



BUSINESS PLAN · INDIA

Biogas / Biomass Energy Plant

Waste-to-energy generation

ENERGY

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This document is confidential and prepared for planning purposes. All financial figures are illustrative model assumptions for an Indian MSME context and must be validated against live quotes, local rates and professional advice before any investment or borrowing decision.

1. Executive Summary

This plan sets out a **Biogas / Biomass Energy Plant** in India — a waste-to-energy facility that converts organic/agri waste (crop residue, cattle dung, food/market/municipal waste, press-mud) into **biogas / Compressed Biogas (CBG), power, or bio-CNG plus bio-fertiliser**, sold under offtake/PPA arrangements. It earns revenue from **energy/CBG sales + bio-fertiliser + tipping fees + carbon credits**, monetising India's waste-management need, the **SATAT (CBG) programme** & MNRE subsidies — a **capex-heavy, feedstock-dependent, utilisation (plant-load-factor)-driven** generation business with a long gestation.

India generates vast agri & organic waste and needs clean fuel & better waste management; biogas/CBG (via SATAT with OMC offtake), biomass power & bio-CNG offer a subsidised, policy-backed route, plus valuable bio-slurry/fertiliser & carbon credits. A biogas/biomass plant is a **capital-intensive generation business**: heavy plant capex, long gestation, & success hinges on **secure feedstock supply (the #1 risk), plant utilisation/PLF, offtake (PPA/SATAT/CBG), technology & O&M**. Revenue rests on **generation × offtake price + fertiliser + tipping + carbon, funded by equity + term debt + subsidy**; success rests on feedstock security, offtake, utilisation, technology & capital — it is capex-, feedstock-, offtake- & utilisation-driven.

This is a capital-intensive generation business — funded by promoter equity plus substantial term debt & MNRE/scheme subsidy. This plan models a biogas/CBG plant requiring **₹12 crore** (₹4 crore promoter equity + ₹6.5 crore term debt + ₹1.5 crore subsidy), reaching stabilised operations with revenue of **₹6 crore** in Year 1 (partial) scaling to **₹11 crore** by Year 3. *(Biogas/biomass plant; generation × offtake + fertiliser/tipping/carbon, capex/feedstock/offtake/utilisation-driven, long-gestation — figures illustrative.)*

2. Business Description, Vision & Legal Structure

Concept: A biogas/biomass waste-to-energy plant - converting organic/agri waste to CBG/biogas/power + bio-fertiliser, sold under SATAT/PPA/offtake, aided by MNRE subsidy.

Vision: To turn waste into clean energy & value - sustainably & profitably.

Mission: Run a well-fed, high-utilisation plant with secure feedstock, reliable offtake & sound O&M.

Legal structure options

- **Private Limited / LLP** — recommended for capex, term debt, SATAT/PPA & subsidy.
- **SPV** — often used for a single plant (project finance).

Regulatory anchor: a biogas/biomass plant operates within MNRE/SATAT (CBG) & state renewable programmes, OMC/DISCOM offtake (CBG/power PPA), pollution/environment (CTE/CTO), factory/boiler/gas safety, FCO for bio-fertiliser, subsidy empanelment & land/feedstock arrangements. Feedstock security, offtake, utilisation/PLF, technology, O&M & capital determine success; it is capex-, feedstock-, offtake- & utilisation-driven, long-gestation.

3. Promoter & Ownership

Led by a promoter with renewable-energy, biogas/CBG, agri or plant-operations expertise & the capital/feedstock access. The team includes plant operations/O&M, feedstock procurement/aggregation (critical), technical/process, offtake & sales (energy/fertiliser), finance & compliance. Feedstock security, utilisation, offtake & O&M are the differentiators. Ownership, equity & any investors/subsidy are editable inputs.

4. Market Analysis — India

India's large agri/organic waste, clean-fuel push (SATAT targets thousands of CBG plants with OMC offtake), MNRE subsidies, waste-management need & carbon/ESG demand create strong policy-backed demand for biogas/CBG/biomass energy. Demand is waste-/clean-fuel-/policy-driven & offtake-backed. The market rewards feedstock security, offtake (SATAT/PPA), utilisation/PLF, technology, O&M & capital; it is feedstock-, offtake-, policy- & capex-sensitive, met with feedstock, offtake, utilisation & capital.

