


**BioCycle
REFOR17**
RENEWABLE ENERGY FROM ORGANICS RECYCLING


Anaerobic Digestion as a Business Opportunity for Tribal Communities

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Outline

- Introduction & Motivation
- Findings
- Benefits of partnering with tribal businesses
- Next steps



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Quality – Value – Ethics – Results




- Established in 1980
- Solid Waste Management and Technology Consultants
- Helping Clients Turn Problems into Opportunities



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GBB's Waste Consulting Services

- Economic, technical and environmental reviews
- Procurements
- Due diligence third-party reviews
- Waste characterization and sourcing
- Process planning and conceptual designs
- Independent feasibility consultant





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GBB Assignment

- Conceptual Study for a Biomass Facility:
 - Amount and composition of potential feedstocks (MSW, organics, non-recyclable plastics)
 - Potential impacts on the existing collection system
 - Technical feasibility analysis on three different solid waste processing technologies
 - Financial Projections for the best applicable technical solution
 - Education workshop for the tribal members
 - Implementation strategy

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Mesa Grande Band of Mission Indians- San Diego, CA

- Located in San Diego County
- Enrollment of 620 members (175 live on tribal land)
- Federally recognized tribe
- General Council- tribal governing body
- Business Committee- day to day operations



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Motivation for the Initiative

- On-site electricity generation for new developments on tribal land
- Renewable Energy Microgrid including:
 - Solar
 - Wind
 - Biomass
- Business opportunity for economic growth
- Improvement of the solid waste processing infrastructure in the San Diego County



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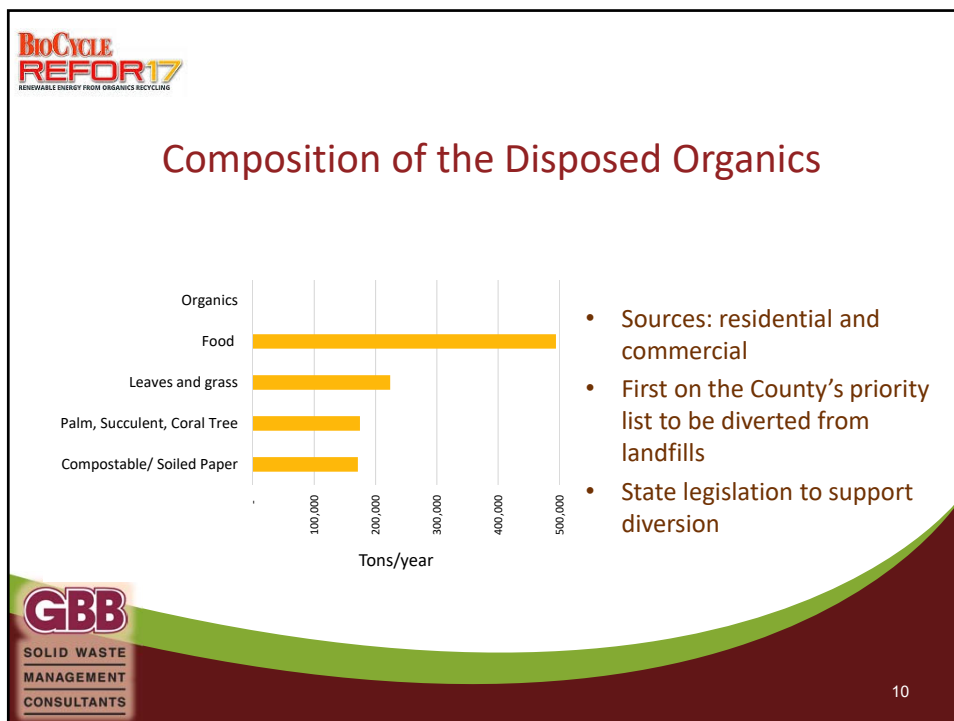
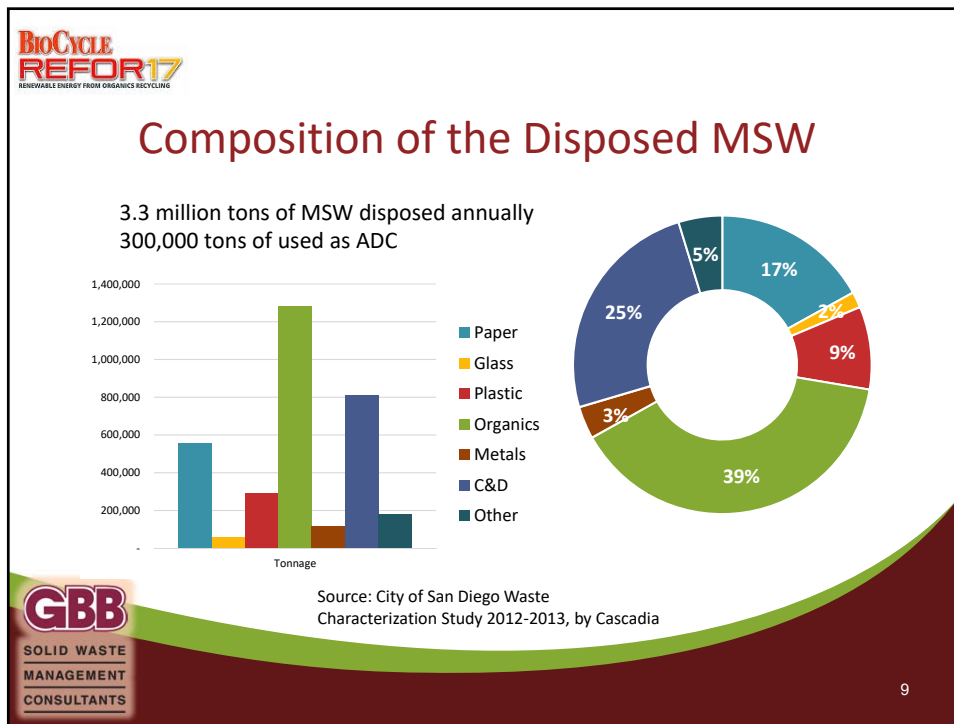
Findings

