishabh Dangi

Institute Code (AISHE) : C-25144

MoE's INNOVATION CELL (GOVERNMENT OF INDIA)

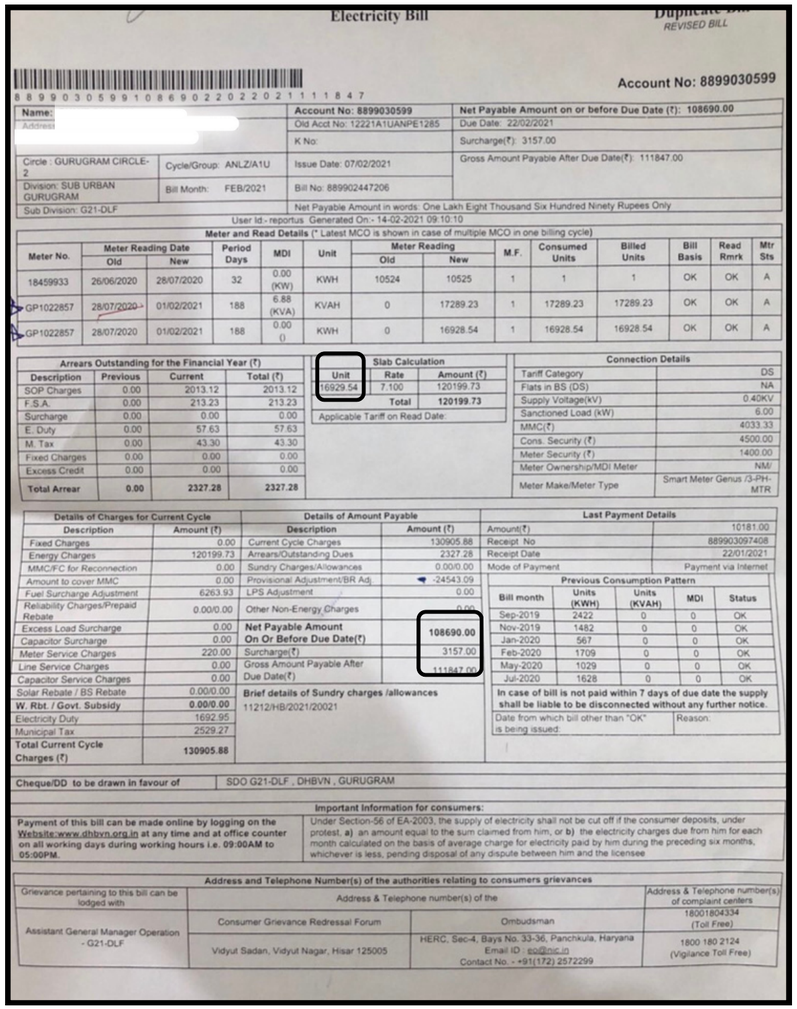
Ministry of Education Government of India

SMART INDIA HACKATHON 2023

आज़ादी का अमृत महोत्सव

G20 भारत 2023 INDIA

Get Started



Electricity Bill

REVISED BILL

Account No: 8899030599

Name:	Account No: 8899030599	Net Payable Amount on or before Due Date (₹): 108690.00	
Address:	Old Acct No: 12221A1UANPE1285	Due Date: 22/02/2021	
	K No:	Surcharge(₹): 3157.00	
Circle : GURUGRAM CIRCLE-2	Cycle/Group: ANLZ/A1U	Issue Date: 07/02/2021	Gross Amount Payable After Due Date(₹): 111847.00
Division: SUB URBAN GURUGRAM	Bill Month: FEB/2021	Bill No: 889902447206	
Sub Division: G21-DLF		Net Payable Amount in words: One Lakh Eight Thousand Six Hundred Ninety Rupees Only	

User Id - reportus Generated On:- 14-02-2021 09:10:10

Meter and Read Details (* Latest MCO is shown in case of multiple MCO in one billing cycle)

Meter No.	Meter Reading Date Old	Meter Reading Date New	Period Days	MDI	Unit	Meter Reading Old	Meter Reading New	M.F.	Consumed Units	Billed Units	Bill Basis	Read Rmrk	Mtr Sts
18459933	26/06/2020	28/07/2020	32	0.00 (KW)	KWH	10524	10525	1	1	1	OK	OK	A
GP1022857	28/07/2020	01/02/2021	188	6.88 (KVA)	KVAH	0	17289.23	1	17289.23	17289.23	OK	OK	A
GP1022857	28/07/2020	01/02/2021	188	0.00 ()	KWH	0	16928.54	1	16928.54	16928.54	OK	OK	A

Arrears Outstanding for the Financial Year (₹)

Description	Previous	Current	Total (₹)
SOP Charges	0.00	2013.12	2013.12
F.S.A.	0.00	213.23	213.23
Surcharge	0.00	0.00	0.00
E. Duty	0.00	57.63	57.63
M. Tax	0.00	43.30	43.30
Fixed Charges	0.00	0.00	0.00
Excess Credit	0.00	0.00	0.00
Total Arrear	**0.00**	**2327.28**	**2327.28**

