

CommonWealth

Resource Management Corporation

The ISWM Business Plan: Vendor Technologies in Perspective Phase II: The Long-Term Site Development Plan

**Presented to
the Town of Bourne
ISWM Business Model Working Group**

22 July 2010

The ISWM Business Plan: Vendor Technologies in Perspective

ISWM tomorrow: depends on choices made (or not made) today

Phase I: The Landfill Waste Acquisition Plan

1. Acquire waste at tip fees that
 - Generate cash to meet targets
 - Maximize airspace value

2. Manage business risks

3. Pursue key opportunities



- Covanta proposal on processed bottom ash

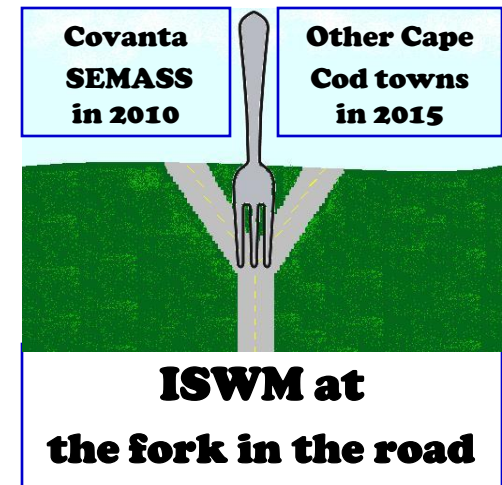


- Cape Cod Commission process for Town MSW

Phase II: The Long-Term Site Development Plan

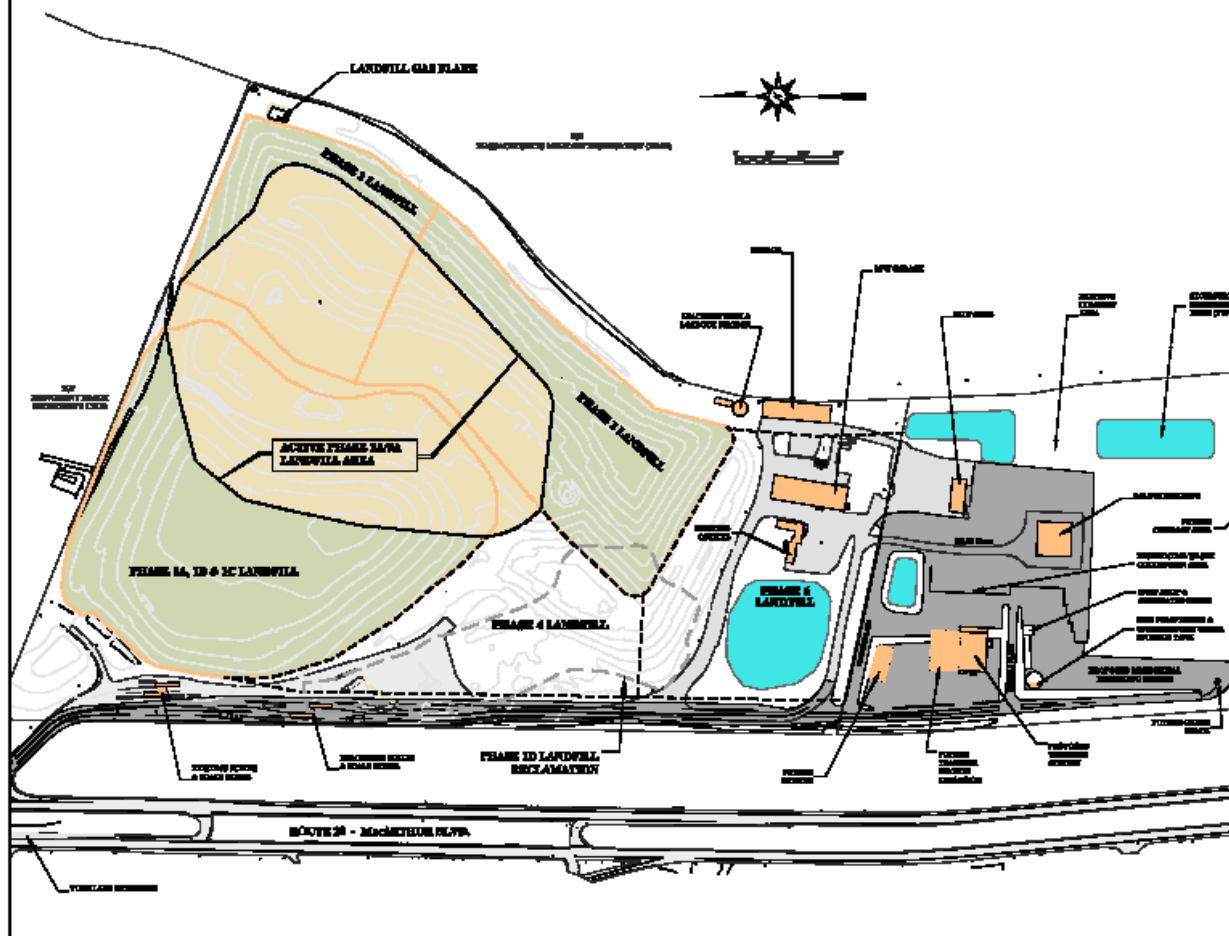
1. Manage Town waste after Landfill closes

