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CHARACTERIZATION AND CALORIFIC VALUE OF COMBINED BIOMASS SUCH AS MUNCIPAL SOLID WASTE (MSW) AND WASTE RUBBER TYRE

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ABSTRACT

In this paper we have studied about characterization of MSW + Waste rubber tyres. As we know that we can produce electricity from solar ,thermal ,hydro, nuclear etc but there are some disadvantages of it like CO2 emission pollution, problem of global warming requirement of fuels cost etc. For the application like replacing some amount coal with pellets of MSW + Waste rubber tyres. To find the calorific value of individual materials and combined materials. The pellets mainly comprises of 80% of MSW and up to 20% of waste rubber tyres. For the preparation of pellets we collect waste from nearby kitchen and hotels and dry them in sunlight and thermostatic oven , then we collect waste rubber tyres from industries ,convert them into powder form both kitchen waste and rubber tyres.

I. INTRODUCTION

Municipal solid waste (MSW) management is becoming complicated by the exponential growth of the global population. Although recycling technologies are getting more advanced, a significant portion of MSW still ends up in landfills. MSW consists of three major fractions of combustible, non-combustible and moisture or evaporative material. Burying waste in landfills Reaches the toxins into the soil and water and emits greenhouse gases like methane and carbon dioxide. Landfilling is a big loss of resources such as material, energy and the valuable land used up for landfill sites.

II. LITERATURE SURVEY

Pelletization of Refuse-Derived fuel with varying compositions of plastic, paper, organic and wood.

Municipal solid waste (MSW) management is becoming complicated by the exponential growth of the global population. MSW consists of three major fractions of combustible, non-combustible and moisture or evaporative material. Pellet density of an RDF composition with faction od 35% paper,22% plastics,14%fabrics,6% organs/wood and 23% fines are investigated. This research presented the pelletization of RDF sample made up of several proportions of paper, plastic and organic material. The experimental data confirmed that paper and plastics had opposite influences on pelletization performance higher paper content increased the total energy for compaction but generated a higher dural pallet lowered durability at 80 c but increased durability considerably at 100 c pelletization temperature.

SI.NO	TITTLEOF THE PRODUCT	AUTHOR	DISCRIPTION	INFERENCE
1.	The evaluation of waste tyre pulverized fuel for Nox reduction by reburning.	W.Nimmo S.Singh B.M.Gibbs P.T.Wiliams	Coal combustion for electricity generation creates significant pollutant emission problems including oxides of nitrogen (Nox). This paper is concerned with reburying which can be defined as a three stage combustion process and consist of primary zone, a rebury zone and char burnout zone .	The result presented in this paper has addressed the novel application of waste, pulverised tyre fuel as Nox reburning fuel. The resulting data for waste shredded tyres and coal reburn with either coal or propane as primary fuels. But it is noted that this occurred at significantly different

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				re burn zone stoichiometries.
2.	Energy recovery potential and environmental impact of gasification for municipal solid waste.	Barkha Vaish. Bhavisha Sharma. Vaibhav Srivastava. Pooja singh. M Hakimi Ibrahim. Rajeev Prathap singh.	Among the various categories of solid waste produced by urban centres, municipal solid waste (MSW) Is a significant type of waste originating from different sectors such as residential, commercial, industrial, institutional, construction and demolition debris etc. MSW generation in India has also witnessed an increasing trend from 48 million tonnes in 1997 to 90 million tonnes in 2009 and is expected to increase up to 300 million tonnes by year 2047.	The burgeoning amount of unmanaged MSW around the world represents a threat to the environment and human health, but is also potential source of energy Gasification of MSW helps address and solve measure environmental such as degradation of environment quality due unscientific waste disposal and burning of fossil fuel. MSW gasification is promising sustainable technology with multiply environmental, social and economic benefits.
3.	Determination of uncertainty in gross calorific value of coal used bomb calorimeter	Nitin.K.Mandavgade. Santhosh Jaju	Sample is weighed and placed in heavy –duty stainless steel cylinder referred as 'bomb 'A bomb calorimeter is an apparatus used for measuring heats of combustion of a coal. Rajdhani –RSB Digital bomb calorimeter provides a simple, inexpensive at accurate method for determination of heat of combustion and sulphur content of liquid and solid hydrocarbon and other fuels.	The bomb is sealed with oxygen and then the sample in ignited electrically, the complete oxidation of the compound realises heat, and this is measured through the temperature charge of water bath surrounding the bomb. The heat combustion at constant volume can be calculated the resulting rise in temperature.
4.	Energy production from biomass	Mr.Anil. Tekale. Mr. Balaji Bendre. Mr.Ganesh Madake. Ms.Swapna God. Mr.Pankaj Vaghela. Ms.Suvarna Labade.	Biomass refers to the biological material derived from living or recently living organism. It has been necessitated the western countries and petroleum starved countries to look for alternate fuels. Another	It can be concluded that huge potential exists for exploration of available biomass in world to convert it to energy. Selection pf conversion technologies for biomass depends upon the form

