

India's Biomass Blueprint: Policy Formulation & Global Case Study Synthesis

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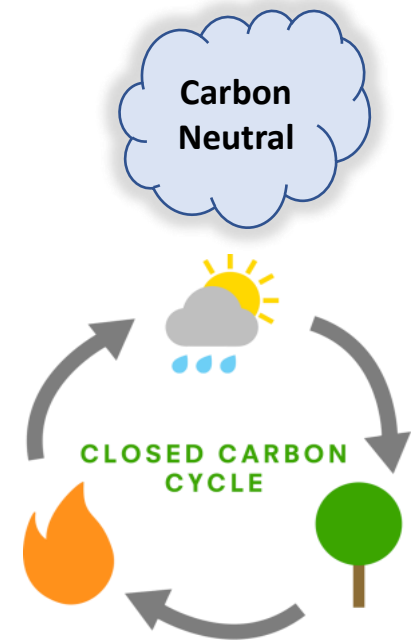


Introduction

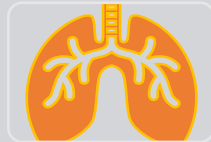
Biomass is renewable organic material that comes from plants. It is defined as biological material which is directly or indirectly produced by photosynthesis.

Source: US EIA & IEA

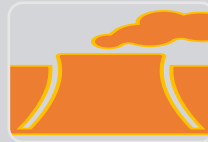
Next Cycle of Plant's generation removes as much CO₂, as is emitted into the atmosphere from its agro-residue(Biomass) combustion and thus is Carbon Neutral.



Carbon neutral: Net Zero emissions: Enhancing climate



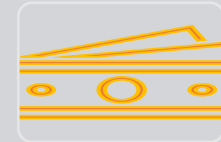
GHG reduction: Biomass co-firing is a suitable method to reduce GHG emission, because this process reduces net CO₂, PM, SO₂ and often NOX emissions, compared to coal combustion.



Reduction in fossil fuel Dependency: It reduces the over reliance on fuel for Power generation.



Supplement Renewable source: Many coal plants are aging and near replacement, cofiring with biomass could be an excellent survival strategy to bring down specific CO₂ emissions of aging plants.



Income generation: Revenue source for MSME entrepreneurs and Farmers.

COP 28: Combat for Clean air & Climate

The United Nations Framework Convention on Climate Change (UNFCCC) at the 28th Conference of Parties (COP 28) in Dubai sets the stage for transformative action in addressing global challenges. Embracing four key paradigm shifts is essential for navigating the complex landscape of environmental, social, and economic sustainability.

“Four paradigm shifts” for transformative action

Shift 1: Fast-Tracking the Energy Transition and Emission Reduction: Expediting the energy transition and emission reduction by 2030

Shift 2: Transforming Climate Finance for Old Promises and New Deals: Reforming climate finance to fulfil previous commitments.

Shift 3: Placing People, Nature, Lives, and Livelihoods at the Heart of Climate Action: Establishing a framework for a new financial agreement, prioritizing people, nature, lives, and livelihoods in climate action.

Shift 4: Mobilizing for the Most Inclusive COP Ever: Encourage the active involvement of stakeholders from various sectors , striving for the most inclusive COP ever.

