



A Startup Project on Solid Waste Management &
Circular Economy & Green Hydrogen
By: Varanasi Recyclers Private Limited

About Varanasi Recyclers Private Limited

History & Origin:

This Start Up company was formed with the objective of transforming all types of city wastes into Electricity & later into Green Hydrogen.

Parallely we are approaching schools and colleges for awareness programs, training & mentorship programs in the above domains in the form of capacity building under the State Govt. mission of creating Samriddh Uttar Pradesh-2047 & also Nari Shakti Mission- 2047 has also been discussed in the later slides.

Firm's Registration Information:

The firm is registered with Corporate Identification Number: U39000UP2025PTC231871

Certificate of Corporation

Information of Director:

1. Mr. Piyush Pandey, B.Tech & MBA, and a former Project Officer at Sponsored Research & Industrial Consultancy Office, IIT Roorkee.

Companies Email: vrplvns@gmail.com

Website- In preparation

DPIIT Certification: A Govt. of India recognized Startup Co.



Mission of the Project

- To contribute in “**Viksit Bharat Mission-2047**”- the PM initiative for developed India, through hiring all along 50% women employees in our project to make 70% women in economic activity to promote
- The project will contribute to **SDG-3** promoting awareness and learning for environment and other sustainability domain.
- This Plasma based initiative will prevent water & soil pollution through waste to energy conversion while having almost zero harmful emissions also, no leachate will contaminate the ground water and this will ensure sanitation with MSW recycling, hence help in fulfilling **SDG-6**.
- This project has focused on the ‘**Swadeshi Mantra**’ while having the Indigenous technology developed by CSIR-CMERI which will make waste to energy and green hydrogen mission possible in Varanasi, Uttar Pradesh.

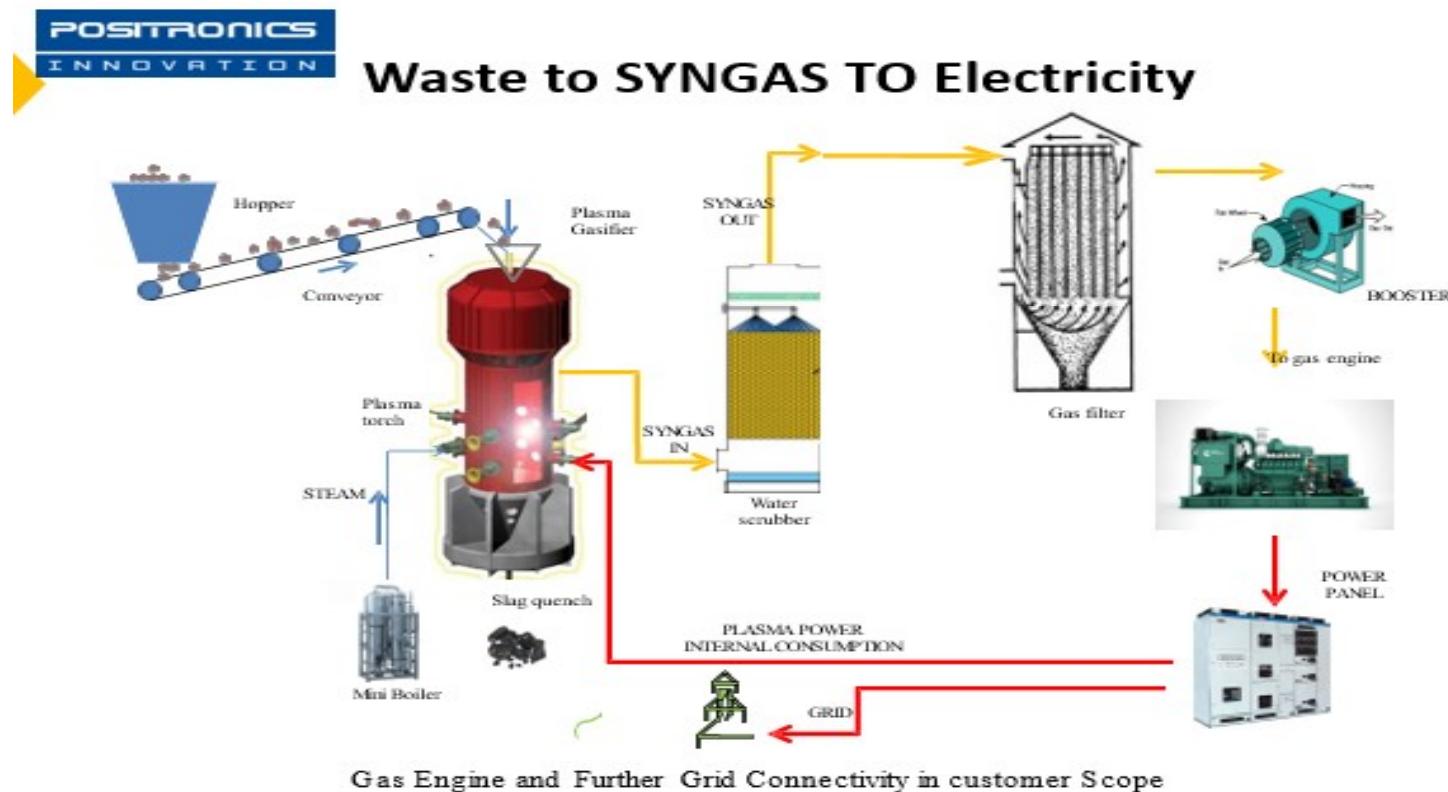
Objective of the Project

- Scientific disposal of Municipal Solid Waste (MSW)/ Plastic Waste/ Biomedical waste (BMW)/Hazardous Waste (HW)/ Metallic Waste of Varanasi city.
- To deploy suitable technology developed by CSIR-CMERI in coordination with Positronics Innovation Private Limited, Durgapur, West Bengal and Bhabha Atomic Research Centre BARC, Mumbai for plasma Gasification/Pyrolysis of MSW/BMW/PW/HW of capacity 5TPD /10 TPD.

Objective of the Project

The Project will work in 2 phases :

- Phase 1- Waste to Syngas to Electricity

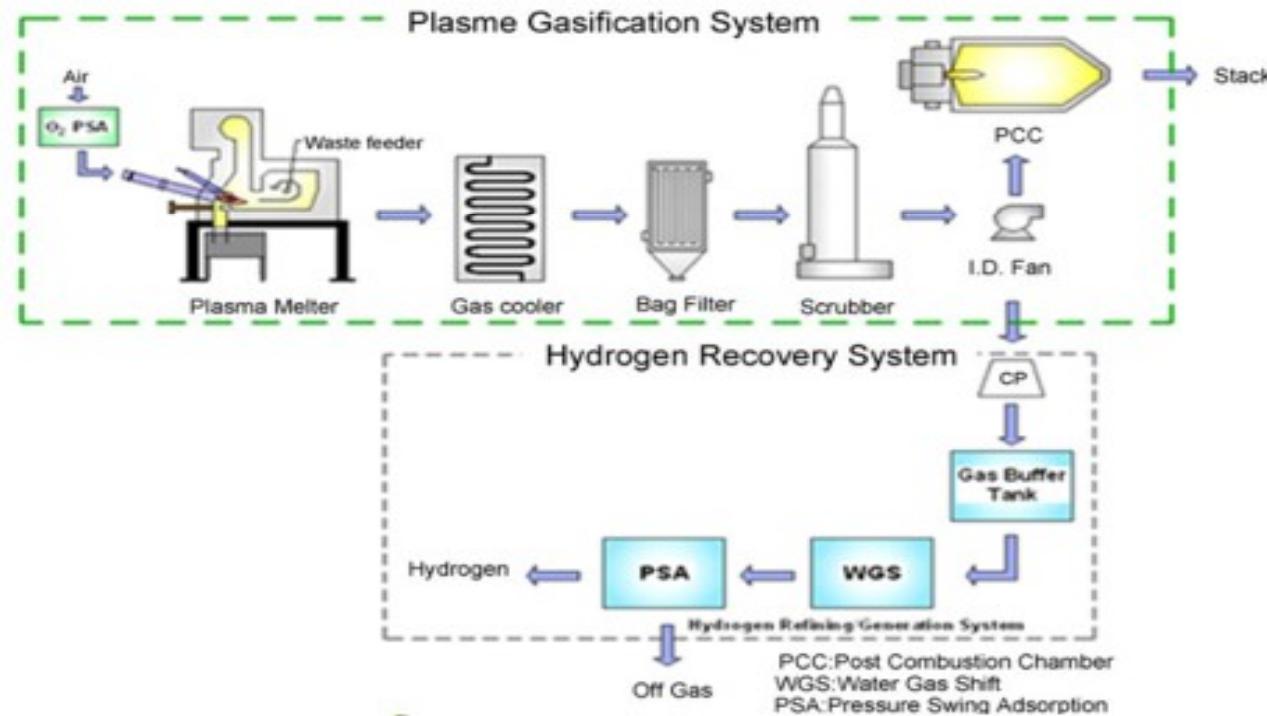


Objective of the Project

- Phase 2- Waste to Syngas to Hydrogen Generation

(The current technology setup can be easily scaled up for generation of hydrogen with a different setup to be attached after the success of phase 1)

