Biomass Pellets as a Sustainable Cooking Fuel

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Abstract

At present, approximately three billion people in the world use firewood and other solid biomass for cooking. This is causing rapid deforestation and spread of desertification in many developing countries. In India, the demand of fossil fuels (kerosene, LPG, Natural Gas and mineral coal) for cooking is rising rapidly. India imports huge quantities of these fossil fuels and provides heavy subsidies on them to the end users but always struggles to meet the ever increasing demand. This scenario is stressing the environment and the economy. The production of additional biomass, using approximately 30 million hectares of the India's existing wasteland, promotion and production of biomass pellets and use of efficient smokeless cook stoves may provide a sustainable solution to these and many associated problems. An easy availability and affordable cost of biomass pellets, will reduce the consumption of firewood and demand of fossil fuels for cooking. India can showcase this initiative to other developing countries facing similar difficulties. Suggestions for solving the supply chain hurdles in using this approach are presented in this paper. It is hoped that policy makers and industries will consider and implement such initiatives on a large scale.

Keywords: *Biomass, Pellets, Smokeless Cook Stoves, Sustainable Rural Energy, Green Cover, Use of Wasteland.*

Introduction

Approximately half of Indians (i.e. > 600 million people) use firewood and other solid biomass as cooking fuel (Economic Times, 2013) and about 80% of this is firewood. Likewise it is reported that globally approximately 3 billion people depend upon solid biomass fuel for their cooking. Most of their kitchens use primitive inefficient "three stone open fire type cooking stoves" which burn excessive biomass and cause harmful indoor smoke pollution. The efficiencies of 10 to 30% are reported for these stoves. This is a huge problem and offers immense opportunities. Scarcity of firewood is causing deforestation and high prices of firewood. The rise in income levels is making more people demand fossil fuels. An average use of one Kg of biomass cooking fuel per head per day corresponds to >200 million ton per year biomass consumption in India (ignoring the additional fuel needed for heating of water for purification, bathing and washing). Assuming if even a small fraction of 600 million people continues to use biomass according to this proposal and / or a small fraction of those using fossil fuels switch to wood pellets, millions of tons of carbon emission per annum can be reduced and thousands of unskilled rural youths can find employment in many new small scale industries.

The Proposed Approach

It is proposed to make use of five valuable resources, which are abundantly and readily available. These are not being harnessed at present and are wasted. These are (1) a lot of waste land, (2) huge unemployed un-skilled rural man power, (3) sun shine, (4) rain and (5) CO2 in the atmosphere. These resources will be put to use for production of large quantity of biomass, practising sustainable forestry. Industries can set up local integrated supply chains for production, collection, distribution and sale of processed biomass pellets. A schematic of this cycle is shown in the Fig 1. Approximately 30 million Ha out of 60 million Ha waste land available in India is suitable for additional production of fast growing biomass species. Likewise, efficient and smokeless biomass stoves for using biomass pellets can be mass produced and popularised by local small scale industry. The consumed biomass pellets will release much smaller quantity of CO2 which will be recycled, making the entire process practically carbon neutral. Both these industries can work together in an