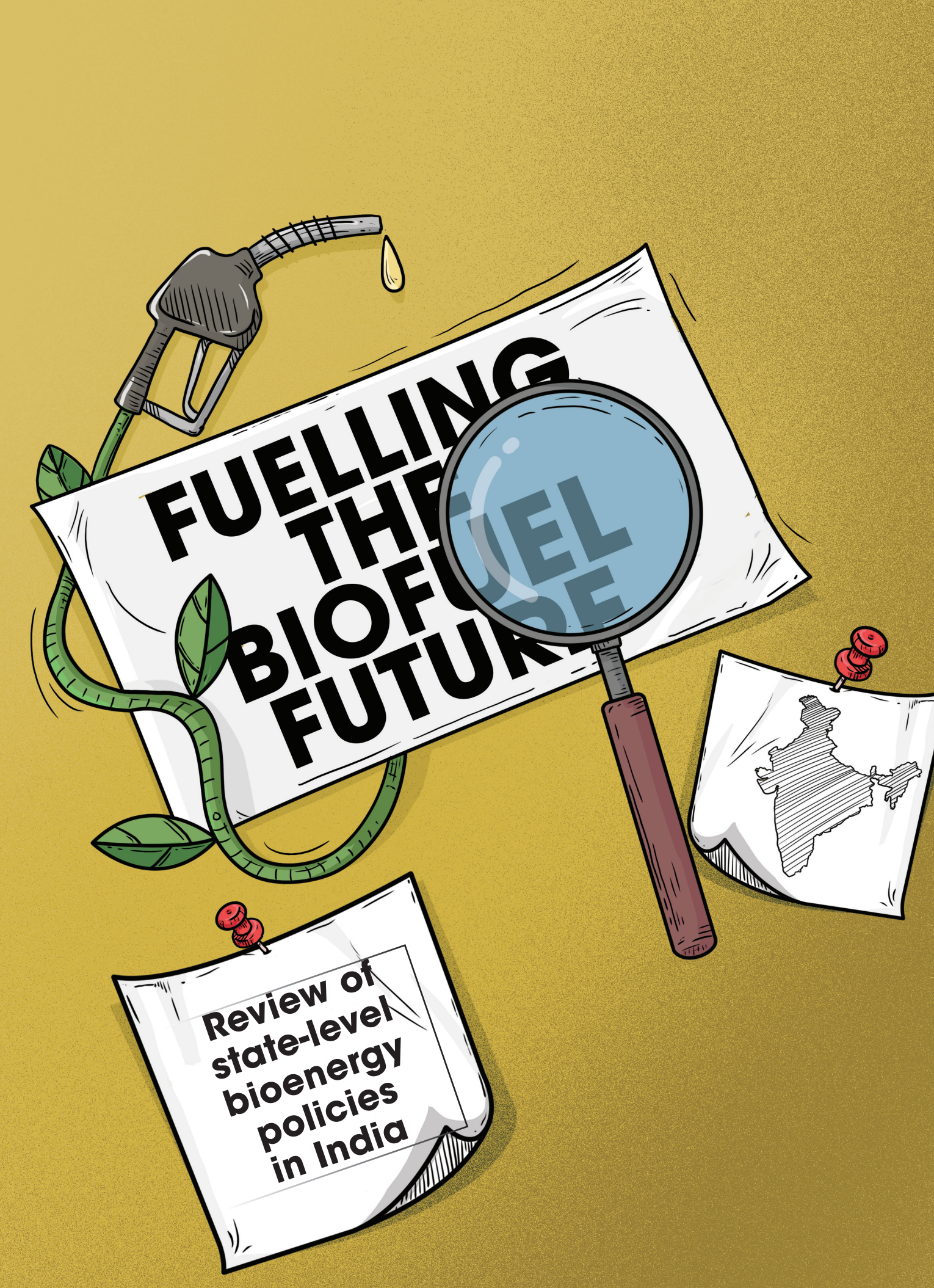
FUELLING
THE
BIOFUEL
FUTURE
Review of state-level bioenergy policies in India

# FUELLING THE BIOFUEL FUTURE

## Review of state-level bioenergy policies in India

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Maps in this report are indicative and not to scale.

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# Contents

# 1. Introduction

The demand for energy in India is continuously increasing due to industrialization and urbanization, where affordability and reliability are the main concerns for energy supply in India.[1] The primary demand for energy in India is fulfilled by fossil fuels, including coal, oil and natural gas, and renewable energy sources, including biofuels.

Coal, including lignite, with its substantial share of 61 per cent of the total primary energy supply, plays a pivotal role in meeting the nation's increasing energy demand. This is evident from the fact that in the last decade, the electricity generated by coal power plants supported an average of 75 per cent of the total electricity generation.[2]

India relies heavily on imported crude to meet its energy demands to fuel transportation, manufacturing and household consumption. The country consumed about 233 million metric tonnes (MMT) of oil in 2023–24, only behind China and the United States.[3]

In 2023–24, the share of gas in India's primary energy mix was 7 per cent. The Government of India aims to increase the share of natural gas to 15 per cent by 2030 as part of the nation's energy transition. Renewable energy is playing an increasingly significant role in India's energy supply, reflecting a shift towards cleaner energy sources. Use of biofuels also minimizes the burning of fossil fuel, which is the largest contributor to $CO_2$ production.[4] In the country's drive towards transitioning from fossil fuels to cleaner and non-fossil fuels, biofuels can play a significant role.

To reduce India's dependence on importing crude oil (89 per cent of its crude oil requirement is imported) and natural gas (around 50 per cent is imported) secure its energy demand and generate employment, India launched the National Policy on Biofuels in 2018 and amended it in 2022. It intended to reduce the country's import dependency on fossil fuels and promote the domestic production of biofuels while securing its energy demand and contribute to climate change mitigation.[5]

An increase in the usage of biofuel leads to an increase in management of different waste streams as feedstock as well as an alternative to chemical fertilizer for agricultural application.[6]

## Types of biofuel

Biofuels are fuels produced from renewable resources. Renewable resources are biodegradable fractions of products, wastes and residues from agriculture, forestry, tree-based oil and used cooking oil, including agricultural and forestry residues, e.g. rice and wheat straw, mustard husk, bagasse, press mud and animal dung. The biodegradable fraction of septage and industrial and municipal wastes is also covered under 'Renewable resources'.

Biofuel, apart from being a renewable alternative to fossil fuel, provides various social, economic and environmental benefits. The use of biofuel leads to a reduction in transport pollution and a reduction of greenhouse gas emissions. The use of biofuel reduces emission of sulphur dioxide, particulate matter and carbon monoxide.

There are different types of biofuels, which can be classified into established sectors or emerging sectors (see *Table 1: Established and emerging sectors for biofuels*).

**Table 1: Established and emerging sectors for biofuels**

| Established sector | Emerging sector |
|---|---|
| Compressed biogas (CBG)<br>Sugar to ethanol<br>Grain to ethanol<br>Biodiesel<br>Densified biomass (pellets and briquettes) | 2G ethanol<br>Sustainable aviation fuel<br>Biochar<br>Biohydrogen<br>Biobitumen<br>Methanol ($Gh_2$/bio-based) |

Source: Compiled by CSE

## Energy scenario of biofuels

India's Bioenergy Mission rests on the nation's commitment of 20 per cent ethanol blending by 2025–26, 5 per cent biodiesel blending by 2030, 5 per cent CBG blending by 2028–29, 2 per cent Sustainable Aviation Fuel (SAF) for international flights by 2028 and 7 per cent of co-firing solid biomass in coal power plants.[7]

Compressed biogas (CBG) generation capacity expanded from a single project with 8 tonnes per day (TPD) in 2014 to 150 projects with a cumulative capacity of 1,211 TPD as of March 2025.[8]

Ethanol procurement surged from 380 million litres in 2014 to 4.4 billion litres in 2025. Accordingly ethanol blending also increased from 1.53 per cent (2014) to 18.5 per cent (2025). Also, biodiesel procurement rose sharply from 11.9 million litres (2015–16) to about 440 million litres (2024).[9]

During 2024–30, demand for biogas will increase in the transport sector. India aims to shift its energy sector from coal-based to gas-based by encouraging the gas share from 6.7 per cent in 2023 to 15 per cent by 2030 by planning to fund the expansion of gas grid infrastructure through the One Nation One Grid programme while the compressed biogas (CBG) plays an important role for strengthening the energy security by providing the $CO_2$ and $CH_4$ emission reduction.[10] Thus, CBG demand is set to increase as gas off-take entities consider CBG under domestic gas procurement and use it to replace imported gas

## Rationale

India launched its National Policy on Biofuels in 2018, which clearly highlighted the vital role states have to play in the planning and implementation of the biofuel programmes. State governments were asked to designate an existing agency, or create a new agency suitably empowered and funded to act as the nodal agency for development and promotion of biofuels in their states. Accordingly, many states have come up with their bioenergy policies after 2018, e.g. Uttar Pradesh and Bihar etc. Also, some states have not brought any specific policy on bioenergy but have addressed the biofuels in its integrated clean energy or green energy. The state-level policies have included incentives for the potential entrepreneur or investors in the biofuel sector.

CSE's report on the National Blueprint for the CBG sector, *Greening India's Energy Mix with Compressed Biogas (CBG),* also highlighted the need to strengthen the state-level policies to upscale the CBG sector in the country. Taking the recommendation forward, this report intends to review the state-level policies in terms of provisions of incentives and subsidy offered to the entrepreneurs as these policies are one of the main drivers for upscaling of biofuel sectors. Thus, accordingly, different state-level policies with significant stress on biofuels have been reviewed and good cases of incentivization under these policies have also been drafted in the report.

# 2. Status of biofuel policies in the states

CSE reviewed the biofuel policies in different states of the country. The states of Uttar Pradesh, Bihar, Gujarat (which leverages its broader biotechnology policy), Haryana and Madhya Pradesh have consolidated bioenergy policies while Tamil Nadu, Maharashtra, Chattisgarh, Assam and Goa etc are in the process of developing their states' dedicated bioenergy policies.

A large number of states have integrated RE policy wherein bioenergy and biofuels have been addressed to an extent. Andhra Pradesh, Assam, Karnataka, Maharashtra, Odisha, Rajasthan and Telangana have integrated policies on renewable energy, including bioenergy.

Several states such as Bihar, Jharkhand, Rajasthan, West Bengal and Uttarakhand also have biofuel policies for specific categories of biofuels, mainly ethanol or biomass.

States such as Chhattisgarh, Meghalaya and Himachal Pradesh do not have any specific biofuel or renewable energy policy, but have addressed the bioenergy and biofuels sector in their state-level industrial policies (see *Table 2: Details of state-level bioenergy and/or RE policies*).

CSE has reviewed each state-level policy on specific parameters and collated the incentive and assistance mechanisms provided by each state to each biofuel, if explicitly mentioned.

The objective of this report is to analyse the state-specific policies and how the states have incorporated and considered biofuel sectors into their policy frameworks. The inclusion of biofuels in a state's policy is an initial step that aligns with the state's administration's vision for energy management and the upscaling of renewable energy in the state. However, this is not the only criterion that ensures the development of the biofuels sector; the implementation plan of the policy framework plays an essential critical role in the success and upscaling of the biofuels sector.

## Table 2: Details of the state-level bioenergy and/or RE policies

| States with integrated RE policy | States with dedicated Bioenergy Policy | States with Biofuel Policy (specific) | Other policies addressing biofuel | States are working on their Bioenergy Policy |
|---|---|---|---|---|
| Andhra Pradesh: Andhra Pradesh Integrated Clean Energy Policy, 2024 | Bihar: Bihar Bio-Fuel Production Promotion Policy, 2023 | Bihar: Bihar Ethanol Production Promotion Policy, 2021 | Chhattisgarh: CG Industrial Policy, 2024 | Maharashtra |
| Assam: Assam Integrated Clean Energy Policy, 2025 | Gujarat: Gujarat State Biotechnology Policy, 2022–27 | Jharkhand: Jharkhand Ethanol Production Promotion Policy, 2022 | Himachal Pradesh: Himachal Pradesh Energy Policy, 2021 | Gujarat |
| Bihar: Bihar Policy for Promotion of Bihar New and Renewable Energy Sources, 2025 | Haryana: Haryana Bio-Energy policy, 2018 | Rajasthan Ethanol Production Promotion Policy, 2021 | Meghalaya: Meghalaya Power policy, 2024 | Tamil Nadu |
| Karnataka: Karnataka Renewable Energy Policy, 2022–27 | J&K: Bio-Energy Policy, 2022 (Draft) | Rajasthan: Rajasthan Biomass and Waste to Energy Policy, 2023 | Punjab Industrial and Business Development Policy, 2026 | Assam |
| Madhya Pradesh: Madhya Pradesh Renewable Energy Policy, 2025 | Uttar Pradesh: Uttar Pradesh State Bio-Energy Policy, 2022 | West Bengal: West Bengal Ethanol Production Promotion Policy, 2021 | | Goa |
| Maharashtra: Maharashtra Renewable Energy Policy, 2020 | Madhya Pradesh: Biofuel scheme 2025 (covered under RE policy) | Uttarakhand: Policy for Power Generation from Pine Leaves and Other Biomass, 2018 | | Chhattisgarh |
| Odisha: Renewable Energy Policy, 2022 | | | | |
| Punjab: New and Renewable Source of Energy (NRSE) Policy, 2012 | | | | |
| Rajasthan: Integrated Clean Energy Policy, 2024 | | | | |
| Telangana: Telangana Clean and Green Energy Policy, 2025 | | | | |

Source: Compiled by CSE

Also, a comparative analysis of policies has been conducted, and good examples of substantial technical or economic support have been identified and highlighted in the report. This is intended to be a baseline document for the states where biofuel policy development is in progress, and accordingly, the states may consider the different aspects to be included in their bioenergy policies.