Waste TO Hydrogen Line Diagram by PAGS



Objective Execution Plan

- A separate waste vehicle will be mounted and covered in a closed manner with a tripper as part of the proposed project, which aims to transport waste from all stakeholders in accordance with their mutual agreements. There will be a separate expense and cost list for this vehicle. The project will also incorporate later Varanasi Nagar Nigam's waste.
- This expense will be covered by VRPL out of the start-up's funding.
- To promote green energy, a **CNG or Electric Van** vehicle with a **1.5–2 ton/run** carrying capacity will operate throughout the city.

Varanasi Waste Solutions Private Limited

Established in 2020, Varanasi Waste Solutions Private Limited is a step-down subsidiary of Antony Waste Handling Cell Limited, specializing in comprehensive waste management solutions. The company aims to address the waste management needs of Varanasi city through a **7-year contract with the Varanasi Municipal Corporation**.

Since the project's initiation on **October 2, 2021**, Varanasi Waste Solutions has been actively involved in door-to-door collection and transportation of Municipal Solid Waste services, mechanized road sweeping, and other related services.



Mode in which wastes will be carried

TYPES OF COLOUR-CODED DUSTBINS AND THEIR USAGE



GREEN DUSTBIN

Biodegradable and organic waste



BLUE DUSTBIN

Dry waste and recyclable items



RED DUSTBIN

Hazardous or biomedical waste



YELLOW DUSTBIN

Sanitary and medical waste

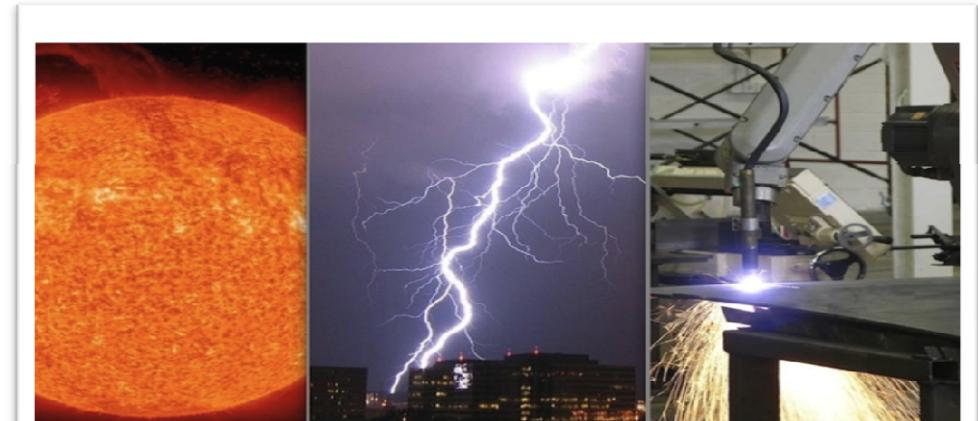
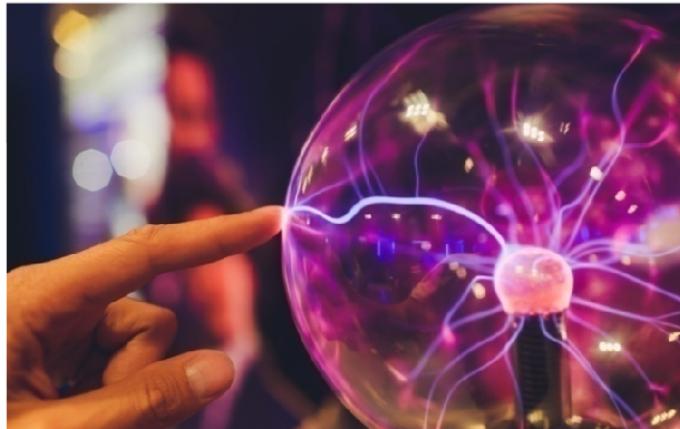


BLACK/GREY DUSTBIN

General waste not suitable for recycling

What is Plasma?

- After Solids, Liquid and Gases the fourth state of matter is Plasma, and is a superheated, ionized gas composed of ions and electrons.
- Lightning in the sky is an example of Plasma.



What is Plasma Gasification?

Plasma gasification is a non-incineration thermal process which uses extremely high temperatures in an oxygen starved environment to completely decompose waste material into very simple molecules.

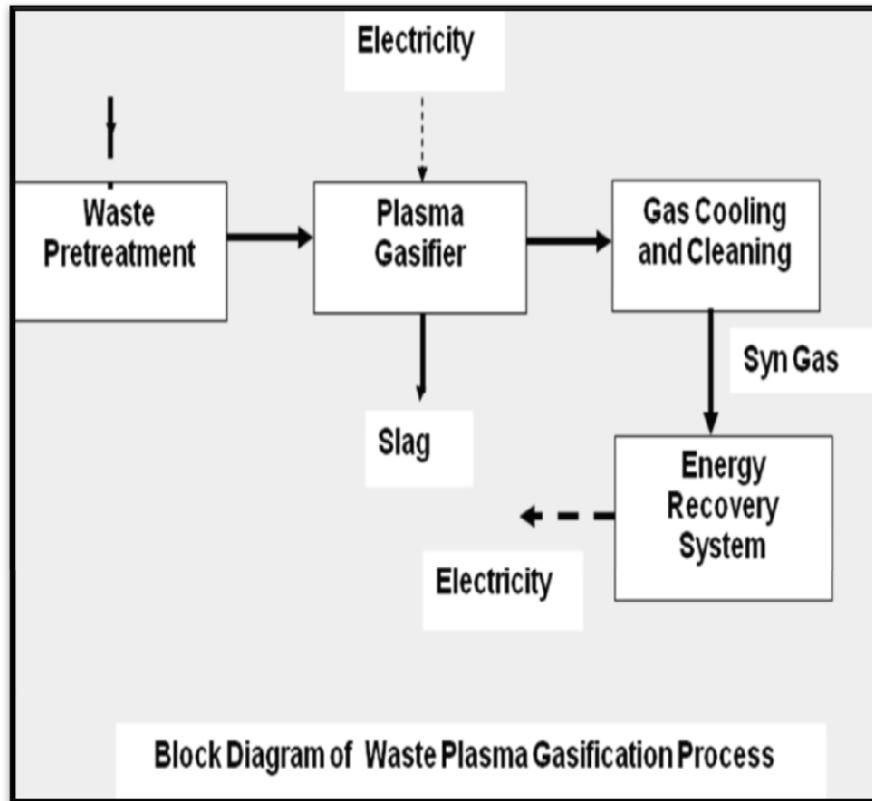
A VERY SMALL AMOUNT OF SEGREGATION OF (WET / DRY PLASTICS) IS REQUIRED IN THIS PROCESS.

The process produces a clean combustible gas and a non-toxic, inert slag, both of which have commercial value. The project produces Electricity and Hydrogen which can be used in many ways.

