Turning Waste into Watts:
From Field to Fuel

ESB-R BIO-CHAR PLANT

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Empowering Farmers, Enriching Soil

ESB-R ECO-GREEN BIOCHAR10

The ESB-R Eco-Green BioChar10 is an innovative biochar plant designed to convert agricultural waste, specifically parali (rice straw), into biochar. With a capacity to generate 10 kg of biochar per hour, this compact unit provides farmers with a sustainable solution for managing crop residues.

By transforming agro-waste into valuable biochar, the ESB-R EcoGreen BioChar 10 not only helps farmers reduce waste but also generates additional income. Moreover, the produced biochar enhances soil fertility, improving crop yields and promoting healthier farm ecosystems. This eco-friendly technology supports sustainable agriculture and offers economic and environmental benefits to the farming community.

Enersol Biopower

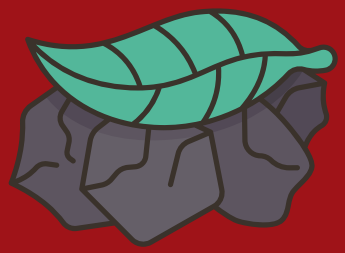
ENERSOL BIOPOWER PVT. LTD.

Established in 2013 by Mr. Rai Singh Dahiya, a grassroots innovator in biomass gasifier technology, our company is renowned for its small-size biomass gasifiers, smokeless biomass stoves, and other renewable energy products.

TRANSFORM YOUR ENERGY, TRANSFORM YOUR WORLD...

AGRICULTURE IN INDIA

- Agriculture has been a significant contributor to India's economy.
- Employing more than 50% of the Indian workforce.
- Contributing 20.2% to the country's GDP.
- This GDP contribution could be more if we utilize the crop residues too.



Empowering Farmers, Enriching Soil

India generates on an average 500 Million Tonnes (MT) of crop residue per year

अब पराली से धुआँ नही, आमदनी बढ़ाये।

CROP RESIDUE IN INDIA

In India, crop residue refers to the leftover plant material after harvesting crops like rice and wheat. Annually, millions of tons of these residues are generated, often managed through burning, leading to severe air pollution and soil degradation. Innovative solutions like converting residues into biochar or bioenergy can mitigate these issues, enhancing soil health and providing additional income for farmers. Effective crop residue management is crucial for sustainable agriculture and environmental protection.

A surplus of 140 MT out of which 92 MT is burned each year.

STUBBLE BURNING IN INDIA

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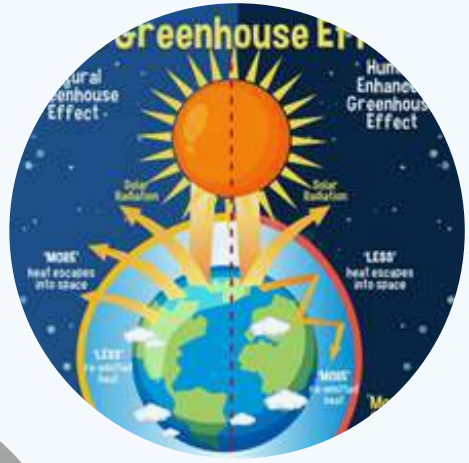
EFFECTS OF STUBBLE BURNING

LOW AGRICULTURAL PRODUCTIVITY



GREENHOUSE EFFECT

SOIL EROSION

HEALTH HAZARDS

BIOCHAR PRODUCTION: A SUSTAINABLE SOLUTION FOR CROP RESIDUE BURNING

Biochar has been shown to be potentially effective in boosting soil carbon sequestration, crop production, and remediating contaminated soil and water.

Farmers can use biochar as an alternative for stubble burning as it is a carbon-rich, stable, and long-lasting substance and it will help to improve health and quality of the soil.

From Crop Residue to Revenue: A Clean Solution

BIOCHAR FROM CROP RESIDUE

AN ALTERNATE TO STUBBLE BURNING

ESB-R
ECO-GREEN BIOCHAR10

Biomass torrefaction is a thermal process that converts raw biomass into a coal-like material. It involves heating biomass with limited oxygen to a temperature of typically 300 to 600°C.

10KG BIOMASS BASED ESB-R TORREFACTION PLANT

Crop Waste to Earnings, No More Burning

KEY FEATURES OF ESB-R
ECO-GREEN BIOCHAR10

Biomass torrefaction is a thermal process that converts raw biomass into a coal-like material. It involves heating biomass with limited oxygen to a temperature of typically 300 to 600°C.