## Parameters considered for analysis of policies

For the review of the policies, CSE has identified several indicators or parameters important for the investors to understand and help in decision making on investing in the biofuel sectors. The parameters have been grouped as CapEx support or OpEx support for better visualization of the assistance provided under each policy. Also it is important to have CapEx and OpEx assistance since biofuel sector (specifically compressed biogas) is an OpEx intensive sector wherein 30–40 per cent of the cost is CapEx whereas 60–70 per cent is operational expenditure, this OpEx is significantly higher when compared to other RE technologies like solar installations, where CapEx alone is 80–90 per cent.

The comparative analysis will provide clarity on support extended in terms of economic, technical, as well as operational aspects.

The following are the indicators considered and their significance in the biofuels sector.

### Parameters considered under support on CapEx

- **Capital assistance:** Capital assistance, also known as capital subsidy, is a financial support provided by the government to industries to reduce the initial and upfront cost of the project. It is a major support for the sector if provided by the government. Also, the scale of support varies from state to state.

- **Land assistance:** Land assistance is a support provided by the government to industries for the establishment of RE projects in the form of land allotment at a concessional rate, land lease and allotment of government-owned land. As per CSE's analysis, land cost is about 10 per cent of total CapEx second to machinery and equipment which is major (80 per cent).

- **Land conversion fees:** Land conversion fees are charges imposed by the government when agricultural land is converted into non-agricultural land to establish industries to build a solar plant, bioenergy project, wind farm, etc.

- **Tax benefits:** The government provides tax benefits for financial relief through reimbursement or exemption from tax to promote investment in renewable energy and to encourage domestic manufacturing.

- **Registration/stamp duty:** The government provides the registration/stamp duty exemption or reimbursement to industries to lower the overall capital cost for the establishment of the RE projects.

- **Approach road:** A connecting road that provides direct access from the main road or highways to renewable energy project sites. It reduces the operational costs as well as ensures transportation access. Some states have included approach road facilities in their policies to set up biofuel plants.

- **Catchment area:** Catchment area is the area around a biofuel plant from where the raw material, feedstock and waste are drawn for the generation of renewable energy. Catchment area plays an important role in ensuring regular, reliable and cost-effective supply of feedstock and in ensuring the regular supply of feedstock to the industries. The government promotes one industry in each tehsil. For example, Uttar Pradesh government encouraged the installation of one bio-plant (CBG or bio-pellet or biodiesel) in each tehsil of Uttar Pradesh through their Uttar Pradesh Bio Energy Policy, 2022.

## Parameters considered under support on OpEx

- **Operational assistance:** Operational assistance provided by the government to the industries is a financial incentive to support industries in covering the cost of day-to-day operational expenditure. This has relevance for the majority of the biofuels, including CBG. For example, unlike solar plant installation, which is capital-intensive but has optimized operational costs, the CBG sector is one where apart from capital investment the operational expenditure is also substantial. Any such support to the sector is important in upscaling of manufacturing of biofuels.

- **Interest subvention:** It is provided by the government in the form of financial assistance to cover the interest portion on a loan. So, a developer repays the loan at a lower and subsidized interest rate. Any rationalization of the interest percentage in financing from banks will result in a smaller burden on entrepreneurs.

- **Power subsidy:** Power subsidy provided by the government to the industries in the form of financial support to reduce the cost of electricity and to encourage the adoption of clean and renewable energy technologies.

- **Electricity duty:** The state government imposed a tax or charge on the consumption, sale and generation of electricity. Normally, it applies to all power users; the state government exempts or reduces this electricity duty for RE projects to encourage clean energy.

- **Employment incentive**: The financial incentive to industries for boosting local employment generation while supporting the clean energy.

- **Capacity building of manpower:** It is important for the sector to have skilled manpower to operate the plants and therefore it is important for the industry to also invest in capacity building of its manpower and therefore incentivizing the industries on investment towards capacity building of its workforce will encourage and ensure development of skilled manpower in the sector.

- **Subsidy on biomass aggregation machinery:** Procurement of biomass includes its proper collection and storage for which deployment of specialized machinery is important. This is feedstock specific (mainly relevant for the paddy straw-based CBG sector) and also specific to states where paddy straw is available in significant quantities to be used in the biofuel sector.

- **Feedstock supply chain:** Building upon the feedstock supply chain is important as it ensures feedstock security for the industries. If not addressed, it can be a challenge for the sector and thus it is important for state-level policies to support development of the feedstock supply chain.

- **Management of organic manure:** Management of biodigestate (fermented organic manure [FOM]/liquid fermented organic manure [LFOM]) generated in the CBG industries is important as it also drive the feasibility of the plant to an extent. Any support to the sector on this aspect will be helpful for the cost economics of industries.

**Parameters under 'ease of doing business'**

- **Online portal:** The government or implementing agency creates an online portal to manage and monitor the RE projects. It works as a single-window system for all stakeholders.

- **Single-window clearance: A s**ingle-window clearance is a single portal where investors and developers can submit all their documents, applications and compliance requirements to get approval from various departments (forest, water, pollution control etc.). A single-window clearance portal reduces the project set-up time by enabling faster approval. Further, by making the process investor-friendly it attracts domestic and foreign investment.

## Analysis of dedicated bioenergy policies in the states

### Uttar Pradesh State Bio-energy Policy, 2022

Uttar Pradesh has been seen as the model state for developing and setting up an ecosystem for bioenergy enterprises. To pave the way for the bioenergy/biofuel sectors in the state, the Uttar Pradesh Bioenergy Policy was released in 2022. Under this policy, the Uttar Pradesh New Energy Development Agency (UPNEDA) is the nodal agency to promote the establishment and execution of bioenergy units.

This policy provides various incentives to promote the production of bioenergy, with specific focus on bio-CNG/CBG. An upfront subsidy for rakers, balers and trawlers involved in the collection of biomass shall be provided t projects registered under this policy and Farmer Producer Organizations (FPOs) or cooperative societies operating in the catchment areas of these plants or projects. It is also intended that at least one FPO in each block of the state for biomass collection, and its training and handholding will be done by the agricultural department to ensure a steady supply of agricultural waste to CBG plants and to secure long-term supply contracts with a letter of intent.

The policy offers a subsidy of Rs 75 lakh per tonne of CBG production capacity, capped at Rs 20 crore per project, and a subsidy on the production of biodiesel at the rate of Rs 3 lakh per kilolitre, up to a maximum of Rs 20 crore. Industries can use this subsidy for plant and machinery, infrastructure, construction, power supply and transmission-system related work that does not include the cost of administrative building and land.

One major component of biofuel projects that has been dealt with by the government of Uttar Pradesh under this policy is land assistance. The Revenue Department has been entrusted with responsibility for land allocation for setting up bioenergy plants and for collection and storage of feedstock. Government-owned land can be leased at a nominal rate of Rs 1 per acre per year to set up CBG plants and store feedstock for a maximum lease period of 30 years. Development fees, stamp duty and electricity duty are fully waived to reduce initial costs. Additionally, economic

assistance is provided through an infrastructure subsidy for constructing up to 5 km of approach roads, with a maximum investment limit of Rs 50 crore.

To support the acquisition of balers, rakers and trolley equipment, a state subsidy of 30 per cent of the cost up to Rs 20 lakh is available. The policy also includes provisions for land-use alterations and exemptions from the Land Ceiling Act.

A bioenergy online portal, with a single-window clearance system, has been created to streamline the application process and offers a unified platform for investors. Under this policy, to ensure the continuous availability of biomass for the operation of the plant, it will be mandatory to install one bioplant in each tehsil where the tehsil works as a catchment area for the bioplant.

A project officer will be deployed in each district to assist investors and serve as the primary contact for obtaining necessary approvals from the district magistrate's office. Additionally, a district-level committee will be constituted to make agricultural waste readily available to investors at market prices. The Agriculture Department and State Agricultural Universities will promote the research, marketing and distribution of organic manure produced by CBG units, further integrating bioenergy into the state's agricultural economy.

Under this policy, a mechanism has been developed for the collection and supply of cow dung at a fixed price rate from private gaushalas to CBG plants, as well as a mechanism for the collection of agricultural waste to CBG plants, and a delivery contract will be set between krishi mandis and CBG plant investors.

Through this policy, electricity fees, stamp duty, and development charges shall be 100 per cent exempted to reduce the initial costs. Additionally, an approach road facility will be provided up to a maximum of 5 km from the plant to the main road, with a maximum investment of Rs 50 crore or more. To ensure the waste supply chain, Uttar Pradesh New & Renewable Energy Development Agency (UPNEDA) will develop an IT-based portal and mobile app to bring all aggregators, farmers and developers on a single platform. UPNEDA, at regular intervals of time, will conduct district- or tehsil-wise survey to upgrade the report of biomass production capacity and viability of different types of biomass. This policy shall remain up to five years from the date of notification.

## Gujarat State Biotechnology Policy (2022–27)

The Gujarat State Biotechnology Policy has been put forth by Gujarat State Biotechnology Mission (GSBTM), established by the government of Gujarat under the Department of Science and Technology. GSBTM has been designated as the nodal agency responsible for implementation, support and coordination between various government departments to ensure the policy's effective execution.

Under the policy, biofuels have been covered by GSBTM as it comes under the umbrella of biotechnology products. Biofuel projects have been considered as 'special projects' under the policy. Special projects are projects of strategic importance in challenging areas and in emerging technologies, as defined under the policy.

The policy aims to support 500 biotechnology units and create over 1.2 lakh jobs in the biotechnology sector, including areas such as biofuels and biofertilizers.

The policy offers incentives under two packages based on the Gross Fixed Capital Investment (GFCI). Package 1 covers incentives for units with GFCI <Rs 200 crore, while package 2 includes incentives for units with GFCI >Rs 200 crore and covers mega and/or special project (biofuels included). Capital assistance will be provided based on basic investment promotion assistance for the project, which will be calculated on the basis of the formula given under the policy, which considers the Eligible Fixed Capital Investment (EFCI) as a factor along with several incentive multipliers such as export multiple, gross supply multiple, and capital assistance of 25 per cent of capital investments, with a ceiling of Rs 40 crore disbursed in 20 quarterly installments over five years.

Gujarat state policy has, significantly, provided operational assistance at 15 per cent of expenses, capped at Rs 5 crore per annum. This is an important aspect for the biofuels sector as unlike other renewable energy sectors such as wind and solar, there is significant cost involved in the operation and maintenance of the biofuel projects. Thus, this initiative from the government of Gujarat is a benchmark for all other states.

To streamline the establishment of new units, a single-window clearance mechanism has been established to grant necessary approvals and clearances. The policy also includes a 100 per cent reimbursement of electricity duty on power purchased from state electricity distribution companies or power distribution licensees for a period of five years. Interest subsidies on term loans are available

at 7 per cent for borrowings up to Rs 100 crore, with a ceiling of Rs 7 crore per annum, and an additional 3 per cent for borrowings above Rs 100 crore, with an overall ceiling of Rs 20 crore per annum or the actual interest paid, whichever is lower.

The policy introduces an Employment Generation Incentive titled Aatmanirbhar Gujarat Rojgar Sahay, offering benefits of up to 50 per cent of CTC, with a maximum of Rs 50,000 per male employee and Rs 60,000 per female employee. This incentive is available to applicants for local employees who have completed at least one year of employment with the unit.

Currently, the government of Gujarat along with the Gujarat Energy Development Agency (GEDA) is also in the process of developing a specific bioenergy policy for the state.

## Haryana Bioenergy Policy, 2018

The Haryana Bioenergy Policy was released in 2018 to encourage generation of energy from surplus biomass. The Haryana Bioenergy Policy designates the Haryana Renewable Energy Development Agency (HAREDA) as the nodal agency responsible for facilitating bioenergy projects and implementing the policy.

Due to the surplus biomass availability, Haryana has a great potential to generate electricity, biogas, bio-CNG, biofuels, etc. by using crop residues. To harness clean power and a safe environment, the state is encouraging the production of biomass projects, with various incentives for such projects.

For setting up biomass projects within the state, agricultural land is also permitted to be used, and the government is also providing panchayat land on lease/rent at a reasonable price directly through the panchayat for 35 years.

To support the efficient collection of biomass for approved projects, the policy provides reapers, balers and trawlers either on rent or through an upfront subsidy. To ensure a consistent and continuous supply of biomass, the Department of Agriculture and Farmer Welfare has been designated to carry out area demarcation, ensuring that proposed projects do not conflict with other agricultural initiatives. The capacity of these projects is capped at 80 per cent of the feedstock availability in the district, as determined by the biomass assessment report.