- Feedstock Available in 35 miles radius:
 - MSW
 - Organics
 - Non- recyclable plastics
- Current collection and waste management system
- Technical feasibility evaluation criteria and results



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Non- recyclable Plastics

- Feedstock for potential pyrolysis facility
- Plastics made of couple of different types of plastics
- Sources:
 - Landfilled material,
 - MRF residue,
 - industrial scrap;

| MRF Name | Location | Tons/ year | Residue % | Residue tons | 29% plastics (Lee Co, FL) | 20% plastics (Palo Alto, CA) |
|------------------------------|-------------|------------|-----------|---------------|---------------------------|------------------------------|
| Allan Company | San Diego | 87,000 | 8% | 6,960 | 2,088 | 1,392 |
| EDCO Recycling | Lemon Grove | 112,302 | 14% | 15,722 | 4,717 | 3,145 |
| IMS Recycling Services, Inc. | San Diego | 30,122 | 11% | 3,313 | 994 | 663 |
| SANCO Recycling | Escondido | 200,000* | 11%** | 22,000 | 6,600 | 4,400 |
| TOTAL | | | | 48,000 | 14,400 | 9,600 |

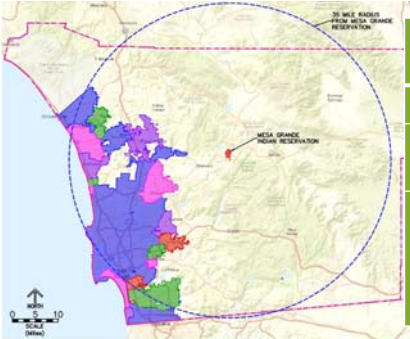
Calculated by GBB based on 2016-2017 Materials Recycling and Processing in the United States by GAA Inc., GBB characterization study for Lee Co. FL, and Cascadia Characterization study for Palo Alto, CA