- **Best Method:** Provides the optimal solution for converting crop residues into biochar.
- **Portable System:** Highly useful for farmers due to its mobility and ease of deployment in various locations.
- **Reliable and Rugged:** Built to be durable, dependable, and easy to maintain.
- **User-Friendly:** Designed for ease of use, ensuring that farmers can operate it with minimal training.
- **Capacity:** Produces 10 kg of biochar per hour, suitable for small to medium-sized operations.
- **Environmental Benefits:** Reduces air pollution and enhances soil health by offering an alternative to burning crop residues.
- **Economic Advantage:** Generates additional income for farmers through biochar sales while improving soil fertility and crop yields.
- **Sustainability:** Supports sustainable agriculture and provides renewable energy through pyrolysis byproducts.

TECHNICAL SPEFICATIONS

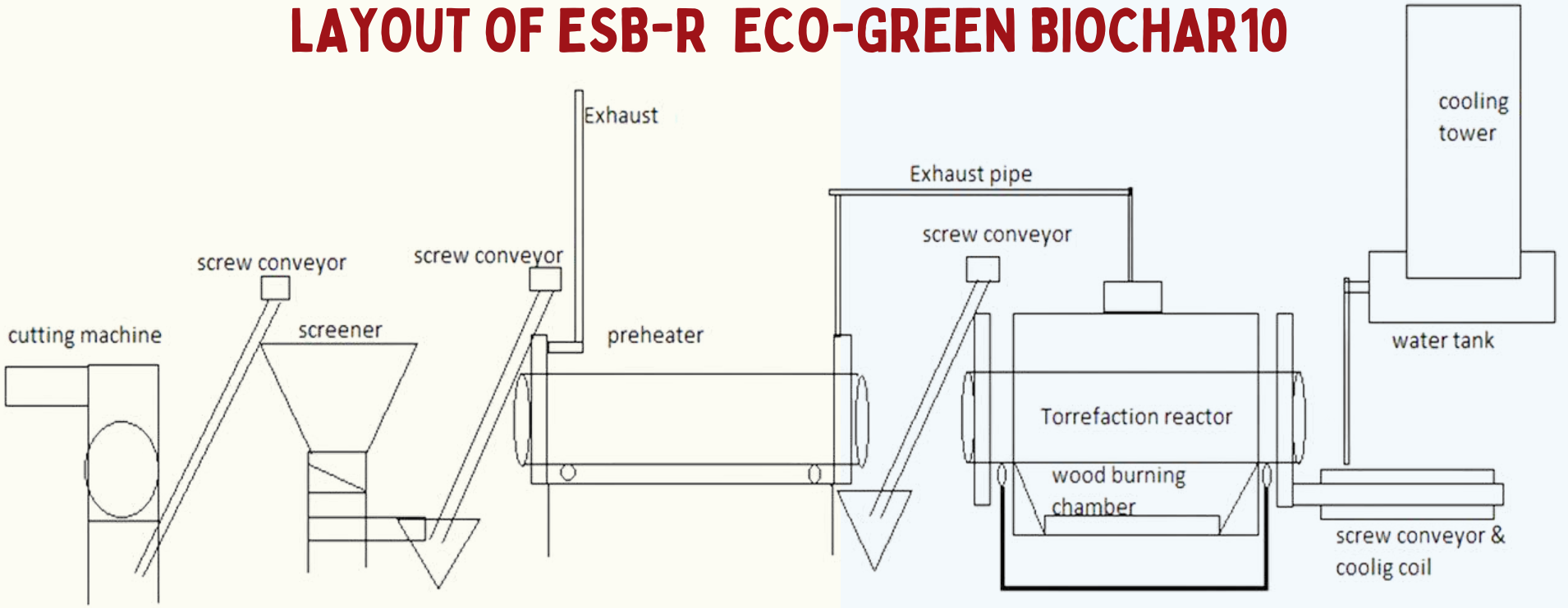
SR. NO.	PARAMETER		MADE OF
	SPECIFICATIONS OF ESB-R ECO-GREEN BIOCHAR10		
1.	Make	-	Enersol Biopower®
2.	Fuel mode	-	100% biomass based
3.	Feeding system	-	Semi- automatic
4.	Acceptable moisture in biomass	-	Less than 15%
5.	Biomass acceptable size	-	6-10mm
6.	Power required	-	2.5-3HP
	HOPPER WITH SCANNER		
7.	Capacity	-	10kg/hr. (biomass input)
8.	Conveyor flow rate	-	10kg/hr.
9.	Material	-	Mild Steel (MS Sheet)
	SCREW CONVEYOR		
10.	Capacity	-	10kg
11.	Material	-	Mild steel
12.	Grear-box with motor	-	40 watts
	PRE-HEATER		
13.	Capacity	-	10kg/hr.
14.	Operating temperature	-	100°C -200°C
15.	Insulated cover	-	Provided
16.	Material	-	Mild Steel (MS Sheet)
	AIR LOCKING SCREW		
17.	Specifications	-	Low pressure reaction vessels with 10kg/hr. capacity
18.	Material	-	Mild Steel (MS Sheet)
	MAIN REACTOR		
19.	Material	-	Stainless Steel & Mild Steel
20.	Capacity	-	10kg/hr.
21.	Insulated cover	-	Provided
22.	Gear-box motor	-	0.5HP
23.	Temperature	-	250°C -700°C

