



**Turning Waste into Watts:
From Field to Fuel**

ESB-R BIO-CHAR PLANT

ESB-R ECO-GREEN BIOCHAR05

The ESB-R Eco-Green BioChar05 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.



ESB-R BIO-CHAR PLANT



Empowering Farmers, Enriching Soil



**ENERSOL BIOWEALTH
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...



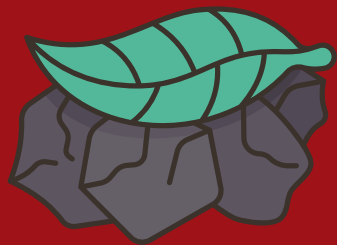
AGRICULTURE IN INDIA

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

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.



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EFFECTS OF STUBBLE BURNING



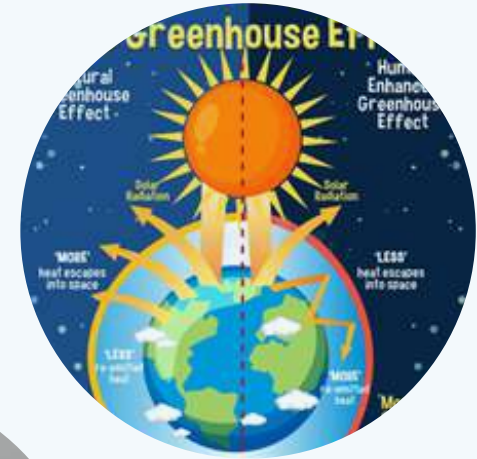
**LOW
AGRICULTURAL
PRODUCTIVITY**



**SOIL
EROSION**



**SEVERE
DETERIORATION OF
THE AIR QUALITY**



**GREENHOUSE
EFFECT**



**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 BIOCHAR05

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.



5KG BIOMASS BASED ESB-R TORREFACTION PLANT

Crop Waste to
Earnings,
No More Burning



KEY FEATURES OF ESB-R ECO-GREEN BIOCHAR05

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 SPECIFICATIONS

SPECIFICATIONS OF ESB-R ECO-GREEN BIOCHAR05

| | |
|----------------------------------|-----------------------|
| ➤ Make | - Enersol Biopower® |
| ➤ Model Name | - ECO-Green Biochar05 |
| ➤ Fuel Mode | - 100% Biomass based |
| ➤ Feeding System | - Semi-Automatic |
| ➤ Acceptable moisture in biomass | - Less than 15% |
| ➤ Biomass acceptable size | - 6-10mm |

SCREW CONVEYOR WITH HOPPER

| | |
|----------------------|-------------------------|
| ➤ Capacity | - 2.5-3kg/hr. |
| ➤ Conveyor flow rate | - 5kg.hr. |
| ➤ Material | - Mild Steel (MS Sheet) |

PRE-HEATER

| | |
|-------------------------|-------------------------|
| ➤ Capacity | - 5kg/hr. |
| ➤ Operating temperature | - 100°C - 200°C |
| ➤ Material | - Mild Steel (MS Sheet) |

AIR LOCKING SCREW

| | |
|------------------|---|
| ➤ Specifications | - Low pressure reaction vessels with 5kg/hr. capacity |
| ➤ Material | - Mild Steel (MS Sheet) |

MAIN REACTOR

| | |
|------------|-------------------------|
| ➤ Material | - Mild Steel (MS Sheet) |
| ➤ Capacity | - 5kg/hr. |

GAS COOLING & CLEANING SYSTEM WITH CONDENSOR

| | |
|--|------------------------------|
| ➤ Water tank with cooling tower | |
| Water tank capacity | - 80liter |
| Material | - Mild Steel (MS Sheet) |
| ➤ Condenser | |
| Material | - Stainless Steel (SS Sheet) |
| ➤ Gas Cleaning Scrubber | |
| Material | - Stainless Steel (SS Sheet) |

SCREW CONVEYOR WITH COOLING SYSTEM

| | |
|---------------------|---|
| ➤ Capacity | - 5kg/hr. (shell & tube heat exchanger) |
| ➤ Material | - Mild Steel (MS Sheet) |
| ➤ Temperature range | - 350°C – 50°C |

GAS BURNER

| | |
|---------------------------------|-------------------------|
| ➤ Material | - Mild Steel (MS Sheet) |
| ➤ Number of gas burner provided | - Single Burner |