Demand drivers

- **SATAT (CBG)** & OMC offtake.
- **Vast agri/organic waste** & waste-management need.
- **MNRE subsidies & clean-fuel** push.
- **Bio-fertiliser & circular-economy** value.
- **Carbon credits & ESG.**

Market sizing (illustrative framing)

Layer	Definition	Indicative scale
TAM	Biogas/CBG/biomass in India	Large & policy-driven
SAM	Region/feedstock & offtake	Substantial
SOM (Yr 1-3)	Plant output (CBG/power)	Stabilising/scaling

Offtake / customers

- OMCs (CBG under SATAT).
- DISCOMs / industry (biomass power PPA).
- Bio-fertiliser buyers (farmers/agri).
- Waste generators (tipping fees) & carbon buyers.

5. Competition & Competitive Advantage

Landscape: other biogas/CBG/biomass developers, large energy/waste players & alternative renewables. The plant competes on feedstock security, plant efficiency/utilisation, offtake tie-ups, technology, O&M & cost — feedstock & utilisation are the real battleground.

The business's edge

- **Secure feedstock supply (the #1 lever).**
- **Plant utilisation/PLF & efficiency.**
- **Offtake tie-ups (SATAT/PPA).**
- **Technology & O&M reliability.**
- **Bio-fertiliser/carbon & subsidy capture.**

6. Products & Revenue Model

Stream	Model	Basis
CBG / biogas (SATAT/OMC)	Offtake price × volume	Core
Biomass power (PPA)	Tariff × generation	Core (if power route)
Bio-fertiliser / slurry	Sales	By-product value
Tipping fees (waste)	Fee per tonne	Feedstock-linked
Carbon credits	Credit sales	Upside

Core revenue is **CBG/biogas (SATAT/OMC offtake) or biomass power (PPA)** — generation × offtake price; bio-fertiliser, tipping fees & carbon credits add valuable by-product/ancillary income. Economics = generation (feedstock × utilisation/PLF) × offtake + by-products – feedstock/O&M – debt; feedstock security, utilisation, offtake & capital drive it — the decisive biogas levers (capex-heavy, feedstock-critical).

7. Go-to-Market — Offtake & Feedstock

- **Feedstock aggregation** (farmers/dairies/mandis/municipal — secure, long-term).
- **Offtake tie-ups** (OMC/SATAT, DISCOM/industry PPA).
- **Bio-fertiliser sales** (agri channels).
- **Tipping-fee & waste** arrangements.
- **Subsidy & carbon** capture.

Approach

Secure feedstock (the make-or-break) & offtake (SATAT/PPA) → build/commission plant → ramp utilisation/PLF → sell CBG/power + fertiliser + tipping + carbon → capture subsidy → stabilise & optimise O&M. Feedstock security, utilisation & offtake build a viable plant; long gestation demands patient capital & disciplined execution.

8. Operations Plan (capex-heavy generation)

- **Plant & technology:** digesters/gasifiers, purification/compression (CBG), gas/power equipment, storage — capital-intensive; technology choice critical.
- **Feedstock:** aggregation, storage, quality & year-round supply — the #1 operational risk & cost.
- **Operations/O&M:** utilisation/PLF, process stability, maintenance, safety (gas/boiler).
- **Offtake & by-products:** CBG/power dispatch, fertiliser packaging/sales, tipping, carbon.
- **Compliance:** MNRE/SATAT, pollution CTE/CTO, factory/gas safety, FCO (fertiliser), subsidy.

Plant workflow

Stage	Activity	Metric
Feedstock	Aggregate/store	Supply security/cost
Process	Digest/purify/compress	Yield/efficiency

Generate	CBG/power	Utilisation/PLF
Sell	Offtake + by-products	Realisation
Comply	Subsidy/pollution/safety	Compliance

9. Regulatory, Licences & Compliance (India)

- **MNRE / SATAT:** CBG scheme, OMC offtake agreement, subsidy/empanelment.
- **Offtake:** OMC/DISCOM PPA/agreement; tariff.
- **Environment/safety:** pollution CTE/CTO; factory/boiler/gas safety; land.
- **Fertiliser:** FCO (bio-fertiliser); GST; company/SPV.