The policy offers exemptions from land use approval, external development charges, scrutiny fees and infrastructure development charges. Additionally, there is a 100 per cent exemption from entry tax on all supplies, including capital goods, structures and raw materials necessary for setting up and trial operations of the projects.

The Agriculture and Farmer Welfare Department, along with state agriculture universities, will promote organic fertilizers produced by these projects, provided they meet specified standards. State Agriculture Universities will conduct trials to document results without charging any fees. The State Transport Department will also encourage the use of biofuels in public transport vehicles. The policy includes an offline application system with an associated application fee, a non-refundable scrutiny fee, and a performance security fee.

The nodal agency HAREDA shall provide clearance or arrange clearance for various departments, whichever is required by the act, as a single window. Under this policy, the project shall be eligible for Central and state financial assistance as well as exemptions such as excise duty, customs duty etc.

Haryana state also has introduced the 'Renewable Energy Projects for all category enterprises' scheme in May 2023, with the objective of boosting usage of renewable energy in the state. Under the scheme, a capital subsidy of 25 per cent up to Rs 1 crore per MW or equivalent, capped at Rs 2.5 crore, has been provisioned for bioenergy units (based on agricultural residue).

## Bihar Biofuels Production Promotion Policy, 2025

The government of Bihar notified the Ethanol Production Promotion Policy in 2021. The policy had been proposed to make ethanol manufacturing in the state more attractive for potential investors. To broaden the coverage of the policy for biofuel production, the government of Bihar amended and renamed the policy in 2023; the most recent amendment came in July 2025, and the policy is now named Bihar Biofuels Production Promotion Policy, 2025.

The Policy was released with the focus on the production of ethanol and compressed biogas (CBG)/bio-CNG and to create local job opportunities through the promotion of new ethanol and CBG industries. Only standalone distilleries producing 100 per cent fuel-grade ethanol developed as a greenfield project as well as units producing CBG shall be eligible for the incentive under this policy.

Incentives under this policy will be in addition to the wide range of benefits eligible under the Bihar Industrial Investment Promotion Policy, 2016. The capping of total of interest subvention incentive under the Bihar Industrial Investment Promotion Policy and capital subsidy under this policy shall be at 50 per cent of the approved project cost under the Bihar Industrial Investment Policy.

For special class investors such as women entrepreneurs, differently abled, war widows, acid attack victims and third-gender entrepreneurs, the maximum limit of incentive shall be increased by an additional 5 per cent (capping will be 52.5 per cent of the approved project cost under the state investment policy).

The incentives for eligible manufacturing units in Bihar will be entitled to be availed of after the notification of this policy, as per the Bihar Industrial Investment Policy, 2016 as well as the Bihar Biofuels Production Promotion Policy, 2025.

The capital subsidy shall be 15 per cent of the cost of plant and machinery or Rs 5 crore, whichever is lower. Additionally, interest subvention incentive shall also be provided by the government at 10 per cent the term loan, the upper limit being 50 per cent of the project cost, up to a maximum Rs 20 crore, for five years (in the case of priority sectors, the upper limit is 30 per cent of the project cost, up to a maximum of Rs 10 crore). The government shall provide a 100 per cent exemption on stamp duty, registration fees, land conversion fees, SGST and electricity duty (in case of priority sectors, 80 per cent reimbursement on SGST and 100 per cent reimbursement on electricity duty, the upper limit being 100 per cent of the project).

The government shall also provide an employment subsidy of Rs 20,000 for skill development, and this incentive will only be applicable for training of employees/ staff domiciled in Bihar. The maximum limit for the reimbursement of employment cost subsidy will be Rs 1,000 per month for SC/ST and women, and Rs 500 per month for general employees.

Application for land allocation shall be submitted to the Bihar Industrial Area Development Authority (BIADA) portal; the Project Clearance Committee (PCC) of BIADA shall organize weekly meetings to clear all applications for high-priority sectors in seven working days.

All NOCs, clearances and permissions required for ethanol and CBG manufacturing shall be done by the single-window clearance portal of the Department of Industries, Government of Bihar. The Department of Industries, Government of

Bihar, shall be responsible for the implementation of the policy and act as a nodal agency, and the Director of Industries shall be the nodal oOfficer for this policy. This policy shall remain in effect till March 31, 2028.

## Scheme for Implementation of Biofuel Projects in Madhya Pradesh (under Madhya Pradesh Renewable Energy Policy, 2025)

The Scheme for Implementation of Biofuel Projects in Madhya Pradesh was released in 2025 to encourage the production and usage of biofuels, establish an infrastructure for biomass and waste collection, storage and transportation, and encourage the establishment of biofuel-dispensing outlets across rural and urban areas. The scheme is a part of the Madhya Pradesh Renewable Energy Policy, 2025. Biofuels included under the policy include briquettes and pellets from biomass, torrefied biomass, biochar, syngas, bio-CNG/CBG, biodiesel, biogas, green hydrogen, etc. The policy has included the term drop-in fuels for any liquid fuel produced from biomass, agri- residue, municipal solid waste, etc., which meets the Indian standards for motor spirit, HSD, jet fuel in pure or blended form, and can be utilized in vehicles without any modification in the engine system, and can use the existing petroleum distribution system.

The scheme applies to biofuel manufacturing units and biomass supply chain units with an investment of more than Rs 10 crore (doesn't include biomass/pellet manufacturing plants, biomass-based steam generation, power, cogeneration plants, and conversion of existing sewage treatment plants to biofuel plants.

The objective of the scheme is to promote the production and usage of biofuels in Madhya Pradesh, reduce dependence on fossil fuels and set up infrastructure to collect, store and transport biomass and wastes, which ultimately acts as a feedstock for the CBG or other biofuels sectors.

The policy provides Basic Investment Promotion Assistance (BIPA) limited to Rs 200 crore, provided in seven equal installments. It also includes a provision of 50 per cent (maximum up to Rs 5 crore) assistance for infrastructure development (developing power, water, gas pipeline, road, drainage, etc.) as well as green industrialization assistance wherein the policy supports the development of ETP, STP or pollution control devices with similar assistance as in case of infrastructure development.

Quality certification (50 per cent of certification cost or Rs 1 lakh, whichever is lower) and IPR assistance (100 per cent reimbursement up to a maximum of

Rs 10 lakh per unit for the first five years) are add-on assistance provided by the government of Madhya Pradesh. A 100 per cent exemption in electricity duty, exemption in energy development cess, and 50 per cent reimbursement on stamp duty on the purchase of private land for the project have also been provisioned under the scheme.

The government of Madhya Pradesh also intends to provide the upfront subsidy to cutters, rakers, balers, trawlers, trolleys and other farm equipment used in the collection of biomass. Additionally, the government shall provide an exemption on cross-subsidy surcharge for 10 years from the date of Commercial Operation Date (COD).

Another important aspect that has been addressed by the Madhya Pradesh government only after UP's bioenergy policy is land assistance. Under the scheme, the government intends to provide revenue land at 50 per cent of the circle rate for establishment and operation of bioenergy industries.

The scheme has also addressed a major issue that has plagued the CBG sector. The government of Madhya Pradesh has included specific provisions to manage and promote Fermented Organic Manure (FOM) and Liquid Fermented Organic Manure (LFOM) produced by bioenergy units. This covers the promotion of research, marketing and distribution of organic manure produced by bioenergy units under defined standards. The sale and purchase of this bio-manure at licensed fertilizer shops will be made mandatory by the state agriculture department.

Unlike other states, the central state has tried to address the major bottlenecks in India's CBG sector. The first is the feedstock supply chain, wherein Madhya Pradesh has deputed the state animal husbandry department to execute long-term contracts with letter of intent holders under the Sustainable Alternative towards Affordable Transportation (SATAT) scheme for the availability of land for animal shelters and availability of cow dung in the state.

Under this policy, a mechanism will be developed for the collection and supply of cow dung from private gaushalas to CBGs plant by fixing the price of cow dung. The schemem also provides a mechanism for the collection of waste from the state Agricultural Produce Market Committee and delivery to CBG plants. Feedstock delivery contracts are to be executed between Krishi Upaj Mandis and CBG plants.

To help build a supply chain ecosystem in Madhya Pradesh, the state government

has also proposed to develop an information technology-based portal and mobile app by the New and Renewable Energy Department to bring waste aggregators, farmers and CBG manufacturers on one platform. Long-term contracts among these parties have been encouraged in the scheme. Under the chairmanship of the Collector for the development of the supply chain, the entrepreneurs will encourage regular clearance, such as fire, land ceiling, conversion of land to non-agricultural use, availability of government land, electricity supply, transmission system, etc.

### Jammu and Kashmir (draft Bio-energy Policy 2022)

The main focus of this policy is to attract private investment in the Biomass Project and to harness biomass-based power, biogas, bio-CNG, bio-manure, biofuels, etc. The government has provided various incentives to establish biomass-based projects. Under this policy, the government allocates agricultural land to establish a biomass-based project and assists in the lease of land at a reasonable price to establish biomass projects for a minimum of 35 years; the projects are exempt from the land use approval, external development charges, scrutiny fee and infrastructure development charge.

Registration of rent, lease or scale deed for the land required to establish the projects are 100 per cent exempt from the payment of fees and stamp duty. The Pollution Control Board will not apply any charge for issuing the Consent to Establish (CTE) and Consent to Operate (CTO) for projects anywhere in a Union Territory.

A 100 per cent exemption from entry tax shall be allowed in respect to all supplies made for establishing and trial operation of the projects, and projects established under this project are also eligible to claim the Central and state financial assistance, as well as exemptions like excise duty and custom duty, etc. To implement the policy, the Jammu and Kashmir Energy Development Agency (JAKEDA) act as a nodal agency and also provides clearance or arranges clearance for various departments, wherever required. This policy is still a draft, and there is no update regarding this policy.

## Analysis of integrated RE and/or other clean energy policies in the states

### Assam Integrated Clean Energy Policy, 2025

Assam Integrated Clean Energy Policy was released in 2025. Assam Power Distribution Company Limited (APDCL) is the nodal agency under this policy. Scope of the policy is inclusive of ten major areas with the focus on biofuels and/or biomass and waste-to-energy projects. The policy aims to achieve a target of 10,000 tonne per day CBG production and ethanol production of 1,500 kilolitre per day by 2029–30.

The government of Assam has included a capital subsidy of 20 per cent on farm machinery for the collection and/or supply of feedstock to biofuel plants, which shall be paid to the developer.

The government shall allot the land for biofuel projects (1G ethanol and CBG plants) as per the rules of the Revenue & DM Department and prevailing industrial policy of the government of Assam. The government, revenue or concerned department is to allot the land to the developer for lease up to a maximum of 30 years. Also, there is provision for 100 per cent reimbursement of charges spent in respect of reclassification of land.

For 1G and CBG plants, government shall provide the 100 per cent reimbursement on net SGST for the sale of 1G and CBG in the state for seven years and 100 per cent reimbursement on electricity duty for consumption of energy for production of 1G and CBG for a period of 10 years as well as 100 per cent reimbursement on consumption of energy for production of 2G ethanol and the reimbursement of power tariff for 1G and 2G ethanol and CBG plants at Rs 1/KWh for 10 years.

To establish a biofuel and biomass plant, all the clearance of projects shall be done through single-window clearance; the single-window clearance will be developed by the nodal agency, Assam Power Distribution Company Limited (APDCL).

The policy also intends to develop feedstock collection centres with support from local bodies, farmers and other stakeholders; these collection centres will facilitate the procurement of feedstock/raw material for the CBG plants.

This policy shall remain valid till March 31, 2030.

## Telangana Clean and Green Energy Policy, 2025

The Telangana Clean and Green Energy Policy was released in 2025. Telangana Power Generation Corporation Limited (TGGENCO)/Telangana Renewable Energy Development Corporation Limited (TGREDCO) will be the nodal agency to enable smooth implementation of this policy. The policy is applicable to biofuel projects under the category 'other renewable energy projects'.

For CBG plants, the government shall provide the capital subsidy of 20 per cent on Fixed Capital Investment (FCI), up to a maximum of Rs 1 crore per tonne per day (TPD). This subsidy is only available for the plant with minimum capacity of 10 TPD and will apply to the first 1,000 plants or up to a total capacity of 10,000 TPD, whichever comes first. This subsidy is capped at Rs 30 crore per plant, and will be distributed over a period of five years from the date of commencement of commercial production.

For 2G ethanol, government shall provide the capital subsidy of 20 per cent on Fixed Capital Investment (FCI), up to maximum of Rs 1.5 crore per kilolitre per day (KLPD) capacity. This subsidy is only available for plants with a minimum capacity of 25 KLPD and it will apply to the first 50 plants or up to a total capacity of 1,500 KLPD, whichever comes first. The subsidy is capped at Rs 30 crore per plant, and will be disbursed over a period of five years from the date of commencement of commercial production.

Electricity tariff of Rs 2 per unit will be reimbursed by the government, and 100 per cent net SGST revenue will be reimbursed on the sale of product for 1G, 2G ethanol and CBG for a period of five years.

For the manufacturer, 100 per cent electricity duty shall be waived off for five years. A capital subsidy of 20 per cent shall be provided for biomass collection/ subsidy for setting up 2G bio-ethanol plants; this subsidy will be capped at Rs 30 crore per plant.