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Feedstock Available



| Type of feedstock | Mixed untreated MSW | Non-recyclable Plastics | Organics |
|--------------------|--|---|---------------------------------|
| Amount (tons/year) | 3,300,000 | 10,000-15,000 | 1,200,000 |
| Sources | Residents and commercial dwellers | MRF Residue | Fraction of the MSW |
| Sourcing strategy | Contact with solid waste collection companies and responsible jurisdictions. | Contact with the MRF management companies | New separate collection program |

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Current SWM System

- County is responsible for the unincorporated areas through non-exclusive franchise contracts
- Cities have exclusive collection contracts
- County has 65% landfill diversion rate through a network of MRFs, transfer stations and drop off centers, composting and mulching facilities
- The County and the City of San Diego have expressed the urgent need for anaerobic digestion capacity for food waste
- Private companies leading the initiatives for development of processing infrastructure

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Amount of Waste Disposed by the Haulers

Incorporated Cities

| Hauler | Amount |
|---------------------------------|-----------|
| Waste Management Inc. | 1,571,149 |
| Republic Services | 173,121 |
| EDCO | 348,578 |
| Escondido Disposal inc. | 434,479 |
| SD Collection Services Division | 150,682 |

Unincorporated areas

| Hauler | Amount |
|----------------------|---------|
| EDCO | 317,388 |
| Hauler 2 (WM or Rep) | 110,607 |
| Hauler 3 (WM or Rep) | 67,481 |
| All other haulers | 15,356 |

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Waste Handling Facilities

4 Material Recovery Facilities
11 Transfer Stations/ drop off centers
9 Commercial Composting Facilities

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Feedstock Sourcing Options

- Partnership with a local hauler;
- Possibility for the City of San Diego to close the commercial waste market to boost the organics collection;
- Contracting with local MRF's for the residue;

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County plans for the future

- Primary focus 2017-2018: Supporting development of large scale organics processing facilities and on-site community and farm composting
- Implementing changes to the non-exclusive solid waste management agreements to increase residential and commercial diversion and C&D diversion
- Implement commercial food scrap collection and single family homes




