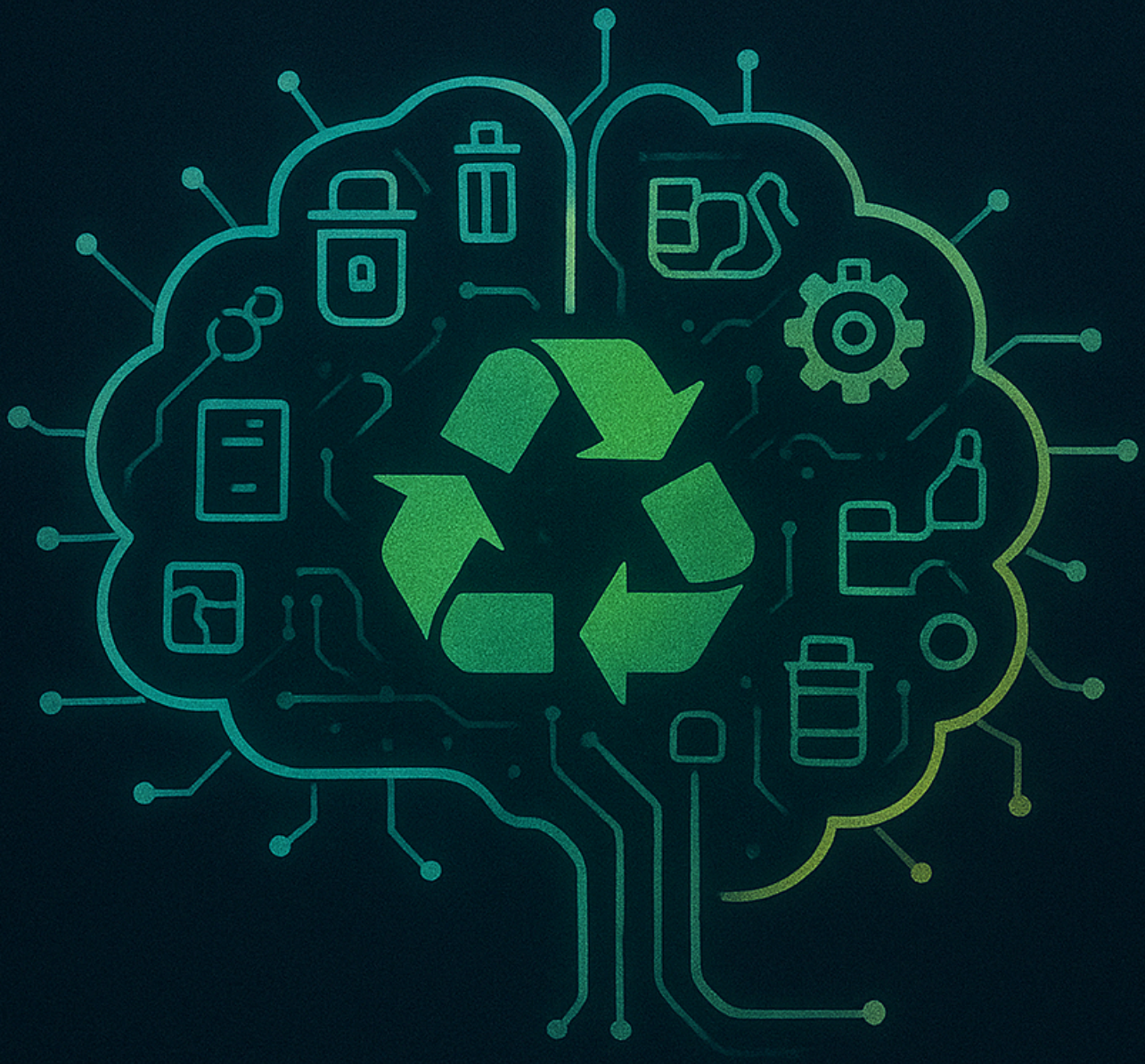
Office of the Principal Scientific Adviser to the Government of India

सत्यमेव जयते

SCIENCE & TECHNOLOGY CLUSTERS



TECHNOLOGY COMPENDIUM

SOLID WASTE MANAGEMENT

Transforming Waste to Wealth

CKIC-DRIIV

PUNE KNOWLEDGE CLUSTER PKC

RICH Research and Innovation Circle of Hyderabad

PI - RAHI

BCKIC Bhubaneswar City Knowledge Innovation Cluster

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PKC

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BCKIC
Bhubaneswar City Knowledge Innovation Cluster

Compiling and editing

Dr. Chaitra Narayan
Dr. Priya Nagaraj

Designed by

Ms. Komal Malik

Acknowledgements

The establishment of eight S&T Clusters across the nation by the Office of the Principal Scientific Adviser (PSA) to the Government of India, on the recommendation of PMSTIAC, has been instrumental in fostering innovation and collaboration among various stakeholders. The structured and strategic approach enabled by the S&T Clusters has provided a robust framework for addressing pressing environmental and energy challenges through research, innovation, and implementation.

This compendium is compiled and designed by the Pune Knowledge Cluster as a valuable resource for researchers, policymakers, and stakeholders working towards a more sustainable future. We express our profound gratitude to Office of the Principal Scientific Adviser (PSA) to the Government of India for its unwavering support towards S&T initiatives and clusters. PKC also wishes to express its heartfelt gratitude to the sister clusters – DRIIV, PI-RAHI, BCKIC and RICH for extending their support to the making of this compendium. The information presented in this compendium aims to guide and inform ongoing efforts in sustainability and innovation, ultimately contributing to the realization of an Atmanirbhar Bharat.

Sincerely,
PKC team

अजय के. सूद
भारत सरकार के प्रमुख वैज्ञानिक सलाहकार
Ajay K. Sood
Principal Scientific Adviser to the Govt. of India

सत्यमेव जयते

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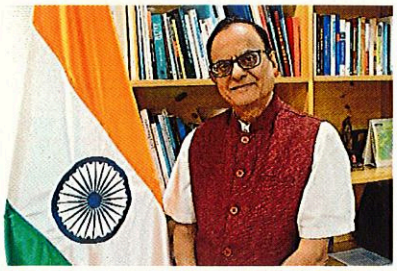
Website : www.psa.gov.in



Foreword – Plastics and E-Waste Management

India's innovation ecosystem has entered a dynamic phase, where scientific research, entrepreneurship, and technological advancement are converging to address sectors of critical national importance. Sustainable plastics and e-waste management has become a key priority, with deep-tech start-ups, research institutions, and industry partners collaboratively developing solutions that are efficient, affordable, and scalable. As global interest in India's capabilities in circular economy and waste management grows, significant opportunities are emerging for indigenous technologies to contribute to international sustainability efforts, while also enabling global solutions to be tailored and validated within India's diverse environmental and operational contexts.

The Science and Technology (S&T) Clusters initiative of our Office plays a pivotal role in fostering cross-sectoral and cross-border collaboration. Designed as integrated regional ecosystems, the Clusters bring together academia, industry, startups, and government to address local priorities, drive multidisciplinary innovation, and advance socio-economic development aligned with India's national and global competitiveness and the vision of Atmanirbhar Bharat. Within this coordinated framework, the Clusters connect scientific capabilities with entrepreneurial drive, accelerating technology maturation, strengthening data-driven evaluation, and improving pathways for deployment. Moreover, the Clusters function as key platforms for international engagement, facilitating collaboration with global partners on joint research, co-development, and technology transfer, thereby further integrating India into the global innovation landscape.

This Plastics and E-Waste Management Compendium showcase a curated set of technologies from India's waste management innovation ecosystem that have demonstrated tangible on-ground impact and are ready for wider adoption. These solutions highlight a collective commitment to improving resource recovery, strengthening circular economy practices, and enhancing India's contribution to global progress in sustainable plastics and e-waste management.

The contributions of the participating Clusters and start-ups are acknowledged for their commitment and for presenting solutions that highlight the capability of India's science and innovation ecosystem. This compendium aims to provide policymakers, researchers, industry leaders, and ecosystem enablers with a reference point for understanding India's evolving plastics and e-waste management landscape and its emerging opportunities for international collaboration.

(Ajay K Sood)

Date: 21st November 2025

डॉ. (श्रीमती) परविन्दर मैनी
वैज्ञानिक सचिव
Dr. (Mrs) Parvinder Maini
Scientific Secretary

सत्यमेव जयते

भारत सरकार के
प्रमुख वैज्ञानिक सलाहकार के कार्यालय
कर्तव्य भवन 3, जनपथ, नई दिल्ली - 110001
Office of the Principal Scientific Adviser
to the Government of India
Kartavya Bhavan 3, Janpath, New Delhi-110001

Message

Plastics and e-waste management has become integral to India's sustainable development agenda, influencing environmental quality, public health, and the broader socio-economic landscape. As the nation confronts rising waste volumes, resource depletion, and the environmental risks associated with improper disposal, science and technology are emerging as key drivers for creating more efficient, resilient, and sustainable waste management systems.

India's plastics and e-waste management ecosystem has seen significant progress in recent years. From material recovery and recycling innovations to IoT-enabled tracking, AI-driven sorting, robotics, and data analytics, the sector is rapidly evolving. Advanced technological solutions are enabling innovators to address persistent challenges in waste segregation, resource recovery, and environmentally safe disposal. These developments are enhancing operational efficiency, supporting informed decision-making, optimizing resource utilization, and delivering tangible impact across diverse waste management domains.

