

Transition from Linear to Circular Economy in Gypsum in India

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Abstract : For sustainable development in India, there is an urgent need to follow the principles of industrial symbiosis in the industrial processes, under which the scraps, wastes, or by-products of one industry can become the raw materials for another. This will not only help in reducing the dependence on natural resources but also help in gaining economic advantage to the industry. Gypsum is one such area in India, where the linear economy model of by-product gypsum utilization has resulted in unutilized legacy phosphogypsum stock of 64.65 million tonnes (mt) at phosphoric acid plants in 2020-21. In the future, this unutilized gypsum stock will increase further due to the expected generation of Flue Gas Desulphurization (FGD) gypsum in huge quantities from thermal power plants. Therefore, it is essential to transit from the linear to circular economy in Gypsum in India, which will result in huge environmental as well as ecological benefits. Gypsum is required in many sectors like Construction (Cement industry, gypsum boards, glass fiber reinforced gypsum panels, gypsum plaster, fly ash lime bricks, floor screeds, road construction), agriculture, in the manufacture of Plaster of Paris, pottery, ceramic industry, water treatment processes, manufacture of ammonium sulphate, paints, textiles, etc. The challenges faced in areas of quality, policy, logistics, lack of infrastructure, promotion, etc., for complete utilization of by-product gypsum have been discussed. The untapped potential of by-product gypsum utilization in various sectors like the use of gypsum in agriculture for sodic soil reclamation, utilization of legacy stock in cement industry on mission mode, improvement in quality of by-product gypsum by standardization and usage in building materials industry has been identified. Based on the measures required to tackle the various challenges and utilization of the untapped potential of gypsum, a comprehensive action plan for the transition from linear to the circular economy in gypsum in India has been formulated. The strategies and policy measures required to implement the action plan to achieve a circular economy in Gypsum have been recommended for various government departments. It is estimated that the focused implementation of the proposed action plan would result in a significant decrease in unutilized gypsum legacy stock in the next five years and it would cease to exist by 2027-28 if the proposed action plan is effectively implemented.

Keywords : circular economy, FGD gypsum, India, phosphogypsum

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