10. Organisation & Manpower Plan

Role	Yr 1	Yr 2	Yr 3
Promoter / plant head	1	2	2
Plant operations & O&M	12	16	20
Feedstock procurement/aggregation	5	8	11
Technical, sales (energy/fertiliser) & safety	4	6	8
Finance, compliance & admin	3	4	5
Total	25	36	46

11. Implementation Timeline & Milestones

Phase	Timeline	Milestone
Develop	Month 0-8	SPV, land, feedstock & offtake tie-ups, subsidy, financial close
Build	Month 8-16	Plant construction, equipment, commissioning
Ramp	Month 16-24	Utilisation/PLF ramp, offtake, ₹6cr (partial-year) revenue
Stabilise	Year 2	Stable PLF, by-products, ₹9cr
Optimise	Year 3	₹11cr revenue; utilisation & margins optimised

Note: gestation is long — development + build can take 12-18 months before revenue; the P&L below is shown from the first operating year.

12. Financial Plan (Illustrative — first operating year onward)

All figures are illustrative model assumptions for an Indian context, shown so the promoter can replace them with live rates. They are not projections of guaranteed results. Biogas/biomass is capex-heavy & long-gestation; feedstock cost/security & utilisation (PLF) are the make-or-break; funded by equity + term debt + subsidy.

12.1 Project cost & means of finance

Capital requirement	₹
Plant, digesters, purification/compression & equipment	8,50,00,000
Land, civil & infrastructure	1,80,00,000
Working capital (feedstock + operations)	1,20,00,000
Pre-operative, development & contingency	50,00,000
Total project cost	12,00,00,000
Promoter equity	4,00,00,000
Term debt (project finance)	6,50,00,000
MNRE / scheme subsidy	1,50,00,000

12.2 Projected Profit & Loss (3 operating years)

Particulars	Year 1	Year 2	Year 3
CBG / energy sales (offtake)	4,50,00,000	7,00,00,000	8,50,00,000
Bio-fertiliser & tipping fees	1,20,00,000	1,60,00,000	2,00,00,000
Carbon credits & other	30,00,000	50,00,000	50,00,000
Total revenue	6,00,00,000	9,10,00,000	11,00,00,000
Feedstock cost (largest)	2,40,00,000	3,50,00,000	4,20,00,000
O&M, labour & utilities	1,60,00,000	2,20,00,000	2,60,00,000
Interest & depreciation	1,50,00,000	1,80,00,000	1,80,00,000
Overheads & other	30,00,000	45,00,000	55,00,000
Total expenses	5,80,00,000	7,95,00,000	9,15,00,000
Net profit (before tax)	20,00,000	1,15,00,000	1,85,00,000
Net margin	3.3%	12.6%	16.8%

12.3 Unit economics & break-even

- **Generation (feedstock × PLF) × offtake:** revenue = plant output × offtake price + by-products; utilisation/PLF & offtake price drive the top line; feedstock cost/security is the largest & most volatile cost — the make-or-break.
- **Long gestation & capex:** heavy capex + long build/ramp before stable PLF; subsidy & term debt fund it; margins improve as PLF stabilises & by-products (fertiliser/carbon) add value.
- **Break-even:** at a PLF/offtake threshold covering feedstock, O&M, interest & depreciation; early years thin (ramp), improving strongly at stable utilisation.

12.4 Projected Cash Flow — Year 1 operating (quarterly, illustrative)

Particulars (₹)	Q1	Q2	Q3	Q4
Opening balance	40,00,000	35,00,000	36,00,000	38,00,000

Sales collections (offtake + by-products)	1,25,00,000	1,45,00,000	1,60,00,000	1,70,00,000
Feedstock, O&M, interest & operating	1,30,00,000	1,44,00,000	1,58,00,000	1,66,00,000
Closing balance	35,00,000	36,00,000	38,00,000	42,00,000

Biogas/biomass is capex-heavy & long-gestation with feedstock cost/security the dominant risk. Secure long-term feedstock, PLF ramp, offtake (SATAT/PPA) certainty, by-product/subsidy income, term-debt structuring & a WC buffer manage cash; the key risks are feedstock shortage/price, low utilisation/PLF, offtake/tariff, technology/O&M & capex/gestation overrun — met with feedstock contracts, utilisation, offtake tie-ups & disciplined execution.

