



Bio-Cancun – Organic Waste to Energy in Cancun, Mexico

Feasibility Study

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AGENDA

- **Project Background**
- **Feedstock Survey**
- **Biogas Utilization**
- **Project Design**
- **Project Economics**
- **Current Status and Updates**





PROJECT BACKGROUND

- ✓ Canada's support to GMI
- ✓ Technology/knowledge transfer
- ✓ [Cancun Local Government/Quintana Roo SEDUMA/SEMARNAT] + [SENE/EC]
- ✓ Feasibility study: Organic waste to energy
- ✓ Feedstock: Organics from Hotel Zone of Cancun

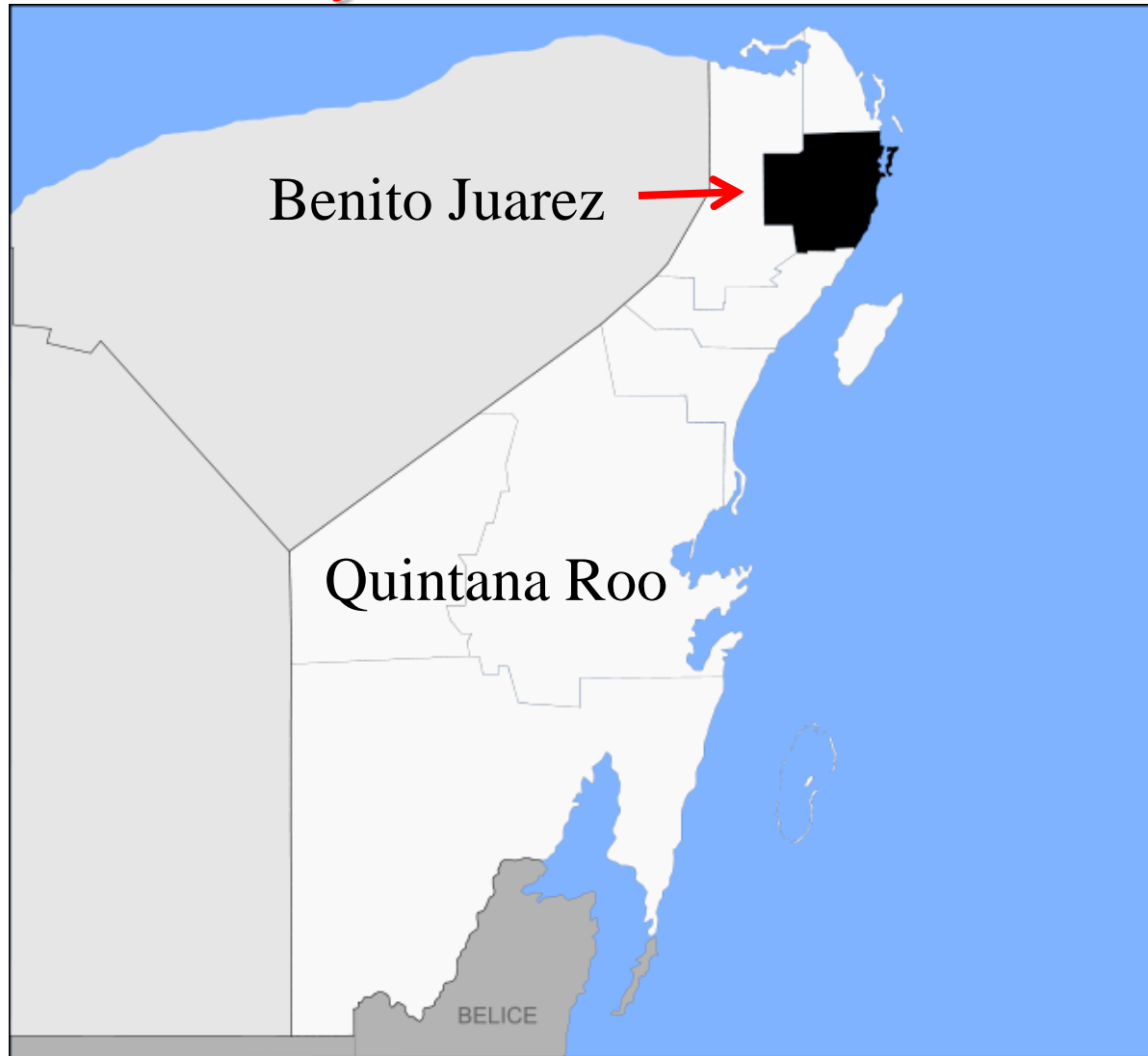


PROJECT LOCATION



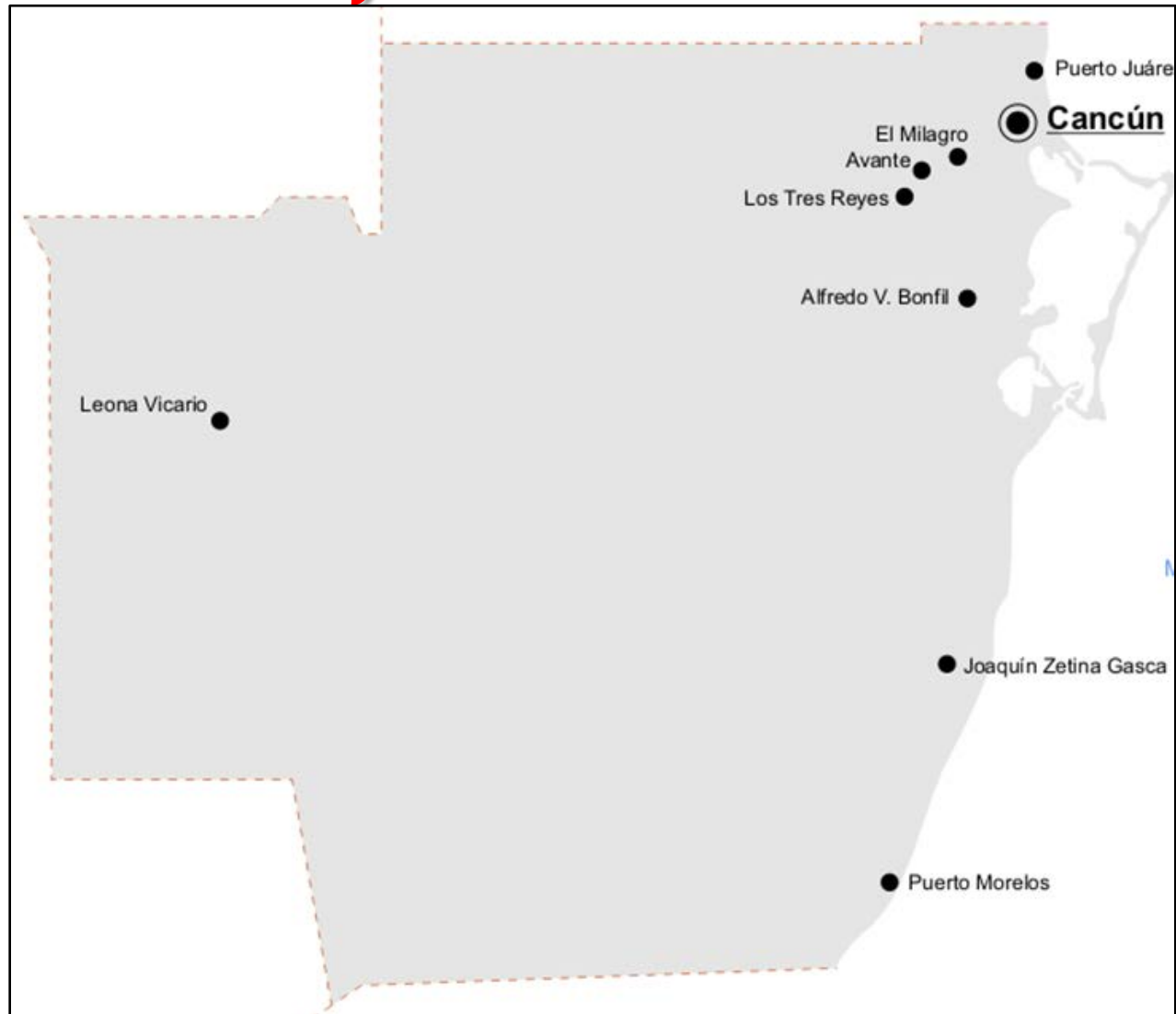


PROJECT LOCATION





PROJECT LOCATION