Benefits:

- Decomposition of waste into Hydrogen rich fuel gas Eco-friendly disposal of waste
Large volume reduction, the slag is 1/250 th of the volume of the processed solid waste.
- The slag is usable as road/ building material.
- Emission standards

Plasma Gasification Process



(a) Plasma Gasification plant

Composition of MSW in India and Regional Variation

Region/City	MSW (TPD)	Compostables (%)	Recyclables (%)	Inerts (%)	Moisture (%)	Cal. Value (MJ/kg)	Cal. Value (kcal/kg)
Metros	51402	50.89	16.28	32.82	46	6.4	1523
Other cities	2723	51.91	19.23	28.86	49	8.7	2084
East India	380	50.41	21.44	28.15	46	9.8	2341
North India	6835	52.38	16.78	30.85	49	6.8	1623
South India	2343	53.41	17.02	29.57	51	7.6	1827
West India	380	50.41	21.44	28.15	46	9.8	2341
Overall Urban India	130000	51.3	17.48	31.21	47	7.3	1751

Plasma Gasification Trial Results

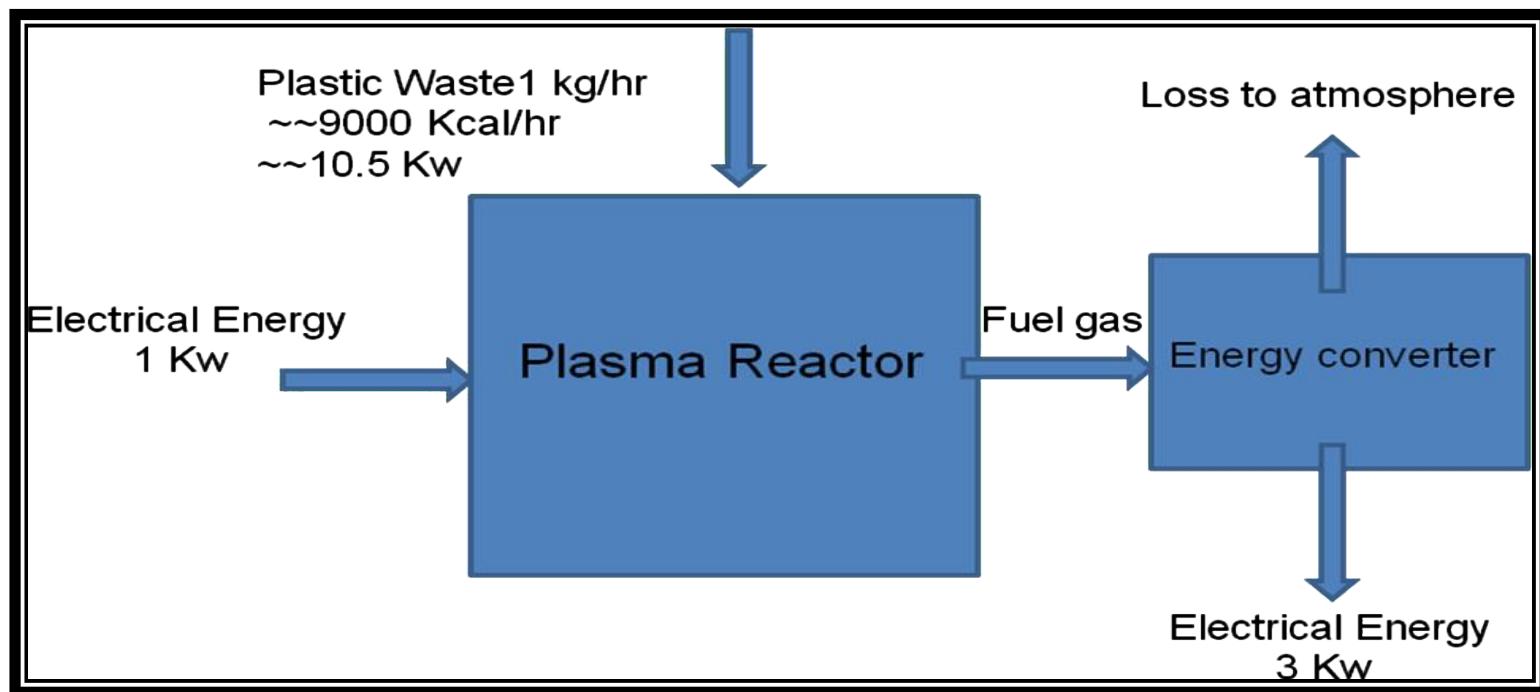
Waste Type	Input Power/hr	Output Power/hr	Net Power/hr	Syngas Produced	Slag Produced	Power Output
MSW (20% moisture)	35 kW	66 kW	31 kW	~65 m³/hr	~130 kg/hr	~0.7 MW/ton
Plastics	30 kW	120 kW	90 kW	~118 m³/hr	~60 kg/hr	~2.1 MW/ton
Hazardous Waste	105 kW	52 kW	42 kW	~51 m³/hr	~100 kg/hr	~1.0 MW/ton
Tires	20 kW	98 kW	78 kW	~97 m³/hr	~120 kg/hr	~1.8 MW/ton
Oil Sludge	32 kW	125 kW	93 kW	~126 m³/hr	~63 kg/hr	~2.2 MW/ton
Biomedical	20 kW	80 kW	64 kW	~87 m³/hr	~80 kg/hr	~1.6 MW/ton

Benefits of the Project

- Electricity from syngas
- Slag (usable as construction material)
- Heat recovery options
- Reduction of landfill waste
- Green energy contribution
- Sustainability and circular economy approach
- Environmental & Social Impact
- Reduces greenhouse gas emissions.
- Eliminates harmful dioxins & furans.
- Reduces landfill burden → cleaner cities.
- Creates local jobs & green economy opportunities.

Techno-Economics of Plasma disposal for Plastic Wastes

- 1kg plastic will require 1 kW_e power in a Plasma Gasifier.
- The calorific value of plastic is 43.5 MJ/kg. If the overall efficiency of conversion is 30 % then the output electrical energy is 13.05 MJ which is equivalent to 3.6 kW_e for 1 kg/hr plastic conversion.
- Considering 1.2 kW_e for auxiliary power requirement the net recovery is 2.4 kW_e or Rs. 7.0 (approx).



Sensitivity Analysis

Sensitivity analysis in plasma gasification is crucial for understanding how different operational parameters impact the process's efficiency and costs.

Effect of Plasma Gas Flow Rate: Increasing the flow rate of plasma gas decreases syngas production.

Effect of MSW Flow Rate: Increasing the municipal solid waste (MSW) flow rate results in increased syngas production.

Energy Efficiency: Achieving a higher cold gas efficiency (CGE) is more crucial than reducing plasma power consumption for better energy efficiency.

Operational Parameters:

Sensitivity analysis aims to maximize net energy produced and minimize costs of the plant .

Applications and Considerations-

Waste Management: Plasma gasification is a viable technique for handling solid waste, including hazardous waste, with potential for energy recovery.

Cost Analysis: For a plasma gasification plant handling 5 TPD / 15 TPD as proposed by VMC & Varanasi district administration specially for MSW, the estimated capital and annual operational costs are usually high respectively.

Life-Cycle Analysis of Plasma Gasification

- Plasma gasification plants are considered a promising technology for waste-to-energy conversion, with potential environmental benefits. A life cycle assessment (LCA) of a two-stage plasma gasification plant treating municipal solid waste (MSW) showed :-
- **Environmental Benefits:** The process resulted in negative values for all assessed environmental impact categories, indicating environmental benefits in terms of natural resource savings and reduced pollutant emissions.
- **Global Warming Potential:** - 31 kg CO₂ eq. per ton of MSW treated.
- Key Aspects of Plasma Gasification LCA
- **Efficiency Comparison:** Plasma gasification outperformed conventional incineration in terms of environmental impacts and electricity production.
- **Waste Reduction:** Two-stage plasma gasification achieved higher waste reduction (~86%) compared to incineration (~76%).
- **Air Pollution Control Residues:** Plasma gasification produced fewer residues (15 kg/ton MSW) than incineration (>40 kg/ton MSW).

Safety Measures

- Plasma Gasifiers use extremely high temperatures to convert waste into syngas and by-products like slag. Ensuring safety during their operation is critical due to the hazardous materials and high-energy processes involved. Here are key safety measures for plasma gasifiers:
 - **1. Temperature Control and Monitoring**
 - **Plasma Torches:** The gasifiers operate at temperatures exceeding 3,000°C, requiring robust control systems to avoid overheating or malfunction of the torches.
 - **Thermal Insulation:** Proper insulation and cooling systems prevent heat from damaging the plant infrastructure.
- **2. Air Quality and Emission Control**
 - **Gas Filtration:** Advanced filtration systems, including scrubbers and filters, capture pollutants like particulate matter, sulfur dioxide, and heavy metals from the syngas.
 - **Real-time Monitoring:** Continuous emission monitoring systems (CEMS) ensure pollutants are within safe limits, as gases like carbon monoxide and volatile organic compounds can be dangerous.
- **3. Pressure Control**
 - **Sealed Systems:** Plasma gasifiers operate in a sealed environment to maintain specific pressures. Overpressure can cause explosions, so pressure sensors and relief valves are critical for safe operations.
 - **Pressure Relief Systems:** These ensure safe venting in case of pressure build-up, protecting both equipment and personnel.

