

# ENSURING BANKABILITY IN SWM & WTE PROJECTS IN INDIA

PREPARED FOR 3<sup>RD</sup> INTERNATIONAL WORKSHOP ON  
“SUSTAINABLE MUNICIPAL SWM IN INDIA”

ORGANIZED BY – WASTE TO ENERGY RESEARCH &  
TECHNOLOGY COUNCIL

# Presentation Outline

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**Indian Waste Scenario**

**Indian SWM Industry**

**MSW Value Chain**

**Project Size Considerations**

**Structuring Projects & Example Business Models**

**SWM/WTE Project Development Challenges**

**The Consortium SPV Structure Advantages**

**Additional Financing Considerations**

# PM Narendra Modi's Mission

## Swachh Bharat / Clean India

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**National level campaign covering 4041 statutory towns to clean streets, roads and infra; involving industry, government, media, entertainers, and overall population**



# Indian Waste Scenario – Favorable Climate

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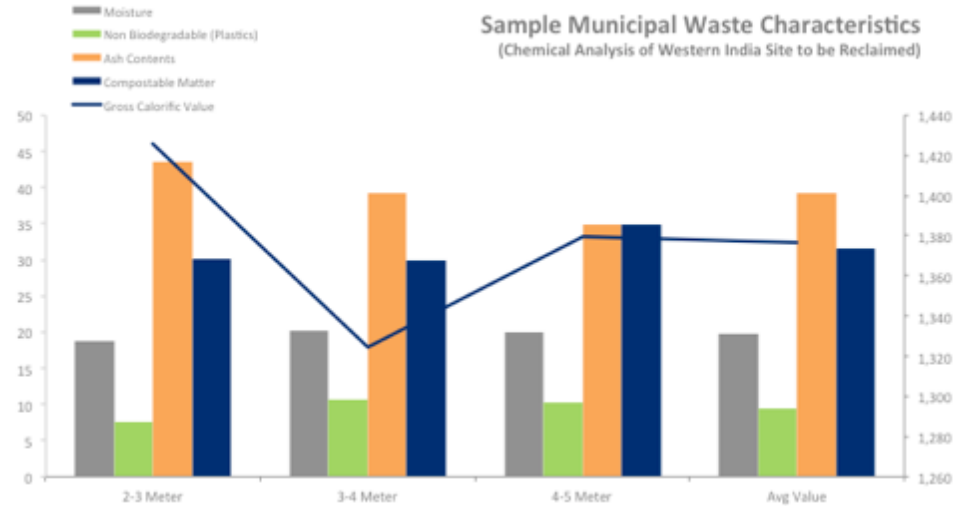
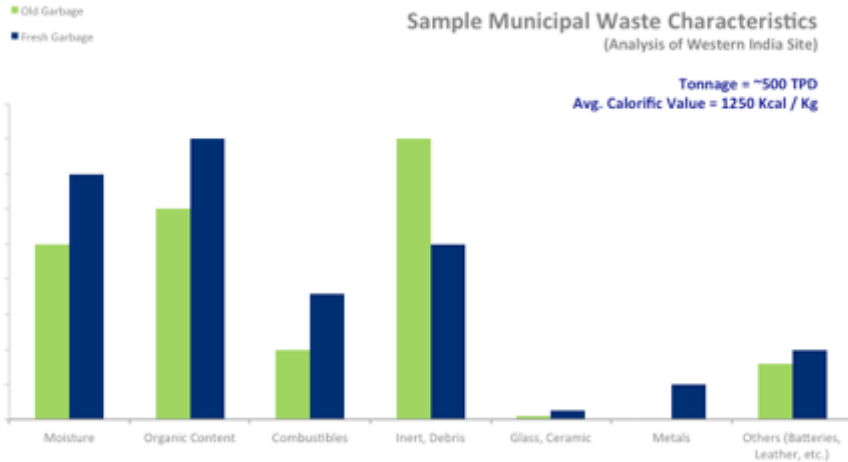
- ✓ India's annual generation of urban waste is ~69M tons
- ✓ Expected to increase to 137M tons annually by 2025
- ✓ 63.7% of MSW is not collected
- ✓ Large potential and under-penetrated
- ✓ PPP emerging as new model for SWM
- ✓ Current spending on waste management by municipalities is principally on collection and transportation
- ✓ Potential of about 1700 MW from urban waste (1500 from MSW and 225 MW from sewage) and about 1300 MW from industrial waste exists in India
- ✓ Indian municipal solid waste to energy market could be growing at a compound annual growth rate of 9.7% by 2013

