

# URBAN BIOMASS RESOURCES IN MICHIGAN

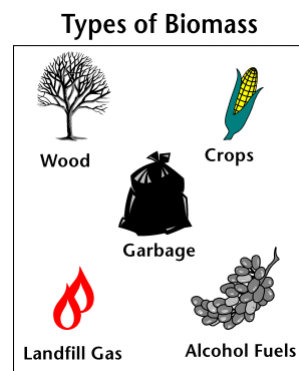
## PROCUREMENT AND HANDLING

Project Development Conference  
Oakland University  
May 22, 2008

Controlled Performance, L.L.C.  
E.P. (Ted) Barrett, Jr.

## BIOMASS

- What is Biomass?
- Why Biomass?



## Forest vs. Urban Wood Waste

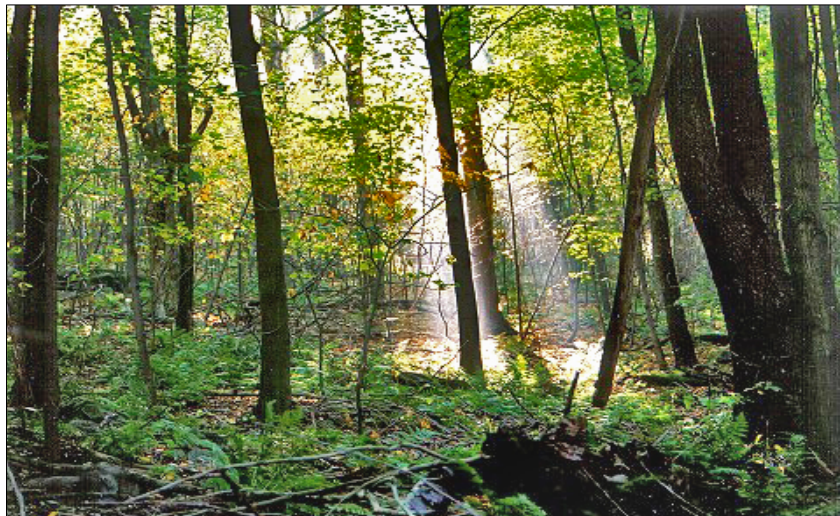
- Forest



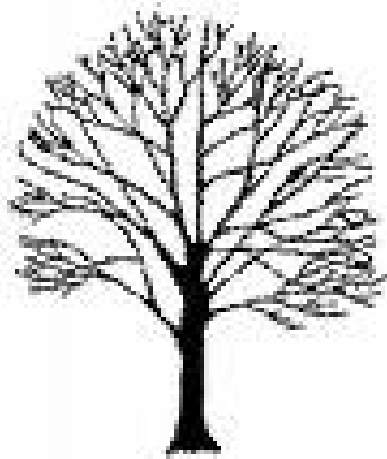
- Urban



## Forest Wood Waste



## Log vs. Wood Waste



## Urban Wood Waste



## Pre-Procurement Initial Work

- Feasibility Study

## Pre-Procurement Detailed Work

- Fuel Risks
- Wood Specifications
- Processing Equipment
- Volumes and Burn Rates
- Volumes and Price Variables
- Transportation Infrastructure
- Economics – Price Ranges
- Competition

# Pre-Procurement Detailed Work

- Fuel Risks
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## IX BOILER-READY WOOD WASTE FUEL PROTOCOL

- A Scope.....
- B Significance and Use.....
- C Apparatus.....
- D Procedure.....
  - a Collection of Core Sample.....
  - b Preparation of Core Sample.....
- E Inspection.....
  - a Visual Observations of Painted Wood and Painted Wood & Non-wood Materials.....
  - b Recording Results.....
- F Calculations.....
- G Frequency of Sampling and Inspection.....
- H Wood Waste Fuel Load Rejection Criteria.....
- I Re-inspection.....
- J Records

