

Literature review of white coal production

Samreen Parveen Abdul Sattar¹, Sakshi D. Ahire², Sahil L. Kamble³, Aditya V. Kamdi⁴

Jawaharlal Darda Institute Of Engineering And Technology, yavatmal, India¹⁻⁴

Abstract: NOW a day, most of thermal power plant uses the natural coal as power sources the but it is limited in nature. Due to mining of this coal pollution is increases and pollution is the biggest issues in the current situation. to overcome this problem, it is required to replace conventional coal with the white coal or bio-coal.

The white coal briquettes are the process of converting agricultural waste such as sugar cane bagasse, cotton hulks and stalks, wheat straws and so on into white coal briquettes which can be used as the fuel in many industries. This review explores how it's made, its qualities, and where it's used. Different methods like pyrolysis and briquetting are used to produce it. White coal burns efficiently, emits less pollution, and has diverse applications in power plants, factories, and households for cooking the result of using white coal is more satisfactory, economical and environmentally friendly.

Keywords: white coal briquettes, Biomass, agricultural waste, production process.

I. INTRODUCTION

India is the country of villages. There is total 6,40,867 villages in India. Indian economy is basically dependent on agricultural products. [1] The world's need for energy increases very rapidly in recent years. On the other hand, the reserve of fossil fuel, as the primary energy source, has been depleted steadily. Therefore, a global search for alternative energy resources has been done intensively within the last few years. [2] many of the developing countries uses the agricultural waste for the production of alternative fuel in the form of white coal or bio coal. The white coal is produced from the rice husk, coffee husk, coir pith, bagasse, groundnut shells, mustard stalks and cotton stalks. Sawdust is also available in huge quantity.

Bio-Coal Briquetting plants are of various sizes which converts agricultural waste into solid fuels. Briquettes are ready substitute of Coal/wood in industrial boiler and brick kiln for thermal application. This development can significantly reduce greenhouse gases and heating costs and sustainably assist the development of rural communities. Groundnut Shell is identified as ideal biomass for Bio-coal production due to low moisture contents, high net energy yield per hectare and low cost of production. [3] briquettes have several advantages over fuel wood in terms of greater heat intensity and uniform and ideal physical dimensions and combustion characteristics result in more efficient energy conversion. Briquettes usage helps to reduce deforestation by providing a substitute to fuel-wood with biomass residues. [4]

II. REVIEW OF LITERATURE

[1] This gave the brief idea about the agricultural area present in India and how Indian economy depends on the agricultural product. Having such a big farming area in our country, farmers of our country face a major problem of disposal of agricultural waste. Actually, this agricultural waste, if used properly, can be one of the sources of income for farmers, and it also helps to produce one of the most important sources of energy, which is called „Bio-Energy. The production of this energy in the form of white coal is discuss.

[2] This focused on the increasing need of energy in recent years and the scarcity of fossil fuels. Biomass has attracted much attention since it can be used as a chemical feedstock and or a renewable energy source. Due to its sustainability and environmentally friendly characteristics, biomass is considered to be a promising alternative. Various types of biomass sources can be found almost all over the world in large quantities, less expensive, and they have the potential for further utilization.

[3] This gave the brief idea about the production process of white coal and where it is use in actual practices and investigates its impact on the environment. This development can significantly reduce greenhouse gases and heating costs and sustainably assist the development of rural communities. Various Industries requiring heating applications in making their products, can make maximum use of white-Coal and also save nations foreign exchange, which is used to purchase conventional fuels.

[4] Investigated experimentation of white coal to verify the effectiveness of bio-coal for cooking clay bricks and its comparison with use of raw coal for same purpose, this gave the idea about the properties of white coal, the combustion of white coal does not generate the pollution as compared to the coal. It took a lot of efforts or even external ignition source for initial combustion of coal while white coal burns easily in comparison with the coal.

[5] Proposed the various technologies for the production of white coal, High compaction technology or binder less technology consists of the piston press and the screw press. Most of the units currently installed in India are the reciprocating type where the biomass is pressed in a die by a reciprocating ram at a very high pressure. In a screw extruder press, the biomass is extruded continuously by a screw through a heated taper die. This also investigate the merits and demerits of this technologies.

[6] Describe the wide range of materials that can be used in manufacturing of white coal some of which are Rice husk and paddy straw, Press Mud, Sugarcane Straw, Groundnut shells, Cotton hulls and sacks, Castor seed shells, Forest leaves; wood chips and shavings, Sugarcane bagasse, Mustard Waste, Coir Dust, Coffee Husk, Sunflower waste, Maize Stalks, Bajra cobs, Sesame seeds oil cakes, Wheat straw and many other agricultural and forest waste. Focused on the incentives provided by the Indian government to increase the use of white coal, Many Indian companies have switched their boiler fuel from black coal to White coal. Due to this increasing shift many manufacturing units have come up in Gujarat, Maharashtra, Tamil Nadu, and Rajasthan. As these units use agricultural wastes most of these units are spread in the Northern part of India. Basically, in the farming belt of India. To encourage this companies the Indian government provides the incentives to these companies.

