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Pine needles available in Uttarakhand, India as a potential energy feedstock

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The amount of pine needles (pinus roxburgii) that is potentially available for use as energy feedstock in the Central Himalayan state of Uttarakhand in India has been estimated. It involves estimating the gross annual amount of pine needle yield in the state followed by a comprehensive identification and quantification of the factors that affect the net annual pine needle yield available as energy feedstock. These factors include considerations such as accessibility, alternative uses, forest fires, other losses, etc., that are influenced by aspects ranging from physical constraints to traditional societal traits. Tree canopy cover method has been used for estimating of the gross annual pine needle yield. The gross annual pine needle yield have been estimated at 1.97 million tonnes while the estimate for net annual pine needle yield is at 1.38 million tonnes. The annual primary energy potential of the pine needles available as energy feedstock has also been estimated. Electrical energy generation from pine needles using thermochemical conversion route has been considered and the corresponding potential for electricity generation has also been estimated. An installed capacity of 982 MW can be supported with pine needles as feedstocks for supplying electricity in rural areas for five hours a day. In terms of round the clock generation, an installed capacity of 205 MW can be supported by the pine needles as energy feedstocks.

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