Slab Calculation

Unit	Rate	Amount (₹)
16929.54	7.100	120199.73
	Total	**120199.73**

Applicable Tariff on Read Date:

Connection Details

Tariff Category	DS
Flats in BS (DS)	NA
Supply Voltage(kV)	0.40KV
Sanctioned Load (kW)	6.00
MMC(₹)	4033.33
Cons. Security (₹)	4500.00
Meter Security (₹)	1400.00
Meter Ownership/MDI Meter	NM/
Meter Make/Meter Type	Smart Meter Genus /3-PH-MTR

Details of Charges for Current Cycle

Description	Amount (₹)
Fixed Charges	0.00
Energy Charges	120199.73
MMC/FC for Reconnection	0.00
Amount to cover MMC	0.00
Fuel Surcharge Adjustment	6263.93
Reliability Charges/Prepaid Rebate	0.00/0.00
Excess Load Surcharge	0.00
Capacitor Surcharge	0.00
Meter Service Charges	220.00
Line Service Charges	0.00
Capacitor Service Charges	0.00
Solar Rebate / BS Rebate	0.00/0.00
W. Rbt. / Govt. Subsidy	**0.00/0.00**
Electricity Duty	1692.95
Municipal Tax	2529.27
Total Current Cycle Charges (₹)	**130905.88**

Details of Amount Payable

Description	Amount (₹)
Current Cycle Charges	130905.88
Arrears/Outstanding Dues	2327.28
Sundry Charges/Allowances	0.00/0.00
Provisional Adjustment/BR Adj	-24543.09
LPS Adjustment	0.00
Other Non-Energy Charges	0.00
Net Payable Amount On Or Before Due Date(₹)	**108690.00**
Surcharge(₹)	3157.00
Gross Amount Payable After Due Date(₹)	111847.00

Brief details of Sundry charges /allowances

11212/HB/2021/20021

Last Payment Details

Amount(₹)	10181.00
Receipt No	889903097408
Receipt Date	22/01/2021
Mode of Payment	Payment via Internet

Previous Consumption Pattern

Bill month	Units (KWH)	Units (KVAH)	MDI	Status
Sep-2019	2422	0	0	OK
Nov-2019	1482	0	0	OK
Jan-2020	567	0	0	OK
Feb-2020	1709	0	0	OK
May-2020	1029	0	0	OK
Jul-2020	1628	0	0	OK

In case of bill is not paid within 7 days of due date the supply shall be liable to be disconnected without any further notice.

Date from which bill other than "OK" is being issued: | Reason:

Cheque/DD to be drawn in favour of: SDO G21-DLF , DHBVN , GURUGRAM

Important Information for consumers:

Payment of this bill can be made online by logging on the Website:www.dhbvn.org.in at any time and at office counter on all working days during working hours i.e. 09:00AM to 05:00PM.

Under Section-56 of EA-2003, the supply of electricity shall not be cut off if the consumer deposits, under protest, a) an amount equal to the sum claimed from him, or b) the electricity charges due from him for each month calculated on the basis of average charge for electricity paid by him during the preceding six months, whichever is less, pending disposal of any dispute between him and the licensee

Address and Telephone Number(s) of the authorities relating to consumers grievances

Grievance pertaining to this bill can be lodged with	Address & Telephone number(s) of the		Address & Telephone number(s) of complaint centers
Assistant General Manager Operation - G21-DLF	Consumer Grievance Redressal Forum	Ombudsman	18001804334 (Toll Free)
	Vidyut Sadan, Vidyut Nagar, Hisar 125005	HERC, Sec-4, Bays No. 33-36, Panchkula, Haryana Email ID : ep@nic.in Contact No. - +91(172) 2572299	1800 180 2124 (Vigilance Toll Free)

Total Power Consumed :16929.54 kWh

Total Electricity Bill amount:Rs.111847/-

Which **device** I used **more** I got very **high electricity bill**??

Want to know?