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			measure compelling reason to look for alternates for fossils fuel is global warming. In India 370 billion tonnes of biomass is available per year 1mw/year electricity generation required about 15000 tons of biomass. It is more economic and environmentally safe.	in which the energy is required like combustion produce heat, mechanical, electricity energy etc. The prime motto of biomass energy plant is to provide the use of non-conventional energy source of energy which helps in sustainable development of nation
5.	Enhancement of biomass to hydrogen conversion.	Ackmez Mudhoo Paulo.C.Tores-Mayanga Tonia Forester-Carneiro Periyasamy sivaguruna-Than Gopalkrishnan Kumar Dimitrios komilis Antoni san chez	Research on hydrogen production from various biomass types specifically in relation to reaction environments were, (1) Different biomass pre-treatment routes involving microwaves, ultrasound waves and ionic liquid have been assessed (2) Novel microbial strains have been developed (3) Subcritical and supercritical water processing condition have been tested for biomass gasification.	Cell immobilization and the use of Nano particles have been found to considerably enhance biomass to hydrogen generation rate and yields. *Microwave irradiation, ultrasonication and the use of ionic liquid all unanimously, and in their own respective specificities.
6.	Pelletization of Ref with varying compositions of plastic, paper, organic and wood. use-Derived fuel	Hamid Rezaei. Fahimeh Yazasan Panah. C.Jim lim. Shahab sokhan sanj.	Municipal solid waste (MSW) management is becoming complicated by the exponential growth of the global population. MSW consists of three major fractions of combustible, non-combustible and moisture or evaporative material. Pellet density of an RDF composition with faction of 35% paper, 22% plastics,14%fabrics,6% organs/wood and 23% fines are investigated.	This research presented the pelletization of RDF sample made up of several proportions of paper, plastic and organic material. The experimental data confirmed that paper and plastics had opposite influences on pelletization performance higher paper content increased the total energy for compaction but generated a higher dural pallet lowered durability at 80 c but increased durability considerably

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				at 100 c pelletization temperature.
7.	Biomass pellets for power generation in India; - a tech-economic evaluation	Pallov Purohit. Vaibhav Chaturvedi.	Biomass is the largest renewable energy source with 14% out pf 18% renewables in the energy mix and supplies 10% of global energy supply. Most of this is consumed in developing countries for cooking and heating, using traditional cook stoves, with considerable impact on human health and on the environment.	Modern biomass is being recognized as an increasingly important loe-carbon resource by policymakers around the world to meet climate policy target. Bio energy for power generation can be used in two different forms are pelletized and non-pelletized. The non-pelletized form has been used for a long time for co-firing in coal thermal power plants pr biomass power plants.
8.	Solid waste composition and the properties of bio-degradable fractions in Izmir city, Turkey. An investigation on the influencing factors.	Aysenur boulkngs. Gorkem Akinci	Municipal solid waste management has always been a major problem, especially for large cities. The location of city on earth, the geographical features of its land, and climate are the most important determinations of agricultural and industrial potential and tread opportunities of its terrain. Waste composition and characteristics are determinative in selecting technological alternatives to develop waste management strategies that can meet legislative requirements	In this research study, the composition of MSW samples from low, medium, and high-income level areas of Izmir city. Turkey and the analytical properties of biodegradable fractions were determined and the major factors influencing the waste characteristics were identified by using statistical analysis.

Enhancement of biomass to hydrogen conversion.

Research on hydrogen production from various biomass types specifically in relation to reaction environments where,

(1) Different biomass pre-treatment routes involving microwaves, ultrasound waves and ionic liquid have been assessed

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(2) Novel microbial strains have been developed
(3) Subcritical and supercritical water processing condition have been tested for biomass gasification.
Cell immobilization and the use of Nano particles have been found to considerably enhance biomass to hydrogen generation rate and yields. Microwave irradiation, ultasonication and the use of ionic liquid all unanimously, and in their own respective specificities.