Launched in 2020, the S&T Clusters, a flagship initiative of the Office of the Principal Scientific Adviser (OPSA), function as demand-driven, collaborative ecosystems that bring together academia, industry, startups, MSMEs, government bodies, and civil society. By building interconnected innovation networks, the clusters accelerate the development and deployment of technology-driven solutions that tackle regional challenges while advancing national priorities. At present, we have eight S&T Clusters across India working in diverse sectors and delivering transformative outcomes through technological innovation, public-private partnerships, and implementation frameworks.

This *Compendium on Plastics and E-Waste Management* reflects these collective efforts. It showcases a curated set of promising technologies that have achieved market readiness, demonstrated field-level success, and shown strong potential to strengthen India's waste management sector. Each featured solution demonstrates the commitment of India's science and innovation community to improve plastics and e-waste management, advance sustainable resource utilization, and foster the development of a resilient, future-ready circular economy.

I commend the participating Clusters for their sustained efforts in advancing plastics and e-waste management innovation, and for showcasing impactful, scalable, and forward-looking solutions that strengthen India's emerging leadership in science- and technology-driven circular economy practices.

PMaini

(Parvinder Maini)

Dated : 21st November, 2025

Tel. : +91-11-24011869, E-mail : parvinder.maini@gov.in Website : http://www.psa.gov.in

TABLE OF CONTENTS

Angirus Ind Private Limited

INPUT OUTPUT

Construction & Demolition Waste & Multilayered Plastic Waste to Bricks
Technology: Thermal Catalytic Cracking

ABOUT THE COMPANY:

Angirus Ind manufactures Wricks, which are bricks made from low-value multi-layered plastic (MLP) waste and construction and demolition (C&D) waste. They are produced without virgin materials through an energy-efficient and resource-conscious manufacturing process, significantly reducing embodied carbon emissions and can be used for structural, non-load bearing and load-bearing applications using standard masonry techniques.

Year of Incorporation: 2020

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Construction & Demolition Waste and Multilayered Plastic Waste
End Product : Bricks
Capacity : 1500 Bricks per Day
System : Centralized

USP

- 90% damp-proof, 40% stronger and 20% lighter than conventional red bricks.
- 60% better thermal properties than conventional red bricks.
- Minimise the need for plastering and waterproofing and can reduce both construction time and costs.
- Does not require soaking in water before laying

TYPE OF END CUSTOMER

Builders, Architects, Contractors

DEPLOYMENT USED CASES

- No. of Units Deployed: 1,80,000
- Locations Covered: Srinagar, Chennai, Udaipur, Bengaluru, Mumbai, Tumakuru and Indore

CORE SDGs ALIGNED:

8 9 12 13

FOUNDER : Kunjpreet Arora, Lokesh Puri Goswamil

LOCATION : Bengaluru

COMMERCIAL READINESS :

Pilot ready

TECHNOLOGY READINESS LEVEL :

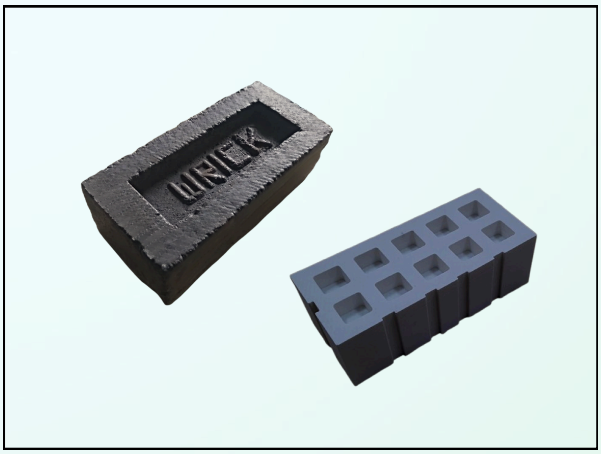
TRL 8

IP DETAILS

Patent Number: 488761
Status: Granted
Patent Title: A Rotary Dryer System For Drying a Raw Material For Making Brick
Type: Indian

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=xqtNAFNyF0s



ACHIEVEMENTS/ COMPLIANCES

Awards/Recognition: Forbes 30 Under 30, Atmanirbharta Ki Kahaniyan by Netflix India, Swachta Start-up Challenge by Ministry of Housing & Urban Affairs, Green Future Award

Major Partnerships Forged: Brigade REAP, NSRCEL, Social Alpha, MariCo Innovation Foundation

Website Link:
https://www.angirusind.com/

Agro Stubble Management Pvt Ltd

INPUT OUTPUT

Agri waste to ceiling tiles
Technology: Hot press

ABOUT THE COMPANY:
Agro Stubble Management Pvt. Ltd. collects agricultural stubble that would otherwise be burned and transforms it into eco-friendly products like ceiling tiles. Stubble is mixed with a special binder and hot-pressed to create durable, renewable products that have good thermal insulation, high strength, and are non-flammable. This approach reduces air pollution and greenhouse gas emissions by preventing stubble burning, while promoting a circular economy by converting farm waste into valuable, sustainable products.

Year of Incorporation: 2022

USP

- Stubble burning is a global environmental issue, contributing to severe air pollution.
- Annually, 500 MT of crop residue is generated in India, with 20 MT from Punjab alone, of which large part of it is burned.
- This releases harmful pollutants, including 1,400 kg of CO2 per tons. Despite the surplus crop residue, burning persists due to a lack of viable alternatives

TYPE OF END CUSTOMER

Builders, Architects, Contractors

DEPLOYMENT USED CASES

Not deployed yet

FOUNDER : Parminder Singh

LOCATION : Gurdaspur, Punjab

COMMERCIAL READINESS :
Piloted

TECHNOLOGY READINESS LEVEL :
TRL 6

IP DETAILS
Patent Application Number: 202311023721 & 202311025157
Status: Pending grant
Type: Indian
DPIIT: DIPP120671

TECHNOLOGY VIDEO LINK
https://www.instagram.com/reel/DCy5wJXolAl/?igsh=MTduYzczeTcwZnZkeQ==

https://drive.google.com/file/d/15LwwC7saiQuBO9MNjRyxSpiH52F5YQg1/view?usp=drivesdk

ACHIEVEMENTS/ COMPLIANCES

Funds Raised : 20 Lac
Awards/Recognition: First prize at the HARVEST AgriTech Challenge 2025

CORE SDGs ALIGNED:

3 12 13 15

Website Link:
https://www.agrostubblemanagement.com/

Antony Lara Renewable Energy Pvt. Ltd.

INPUT OUTPUT

Municipal Dry waste to Electricity
Based on RDF Incineration Technology

ABOUT THE COMPANY:

Antony Lara Renewable Energy Pvt. Ltd. is of facilities and infrastructure for -

- Pre-Processing, segregation and recovery of Municipal Solid Waste through Material Recovery Facility (the "MRF")
- Processing compost from received biodegradable waste.
- Development and operation of approximately 700 TPD Waste to Energy (WtE) Plant to convert the MSW into energy.

Year of Incorporation: 2018

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Dry & Wet & Mixed Waste
End Product : Electric Power Generation & Compost
Capacity : 14 MW/ 700 TPD RDF/1000 TPD MSW
System : Centralized

USP

- A public private partnership
- End-to-end waste chain management from door-to-door collection, transport, processing to disposal.
- Emissions are displayed on live dashboard at MPCB Mumbai
- Clean energy from entire city's MSW

TYPE OF END CUSTOMER

State Electricity Boards; Power Corporations

DEPLOYMENT USED CASES

Pimpri-Chinchwad Municipal Corporation, Moshi

CORE SDGs ALIGNED:

7

FOUNDER : Shri Jose Jacob

LOCATION : Moshi, Pune

COMMERCIAL READINESS :

Deployed

TECHNOLOGY READINESS LEVEL :

TRL 9

IP DETAILS

IP owned by Kanadevia Inova

TECHNOLOGY VIDEO LINK

https://www.antony-waste.com/solutions/waste-to-energy/

ACHIEVEMENTS/ COMPLIANCES

- Awarded WTE project at Kadapa & Kurnool, Andhra Pradesh
- Awarded India Risk Management Awards by ICICI Lombard & CNBC-TV18
- Achieved the key milestone of processing 1 million tonnes of MSW in 2016
- Got listed on the BSE & NSE in 2021
- Awarded second position at the CII, JCB Clean Earth Award for Excellence in Solid Waste Management.

Website Link:
https://www.antony-waste.com/

APChemi Pvt. Ltd.

INPUT OUTPUT

Plastic & Tyre Waste to Pyrolysis Oil
Technology: Pyrolysis Oil Purification

ABOUT THE COMPANY:

APChemi is a clean-tech startup specializing in advanced pyrolysis and purification technologies that convert plastic, tyre, laminate, legacy and biomass waste into high-quality circular oil.
They produce 5,000,000 liters/year of fractionally vacuum-distilled pyrolysis oil with 62% Biofuel Content.