Advantages of Plasma Arc Gasification System

- High Diversion Rate Of: 95%
- Vitrified Slag Production
- No Segregation Required
- Safe Disposal Of Hazardous Waste
- Dioxin And Furan Mitigation
- Clean Air Emissions
- Low Carbon Footprint
- Biomass Gasification
- Industrial Waste Utilization
- Hazardous Waste Treatment
- Environmental Sustainability
- Versatile Industrial Application

Key Challenges Identified in Plasma Gasification

- High energy demand to power the plasma torches

(The discussion is being done with Purvanchal Vidyut Vitran Nigam Ltd, Uttar Pradesh for making the availability of input power supply at a subsidised rate)

- Requires careful syngas cleaning to avoid toxins

(As part of start-up project, the man power hiring will be done on the basis of suitable qualification and needful experience related to plant operation and working on the manual and guideline provided for operator training by technology facilitator).

The dioxins and furans generated in case of waste disposal is the major source of human cancer, and unlike others Plasma Gasification technology is the solution to avoid cancerous growth and other animal / human diseases. This ROI is measured by nobody which has to be taken care of. Based on this current technology we can improve AQI and control air pollution.

Challenges faced by other WTE Plants and causes of their failures

Which is the first waste-to-energy plant in India?

AI Overview

India's first waste-to-energy plant was established in **Timarpur, Delhi, in 1987**. It was designed to convert municipal solid waste into energy to help with waste management challenges in the city. The Timarpur-Okhla Waste Management Company (TOWMCL) later set up another facility at the same site in January 2012, which processes 2,000 tonnes of waste per day to generate 16 MW of power.

- **Location:** Timarpur, Delhi.
- **Year:** 1987.
- **Purpose:** To manage urban waste and generate energy from it.



An Environmental Hazard

Apart from health concerns, municipal solid waste may contain many materials with the potential to cause serious environmental degradation.

A 2021 report by the [Central Pollution Control Board \(CPCB\)](#) found that Delhi's waste-to-energy plants failed to comply with air quality standards. The plant in Bawana exceeded permissible levels of PM 2.5 and PM 10 (the numerals refer to the diameter of particulate matter, in micrometers), which are tiny inhalable particles that can cause respiratory and cardiovascular diseases.

Challenges faced by other WTE Plants and causes of their failures

#18: Why Over 50% of India's Waste-to-Energy Plants Have Already Shut Down?

In fact, only around 47% of collected waste is processed, about 27% is officially landfilled, and a staggering 25% of all trash isn't accounted for at all - often just dumped or burned in the open.

A 2018 [report](#) by the Centre for Science and Environment also found that most waste-to-energy plants received mixed waste, comprising a high percentage of biodegradable and inert materials (wastes that do not burn easily, such as construction waste, glass, drywall material, bricks, metal, etc). The calorific value of these wastes ranges between 1,41 kcal/kg to 2,150 kcal/kg, the study found, whereas efficient combustion requires waste with a calorific value of at least 1,900 kcal/kg to 3,800 kcal/kg.

Challenges faced by other WTE Plants and causes of their failures

The Centre for Financial Accountability (CFA), an outreach and research organisation, found in its December 2022 [report](#) that incineration not only emits toxic pollutants, but it also often leads to the destruction of valuable recyclables such as paper, plastics and other materials.

The EPR targets fixed by the government permit plastic producers to fulfil up to 70% of their recycling obligations through incineration or co-processing in cement kilns, rather than through actual recycling. This policy effectively allows a significant portion of recyclable plastics to be burned in waste-to-energy plants.

A report by Toxic Tours, a community-led storytelling group that focuses on the impacts of plastic production, identified residents near the Okhla plant who suffered from chronic cough, lung disorders, eye and skin ailments, and also cancer.

Serious concern over the wastes : CPCB & NITI Aayog report

Similarly, a 2025 fact-finding [report](#) from Hyderabad's Jawahar Nagar waste-to-energy plant highlighted severe environmental degradation in the surrounding area.

Stones and small rock particles had eroded to the point of crumbling at the slightest touch, and roads leading from the plant were coated in ash. Leachate from the landfill, more toxic due to ash from the incinerator, was flowing directly into a nearby pond, said the report, compiled by representatives of various environmental groups in Hyderabad.

Garbage Mismanagement

According to a 2020-21 Central Pollution Control Board (CPCB) [report](#), the overall quantity of solid waste generated in India stands at 160,038.9 tonnes per day (TPD), or 58.3 million tonnes of MSW per year.

This figure is projected to increase to 165 million tonnes by 2031 and could reach 436 million tonnes by 2050, according to a NITI Aayog report.

Serious concern over the wastes

Yet, policy-makers forged ahead regardless: back in 2007, the Ministry of New and Renewable Energy (MNRE) even told the Supreme Court that WTE plants “can function on un-segregated waste,” a claim that ground reality has proven tragically wrong.

Economics have been an equally crippling issue. Power from waste in India is very costly.

Despite heavy subsidies, WTE electricity is priced around ₹7 per kWh, which is about double the cost of power from coal or solar plants.

This makes it unattractive for power distribution companies to purchase.

The high cost stems from the small scale and inefficiencies - WTE incinerators are generally 5–25 MW each, far less efficient than large power stations.

They also have high operating and maintenance expenses.

95% Of Delhi's E-Junk Still Being Handled Informally

Wait For Eco-Park At Holambi Kalan May Last Another 18 Mths



but with rudimentary processes and poor recovery efficiency. "When it comes to precious metals like gold, silver or palladium, recovery efficiency in the informal sector is only 20-30%. None of the units had any health or environmental protection measures," it noted.

Industrial players view e-waste as a significant economic opportunity that India is yet to fully tap. "The moment waste becomes profitable, it becomes part of policy," said Radhika Kalia, MD of RLG Systems India Pvt Ltd, which manages e-waste collection and recycling.

Calling e-waste a micro-mining of lithium, cobalt and rare

The Solid Waste Management Rules 2016, notified by the government of India to regulate the collection, segregation, handling, storage and processing of solid waste, stipulates that only non-recyclable and non-biodegradable waste with a calorific value of 1,500 kcal/kg or more should be directed to waste-to-energy plants.



For basic Understanding

- **Incineration** – Incineration technology is complete combustion of waste with the recovery of heat to produce steam that in turn produces power through steam turbines.
- **Gasification** – Gasification is a process that uses high temperatures (500–1800°C) in the presence of limited amounts of oxygen to decompose materials to produce synthetic gas.
- **Pyrolysis** – Pyrolysis uses heat to break down combustible materials in the absence of oxygen, producing a mixture of combustible gases, liquids and solid residues.

Challenges faced by Society/World



Good News for our Country's Renewable Energy Achievement

 **India Hits a Historic Energy Milestone** 

500+ GW Installed Capacity
51% Power from Clean Sources

A proud moment for India's power sector – the nation has officially crossed 500 GW of total installed electricity capacity (as of 30 Sept 2025), marking a massive leap toward a clean, secure, and self-reliant energy future.