2. **Provide ongoing value for the Town (starting now!)**



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ISWM today: a **solid waste enterprise** providing \$ for the Town



ISWM Assets

1. Landfill permitted for disposal of 219,000 tons per year
2. Transfer stations for C&D and/or MSW (ISWM + UCRTS)
3. Recycling center with baling facility
4. Compost/organics processing area
5. Landfill gas available for beneficial use
6. Infrastructure and space available for more development

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ISWM Goal and Approach to Vendor Technology Proposal

1. Leverage ISWM assets to provide maximum ongoing value for the Town of Bourne
2. Ensure that the Town controls the process
 - Learn the value technology can create
(What might we get?)
 - Understand requested commitments
(What do they want us to do? What risks would we be taking?)
 - Focus on leveraging assets *(What should we let them have? What should we get for what we give them?)*
 - Determine steps for achieving the goals
(What do we do next?)

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To ensure that the Town controls the process
and achieves its goals...

*Ask not what the Town of Bourne
can do for technology vendors.*

*Ask what technology vendors
can do for the Town of Bourne!*

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Q: How might technologies create added value for the Town?

A: Some possibilities:

1. Extend landfill life by improving value of airspace use
2. Enhance the value of the transfer station operations
3. Enhance the value of the recycling operations
4. Enhance the value of the organics operations
5. Create value from beneficial use of landfill gas
6. Generate revenue from compatible uses on available space





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Vendor technology presentations to date or scheduled

Use landfill gas emissions to enhance algae growth to produce biodiesel	June 10 Plankton Power
Generate electricity from solar PV on closed portions of the landfill	June 15 Brightfields Development
Produce biogas from anaerobic digestion of organic materials	August 12 Harvest Power
Upgrade landfill gas to pipeline quality	August 26 National Grid
Convert C&D wood waste to biodiesel and waxes	Sept 9 (tentative)Turning Mill Energy

Other technologies for consideration

MSW processing technologies	Thermal: plasma arc, gasification, pyrolysis Chemical: hydrolysis, de-polymerization Biological: digestion, composting (MSW or SSO)
Standard landfill gas use	Electricity generation
Emerging landfill gas use	Conversion to vehicle fuels (CNG and LNG)

