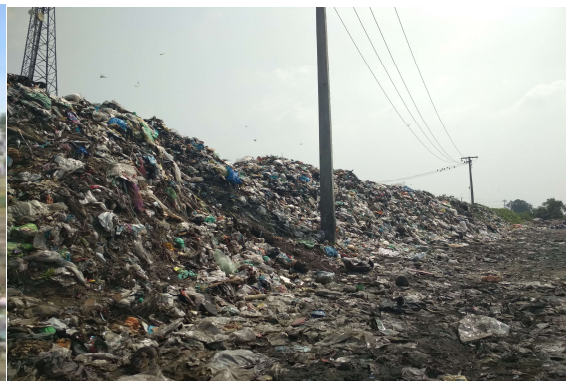
SWATCH BHARATH ABHIYAN

PROBLEM:

- In India we use two methods to dispose the garbage

1. Incineration In open space 2.Deposition In land fills

SOLUTION: What We Propose!

We are providing a way to dispose this garbage in a useful manner and we are also producing electricity from it around 1150 kilo watts of electricity per ton of garbage.

This project will also leverage the life of poor people, orphans, transgenders and also anyone who wants to get benefitted by this facility.

We are converting a 100% waste material into a 100% useful product.

The Step wise procedure is given as follows

1.THE GARBAGE COLLECTION AND AUTOMATED TRUCK:

The garbage truck is fully automated with IoT. It uses the RFID tags to detect the houses and inform the house owner about the arrival of the garbage truck through message and wait for 5-10 mins, if the house hold garbage is dropped it will move to the next house.

We use passive **RFID tags** as we have most of the houses located within 10 meters. If the garbage is not dropped then it will sense it through the **weight sensor** and moves through the next house.

Our project starts with the collection of house hold and industrial garbage for which we can use the people who are interested in keeping their

surrounding clean and also the people who need to make money for their daily life.

Government can take this project as an initiative under the Swatch Bharath Abhiyan to help the poor people.

The idea behind this is we can reward money to the poor people who collect the garbage for the plant. From the profit of our plant we can provide them 10 rupees for 1 kg of garbage they provide.

This makes the daily income of the person to 100 rupees if collects 10 kg of garbage per day, according to our government this is twice the income of an average person in India. By this we are also leveraging and bringing the betterment in their life.

After collecting the municipal waste, it will deposit the waste in the garbage collector in the plant. Now the garbage collector moves garbage into the conveyor belt.

From the conveyor belt we will remove the metal waste for recycling using electromagnet.

2.THE GARBAGE INCINERATOR:

The garbage incinerator burns the garbage at the rate of 2000 degree Fahrenheit. The reason why we are chosen 2000 degree is the biodegradable elements don't burn completely.

It is because when a fire is lit the moisture in the elements are driven off, and then it gets hotter, chemical reaction takes place which produces gases.

These gases are unburnt portion of these elements. The DIOXINS are produced when halogenated plastics are burnt. ***WHO*** says "Dioxins are human carcinogen which means once they enter the body or environment, they will stay for a long time for their **UNCANNY ABILITY** to dissolve in fats and to their rock – solid stability".

Now we will use this heat to evaporate the water stream around the plant which will rotate the turbine and that **produces electricity.**

3.THE GASES AND THEIR PROPERTIES:

Since our project only concerns with the major composition of gases produced while burning degradable and non-biodegradable elements and their boiling point we have discussed those two properties only.

GASES	CHEMICAL FROMULA	BOILING POINT
Carbon monoxide	CO	191.5°C

Benzene	C_6H_6	80.1°C
Formaldehyde	CH_2O	19°C
Carbon dioxide	CO_2	56.6°C
Nitrous oxide	N_2O	21°C
Terephthalic acid	$C_8H_6O_4$	20°C
Phthalic acid	$C_6H_4(COOH)_2$	207°C
Hydroxy benzoic acid	$C_7H_6O_2$	249°C
Phosphoric acid	$PO-_{43}$	94°C
Triphenyl Benzene	$C_{24}H_{18}$	460°C

From all these gases produced while burning garbage there is a single common element that is present in 90% of all these gases in the smoke. And that element is carbon, we are using this property of the smoke to break it stability. Now we are concentrating the smoke into a valve using the exhaust fan.