Here's the big picture:

- **Total Capacity: 500.89 GW**
- **Non-Fossil Sources: 256.09 GW (51%)**
 - Solar: 127.33 GW
 - Wind: 53.12 GW
 - Hydro: 30.29 GW
- **Fossil Fuel: 244.80 GW (49%)**

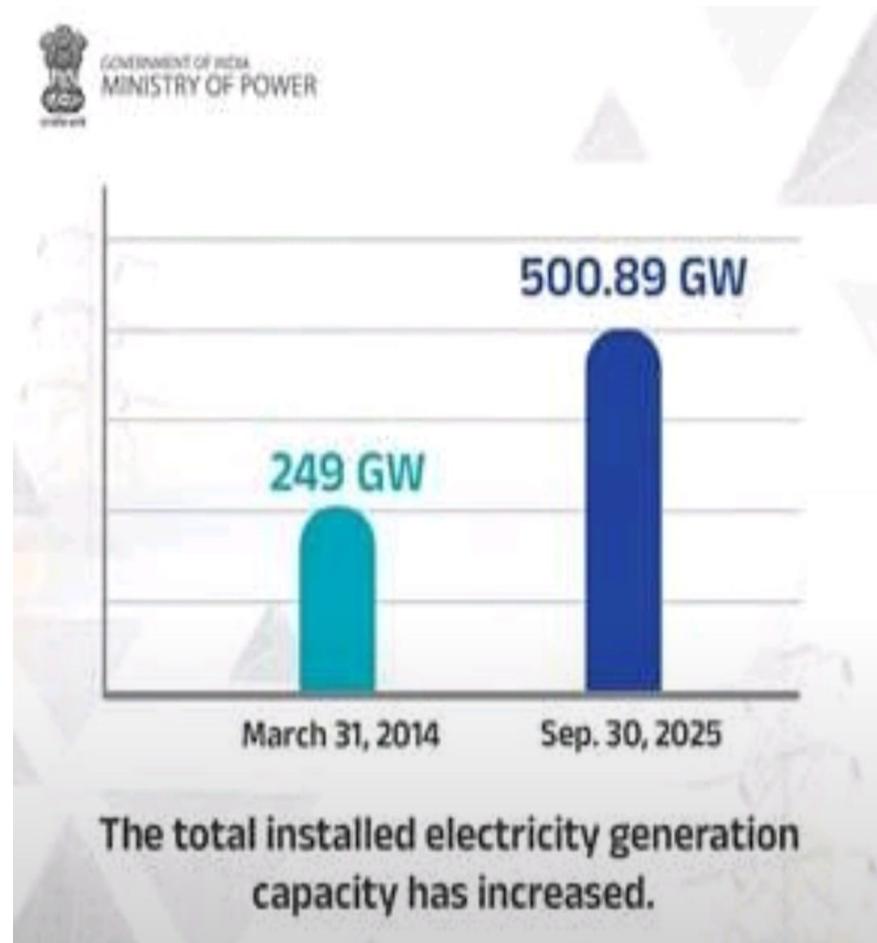
And that's not all —

 On 29 July 2025, India recorded its highest-ever renewable share in power generation – renewables met 51.5% of total demand (203 GW) in a single day

  **Solar: 44.5 GW**  **Wind: 29.9 GW**
 **Hydro: 30.3 GW**

 India has achieved its COP26 goal of 50% non-fossil power capacity – five years ahead of schedule

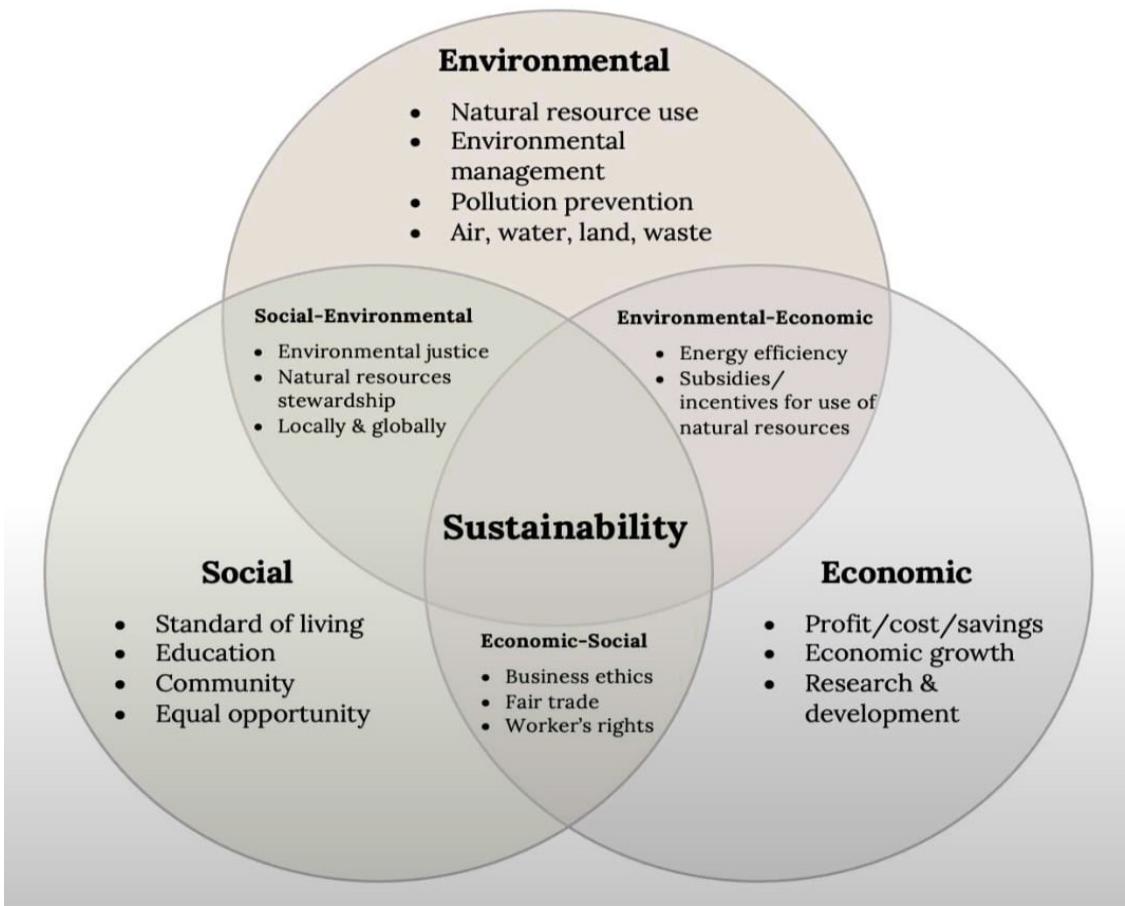
This milestone reflects the combined efforts of policymakers, innovators, utilities, and engineers working together to build a greener tomorrow. 



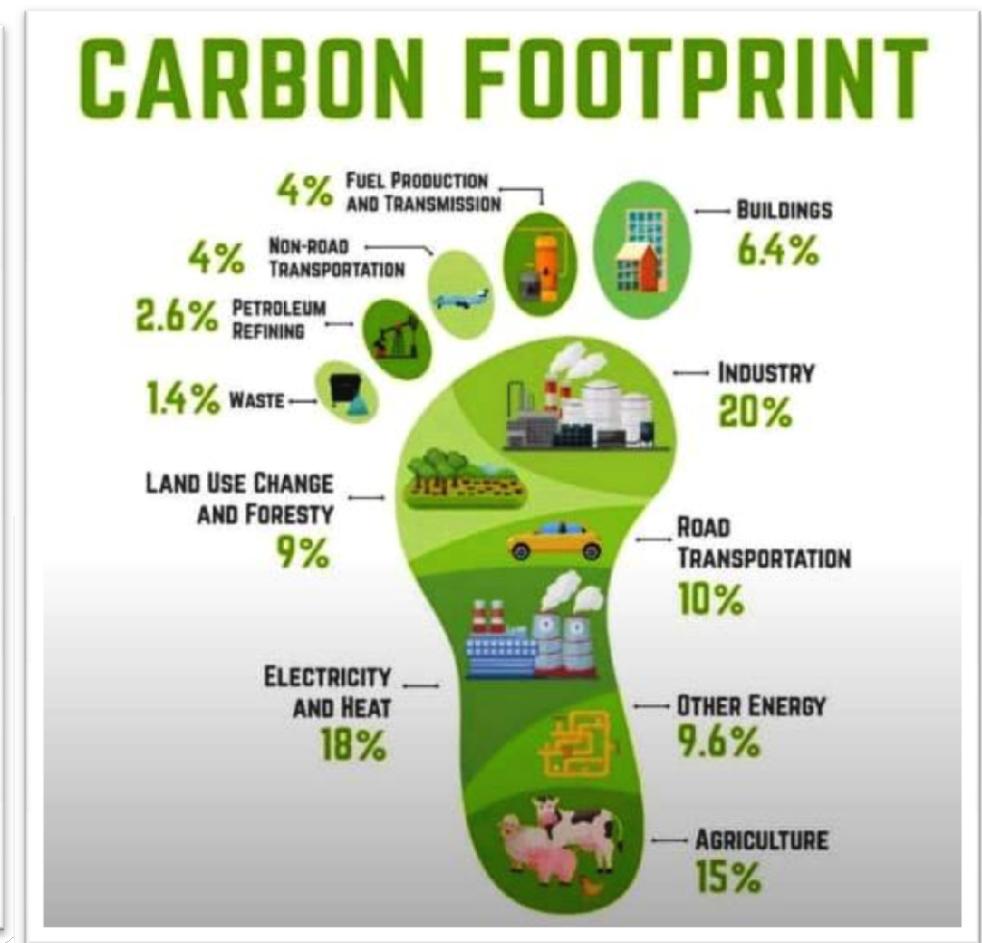
What we need basically

SUSTAINABILITY IN ACTION

ENVIRONMENTAL • SOCIAL • ECONOMIC



Focus must be on : - ESG / ISO Quality Standards



Key Challenges Identified by District and State Administration with a concern over the national average