## MSW Generation in India (Million Tons)



# Sample Waste Characteristics

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# Indian Waste Scenario – Key Factors

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## Key Drivers

### Increasing Population → Increasing Waste

- ✔ Burgeoning population is ensuring India is generating waste in epic proportions that is overstressing the already overburdened municipal infrastructure

### Reducing Space of Landfills

- ✔ Increasing gravitation of population to metro and tier II cities has dramatically reduced space available for landfills
- ✔ Existing mismanaged landfills are overflowing

### Landfill Mismanagement → Health Issues

- ✔ Improper SWM is deteriorating public health, causing environmental pollution & climate change and greatly impacting the quality of life of citizens

### Accelerated Government Initiatives

- ✔ Many government schemes are being provided for infrastructure development in small and medium sized towns

## Key Challenges

### Inefficient Storage / Segregation System

- ✔ Source storage and segregation of waste based on degradability and hazards is almost not done in India
- ✔ Proper planning and specific benchmarks for street sweeping do not exist

### High Reliance on Age-old Technologies

- ✔ Absence of scientific landfills encourages open dumping of wastes which are highly polluting to nearby aquifers, water bodies and settlements

### Lack of Financial Closures and a Fragile Regulatory Framework

- ✔ There is lack of bankable and financially sustainable projects considering the opportunities and risks involved
- ✔ An ambitious waste management strategy without considering project development realities is resulting in stalled projects

# Indian SWM Industry – Quick Snapshot

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- Household level coverage of waste C&T in metro and Tier I cities is 100%
- For example BMC<sup>(1)</sup> spends ~Rs. 1160/ton (\$25/ton) on C&T and disposal of MSW
- C&T constitutes ~80% of the total cost of a project
- In India, the average municipal expenditure on solid waste management is `500 to `1500/ton (\$10 to \$32/ton)

## Collection & Transportation

- Segregation is an emerging practice at the household level with awareness increasing slowly but steadily
- Rag pickers pick up recyclables from bins and sell them in the market
- Due to this informal segregation, volume reduction is achieved, but it ignores economic, environmental and health aspects

## Segregation

- In India, MSW is disposed of in an unregulated and unscientific manner in open dumpsites
- Most dumps lack systems for leachate collection, landfill gas collection or monitoring, nor do they use inert materials to cover the waste
- This results in ground and surface water contamination from runoff and lack of covering, air pollution caused by fires resulting in severe health problems

## Processing

- Recent WtE projects have not yielded positive results since technologies were deployed without considering the local waste characteristics
- Based on the composition of Mumbai MSW, processing the waste in a WtE facility would reduce its volume significantly, thus freeing up land that would otherwise have been used for landfills
- With space in urban areas at a premium WtE provides an effective way to reduce the volume of waste

## WtE

## SWM Waste Processes

# What about Investor Returns?

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Same project ... but ...