A 33 per cent land cost rebate will be provided, limited to Rs 20 lakh, to biofuel units established by Women Self Help Groups (SHGs), Farmer Producer Organization (FPOs) etc. in Special Food Processing Zones (SFPZs). For SFPZs, 25 per cent land cost rebate will be provided for the first 20 per cent plots.

One important incentivization provided by the Telangana Clean and Green Policy, 2025 is interest subvention of 75 per cent of the total interest payable on term loans

not exceeding a total of Rs 2 crore. Manufacturing units established by Women Self-Help Groups (SHGs), Farmer Producer Organization (FPOs) etc. in SFPZs are eligible for an additional 10 per cent interest subvention of the interest payable on term loan (over and above 75 per cent), with the total not exceeding Rs 2 crore. This policy shall remain valid for up to 10 years from the date of issuance till the notification of the new policy.

## Andhra Pradesh Integrated Clean Energy Policy, 2024

Andhra Pradesh Integrated Clean Energy Policy was released in 2024. To ensure the smooth implementation of this policy, New and Renewable Energy Development Corporation of A.P. Ltd (NREDCAP) will act as the nodal agency. This policy has specific focus on 10 clean energy technologies, including biofuels (CBG and ehanol) by providing various incentives. Under the policy, the state intends to increase capacity by 1500 kilolitre per day for ethanol and 10,000 tonnes per day for CBG.

This policy offers capital assistance of 20 per cent on fixed capital investment to the CBG plants, subject to a maximum of Rs 1 crore tonnes per day (TPD) capacity of CBG plant for five years post Commercial Operation Date (COD). However, this is only applicable for the first 1,000 plants or up to 10,000 TPD capacity, whichever is achieved first.

For the 2G ethanol, a capital subsidy of 20 per cent is provided on the fixed capital investment, subject to a maximum of Rs 1.5 crore per kilolitre per day (KLPD) capacity of the plant, for five years post-Commercial Operation Day (COD). However, this subsidy is only eligible for plants with a minimum capacity of 25 KLPD and is only applicable either for the first 50 plants or up to 1,500 KLPD capacity, whichever is achieved first.

The government provides the land at the lease rate of Rs 15,000 per acre per year with 5 per cent escalation for every two years for biofuel projects for only revenue/ government land.

The state nodal agency will identify land resources to promote biofuel projects. For one one-time land conversion, an application has to be submitted to the Revenue Department, and land conversion for biofuel projects eligible under this policy shall be exempted from any applicable fees.

For 1G, 2G ethanol and CBG, government will provide 100 per cent reimbursement of electricity duty on power consumed for the production of biofuels as well as

100 per cent reimbursement of SGST revenue to the developer for sale of 1G, 2G ethanol and CBG in the state for five years from Commercial Operation Day (COD). The government shall also provide the reimbursement of the power tariff at Rs 1/KWh for five years.

This policy gives support to the local bodies, farmers and stakeholders for setting up the feedstock collection centre with feedstock storage facilities. To obtain time-bound statutory clearance for establishing biofuel plants, NREDCAP will develop a portal to assist single-window clearance for all biofuel projects. This policy shall remain active for five years from the date of issuance of the policy till the issuance of a new policy.

## Industrial Development Policy 2024–30, Chhattisgarh

Chhattisgarh's Industrial Development Policy was released in 2024 by the Department of Commerce & Industries, Chhattisgarh, with the motive of innovation, economic growth, industry development and sustainability by encouraging local entrepreneurs and empowering micro, small and medium enterprises (MSMEs). The compressed biogas sector has also been earmarked as a focus area under the policy.

Under this policy, an Udyam Aakanksha acknowledgement certificate shall be provided through the Department of Commerce and Industry, Government of Chhattisgarh, and will be necessary for entities applying for investment incentives.

The scheme has the provision of incentivization based on categorization of enterprises. There are three major categories for the investment incentive and, accordingly, the scale of incentives varies for each category. These categories are Expansion, Diversification, and Substitution/Modernization. To take incentives for these categories, enterprises have to meet some conditions as mentioned in the policy. For Expansion, the enterprise should have a minimum 25 per cent increase in registered capacity or in average production of the enterprise (whichever is higher).

For Diversification, enterprises should have at least 10 per cent increase in total employment, and for Substitution/Modernization should they have a minimum capital investment of 125 per cent of the original investment in the plant and machinery. Units shall be eligible for incentive up to 50 per cent of the invested amount in fixed capital if there is  a 10 per cent increase in total employment.

Under this policy, various incentives shall be provided to new compressed biogas enterprises for the establishment, as well as in the case of expansion, diversification, and substitution/modernization of established enterprises. Government shall provide either the reimbursement of the net SGST paid up to 12 years, up to 100 per cent of the maximum fixed capital investment or fixed capital investment subsidy.

Electricity duty exemption has been provided up to 12 years to only new enterprises, however the volume of exemption is not provided by the policy. The policy has a provision of 100 percent exemption from stamp duty on executed deed for the purchase of land, sheds and buildings including land purchase deeds.

A 50 per cent reimbursement of the registration fee is payable on land in the policy, and a 50 per cent exemption on land conversion fees has been provided for up to a maximum of 50 acres of land for industrial purposes. A 50 per cent reimbursement of charges for new electricity connections (excluding security deposit) has also been provided.

Based on a certificate issued by the Chhattisgarh Environment Conservation Board, a 50 per cent reimbursement of the expenditure on the effluent treatment plant (ETP) has been provided up to a maximum of Rs 1 crore.

The government of Chhattisgarh has included the provision of reimbursement of 75 per cent of the contribution of Employment Provident Fund for skilled and semi-skilled employees from the state for five years with a maximum eligibility of Rs 1 crore per year. It has also included provision of reimbursement of the training stipend for capacity-building of manpower and reimbursement of training expenses of skilled and semi-skilled employees with state domicile and earning less than Rs 50,000 per month. Reimbursement is based on one month's salary paid by the employer or up to Rs 15,000 per person, whichever is lower, for five years.

Full exemption from the mandi fee has been provided for five years up to Rs 5 crore per year with total exemption not exceeding 50 per cent of the fixed capital investment made by the enterprises.

This policy shall remain valid till March 31, 2030.

## Odisha Renewable Energy policy, 2022

The Odisha Renewable Energy policy was released in 2022. This policy provides various incentives with the focus on large hydro, small hydro, solar rooftop, floating solar, wind, biomass, as well as waste-to-energy projects. The policy also promotes energy through bio-CNG/CBG to enable the development of bioenergy-based projects in the state.

Under this policy, land conversion charge, registration charges and stamp duty on purchase/lease of land shall not be applicable for renewable energy projects. All the projects will be developed through the Build-Own-Operate (BOD) model. The sites will be awarded for a period of 30 years.

The government will earmark the land for industry under its 'land bank' scheme. The land shall be allotted for the RE projects on priority at the specified rates. Projects with an operational life of 25–30 years shall also be allotted government land on a lease basis at an annual lease rent of 2 per cent of the prevailing IPR rate. Single-window clearance facility shall be provided by the government through a nodal agency to track the progress, monitor and take decisions on project approvals. The nodal agency shall assist the project developer to obtain the consent, clearance and permit for the development of a renewable energy project by providing a letter of recommendation to the concerned authorities.

The Department of Energy acts as the nodal agency for the smooth implementation of the policy. This policy shall remain till March 31, 2030 or until a new policy update.

## Rajasthan Integrated Clean Energy Policy, 2024

The Rajasthan Integrated Clean Energy Policy was released in 2024. Under this policy, government provides various incentives with the focus to establish biomass-based projects, bio CNG/CBG, briquette/pellet manufacturing industries for utilization of waste such as MSW, RDF, industrial and medical waste.

For establishment of CBG, a maximum of 10 acres of land has been allowed for setting up of a CBG plant of 10 MTPD capacity and about 25 acres of land for the storage of feedstock. For a bio-coal plant, a maximum of 2 acres of land would be allowed for 100 MTPD.

For a bioethanol plant, about 1.5 acres of land would be allowed for a plant capacity of 100 kilolitre. To allot land for a CBG plant, developers have to

deposit a security amount of Rs 1 lakh/MTPD by DD/NEFT/RTGS in favour of RREC, and this security deposit money will be refunded on the successful commissioning of the project.

Under this policy, various exemptions and reimbursements have been provided, such as 100 per cent exemption from electricity duty for seven years, 75 per cent exemption from stamp duty, as well as 25 per cent reimbursement of stamp duty, and 100 per cent reimbursement of mandi fee/market fee for seven years.

The mechanism for the waste supply chain will be established by the state, but detailed information about the waste supply chain is not given in the policy.

All the projects under this policy are eligible for Central Financial Assistance (CFA) as per the scheme of the Ministry of New and Renewable Energy (MNRE). RREC grants approval/clearance for the projects.

The Energy Department intends to issue separate comprehensive guidelines for implementation and promotion of CBG, bio-ethanol projects in the state.

This policy remains valid till March 29, 2029.

### Punjab Industrial and Business Development Policy, 2026

Punjab currently does not have a dedicated bioenergy policy and is among the states working to develop one. At present, investments in bioenergy and biomass utilisation are governed by the Industrial and Business Development Policy, 2026. The policy identifies the processing of agro-waste (biomass) into energy, bioenergy, or manure as a priority sector, allowing such projects to access fiscal incentives under the industrial policy framework.

To understand how conducive the policy environment is for the biofuel sector, the provisions of the Punjab policy have been mapped against the parameters identified by CSE in this report (see *Table 3:Assessment of Punjab Industrial and Development Policy as per parameters identified*).

**Table 3: Assessment of Punjab Industrial and Development Policy as per parameters identified**

| Category | Parameter | Provision in Punjab Industrial and Business Development Policy, 2026 | Assessment |
|---|---|---|---|
| **CapEx support** | Capital assistance | Capital subsidy up to 20 per cent of the eligible fixed capital Investment, capped at Rs 10 crore | Present |
| | Land assistance | No specific provision for government land allocation or concessional leasing for bioenergy projects | Not explicit |
| | Land conversion fees | No explicit exemption mentioned | Not explicit |
| | Tax benefits | Reimbursement of up to 75 per cent of Net SGST on incremental production | Present |
| | Registration / Stamp duty | 100 per cent exemption or reimbursement of stamp duty for eligible units | Present |
| | Approach road | No dedicated infrastructure provision for plant access roads | Not present |
| | Catchment area | No defined biomass catchment area mechanism | Not present |
| **OpEx support** | Operational assistance | No operational subsidy for bioenergy production | Not present |
| | Interest subvention | Not provided in policy | Not present |
| | Power subsidy | Exemption in energy cost based on actual power consumption | Not available |
| | Electricity duty | 100 per cent electricity duty exemption for eligible new or expansion units | Present |
| | Employment incentive | Employment Generation Subsidy (Rs 3,000–4,000 per employee/month) for five years | Present |
| | Capacity building | No specific training or skill development incentive | Not explicit |
| | Biomass aggregation machinery subsidy | Not addressed | Not present |
| | Feedstock supply chain | No support mechanism for biomass collection or supply contracts | Not present |
| | Organic manure management | No provisions for digestate or organic manure utilization | Not present |
| **Ease of doing business** | Online portal | Digital Common Application Form (CAF) for approvals and incentives | Present |
| | Single-window clearance | Integrated single-window approval system | Present |

Source: Compiled by CSE

## Analysis of capital expenditure support

Capital expenditure support is essential for attracting investment into bioenergy projects because plant infrastructure, machinery and land acquisition constitute major upfront costs. The Punjab policy provides some incentives that can support bioenergy projects indirectly.

The most important incentive is the **capital subsidy of up to 20 per cent of eligible fixed capital investment,** subject to a maximum of Rs 10 crore. This subsidy can be accessed by new units or by existing industries undertaking modernization or expansion. Biomass processing and bioenergy projects classified under priority sectors can therefore benefit from this provision.

In addition, the policy provides **100 per cent exemption or reimbursement of stamp duty** on the purchase or lease of land or buildings required for industrial projects. This reduces the initial financial burden for investors and encourages industrial establishment within the state.

Another significant incentive is the **reimbursement of net SGST,** which allows eligible units to recover up to 75 per cent of the tax paid on incremental production. While this incentive is linked to production rather than capital investment, it improves project viability and indirectly supports capital deployment.

However, several CapEx-related provisions typically found in dedicated bioenergy policies are absent in the Punjab policy. There is no provision for **government land leasing at concessional rates, a waiver of land conversion fees, or infrastructure support, such as approach roads,** for bioenergy plants. The policy also does not define **biomass catchment areas**, which states often use to ensure a reliable feedstock supply for bioenergy plants.

## Analysis of operational expenditure support

Operational support is particularly important for the biofuel sector because these projects have high recurring costs. Feedstock procurement, logistics, labour, and plant operation often account for a large share of the total project expenditure.

The Punjab policy provides limited support in this area. One of the key incentives is the **exemption from electricity duty,** which reduces the cost of electricity consumption for industrial units. Since bioenergy plants require electricity for various operational processes, this exemption offers some financial relief.

The policy also includes an **employment-generation subsidy, under which industries can receive financial assistance to hire** workers. Eligible units can receive subsidies of approximately Rs 3,000 per employee per month for male workers and Rs 4,000 per employee per month for female or special-category employees for a period of five years. This incentive reduces labour costs and indirectly supports operational expenditure.