Year of Incorporation: 2008

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Plastic, Tyre and Biomass
End Product : Pyrolysis Oil
Capacity : 15 TPD to 500 TPD
System : De-centralized and Centralized

USP

- Up to 99.7% impurity removal. Drastically reduces oil impurities due to PVC/ PVDC/PET/ Nylon/PUR/Acrylates contaminated polyolefin feedstock.
- Enables the use of landfill and post-consumer plastic waste for plastic pyrolysis
- 8+ year plant life. Lowest CAPEX/OPEX.
- Batch/Semi-continuous/Continuous.

TYPE OF END CUSTOMER

- Oil Industries & Refineries
- Circular plastic industry
- Sustainable Chemical industry

DEPLOYMENT USED CASES

- 45 Pyrolysis Plants for Plastic, Tyre and Biomass
- Pilot plants supplied to Europe, Australia, Middle-East and Africa

CORE SDGs ALIGNED:

9 11 12 13 14

FOUNDER : Suhas Dixit

LOCATION : Navi Mumbai

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 8

IP DETAILS

Granted Indian Patent (374847)
Applied for other Indian patents

TECHNOLOGY VIDEO LINK

https://youtu.be/ixAmvS6R44k?si=jWxbXwAdU-MvmhFU

ACHIEVEMENTS/ COMPLIANCES

- Winner of Clean Air India Challenge hosted by Smart Cities Procurement, ACT Grants and Social Alpha (April 2022).
- Received €50,000 under Sacyr foundation innovation award. and USD 12,000 under Indo-Danish green hydrogen call
- Private investment of 7.8Cr by Technology Development Board, KIIT-TBI, ACT Capital, Bank of Maharashtra

Website Link:
www.apchemi.com

Bijson Innovations Private Limited

INPUT OUTPUT

Wet Waste (Municipal Organic) to Cooking Gas and Manure
Technology: Anaerobic Digestion

ABOUT THE COMPANY:

Bijson manufactures biodigesters and bio-inoculums to treat wet waste efficiently within client premises. The biodigestors and bio-inoculums are equipped with unique microbes operating under controlled conditions which convert the waste into cooking gas & organic manure without using any external energy with lower Hydraulic Retention Time.

Year of Incorporation: 2015

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Wet Waste
End Product : Cooking Gas, Manure, BioCNG
Capacity : 50 kg – 2 TPD
System : De-centralized

USP

- Uses Proprietary Technology of Cultured Consortia of Bacteria to process waste.
- Produces usable gas even in cold climates.
- Plug & play product, no civil construction required, can be easily relocated.
- Compact, space efficient, easy maintenance.

TYPE OF END CUSTOMER

- Hotels, Restaurants,
- Educational Institutes,
- Urban Local Bodies

DEPLOYMENT USED CASES

- No. of Units Deployed: 150
- Locations Covered: Rajasthan, Haryana, Uttar Pradesh, Himachal Pradesh, Delhi-NCR, Madhya Pradesh, Maharashtra, Gujarat, West Bengal, Jammu & Kashmir

CORE SDGs ALIGNED:

7 11 12 13

FOUNDER : Amit Kumar Jain, Raj Kumar Saini

LOCATION : Jaipur

COMMERCIAL READINESS :

Deployed

TECHNOLOGY READINESS LEVEL :

TRL 9

IP DETAILS

Not Available

TECHNOLOGY VIDEO LINK

https://youtu.be/pTJceLhQtM4

ACHIEVEMENTS/ COMPLIANCES

- Winner of 'Champion of cause' under MSME category.
- Winner of Swachhta Grand Challenge under Gobardhan Yojana. Approved as implementation partner across several states.
- Winner of Tech4Raj Grant at Jodhpur Startup Fest
- Winner of SBM Gramin Award

Website Link:
https://www.bijson.com/

Biofield Power Pvt. Ltd.

INPUT OUTPUT

Digital biomass supply chain
Technology: Blockchain Technology

ABOUT THE COMPANY:

Biofield Power Pvt. Ltd. is a cleantech and agritech startup digitalizing the biomass supply chain. They work towards bridging the gap between farmers and industries through an end-to-end traceability platform that enables easy pickup of crop residues and ensures a reliable, transparent supply of biomass year-round.

Year of Incorporation: 2023

TECHNOLOGY/PRODUCT DETAILS :

We have developed a digital platform that functions as the "Uber of Biomass", connecting farmers, baler operators, transporters, and industries to create a seamless, traceable, and data-driven biomass supply chain.
DPIIT: DIPP160258

USP

- Digitalisation of Biomass Supply Chain
- Onboards farmers, balers, and industries in one platform
- Reduces manual coordination and quality disputes
- Micro-storage and logistics optimization in rural areas

TYPE OF END CUSTOMER

Biofuel plants, Paper industry, CBG producers, Power plants

DEPLOYMENT USED CASES

No. of Units Deployed: 1 pilot ongoing
Locations Covered: Chamkaur Sahib, Punjab

FOUNDER : Anmol Gupta

LOCATION : Rupnagar, Punjab

COMMERCIAL READINESS :
Piloted

TECHNOLOGY READINESS LEVEL :
TRL 6

IP DETAILS

DPIIT: DIPP160258

TECHNOLOGY VIDEO LINK

https://biofieldpower.com/

ACHIEVEMENTS/ COMPLIANCES

- Funds Raised - 5 Lakhs grant from SISF
- 18 lakh grant from iHub Awadh
- 3 lakh grant from Startup Punjab
- Awards/Recognition -
- 2nd in Harvest Pitch Competition
- Top 60 Startups by Earthon Foundation

CORE SDGs ALIGNED:

7 8 9 13

Website Link:
https://biofieldpower.com/

Blue Planet Integrated Waste Management Solutions

INPUT OUTPUT

Municipal solid waste, Legacy waste to Biogas, Polyfuel
Technology: Thermo-Catalytic Depolymerization

ABOUT THE COMPANY:

Blue Planet Environmental Solutions is a Singapore-based company that has established a fully integrated waste management enterprise. Their operations extend from the point of waste generation through to collection, segregation, treatment, processing, to the point of sale of energy and other waste-derived fuels and products. Blue Planet aims to revolutionize waste management practices, minimize environmental impact, and pave the way for a more sustainable future.

Year of Incorporation: 2017

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : MSW, Legacy waste
End Product : Polyfuel, Biogas
Capacity : 0.5 TPD – 200 TPD
System : De-centralized & Centralized

USP

- End-to-end process of collection, transportation, scientific processing and disposal
- Multiple technologies to process different waste streams
- State-of-the-art segregating mechanism for mixed waste developed in-house

TYPE OF END CUSTOMER

ULBs, Corporates, Institutions

DEPLOYMENT USED CASES

- Blue Planet's Greater Noida facility processes about 20–25 TPD of mixed waste using an integrated, decentralized model. It employs bio-methanation, plastic-to-fuel conversion, and incineration for complete waste utilization. The plant generates biogas, poly-fuel, and compost, turning waste into valuable resources.

CORE SDGs ALIGNED:

7 8 9 11

FOUNDER : Madhujeet Chimni, Bharadwaj Chivukula & Prashant Singh

LOCATION : Singapore & New Delhi

COMMERCIAL READINESS :

Deployed

TECHNOLOGY READINESS LEVEL :

TRL 9

IP DETAILS

Not Available

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=kZyTjvjLKZQ
https://www.driiv.co.in/MS/Plastic-Waste-to-Oil-Conversion/

ACHIEVEMENTS/ COMPLIANCES

- Among HolonIQ's 2024 Top 10 Indo-Pacific Climate Tech Startups
- Winner of Enterprise 50 Award in 2023
- 4,537,800 M3/TON total quantity of waste processed
- 125,697 tons of methane generation saved per year.

Website Link:
https://blueplanet.asia/

Canvaloop Fibre Private Limited

INPUT OUTPUT

Agricultural Waste to Textile Fibres
Technology: Patented Chemicals and Enzymatic Technology for Fibre Production

ABOUT THE COMPANY:

Canvaloop Fibre uses a patented technology to engineer fibre and yarn materials from hemp and other agricultural waste, selling them as raw materials to garment and apparel manufacturers, and subsequently to global brands. Through its custom-built production line and specialised fibre chemicals and enzymatic softeners, Canvaloop has been able to build the back-end of the linen and hemp supply chain in India, which caters to a global B2B customer base who are actively aiming to reduce the carbon footprint of the textile industry.

Year of Incorporation: 2020

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Hemp & Agricultural Waste
End Product : Textile Fibres
Capacity : 200 tonnes of agri waste processed per month; 50 tonnes of fibre production capacity
System : Centralized

USP

- 20 – 40% cheaper than alternatives
- Capital light and modular technology to process waste and produce fibres
- 99% water saved, 87% reduction in fossil fuel and 82% energy saved when compared to cotton

TYPE OF END CUSTOMER

- Garment & Apparel Manufacturers

DEPLOYMENT USED CASES

- No. of Units Deployed: 1000+ tonnes of fibre delivered
- Locations Covered: Pan India

CORE SDGs ALIGNED:

12 13

FOUNDER : Shreyans Kokra, Dhruv Gupta

LOCATION : Jaipur

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 9

IP DETAILS

Patent Number: 202221049870
Status: Request for Examination
Title: TEXTILE-GRADE FIBRE FROM AGRICULTURAL WASTE AND PREPARATION METHODS THEREOF
Type: Indian

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=lLURMcD7cI4

ACHIEVEMENTS/ COMPLIANCES

- Awards/Recognition: Material Innovation Award at Apparel Sourcing Week 2023, Sustainability at Scale Award at Circular Economy Forum 2023 (ABFRL-GIZ), Most Scalable Innovator at Agri-Waste Challenge by Fashion for Good
- Major Partnerships Forged: Social Alpha, Theia Ventures, Arvind Textiles, Aditya Birla Grasim, Levi's, Raymond, Target, Shahi Textiles, GAP, H&M

Website Link:
https://www.canvaloop.com/

CarbonCraft Design Private Limited

INPUT OUTPUT

Industrial Waste to Tiles and Murals
Technology: 4-step Proprietary (Collect, Process, Build, Cure)

ABOUT THE COMPANY:

CarbonCraft creates low-carbon footprint building materials by transforming inputs such as industrial byproducts and recovered carbon black into durable and aesthetically pleasing tiles, wall claddings, and decorative art pieces.