**Quantifies** penalties and uncertainties ...



# Example of Risk-adjusted Returns ...

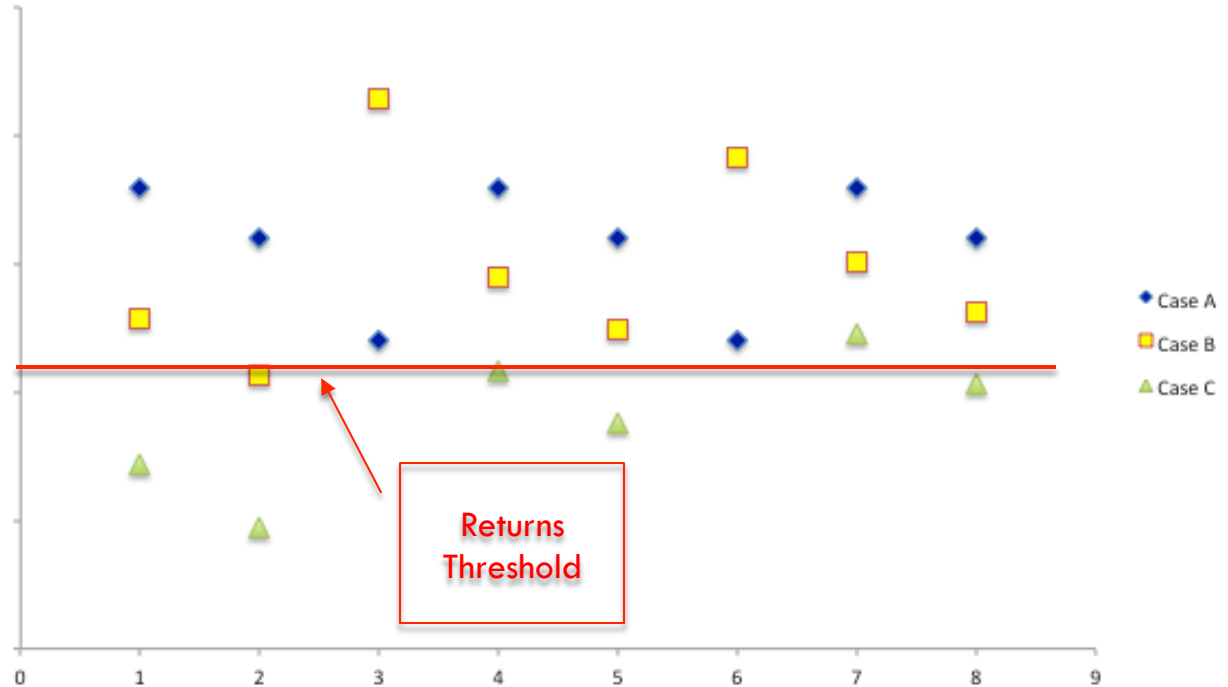
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**Tariff Selection based on Evaluation of Impact of Risk on Returns**

**3 cases for Penalty / Uncertainty Evaluation**

**3 Concession Periods**

**Several Tariff Models**



REST OF THE SLIDES ELABORATE ON  
VARIOUS ASPECTS OF  
**ENSURING BANKABILITY ... &  
MITIGATING RISKS**

# Ensuring Bankability Requires ...

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**Contractual Considerations**