Despite these provisions, the policy does not provide several forms of support critical to bioenergy projects. There is no **interest subvention on loans, direct operational subsidy, or support for biomass aggregation machinery** such as balers and rakers. Similarly, there is no mechanism to strengthen the feedstock supply chain or facilitate long-term biomass procurement contracts. Another gap is the lack of provisions for organic manure or digestate management, a key by-product of CBG plants that can contribute to plant profitability when integrated into agricultural markets.

## Provisions for ease of doing business

The policy performs strongly in terms of ease-of-doing-business mechanisms. It introduces a **digital Common Application Form** (**CAF**) system that allows industries to apply for incentives and approvals through a single online platform. This reduces administrative complexity and improves transparency.

In addition, the policy provides a **single-window clearance mechanism,** enabling investors to obtain approvals from multiple government departments through an integrated system. This significantly reduces the time required for project approvals and facilitates faster establishment of new industrial units.

These provisions strengthen Punjab's investment environment and can encourage industries, including those working in the bioenergy sector, to set up operations in the state.

## Overall assessment

The Punjab Industrial and Business Development Policy, 2026 provides a broad industrial incentive framework that can support investments in biomass-based industries. The inclusion of **agro-waste processing into energy and bioenergy as a priority sector** is an important step that acknowledges the role of biomass in the state's industrial and energy strategy.

However, when assessed against the parameters used in the CSE report, the policy demonstrates **moderate support for capital investment but limited sector-specific support for bioenergy operations.** The policy primarily provides general industrial incentives such as capital subsidy, SGST reimbursement and electricity duty exemptions, but does not address key aspects of the biofuel value chain such as biomass aggregation, feedstock logistics, operational subsidies and digestate utilization. Compared to states that have introduced dedicated bioenergy policies—such as Uttar Pradesh, Haryana and Gujarat—Punjab's policy framework remains largely **generic rather than sector-specific.**

## Table 4: Comparative analysis of states' policies

| Parameter | Name of state | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Bihar** | **Gujarat** | **Haryana** | **Madhya Pradesh** | **Uttar Pradesh** | **Jammu and Kashmir (Draft)** | **Andhra Pradesh** | **Assam** | **Chhattisgarh** | **Odisha** | **Rajasthan** | **Telangana** |
| Name of state policy | Bihar Bio-Fuels Production Promotion Policy 2025 | Gujarat State Biotechnology Policy, 2022-2027 | Haryana Bio-energy Policy 2018 Scheme for Renewable Energy Projects for all category enterprises, 2023 | Scheme for implementation of Biofuel projects (under M.P. Renewable Energy Policy-2025) | Uttar Pradesh State Bio-Energy Policy, 2022 | Jammu and Kashmir ( Draft Bio-energy Policy, 2022) | Andhra Pradesh Integrated Clean Energy Policy-2024 | Assam Integrated Clean Energy Policy 2025 | Chhattisgarh Industrial Policy 2024–30 | Renewable Energy Policy 2022 | Integrated Clean Energy Policy, 2024 | Telangana Clean and Green Energy Policy, 2025 |
| Nodal agency for implementation of policy | Department of Industries, Government of Bihar | Gujarat State Biotechnology Mission (GSBTM) | Haryana Renewable Energy Development Agency (HAREDA)<br><br>Industries and Commerce Department/ MSME Department | New and Renewable Energy Department, Govt. of Madhya Pradesh | Uttar Pradesh New Energy Development Agency (UPNEDA) | The Jammu and Kashmir Energy Development Agency (JAKEDA) | New and Renewable Energy Development Corporation of Andhra Pradesh Ltd (NREDCAP) | Assam Power Distribution Company Limited (APDCL) | Department of Commerce and Industries, Government of Chhattisgarh | Department of Energy | Energy Department, Government of Rajasthan | Telangana Power Generation Corporation Ltd (TGGENCO)/ Telangana Renewable Energy Development Corporation Limited (TGREDCO) |
| **Support on CapEx** | | | | | | | | | | | | |
| Capital assistance | Up to 15 per cent of the cost of plant and machinery (max. Rs 5 crore), higher for priority groups at 15.75 per cent (max. Rs 5.25 crore) | Capital assistance at 25 per cent of eligible gross fixed capital investment | 25 per cent up to Rs 1 crore per MW equivalent capped at Rs 2.5 crores | Basic investment promotion assistance (BIPA) for the project, limited to a maximum of Rs 200 crore, provided in seven equal annual installments. | Subsidy of 75 lakh/ tonne of CBG production; capped at a max of Rs 20 crore. Biodiesel subsidy at the rate of Rs 3 lakh per kilolitre, capped at Rs 20 crore. | Not available | CBG—20 per cent on fixed capital investment of CBG plant, capped at Rs 1 crore per TPD capacity of CBG plant for a five-year duration post COD. 2G ethanol—20 per cent capital subsidy on FCI, capped at Rs 1.5 crore per KLPD capacity of plant for a period of five years post COD. | 20 per cent capital subsidy shall be paid to the developer on farm machinery. | Up to 100 per cent of maximum fixed capital investment. 50 per cent reimbursement of the expenditure on ETP will be provided, up to a maximum of Rs 1 crore, based on a certificate issued by the Chhattisgarh Environment Conservation Board. | Not available | Not available | CBG subsidy of 20 per cent on fixed capital investment up to max. Rs 1 crore per tonne per day capacity for duration of five years. 2G ethanol—20 per cent on FCI capped at Rs 1.5 crore per kilolitre per day (KLPD) capacity for five years. |

| Parameter | Name of state | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bihar | Gujarat | Haryana | Madhya Pradesh | Uttar Pradesh | Jammu and Kashmir (Draft) | Andhra Pradesh | Assam | Chhattisgarh | Odisha | Rajasthan | Telangana |
| Land assistance | Land allotment from Bihar Industrial Area Development Authority (BIADA) for CBG units for 30-year lease at Rs 75,000 per acre annually | Facilitation for land identification | Assistance in lease of panchayati lands | Revenue land shall be provided at 50 per cent of the circle rate. | Revenue Department provides the land on token lease rent of Rs 1 per acre annually for a maximum lease period of 30 years. | Government facilitate lease of land at reasonable rate for minimum 35 years. | Land lease at Rs 15,000 per acre per year with 5 per cent escalation for every two years for biofuel plant. | Land allotment to developer for lease up to maximum 30 years. | Not available | Government land will be allotted on lease basis to the project with operational life of 25–30 years at an annual lease rent of 2 per cent of the prevailing IPR rate. Land earmarked under 'Land bank' scheme | CBG plant Allotment of government land developer to deposit Rs 1 lakh/MTPD. | 33 per cent rebate in land cost to be provided to Biofuel units established by SHGs or FPOs capped at Rs 20 lakh. |
| Land conversion fees | 100 per cent exemption on land conversion fees and the same for priority cases. | Fee paid towards conversion of land use from agriculture to non-agriculture covered under capital assistance. | Not available | Not available | Conversion of land for setting up bioenergy plants as well as gathering and storing of feedstock, is permitted, along with deemed exemption from land ceiling. | Exemption from land use approval. | Any applicable fee for one time land conversion shall be exempted for all the eligible biofuel projects. | Reimbursement of 100 percent charges spent in respect of reclassification of land | 50 per centexemption on land use conversion fees up to maximum of 50 acres of land | Not applicable | Exemption of 75 per cent conversion charges and reimbursement of 25 per cent conversion charge. | Not available |
| Tax benefits | 100 per cent SGST reimbursement and 80 per cent reimbursement in case of priority sector, for five years, upper limit being 100 per cent the project cost. | Not available | 100 per cent exemption from entry tax will be allowed for all supplies made for setting up and trial operation of the project | Not available | 100 per cent reimbursement of state goods and service tax for 10 years. | 100 per cent exemption from entry tax shall be provided for supplies made for setting up and trial operations of the project. | Reimbursement of 100 per cent net SGST revenue to the Developer for sale of 1G and 2G Ethanol and CBG | Not available | Reimbursement of net SGST paid up to 12 years from the starting date of commercial production.<br><br>Note: Only one benefit can be availed either Reimbursement of net SGST or capital subsidy. | Not available | Not available | Reimbursement of 100 per cent net SGST on sales of product for 1G, 2G ethanol and CBG for period of five years. |

| Parameter | Name of state | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bihar | Gujarat | Haryana | Madhya Pradesh | Uttar Pradesh | Jammu and Kashmir (Draft) | Andhra Pradesh | Assam | Chhattisgarh | Odisha | Rajasthan | Telangana |
| Registration and stamp duty | 100 per cent exemption on stamp duty and registration, and the same for priority cases. | Stamp duty and registration fee paid towards purchase, lease or transfer of land and/ or office space and fee paid towards conversion of land is exempted. | 100 per cent exemption from payment of fees and stamp duty charges | 50 per cent reimbursement shall be provided to developer on stamp duty to purchase private land. Reimbursement of stamp duty is applicable only after the COD/ completion of the project/ park. | 100 per cent exemption of stamp duty will be given on the rent deed/ lease/ sale deed and registration | 100 per cent exemption from payment of fees and stamp duty charges shall be provided for the registration of rent/ lease/sale deed for the land. | Not available | Reimbursement of 100 per cent stamp duty for the land utilized for the development of clean energy projects | 100 per cent exemption from stamp duty will be granted for the establishment. Registration fee reimbursement of 50 per cent payable on land. | Stamp duty on purchase/ land lease and land registration charge will not be applicable for RE projects. | 75 per cent exemption from stamp duty and 25 per cent reimbursement from stamp duty. | 100 per cent reimbursement of stamp duty will be provided. |
| Approach road | Not available | Not available | Not available | 50 per cent assistance for road including gas pipeline, power, drainage and sewage infrastructure up to factory gate, maximum Rs 5 crore under infrastructure development assistance | Approach road up to a max. of 5 km from the unit to main road. Facilities will be provided to entrepreneurs who invest Rs 50 crore or more in a bio-plant. | Not available | Not available | Not available | Not available | Not available | Not available | Not available |
| Catchment area | Not available | Not available | Department of Agriculture and Farmer Welfare to carry out area demarcation | One block, one plant: District-level committee can increase the catchment area considering capacity of the project. | One bio plant (CBG or bio-pellet or biodiesel) will be installed in each tehsil, and will be made as a catchment area for bio plant. | Capacity of project should not be more than 80 percent of biomass potential of proposed district as per JAKEDA. | Not available | Not available | Not available | Not available | Not available | Not available |

| Parameter | Name of state | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bihar | Gujarat | Haryana | Madhya Pradesh | Uttar Pradesh | Jammu and Kashmir (Draft) | Andhra Pradesh | Assam | Chhattisgarh | Odisha | Rajasthan | Telangana |
| Support on OPEX parameters | | | | | | | | | | | | |
| Operational assistance | Not available | 15 per cent of Operational Expenditure with a ceiling of Rs 25 crore per annum. | Not available | Not available | Not available | Not available | Not available | Not available | Not available | All project will be developed through Build-Own-Operate (BOO) model and the site will be awarded for duration of 30 years. | Not available | Not available |
| Interest subvention | 10 per cent of the term loan for five years, the upper limit being 50 per cent of the project cost, with a maximum Rs 20 crore. | Subsidy on term loan at the rate of 7 per cent for borrowings up to Rs 100 crore. capped at Rs 7 crore per annum | Not available | Not available | Not available | Not available | Not available | Not available | Not available | Not available | Not available | 75 per cent of total interest on term loan not exceeding total of Rs 2 crore. |
| Power subsidy | Not available | Covered under operational assistance for a period of five years. | Not available | Exemption in energy development cess on power consumed for 10 years from COD. | Not available | Not available | Power tariff reimbursement at Rs 1/KWh for 5 year shall be paid | Power tariff reimbursement at INR 1/KWh for 10 years shall be paid for 1G, 2G ethanol and CBG plants | Not available | Open Access consumer on consuming energy from RE project will get 50 per cent exemption of Cross-Subsidy Subcharge. | Not available | Reimbursement of electricity tariff of Rs 2 per unit for the period of five years. |

| Parameter | Name of state | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bihar | Gujarat | Haryana | Madhya Pradesh | Uttar Pradesh | Jammu and Kashmir (Draft) | Andhra Pradesh | Assam | Chhattisgarh | Odisha | Rajasthan | Telangana |
| Electricity duty | 100 per cent electricity duty reimbursement for five years. | 100 per cent reimbursement for five years. | Not available | 100 per cent exemption of electricity duty on consumption of electrical energy for 10 years from the date of COD. | 100 per cent exemption from electricity duty will be given to the bioenergy enterprises for 10 years. | Not available | 100 per cent reimbursement of electricity duty on power used for five years from Commercial Operation Date (COD). | 100 per cent reimbursement of electricity duty for 1G and 2G ethanol and CBG plants | Only new enterprises get the electricity duty exemption up to 12 years from the date of the starting of the commercial production.<br><br>Additionally, 50 per cent reimbursement of the charges for new electricity connections | Not available | 100 per cent exemption from electricity duty for seven years. | 100 per cent electricity duty will be waived off for manufacturer for five years. |
| Employment incentives | 50 per cent reimbursement (for male) and 100 per cent reimbursement (for female) of expenditure related to the contribution to the ESI and EPF scheme for five years for new unit for employee who are domicile of Bihar. | 100 per cent reimbursement of EPF scheme in case of females and 75 per cent in case of male employees for five years. Claim up to 50 per cent of CTC with cap of Rs 50,000 per male and Rs 60,000 per female employee, for local employees after one year of employment | Not available | Not available | Not available | Not available | Not available | Not available | 75 per cent reimbursement for employees Provident Fund contribution for skilled and semi-skilled employees (domicile of Chhattisgarh) for up to five years with maximum eligibility of Rs 1 crore per year. | Not available | Not available | Not available |

