Greening Industries: Biomass shows the way

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The International Energy Agency (IEA) estimates that industrial heat forms about two-thirds of the industrial energy demand and about one-fifth of the global energy demand. Being heavily reliant on fossil fuels, the industrial sector currently accounts for about one-fourth of India's total greenhouse gas (GHG) emissions, and it is estimated that industrial heat would alone account for a quarter of the global energy-related CO2 emissions by 2040. Such circumstances necessitate the greening of industrial process heat demand by focusing on reduction of fossil fuel usage. Amongst the various interventions possible at this juncture, shifting of fuel usage to biomass in industrial boilers can help bring about substantial benefits in the quest for combatting GHG emissions from industrial heat. A fuel shift to biomass has the potential to reduce the projected GHG emissions 15–20% by 2050.

The total power generation possible from biomass (excluding cogeneration) in India is 17.5 GW; however, the current installed capacity is not even 2% of the potential.[5] One of the key reasons for this low installed capacity in India is the lack of sustainable availability of biomass at viable prices. Further, there is a need to focus on the promotion of usage of biomass in industrial boilers, in addition to the prevailing policies for biomass-based power generation. This gap must be filled by policy interventions that focus on incentivising stakeholders in the supply chain of biomass.

Value chain of biomass

Farmers are a key source of biomass, but policy in this sphere has remained underdeveloped. Infrastructure should be built to ensure that farmers have a greater incentive to collect and supply biomass rather than discard it. To ensure this, a slew of measures are required. First, it has become quite evident that coercive diktats such as mandates prohibiting farmers from clearing the land by way of burning have outrun their utility and fallen short of achieving the desired aims. In order to develop this nascent industry and harness the latent potential of biomass, a significant step could be to establish a minimum price for the delivery of biomass at notified government-sanctioned storage spaces. Such a minimum price must understandably include the cost of collecting and transporting the biomass.

Thereafter, the interests of intermediaries — companies involved in biomass densification, storage, and supply — must be catered

to. A recurring concern raised by such companies is that low-cost storage spaces are hard to secure. Storage spaces can be set up on government land, which would help create options for low-cost storage. Along with this, linking of biomass storage spaces with cold storages can help with sourcing requirements. In addition, a system for availability of information regarding the timings of harvest of agricultural plots could help in higher coverage for these intermediaries. Further, equally hard for these intermediary companies is to secure capital investments owing to capital-intensive imported machinery. In this regard, fiscal benefits and relaxation of stringent norms (such as relaxation of FDI rules on import of machinery and economies-of-scale procurement within the biomass supply industry) might go a long way, as the industry requires a tacit, not passive, push. For example, a program for indigenous technology development would help in reducing the capital costs required for the import of expensive machinery.

Finally, the operations of industries must be realigned with the global push for reducing GHGs; in this regard, promoting a fuel shift to biomass through monetary and fiscal incentives is necessary. Industries that opt for shifting to biomass as fuel for process heating must receive benefits. The Central Financial Assistance (CFA) provided under the biomass cogeneration scheme in sugar mills must be extended to industrial boilers. Such capital subsidies incentivise industry owners to make the shift from traditional fossil fuels to biomass. Further, the currently offered 40% accelerated depreciation for industrial boilers using biomass under the current framework must be increased.

Accelerated depreciation mechanisms help in reducing the taxable income of an establishment, thereby acting as an effective incentive. These mechanisms would be beneficial while the carbon market develops in India.

Way forward

Logistical concerns related to biomass have been persistent and troublesome. Studies show that the greatest hurdle in making the fuel shift to biomass is the reliability of supply. Accordingly, incentivising stakeholders in the supply chain of biomass for industrial process heating is the only viable way, as it helps decentralise sourcing and thereby overcome the issues of reliability and consistency in supply. However, it is not sufficient to simply identify different stakeholders and create incentive structures. It is crucial to link all the stakeholders to facilitate reliable communication which would result in decreased logistical costs and increased trustworthiness. The role of farmers must be understood adequately — if the demand for biomass exceeds supply, the deficit will have to be sourced from forests. Though India has a surplus of agricultural and forest land, depletion of forests would make this a highly unsustainable practice as the rate of transfer of biogenic CO_2 into the atmosphere would outpace the reduction rate from creation of new biomass. Accordingly, policy should be framed in a manner that emphasises the role of farmers as the source of biomass. The question of sustainability of biomass fuel boils down to the manner in which it is sourced.

Conclusion

GHGs from industrial process heating significantly contribute to the ongoing deterioration of this planet. Amongst the various interventions possible, making a fuel shift to biomass can help bring about substantial positive changes. However, for this to happen it is necessary that the stakeholders in the value chain are appropriately incentivised and connected, so as to ensure reliability in supply. The promotion of biomass would not only contribute to reducing GHG emissions, it would also reduce the crop residue burning practice, which leads to an estimated annual economic loss of about US$ 35 billion in India. This, in turn, would positively impact the air pollution levels and contribute towards the government's goal of doubling farmers' incomes.

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