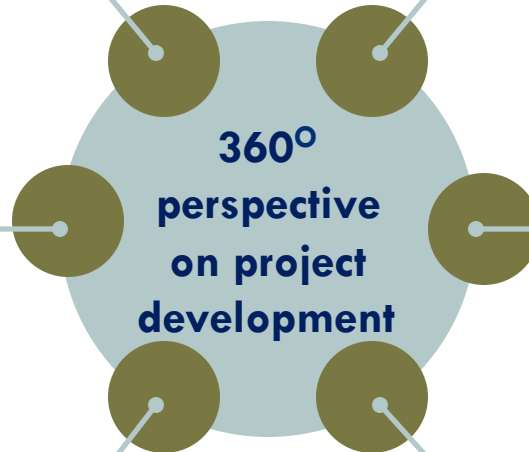
**Project Size & Type**

**Governance & Permitting**

**Technology Selection**

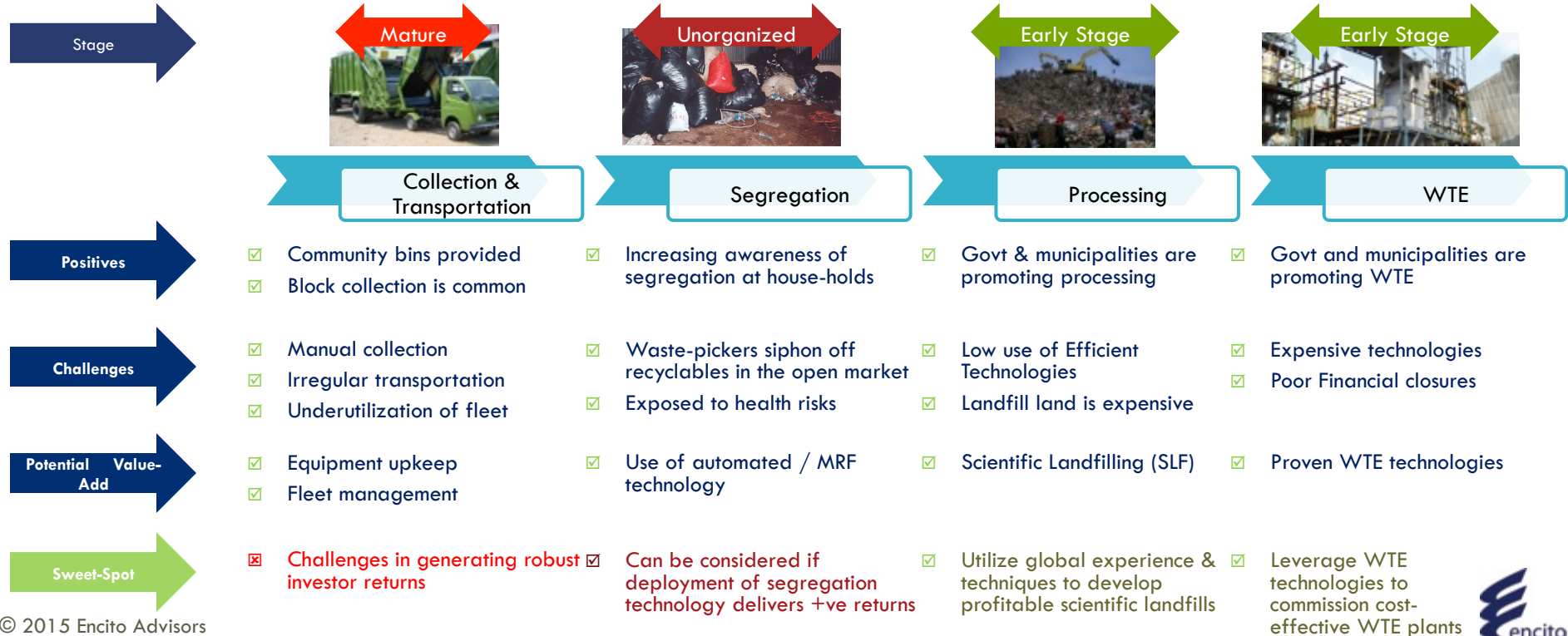
**Revenue Model & Returns**

**Project Structure Design**



# MSW Value Chain & Recommendation

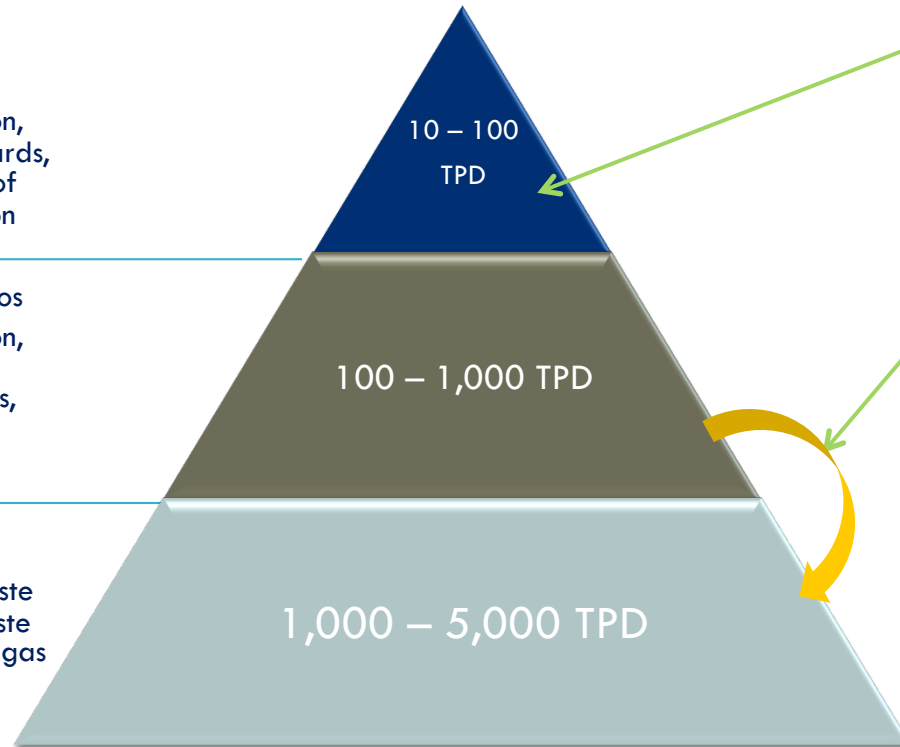
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# Project Size Considerations