India's Current Biomass Landscape

Two Major Biomass Ministries

Ministry of
Agriculture and
Farmers' Welfare

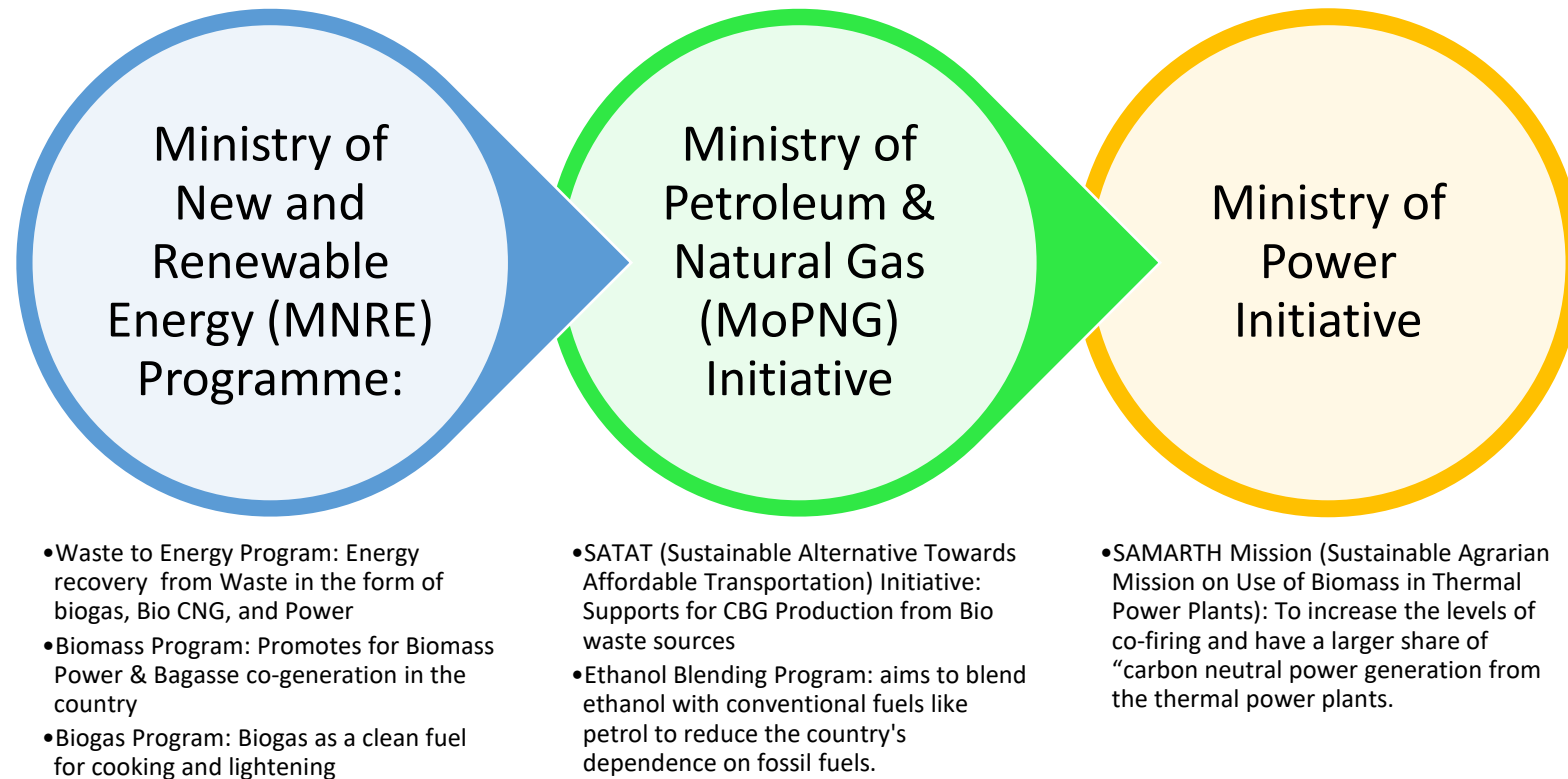
- Annually Producing 228 MMTPA of surplus agro residue
- Taken Initiative for In-situ & ex- situ crop residue management

Ministry of
Environment, Forest
and Climate Change

- Guard for the forest conservation, climate change and environment sustainability
- Introduced many compliance and obligation to protect environment.

