PUBLIC PRIVATE PARTNERSHIPS FOR IMPLEMENTING ORGANIC WASTE TREATMENT PROJECTS: EXPERIENCE IN VIÑA DEL MAR, CHILE

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CCAP
CENTER FOR CLEAN AIR POLICY

THE CASE OF VIÑA DEL MAR

- One of the top tourist destinations in Chile.
- Prioritized by the Chilean government to become a pilot city on waste management over 5 years ago.
- Not having a local disposal site available, collection and disposal costs are high.
- Joined the CCAC in 2013 to analyze different options to improve waste management, with a focus on organic waste.

CITY FACTS

Population:
≈ 330,000

Waste Generation Rate:
≈ 1.1 kg/person/day

Waste Collection Rate:
≈ 99%

OBJECTIVE AND ACTIVITIES UNDER CCAC

- **Objective:**
  - Support Viña del Mar to improve their waste management and reduce GHG emissions, advancing a project to an implementation-ready stage.

- **Activities:**
  - Analyze technological alternatives for organic waste management and select the most appropriate one.
  - Develop a basic design of the pilot project, including an initial financial analysis, business model and implementation plan.

ORGANIC WASTE AVAILABLE

- Projected capture rate:

Timeframe	Households	Hotels & Restaurants	Markets	Wineyards and other agro-industrial sources
Short-term (2020 – 2025)	40%	80%	80%	90%
Medium-term (2026 – 2030)	70%	90%	90%	95%
Long-term (2031 – 2040)	90%	95%	95%	99%

Total

2020: 50,566 TPA = 139 TPD

2030: 104,709 TPA = 287 TPD

2040: 170,947 TPA = 468 TPD

CHOICE OF TECHNOLOGY

- After careful consideration, **anaerobic digestion** was the selected technology.
- In consultation with the Municipality, it was decided that two utilization options for biogas would be investigated in detail:
  - Production of combined heat and power (CHP).
  - Production of substitute natural gas (SNG), which could be used as a clean-burning vehicular fuel.
  - Both options include composting the remaining digestate.

Year	Power (MW)	Electricity to Grid (kWh)		SNG Production (m3/day)	SNG Sold (MMBTU/day)
2020	1.3	25,216		8,947	304
2025	1.5	28,767		10,207	347
2030	2.7	52,217		18,528	630
2035	3.8	74,561		26,456	899
2040	4.4	85,248		30,248	1,028

MITIGATION POTENTIAL

- The mitigation potential for the CHP project has been estimated at around 300,000 tCO_2e during a 20 year period.

FINANCIAL ANALYSIS

Base case scenario

	Capital Cost (million US$)	NPV (million US$)	IRR
AD + CHP	10	10.8	14.53%
AD + SNG	10	8.9	13.19%

- The base case scenarios (CHP vs SNG Options) indicate that CHP is more profitable than the SNG Option.
- For both Options, compost sale price does not have a big impact on project viability.
- Both the sale price of electricity (for the CHP Option) as well as the sale price of SNG (for the SNG Option) have a medium-level impact on project viability, as do operational and maintenance costs.
- Initial capital costs have a large impact on project NPV and IRR.
- The most significant parameter appears to be the tipping fees.

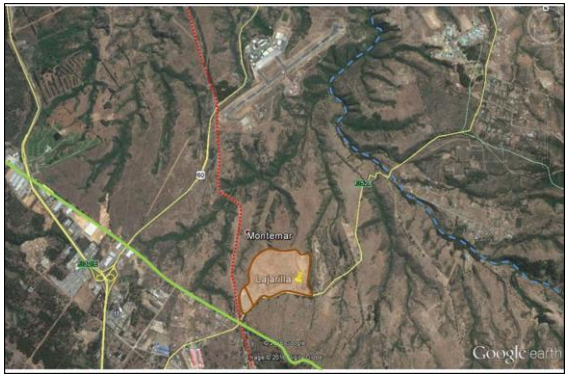
THE CASE FOR A PPP

For the Government:

- Large capital costs.
- Lack of technical expertise in the public sector.
- Large collection and disposal costs.
- Landfill contract negotiations due in 2021.
- Access to low cost compost/fertilizer/electricity.

For the private sector:

- Expertise in the private sector, both international and local (although not with MSW).
- Flexibility in the contracts, allowing the intake of agro-industrial waste to help with homogenization of waste (and potential for larger tipping fees).
- Long term contracts.
- Availability of public land.



CURRENT STATUS:

- Several local and international developers have shown interest.
- The city is ready to launch a call for proposals for the construction and operation of the plant.
- Tender documents are being developed, expected summer/fall 2018.

KEY LESSONS

- **For identifying the right project:**
  - Focus on emission reductions from the start looking at what the major sources of organic waste are.
  - Try to ID as soon as possible what are the main sources of emissions in the city:
    - Landfill not collecting gas, outdated and/or inefficient transport, current us of waste, etc.

- **For increasing the chances for project implementation:**
  - Find a trusted intermediary between public and private parties.
  - Engage large organic waste producers to ensure long term contracts that can “guarantee” the correct functioning of the plant.

KEY LESSONS (2)

- **For finding the best financing options:**
  - Engage private sector early in the process:
    - Understand the main barriers to investment they are facing.
    - Usually they have already evaluated the regulations and tariff schemes preventing them from moving forward, and are familiar with the main barriers: guarantee for feedstock, regulations, etc.
    - Capabilities and expertise may exist locally, even if they are not in the specific field.

NEXT STEPS

- Replicate the model around the country. After this experience all stakeholders will be better prepared to promote similar projects in other municipalities.
- Create a new market for MSW management.

Upcoming Opportunities

- Canada – Chile collaboration underway, looking at 12 other municipalities to find the best way to deal with organic waste.
- Test MRV approaches to consider the generation of ITMOs.

THANK YOU

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