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- ✓ Rural and small towns
- ✓ Activities include waste collection, transportation to local dump-yards, limited segregation, prospects of composting and bio-methanation
- ✓ Tier II cities and regions in metros
- ✓ Activities include waste collection, transportation to local landfill, tenders out for scientific landfills, composting, RDF, and waste to energy
- ✓ Metropolitan cities
- ✓ Activities include integrated waste processing landfill facilities, waste to energy facilities and landfill gas to energy facilities



- ✓ Ideal for C&T and Processing
- ✓ WTE is expensive

- ✓ Processing & WTE in this segment is the suggested sweet-spot
- ✓ Leverage efforts in the 1,000 TPD segment and replicate projects for sustained success

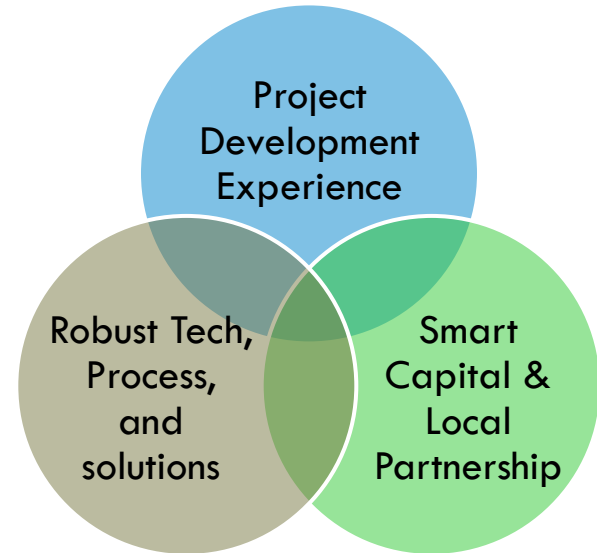
# Partnering for Successful Mid-to-Large Projects

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## Goals

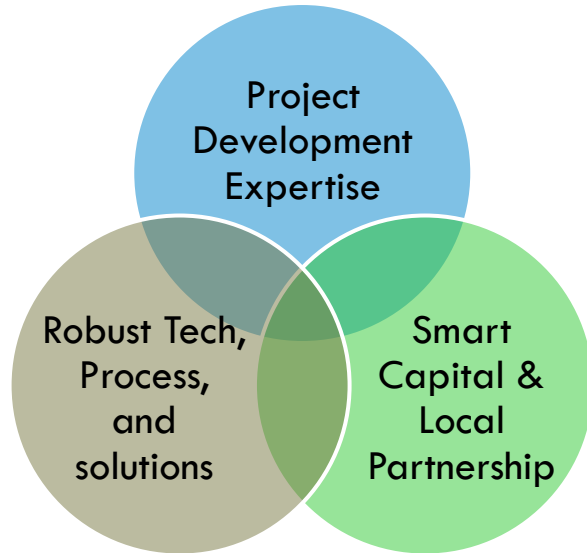
- 1 Focus on Processing & WtE
- 2 Quantify risks and educate investors / lenders
- 2 Ensure robust project returns
- 3 Deploy cost-effective solutions
- 4 Work with synergistic partners
- 5 Ensure successful project execution & long term ownership

## Met By



# The Winning Partnership Formula for Processing & WTE Projects

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## Global Expertise

PQ's, Design, Financing and O&M

Global  
Tech  
Partner

**Project Lead**

## Local Partner

Procurement, Execution & Commissioning

Local  
Partner

**Project Partner**

## Smart Capital

Investors with deep SWM/WTE understanding

Lenders aware of risks

Investors &  
Lenders

**Financial Closure**

# The Ideal SWM/WTE Project Structure

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## Building a Foundation for a Long Term Win-Win Relationship

### Strategic Investor

Majority Equity Owner  
O&M (supported by Local Partner)