Year of Incorporation: 2019

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Industrial By-products & Carbon Black
End Product : Tiles, Wall Claddings, Art Pieces
Capacity : 1,000 sq ft per day
System : Centralized

USP

- Low carbon footprint tiles that consume only 1/5th of the energy and produce 10 times fewer emissions compared to conventional vitrified tiles
- Tiles upcycled using 95% industrial and C&D waste, avoiding virgin materials
- Customizable designs and reduced curing time
- BIS compliant, ISO certified, VOC free

TYPE OF END CUSTOMER

Architects, Interior Designers, Real Estate Developers, Retail Customers (Homeowners), Govt./Institutions with Green Building Mandates

DEPLOYMENT USED CASES

- No. of Units Deployed: 16,000 sq.ft
- Locations Covered: Karnataka, Punjab, Tamil Nadu, Maharashtra, Kerala

FOUNDER : Tejas Sidnal

LOCATION : Bengaluru

COMMERCIAL READINESS :

Piloted

TECHNOLOGY READINESS LEVEL :

TRL 8

IP DETAILS

Patent Number: 202121017369, IN202541065531
Status: Applied
Patent Title: Geopolymer composition with reduced efflorescence and method for producing geopolymer with reduced efflorescence

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=LnB7Hh40nYk

ACHIEVEMENTS/ COMPLIANCES

- Awards/Recognition: Lexus Design Award India 2020, D & AD 2020, Climate Launchpad 2020, Good Design Award 2021, What Design Can Do 2021

- Major Partnerships Forged: TROVE Innovations India

CORE SDGs ALIGNED:

9 11 12 13

Website Link:
https://www.carboncraftdesign.com/

INPUT OUTPUT

Digital Platform for Circular Commodity Trading
Technology: AI-enabled Blockchain Technology

ABOUT THE COMPANY:

EcoEx is a tech-enabled environmental services company committed to transforming waste management by using innovative technology platforms for better traceability to improve sustainability. The platform offers expertise in waste collection, waste commodity trading, and EPR services. Additionally, they offer expert consulting services for registration and annual return filing in CPCB Portal and ESG initiatives, BRSR reporting.

Year of Incorporation: 2018

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : All categories of waste under CPCB norms
End Product : Online Marketplace and Mobile Application
Coverage : Pan-India
System : Centralized

USP

- Handle every category of waste under the CPCB ambit, including plastics, e-waste, batteries, tyres, hazardous waste, and industrial dry waste
- IoT-enabled waste tracking
- Transacted 2 Lakh+ MT

TYPE OF END CUSTOMER

FMCG / Electronics & Appliances / Battery & EV / Automobile / Pharma & Healthcare / Retail & E-commerce / Packaging Industries / Oil & Chemical Companies.

DEPLOYMENT USED CASES

- 300+ corporate clients
- 16 brand partners

CORE SDGs ALIGNED:

3 6 7 9 11 12 13 14 15

FOUNDER : Nimit Aggarwal

LOCATION : Delhi

COMMERCIAL READINESS :

Deployed

TECHNOLOGY READINESS LEVEL :

TRL 8

IP DETAILS

ISO 27000

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=9Y6uPFr1IYk

ACHIEVEMENTS/ COMPLIANCES

- Winner of Distruptive Solutions Category Award at FICCI Smart Urban Innovations Award 2023
- Winner of The Policy Times Sustainability Business Excellence Award

Website Link:
https://ecoex.market/

Eco Wrap Impact Pvt. Ltd.

INPUT OUTPUT

Municipal Solid waste Collection and Segregation Service
Digital Platform based on AI and IoT

ABOUT THE COMPANY:

ECOWRAP is a tech-driven waste management company focused on building a zero-dump, circular economy through AI-powered waste segregation, tracking, and sustainable disposal. They offer end-to-end solutions including source segregation, real-time monitoring, and responsible recycling for households, businesses, and municipalities. By leveraging AI/ML for waste prediction, route optimization, and incentivizing responsible practices, ECOWRAP transforms waste into valuable resources, promoting a cleaner, greener, and circular economy

Year of Incorporation: 2018

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Solid Waste
Product : Mobile Application for Collection Services
Operational range : Jaipur City
System : Centralized

USP

- Collected over 11,500 MT of waste
- four-category primary segregation preserves waste value
- leveraging AI/ML for waste prediction, route optimization, and incentivizing responsible practices
- auto-generated audit reports to empower users

TYPE OF END CUSTOMER

ULBs,, Residential Communities, Commercial and Industrial Sectors, Educational Institutions, Individual Households

DEPLOYMENT USED CASES

The technology is deployed in Jaipur, Rajasthan, with plans to expand to other Indian cities like Udaipur, Kota, and Bikaner.

CORE SDGs ALIGNED:

5 8 10 11 12 13 14 15

FOUNDER : Angraj Swami

LOCATION : Jaipur

COMMERCIAL READINESS :
Piloted

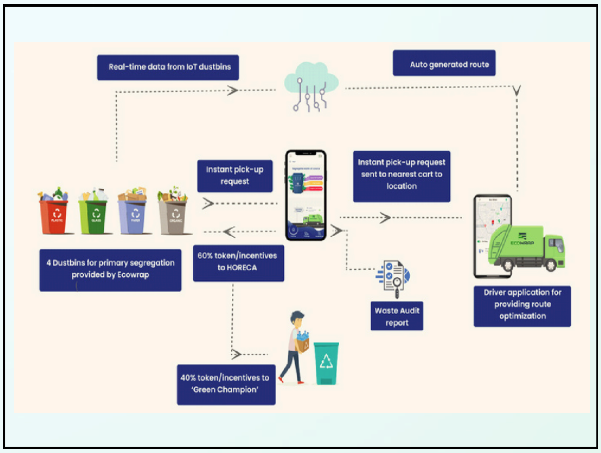
TECHNOLOGY READINESS LEVEL :
TRL 7

IP DETAILS

Not Available

TECHNOLOGY VIDEO LINK

https://www.driiv.co.in/MS/Ecowrap/
https://www.youtube.com/watch?v=OvcOnhIzAcE



ACHIEVEMENTS/ COMPLIANCES

- 1000+ clients connected, including hotel, restaurant, cafe, bar, and so on
- Winner of United Nations Youth CoLab 2020 and 2021
- recognized as one of the Top 30 "Cleanovation Startups" by the Ministry of Housing and Urban Affairs (MOHUA) in Swachhata Startup Challenge

Website Link:
https://ecowrap.in

Ensect Farm Pvt. Ltd.

INPUT OUTPUT

Municipal Wet Waste to Alternative Protein & Compost
Technology: Composting using Black Soldier Fly Larvae

ABOUT THE COMPANY:

Ensect Farm Pvt. Ltd. is a sustainable biotech startup using Black Soldier Fly larvae to convert organic waste into high-value products such as insect protein, oil, and frass, supporting circular economy, waste reduction, and eco-friendly animal nutrition.
Year of Incorporation: 2022

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Wet Waste
End Product : Animal Food & Compost
Coverage range : Pan India
System : Centralized

USP

- Excellent Nutritional Profile: ~55 % Protein, 10 % fat (Defatted protein meal)
- Sustainable & Environment Friendly: Easier to raise, use less water, feed on broad range of organics, and produce less greenhouse gases than other livestock
- Affordable Market Price: Insect protein meal much lesser than fishmeal

TYPE OF END CUSTOMER

Municipal corporations and urban local bodies, Aquaculture, poultry, livestock, and pet food manufacturers

DEPLOYMENT USED CASES

- Deployed at: Vellore, Tamilnadu – 1TPD
- Supported by: Govt of Tamilnadu

CORE SDGs ALIGNED:

2 11 12 13

FOUNDER : Anup TV

LOCATION : Vellore

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 8

IP DETAILS

Not Available

TECHNOLOGY VIDEO LINK

https://youtu.be/AYGWqHJBtsY?si=W-HkS_o9wBPZ3HK7

ACHIEVEMENTS/ COMPLIANCES

- DST Nidhi Prayas - 10,00,000/-
- DBT BIRAC BIG - 50,00,000/-
- Carbon Zero Challenge IIT Madras - 4,00,000
- Won Startup Gateway for Garbage Free Cities 2.0 from MoHUA & IIT K
- Won Asia's largest business model competition (Social Track) EUREKA 24 IIT Bombay - 2,00,000 cash award

Website Link:
www.ensectfarm.com

INPUT OUTPUT

Mixed Municipal Solid Waste (Dry, Wet & Mixed Waste) to Green Coal, Syngas, Heat Energy, and Fuel Oil

Technology: Tri Fusion Dehydration with Gasification & Pyrolysis (TFD-GPT) and Plastic-to-Pyrolysis Technology

ABOUT THE COMPANY:

GD Environmental is a pioneering waste-to-energy company based in Pune, India, specializing in Decentralized Waste Processing Technologies, with its core mission to transform municipal solid waste into valuable resources like Biochar, green coal, pyrolysis oil, fuel pellets, and clean energy—all while striving for near-zero landfill dependency.