OBJECTIVES

1

Full Oversight of Industry/Household Energy Consumption

2

Visual representation of how energy is being used

3

AI/ML based energy Prediction

4

Alert to keep track on energy goal

5

Management of Load and fault detection

6

User Interface for Centralized Monitoring & backup to Past data

7

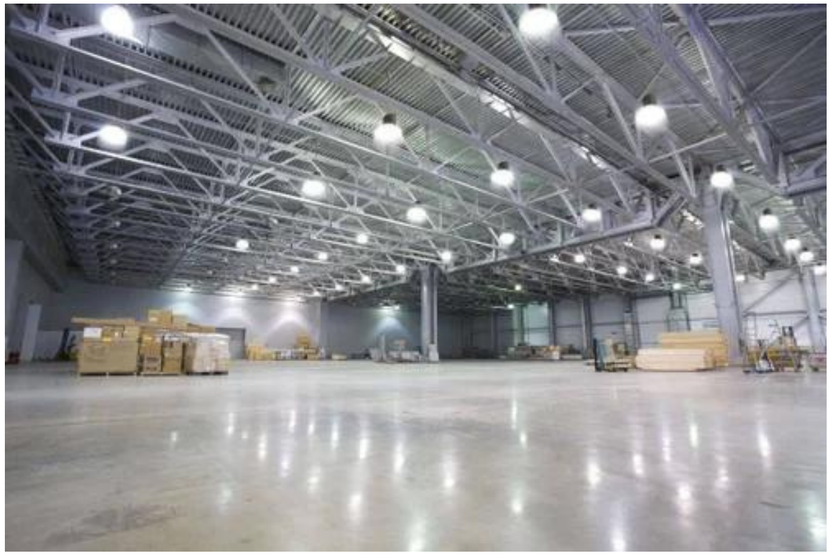
Energy calculator to set energy goal

BRIGHT SPARKS

A Survey at Marble Industry

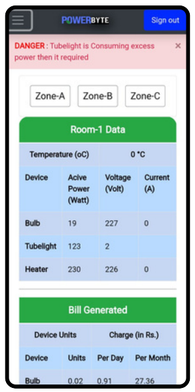
S.no	Load	Power Consumption
1.	Wire Saw Machine	100 kWh
2.	Waterjet Cutting Machine	25 kWh
3.	CNC Machine	10 kWh
4.	Edge Profiling Machine	3 kWh
5.	Grinding Machine	1.3 kWh
	Lightning	
1.	Flood Light 150W (45)	150 x 45 = 6.7 kWh
2.	Bay Light 100W (25)	100 x 25 = 2.5 kWh
3.	LED BULB 60W (250)	60 x 250 = 15 kWh
4.	LED BULB 40W (200))	40 x 200 = 8 kWh
5.	LED BULB 10W (80)	10 x 80 = 0.8 kWh