4.ACTIVATED CARBON FILTERS:

Being forced into the pipe the smoke will pass through the activated carbon filters which will absorb the carbon particles from the smoke. In general, these filters can remove up to 97.99% of carbon particle with 0.3 microns, fortunately the carbon with the smoke is found to be 0.52 micron.

5.GENERATING ELECTRICITY AGAIN:

After passing through the carbon filters now it will strike the turbine of a DC generator which will rotate produce electricity. At this part we are able to produce 600 kilo watts of electricity.

6.AGAR-AGAR PROCESS:

The agar-agar process is the process of filtering the compounds present in the smoke which are in the gaseous state where they can be condensed into their original. Here we have coconut charcoal activated with potassium hydroxide which forms different layers of porosities in it. These coconut charcoal will fill its pores with the components of the smoke that are being weak by the removal of the carbon atom from it. But still there are some materials like dioxins and hydrocarbons which will not get reduced by this carbon filtration.

7.THE M^2AKM SOLUTION:

The M^2AKM solution is the main part of this plant because it is where the dioxins are removed from the smoke which I have already stated as a rock-solid bonding material. This composition consists of there materials dioxide, lime, furan-which is a radioactive material. This composition will deal with the left overs of the smoke from the whole incineration plant. I named this composition after Dr.A.P.J.Abdul Kalam (Missile Man Abdul Kalam).

This solution will absorb all the left overs of the components of the smoke . And it will form the **UREA** eventually which is a **fertilizer.**

8.THE CHEMICAL REACTIONS AND THEIR WORKING:

In order to convert such huge number of gaseous elements into the state we want we need 5 kinds of reactions. They are listed as follows

1. Synthesis Reaction
2. Decomposition Reaction
3. Single Replacement Reaction
4. Double Replacement Reaction
5. Neutralization reaction

The reactions which will happen while the smoke moves through the M^2AKM solution and the agar-agar process are listed below and solved it by myself

$C_6H_6 + H_2O_2 \text{ ---> } 6CO_2 + 4H_2O$

$C_5H_{11}NH_2 + O_2 \text{ ---> } CO_2 + H_2O + NO_2$

$N_2O + CH_4 \text{ ---> } N_2 + CO_2 + H_2O$

$C_6H_6 + H_2O_2 \text{ ---> } CO_2 + H_2O$

$2C_5H_{11}NH_2 + O_2 \text{ ---> } 10CO_2 + 13H_2O + 2NO_2$

$4N_2O + CH_4 \text{ ---> } N_2 + CO_2 + 2H_2O$

$HNCO \text{ ---> } C_3N_3(NH_2)_3 + CO_2$

$CH_3CCl_3 + O_2 \text{ ---> } CO_2 + H_2O + Cl_2$

$H_2S + CO \text{ -----> } CH_3COOH + S_8$

$C_3H_5(NO_3)_3 \text{ ---> } CO_2 + H_2O + N_2 + O_2$

$CO(NH_2)_2 + NO_2 \text{ ---> } CO_2 + H_2O + N_2$

$C_2H_2 + O_2 \text{ ---> } CO_2 + H_2O$

$C_4H_{10}S + O_2 \text{ ---> } CO_2 + H_2O + SO_2$

$C_5H_7O + O_2 \text{ ---> } CO_2 + H_2O$

$S_2H_5 + O_2 \text{ ---> } SO_2 + H_2O$

$C_{10}H_{22} + PO-_{43} \text{---> } C_4H_{10} + O_2 + C_2H_4$

$C_3H_5O_9N_3 \text{ ---> } CO_2 + N_2 + O_2 + H_2O$

$C_3H_5 + O_2 \text{ ---> } CO_2 + H_2O$

$C_5H_{11}SO_2N + O_2 \text{ ---> } CO_2 + H_2O + SO_2 + NO_2$

$Ca(OH)_2 + C_4H_6O_5 \text{ ---> } H_2O + CaC_4H_4O_5$

The above solved reactions are balanced thoroughly. This brings to the end of our project. The first ***waste to clean energy*** project in INDIA that gives sustainable energy for the government and produces zero left behind for the garbage disposal. This project will make India The Cleanest Place within 2020.

The carbon filters can be used to prepare cosmetics, soap and all other cosmetics related materials.

The ashes left over can be reacted with limestone to produce a cement like material that is 5% less adhesive than cement.

We are converting a 100% waste material into a 100% useful product.

Thank You