Microplastics Have Now Reached the Human Brain

Swachh Bharat Mission 2.0, launched in 2021, had a clear mandate to completely remediate existing dumpsites by 2026. Towards this end, one of the major objectives under the Mission is the "Lakshya Zero Dumpsite" to remediate legacy waste dumpsites occupying nearly 6,000 ha of city land



NGT Concern and Report



National Green Tribunal

- The National Green Tribunal (NGT) has raised objections on the discharge of domestic and industrial waste into storm water drains in Varanasi. It observed that these drains are meant only for rainwater, and connecting them directly to sewage treatment plants (STPs) could overload the facilities, especially during monsoon.
- NGT chairman Justice Prakash Srivastava and expert member Ishwar Singh on August 29 directed the National Mission for Clean Ganga (NMCG) to clarify how the issue will be addressed and to file a response within four weeks.
- Reports indicate that Varanasi has 48 sewage-carrying drains, of which 32 have been connected to STPs, while 16 are either unconnected or incomplete.

CAG Report/ Findings and Solutions

यूपी में कूड़ा निस्तारण औसत से कम

कैग रिपोर्ट

लखनऊ, विशेष संवाददाता। उत्तर प्रदेश में कूड़ा निस्तारण की स्थिति राष्ट्रीय स्तर पर तय मानक 46 प्रतिशत से कम है। यूपी में कूड़ा निस्तारण की स्थिति मात्र 35 प्रतिशत है। उदाहरण के लिए वर्ष 2020-21 में कूड़ा निकला 14710 मीट्रिक टन और इनका प्रसंस्करण या उपचार 5520 मीट्रिक टन ही हुआ। यह

मात्र 39 प्रतिशत ही है।

इसकी मुख्य बजह कर्मियों की कमी बताई गई है। यह भी कहा गया है कि प्रबंधन के अभाव से भी ऐसा हो रहा है।

भारत के नियंत्रक एवं महालैखा परीक्षण (कैग) की रिपोर्ट में बिंदुवार इसका जिक्र किया गया है। रिपोर्ट में कहा गया है कि शासन स्तर पर अपर या प्रमुख सचिव नगर विकास, निदेशालय में निदेशक और स्थानीय स्तर पर नगर आयुक्त व अधिशासी

अधिकारी इसके लिए जिम्मेदार हैं। इनकी देखरेख में कूड़ा निस्तारण की व्यवस्था कराई जानी चाहिए। रिपोर्ट में इनके दायित्वों पर भी सवाल उठाए गए हैं। कैग को जांच के दौरान कूड़ा प्रबंधन, संग्रहण, छंटाई, भंडारण, परिवहन और उसके निस्तारण में खामियां मिली हैं।

शहरों में कूड़ा निस्तारण प्रबंधन योजना, निर्माण, स्थापना, संचालन और प्रभावी रख-रखाव वित्तीय रूप से मजबूत पाया गया है।

Air Quality Ranking of Varanasi city

CPCB AQI 2025

The dioxins and furans generated in case of waste disposal is the major source of human cancer, and unlike others Plasma Gasification technology is the solution to avoid cancerous growth and other animal or human respiratory infections and diseases.

स्वच्छ वायु सर्वेक्षण में हम 48 शहरों में 11वें पायदान पर

सैमेंसे बाराणसीको	आधारोंपर तथा कीर्तिग्रन्थी
102 प्राप्त हुए 184 अंक	विमलशहरोंकी रैंकिंग

बाराणसी, बारिष संवाददाता। स्वच्छ वायु सर्वेक्षण 2025 में बनारस 11वें स्थान पर चुना गया है। देश में दस लाख से अधिक जनसंख्या वाले 48 शहरों में बनारस को यह रैंकिंग मिली है। हालांकि पिछले साल की तुलना में बनारस दो पायदान फिसला है। स्वच्छ वायु सर्वेक्षण 2024 में बनारस की नोवीं रैंकिंग थी। वहाँ अंक की टूटी से बनारस को अब तक का सर्वसंबोहत नंबर मिला है। स्वच्छ वायु सर्वेक्षण 2025 में बनारस को 200 में से 184 अंक प्राप्त हुए हैं। जबकि पिछले साल 176.5 अंक थे। उत्तर प्रदेश में आगरा,

कानपुर और प्रयागराज बनारस से आगे हैं जबकि लखनऊ को पछाड़ा। इन आधारों पर सर्वेक्षण, शहरी विकास मंत्रालय ने नौ आधारों पर सर्वेक्षण में रैंकिंग तय की है। सइक निर्माण में काशीवासियों के लिए लगातार प्रयास किए जा रहे हैं। इसका परिणाम भी मिल रहा है। काशीवासियों में इसे लेकर जागरूकता बढ़ी है जिसका आधार पर शहरों के नंबर काटे हैं। सइक पर उड़ाती धूल पर 20 प्रतिशत अंक निर्भर है।

बनारस में वायु गुणवत्ता में सुधार के लिए शंखीर नार निगम प्रशासन ने निर्माण समंग्रियों के बेहतर प्रबन्धन के लिए स्थान विहित किया। वायु गुणवत्ता में बेहतरी प्रयास हो रहे हैं। उमीद है कि अगले सर्वेक्षण में सकारात्मक परिणाम मिला है। बेहतर रैंकिंग मिलेगी। अशोक कुमार तिवारी, महापार अक्षत दर्मा, नगर आयुक्त

जिम्मेदार बोले




Government/ District Administration: Problem / Support & Initiative

CM Yogi wants Varanasi in top 5 cleanest cities

By HT Correspondent, Varanasi

Published on: Jul 17, 2025 09:47 pm IST



The CM said cleanliness campaigns must be run regularly and asked municipal commissioner Akshat Verma to monitor the efforts. He also instructed that road widening work in Dalmandi should begin immediately after the monsoon, with proper consultation on relocating religious sites falling within project limits.

रमना वेस्ट टु चारकोल प्लांट का लिया जायजा, दी हिदायत

वाराणसी। डीएम सत्येंद्र कुमार ने मंगलवार को रमना वेस्ट टु चारकोल प्लांट का निरीक्षण किया। डीएम ने रख-रखाव एवं अपशिष्ट निस्तारण की समीक्षा की और विस्तार पर जोर दिया। कार्यदायी संस्था ने बताया कि रोज 400 टन कूड़ा निस्तारित किया जा रहा है। प्लांट में 200-200 टन की तीन यूनिट हैं। इसमें दो यूनिट क्रियाशील हैं। प्रतिदिन बनने वाले चारकोल का प्रयोग बिजली उत्पादन में किया जा रहा है। डीएम ने कहा कि प्लांट परिसर में एनटीपीसी की ओर से स्थापित बंद पड़े वेस्ट टू एनर्जी प्लांट को उपयोग में लाने पर जोर दिया।

Need: An urgent action for Initiation of Startups in this domain

नगर निगमों में कूड़े से बनेगा चारकोल, बायोगैस व बिजली

राज्य व्यारो, जागरण • लखनऊ : प्रदेश के सभी 17 नगर निगमों में ठोस अपशिष्ट से बायो गैस, चारकोल और बिजली बनाने की शुरुआत की जा रही है। लखनऊ के सिवरी संयंत्र में कूड़े से बायोगैस बनाने की प्रक्रिया शुरू की जा रही है। वाराणसी में एनटीपीसी की मदद से कूड़े से चारकोल बनाने की तैयारी है। अयोध्या और वाराणसी में पूजा में चढ़ने वाले फूलों से अगरबत्ती बनाई जा रही है। नगरीय निकाय निदेशालय की सहायक निदेशक ऋष्टु सुहास ने स्वच्छ भारत मिशन (नगरीय) 2.0 के तहत ठोस अपशिष्ट प्रबंधन पर बुधवार को आयोजित क्षमता संवर्धन प्रशिक्षण कार्यक्रम में यह जानकारी दी।