Pacific Industries, Udaipur



IDEA APPROACH

Website & App



AI & ML Model

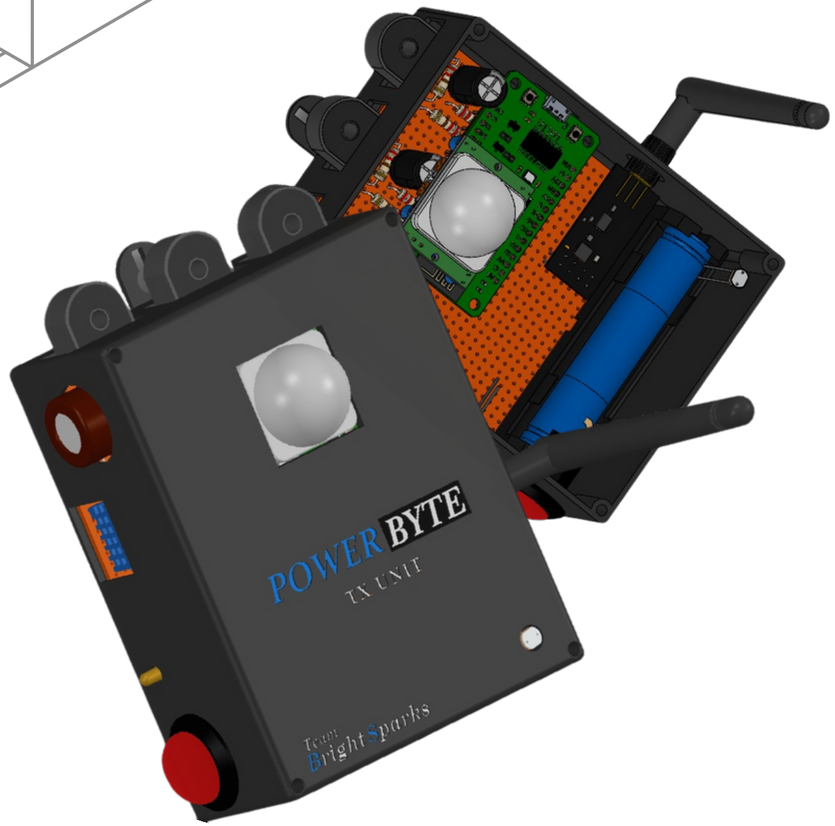
Cloud

Powerbyte

Industry & Domestic

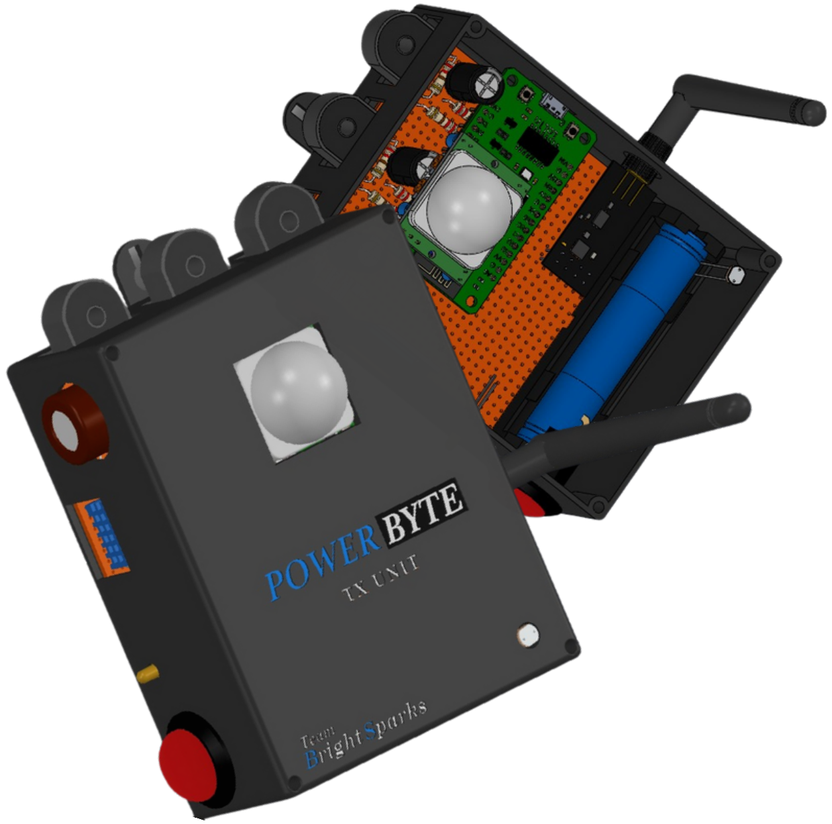
Prediction and Optimisation

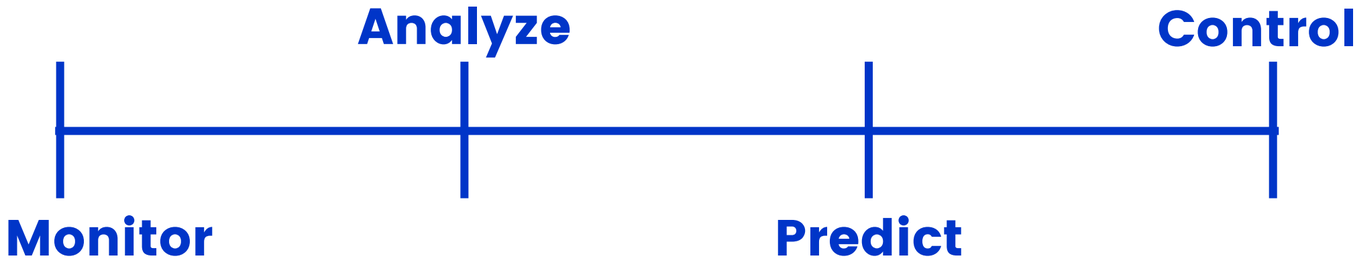
PowerByte??



PowerByte

- **PowerByte** is a intelligent device which track energy and manage consumptions.
- IoT and AI powered device
- Provides real time visualization of energy consumption