## Wood Chips



## Testing for Moisture Content



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## Wood Chipper



## Wood Grinder



## Tub Grinder





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## Wood Inventory



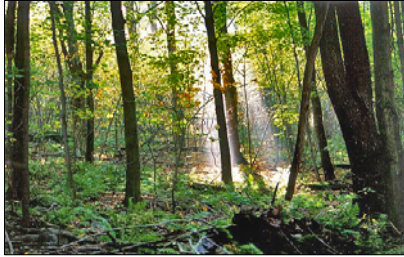
## Boiler Fire



## Pre-Procurement Detailed Work

- Fuel Risks
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## Wood Sources



## Wood Types



# Source Proximity



# Processing



# Transportation



## Pre-Procurement Detailed Work

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- Volumes and Price Variables
- **Transportation Infrastructure**
- Economics – Price Ranges
- Competition

## Limits and Restrictions



R12-2

Sign image from the Manual of Traffic Signs - <http://www.traffic-signs.us/>  
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## Traffic Congestion



## Pre-Procurement Detailed Work

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- **Economics – Price Ranges**
- Competition

## Pre-Procurement Detailed Work

- Fuel Risks
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- Volumes and Burn Rates
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- Transportation Infrastructure
- Economics – Price Ranges
- **Competition**

## Competition



## Alternative Wood Uses





## Facility Review

- Plant Unloading Equipment
- Mobile Equipment
- Logistics and Routing

## Unloading & Storage



## Facility Review

- Plant Unloading Equipment
- **Mobile Equipment**
- Logistics and Routing

## Mobile Equipment



## Facility Review

- Plant Unloading Equipment
- Mobile Equipment
- **Logistics and Routing**

## Strategy and Implementation

- **Schedule**
- Required Reserves
- Wood Supply Contracts
- Establish Wood Receiving Yards
- Pricing/Receiving Methods

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## Wood Reserves



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- Schedule
- Required Reserves
- Wood Supply Contracts
- **Establish Wood Receiving Yards**
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# Yard Locations



# Wood Collection Yards



## Yard Equipment



## Strategy and Implementation

- Schedule
- Required Reserves
- Wood Supply Contracts
- Establish Wood Receiving Yards
- Pricing/Receiving Methods

## Attracting Wood



## Pricing & Receiving Methods





## Receiving & Inspections



## Testing for Moisture Content



## Operations

- Wood Receiving Procedures
- Wood Storage and Feed System
- Account Management

## Operations

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- Wood Storage and Feed System
- Account Management

## Storage



## Wood Feed



## Wood Feed



## Operations

- Wood Receiving Procedures
- Wood Storage and Feed System
- **Account Management**

