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What is the Potential of Bio-based Synthetic Fibers to Move Towards a Sustainable Textile Industry?

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Numerous studies have shown that the textile sector has a high fossil-fuel dependency, emits excessive amount of greenhouse gases and uses vast amount of water. Currently, polyester (fossil-based) makes up about a half of the industry's fiber production and the volumes are expected to increase. Polyester fiber is traditionally made out of polyethylene terephthalate (PET) polymer. In order to break from the fossil-fuel dependency, textile industry has the possibility to use alternative feedstock for the polyester by reverting to bio-sourcing – strategy where the product's carbon backbone comes partially or fully from the bio-based feedstock. The polyester fiber can be substituted by three bio-based fibers: bio-based PET fiber; polytrimethylene terephthalate (PTT) fiber and polylactic acid (PLA). In spite of the existing political will to prioritize bio-based products, e.g. European Green Deal, the environmental effects of this feedstock substitution have not been studied abundantly.