EBC Solid Waste Management Committee

Follow up Stakeholders’ Meeting - MassDEP Master Plan
Welcome

David Murphy

Chair, EBC Solid Waste Committee

Vice President, Tighe & Bond
Introduction & Overview

Thomas Mackie
Meeting Chair & Moderator
Managing Shareholder
Mackie Shea PC
History of MassDEP’s role in development of NSWC, other W to E and Springfield MRF

Phil Weinberg

Former Regional Director
MassDEP
NESWC & MRF
PUBLIC-PRIVATE COLLABORATIONS TO BUILD
SOLID WASTE MANAGEMENT INFRASTRUCTURE
WHAT IS NESWC

• Northeast Solid Waste Committee

• Public-Private “partnership” to build/operate a RRF/WTE facility
  • Commonwealth’s Bureau of Solid Waste Disposal (DEM)
  • Consortium of 23 northeast municipalities,
  • Private waste management company (MRI/Wheelabrator)

• Innovative
  • 1st in country RFP full service contract with revenue sharing

• Complicated & Controversial
  • 13 years from expression of interest to operation
FACILITY STATS

• Facility Capacity-1500 tpd/ 465,000 tpy
• Located in No. Andover
• Cost-$197M
  • $167M Municipal tax exempt industrial revenue bonds
  • $30M private financing
• Operation Start-up in 1985
WHAT DROVE NESWC

• Municipal Landfills Problems
  • Municipal Capacity Shortfall
  • Environmental Problems with Pre-1971 Open Dumps

• Emergence of WTE industry
  • Preserve Landfill Capacity
  • 1st Energy Crisis-Interest in non-fossil fuel alternatives

• Policy/Legislative Authorization
  • M.G.L. c. 16, §§16-19 (1973)
COMMONWEALTH’S LEGISLATIVE WASTE MANAGEMENT STRATEGY

- Bureau of Solid Waste Disposal (DEM)
- Broad authority to manage waste & organize municipal participation
  - Dispose of waste, lease land/contract for construction and operation disposal facilities
  - Create solid waste districts
  - Projects remained subject to municipal approval
  - 1st reference to a solid waste master plan
- Plan to 5 create waste disposal districts
  - Focus on WTE in 70’s to early-mid 80s
  - NE, 128 West, Central, Lower Pioneer Valley, Essex County
COMMONWEALTHS ROLE & CAPITAL INVESTMENT IN NESWC

- Community Advocate
  - Promoter, Tech Assistance, Contract Representative
- Select Contractor and Negotiate Contract Terms
  - Developer and Communities (uniform contract)
- Purchase Facility Site and Lease to Developer (20 acres)
- Guarantor of 20 years Ash/Bypass Disposal Capacity
  - 3M+ tons.
  - Peabody Landfill
- Capped No. Andover Landfill
DEAL COMPONENTS

• Community Contracts
  • 20 year put or pay disposal with guaranteed tonnage commitment
    • 50% of facility capacity
    • Constrained recycling
  • Pay facility construction debt service and operator’s cost and profit
  • Pay landfill costs
  • Revenue share-90% of energy/50% of metal’s recovery

• Private Hauler Contracts
  • 8 companies
    • 90% put or pay
    • 20% of facility capacity

• Operator Contractor
  • Facility performance guarantees
  • 20 year take or pay energy contract with NEP
  • Price paid per kWh based on avoided fuel cost
SCORE CARD

• Communities
  • Project Objective-Minimize Cost to User Communities
    • Tip Fees Soared
      • Projected cost $8 ton in 1985; $0 in 1990, receive $75 ton 2005
      • Actual costs- Paying $95.00 in 1997, 2x state average
    • Fuel prices dropped, facility AQ upgrade for acid gas scrubbers

• Owner/Operator
  • Communities largely paid for a privately owned facility to be built, upgraded, and covered the owner’s cost and profit.

• Commonwealth
  • Responded to landfill disposal capacity and environmental problems
  • Promoted new technology with waste reduction and energy generation benefits
  • Failed the project objective on cost minimization
WHAT IS THE SPRINGFIELD MRF

- State-owned, privately operated materials recovery facility
  - Waste Management Recycle America

- Processes paper and containers (metal, glass and plastics).
  - Dual (source separated) stream and single (comingled) stream facilities

- Currently serves 73 communities
- Started operation in 1990
- Process 45,000 tons per yr.
WHAT DROVE THE MRF

• Major policy shift to ISWM priorities: Reduce/Recycle-WTE-Landfill
• C. 584 of Acts of 1987
  • Expanded upon the Master Plan concept
  • Provided clear authority and funding for recycling/composting projects in addition to prior authorization
  • Revised siting statute
    • Retained final authority in municipalities
    • Established DEP’s “waste ban” authority
  • Capping Grants program
• 80 communities in Western Mass willing to sign contracts
COMMONWEALTH STRATEGY

• A multi-prong initiative: grant/loan funding, market development, tech assistance, education, organization building, and regulatory exceptions/mandates to promote recycling and composting.