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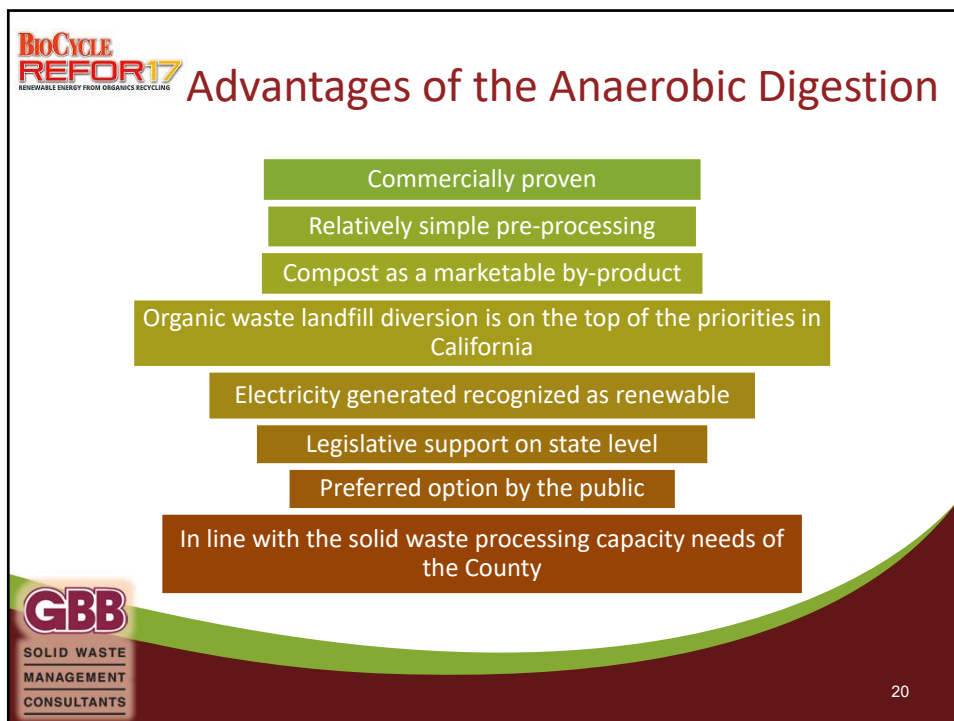
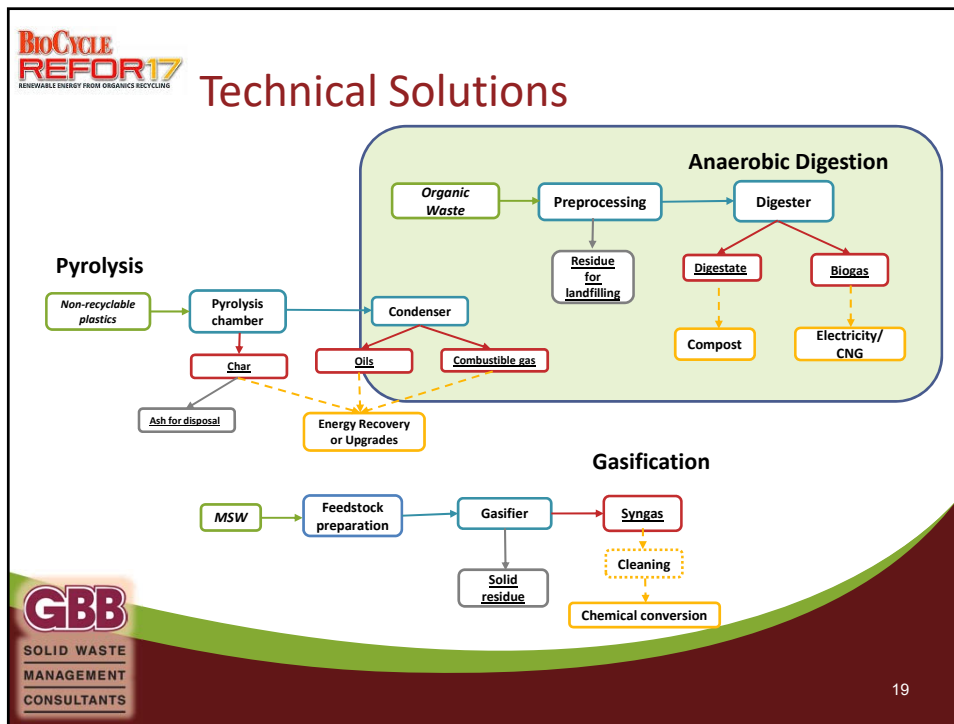


Technical evaluation

| | | |
|-----------------------|---|--|
| Eligible technologies | } | <ul style="list-style-type: none"> • Anaerobic digestion, • Pyrolysis, • MSW conversion technology producing renewable energy and/or fuel (liquid or gaseous) acceptable in California |
| Minimum Requirement | } | <ul style="list-style-type: none"> • At least one commercial-scale facility processing the same feedstock |
| Evaluation Criteria | } | <ul style="list-style-type: none"> • Level of pretreatment required, • Amount of electricity generated, • Marketable by-products, • Amount of residue for disposal, • Facility footprint, • Scalability to <1MW, • How it meets the regional solid waste processing needs. |



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Incentives for doing business with Indian tribes

| | | |
|--|------------------------------|-----------------------------------|
| Land Use Exemption | Tax- exempt Financing | Tribal Economic Development Bonds |
| Loan Guaranty, Insurance, and Interest Subsidy Program | Federal income tax exemption | Accelerated Depreciation |
| State tax exemption | New Market Tax Credit | Indian employment tax credit |

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Current Status & Next Steps

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    graph TD
      2017[Ongoing/ by the end of 2017] --> 2018[2018]
      2018 --> 2019[2019]
  
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- Conceptual Study for a Waste to Energy Facility
- Feedstock Procurement Plan
- Compost market study

2018

- RFIQ
- Identify the best applicable AD & Composting technologies
- Business Plan
- Preliminary design and renderings of the facility
- Project Implementation Strategy

2019

- Final “go”- “no go” decision

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Thank you!

Questions?

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