Year of Incorporation: 2014

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Dry, Wet & Mixed waste
End Product : Green Coal, Syngas, Heat Energy, Pyrolytic Oil
Capacity range : 1 - 100 TPD
System : De-centralized

USP

- Generates Zero-Waste Discharge and Carbon Credits
- Modular & Decentralized — suited for Urban & Island Environments
- Validated under Office of Principal Scientific Adviser (PSA), Govt. of India
- Handles all waste streams — Dry, Wet, Mixed & Non-recyclable Plastics

TYPE OF END CUSTOMER

Cement factories, industrial boilers companies, Power generation utilities, ULBs

DEPLOYMENT USED CASES

Pune city by PMC, Pune Rural, Madgao by MMC, Leh-Ladakh

CORE SDGs ALIGNED:

6 7 9 11 12 13

FOUNDER : Ajit Gadgil, Abhijit Datar

LOCATION : Pune

COMMERCIAL READINESS :

Deployed

TECHNOLOGY READINESS LEVEL :

Not Available

IP DETAILS

Tri Fusion Dehydration with Gasification & Pyrolysis (TFD-GPT), Dual Fusion Dehydration with Gasification (DFD-GT), Plastic-to-Oil (Pyrolysis) Process
Trademarks: “TFD GPT”, “DFD GT” and “PtP” under GD Environmental Pvt. Ltd.

TECHNOLOGY VIDEO LINK

https://www.youtube.com/@gdenvironmentalpl3656

ACHIEVEMENTS/ COMPLIANCES

- Recognized among 75 Promising & Impactful Graduate Startups in India (DIPP #1229)
- Technology Validation under Principal Scientific Adviser (PSA), Government of India
- Successful Public–Private Partnerships with PMC, GEDA, MMC & Leh–Ladakh

Website Link:
www.gdepl.org

Gangotree Energy Projects Pvt. Ltd

INPUT OUTPUT

Dry waste and Garden Waste to Pellets
Technology: Roller Die Compression

ABOUT THE COMPANY:

Gangotree uses pelleting technology, to converts Dry and Garden Waste into Solid Fuel Pellets which are used as a clean form of fuel in Boilers. The approach is to set up Decentralized Dry Waste Pelleting centres to avoid multiple handling and travelling of waste in the current centralized systems.
Year of Incorporation: 2015

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Dry Waste and Garden Waste
End Product : Solid Fuel Pellets (RDF)
Capacity : 200 kg to 2 TPD
System : De-centralized

USP

- Decentralized processing of Waste
- Utilization of Waste as a Fuel in Boilers
- Avoidance of Dumping (Landfills)
- More efficient utilization than Cement Plants
- Gainful employment for people

TYPE OF END CUSTOMER

Industrial boiler companies

DEPLOYMENT USED CASES

- Khadki Cantonment Board - Khadki
- Daund Sugar - Daund
- Muni Seva Ashram - Vadodara
- Ammunition Factory – Khadki
- BEG – Dighi
- Welspun – Vapi, Anjar
- IIT Powai – Mumbai
- Matru Waste Management – Vadodara
- Rudrapur Gram Panchayat – Uttarakhand
- Siachen Warriors Army Unit - Leh

CORE SDGs ALIGNED:

3 6 7 8 9 11 12 13

FOUNDER : Ashish Vaishnav
Sunil Gokhale

LOCATION : Pune

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 8

IP DETAILS

Copyrighted Trademark Logo for Urjwala Pellets

TECHNOLOGY VIDEO LINK

https://drive.google.com/file/d/15wZe9ox7zt5kbJQ6qRsmDmlzCBdZxGSt/view?usp=drivesdk

ACHIEVEMENTS/ COMPLIANCES

- CSR Funds Raised
- Awards/Recognition:
- CII 4 R - Innovative Solution Award
- CII - Top 25 Waste Management Companies of India
- Major Partnerships Forged: Thermax Ltd

Website Link:
https://www.gangotreeenergy.com

Go Do Good Studio Private Limited

INPUT OUTPUT

Agricultural Waste to Sustainable Packaging Solutions

Technology: Proprietary bio-based coatings and plant-based ink for home compostable packaging

ABOUT THE COMPANY:

Go Do Good Studio develops sustainable packaging and new materials for a better future. As a material innovation and agro-waste management company, they specialize in 100% sustainable packaging solutions to reduce environmental impact through water and grease resistant, plastic-free packaging that is Good for People and Good for the Planet.

Year of Incorporation: 2021

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Agricultural Waste (sugarcane, seaweed, coconut coir)
End Product : Packaging Materials
Capacity : Produce 1-2 lakh packaging boxes per month (Installed capacity is 30,00,000 boxes per month)
System : Centralized

USP

- The Good Coating
- 100% bio-based, plant gum derived
- Oil, water and moisture resistant
- Grease-proof & heat sealable
- The Good Ink
- 100% plant-based non-toxic, VOC-free ink

TYPE OF END CUSTOMER

Hotels, Cafes, Restaurants, Bakeries, Cloud Kitchens, Quick Service Restaurants, Catering Services, Food Delivery Aggregators, Corporate Offices

DEPLOYMENT USED CASES

- No. of Units Deployed: ~10 cr units of plastic packaging have been replaced by Go Do Good's products
- Locations Covered: Pan India

CORE SDGs ALIGNED:

5 8 11 12 13

FOUNDER : Khushboo Gandhi, Chanakya Medh, Ronak Gandhi

LOCATION : Pune

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 9

IP DETAILS

Not Available

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=rhCC3uqHqZU

ACHIEVEMENTS/ COMPLIANCES

Major Partnerships Forged: Social Alpha,, Swiggy, Zomato, Flax, Bare Necessities, Without by Ashaya, Paul and Mike

Website Link:
https://www.go-dogood.in/

GREENRICH GROW INDIA PVT LTD

INPUT OUTPUT

Municipal Solid Waste to Compost & Pellets
Technology: Anaerobic Digestion

ABOUT THE COMPANY:

Greenrich Group, a pioneer in eco-friendly waste management, has been revolutionizing organic waste recycling since 2017. Their MY GREEN BIN brand offers cutting-edge composting solutions for homes, communities, institutions, and industries, ensuring a sustainable, zero-waste future.
Year of Incorporation: 2017

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Solid Waste
End Product : Compost and Pellets
Capacity range : 1 – 100 TPD
System : De-centralized

USP

- End-to-end eco-friendly waste & composting solutions
- Organic farming / soil-enhancement products
- Certification & credible sustainability credentials
- Local presence with national reach, especially suitable for Indian urban/municipal contexts

TYPE OF END CUSTOMER

ULBs, Institutions and Residential Townships and Households.

DEPLOYMENT USED CASES

- Municipal Corporations in Tamil Nadu , Karnataka and Andhra Pradesh
- Zoho Pvt Ltd, Chennai

CORE SDGs ALIGNED:

3 4 9 11 13 15

FOUNDER : Manoj Nair K

LOCATION : Chennai

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL - Not Applicable

IP DETAILS
Not Available

TECHNOLOGY VIDEO LINK

https://drive.google.com/file/d/15wZe9ox7zt5kbJQ6qRsmDmlzCBdZxGSt/view?usp=drivesdk

ACHIEVEMENTS/ COMPLIANCES

- ISO 14001: 2015 Certified
- GreenPro Certification from CII and IGBC
- IGBC

Website Link:
https://www.greenrichgrow.in/

GreenShift Energy Private Limited

INPUT OUTPUT

Biomass to Bioclay to Different Biodegradable products for Bioenergy, Packaging, Insulation
Technology: Patented Biomass Densification

ABOUT THE COMPANY:

GreenShift Energy Pvt. Ltd. blends innovation with sustainability to transform the way waste is managed. They strive to develop advanced bio-based technologies that extract value from complex waste streams—minimizing environmental impact while maximizing resource recovery.
Year of Incorporation: 2019

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Biomass (Agricultural/Garden/Horticulture/Tree)
End Product : Bio Logs, Biospheres, Sheets for Packaging, Bio Idols
Capacity range : 2 – 100 TPD
System : De-centralized and Centralised

USP

- Utilization of wide range of agricultural waste without initial drying requirement for biomass
- Biomass can be densified in different shapes
- Leveraging biomass moisture as an asset rather than a hindrance.
- All reagents recycled

TYPE OF END CUSTOMER

Thermal Power Plants, Industrial boilers, Biobased packaging and insulation industry

DEPLOYMENT USED CASES

- Brihanmumbai Municipal Corporation, Bandra

CORE SDGs ALIGNED:

7 8 9 11 12 13 15

FOUNDER : Kunal Godambe

LOCATION : Mumbai

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 8

IP DETAILS

Patent No. 544866

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=YQ665jeBdy8

ACHIEVEMENTS/ COMPLIANCES

- Best Startup Award in Industrial Biotechnology at Global Bio-India 2023.
- Best Innovation Award at CiiA-3, CiiA Mumbai, India.
- Awarded in Enviroexcel 2.0 scheme, part of HDFC Parivartan program
- Grantee of Biotechnology Ignition Grant (BIG) from Biotechnology Industry Research Assistance Council (BIRAC), Department of Biotechnology (DBT).