### Local Partner

Main EPC Contractor, minority stake, on the ground activities

### Others

- Technology providers
- Subcontractors
- Lenders

### SPV

- Designs, Finances, Builds, Owns and Operates Plant & Machinery
- Handles permitting



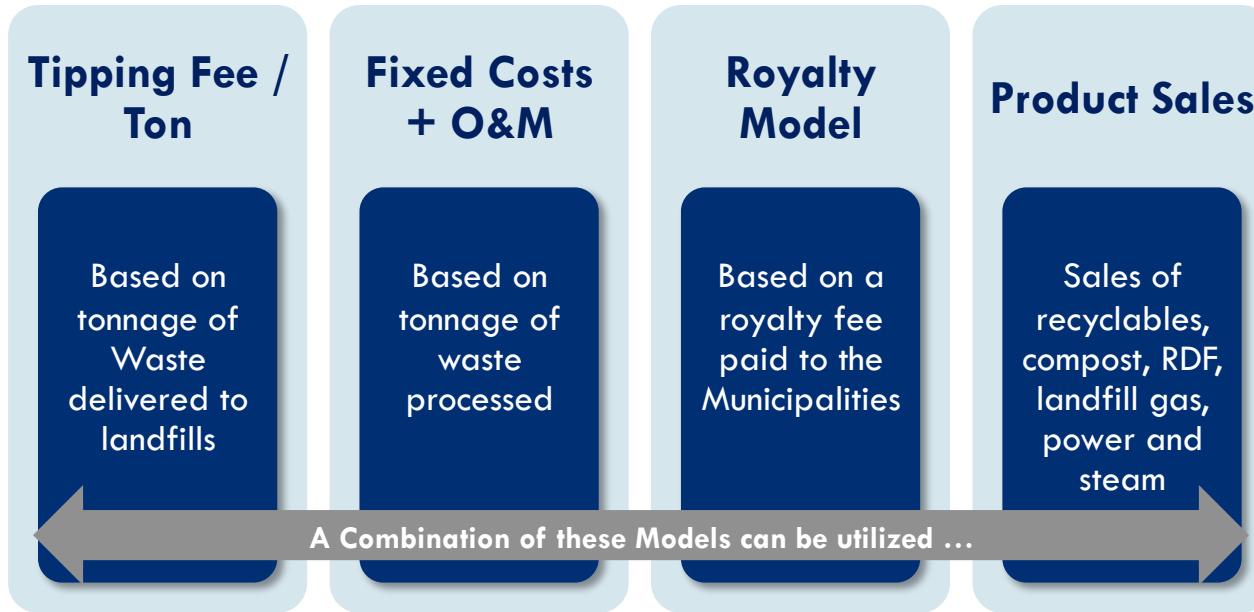
Municipalities  
/ Industrial  
Clients

- Provides
- Land lease
  - MSW
  - Statutory permits



# Example SWM/WTE Business Models

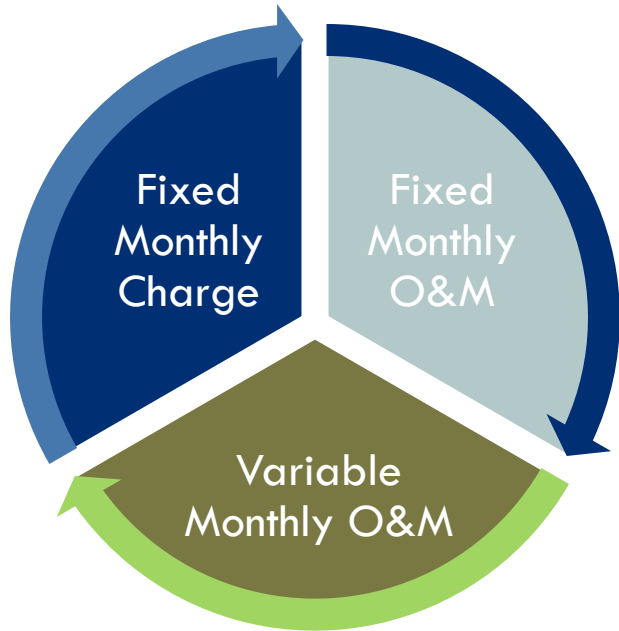
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**A Well-Defined Structure and Business Model is Key to Profitability and Bankability of the Project**