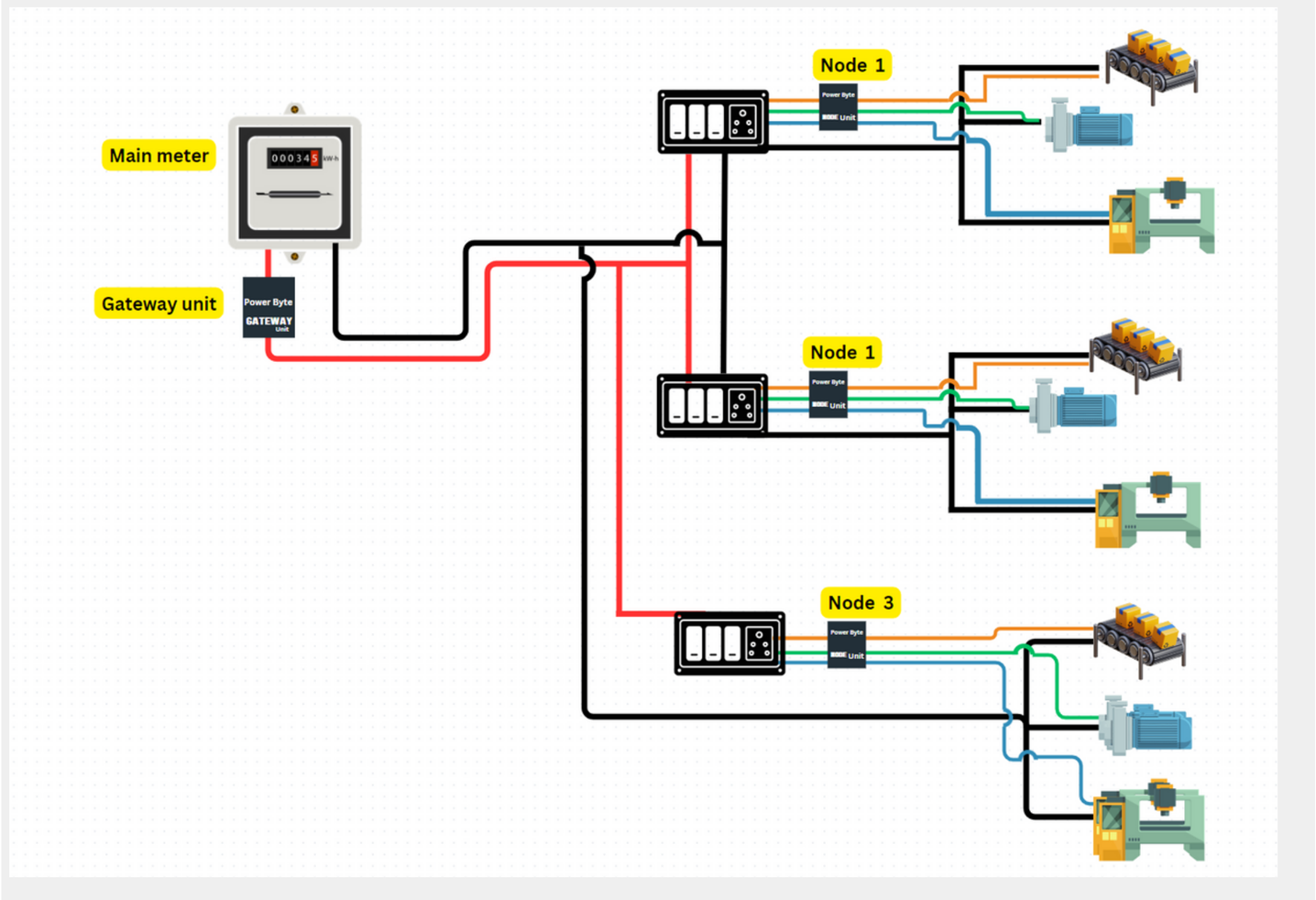




POWERBYTE
A ENERGY SOLUTION

IMPLEMENTATION

Gateway and Node Technology

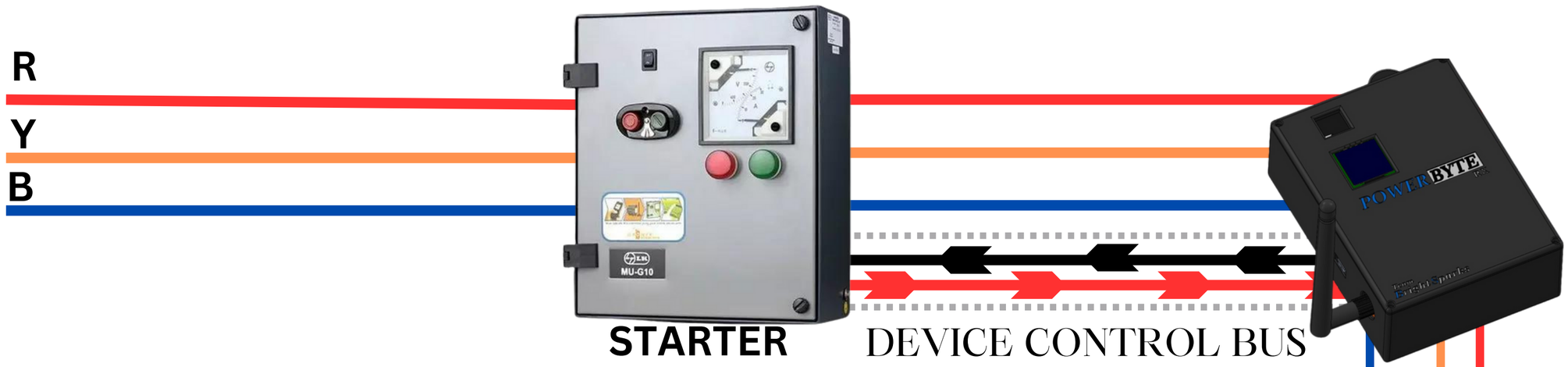


POWERBYTE

A ENERGY SOLUTION

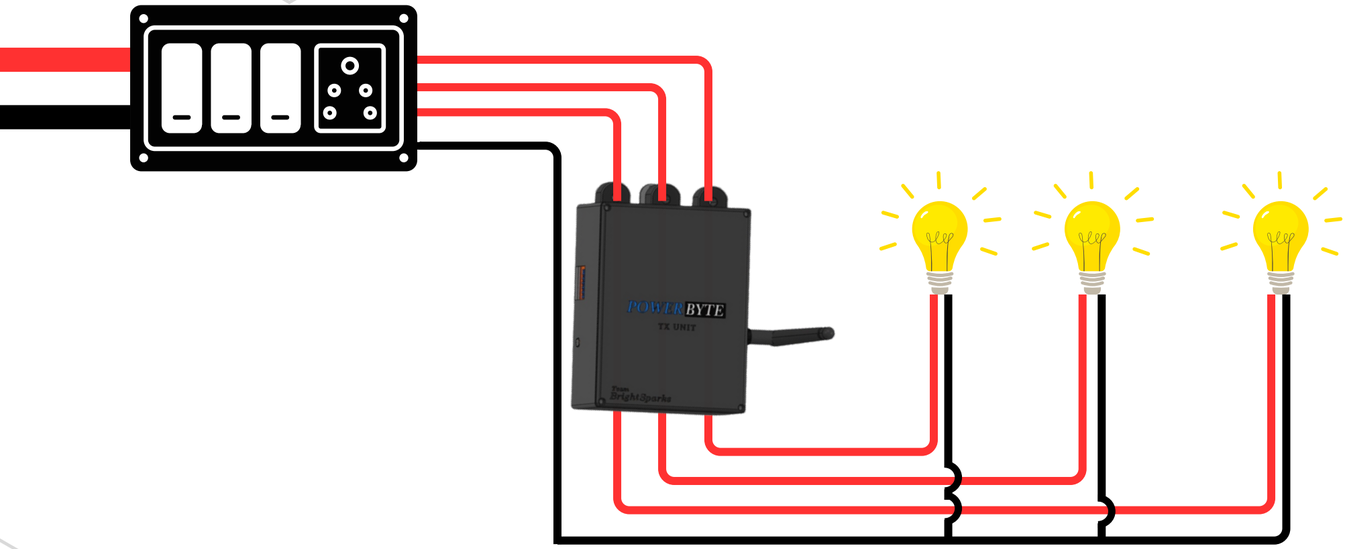
INDUSTRIAL SOLUTION

- Monitoring current
- Monitoring Temperature of Machine
- Controlling speed of machines.
- Monitoring Carbon Emissions
- Notifications Alert
- Visualization on app.