# Account Management



# Accounting Records

## SCALE HOUSE DAILY REPORT

SCALE HOUSE REPORT REFLECTS, ON A DAILY BASIS, ALL MATERIAL GOING INTO THE STORAGE PILE

August 2006		MMR		Broker		Prim. Fuels		Total		Green Tons			Bone Dry Tons		
Adj	Day	Lds	Recd	Lds	Recd	Lds	Recd	Lds	Recd	Burned	Inventory	Moisture	Recd	Burned	Inventory
	1	19	639.59	24	817.90	0	-	43	1,457.49	1,407.56	24,741.36	33.53%	968.80	935.61	16,574.69
	2	12	362.81	21	646.86	0	-	33	1,009.67	1,368.40	24,382.63	36.19%	644.28	873.18	16,345.73
	3	15	180.53	14	492.74	0	-	19	673.27	1,437.70	23,618.20	40.49%	400.65	855.58	15,890.86
	4	7	259.39	15	487.10	0	-	22	746.49	1,173.37	23,191.32	36.51%	473.97	744.97	15,619.86
	5	8	275.42	2	81.11	0	-	10	356.53	986.70	22,561.15	31.86%	242.94	672.34	15,190.46
	6	0	-	-	-	0	-	0	-	992.20	21,568.95	35.72%	-	637.79	14,552.67
	7	23	767.88	14	412.31	0	-	37	1,180.19	1,186.90	21,562.24	34.46%	773.50	777.89	14,548.28
	8	29	1,029.40	15	502.89	0	-	44	1,532.29	1,125.96	21,968.57	33.76%	1,015.02	745.84	14,817.46
	9	39	1,290.47	12	370.08	0	-	51	1,660.55	1,022.67	22,606.45	32.06%	1,128.16	694.80	15,250.82
	10	32	973.02	10	301.49	0	-	42	1,274.51	1,041.81	22,839.15	30.17%	889.97	727.50	15,413.29
	11	34	1,063.20	15	526.28	0	-	49	1,589.48	1,040.82	23,387.81	32.77%	1,068.62	699.74	15,782.17
	12	13	421.00	0	-	0	-	13	421.00	848.10	22,960.71	38.92%	257.16	518.02	15,521.31
	13	0	0	-	-	0	-	0	-	824.89	22,136.82	33.54%	-	648.22	14,973.09
	14	10	322.42	18	579.66	0	-	28	902.08	939.18	22,098.72	35.92%	578.04	601.83	14,949.30
	15	14	432.95	21	662.78	0	-	35	1,095.73	978.67	22,215.78	35.99%	701.36	626.45	15,024.21
	16	24	763.72	24	714.65	0	-	48	1,478.37	949.52	22,744.63	33.60%	981.63	630.48	15,375.36
	17	23	634.30	16	491.24	0	-	39	1,125.54	1,052.70	22,817.47	34.92%	732.47	685.10	15,422.73
	18	18	604.23	13	377.84	0	-	31	982.07	1,047.20	22,752.34	31.90%	668.81	713.14	15,378.40
	19	11	396.34	8	273.54	0	-	19	669.88	1,127.50	22,294.72	34.48%	438.91	738.74	15,078.57
	20	0	-	0	-	0	-	0	-	1,007.60	21,287.12	34.18%	-	663.20	14,415.37
	21	11	333.62	14	452.44	0	-	25	786.06	992.20	21,080.95	33.61%	521.88	658.72	14,278.53
	22	37	1,241.37	16	530.12	0	-	53	1,771.49	995.50	21,856.97	31.49%	1,213.63	682.02	14,810.14
	23	37	1,227.32	12	394.36	0	-	49	1,621.68	1,126.40	22,352.25	33.09%	1,085.08	753.67	15,141.55
	24	35	1,033.24	13	389.79	0	-	48	1,423.03	1,165.01	22,610.27	36.65%	901.50	738.03	15,305.02
	25	29	937.92	21	689.37	0	-	50	1,627.29	1,071.29	23,146.27	37.78%	959.91	686.45	15,638.48
	26	14	511.59	12	416.83	0	-	26	928.42	1,053.80	23,020.89	35.33%	600.39	681.49	15,557.38
	27	0	-	3	109.79	0	-	3	109.79	1,161.82	21,968.86	36.14%	70.11	741.94	14,885.55
	28	25	974.51	12	368.98	0	-	37	1,343.39	806.63	22,505.62	39.79%	808.84	485.67	15,208.72
	29	22	764.67	14	424.64	0	-	36	1,189.31	1,102.42	22,592.51	41.03%	701.36	650.10	15,259.98
	30	30	1,173.94	14	458.94	0	-	44	1,632.88	1,147.85	23,077.54	37.44%	1,021.51	718.10	15,563.39
	31	27	1,024.84	24	875.44	0	-	51	1,900.28	1,122.55	23,855.27	36.73%	1,202.30	710.24	16,055.45
	31	-	-	-	-	-	-	-	-	(194.80)	24,050.07	-	-	(126.31)	16,181.76
	<b>Total</b>	<b>588</b>	<b>19,639.69</b>	<b>397</b>	<b>12,829.07</b>	<b>0</b>	<b>-</b>	<b>985</b>	<b>32,468.76</b>	<b>33,110.12</b>	<b>24,050.07</b>	<b>35.16%</b>	<b>21,090.80</b>	<b>21,450.54</b>	<b>16,181.76</b>

## Boiler Controls



## MIS-USES



Dropping off at Landfill



Open Burning

## Green Uses