# A Example BOOT SWM/WTE Business Model

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## Fixed Monthly Charge

Covers project capital expenditures

## Monthly Fixed O&M

Covers fixed monthly costs

## Variable O&M

Based on tonnage of waste

## Contractual Considerations

- Type: BOO, BOOT, BOT etc
- Minimum off-take
- MSW calorific values
- Plant outages / shutdowns
- Equity structures & exit scenarios
- Termination and take over
- Delays, liabilities & damages
- Force Majeure & Indemnity
- Jurisdiction & arbitration
- Others

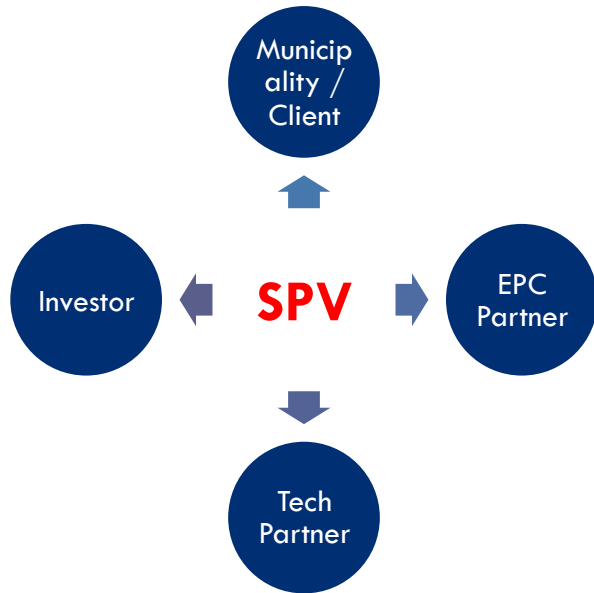
# SWM/WTE Project Development Considerations

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# The Consortium SPV Structure Advantages

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**The goal of the consortium is to build effective long-term partnerships delivering robust project returns**

# Additional Financing Considerations ...

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**Methods of bid  
evaluation (e.g.  
NPV, Payback, etc.)**