CONTROL PANEL & THERMOCOUPLES

| | |
|--|-------------|
| ➤ Basic control panel with temperature control provision | |
| ➤ K type thermocouples | - 3nos |
| ➤ J typer thermocouples | - 4nos. |
| ➤ Exhaust | - Provided |
| ➤ Power required | - 1 -1.5 HP |

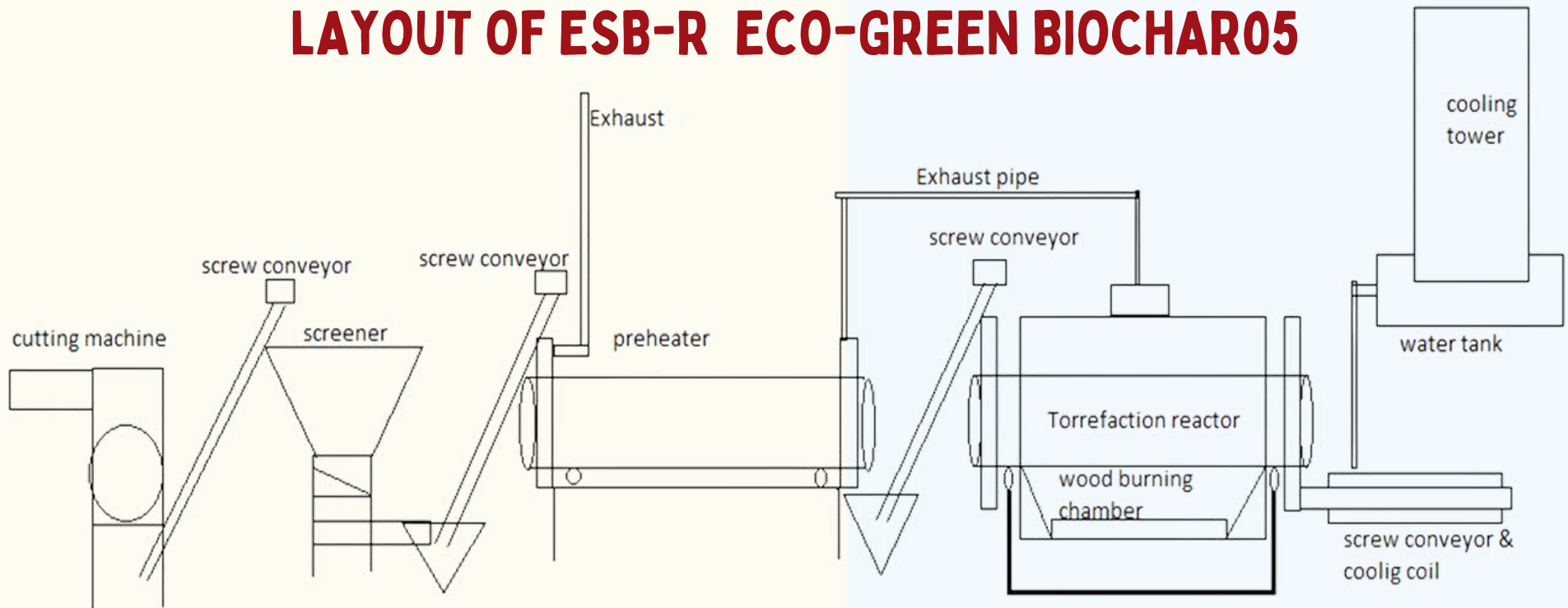
PLANT DIMENSION AND WEIGHT

| | |
|--------------------|-------------------|
| ➤ Dimension | |
| Length | - 10 feet approx. |
| Width | - 5 feet approx. |
| Height | - 5 feet approx. |
| ➤ Weight | - 600-800 approx. |



