



Tools and Strategies to Save Energy

Energy Trust Program Overview

Example Success Story:
Advanced Control of Air Pollution System

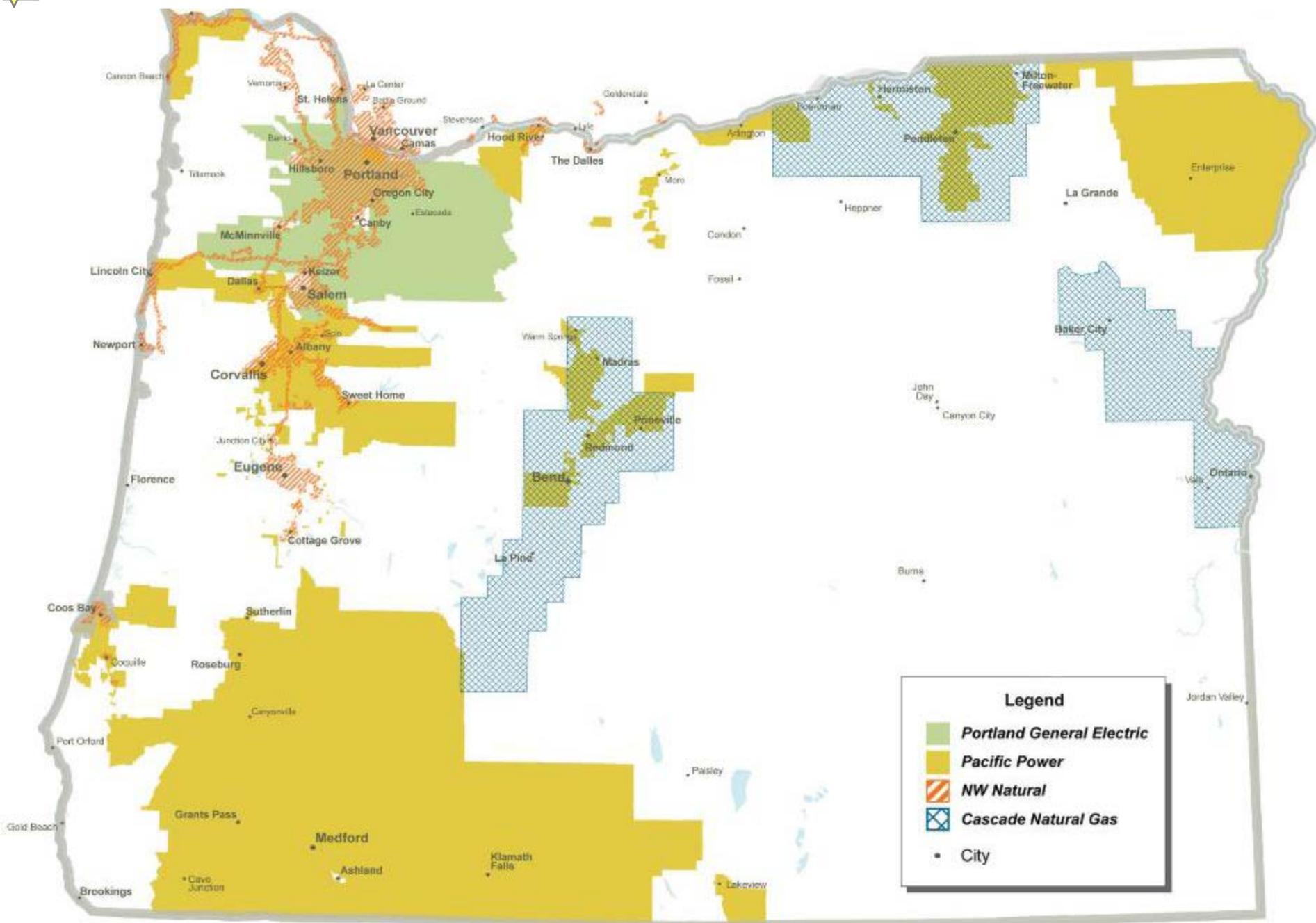
PPRC Regional Roundtable
October 25th, 2016


EnergyTrust
of Oregon



About

- Independent nonprofit
- Serving 1.5 million customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas
- Providing access to affordable energy
- Generating homegrown, renewable power
- Building a stronger Oregon and SW Washington



Legend

- Portland General Electric
- Pacific Power
- NW Natural
- Cascade Natural Gas
- City

Acquisition Program Tools and Services

- Streamlined Measures
 - Calculator Toolset
- Custom Projects (capital and O&M)
 - Free Investment Grade Engineering Analysis
- Strategic Energy Management (SEM)
 - Long Term Engagement





Example Success Story

Advanced Control of Air Pollution System

- Complex multiple dust collector system
- Numerous machine centers
- Constantly changing demand
- Leading edge comprehensive controls
- Ductwork changes and system rebalance
- Automated gates to maintain correct flow



Necessary Evil?

Most industrial businesses create emissions and many have air pollution control equipment in place as a means of meeting permit requirements.

Opportunity!

Air pollution equipment quite often consumes significant electricity and therefore provides an opportunity to reduce operating costs.

Table 3: Energy & Cost Savings Summary

EEM No.	Measure Description	Estimated Baseline Operation kWh/year	Verified Baseline Operation kWh/year	Estimated EEM kWh/year	Verified EEM kWh/year	Annual kWh Savings	Annual Cost Savings @ \$0.0656/kWh	Verified % Savings
1	Ecogate On-demand System	2,351,185	2,348,259	1,201,843	1,037,636	1,310,623	\$85,977	56%
TOTALS:			2,348,259		1,037,636	1,310,623	\$85,977	56%





Optimize

Optimizing your dust collection system with correctly engineered ducting, hoods, collectors, fans, VFDs, and advanced controls can significantly reduce operating costs while providing a cleaner, safer & healthier work environment.