Know Your ESB-R Eco-Green Biochar05

SR. NO.	PARAMETER		MADE OF
	GAS COOLING & CLEANING SYSTEM WITH CONDENSER		
	Water Tank with Cooling Tower		
1.	Water tank capacity	-	100ltr. Approx..
2.	Material	-	Mild Steel (MS Sheet)
	Condenser		
3.	Material	-	Stainless Steel (SS Sheet)
	Gas Cleaning Scrubber		
4.	Material	-	Mild Steel (MS Sheet)

SR. NO.	PARAMETER		DETAILS
	SCREW CONVEYOR WITH COOLING SYSTEM		
1.	Capacity	-	10kg/hr. (shell & tube heat exchanger)
2.	Temperature range	-	350°C -50°C
3.	Material	-	Mild Steel (MS Sheet)
	Gas Burner		
4.	Material	-	Mild Steel (MS Sheet)
5.	No. of gas burner	-	Single burner
	CONTROL PANEL & THERMOCOUPLES		
	Basic control panel with temperature control provision		
6.	K type thermocouples	-	2nos.
7.	J type thermocouples	-	2nos.
8.	Exhaust	-	Provided
9.	Power required	-	2.5-3HP
	PLANT DIMENSION & WEIGHT		
	Dimension		
10.	Length	-	15 feet
11.	Width	-	8feet
12.	Height	-	5feet
13.	**Weight**	-	**800-1000kg approx..**

LAYOUT OF ESB-R ECO-GREEN BIOCHAR10

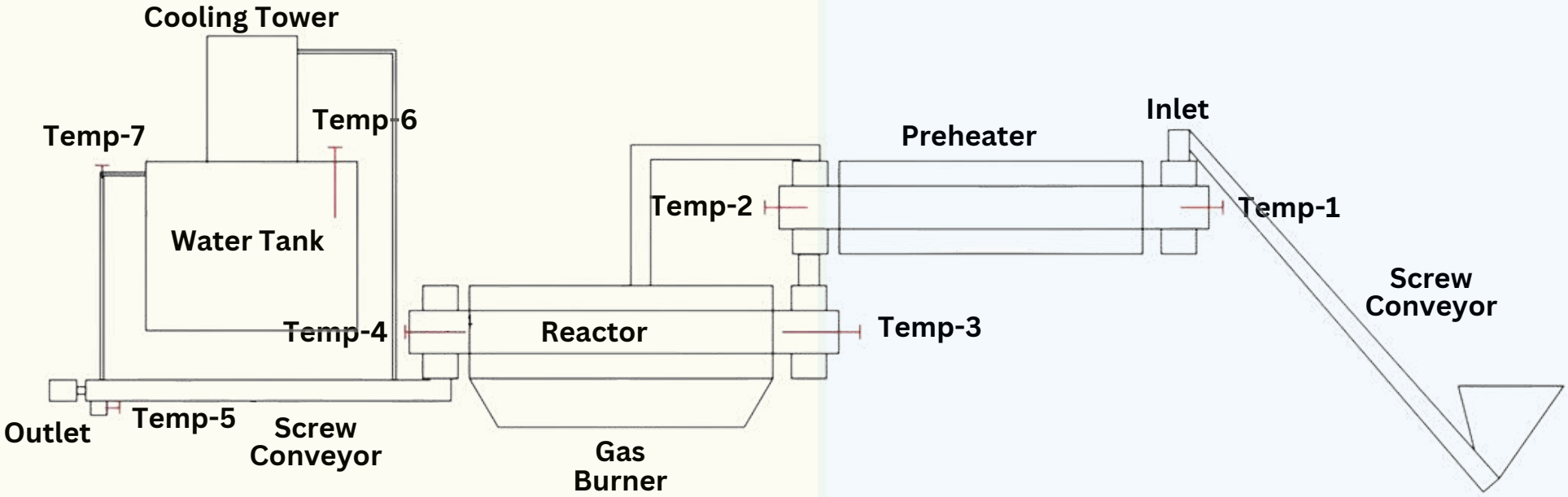


MODEL- 1

1. Cutting machine
2. Screw conveyor-1
3. Screener
4. Screw conveyor-2
5. Preheater & exhaust
6. Screw conveyor-3
7. Exhaust pipe
8. Torrefaction reactor
9. Wood burning chamber
10. Screw conveyor & cooling coil
11. Cooling tower
12. Water tank