Know Your
ESB-R
Eco-Green
Biochar05

LAYOUT OF ESB-R ECO-GREEN BIOCHAR05



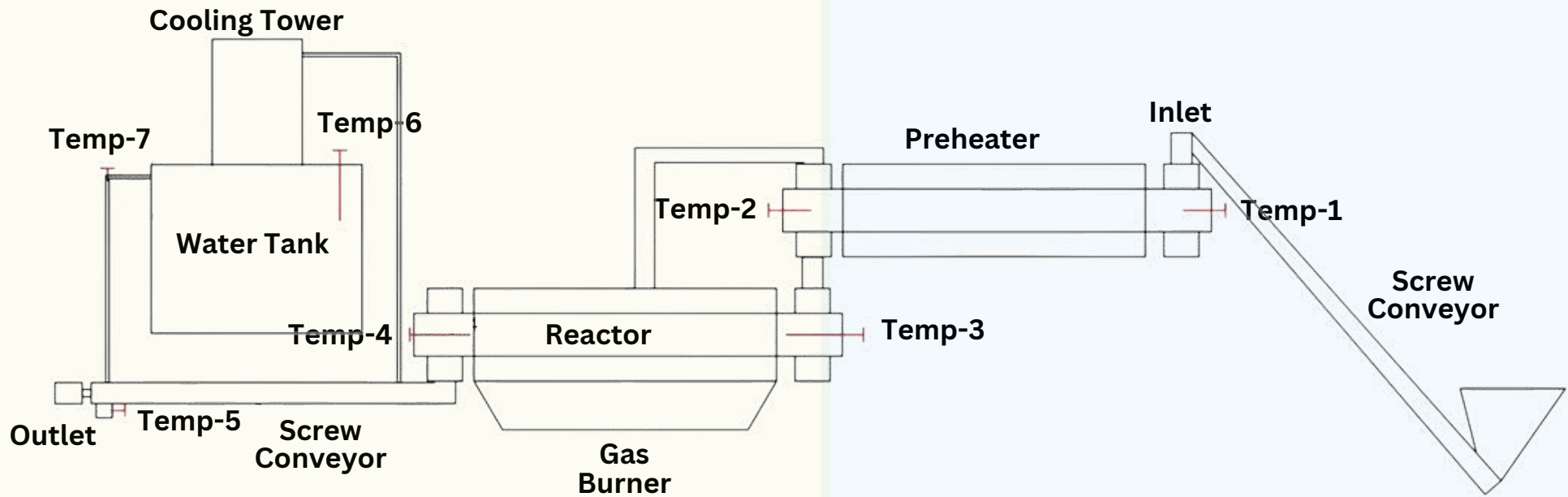
MODEL- 1

- 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
Biochar05

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



BITS-PILANI
Hyderabad



The LNM Institute of
Information Technology

LNMIIT, Jaipur



IIT, Rourkela



NIT, Mizoram



VIT, Vellore



SASTRA,
Thanjavur



GCE, GAYA



CSIR-CMERI
DURGAPUR



Indian Oil



CSIR- NIIST



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=Rp17MmDRiIQ>
- https://www.youtube.com/watch?v=GTmOj_JRLVw
- <https://www.youtube.com/watch?v=pcQN3qzNfh0>
- <https://www.youtube.com/watch?v=IAGaO9LRVOY>
- <https://www.youtube.com/watch?v=OD9ueNYjf1Q&t=23s>
- <https://www.youtube.com/watch?v=fjULT8k4Ayg&t=9s>
- https://www.youtube.com/watch?v=rtjSn_9P-Yc
- https://www.youtube.com/watch?v=ghm_odvyvzc
- <https://www.youtube.com/watch?v=g1iemqc0-80&t=15s>
- <https://www.youtube.com/watch?v=g6ya3XhDBCQ>

- <https://www.youtube.com/shorts/JL5d8YCauc>
- <https://www.youtube.com/shorts/wa0S18DqY-Y>
- <https://www.youtube.com/shorts/hlZd0IjVccY>
- <https://www.youtube.com/shorts/LVqJYhPrLXU>
- <https://www.youtube.com/watch?v=0AhISC5Dw00>
- <https://www.youtube.com/shorts/tlTevfsPD0o>
- <https://www.youtube.com/watch?v=Bb8g5ooogaM>
- <https://www.youtube.com/watch?v=6cYUyY250XE>
- 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=l8NuflvOH4k>
- <https://www.youtube.com/watch?v=7MVHph7NfkY>



OUR PRODUCTS



Portable Biomass Gasifier



Bio-Auto Mawa-Machine



Biomass Roti Maker Stove



Used Oil Recycling Plant



Biomass Torrefaction Plant (Charcoal Plant)



Biogas Genset



Multi-Purpose Food Processing Machine



Portable Biomass Gasifier



Commercial Wood /Biomass Stove



Domestic Biomass/ Wood Stove



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





CONTACT US

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**GO
GREEN**

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www.enersolbiopower.in



<https://www.youtube.com/@enersolbiopower-biomassgas3987>



<https://www.indiamart.com/enersol-biopower-jaipur/profile.html>



<https://twitter.com/EnersolBiopower>



<https://www.linkedin.com/company/enersol-biopower-pvt-ltd>



https://www.instagram.com/enersol_biopower/