• Demonstrate viability of industrial scale processing
  • Initial concept of 5 state facilities down to one state owned/private operator

• Induce community support by insulating them from risk and cost free
DEAL COMPONENTS

• Commonwealth purchased site, building, equipment, collection vehicles and blue bins.
  • $10M in state funds

• Contract Operator
  • Evolved from fee for service to revenue based

• Community
  • Put but not pay
  • Evolved from free tipping to payment per ton + revenue sharing
  • 2005-Current contract-
    • $15.+ per ton start with yearly step down to $6.
    • Commodity market price based revenue share formula
  • Public Education fee- .05 per capita
SCORE CARD

• Declare Victory all around
• Built a thriving recycling and secondary materials use economy and culture
• Sparked other innovations in processing and collection
• Prolonged landfill capacity
• Enhanced municipal revenues
COMPARE AND CONTRAST

• Market Forces and Timing
  • Fuel Price Drop v. China Export/Import Boom
• Technology Status and Industry Interest
• Master Plan policy context
• Risk Burden and Sharing
• Complexity and Consultant Capture
• State Municipal Relationship
MassDEP’s Feasibility Studies of AD Facilities on State Owned Land

Briony Angus

Senior Project Manager & Associate
Tighe & Bond
MassDEP / DCAMM Anaerobic Digestion Projects

EBC Solid Waste Committee Meeting
October 18, 2017

Briony Angus, Tighe & Bond
Agenda

- Casual Discussion!
- Recap of MassDEP/ DCAMM-led AD projects on state-owned land
- More detail on the MCI-Shirley AD Project
- Lessons Learned/ Challenges with AD
- Discussion
MassDEP/ DOER / MassCEC evaluated 200+ state-owned facilities: Looked for high energy users, food waste generators, adequate space

Top Three Candidates:
- MCI-Norfolk, MCI-Shirley, Amherst Wastewater Treatment Plant (at UMASS campus)

MCI-Norfolk and Shirley – Food Waste / Leaf & Yard Waste ONLY

Amherst WWTP project – Food Waste and Sludge
MassDEP used SARSS pre-qualified contractors to conduct Feasibility Studies

Evaluated:
- Environmental / Regulatory / Permitting
- Feedstock Availability
- Technology Selection and Sizing – Wet and Dry Systems
- Estimate of AEP (Heat and Electricity)
- Electrical and Thermal Interconnection
- Digestate Management
- Community Impacts
- Economics

Tighe & Bond hired for two MCI projects, CDM Smith hired for UMass Amherst
Feasibility Study Conclusions

- No site-related fatal flaws for development of projects at either MCI site, or at UMass
- Project economics need to advance past Feasibility Study analysis
- Next Steps recommended:
  - Further evaluation of thermal interconnection
  - Confirm feedstock availability
  - Evaluate economics/logistics with on-site digestate storage
  - Obtain input from development community
MassDEP/DCAM Study of State Land for Anaerobic Digestion

✓ Screen of State Facilities (done)
✓ Meetings with Facility Managers (done)
→ Meetings with Local Officials

Next Steps:
☐ Feasibility Study (winter 2012)
☐ Draft and Issue RFP Solicitations (spring 2013)
☐ Award Contracts to Vendors (December 2013)
☐ Facilities Constructed and Operating (December 2014)
### DCAMM Procurement Schedule
**Summer 2013**

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Anticipated Date</th>
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<tbody>
<tr>
<td>Responses to RFI Due</td>
<td>July 19, 2013</td>
</tr>
<tr>
<td>Issue RFQ</td>
<td>August 2013</td>
</tr>
<tr>
<td>Receive Qualifications</td>
<td>October 2013</td>
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<tr>
<td>Select Developer</td>
<td>December 2013</td>
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<tr>
<td>MOU Execution</td>
<td>January 2014</td>
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<tr>
<td>Final Proposal</td>
<td>February – April 2014</td>
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<tr>
<td>Negotiate PPA</td>
<td>Initiate April 2014</td>
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<tr>
<td>Start Construction</td>
<td>May – August 2014</td>
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<tr>
<td>Operational</td>
<td>Spring 2015</td>
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Time Passed ...
Next Steps