**Favorably  
managing forex  
impacts**



**Bankability of the  
project**

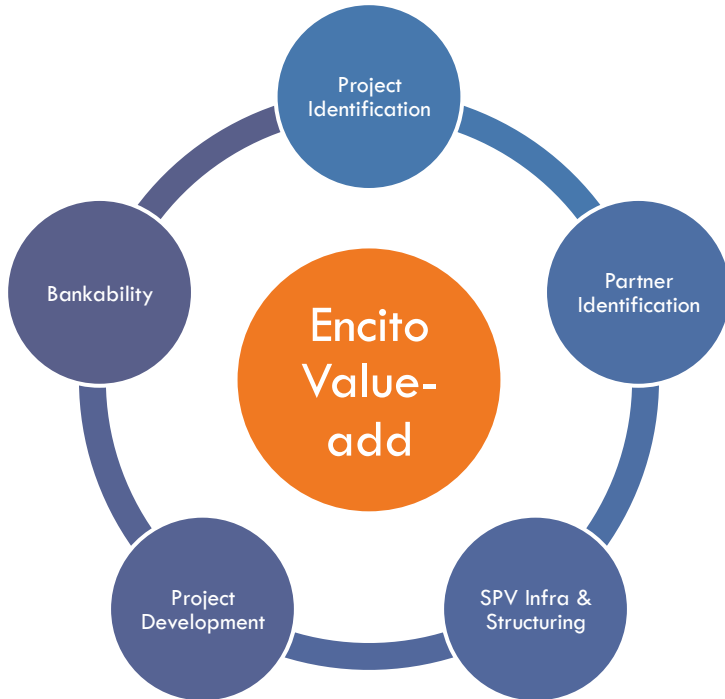


**Harnessing  
incentives from  
Global initiatives**

**These factors need to be carefully evaluated to ensure success in the SWM Projects**

# A Case Study – Water BOOT

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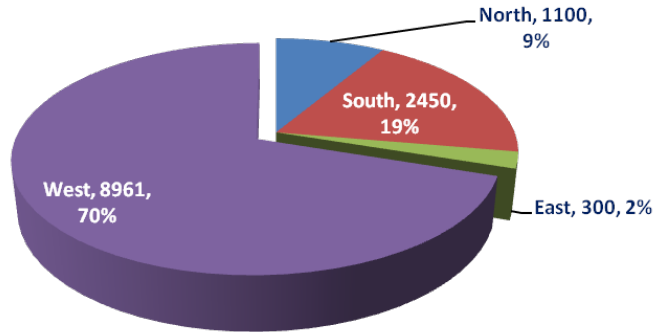
- ❑ Identified solid project opportunities with industrial clients having excellent credit ratings and good payment history
- ❑ Identified local partner (LP) with very good track record and references
- ❑ Enabled technical collaboration between client and LP to submit technical bid
- ❑ Advised partners to develop tariff / pricing / operational model such that NPV would be lowest
- ❑ Led or supported (as need be) negotiations on water purchase agreement. Explained implications of various WPA clauses to water consumer and EPC partner
- ❑ Developed financial models for project, tariff, forex impact etc
- ❑ Supported client in due diligence, negotiating EPC contract, share holding in SPV etc
- ❑ Advised SPV location, structure etc
- ❑ Introduced client to banks to ensure bankability of project and lending terms
- ❑ Introduced legal counsel with experience in water to draft local agreements
- ❑ Held detailed discussions with tax consultants when evaluating tax implications of business model options
- ❑ Addressed critical stumbling blocks during project development and contract negotiations using innovative project planning, structures or approaches

# Select Project Opportunities\*

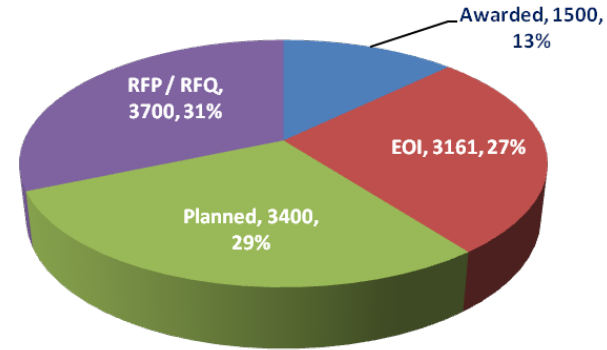
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- Projects tracked: ~12,000 TPD across India
- Projects are either in PPP, BOOT, DBFOO etc models

Tenders Geographical Analysis (in TPD)



Tenders Status Analysis (in TPD)



# References

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- Encito Advisors proprietary research
- India's annual generation of urban waste in 2025 – World Bank Reports
- MSW Potential in India – Ministry of New & Renewable Energy (MNRE)
- Ministry of Agriculture (MOA)
- Ministry of Environment & Forests (MOEF)
- MNRE Annual Reports
- WBI Development Studies
- National Solid Waste Association of India (NSWAI)

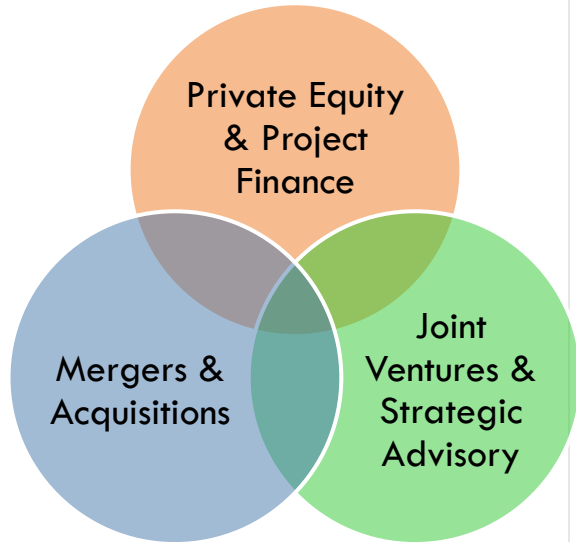


# Encito Advisors

Strategic & Financial Advisory Services

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## Services



## Focus



## Expertise



Cross Border Deals



Water



Waste



Solar



Wind



Hydro



Biomass  
/Biofuels



Oil & Gas



Energy  
Efficiency

*Thank you ...*



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