| Parameter | Name of state | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bihar | Gujarat | Haryana | Madhya Pradesh | Uttar Pradesh | Jammu and Kashmir (Draft) | Andhra Pradesh | Assam | Chhattisgarh | Odisha | Rajasthan | Telangana |
| Capacity building of manpower | The government is providing the employment subsidy of Rs 20,000 for skill development training of employees/ staff who are domicile of Bihar. | Not available | Not available | Agriculture department facilitate formation, training and capacity building of FPOs in respective areas for supply of agro-waste. No assistance for CBG units. | Agriculture department facilitate formation, training and capacity building of FPOs in respective areas for supply of agro-waste. No assistance for CBG units. | Not available | Not available | Not available | Reimbursement of training expenses of skilled and semi-skilled employees who are domicile and earn less than Rs 50,000 per month, up to Rs 15,000 per person | Not available | Not available | Not available |
| Subsidy on biomass aggregation machinery | Not available | Not available | Biomass aggregation machinery to be provided by AFWD on rent or subsidy as per available schemes | Additional subsidy of 30 percent up to maximum of Rs 20 lakh per set of equipment by GoMP in addition to subsidy by GoI. | 30 per cent additional subsidy to aggregators capped at Rs 20 lakh. | Biomass aggregation machinery to be provided by AFWD on rent or subsidy as per available schemes | Not available | Not available | Not available | Not available | Not available | Not available |
| Feedstock supply chain | Not available | Not available | Not available | Animal husbandry department will execute long-term contracts with LoI holders under SATAT for availability of land for animal shelters and availability of cow dung in the state. Developing collection and supply mechanisms for different feedstocks. | Execution of long-term contracts between bioenergy units, waste aggregator and farmer. Facilitation through IT based portal | Not available | Not available | Not available | Not available | Not available | Not available | Not available |

| Parameter | Name of state | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bihar | Gujarat | Haryana | Madhya Pradesh | Uttar Pradesh | Jammu and Kashmir (Draft) | Andhra Pradesh | Assam | Chhattisgarh | Odisha | Rajasthan | Telangana |
| FOM management | Not available | Not available | Agriculture and Farmer welfare department (AFWD) promote organic fertilizer from projects. Agriculture universities to conduct trials without charging cost. | Promote research marketing and distribution of organic manure. Sale and purchase of bio-manure at licensed fertilizer shops to be made mandatory by state agriculture department. | Committee under DM to establish coordination among manufacturers, Agriculture Department, municipal body etc. for marketing of organic fertilizer | Agriculture and Farmer welfare department (AFWD) promote organic fertilizer from projects. Agriculture universities to conduct trials without charging cost. | Not available | Not available | Not available | Not available | Not available | Not available |
| **Ease of doing business** | | | | | | | | | | | | |
| Single-window clearance | Entrepreneurs should submit their application on the single-window clearance portal (swc2.bihar.gov.in) for the financial clearance by March 31, 2028. | To establish a new unit, granting approvals and clearance, the Government of Gujarat will set up "Single Window Clearance Mechanism" | HAREDA will provide all the clearance or arrange clearance for various departments, wherever required by acting as a single window | Not available | Bioenergy online portal, single-window clearance for potential investors. | JAKEDA will provide all the clearance or arrange clearance for various departments, wherever required by acting as a single window. | NREDCAP will develop a portal for single-window clearance for all project to obtaining time bound statutory clearance. | APDCL shall act as a nodal agency to develop the portal for single-window clearance | Single-window system available under the policy | Single-window clearance by project screening committee | No single-window system available | For establishing the project government will provide the single- window clearance/ TG-iPASS facility for obtaining requisite clearance. |
| Online portal for application | Available | Available (https://dstpolicy.gujarat.gov.in/) | No online portal | Not available | Available | No information | Nodal agency to create online portal for filing and tracking of applications | APDCL to create online portal for filing and tracking of applications. | Available | Online portal to be developed | Not available | Not available |
| Duration of policy | March 31, 2028 | March 31, 2027 | Not defined | Valid till five years from the date of notification. | Valid till five years from the date of notification. | Policy in draft since 2022 | For five years from the period of commencement. | Till March 31, 2030 | Till March 31, 2030 | Till March 31, 2030 | March 29, 2029 | Ten years from the date of issuance of policy till updation of new policy |

Source: Based on CSE analysis

## Analysis of biofuel-specific policies in the states

### Rajasthan Ethanol Production Promotion policy, 2021

The Rajasthan Ethanol Production Promotion Policy was released in 2021 with the aim to produce ethanol from all feedstock permitted under the National Biofuel Policy 2018 and by the National Bio-fuel Coordination Committee (NBCC) and to promote and economically incentivize in fuel-grade standalone green field ethanol manufacturing industries as well as existing distilleries planning to expand in the area of ethanol production in Rajasthan and to increase the income of farmer producing feedstock/raw material which used for ethanol production.

The government provides various incentives to establish ethanol-manufacturing industries. Under this policy government has provided a production-linked incentive of Rs 1.5 /litre of ethanol supplied to oil manufacturing companies (OMCs) and manufactured in the unit, up to a maximum limit of 100 per cent investment in plant and machinery.

The government of Rajasthan is also providing incentives under the Rajasthan Investment Promotion Scheme 2019 to the eligible ethanol manufacturing units in the state.

The incentives include:

- **Capital subsidy** of 25 per cent of the plant and machinery subject to maximum Rs 50 lakh.

- **Interest subvention**: Incentive of 5 per cent interest subsidy has been provided on term loans taken from financial institutes, state financial institutes or banks recognized by the Reserve Bank of India by the manufacturer for making an investment in plant and machinery for five years, up to maximum of Rs 25 lakh per year.

- **Stamp/registration duty**: 100 per cent exemption has been provided from stamp duty on purchase and construction or improvement of land.

- **Tax benefits**: 75 per cent reimbursement of state tax due and deposit has been provided for seven years.

- **Land assistance**: 100 per cent exemption from land conversion charge has been provided for the conversion of land and change of land use.

- **Employment incentive**: 50 per cent reimbursement of employers' contribution has been provided towards the Employees' Provident Fund (EPF) and Employees' State Insurance (ESI) for seven years. If the industry provides more than 75 per cent direct employment to the people of state, it receives 75 per cent reimbursement of the employers' contribution towards employees EPF and ESI.

- 100 per cent exemption from electricity, land tax and mandi/market fees for seven years.

Incentives under this policy shall be offered only after commencement of commercial production by the unit. Ethanol units which are set up on a Zero Liquid Discharge (ZLD) basis shall only be considered under this policy.

The Industries and Commerce Department, Government of Rajasthan, is the Nodal Agency for the implementation of the policy in the State, and this policy shall remain valid till March 31, 2026.

## Jharkhand Ethanol Production Promotion Policy, 2022

The 'Jharkhand Ethanol Production Promotion Policy' was released in 2022 with the main focus to establish green-field ethanol-manufacturing industries, to increase the income of farmers producing feedstock/raw material for ethanol manufacturing, to increase the production of grain used in production of ethanol and to increase the local job opportunities and for these government is providing various incentive only to industries producing 100 per cent ethanol under this policy. Ethanol manufacturing units which are producing fuel-grade ethanol shall be eligible for financial assistance under this policy.

Incentives under this policy shall be offered only after the commencement of commercial production by the units. Incentives under this policy will be in addition to the benefits under the Jharkhand Industrial Investment Promotion Policy, 2021.

Incentives provisions proposed under this policy is as below:

- **Capital subsidy**: A Comprehensive Project Investment Subsidy (CPIS) at 25 per cent of investment made in fixed capital investment, maximum up to Rs 10 crore for MSME and Rs 30 crore for non-MSME shall be provided. An early bird subsidy of an additional 5 per cent of CPIS shall be provided in addition to other incentives.

- **Stamp/registration duty**: 100 per cent reimbursement of stamp duty and registration fee for land directly purchased from the riayts/acquired through consent award shall be provided.

- **Land assistance:** Units producing 100 per cent ethanol will be eligible for 50 per cent rebate on prevailing land lease premium on land allotted by state government agencies and land will be provided to the industries as upfront or in 10 equal instalments in five years

- **Interest subvention:** The government is providing new Micro, Small and Medium Enterprises (MSMEs) and non-MSME an interest subsidy for timely payment at 6 per cent per annum on total loan taken from banks or public financial institutions for five years from the date of commercial production.

- For **capacity building of manpower**, government is providing one- time skill development subsidy of Rs 13,000 per employee for training of employees/ staff. For approval of the same, the investor can log into Jharkhand's Single Window Portal and apply through the Common Application Form (CAF).

For the smooth implementation of the policy Department of Industries, Government of Jharkhand acts as a Nodal Agency. This policy will remain applicable for 5 years.

## Bihar Ethanol Production Promotion Policy, 2021

Bihar's Ethanol Production Promotion Policy, 2021 explicitly allows for the production of ethanol from all feedstocks that are permitted under the National Policy on Biofuels, 2018, and by the National Biofuel Coordination Committee. The primary objective of the policy is to make ethanol manufacturing more appealing to potential investors in the state by providing financial incentives.

The policy provides a range of incentives for new, standalone ethanol manufacturing units. These incentives are offered in addition to those available under the Bihar Industrial Investment Promotion Policy, 2016.

The major incentives provided to eligible units include:

- **Capital subsidy:** A capital subsidy of 15 per cent of the cost of plant and machinery, with an upper limit of Rs 5 crore, is provided under this policy.

- **Total financial assistance capping:** The combined total of the interest

subvention from the Bihar Industrial Investment Promotion Policy, 2016, and the capital subsidy from this policy is capped at 50 per cent of the approved project cost.

- **Tax-related incentives:** The policy provides incentives for a period of five years. This includes 100 per cent reimbursement of State Goods and Services Tax (SGST) and 100 per cent reimbursement of electricity duty.

- **Interest subvention:** Eligible units can receive an interest subvention of 10 per cent on their term loan for five years, capped at Rs 20 crore or 50 per cent of the project cost, whichever is less.

- **Employment and skill development subsidies:**
  - **Employment cost subsidy:** New units can receive a 50 per cent reimbursement of their expenditure on ESI and EPF contributions for male employees and 100 per cent for female employees who are domiciled in Bihar. The maximum monthly reimbursement is Rs 1,000 for SC/ST and women employees, and Rs 500 for general employees.

  - **Skill development subsidy:** A subsidy of Rs 20,000 per employee is available for the training of Bihar-domiciled staff.

- **Exemptions and land allotment:**
  - **Exemptions:** 100 per cent exemption on stamp duty, registration fees, and land conversion fees is provided.

    - **Land allotment:** The Bihar Industrial Area Development Authority (BIADA) will give priority in land allotment to ethanol manufacturing units.

# 3. Rating of the bioenergy policies in India

## Methodology for rating of state-level bioenergy policies

There has been a good policy ecosystem in India at the national level for promoting and supporting bioenergy. However, CSE observed that the implementation of the compressed biogas (CBG) sector on the ground remains sluggish despite the enabling national framework. A key reason for this gap is that on-the-ground momentum depends critically on state-level policy support, which varies significantly across states.

To assess the quality and comprehensiveness of state CBG policies regarding incentive provision, CSE developed a structured rating framework. Thirteen states were evaluated across 18 parameters, grouped under Capital Expenditure (CapEx) and Operational Expenditure (OpEx) heads as mentioned in previous chapter. The rationale for categorizing the parameters is that CBG unlike other RE sectors (solar, wind) requires significant operational expenditure. The ratio of CapEx to OpEx for CBG sector is 30:70 or 40:60 while in other RE sectors this ratio is generally 80:20 or 90:10. Accordingly, the parameters have been selected categorically.

Each parameter was scored on a scale of 0–5, with 0 indicating no policy provision and 5 indicating a comprehensive and generous policy. Weightages reflect the relative importance of each parameter in determining a state's overall CBG policy competitiveness.

### CapEx parameters

CapEx parameters assess the state's upfront investment environment for a CBG project. **Capital assistance** carries the highest weightage of 50 per cent, as direct financial support towards project capital cost is the single most impactful lever a state can offer. **Land-related provisions,** including land assistance, land conversion fee waiver, and stamp duty, are consolidated under a weightage of 10 per cent since they collectively determine the cost of acquiring and securing project land. **Tax benefits** (**SGST**) are assigned a weightage of 15 per cent, as state GST concessions on equipment, feedstock, or output materially improve project economics. **Infrastructure and approach road** support (10 per cent) removes a key

logistics bottleneck, particularly for plants in rural locations. Finally, **catchment area** (**feedstock zone**) definition (15 per cent) provides a policy guarantee of biomass supply, directly reducing feedstock risk and improving project bankability (see *Table 5: CapEx parameters considered and weightages assigned*).

