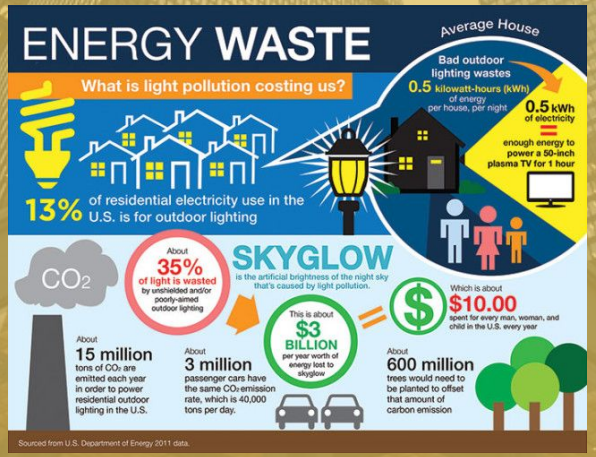
PROJECT
ECO-QUOTIENT CALCULATOR

CITY
SHAPER

FLL
FIRST LEGO® League

PROBLEM

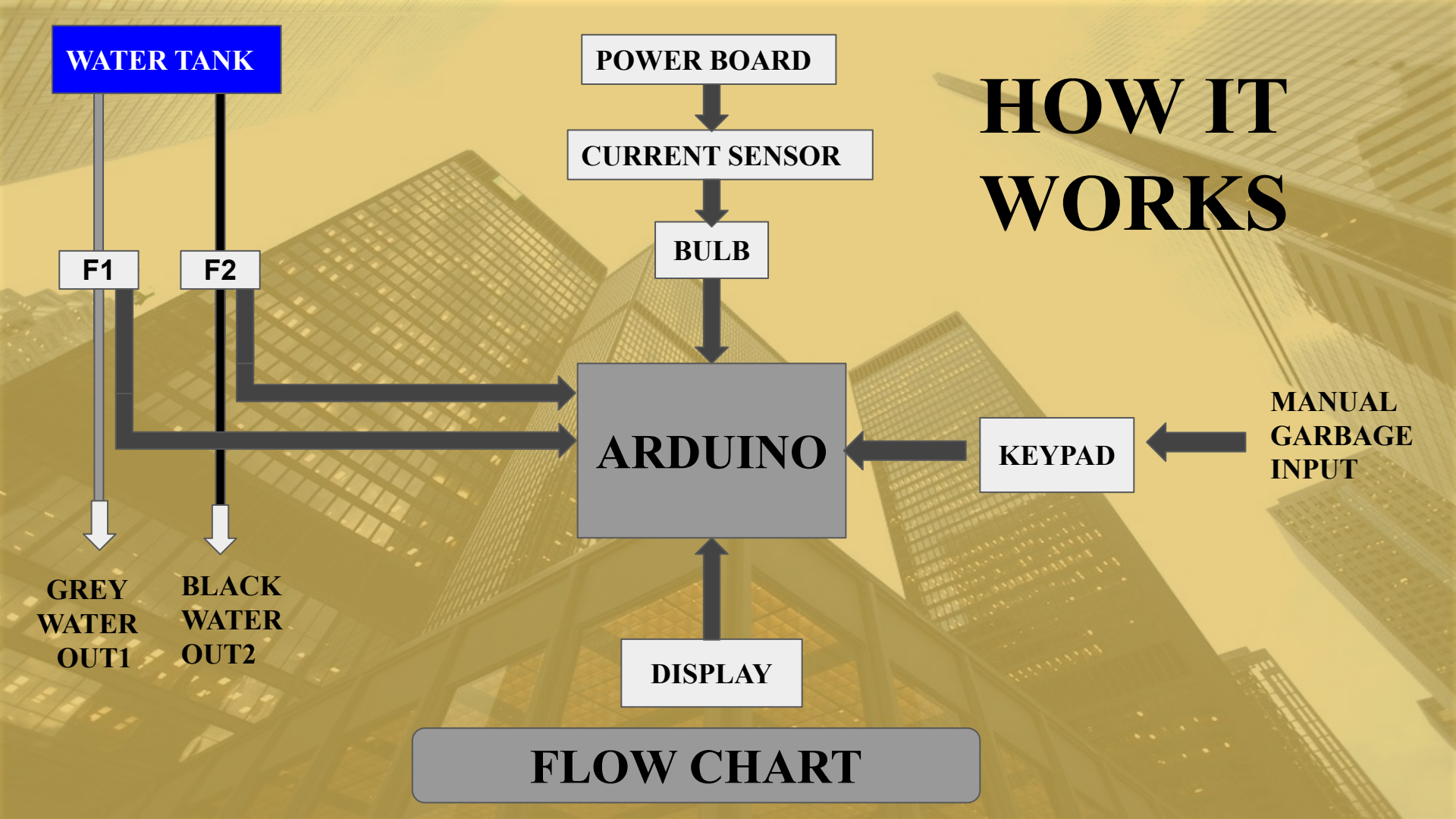
- No accountability for resources used or disposed by buildings.
- Inefficient monitoring system with low awareness for resource management
- Unaware consumer for the 15% Tax rebate, 5 % for waste segregation , 5% for compost and 5% for rain water harvesting.