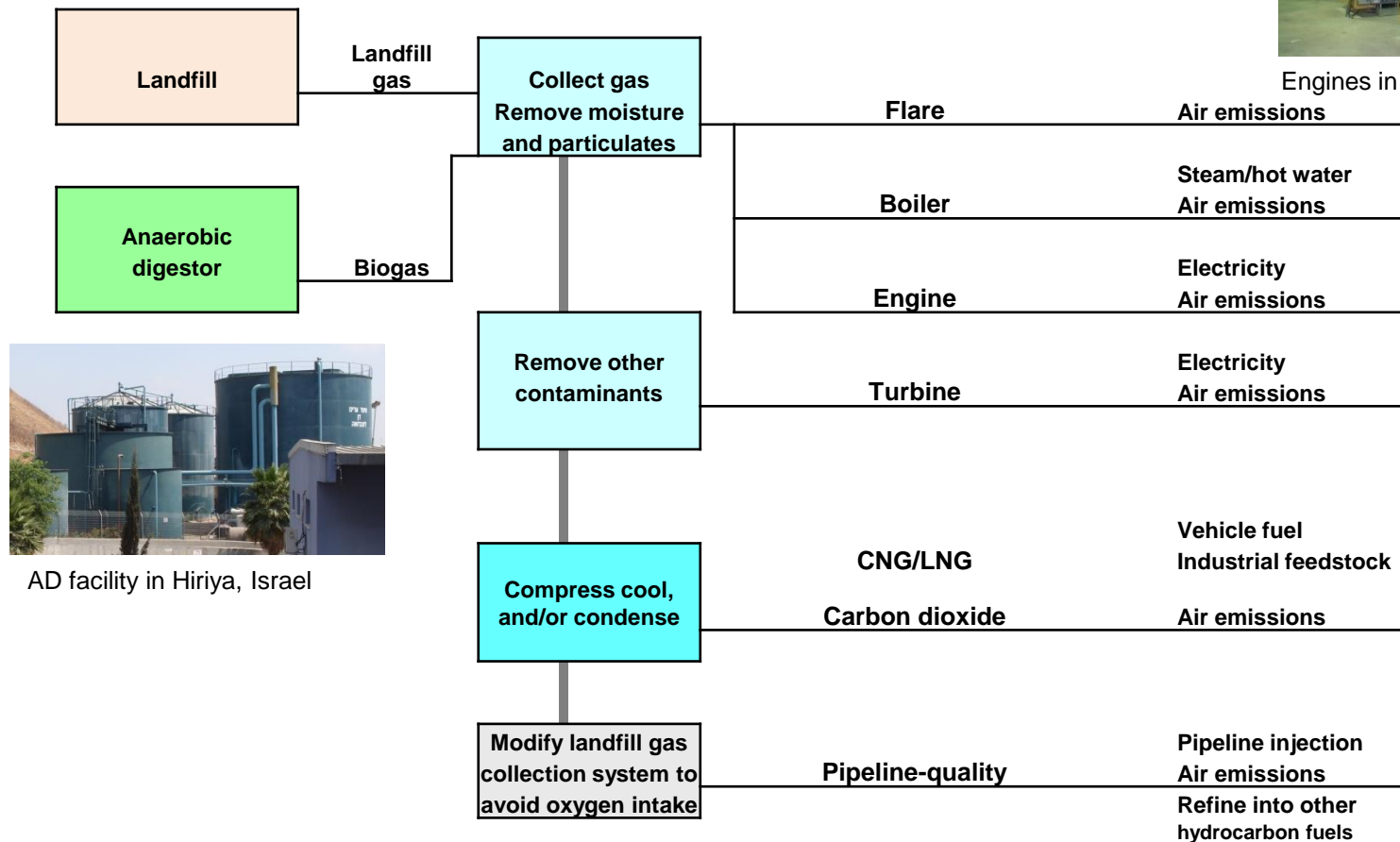
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Potential technology value and Town commitments

Vendor	Plankton Power	Brightfields Development solar PV	Harvest Power	National Grid	Turning Mill Energy
1. Extend landfill life? Affect operations?	No	Avoid active areas	Residuals disposal	No. Modify gas collection system	Residuals disposal
2. Enhance transfer operations?	No	No	No	No	Yes (C&D wood)
3. Enhance recycling operations?	No	No	No	No	No
4. Enhance organics operations?	No	No	Yes	No	No
5. Use the landfill gas?	Yes. Use LFG or emissions	No	Create biogas, might use LFG	Yes	No, but will create syngas

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Technologies for beneficial use of landfill gas and biogas



