Utilizing Pine Cone Briquettes as an Alternative Energy Source

Sigudla, Lungelo

The purpose of this project was to create an efficient, reliable, low-cost and alternative source of energy from pine cones. Mature female Pinus coulteri cones were used in the study. In the experiment, the woody scales were removed and partially combusted for 5 - 10 minutes to form charcoal. The central axis of the pinecone was left intact forming the centre of the finished briquette. The manufactured charcoal was pulverized, sieved and added to melted candle wax together with the residue of harder charcoal pieces. This was added to a second unprocessed pine cone, placed at the centre of an aluminium can and compressed using a hydraulic 10 ton press. This turned the mixture into a briquette. Different binding agents (including candle wax and starch) were examined to determine which was the most effective to form the final briquette. The cost and temperatures of briquettes formed by the different binders were compared to determine binding and cost effectiveness. The briquettes were burnt to determine their efficiency of combustion by observing their heat temperatures, combustion duration and ability to boil different volumes of water at consistent briquette sizes. The experimentations were also able to determine the effectiveness and efficiency of sustaining combustion between intact pine cones and the briquettes. The results indicate that Pinus coulteri briquette cones are able to heat water and are a potentially efficient energy source for heating.

Awards Won:

Fourth Award of $500