Know Your ESB-R Eco-Green Biochar10

LAYOUT OF ESB-R ECO-GREEN BIOCHAR05



MODEL- 2

1. Screw conveyor-1
2. Inlet
3. Preheater
4. Reactor
5. Gas Burner
6. Screw conveyor-2
7. Water Tank
8. Cooling Tower
9. Outlet

Know Your ESB-R Eco-Green Biochar05

PICTURES OF ESB-R ECO-GREEN BIOCHAR05

Green Solutions for a Greener Tomorrow

OUR ESTEEMED PARTNERS

IIT, Ropar

IIT, Roorkee

NIT, Tiruchirappalli

NIT, Rourkela

NIT, Mizoram

VIT, Vellore

CSIR-CMERI DURGAPUR

Indian Oil

CSIIR- NIIST

BITS-PILANI Hyderabad

LNMIIT, Jaipur

SASTRA, Thanjavur

GCE, GAYA

NTPC Madhya Pradesh

UNDP, Yemen

Pioneering Success with Our Valued Partners.

YOUTUBE LINKS

- https://www.youtube.com/watch?v=FYPajsGRrrw
- https://www.youtube.com/watch?v=LKDlbvXdHyM&t=9s
- https://www.youtube.com/watch?v=Rp17MmDRilQ
- https://www.youtube.com/watch?v=GTmOj_JRLVw
- https://www.youtube.com/watch?v=pcQN3qzNfh0
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- https://www.youtube.com/watch?v=OD9ueNYjf1Q&t=23s
- https://www.youtube.com/watch?v=fjUlT8k4Axg&t=9s
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- https://www.youtube.com/watch?v=ghm_odvyvzc
- https://www.youtube.com/watch?v=g1iemqc0-80&t=15s
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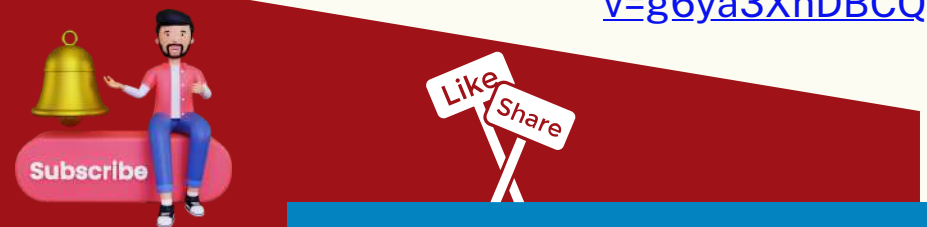
- https://www.youtube.com/watch?v=0AhISC5Dw00
- https://www.youtube.com/shorts/tlTevfsPD0o
- https://www.youtube.com/watch?v=Bb8g5oogaM
- https://www.youtube.com/watch?v=6cYUyY25OXE
- https://www.youtube.com/watch?v=iyiz_OBGFGw
- https://www.youtube.com/watch?v=W9HXk2M-Mgw
- https://www.youtube.com/watch?v=-XmU5L6lytM
- https://www.youtube.com/watch?v=vY73UXW6aIM
- https://www.youtube.com/watch?v=I8NuflvOH4k
- https://www.youtube.com/watch?v=7MVHph7NfkY



OUR PRODUCTS

Portable Biomass Gasifier

Bio-Auto Mawa-Machine

Biomass Torrefaction Plant (Charcoal Plant)

Biogas Genset

Commercial Wood /Biomass Stove

Domestic Biomass/ Wood Stove

Biomass Roti Maker Stove

Used Oil Recycling Plant

Multi-Purpose Food Processing Machine

Portable Biomass Gasifier

Automaking Roti Making Machine

Wood Cutter / Biomass Shredder

Our Products

AWARDS & EXHIBITIONS

- Fifth National Grassroots Innovation Award, 2009.
- Innovation Scholars In-residence Program at President House.
- Indian Merchant Chamber (IMC) – Inclusive Innovation Award, 2012.
- Certificate of Appreciation As “Farmer Scientist” By Rajasthan University of Veterinary & Animal Sciences, Bikaner, Rajasthan.
- Certificate of “Farmer Scientist” By Pacific University, Udaipur, Rajasthan.
- Certificate from Department of Science & Technology at National Science Day, Jaipur, Rajasthan.
- Business Expo Kota 2023, Kota, Rajasthan.
- Exhibition of Innovations, President House, 2010
- Inauguration of ESB-R Biomass gasifier by former chief minister of Meghalaya, 2013
- Third international conference on creativity & innovations at grassroots at Indian institute of management (IIM), Ahmedabad, 2015
- India International Science Festival (IISF), New Delhi, 2016.
- India International Trade Fair (IITF), New Delhi, 2016.
- Mega Science & Technology and Industry Expo, New Delhi, 2017
- Bollywood movie Padman promotion, 2018.

PRESIDENT AWARD WINNER











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