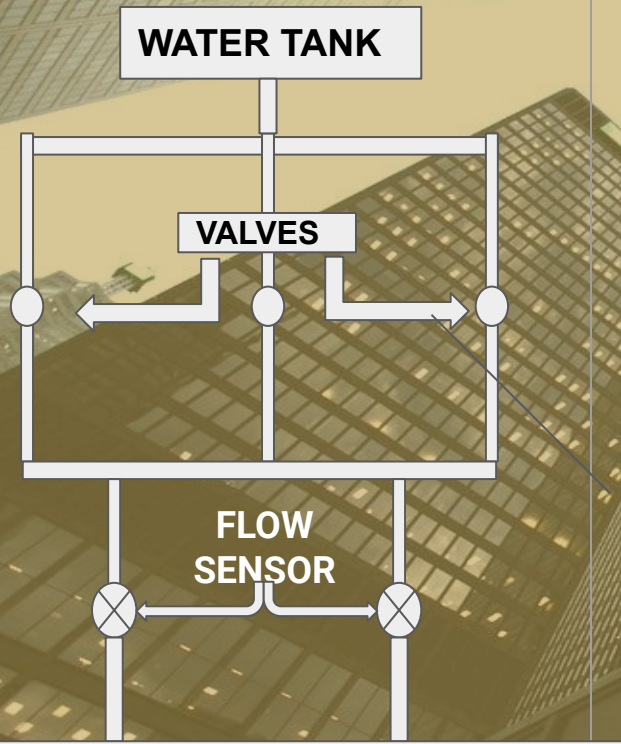
OUR SOLUTION

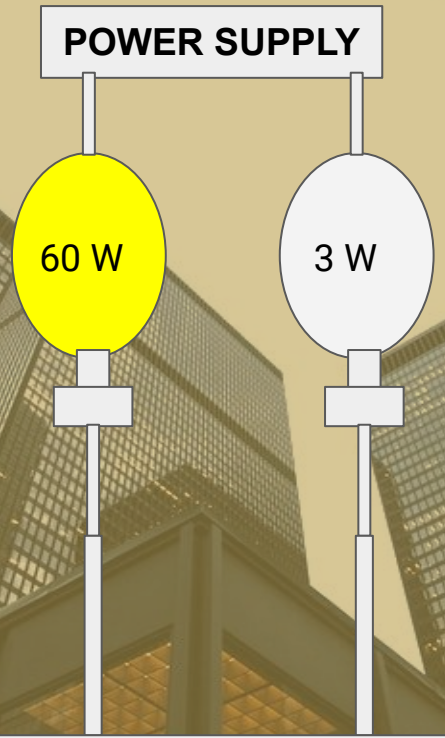
ECO-QUOTIENT OF THE BUILDING

Eco-Quotient Calculator is a parameter that tells how much eco-friendly your building is. We have taken three parameters into consideration and they are 1. Water 2. Electricity 3. Garbage


WATER TANK
POWER BOARD
CURRENT SENSOR
BULB
HOW IT WORKS
F1
F2
ARDUINO
KEYPAD
MANUAL GARBAGE INPUT
GREY WATER OUT1
BLACK WATER OUT2
DISPLAY
FLOW CHART

WATER	ELECTRICITY	GARBAGE





ARDUINO DISPLAY :

Eco Quotient Rate = (Water Rate + Electricity Rate + Garbage Rate) /3

EX: (4 + 9 + 7) / 3 = 6.6 is the rating

CALCULATION FORMULAS

Water

1.Water :

1)(Black water / Water intake) * 10 = X

2) (Grey water / Water Intake) * 10 = Y

3) X -Y = Z

4) 10 - Z = Water Rating

Ex: If 10 Litres of water is intake ,2 lit = Black Water

4 lit = Grey Water , 1 lit = Stored, 3 lit = Consumed

Solution: (2/10) * 10 = 2 This is our X

(4/10) * 10 = 4 This is our Y

10 - (2+4) = Rating

10 - 6 = 4So 4 is the Rating

Electricity

2) Electricity:

Acc to research 1 Flat consumes approximate 100 kWh/month

Power consumed ratio = (Power consumed by building/ No of flats)

Power consumed ration compare with standard value i.e. 100 kWh/ month

- If electricity consumption is less than 100kWh / month than Rating is 7-10
- If electricity consumption is between 100kWh / month and 150kWh/month than Rating is 4-6
- If electricity consumption is more than 150kWh / month than Rating is 0-3

EX: If we have an LED bulb of 3 Watt then the rating of units will be around 15 unit which is less than 110 kW/h then the rating is 9

Garbage

3)Garbage Equation:

Garbage Ratio = (Garbage Produced / 5)

5 is the approximate members in a family

- **If Garbage = Fully Segregated Rating is 8 to 10**
- **If Garbage = Semi Segregated than point is 4 to 7**
- **If Garbage = Not-Segregated then Rating is 0 - 3.**

EX: If garbage produced is 800 kg and

semi segregated than

800/5 = 40 kg then we give rating as 7

WORKING PROTOTYPE

COSTING

- Arduino Controller - 400 Rs
- Flow Sensors- 400 Rs
- Current Sensor - 250 Rs
- Keypad - 100 Rs
- Other Elements - 600 Rs
- Total Costing - 1750 Rs

ADVANTAGE

- Building is responsible to increase the quotient to get the benefit
- Standardised format for the calculation and therefore will generate good awareness with Building Management and make them conscious on how much resources should be used per household
- A building level Evaluation System will help Incentivise and Penalise buildings for Saving or Misusing Resources
- Easy Automatic calculation that can be upscaled with many other features eg: Green Cover that the building has, How airy and ventilated the building is etc
- Since the government already has the incentive plan in place this tool compliments the scheme and it can spread to many more buildings easily methodically and uniformly