निदेशक नगरीय निकाय अनुज कुमार झा ने कहा कि गीले और सूखे कचरे को अलग-अलग करने के साथ ही उसका सही इस्तेमाल करना भी सीखना होगा। गीले-सूखे

- ठोस अपशिष्ट प्रबंधन के लिए होगा आधुनिक तकनीक का इस्तेमाल

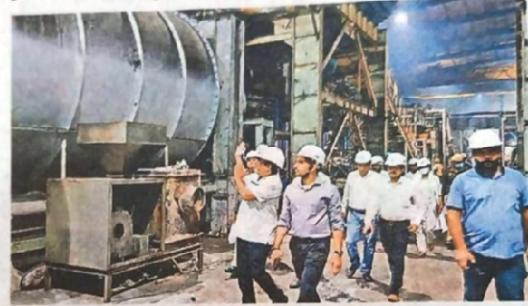
कचरे को अलग-अलग करने से उसका पुनर्चक्रिया (रीसाइक्लिंग) और खाद (कंपोस्टिंग) बनाना आसान हो जाता है।

इससे शहरों और गांवों को साफ-सुथरा व कचरा मुक्त बनाने में मदद मिलती है। घर पर ही गीले और सूखे कचरे को अलग-अलग करने की सभी नागरिकों को आदत डालनी होगी। स्वच्छता मिशन की सफलता तभी संभव है, जब प्रत्येक नगरीय निकाय में गीले व सूखे कूड़े को घरों से अलग-अलग एकत्र किया जाए। कार्यशाला में बरेली, बस्ती, चित्रकूट, देवीपाटन और गोरखपुर मंडल के 130 नगरीय निकायों के 421 से अधिक प्रतिभागी मौजूद थे।

वेस्ट टू चारकोल प्लांट रमना में मात्र 200 टन कचरे का हो रहा निस्तारण

जागरण संघटना, वाराणसी : शहर की स्वच्छता व्यवस्था को मजबूत करने की दिशा में एक महत्वपूर्ण कदम उठाते हुए नगर आयुक्त हिमोनु नागपाल ने बुधवार को रमना स्थित वेस्ट टू चारकोल प्लांट का औचक निरीक्षण किया। इस दौरान प्लांट को बतेमान कार्यप्रणाली पर नागरिकों जारी की।

कार्यदायी संस्था एनटीपीसी के अधिकारियों को सख्त निर्देश दिए कि इसे तत्काल पूर्ण क्षमता पर सञ्चालित किया जाए। 600 टन प्रतिदिन की क्षमता वाले इस प्लांट में फिलहाल मात्र 200 टन कचरे का निस्तारण हो रहा है। इससे शहर के बढ़ते कचरा संकट के बीच चिंताजनक स्थिति बनी हुई है। नगर आयुक्त ने पाया कि प्लांट में मिश्रित कचरे का उपयोग किया जा रहा है, जिसमें सड़क से उठाए गए मलबा और अन्य अपशिष्ट शामिल हैं। इस पर कहीं नाराजगी व्यक्त करते हुए उन्होंने स्पष्ट निर्देश दिए कि केवल डॉर-टू-डॉर संग्रहित घरेलू कचरा ही यहां प्रैसेस किया जाए।

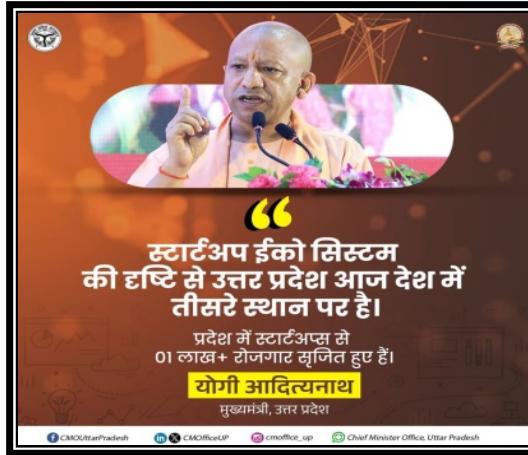


वेस्ट टू चारकोल प्लांट रमना का निरीक्षण करते अधिकारीगण • जागरण

प्रतिदिन औसतन 1100 टन उत्पन्न हो रहा कचरा

वाराणसी में प्रतिदिन औसतन 1100 टन कचरा उत्पन्न होता है, जिसमें से एक बड़ा हिस्सा अनियोजित ढंग से निस्तारित होता रहा है। वेस्ट टू चारकोल तकनीक से कचरे को ऊर्जा स्रोत में बदलने की यह पहल पर्यावरणविदों द्वारा सराहनीय बताई जा रही है। प्लांट से निकलने वाले चारकोल का उपयोग औद्योगिक इंधन के रूप में किया जा सकता, जिससे कार्बन उत्पादन में कमी आएगी। इस प्लांट की स्थापना एनटीपीसी के सहयोग से दो वर्ष पूर्व हुई थी, लेकिन तकनीकी खामियों के कारण यह पूर्ण रूप से घाल नहीं हो सका। अब नगर आयुक्त के हस्तक्षेप से उमीद है कि दिसंबर तक 600 टन का लक्ष्य हासिल हो जाएगा। नगर निगम ने आगामी दिनों में अन्य वार्डों में भी इसी तरह के निरीक्षणों की योजना बनाई है, ताकि स्वच्छ वाराणसी का सपना साकार हो सके। यह कदम न केवल कचरा संकट से निपटेगा, बल्कि सर्कुलर इकोनामी को बढ़ावा भी देगा।

Government/ District Administration: Problem / Support & Initiative



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इन्वेस्ट यूपी अब निवेशकों के लिए उन्नत सिंगल विडो सिस्टम 3.0 विकसित कर रहा

उद्यमियों, कारोबारियों के काम कम दस्तावेजों के बावजूद जल्द हो जाएंगे

राहत

■ अंजित राहत

लखनऊः उद्यमियों, कारोबारियों व आम लोगों के काम कम और कम समय में पूरे होंगे। उन्हें दस्तावेज का लगाने होने चाहे याकूब भाइ भाई भाई हों। इसके लिए संवाद देने में 30 प्रतिशत समय कम किया जाएगा। 30 में 30 प्रतिशत दस्तावेज का कम होगा। विभाग विभागों में भर्ते जाने वाले काफ़ी संख्या भी आधी की जाएगी।

इन्वेस्ट यूपी अब उन्नत सिस्टम विडो सिस्टम 3.0 विकसित कर रहा है। इसमें प्रबुलान विभाग बोर्ड, वायर कार्यालय, राजसभा, सरकारी कार्यालयों को संबरण एवं एकलकृत होंगी। संविधान विभाग अपनी अनावश्यक नियोजनों में सर्विस डिलिवरी टाइम घटायेंगे ताकि उन्हें कम दस्तावेज लगें, कम से कम पांच घण्टाएं की मुश्खिय लगे ही। विभाग ने इससे एकलकृत कार्यक्रम तहत सेवा और लगाना समय कम करने का प्रयत्न किया है।

इन्वेस्ट विडो 3.0 को एक उन्नत सिस्टम विडो 3.0 को क्षेत्र में स्थानान्तरिक करने के लिए योग्यता जेते हो गए हैं। इसका उद्देश्य अद्यावधि अनुमोदन, नियोजनों