**Table 5: CapExparameters considered and weightages assigned**

| CapEx parameter | Weightage (in %) | Maximum score |
|---|---|---|
| Capital assistance | 50 | 5 |
| Land assistance, land conversion fee waiver and stamp duty | 10 | 5 |
| Tax benefits (SGST) | 15 | 5 |
| Infrastructure/approach road | 10 | 5 |
| Catchment area (feedstock zone) | 15 | 5 |

Source: Based on CSE analysis

## OpEx parameters

OpEx parameters assess the ongoing support a state provides to keep a CBG plant commercially viable. **Operational assistance** carries the highest weightage of 30 per cent, as viability gap funding or direct grants are decisive during periods of cost stress. **Interest subvention** (20 per cent) reduces the effective cost of debt, significantly improving project returns over the loan tenure. **Power subsidy and electricity duty exemption** are assessed together under a combined weightage of 30 per cent, since both address the same cost head: power, which is one of the largest recurring expenses in plant operations. **Employment incentive and capacity building of manpower** are combined under a weightage of 10 per cent, as both address the human resource dimension of operations. Finally, **feedstock supply chain, FOM/organic manure support and BAM Incentive** are assessed together (weightage 10 per cent) as they collectively address feedstock sourcing and by-product utilisation, both of which bear directly on operational sustainability (see *Table 6: OpEx parameters considered and weightages assigned*).

**Table 6: OpEx parameters considered and weightages assigned**

| OpEx parameter | Weightage (in %) | Max. score |
|---|---|---|
| Operational assistance | 30 | 5 |
| Interest subvention | 20 | 5 |
| Power subsidy and electricity duty exemption | 30 | 5 |
| Employment incentive and capacity building of manpower | 10 | 5 |

| OpEx parameter | Weightage (in %) | Max. score |
|---|---|---|
| Feedstock supply chain, fermented organic manure (FOM)/organic manure support and BAM incentive | 10 | 5 |

Source: Based on CSE analysis

## State-wise performance across CBG policy parameters

The assessment highlights significant variation in how states support the development of the compressed biogas (CBG) sector across key policy parameters. States were evaluated across **capital expenditure** (**CapEx**) **support parameters,** including capital subsidy, land conversion support, tax incentives, infrastructure support, and catchment area provisions, as well as **operational expenditure** (**OpEx**) **support parameters,** including operational assistance, interest subvention, power subsidy, employment incentives, and BAM or feedstock-related incentives. The final scores reflect the weighted contribution of these parameters (see *Table 7: Overall ranking of states*).

**Table 7: Overall ranking of states**

| Ranking | State | CapEx assistance | OpEx assistance | Overall rating (out of 5) |
|---|---|---|---|---|
| 1 | Gujarat | 2.55 | 3.65 | 3.10 |
| 2 | Madhya Pradesh | 3.70 | 1.75 | 2.73 |
| 3 | Uttar Pradesh | 3.75 | 1.30 | 2.53 |
| 4 | Telangana | 2.88 | 2.10 | 2.49 |
| 5 | Bihar | 2.83 | 1.90 | 2.36 |
| 6 | AP | 3.10 | 1.35 | 2.23 |
| 7 | Punjab | 2.7 | 1 | 1.85 |
| 8 | Chhattishgarh | 1.98 | 1.20 | 1.59 |
| 9 | Haryana | 2.50 | 0.35 | 1.43 |
| 10 | Assam | 0.65 | 1.50 | 1.08 |
| 11 | J&K | 1.25 | 0.35 | 0.80 |
| 12 | Rajasthan | 0.40 | 0.75 | 0.58 |
| 13 | Odisha | 0.30 | 0.75 | 0.53 |

Source: CSE analysis

The rating table highlights significant variation in the strength of bioenergy policies across states, with **Gujarat** emerging as the clear leader with an overall score of 3.10 out of 5. Its top ranking is driven by a strong balance between capital expenditure (CapEx) support and operational assistance, making it the only state

with robust incentives across both dimensions. A second tier of states—including Madhya Pradesh, Uttar Pradesh, Telangana, Bihar and Andhra Pradesh—shows moderate performance, with overall scores ranging from about 2.2 to 2.7. These states generally provide strong CapEx support but fall short on operational assistance, which limits their overall effectiveness.

A key pattern across the table is the dominance of capex assistance over operational support. Many states, such as Madhya Pradesh and Uttar Pradesh, offer high upfront financial incentives for setting up bioenergy projects, but significantly lower support for ongoing operations. In contrast, operational assistance is weak across most states. This imbalance suggests that while states are focused on encouraging project establishment, they are not adequately supporting the long-term viability and performance of bioenergy plants.

Lower-ranked states, including Punjab, Chhattisgarh, Haryana, Assam, Jammu and Kashmir, Rajasthan and Odisha, exhibit weak policy frameworks overall. These low scores reflect limited incentives, particularly on the operational side, indicating underdeveloped or less effective bioenergy strategies. Overall, the table underscores a fragmented policy landscape, where only a few states demonstrate mature and balanced approaches, while most lag in providing the sustained support needed to ensure long-term success in the bioenergy sector.

## Gujarat

Gujarat ranks first and stands out for its strong operational policy support. The state receives **4.5 for capital assistance and 3 for land conversion support,** but does not provide tax incentives or catchment area provisions under the parameters assessed. Its operational framework is particularly strong, with **maximum scores of 5 for operational assistance, 5 for interest subvention, and 2.5 for power subsidy.** These provisions significantly strengthen the operational viability of CBG projects in the state.

## Madhya Pradesh

Madhya Pradesh ranks second with a **CapEx score of 3.7 and an OpEx score of 1.75.** The state records the **maximum score of 5 for capital assistance,** indicating strong capital subsidy provisions. It also receives **2.5 for land conversion support,** and a **high score of 5 for infrastructure or approach road support,** which is unique among the states assessed. The state further receives **3 for catchment area provisions, indicating attention to feedstock availability.**

Operational support in Madhya Pradesh is largely driven by **power subsidy provisions with a score of 4,** along with **0.5 for employment incentives.**

## Uttar Pradesh

Uttar Pradesh emerges as the third-strongest-performing state in the assessment, with a **CapEx score of 3.75 and an OpEx score of 1.3.** The state provides **strong capital assistance, with a score of 3.5 and the highest score of 5 for land assistance,** indicating a favourable policy environment for securing land for CBG projects. The state also receives **5 for tax incentives** and 3 for infrastructure or approach road support, strengthening its capital support framework. In terms of feedstock security, Uttar Pradesh scores **3 under catchment area provisions.**

On the operational side, the state provides **power subsidy support with a score of 2.5, and 0.5 for employment incentives.**

## Telangana

Telangana records a **CapEx score of 2.88 and an OpEx score of 2.10.** The state receives **4 for capital assistance, 2 for land conversion,** and **4.5 for tax incentives,** indicating moderate capital support. However, it does not provide infrastructure support or catchment area provisions.

Operationally, Telangana performs strongly on **power subsidy with the maximum score of 5,** and receives **3 for interest subvention,** although **operational assistance and employment incentives are absent,** which constrains the OpEx score.

## Bihar

Bihar records a **CapEx score of 2.83 and an OpEx score of 1.9.** The state provides **3.5 for capital assistance, 4 for land conversion support, and 4.5 for tax incentives,** indicating moderate support for capital policy.

Operationally, Bihar performs relatively well with **4 for interest subvention, 2.5 for power subsidy,** and **3.5 for employment incentives,** although **operational assistance and catchment area provisions are absent,** limiting the overall score.

## Andhra Pradesh

Andhra Pradesh records a **CapEx score of 3.1 and an OpEx score of 1.35**. The state receives **4 for capital assistance** and **3.5 for land conversion support,** indicating moderate capital support. It also records **5 for tax incentives** but does not provide infrastructure support or catchment-area provisions.

On the operational side, the state performs well on **power subsidy with a score of 4.5, but operational assistance, interest subvention, employment incentives,** and BAM-related incentives are absent, which reduces the operational score.

## Punjab

Punjab scored 2.7 under CapEX support and 1 under OpEx support. The state received **4 for capital assistance, 4 for tax incentives and 1 under land assistance,** scoring better than half of the states on capital support. However, the state scored relatively low on the operational assistance, with a score of 2.5 under the power subsidy/electricity duty and 2.5 on the **employment incentive.**

## Chhattisgarh

Chhattisgarh records a **CapEx score of 1.98 and an OpEx score of 1.2.** The state receives **2.5 for capital assistance** and **3 for land conversion support,** along with **3.5 for tax incentives,** indicating moderate capital policy support.

Operational support is primarily driven by **power subsidy (2.5) and strong employment incentives (4.5),** although **interest subvention and operational assistance provisions are absent,** which reduces the operational score.

## Haryana

Haryana records a **CapEx score of 2.5 but a low OpEx score of 0.35.** The state receives **3 for capital assistance, 2.5 for land conversion,** the maximum score of 3 for tax incentives, and **2 for catchment area provisions.**

However, the state provides no **operational assistance, interest subvention, power subsidy, or employment incentives,** which significantly weakens its operational support framework.

## Assam

Assam records a **CapEx score of 0.65 and an OpEx score of 1.5.** The state provides **0.5 for capital assistance and 4 for land conversion support,** but does not provide tax incentives, infrastructure support, or catchment area provisions.

Operational support comes mainly from **power subsidy with the maximum score of 5**, while **operational assistance, interest subvention, and employment incentives are absent.**

## Jammu and Kashmir

The policy is still in the draft stage. However, Jammu and Kashmir records a **CapEx score of 1.25** and an OpEx score of **0.35. The state provides 3.5 for land conversion suppor**t and **3 for tax incentives, along with 3 for catchment area provisions,** but does not provide capital subsidy support.

Operational provisions are limited, with **no power subsidy, interest subvention, or employment incentives,** resulting in a low operational score.

## Rajasthan

Rajasthan records a **CapEx score of 0.4 and an OpEx score of 0.75.** The state receives **4 for land conversion support** but provides no capital subsidy, tax incentives, infrastructure support or catchment area provisions.

Operational support is limited to **power subsidy** (**2.5**)**,** while all other operational parameters are absent.

## Odisha

Odisha ranks last with a **CapEx score of 0.3 and an OpEx score of 0.75.** The state receives **3 for land conversion support** but does not provide capital subsidy, tax incentives, infrastructure support, or catchment area provisions.

Operationally, the state receives **2.5 for power subsidy,** but all other operational parameters are absent..

## Key insights

The analysis shows that capital subsidy, land conversion incentives, and power subsidy are the most common policy instruments across states, while operational assistance, interest subvention, and structured feedstock or catchment area provisions remain limited or absent in several states. States such as Gujarat, Madhya Pradesh and Uttar Pradesh perform better because they combine multiple capital and operational incentives, whereas lower-ranked states rely on only one or two policy measures.

# 4. Good practices and recommendations

Based on the review of different states' policies on bioenergy or integrated renewable energy or industrial policy, it has been observed that different states are doing well in terms of providing significant incentives on different parameters of importance for biofuel sector.

## Good practices under state-level policies

This section intends to highlight good cases (largely in commercial aspects) of incentivization provided in different states and its policies pertaining to different parameters (see *Table 8: Consolidated examples of good practices on incentivization under states' bioenergy or integrated clean energy policy*).