[7] This gave the brief knowledge about the difference between the traditional black coal and the white coal. Black coal is a black sedimentary rock. It usually occurs in coal beds found in coal mines. Coal comprises of carbon, hydrogen, oxygen, sulphur etc. When dead plants and animals decay and convert into peat which in turn turns lignite, sub-bituminous coal after that bituminous coal lastly anthracite. Hence, coal is a fossil fuel. While the white coal is a form of fuel produced by drying chopped wood wastes obtained from carpenter shops and Saw mills over fire.

[8] proposed the various mixtures that can be used in the manufacturing process of the white coal various mixtures of biomass with coal were used. Namely, the mixtures used were coconut fibre mixed with brown coal, rice straw mixed with coal, and corn cobs mixed with brown coal. In all cases starch and molasses were used as a binder. The results of the study show that the compositions of briquettes have a good calorific value. However, briquettes from 60% coal and 40% corn cobs showed better combustibility qualities compared to other compositions. This type of briquettes has the following characteristics: ash content 20.17%, moisture content 2.5%, density 0.414 g/cm³, volatile matter 32.50%, calorific value 124.45 kJ/kg, ignition time 29.56 s, and burning time 19.76 min.

[9] investigated the benefits for developing white coal based renewable energy source and the production it is estimated that the global biomass production is around 146 billion tons/year of which about 3% is agricultural wastes. Thus, it would be a great chance for developing countries to substitute the conventional fossil fuel-based energy with bio-coal-based renewable bioenergy. Taking China as an example, about 402 million tons of bio-coal could be produced with agricultural and forestal wastes, which is equal to 384 million tons of standard coal equivalent.

[10] Recently, researches show that mixing coal and biomass will result in an environmentally friendly briquette with better combustion and physical characteristics. In this experiment, briquettes of coal and corn cob were produced. The different briquette samples produced are made by blending various compositions of coal and corn cob in the following ratios of 100:0, 80:20, 60:40, 40:60, 20:80 and 0:100 using bitumen as a binder and calcium hydroxide as the desulphurizing agent. The briquettes are produced mechanically using a manual briquetting machine with pressure maintained at 5 Mpa.

III. IN THE LITERATURE REVIEW, THE CONTRIBUTIONS OF VARIOUS AUTHORS ARE SUMMARIZED BRIEFLY IN A TABULATED FORMAT.

Sr. No.	Author	Contribution
1	Maulin Yogesh Raval, 2014	This paper gives the idea about the production of energy sources by the utilization of farming waste.
2	Ahmad t. yuliansyah, muslikhin hidayat, Ahmad annas, faez, prasasti w. putra, Cornelius t. kusheandi, 2019	This focus on the increasing need of energy and the scarcity of fossil fuels. And explain the various biomass that can be used as the renewable energy sources.

3	W.K. POKALE, S.R. WARHATE ^a , H.R. DHANBAR ^b , R. R. SHARMA ^c and G. P. DATIR ^d ,2012	Explain the production process of the white coal and explains where it is actually used and investigated the impact of this coal on the environment.
4	Kaliyan N, Morey RV,2009	Investigated the experimentation of white coal to verify the effectiveness of the white coal for the various day to day life application also gives the idea about the properties of the white coal.
5	P.d. Grover & s.k. Mishra,1996	Proposed the different technologies that can be used for the production of white coal.
6	Kavish Nijhawan,2022	This paper gives the brief knowledge about the wide range of material that are used for the manufacturing of white coal as well as focused on the incentives scheme provided by the Indian government.
7	Tuhina Chatterjee,2020	This differentiates between the black coal and the white coal and explain the production process of both the white coal and the black coal.
8	Nurkina, Alexandr Nikiforov, Akmaral Kinzhibekova, Evgeniy Prihodko, Amangeldy Karmanov and Sholpan,2023	Various mixtures that are used in the production process of white coal are explained. The results of the study show that the compositions of briquettes have a good calorific value.
9] Bin-Hai Cheng ¹ , Bao-Cheng Huang ² , Rui Zhang ¹ , Ya-Li Chen ¹ , Shun-Feng Jiang ¹ , Yan Lu ³ , Xue-Song Zhang ¹ , Hong Jiang ¹ , Han-Qing Yu ¹ ,2020	Explain the benefits of developing white coal based renewable energy source and also give knowledge about the global production of white coal.

IV. PHOTO GRAPHIC VIEW OF WHITE COAL, ITS PRODUCTION MACHINERIES AND MATERIAL



[white coal - Search Images \(bing.com\)](#)

<https://5.imimg.com/data5/WD/NG/MY-20663093/white-coal-making-machine-500x500.jpg>

<https://images.app.goo.gl/EDcXzwRJ43aMhnCa8>,

<https://images.app.goo.gl/sMtnQHufC7BQNE2Q7>

V. CONCLUSION

choosing white coal over black coal is not just an eco-friendly decision but also a financially beneficial one for farmers, as it allows them to generate extra income from their waste. This shift towards white coal corresponds with creating a more sustainable future. This paper gives the overall literature review on the production of white coal. For future research we can focus on making the production process more efficient, finding new materials for making white coal, and figuring out how to produce it on a larger scale.

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