12.5 Key Performance Indicators to Monitor

- **Feedstock:** supply security; cost/tonne; quality; storage.
- **Plant:** utilisation/PLF; yield/efficiency; uptime.
- **Revenue:** offtake price/volume; by-product/fertiliser; carbon.
- **Finance:** margin; DSCR; subsidy; break-even PLF.

13. Funding Requirement & Bankability

This plant is **capital-intensive & long-gestation**: ₹12 crore funded by **₹4 crore promoter equity + ₹6.5 crore term debt (project finance) + ₹1.5 crore MNRE/scheme subsidy**. Bankability rests on **secure long-term feedstock, firm offtake (SATAT/OMC or PPA), realistic PLF, technology & DSCR** — lenders scrutinise feedstock & offtake contracts & the ramp. Early years are thin (gestation/ramp), improving strongly at stable utilisation. Feedstock security, utilisation, offtake & capital underpin the model. *(Business model, not investment advice; SATAT/MNRE/pollution approvals are prerequisites.)*

13.1 Funding utilisation (₹12 crore)

Use of funds	₹	% of total
Plant, digesters, purification & equipment	8,50,00,000	70.8%
Land, civil & infrastructure	1,80,00,000	15%
Working capital (feedstock + operations)	1,20,00,000	10%
Pre-operative, development & contingency	50,00,000	4.2%
Total	12,00,00,000	100%

14. Risk Analysis & Mitigation

Risk	Mitigation
Feedstock shortage / price (the #1 risk)	Long-term feedstock contracts, aggregation network, diversification, storage
Low utilisation / PLF	Feedstock security, technology, O&M, ramp discipline
Offtake / tariff (SATAT/PPA)	Firm offtake agreements, OMC/DISCOM tie-ups
Capex / gestation overrun	Project management, contingency, phased execution

Technology / O&M	Proven technology, O&M, safety, maintenance
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15. SWOT Analysis

Strengths Policy-backed (SATAT/MNRE); offtake & subsidy; by-products (fertiliser/carbon); waste-to-value; ESG.	Weaknesses Capex-heavy & long-gestation; feedstock-security-critical; utilisation/PLF-dependent; execution/technology risk.
Opportunities SATAT/CBG scale; agri-waste; carbon credits; bio-fertiliser; waste-management tie-ups; replication.	Threats Feedstock competition/price; offtake/tariff/policy shifts; capex/technology risk; gestation delays.

16. Recommended AiSevak Tools for This Business

This biogas/biomass plant would use AiSevak's Energy vertical tools in delivery:

- **Plant ops:** feedstock-aggregation/cost & utilisation/PLF, generation/yield & offtake/by-product, O&M/safety tools.
- **Project & compliance:** SATAT/MNRE-subsidy & pollution/FCO, project-finance/DSCR & offtake-contract tools (with Finance & Legal verticals).
- **Practice:** Business Plan, PLF/feedstock/offtake and DSCR/Break-even modelling tools to plan & monitor the plant.

17. Key Assumptions & Notes

- Biogas/biomass plant: waste-to-energy (CBG/biogas/power) + bio-fertiliser + tipping + carbon, under SATAT/PPA/offtake & MNRE subsidy; capex-heavy, long-gestation.
- Generation (feedstock × PLF) × offtake + by-products decisive; feedstock security (the #1 risk), utilisation/PLF, offtake & technology are the levers.
- Funded by equity + term debt (project finance) + subsidy; SATAT/MNRE, pollution CTE/CTO, factory/gas safety, FCO apply; long build/ramp before revenue.
- Feedstock, utilisation, offtake & capital drive economics; figures illustrative (first operating year onward), exclude GST; business model, not investment advice.

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