



# India

## 1 Which bioeconomy-related policy strategies exist?

The Indian strategy on bioeconomy is largely defined by its biotechnology policy.

After the “**Biotechnology Development and Innovation Strategy**” of 2007, the government has

released the updated “**Biotechnology Strategy II**” in January 2014. For the first time, the strategy underwent a public consultation.

## 2 Is the term “bioeconomy” or “biobased economy” used in the strategy documents?

Yes No

X

Bioeconomy is defined as “translating life sciences knowledge into socially relevant eco- friendly and competitive products”<sup>13</sup>.

<sup>13</sup> Albrecht & Ettlting, 2014.

## 3 Who is the author of the strategies?

The strategy was developed under the guidance of the Department for Biotechnology, DBT in the Ministry for Science and Technology. However, inter-ministerial coordination, especially with the Ministry for Agriculture, should be increased. Policy coherence, specifically in the regulatory framework,

is also identified as an issue of high relevance in the future. In view of strategy implementation, the “Biotechnology Industry Research Assistant Council (BIRAC)” has been created under the purview of the Department of Biotechnology.

## 4 What are the key goals of the strategies?

Bioeconomy development should provide opportunities for modernizing the scientific landscape, especially by accelerating innovation processes and promoting interdisciplinary and cross-sectoral projects. India specifically seeks to leverage the enormous potential of its well-educated, large

population. The biotech industry should become a competitive driver of growth, following the example of the IT industry. The 2014 strategy seeks to promote a high-performing R&D infrastructure as well as the commercialization of innovative products emerging from a “strong bioeconomy”.

## 5 What are the priority areas of the strategies?

The Indian strategy covers the full breadth of biotechnology applications. While the previous strategy focused largely on pharmaceutical biotechnology, the updated strategy also promotes bioenergy, nano-biotechnology as well as biobased environmental technologies and production processes. Interestingly, it contains a full chapter on Nutrition and Food Security.

In the energy sector, the policy defines a target share of 20 percent biodiesel in its fuel mix by 2025, but seeks to avoid a conflict between food and fuel production. In this respect, the strategy highlights lignocellulosic ethanol produced from agricultural and forestry residues, as well as bio-fuels from algae. In the area of food security, the strategy largely targets (bio)fortification of food crops to address nutrient deficiencies, such as iron deficiency. The idea is to develop special food products that can address moderate and acute child malnutrition. Furthermore, new processing techniques, including nanotechnology applications,

should extend the shelf-life of foods. With regard to agricultural applications, India is cultivating genetically modified cotton varieties. It is continuing its testing of genetically modified food products, although none are currently authorized for commercial purposes. The country is planning further research into transgenic crops capable of resisting biotic and abiotic stresses.

The strategy emphasizes the value chain approach which requires the involvement of all relevant stakeholders alongside new ways of financing, cooperating and training. It will be mostly implemented via financial support programs, for example, the “Biotechnology Industry Partnership Program (BIPP)”.

Additionally, the strategy foresees infrastructure and institutional support, such as the creation of regional Technology Development Centers, e.g. biocubators. Biotechnology-related school, university and postgraduate education measures are another area of intervention.

### REFERENCES

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