Website Link:
www.greenshiftnrg.com

ISHITVA Robotics Pvt. Ltd.

INPUT OUTPUT

Automated High Speed Dry Waste Sorting System
Technology: AI-driven Sorting

ABOUT THE COMPANY:

ISHITVA® is redefining material recovery with AI-driven precision. By replacing slow, inconsistent manual sorting with intelligent, high-speed automation, they bring unmatched accuracy and efficiency to the recycling industry. From plastics and flexible packaging to multilayered, hard-to-recover materials, their technology ensures that every valuable resource is identified, recovered, and reintroduced—powering the circular economy, one smart sort at a time.

Year of Incorporation: 2018

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Dry Waste
End Product : Separated Recyclables
Capacity range : 1 - 8 TPH
System : Centralized

USP

- AI-powered Automation
- High purity and efficiency in sorting
- Versatile sorting capabilities powered by a large library of classified plastic
- Data-driven optimization

TYPE OF END CUSTOMER

Recyclers / Plastic Recycling Facilities, Washing Line Facilities, Plastic Aggregators, Material Recovery Facilities (MRFs) & Waste Management Companies

DEPLOYMENT USED CASES

Deployed over 100+ installations

CORE SDGs ALIGNED:

9 12 13

FOUNDER : Jitesh Dadlani

LOCATION : Ahmedabad

COMMERCIAL READINESS :
Deployed

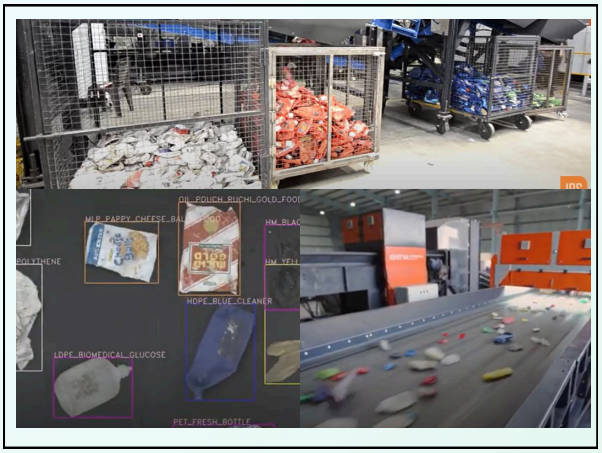
TECHNOLOGY READINESS LEVEL :
TRL 9

IP DETAILS

Not Available

TECHNOLOGY VIDEO LINK

https://www.youtube.com/@IshitvaRobotics



ACHIEVEMENTS/ COMPLIANCES

- Winner of Nasscom Environment Tech4Good 2019
- Winner of Global Waste Tech Startup Challenge 2020
- AIPMA Best Startup in Plastic Sector, 2022
- CII 3R Excellence in Waste Management

Website Link:
Ishitva.in

Fintek LifeTrue Solutions Pvt. Ltd

INPUT OUTPUT

Municipal Mixed waste to Pellets
Technology: Hot-melt Extrusion

ABOUT THE COMPANY:

- Bootstrapped, incubated at IIT Kanpur with the initial project of Medical Oxygen Concentrator (10 LPM & 5 LPM & 100LPM) during COVID under the program "Mission Bharat O2".
- Team of 5 Technocrats cum innovators
- The current focus area is developing equipment for the scientific processing of Municipal Solid Waste to convert it to RDF

Year of Incorporation: 2021

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Mixed (unsegregated) Waste
End Product : Solid Fuel Pellets (RDF)
Capacity : 2 - 25 TPD
System : De-centralized

USP

- The Approach - addressing poorly segregated or mixed MSW.
- No External Fuel burning/no smoke/no bad smell during processing.
- Can work on Grid power/ Solar Electricity (Green)
- Eco-friendly & de-centralization as well centralization possible
- Leads to Zero Landfill
- Methane generation is avoided
- Can generate Carbon-Credits for industries by reducing their fossil fuel consumption
- Generates sustainable source of income for rural youth

TYPE OF END CUSTOMER

Industrial boilers companies

DEPLOYMENT USED CASES

1. Palanhar Energy Pvt. Ltd. – Bailhongal, Karnataka
2. Special Development Authority - Trilokpur, Himachal Pradesh
3. Sambhajinagar, Maharashtra

CORE SDGs ALIGNED:

7 9 11 12 13

FOUNDER : Pranav Vaidya, Samir Kanadkhedkar, Salil Bangale, Nitin Wayal , Omkar

LOCATION : Sambhajinagar

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 8 - 9

IP DETAILS

Applied for patent under India region.
Grant of patent awaited.

TECHNOLOGY VIDEO LINK

https://photos.app.goo.gl/wYHovohzE3qgbsoB6
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https://photos.app.goo.gl/EQySKDRCjKf6LRcm8
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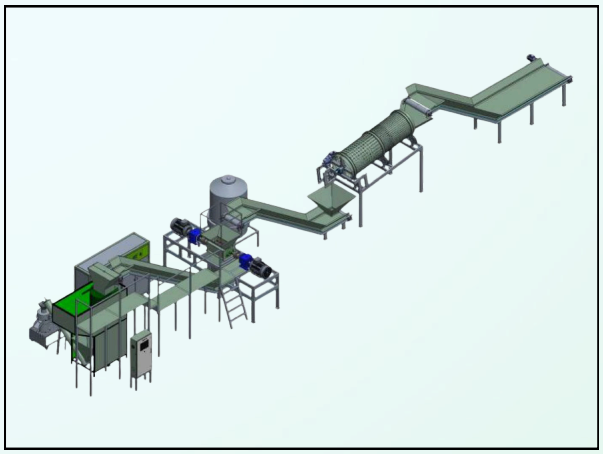
https://photos.app.goo.gl/NykC8XD8x4ghYoz96



ACHIEVEMENTS/ COMPLIANCES

- Funds Raised (Angel Round) : INR 1 Crore.
- Awards/Recognition : INR 27 lakh Grant (CSR) by ICICI Ltd. via IIT Kanpur

Website Link:
www.finteklifetrue.com

PadCare Labs Private Limited

INPUT OUTPUT

Used Sanitary Napkins to Plastic and Cellulose
Technology: Proprietary 5D Chemo-Mechanical

ABOUT THE COMPANY:

Padcare Labs uses a proprietary chemo-mechanical process to recycle used sanitary pads to produce plastic and cellulose. Padcare installs Feminine Hygiene Unit (FHU) bins in female lavatories to store used pads, which are then collected and sent to the central processing unit, PadcareX, for processing. Padcare's processing technology, which can provide recycled output, is a category creating innovation, as no other company in India is currently processing pads in an eco-friendly manner

Year of Incorporation: 2018

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Sanitary Waste (Used Sanitary Napkins)
End Product : Plastic & Cellulose
Capacity : 500kg of processing per day (*will increase to 3MT by 2026)
System : Centralized

USP

- CPCB, MoEFCC and IAPMO Certified-Technology
- The processing of pads via PadCareX does not result in hazardous smoke or water pollution.
- Prevention of unsafe disposal of used sanitary pads, which otherwise take 800 years to decompose.

TYPE OF END CUSTOMER

Corporate Offices, Educational Institutions, Residential Buildings, Hotels

DEPLOYMENT USED CASES

- No. of Units Deployed: 1500+ Active Clients, with 16,000+ bins
- Locations Covered: Pan India (24+ Cities)

CORE SDGs ALIGNED:

3 5 6 11 13

FOUNDER : Ajinkya Dhariya

LOCATION : Pune

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 9

IP DETAILS

4 Patents Granted

- Process Patent: 5D Technology Global Patent No. US 12076766B2
- Design Patent: Padcare Bin 422585-001
- Design Patent: PadcareVend Patent no. 422585-001
- Process Patent – Rotary Shredder – Separation Mechanism

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=vpt9nNWibMU

ACHIEVEMENTS/ COMPLIANCES

- Awards/Recognition: Forbes Asia 30 Under 30, FICCI ISC 2020, Toilet Board Coalition 2019, Tata Social Enterprise Challenge 2020, Global UNICEF 30 Innovations, World Economic Forum's The Circular 2023

- Major Partnerships Forged: Meta, P&G, Pidilite, AT&T, Thermax, Mahindra, Pfizer, Hero, Mercedes Benz, JLL, Saint Gobain

Website Link:
https://www.padcarelabs.com/

PATPERT TEKNOW SYSTEMS PVT. LTD

INPUT OUTPUT

Municipal Dry Waste to PyroOil

Technology: Patpert's Patented Gasolysis Technology

ABOUT THE COMPANY:

Patpert Teknow Systems Pvt. Ltd. is a forward-thinking engineering company dedicated to developing sustainable, science-driven solutions for the future of clean energy that specializes in process engineering, waste-to-energy technologies, and the scientific transformation of bio-waste into renewable resources

Year of Incorporation: 2008

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Dry Waste.\
End Product : Plastic Pyro Oil / Pyro Gas
Capacity range : 5 – 65 TPD
System : De-centralized

USP

- In-built rectification-based system ensures superior and consistent product quality.
- Compliant to emission norms
- Plants Designs adhering to various standards viz. ASME, CE, PED, etc.
- PLC Controlled system – along with data acquisition systems and safety mechanisms
- Process Safety – Guarding, PSVs, and Vents.