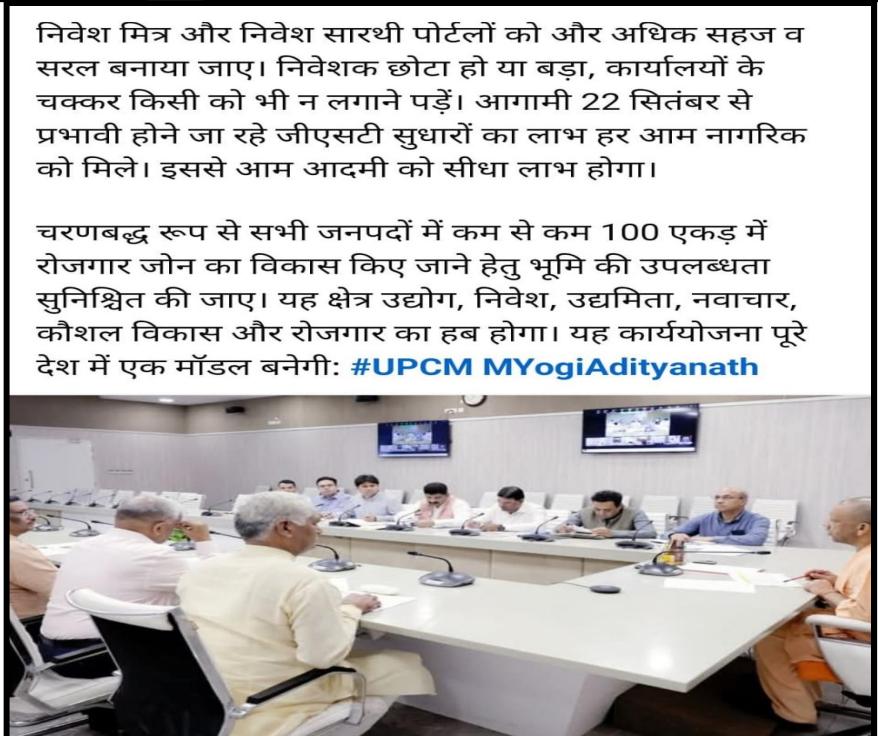


45
30

के बजाए 30 दिन में
राजसभा विभाग देगा
सर्विस
दिन के बजाए पांच
दिन में भारत विभाग
करेगा काम

और सेवा और कार्यालयों से वस्तुचालन, पारदर्शिता और बोर्डर तथा विभागों की अनुपस्थिति स्थानान्तरिक करना है। अप्रील तक विभाग विभागीय स्तर पर विभागों के तहत 45 विभागों में 1,000 से अधिक सुधार 524 डिजिटाइज़्ड सेवाएं और 200 से आधा किया जाएगा।

विभाग	अप्रील दिन लगाए हैं	कम लगाए	कम लगाए काम
राजसभा	45	30	12 से 6
ब्राम	30	05	127 से 50
प्रबुलान विभाग बोर्ड	120	21	400 से 150
अधिकारियां	15	04	39 से 20
वायर कार्यालय	66	40	07 से 05

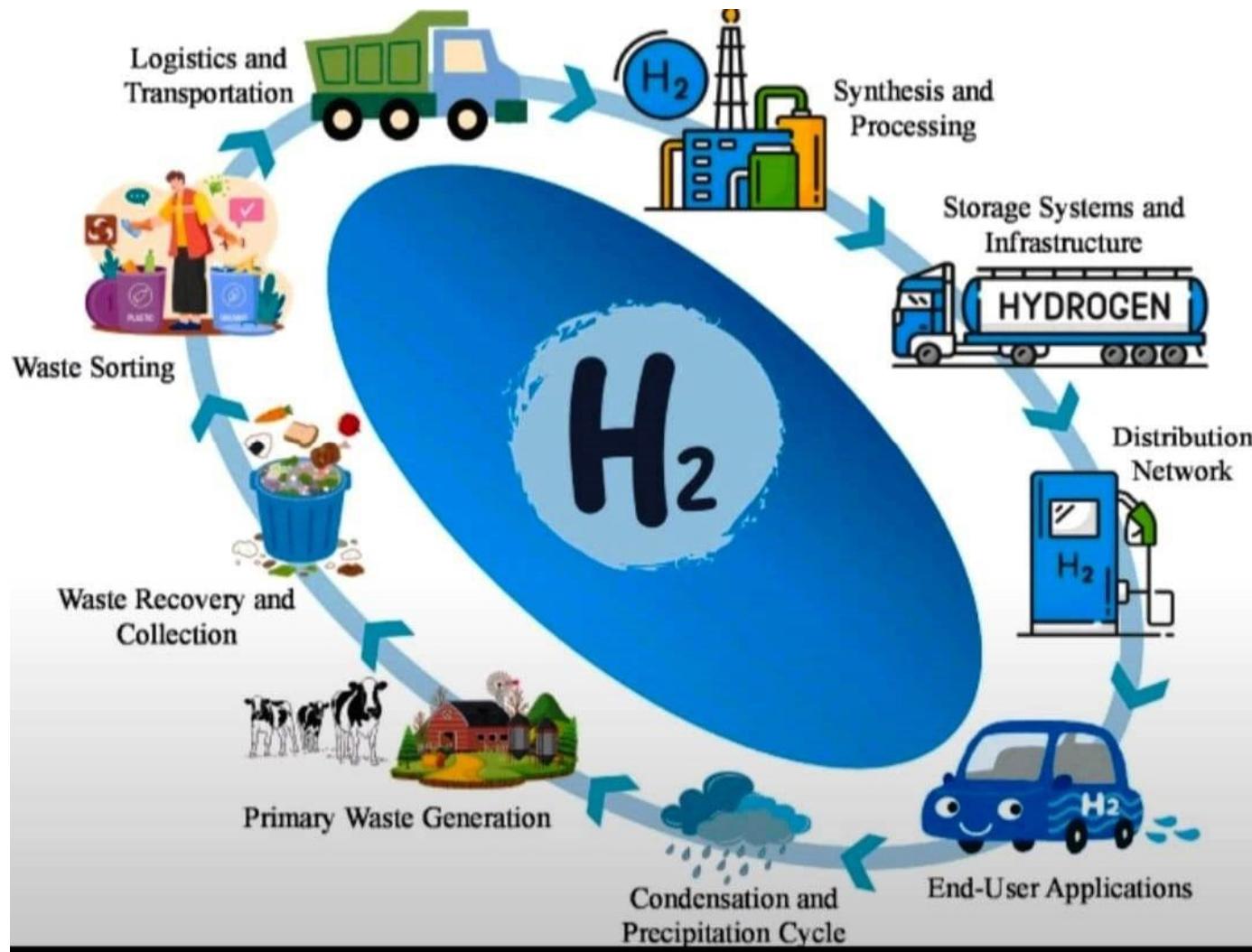


Hydrogen: A Perspective

TYPES OF HYDROGEN

H_2	H_2	H_2	H_2	H_2
Grey Hydrogen	Blue Hydrogen	Green Hydrogen	Turquoise Hydrogen	Brown Hydrogen
Procedure Steam Methane Reforming (SMR)	Procedure SMR with Carbon Capture and Storage (CCS)	Procedure Electrolysis Using Renewable Energy	Procedure Methane Pyrolysis	Procedure Coal Gasification

Hydrogen: A Cycle to study



India's Green Hydrogen Mission: Target set up by Ministry of New & Renewable Energy, Govt. of India

The Mission aims to establish capacities to produce at least **5 Million Metric Tonne (MMT)** of Green Hydrogen annually by **2030**, with the potential to reach **10 MMT per annum** through expansion of export markets and international partnerships.

The **initial budget** for the mission will be **Rs 19,744 crore**. From this **Rs 17,490 crore** will be allocated for the **SIGHT program**, **Rs 1,466 crore** for **pilot projects**, **Rs 400 crore** for **R&D**, and **Rs 388 crore** for other mission components.

The target is to capture 10% of the global market with an annual export demand of about 10 MMT of Green Hydrogen/Green Ammonia.

The decarbonization target is to mitigate 50 MMT per annum of CO₂ emissions with the implementation of the Green Hydrogen initiatives charted under the Mission.

Green Hydrogen: A cumulative thinking and approach

INDIA'S GREEN HYDROGEN PUSH
THE NEXT BIG INDUSTRIAL SHIFT



PRODUCTION TRANSPORT EXPORT

Hydrogen is not just a fuel — it's India's new clean industrial currency.

Important Government Policies / Certifications: Requirement

1. [Solid Waste Management Rules, 2016](#)
2. [Hazardous Waste Management Rules: 2008](#)
3. [CPCB Approved guidelines.](#)
4. Government of India, Emission norms [\[Gazette Notification\]](#)
5. CSE concern over Plastics [CSE Report](#)
6. [Detailed Project Report \[DPR\]](#)
7. Commissioning certificate issued by DISCOM for Grid Power Supply.

[We are into discussion with Purvanchal Vidyut Vitaran Nigam Limited, Varanasi.]

8. Consent to Establishment (CTE) & Consent to Operate (CTO) from UPPCB, Varanasi office.
9. EIA Clearance certificate.
10. MNRE Approval letter.



THANK YOU