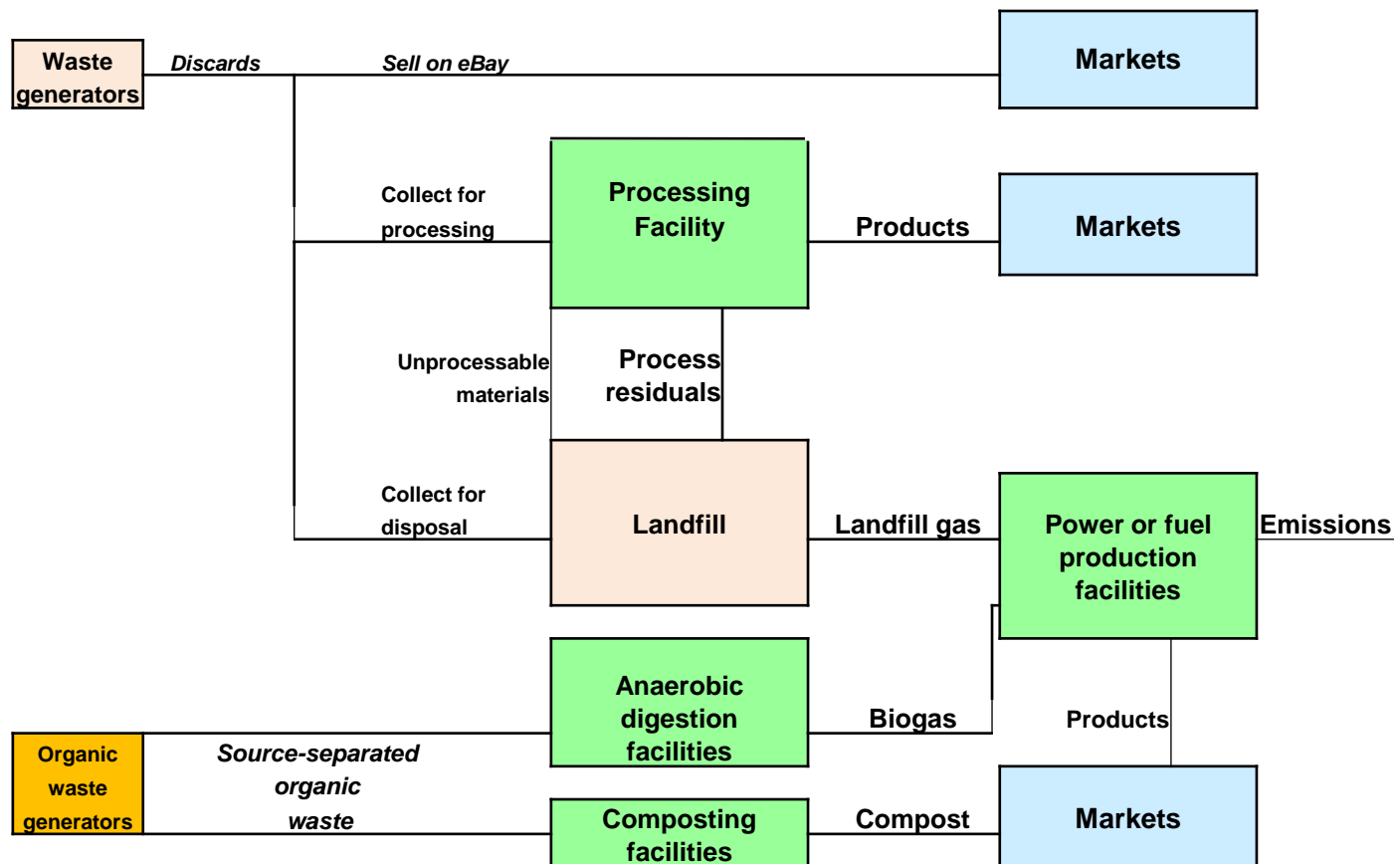
Engines in New Bedford



AD facility in Hiriya, Israel

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Technologies for MSW processing and landfill life extension



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Processing technologies for MSW: no mystery, just high school chemistry

<i>Technology</i>	<i>Description</i>	<i>Nickname</i>
Plasma arc reduction	Use electrical discharge to vaporize waste into elemental form and melt inorganics at 4000- 7000 deg F, then quench to form gas and slag	Zap
Gasification	Convert organic waste to gaseous fuel and liquid products through partial slow oxidation by heating at 1400- 2500 deg F	Bake
Pyrolysis	Convert organic waste to liquids and gaseous fuels by heating <u>with no oxygen</u> at 750-1400 deg F	Steam
Thermal depolymerization	Pulp/slurry organics, then heat to 950 deg F and inject steam to accelerate decomposition to liquid and gaseous products	Mix and mash
Anaerobic digestion	Use microbes <u>in absence of oxygen</u> to convert organic waste to sugars, then acids, then compost, biogas and/or green fuel products, all at < 160 deg F	Bugs in tanks with gas, no air
Mixed waste composting	Use microbes <u>in presence of oxygen</u> to convert organic waste to compost at < 160 deg F (e.g., <i>Waste Options Nantucket</i>)	Bugs in vessels, with air, no gas

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Recommendation #1: continue learning about technologies that might benefit the Town

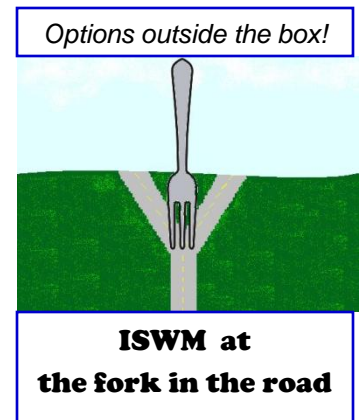
- Continue vendor presentations: consider
 - Readiness for commercial development
 - Impacts on landfill life and use
 - Use of ISWM space, landfill gas, organics, etc.
- Accommodate non-exclusive vendor requests (e.g., Plankton Power request for landfill gas samples)
- Defer requests and developments that interfere with operations (e.g., solar PV electricity in landfill active or expansion areas, technologies for which there is no space or synergy)
- Monitor state policies for emerging technologies