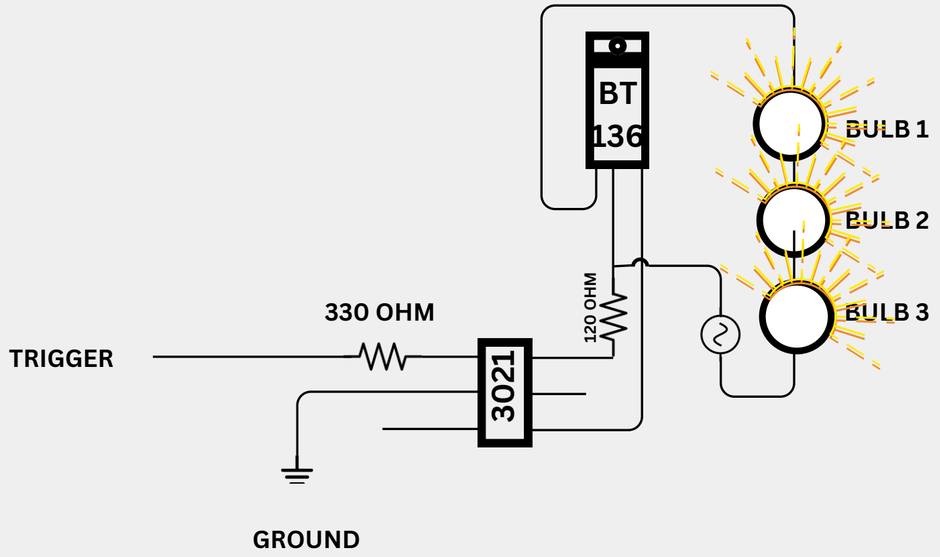


MOTOR

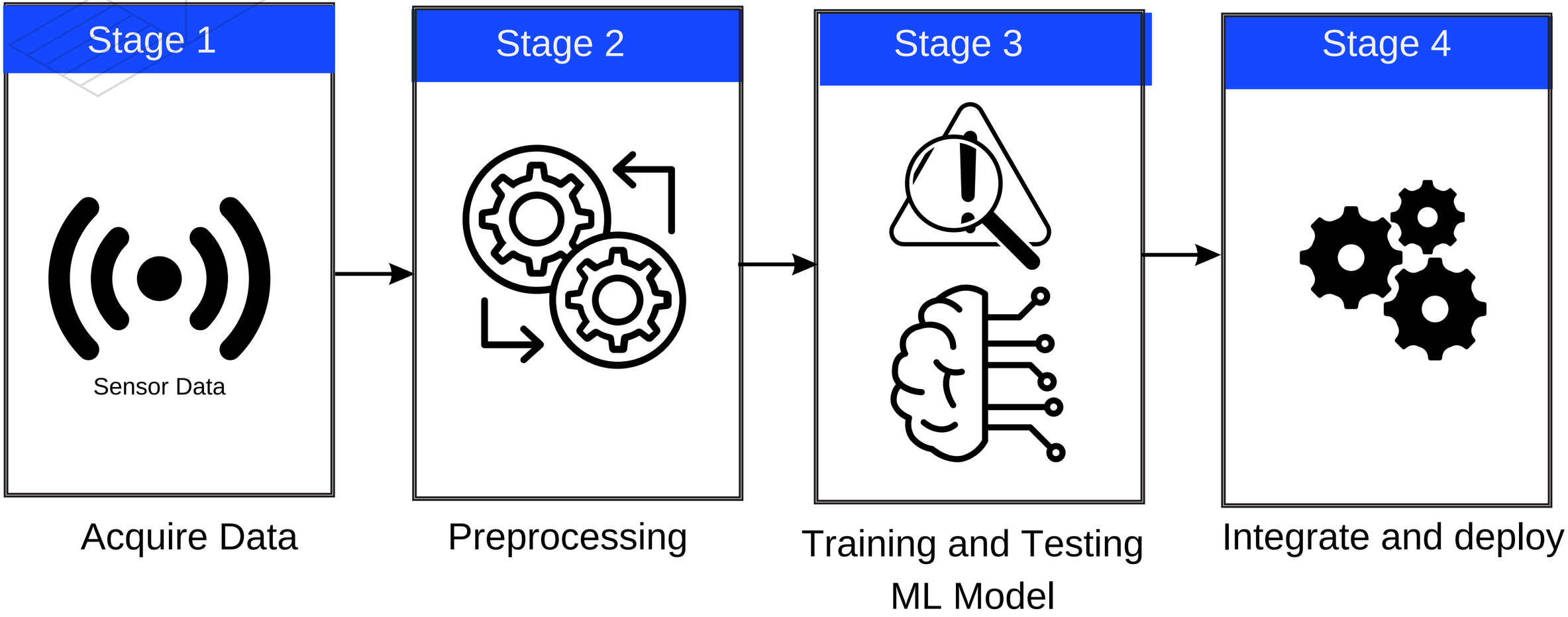
ENERGY OPTIMIZATION



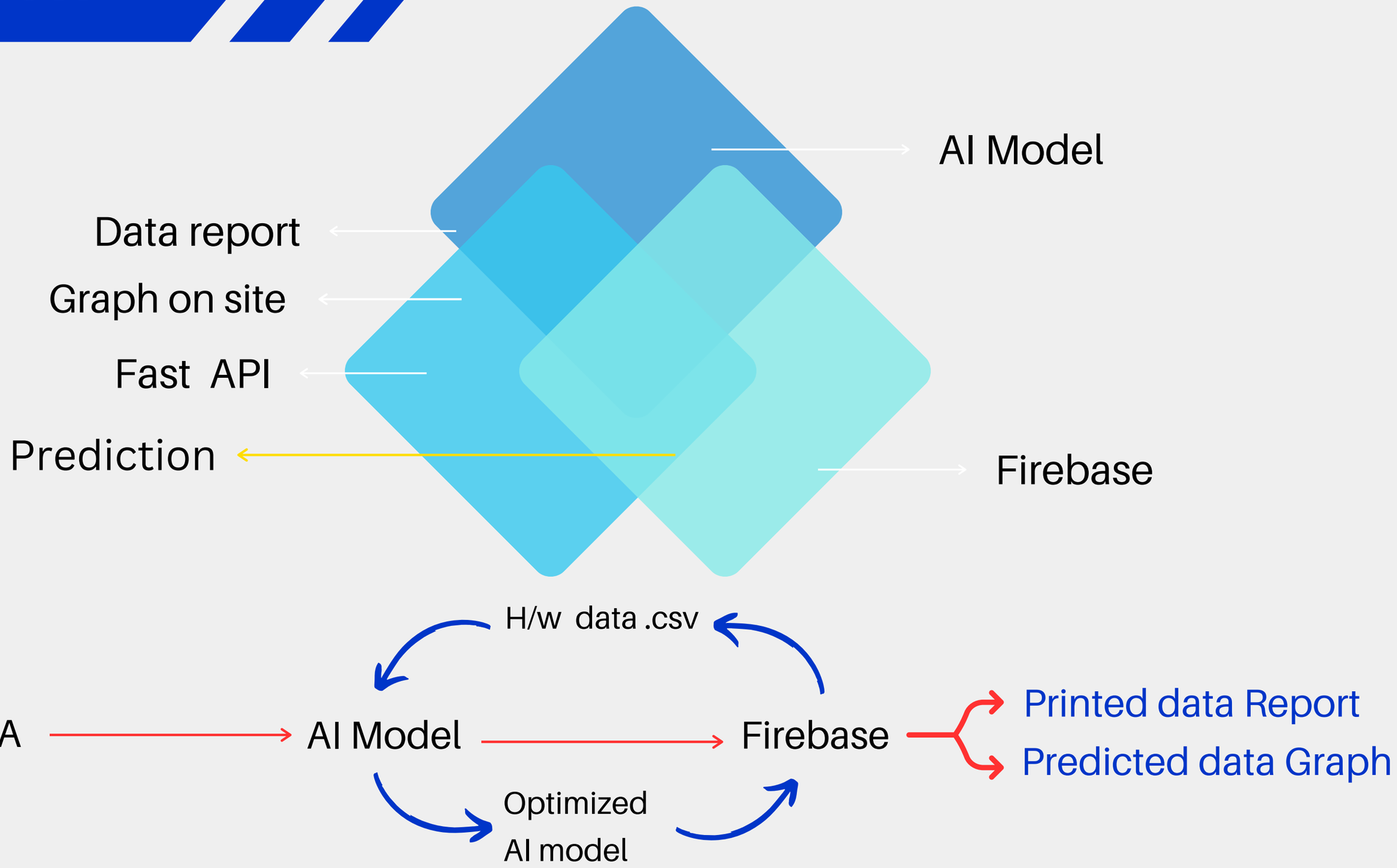
PIR



AI CONCEPT


Stage 1
Sensor Data
Stage 2
Stage 3
Stage 4
Acquire Data
Preprocessing
Training and Testing
ML Model
Integrate and deploy