PROJECT LOCATION





STATUS OF LANDFILL

- ✓ Current landfill nearing end of life
- ✓ New cell constructed in 2011





FEEDSTOCK

- ✓ Zona Hotelera: Tourist hotspot
- ✓ 27 km (17 miles) stretch of beach
- ✓ Over 70 hotels/resorts
- ✓ All hotels/resorts separating organics
- ✓ Not mandated by city
- ✓ Voluntary segregation: 'Green Certification'
- ✓ SSO: very efficient and effective operation



FEEDSTOCK





FEEDSTOCK





FEEDSTOCK



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FEEDSTOCK





FEEDSTOCK





FEEDSTOCK

- ✓ Feedstock survey in Jan 2011
- ✓ Organics collected in separate trucks
- ✓ Organics / inorganics weighed separately
- ✓ MSW from Zona Hotelera = 94 TPD
- ✓ SSO in MSW (60%) = 56.4 TPD



FEEDSTOCK

- ✓ 70 organics bags opened and examined
- ✓ Overall contamination: < 15%
- ✓ Mainly plastic, paper, metal and glass
- ✓ Organics availability (85%) = 48 TPD
- ✓ Tourism sector of Cancun + Riviera
Maya can provide 100 TPD organics
- ✓ Project design = 100 TPD plant



FEEDSTOCK





UTILIZATION: ISSUES TO CONSIDER

Biogas to Electricity

- ✓ Moisture removal
- ✓ Particulates removal
- ✓ H₂S scrubbing
 - Else engine oil needs constant changing



UTILIZATION: ISSUES TO CONSIDER

Biogas to Electricity

- ✓ Connection to electrical grid
- ✓ New substation/power lines
- ✓ Feed in tariffs
- ✓ Power/heat utilization at industries nearby