- June 2013: DCAMM RFI issued
- June 2015: DCAMM / DOC proposal to Asset Management Board for proposed use of site
- February 2016: DCAMM RFP for Procurement Assistance
- April 2016: Tighe & Bond hired to assist DCAMM
- August 2016: RFP (and many other pieces) issued
- Bids Due Oct 2016: No responses!
## Summary of MCI Shirley AD RFI Responses

<table>
<thead>
<tr>
<th>Vendor/Respondent</th>
<th>Minimum System Size</th>
<th>Tipping Fee Range</th>
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<tbody>
<tr>
<td>Agreen Energy, LLC</td>
<td>100 to 200 tons per day per digester is an appropriate commercial size to achieve the necessary economic scale</td>
<td>$20 to $40 per ton</td>
</tr>
<tr>
<td>Anaergia</td>
<td>200 tons per day is an acceptable size</td>
<td>Detailed proforma is required to first assess all revenues and costs</td>
</tr>
<tr>
<td>Harvest Power Inc.</td>
<td>200 tons per day could be sufficient</td>
<td>Cannot be estimated with any degree of confidence without projecting the size and nature of the facility</td>
</tr>
<tr>
<td>NEO Energy</td>
<td>65 tons per day for minimum 200 tons per day is acceptable</td>
<td>Need to know power price, but must be lower than disposal or alternate organic recycling fees</td>
</tr>
<tr>
<td>NOVI Energy</td>
<td>350 tons per day could be done w/ 200 tons per day</td>
<td>For raw products without contamination - approximately $10 to $35 per ton. For products that need to be shredded under a Certified Destruction Program - approximately $50 and $105 per ton</td>
</tr>
<tr>
<td>Yield</td>
<td>200 tons per day if several sources of income</td>
<td>Tipping fees depend on numerous market variables</td>
</tr>
</tbody>
</table>
First step: Updated MCI Shirley Feasibility Study
Project was first privately owned renewable energy generation project proposed on state land
Drafted RFP, PPA, Lease, Technical Study Scope
Issued August 2016
Decent interest at pre-bid and site visit
Chapter 25A EMS Procurement – Required guaranteed energy savings
Unique Approach – Select respondent to conduct Technical Study first, then execute contracts if Technical Study looks good
No responses received
DCAMM Procurement Feedback

- Confusion about procurement approach
- Procurement approach too complex
- Lack of guaranteed feedstock
- Food waste only
- Scale too small
- Existing competitive electricity rates at the state, bidders wanted a pre-set offtake rate

January 2017: Feedback that DCAMM Commissioner ok with using sludge (whatever it will take), may seek assistance with feedstock study
Were the Sites Good?

■ Site specific issues
  – Complexity of siting at DOC facilities
  – Competing facilities
  – Lack of on-site feedstock, integrating into existing infrastructure complex (at DOC facilities, easier at UMass)

■ Bigger Issues
  – Food waste uncertainties
  – Difficult to accurately determine food waste tipping fees, digestate disposal costs, potential beneficial re-use revenue
  – State procurement and contracting process
Successful AD in Massachusetts

**Vanguard/ Jordan Projects**
- Private sites, already generating odors
- Guaranteed feedstock
- No sludge
- On-site offtaker of digestate
- Not without challenges too, i.e. Deerfield interconnection

**Greater Lawrence**
- Existing AD infrastructure
- On-site feedstock, existing relationship with NEFCO
- Added CHP, capacity for 200,000 gallons of high solid food waste slurry
- Grants from MassCEC, DOER, MassDEP, NGrid
State Efforts to Promote AD

- Organic Waste Ban 2014
- Updating Regulations to facilitate AD
- MassCEC $$
- MassDEP SMRP $$ - Diversion
- MassDEP Recycling Business Development Grants - Processing
- Organics Task Force
- Updating Draper Lennon?
- Real Estate Asset Leveraging (REAL) Strategy
Discussion and Questions

Briony Angus, Tighe & Bond
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How State Solid Waste Policies Could be Better Aligned

Phil Goddard
Manager of Facility Compliance & Technology Development
Town of Bourne

Environmental Business Council of New England
Energy Environment Economy
Open Discussion