AI APPROCH


AI Model
Data report
Graph on site
Fast API
Prediction
Firebase
H/w data .csv
DATA
AI Model
Firebase
Printed data Report
Predicted data Graph
Optimized
AI model

IMPACT OF THE IDEA

1

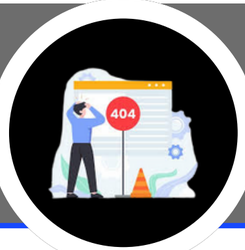
Real time monitoring

2

Effective Energy Management

3

Energy Predictions

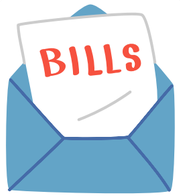


4

No Human Error

5

Energy Optimisation



6

Bill Generation

Use Cases

- Smart Office Building
- Water Treatment
- Shopping Malls
- Hotels and Hospitality
- Agriculture
- Educational Institutions

UNIQUE SELLING POINTS

REDUCED ELECTRICITY BILL

LONG TERM COST SAVINGS

LESS ENVIRONMENTAL IMPACT

LIABILITY OF THE PRODUCT

IMPROVED LIGHTNING QUALITY

REDCUCED HEAT EMISSIONS

Cost Estimation

TX UNIT

S.NO.	Component	Quantity	Cost
1.	Ardunio Nano	1	209 /-
2.	NRF 24L01	1	160/-
3.	Window CT	3	138 /-
4.	Passive Components	1	50 /-
5.	DHT 11 Temp sensor	1	53 /-
6.	Battery Lithium Ion	1	150 /-
7.	PIR Motion Sensor	1	65 /-
8.	Design Packing	1	100/-

TX UNIT TOTAL= RS 925/-

GATEWAY UNIT

S.NO.	Component	Quantity	Cost
1.	ESP 32	1	390/-
2.	NRF 24L01	1	160 /-
3.	Battery Lithium Ion	1	150 /-
4.	OLED	1	205 /-
5.	Window CT	1	42 /-
6.	Design Packing	1	100 /-

GATEWAY UNIT TOTAL= RS 1047/-

TOTAL COST

MANUFACTURING COST= 1500/-
MARKET COST= 2000/-

BUSINESS MODEL

KEY PARTNERS

- **MSME**
- **Discom**
- **Manufacturing Industries**
- **Industries**

KEY ACTIVITIES

- Real Time tracking of power
- Development of AI solution
- Management of load.
- UI development.

KEY RESOURCES

- **Sensor**
- **Data Collection**
- **Partnership**
- **Collaboration**

VALUE PROPOSITIONS

- **Environmental sustainability**
- **Operational efficiency**

CUSTOMER RELATIONSHIP

- **Consultative Approach**
- **Data Security and Privacy**
- **Partnership Mentality**

CHANNELS

- **WebApp**
- **Direct Sale**
- **Partnerships**
- **Online Marketing**

CUSTOMER SEGMENTS

- **Smart Cities and Municipalities**
- **General Public**
- **Real Estate Property Management**

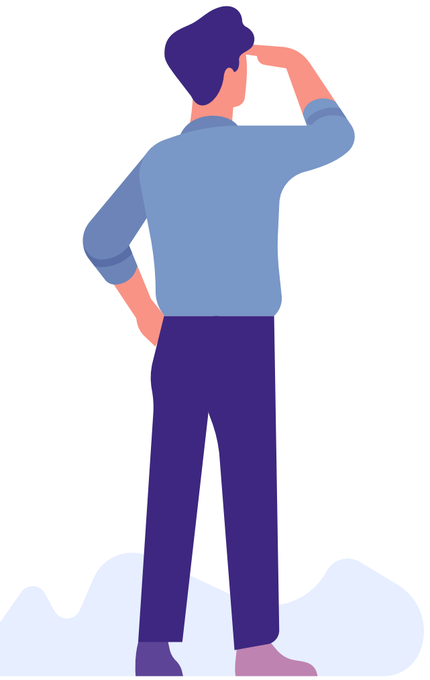
COST STRUCTURE

- Manufacturing cost= Rs 1500/-
- Market cost = Rs 2000/-

REVENUE STREAM

- For sale model
- Equipment Rent model

FUTURE SCOPE



- Smart Plug Switch.
- Integrate Lo-Ra technology for long range.
- Monitoring of water and Energy consumption in A single product.
- Integrate With Payment gateway.
- More accurate reports through AI/ML.

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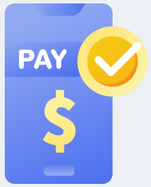

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THANK YOU

BRIGHT SPARKS