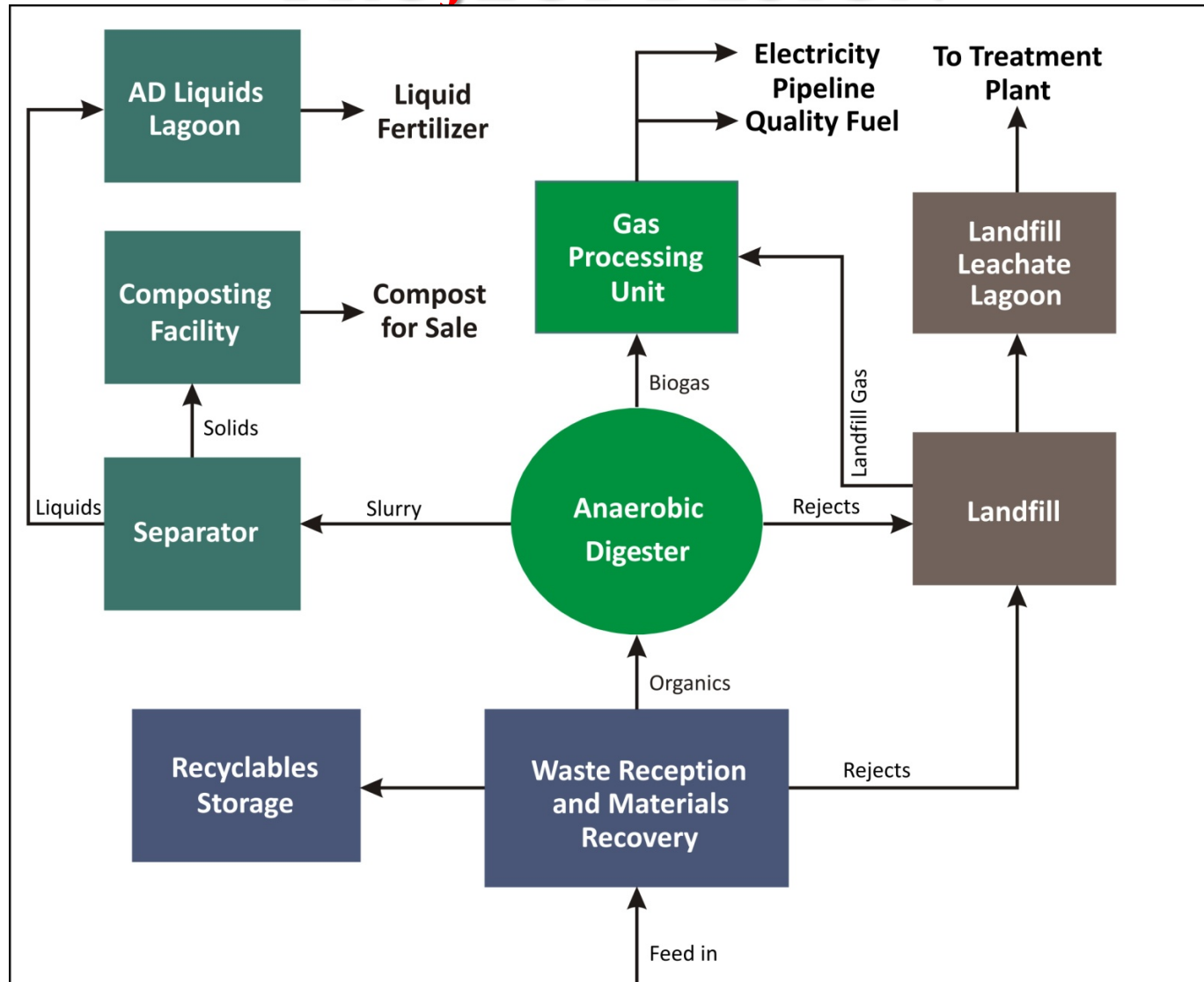
UTILIZATION: ISSUES TO CONSIDER

Biogas to Pipeline Quality Gas

- ✓ Moisture removal
- ✓ Particulates removal
- ✓ H₂S scrubbing
- ✓ CO₂ removal
- ✓ Gas compression and storage