**Table 8: Consolidated examples of good practices on incentivization under states' bioenergy or integrated clean energy policy**

| Parameter | Cases from bioenergy policies | Cases from integrated policies |
|---|---|---|
| **OpEX support** | | |
| Capital assistance | **Madhya Pradesh:** 10–40 per cent of the eligible fixed capital investment, capped at Rs 200 crore<br><br>**Gujarat:** 25 per cent of the eligible gross fixed capital investment capped at Rs 200 crore<br><br>**Uttar Pradesh:** Rs 75 lakh/tonne of CBG production, capped at Rs 20 crore | Andhra Pradesh and Telangana CBG subsidy of 20 per cent on fixed capital investment up to a maximum of Rs 1 crore per tonne per day capacity for duration of five years.<br><br>2G ethanol<br>20 per cent on FCI capped at Rs 1.5 crore per kilolitre per day (KLPD) capacity for five years. |
| Land assistance | **Uttar Pradesh:** The Revenue Department provides the land on token lease rent of Rs 1 per acre annually for a maximum lease period of 30 years.<br><br>**Madhya Pradesh:** Revenue land shall be provided at 50 per cent of circle rate.<br><br>**Bihar:** 25 per cent of land under the Bihar Industrial Area Development Authority (BIADA) for CBG units for 30-year lease at Rs 75,000 per acre annually | **Rajasthan:** For allotment of government land, developer to deposit Rs 1 lakh/TPD.<br><br>**Andhra Pradesh:** Land lease at Rs 15,000 per acre per year with 5 per cent escalation for every two years for biofuel plant<br><br>**Odisha:** Government land will be allotted at an annual lease rent of 2 per cent of the prevailing rates under the Industrial Policy Resolution for 25–30 years. Land is earmarked under the Land Bank scheme |

| Parameter | Cases from bioenergy policies | Cases from integrated policies |
|---|---|---|
| **OpEX support** | | |
| Land conversion fee | **Bihar:** 100 per cent exemption on land conversion fees and the same for priority cases.<br><br>**Uttar Pradesh:** Conversion of land as well as collection and storage of feedstock is permitted, along with deemed exemption from land ceiling. | **Andhra Pradesh and Assam:** Reimbursement of 100 per cent charges spent in respect of reclassification of land. |
| Tax benefits | **Uttar Pradesh:** 100 per cent reimbursement of state goods and service tax for 10 years.<br><br>**Haryana:** 100 per cent exemption from entry tax will be allowed for all supplies made for setting up and trial operation of the project | **Telangana:** Reimbursement of 100 per cent net SGST on sales of product for 1G, 2G ethanol and CBG for period of five years.<br><br>**Chhattisgarh:** Reimbursement of net SGST paid up to 12 years from the starting date of commercial production. |
| Registration/stamp duty | **Bihar:** 100 per cent exemption on stamp duty and registration<br><br>**Uttar Pradesh:** 100 per cent exemption of stamp duty will be given on rent deed/ lease/sale deed and registration | **Chhattisgarh:** 100 per cent exemption from Stamp Duty will be granted for the establishment; Registration Fee Reimbursement of 50 per cent payable on land<br><br>**Assam:** Reimbursement of 100 per cent stamp duty for the land utilized for the development of clean energy projects |
| Approach road | **Uttar Pradesh:** Approach road up to a maximum of 5 km from the unit to main road. Facilities will be provided to entrepreneurs who invest Rs 50 crore or more in a bio-plant.<br><br>**Madhya Pradesh:** 50 per cent assistance for road, including gas pipeline, power, drainage and sewage infrastructure up to the factory gate subject to a maximum of Rs 5 crore under infrastructure development assistance. | Not available |
| Catchment area | **Madhya Pradesh:** One block, one plant: district-level committee can increase the catchment area considering capacity of the project.<br><br>**Uttar Pradesh:** One bio-plant (CBG or bio-pellet or biodiesel) will be installed in each tehsil, and will be made as a catchment area for the bio-plant. | Not available |

| Parameter | Cases from bioenergy policies | Cases from integrated policies |
|---|---|---|
| **OpEX support** | | |
| Operational assistance | **Gujarat:** 15 per cent of operational expenditure with a ceiling of Rs 25 crore per annum | No significant assistance in integrated RE/state policies. |
| Interest subvention | **Bihar:** 10 per cent of the term loan for five years with an upper limit of 50 per cent of the project cost up to a maximum Rs 20 crore.<br>**Gujarat:** Subsidy on term loan at a rate of 7 per cent for borrowings up to Rs 100 crore capped at Rs 7 crore per annum | **Telangana:** 75 per cent of total interest on term loan not exceeding total of Rs 2 crore |
| Power subsidy | **Madhya Pradesh:** Exemption in energy development cess on power consumed for 10 years from COD. | **Telangana:** Reimbursement of electricity tariff of Rs 2 per unit for the period of five years.<br><br>**Assam:** Power tariff reimbursement at Rs 1/KWh for 10 years shall be paid for 1G, 2G ethanol and CBG plants |
| Electricity duty | **Uttar Pradesh and Madhya Pradesh:** 100 per cent exemption of electricity duty on consumption of electrical energy for 10 years. | **Chhattisgarh:** New enterprises to get electricity duty exemption up to 12 years from the date of the starting of the commercial production. Additionally, 50 per cent reimbursement of the charges for new electricity connections<br><br>**Rajasthan:** 100 per cent exemption from electricity duty for seven years. |
| Employment incentive | **Gujarat:** 100 per cent reimbursement of EPF scheme in case of females and 75 per cent in case of male employees for five years.<br><br>**Bihar:** 50 per cent reimbursement (for male) and 100 per cent reimbursement (for female) of expenditure related to the contribution to the ESI and EPF scheme for five years. | **Chhattisgarh:** 75 per cent reimbursement of the EPF contribution for skilled and semi-skilled employees (domicile of Chhattisgarh) for up to five years with maximum eligibility of Rs 1 crore per year. |
| Capacity building of manpower | **Bihar:** Subsidy of Rs 20,000 for skill development training of employees/staff who are domicile of state | **Chhattisgarh:** Reimbursement of training expenses of employee who are domicile and earn less than Rs 50,000 per month, up to Rs 15,000 per person. |
| Feedstock supply chain | **Madhya Pradesh:** The Department of Animal Husbandry, Madhya Pradesh, will execute long-term contracts with Letter of Intent (LoI) holders under the Sustainable Alternative Towards Affordable Transportation (SATAT) scheme for availability of land for animal shelters and availability of cow dung in the state. | **Assam:** The policy intends to develop feedstock collection centres with support from local bodies, farmers and other stakeholders<br><br>**Andhra Pradesh:** Policy gives support to the local bodies, farmers and/or stakeholders for setting up the feedstock collection centres with feedstock storage facilities. |

| Parameter | Cases from bioenergy policies | Cases from integrated policies |
|---|---|---|
| **OpEX support** | | |
| Subsidy on biomass aggregation machinery | **Madhya Pradesh and Uttar Pradesh:** An additional subsidy of 30 per cent up to a maximum of Rs 20 lakh per set of equipment, in addition to subsidy by the Government of India | **Assam:** 20 per cent capital subsidy shall be paid to developers on farm machinery. |
| FOM management | **Madhya Pradesh:** The state Agriculture Department to promote research marketing and distribution of organic manure. Sale and purchase of bio manure at licensed fertilizer shops to be made mandatory by state agriculture department.<br><br>**Haryana:** Agriculture and Farmer Welfare Department (AFWD) to promote organic fertilizer from projects.<br><br>Agriculture universities to conduct trials without charging cost. | Not available |

Source: CSE analysis

To summarize Table 4, a comparative analysis of state policies was done with a focus on both capital expenditure (CapEx) and operational expenditure (OpEx).

In terms of CapEx support, dedicated bioenergy policies in Madhya Pradesh provide 10–40 per cent of the eligible fixed capital investment, capped at Rs 200 crore, while Gujarat offers a 25 per cent subsidy on the same, also capped at Rs 200 crore. Uttar Pradesh's approach is based on production capacity, offering Rs 75 lakh per tonne of CBG, capped at Rs 20 crore. Under integrated policies, Andhra Pradesh and Telangana provide a 20 per cent subsidy on fixed capital investment for CBG, capped at Rs 1 crore per tonne per day, and for 2G ethanol, the same 20 per cent subsidy is capped at Rs 1.5 crore per kilolitre per day (KLPD) capacity, with both for a duration of five years.

For land assistance, Uttar Pradesh's policy is the most lucrative bioenergy policy in the country as it provides land on a token lease rent of Rs 1 per acre annually for up to 30 years, while Madhya Pradesh offers revenue land at 50 per cent of the circle rate. Bihar provides 25 per cent of land under the Bihar Industrial Area Development Authority (BIADA) for CBG units on a 30-year lease at Rs 75,000 per acre annually. Rajasthan requires a deposit of Rs 1 lakh per TPD for government land. Integrated policies in Andhra Pradesh allow land lease at Rs 15,000 per acre per year with a 5 per cent escalation every two years, and Odisha allots government land from its 'land bank' at an annual lease rent of 2 per cent of

prevailing rates for 25–30 years. Regarding land conversion fees, Bihar grants a 100 per cent exemption, and Uttar Pradesh provides a deemed exemption. Andhra Pradesh and Assam's integrated policies offer a 100 per cent reimbursement of land reclassification charges.

In the realm of tax benefits, Uttar Pradesh provides a 100 per cent reimbursement of state goods and service tax for 10 years. Haryana offers a 100 per cent exemption from entry tax for all supplies related to setting up and trial operations. Under integrated policies, Telangana and Chhattisgarh provide a 100 per cent and 50 per cent reimbursement of net SGST respectively, with Telangana for five years and Chhattisgarh for up to 12 years from commercial production. Additionally, policies in Bihar and Uttar Pradesh provide a 100 per cent exemption on stamp duty and registration fees, a benefit also offered by Chhattisgarh and Assam with some variations. For infrastructure, Uttar Pradesh and Madhya Pradesh offer support for approach roads, with Uttar Pradesh providing up to 5 Km of road for investments of 50 crores or more, and Madhya Pradesh offering 50 per cent assistance for various infrastructure up to Rs 5 crore. This specific support is not available in the integrated policies listed.

Operational expenditure (OpEx) support also shows a varied approach. Gujarat is the only state which provides 15 per cent of OpEx with a ceiling of Rs 25 crore per annum, while there is no significant assistance noted in integrated policies. For interest subvention, Bihar offers 10 per cent on the term loan for five years, capped at 50 per cent of the project cost up to Rs 20 crore. Gujarat provides a 7 per cent subsidy on term loans up to Rs 100 crore, capped at Rs 7 crore per annum. Telangana's integrated policy offers a reimbursement of 75 per cent of the total interest on a term loan, not exceeding Rs 2 crore.

Power subsidies are available in Telangana and Assam's integrated policies, with a reimbursement of electricity tariff at Rs 2 and Rs 1 per unit respectively for a specified duration while in Madhya Pradesh, in the form of exemption on energy development cess for 10 years, and furthermore, electricity duty is 100 per cent exempt for 10 years in Uttar Pradesh and Madhya Pradesh, while Chhattisgarh and Rajasthan offer a 100 per cent exemption for 12 and seven years respectively.

Employment incentives are also a key part of these policies. Gujarat and Bihar provide 100 per cent and 50 per cent reimbursement for EPF contributions for female and male employees respectively for five years, with Bihar extending a 100 per cent reimbursement for female employees to the CBG manufacturers.

Chhattisgarh offers a 75 per cent reimbursement of EPF contributions for skilled and semi-skilled domiciled employees for up to five years, capped at Rs 1 crore per year.

For capacity building, Bihar provides a subsidy of Rs 20,000 for skill development training, and Chhattisgarh reimburses training expenses up to Rs 15,000 per person to the CBG industry.

Feedstock supply chain support is seen in Madhya Pradesh, where the Animal Husbandry Department will execute long-term contracts for cow dung supply. Integrated policies in Assam and Andhra Pradesh intend to support the development of feedstock collection centres with assistance from local bodies and farmers.

Finally, Madhya Pradesh and Uttar Pradesh provide an additional 30 per cent subsidy on biomass aggregation machinery, capped at Rs 20 lakh per set. Assam's integrated policy offers a 20 per cent capital subsidy on farm machinery.

Lastly, in terms of FOM management, Madhya Pradesh promotes the marketing and distribution of organic manure, while Haryana's Agriculture and Farmer Welfare Department will promote the use of organic fertilizer from bioenergy projects.

## Recommendations

There are several policies for the bioenergy sector both at the Central and the state levels. The Central government, including the Ministry of New and Renewable Energy (MNRE), Ministry of Petroleum and Natural Gas (MoPNG) etc., has been actively working on the policy front and come up with relevant policies or amendments in existing policies to cater to the requirements of the sector. Parallely, many states (as mentioned in previous sections) have brought dedicated policies addressing the bioenergy sector and are complementing the support extended by policies at the Central level.
Based on the assessment of the policies and existing status of bioenergy sector, the following are the recommendations to ensure upscaling of the sector.

1. **State policies should also consider operational assistance for the bioenergy sector:** As observed, only the state of Gujarat provides considerable operational assistance to the biofuels sector under its biotechnology policy. Since the biofuel sector is an OpEx-intensive sector, it is important that state

agencies consider providing support to the sector on operational expenditure until the sector stabilizes.

2. **Requirement for state-level support and hand-holding to counter slow-paced implementation:** Despite numerous Central and state policies, actual on-the-ground implementation of biofuel projects, especially CBG plants, is extremely slow. A significant number of registered plants (about 1,178) are either under construction or are still to start construction, with only a small fraction (about 150) currently operational.

   To address the implementation challenges, the sector needs strong support and 'hand-holding' from state nodal agencies. It is vital for these agencies to actively address the concerns of registered entrepreneurs—such as regulatory hurdles or supply chain issues—to accelerate the construction and operationalization of plants in the pipeline. An online grievance redressal mechanism may be set up by the states to provide a medium for registered entrepreneurs to raise issues faced by them at any stage of setting up the CBG manufacturing unit.

3. **Need for a comprehensive monitoring framework:** To address the lack of data and slow implementation, a comprehensive monitoring and assessment framework is essential. It is recommended that the GOBARdhan portal be enhanced to include structured and updated information on operational plants. This would serve as a crucial tool for policymakers to understand the challenges faced by entrepreneurs and for stakeholders to track progress.

4. **Address the lack of operational data and transparency:** There is a critical absence of publicly available, real-time data on the performance of operational CBG plants. The GOBARdhan portal and other government websites lack information on operational efficiency, actual CBG production, and the generation/utilization of byproducts, which makes it impossible to assess the sector's performance and identify bottlenecks.

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This report analyses state-specific bioenergy and/or biofuel policies and how states have considered and incorporated the biofuel sectors into their policy frameworks.

The inclusion of biofuels in a state's policy is an initial step that aligns with the state administration's vision for energy management and boosting renewable energy in the state. Strengthening of policy framework and its on-ground implementation is an important aspect in upscaling the biofuel sectors.

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