TYPE OF END CUSTOMER

- Oil Traders
- Industries (for Oil fire Boilers, TFH, etc.)
- Hot Mix Plants

DEPLOYMENT USED CASES

- Liqvigreen Energy – Ahilyanagar, Pune
- Naturepro Creators LLP, Shirwal, Pune
- Art of Living Centre, Bengaluru, KA
- Gowardhan Eco Village, Wada, Thane
- Municipal Waste treatment facility (BVG), Moshi, PCMC, Pune
- CSIR-NCL (National Chemical Laboratory), Pune
- Liqvigreen Energy, Moradabad, UP
- Xycle, Rotterdam, Netherlands

CORE SDGs ALIGNED:

7 8 9 11 13

FOUNDER : Nilesh Inamdar

LOCATION : Pune

COMMERCIAL READINESS :

Deployed

TECHNOLOGY READINESS LEVEL :

TRL 9+

IP DETAILS

Patent No. 295772 dated 11.02.2014
Trademark No. 5848104 dated 15.03.2023

TECHNOLOGY VIDEO LINK

www.Patpert.in

ACHIEVEMENTS/ COMPLIANCES

- Executing Xycle Netherlands project for processing 21KTA plastic waste achieving chemical recycling.
- 10 Most Trusted Waste Management Service Providers 2020
- Award by Techno Polymer Association in International Exhibition and Conference for Showcasing the Technology - Gasolysis

Website Link:
http://www.patpert.in/

Pro-Biokem India Pvt. Ltd.

INPUT OUTPUT

Rice husk to Cellulose and Amorphous Silica

Technology: cost efficient Bio-chemical Processes

ABOUT THE COMPANY:

Pro-Biokem India Pvt. Ltd. is a bio-innovation startup converting rice husk and stubble into high-purity cellulose and silica using sustainable bio-chemical processes, enabling circular, value-added utilization of agricultural residues.

Year of Incorporation: 2018

TECHNOLOGY/PRODUCT DETAILS :

Pro-Biokem has developed a process to extract cellulose and silica from raw rice husk. The proposed process has already been developed on a pilot scale to isolate Cellulose and amorphous Silica in a homogenous form with high purity and yield. The feedstock was processed to generate cellulose pulp. The cellulose pulp was further processed biochemically to generate Microcrystalline cellulose. Silica was isolated from the pulp filtrate liquor. The proposed technology will also be effective if rice stubble is used as a feedstock, since the composition (qualitative and quantitative) of rice husk and rice stubble is very similar.

USP

- Multi-product Isolation from single feedstock with wider applications
- Non-Wood/ Non-Cotton derived products
- Low pollution compared to currently used process technology
- Products derived from Agro residue/waste
- Offer better margin to supply chain
- Lower cost of feedstock and Production cost

TYPE OF END CUSTOMER

Biochemical & Chemical Industries

DEPLOYMENT USED CASES

Pandra, Bhubaneswar

CORE SDGs ALIGNED:

9 12 13 15

FOUNDER : Muhammad Gulebahar Sheikh

LOCATION : Bhubaneswar

COMMERCIAL READINESS :

Deployed

TECHNOLOGY READINESS LEVEL :

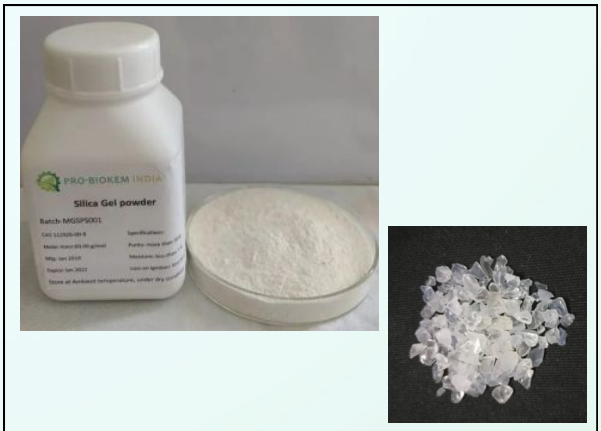
TRL 8

IP DETAILS

Not Available

TECHNOLOGY VIDEO LINK

https://youtu.be/ixAmvS6R44k?si=jWxbXwAdU-MvmhFU



ACHIEVEMENTS/ COMPLIANCES

- BIRAC BIG Grant of INR 50 lakhs
- BIRAC SEED fund of INR 25 lakhs
- Startup Odisha Product Development Fund of INR 12.5 lakhs
- BCKIC-Kotak Grant

Website Link:

www.pro-biokemindia.com

Samakhya Sustainable Alternatives Pvt. Ltd.

INPUT OUTPUT

Discarded Wool Fibres to Insulation Materials

Technology: specialized carding, slivering and binding process

ABOUT THE COMPANY:

Samakhya is a materials company that works with pastoralist communities to collect and use MAGRA Sheep wool to develop sustainable building insulation materials in the form of felting sheets, batts and rolls using MAGRA sheep wool (indigenous natural fibers) which provide 15-18% improved thermal insulation and 20-30% improved acoustic insulation than conventionally available insulation materials.

Year of Incorporation: 2022

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste: Wool Fibres
End Product: Insulation Materials
Capacity: 15,000 sq ft per month
System : Centralized

USP

- 100% natural fibre with a carbon footprint of <3kg CO2/Kg fibre
- Low thermal conductivity, with scope to reduce energy demand by 15 – 20%
- Fire resistant
- Absorbs VOCs to enable clean indoor air

TYPE OF END CUSTOMER

Builders, Architects, Contractors

DEPLOYMENT USED CASES

- More than 1 lakh sq ft deployed
- Locations Covered: Delhi, Tamil Nadu, Rajasthan, Karnataka, Goa, Ladakh, Kashmir, Himachal Pradesh, Maharashtra, West Bengal, Haryana

CORE SDGs ALIGNED:

8 11 12 13

FOUNDER : Prerna Agarwal, Shwetambara Ujjain, Mohd. Danish Chowdhary

LOCATION : Bikaner

COMMERCIAL READINESS :
Piloted

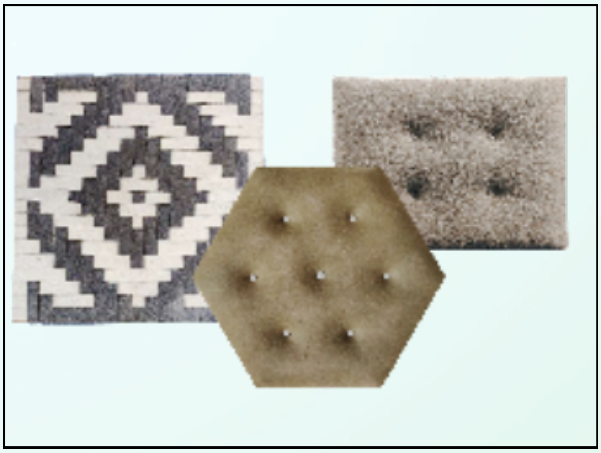
TECHNOLOGY READINESS LEVEL :
TRL 8

IP DETAILS

Application No.: 202411020746 A
Status: Applied
Title: Natural fiber-based insulation material and process of manufacture thereof
Type: International

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=xgqYt5Xkssw



ACHIEVEMENTS/ COMPLIANCES

- Awards/Recognition: Sustainable Material Innovation Award by Apparel Week (2023)
- Major Partnerships Forged: Social Alpha, Desert Resource Centre, Urmul Seemant Samiti, ICAR, Selco Foundation, SEEDS

Website Link:
https://samakhya.com/

Smart Tiles from recycled Plastic Waste

INPUT OUTPUT

Plastic waste into durable, eco-friendly Building and Paver Tiles

Technology: Chemical treatment and Molding

ABOUT THE COMPANY:

CSIR-NPL is India's premier national laboratory for metrology and materials research, established in 1947 under CSIR. It develops national measurement standards, conducts research in physics and materials, and provides calibration and testing services to support industry, academia, and technology development.

Year of Incorporation: NA

TECHNOLOGY/PRODUCT DETAILS :

The main objective of the current project is to utilize waste plastic bags for designing materials for the utilization of tiles in the building of toilets and rooms for the general public, for societal benefits. WP RM composites were developed upon the blending of red mud and LD/PP, which were then subjected to further compression molding to give rise to wall, floor, and paver tiles. Smart tiles have superior mechanical strength, flame retardancy, water permeability, UV protection, and antistatic response to conventional structures.