PROJECT DESIGN



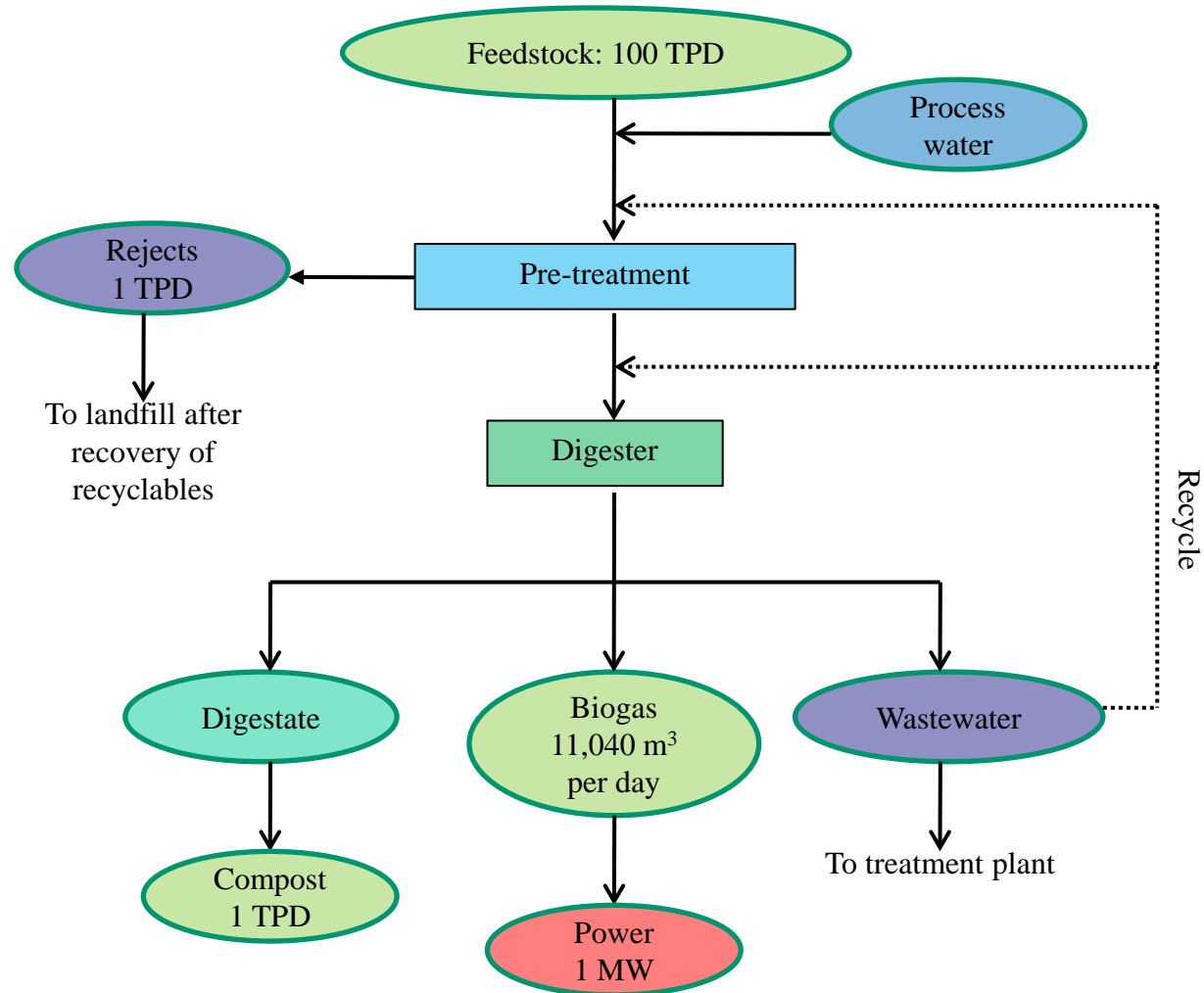


PROJECT DESIGN

Parameters	Details
Feedstock	100 TPD of SSO
Biogas production (65% methane)	11,040 m ³ /day
Calorific Value of methane	8,570 Kcal per m ³
Power plant capacity	1 MW
Net electricity production	22,500 kWh per day
On-site consumption and losses (10%)	2,250 kWh per day
Electricity supplied to grid	20,250 kWh per day
Electricity equivalence	2,000 – 3,000 homes
Compost production	1 TPD



PROJECT DESIGN





PROJECT ECONOMICS...1

- ✓ Capital cost = \$8.4 million
- ✓ O&M expenditure = \$0.34 million per year
- ✓ Project IRR = -1.78%
- ✓ Net Present Value = -\$1.77 million

Assumptions

- ✓ Sale price of power to grid = \$81/MWh
- ✓ Sale price of compost = \$30 per tonne



PROJECT ECONOMICS...2

Key Findings

- ✓ If CER sales available, they contributed to project viability
- ✓ Without CERs, tipping fee of \$17 – \$25/tonne will be required if project capital acquired as a grant

Project Structuring

- ✓ Funded by Mexican government, payback period = 7 – 9 years



CURRENT STATUS AND UPDATES

Sergio Gasca – SEMARNAT to provide project update!