India's Current Biomass Landscape

India has taken many of the initiatives to tap this energy potential of Biomass



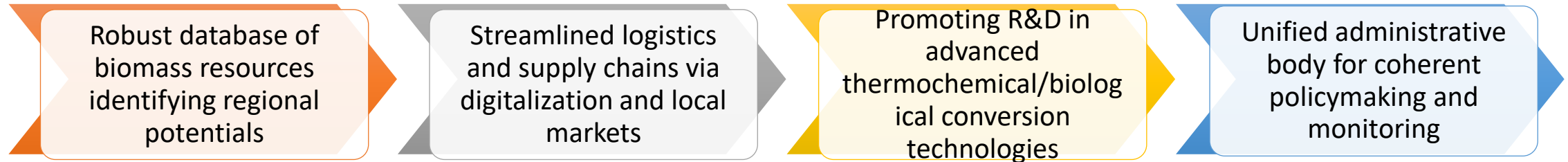
Global case studies comparision

Sl. No.	Country Name	Initiatives	Government Departments/ Missions	Targets	Challenges
1	Brazil	Ethanol from sugarcane supported by policies, infrastructure, stakeholder coordination	<ul style="list-style-type: none"> Ministry of Mines and Energy National Biofuels Policy 	<ul style="list-style-type: none"> Increase the share of biofuels in the energy matrix to 18% by 2030 Reduce the carbon intensity of the transport sector by 10.1% by 2028 Achieve net-zero emissions by 2050 	<ul style="list-style-type: none"> Land use competition and environmental impacts of sugarcane expansion Uncertainty and volatility of oil and ethanol prices Lack of infrastructure and logistics for biofuel distribution
2	Sweden	Efficient municipal waste collection and biogas production systems	<ul style="list-style-type: none"> Swedish Energy Agency Centre for Renewable Energy Development The Swedish bioeconomy strategy 	<ul style="list-style-type: none"> Increase the share of renewable energy in final energy consumption to 50% by 20304 Achieve 100% renewable electricity production by 2040 Achieve net-zero emissions by 2045 	<ul style="list-style-type: none"> High investment costs and risks for bioenergy projects Competition and integration with other renewable energy sources Sustainability and certification issues of biomass feedstocks
4	China	Abundant biomass resources but challenges in optimization and sustainability	<ul style="list-style-type: none"> National Development and Reform Commission Ministry of Science and Technology National Energy Administration 	<ul style="list-style-type: none"> Increase the share of non-fossil fuels in primary energy consumption to 20% by 2030 Achieve carbon peak by 2030 and carbon neutrality by 2060 Increase the share of biofuels in transport fuels to 15% by 2030 	<ul style="list-style-type: none"> High cost and Low efficiency of biomass conversion technologies Lack of clear and stable policy support and incentives for bioenergy competition and trade-offs with food security and environmental protection

Barriers to Bioenergy deployment

- **Political and institutional barriers:**
 - Policy Uncertainty
 - Weak institutional structure
- **Financial and economic barrier:**
 - Fossil fuel subsidies
 - High Cost
 - Lack of access to affordable finance
- **Technical and infrastructure-related barriers:**
 - Low level technology readiness
 - Reliability of technology
 - Lack of infrastructure
- **Supply chain related barriers:**
 - Lack of stable feedstock
 - Lack of qualified workers and skills
 - Sustainability risks
- **Information and public awareness related barriers:**
 - Lack of reliable information
 - Low public awareness

Challenges and their Solutions



Other Country Resolution on Barriers and policies for Bioenergy utilisation enhancement

Barriers	Policies	Country resolution
Weak supply chain	Subsidies and grants	China
Lack of infrastructure		
High Cost	Subsidies and grants, renewable obligations, mandatory biomass cofiring, green power auctions	China, European Union, Germany, India, Indonesia, Japan, Kenya, Republic of Korea, United Kingdom, United states, Vietnam
Lack of finance access		
Technical, logistical and economic challenges related Bioenergy with carbon capture and storage (BECCS)	Funding to demonstration projects, innovative business models	European Union
Sustainability risks	Sustainability governance and regulations.	European Union

Key Recommendations



MECHANISMS FOR AGGREGATED
BIOMASS COLLECTION FROM
RURAL AREAS



TECHNICAL AND FINANCIAL
ASSISTANCE FOR FARMER
COOPERATIVES



CROSS-SECTORAL COORDINATION
BETWEEN GOVERNMENT
MINISTRIES



INVESTMENTS IN TECHNOLOGICAL
ADVANCEMENTS AND SUPPORTIVE
INFRASTRUCTURE

Thank You