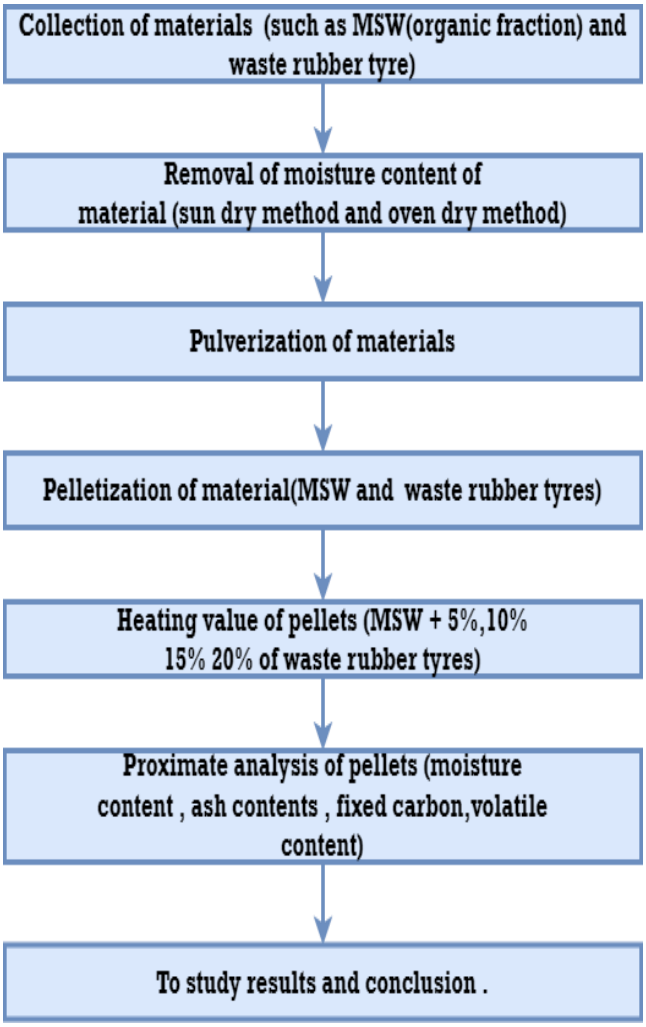
Biomass pellets for power generation in India; - a tech-economic evaluation

Biomass is the largest renewable energy source with 14% out pf 18% renewables in the energy mix and supplies 10% of global energy supply. Most of this is consumed in developing countries for cooking and heating, using traditional cook stoves, with considerable impact on human health and on the environment. Modern biomass is being recognized as an increasingly important loe-carbon resource by policymakers around the world to meet climate policy target. Bio energy for power generation can be used in two different forms are pelletized and non-pelletized. The non-pelletized form has been used for a long time for co-firing in coal thermal power plants pr biomass power plants.

III. OBJECTIVES

- To study characterization of given combined MSW and Waste rubber tyre.
- To find the heating value.
- To prepare the biomass pellets

IV. METHODOLOGY



V. CONCEPT

Collected the materials such as organic fraction of municipal solid waste (MSW) from nearby sources like kitchen, canteen, etc. And also collect waste rubber tyres from industries. After collecting the MSW materials it is kept for the sun dry to get dry for almost 15 days and remove the moisture content of the material. After the

sun dry method, it will be again dried in oven for about 24 hours. The process of pulverization should be done by grinding the materials to reduce the size of the materials or convert to powder that are smaller than the original size. Pelletization is the process of compressing or molding a material (MSW + Waste rubber tyre) into a shape of pellets. After preparing the pellets its will be synthesized. Finding out the heating value of each individual material. Conducting the proximate analysis like moisture content, volatile content, fixed carbon, and ash content and also conduct the ultimate analysis like carbon, hydrogen, sulphur, chloride content. The composition of pellets comprises of MSW + Waste rubber tyre 5%,10%,15%, up to 20% until a specific heating value with lesser pollution is obtained.

VI. ADVANTAGES

1. Biomass energy is comparatively less cost.
2. Landfilling can be reduced.
3. Reduction of coal combustion in energy generation power plants.
4. Reducing the emission of greenhouse gases like methane, Co2 from these waste.

VII. KEY PROPERTIES

1. Pulverization
2. Pelletization
3. Proximate analysis
4. Ultimate analysis
5. Ash content
6. Fixed carbon content
7. Volatile content
8. Gross calorific value
9. Bomb calorimeter

VIII. CONCLUSION

By studying all these above mentioned papers we conclude that using of combined waste rubber tyre and municipal solid waste while burning of coal to produce electricity or any heat transformation. These MSW and Waste rubber tyre after going through several test like to find heating value, if more efficiency, further test can be done like physical properties and chemical properties (proximate analysis and ultimate analysis). Instead of burning or burying those in landfills which emits toxic into the soil that pollutes under water ground table. After complete process it also emits greenhouse gases like methane, carbon dioxide, Etc. The combination of MSW and waste tyre is in the ratio of (1 :0.2) mainly the rubber tyre which we are using should only be up to 20% of the whole MSW quantity , because if the quantity of rubber tyre is increased there by increasing the pollution so as to balance all these factors and to get maximum efficiency from these materials.

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