USP

- Tiles were tested as per ASTM standards for skid resistance
- Surface friction: compatible for both dry & wet conditions
- Resistance to high and low temperature conditions

TYPE OF END CUSTOMER

Builders, Architects, ULBs, Individuals

DEPLOYMENT USED CASES

NPL Campus, New Delhi

CORE SDGs ALIGNED:

9 11 12 13 15

FOUNDER : Dr. Rajiv K Singh

LOCATION : New Delhi

COMMERCIAL READINESS :
Piloted

TECHNOLOGY READINESS LEVEL :
TRL 8

IP DETAILS

Not Available

TECHNOLOGY VIDEO LINK

https://www.youtube.com/watch?v=CZu5uKutH7Y

https://www.driiv.co.in/MS/plastic-waste-to-tiles/

ACHIEVEMENTS/ COMPLIANCES

- Technology transferred to 7 startups Nationwide
- Smart Fifty Innovation Award

Website Link:
https://www.nplindia.org/

Strawcture Eco Private Limited

INPUT OUTPUT

Agricultural Waste to Building Materials (Bio-panels)
Technology: Hot Press

ABOUT THE COMPANY:

Strawcture Eco develops high quality engineered bio-panels from agricultural residue (96%) and a non-formaldehyde binder (4%). The panels are moisture and fire resistant and are available in various thicknesses, sizes and finishes with ceiling, flooring, acoustic, and furniture applications.
Year of Incorporation: 2018

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Agricultural Residue
End Product : Bio-panels
Capacity : 2000 MT agri waste utilized per year
System : Centralized

USP

- 100% bio-based wall panels.
- E1 certified, A+ VOC category, 96% recycled, LCA negative, fire, moisture & termite resistance
- Used for thermal comfort, passive insulation, sound clarity and improved air quality

TYPE OF END CUSTOMER

Builders, Architects, Contractors

DEPLOYMENT USED CASES

- No. of Units Deployed: 1,25,000 sq.m
- Locations Covered: New Delhi, Mumbai, Bengaluru, Chennai, Gurugram, Lucknow, Noida, Pune

CORE SDGs ALIGNED:

3 11 12 13

FOUNDER : Shriti Pandey

LOCATION : New Delhi

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 9

IP DETAILS

Not Available

TECHNOLOGY VIDEO LINK

https://drive.google.com/drive/folders/1Wb1ser-i3pPcw8KI6HMZSLe2Qc7Yo8Eq

ACHIEVEMENTS/ COMPLIANCES

- Awards/Recognition – Echoing Green Grant, UN Social Impact Winner, An Unreasonable Company, Forbes 30 Under 30
- Major Partnerships Forged – Social Alpha, Brigade REAP, NSRCEL, Circular Economy Accelerator, IIT Kanpur

Website Link:
https://strawcture.com/

GG WASTECH Pvt. Ltd.

INPUT OUTPUT

MSW Dry waste to Shredded Refused derived Fuel
Technology: Cluster-Based Mechanical Waste Processing and RDF Production technology

ABOUT THE COMPANY:

GG Wastech Pvt. Ltd., based in Raipur, Chhattisgarh is an organisation, that specialises in Waste Management and Logistics services. They collect, transport and process MSW and Legacy waste into alternative fuel, which is supplied to cement plants across the country. We also offer EPR services with 5+ years of experience.
Year of Incorporation: 2021

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Municipal Solid Wast e & Legacy Waste
End Product : Refused Derived Fuel (RDF)
Capacity range : 120 TPD - 200 TPD
System : Centralized

USP

- Cluster-Based Operational Model
- Supermarket Model for Alternative Fuels
- End-to-End Waste Value Chain Management
- More than 1 Lakh MT converted to RDF

TYPE OF END CUSTOMER

Cement factories

DEPLOYMENT USED CASES

- Raipur Municipal Corporation
- TATA Steel Utilities & Infrastructure Limited
- Moradabad Municipal Corporation

CORE SDGs ALIGNED:

3 11 12 13

FOUNDER : Lokesh Kumar Agrawal & Sunil Sharma

LOCATION : Raipur, Chhattisgarh

COMMERCIAL READINESS :

Deployed

TECHNOLOGY READINESS LEVEL :

TRL 9

IP DETAILS

NA

TECHNOLOGY VIDEO LINK

https://drive.google.com/file/d/1f9U3ac-vNibO7j1-VImer2VUcebVrxMI/view?usp=drive_link

ACHIEVEMENTS/ COMPLIANCES

- CII 3R Awards
- Incubated Under IIT Kanpur
- Tax exemption certificate under StartupIndia
- 5 Lakh+ MT waste Processed

Website Link:
https://www.wastechindia.com/

WomenasticCo Pvt. Ltd.

INPUT OUTPUT

PET bottle waste → 3D-printing filament, textile-grade fiber
Technology: low-energy, solar-assisted polymer-quenching process

ABOUT THE COMPANY:

WomenasticCO (est. 2023) is a sustainability-focused enterprise converting post-consumer plastic waste into usable, market-ready materials through decentralized, low-energy manufacturing systems. The company enables women and youth in rural and peri-urban areas to operate machines, produce 3D printing filament, textile fiber, and pellets, and participate in circular economy value chains.

Year of Incorporation: 2023

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste: PET Bottles and Clean Post-Consumer Plastic Waste
End Products: 3D Printing Filament, Textile-Grade Fiber, and Recyclable Pellets
Capacity: 15–25 kg/day per unit (modular and scalable)
System: Decentralized

USP

- Decentralized system enabling local waste-to-resource conversion.
- Low energy requirement; suitable for rural and semi-urban contexts.
- Generates dignified livelihoods for women and students.
- Includes training in CAD modeling, 3D printing, product design, and handicraft material production.
- Ensures value creation at source with reduced waste transportation burden.

TYPE OF END CUSTOMER

3D Printing Service Providers and Prototype Labs
Textile & Handicraft Clusters / Women's Self-Help Groups
corporate houses and educational institutions

CORE SDGs ALIGNED:

5	8	9	11	12	13

FOUNDER : Uma Sharma

LOCATION : Gurugram

COMMERCIAL READINESS :
Piloted

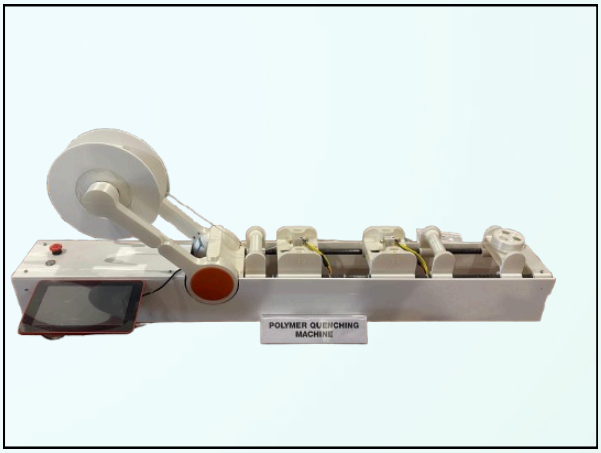
TECHNOLOGY READINESS LEVEL :
TRL 7

IP DETAILS

Patent in Process

TECHNOLOGY VIDEO LINK

https://bento.me/womenastic



ACHIEVEMENTS/ COMPLIANCES

- Recognized by NITI Aayog and Women Entrepreneurship Platform (WEP)
- Selected under PSCST SHE 3.0 Program
- Winner at Startup Haryana
- Top Participant in Together 4.0 by York University, Canada
- Supported by HPCL, Aditya Birla Capital, Capgemini, C-DOT, DERBI Foundation, Startup Punjab

DEPLOYMENT USED CASES

Pilot at Shree Guru Gobind Singh Tricentenary University (SGT University), Gurugram, Haryana.

Website Link:
bento.me/womenastic

2 Degrees Clicon Pvt. Ltd

INPUT OUTPUT

Industrial Plastic Waste to Alternate Diesel Fuel
Technology: Thermal Catalytic Cracking

ABOUT THE COMPANY:

2 Degrees Clicon Pvt. Ltd. turns end-of-life plastics into high-performance industrial fuels. Their Alternate Diesel Fuel (ADF) is a high-grade, clean–burning industrial fuel that can directly replace HSD in boilers and furnaces without any equipment modifications. The technology has been successfully deployed by industries in cement, steel, paints, pharma and other sectors.

Year of Incorporation: 2017

TECHNOLOGY/PRODUCT DETAILS :

Type of Waste : Industrial Plastic Waste
End Product : Alternate Diesel Fuel (ADF)
Capacity : 16 TPD
System : Decentralized

USP

- 100% replacement for diesel (HSD)
- Made entirely from plastic waste
- No burner modifications required
- Cost-effective vs fossil fuels
- Scalable clean-tech solution

TYPE OF END CUSTOMER

Steel, Pharma, Cement and Paint industries

DEPLOYMENT USED CASES

- Gollapally, SangaReddy District, Telangana
- Mallepally, SangaReddy District, Telangana

FOUNDER : Vikas Agarwal, SheetaL Agarwal

LOCATION : Hyderabad

COMMERCIAL READINESS :
Deployed

TECHNOLOGY READINESS LEVEL :
TRL 9

IP DETAILS

Applied for patent under India region.
Grant of patent awaited.

TECHNOLOGY VIDEO LINK

https://www.2degreesclicon.com/our-process

ACHIEVEMENTS/ COMPLIANCES

- Certifications: ISO 9001, ISO 14001, ISO 45001
- CPCB regulations compliant
- EcoVadis Gold Rating in 2025

CORE SDGs ALIGNED:

7 9 11 12 13

Website Link:
https://www.2degreesclicon.com

TECHNOLOGY COMPENDIUM SOLID WASTE MANAGEMENT

PUNE KNOWLEDGE CLUSTER

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