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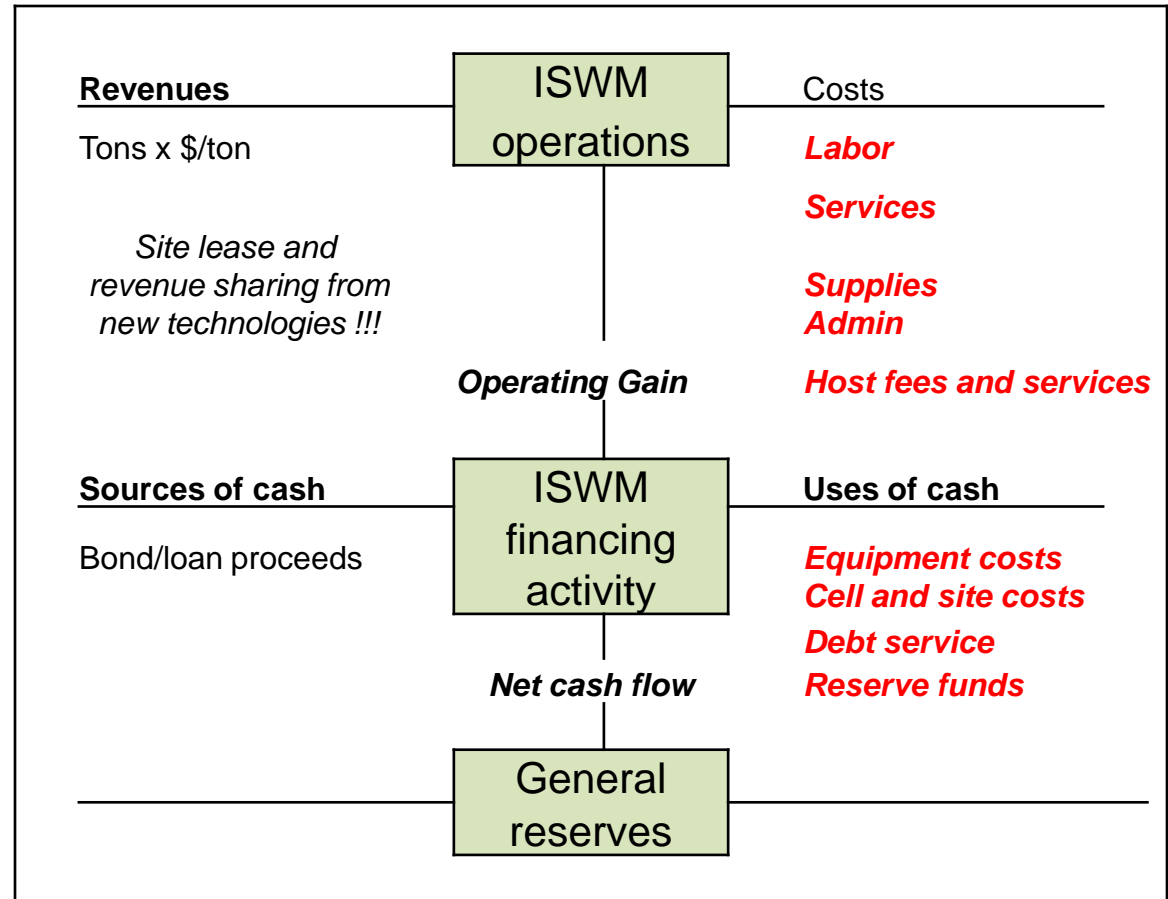
Recommendation #2: prepare for competitive bid(s)

- Ensure bidding vendors fit with the ISWM site master plan and business model
- Select the vendor offering the Town the most value for use of:
 - Available technology now or soon
 - Available space and infrastructure
 - Available landfill gas and other resources
 - Available landfill space for residuals and unprocessables
- Screen for vendors that can perform as promised
 - Control potential environmental and nuisance impacts
 - Guarantee technical and economic performance
 - Have commercial operating experience with proposed technologies in comparable applications and scale
 - Provide financial strength



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ISWM
economics:
keeping it in
perspective



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Next steps: Phases I and II

Schedule	Activity
Aug/Sept	Continue vendor presentations Complete assessment of vendor technologies Monitor landfill waste acquisition options and actions of Covanta and Cape Cod towns
October	Discuss Phase II procurement options and approaches to use the landfill gas and specific parcels Define specific Phase I options Advance the business plan decision process Meet with BOS/BOH/FC
December	Complete and begin to implement business plan Proceed with procurement(s)