Monitor & Control

A: Carothers 150 HP

System Working
Cleaning after 5:21:13

VFD - RUNNING

FREQUENCY	OUTPUT
greenBOX 45.8 Hz	356 V
Reference 45.8 Hz	97 A
Output 45.8 Hz	51 kW

WORKSTATIONS

Total	Active	Request
32	11	

GATES

Total	Active	Request
30	11	
NoCom 0	Open 12	
Error 0	Op.Air 1	
Disabled 1	Request 11	

Actual Savings 62 %
Average Savings 49 %
Avg. Active Gates 10
Average Power 66 kW

DUCT SYSTEM

Req. Air Vol.	15893 CFM
Air Velocity	3444 FPM
Air Volume	19243 CFM
Fan Pressure	15.18 "wc
Filter Pressure	2.99 "wc

B: Western Pneumatic 250 HP

System Working
Cleaning after 1:16:13

VFD - RUNNING

FREQUENCY	OUTPUT
greenBOX 44.8 Hz	355 V
Reference 44.8 Hz	138 A
Output 45.5 Hz	79 kW

WORKSTATIONS

Total	Active	Request
56	14	

GATES

Total	Active	Request
55	16	
NoCom 0	Open 16	
Error 0	Op.Air 0	
Disabled 2	Request 16	

Actual Savings 70 %
Average Savings 63 %
Avg. Active Gates 8
Average Power 78 kW

DUCT SYSTEM

Req. Air Vol.	26697 CFM
Air Velocity	2755 FPM
Air Volume	40638 CFM
Fan Pressure	12.76 "wc
Filter Pressure	2.53 "wc

C: Torit Day 100 HP

System Working
Cleaning after 0:41:13

VFD - RUNNING

FREQUENCY	OUTPUT
greenBOX 48.6 Hz	401 V
Reference 48.6 Hz	73 A
Output 48.6 Hz	37 kW

WORKSTATIONS

Total	Active	Request
13	7	

GATES

Total	Active	Request
14	7	
NoCom 0	Open 7	
Error 0	Op.Air 0	
Disabled 0	Request 7	

Actual Savings 46 %
Average Savings 46 %
Avg. Active Gates 2
Average Power 36 kW

DUCT SYSTEM

Req. Air Vol.	8327 CFM
Air Velocity	2632 FPM
Air Volume	12918 CFM
Fan Pressure	13.92 "wc
Filter Pressure	1.04 "wc

A: Carothers 150 HP

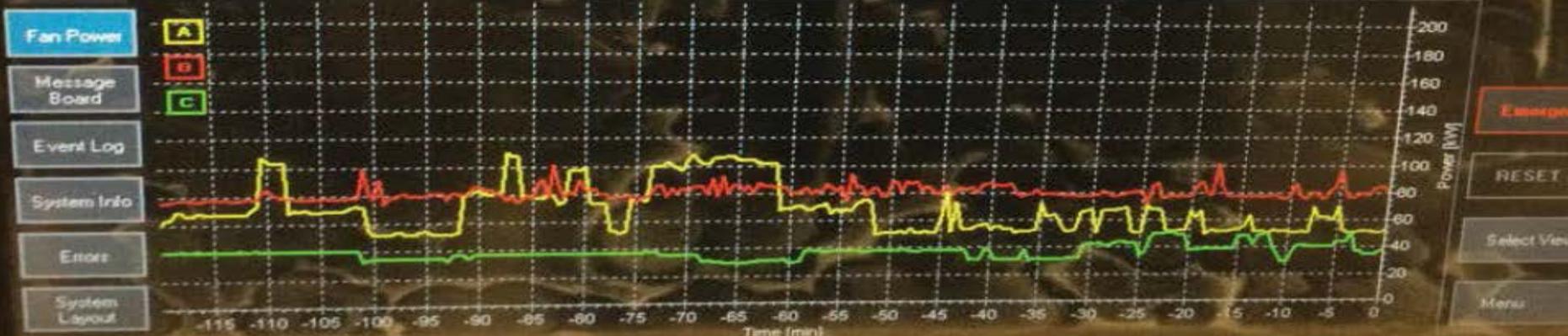
- 7247: 4": 1 Porter C
- 7239: 4": 10 Saw SW
- 7285: 4": 14 Saw Sto
- 0919: 14": 19 TS #1
- 7226: 4": 23 SCMI SI
- 7217: 4": 26 Rip Saw
- 7289: 10": 29 MJ Gar
- 7096: 16": 32 Green I
- 7266: 6": 38 Friulmac
- 7246: 4": 41 SW-035
- 7219: 4": 6 MJ DVTL
- 7201: 4": 11 Saw SW
- 7297: 14": 17 Gold M
- 7218: 4": 20 Cut Saw
- 7252: 4": 24 Saw SW
- 7280: 8": 30 Cresswic
- 7248: 6": 36 Green M
- 7271: 6": 39 Precision
- 7212: 4": 42 SW-036
- 7211: 4": 9 Holzher
- 7160: 4": 12 Saw SW
- 7671: 14": 16 Blue M
- 7218: 4": 21 General
- 7270: 5": 25 104 OP
- 7126: 4": 28 Saw SW
- 7272: 8": 31 Diehl SW
- 7280: 5": 38 Friulmac
- 7244: 6": 40 304 OP
- 7111: 5": 43 SCMI S

B: Western Pneumatic 250 HP

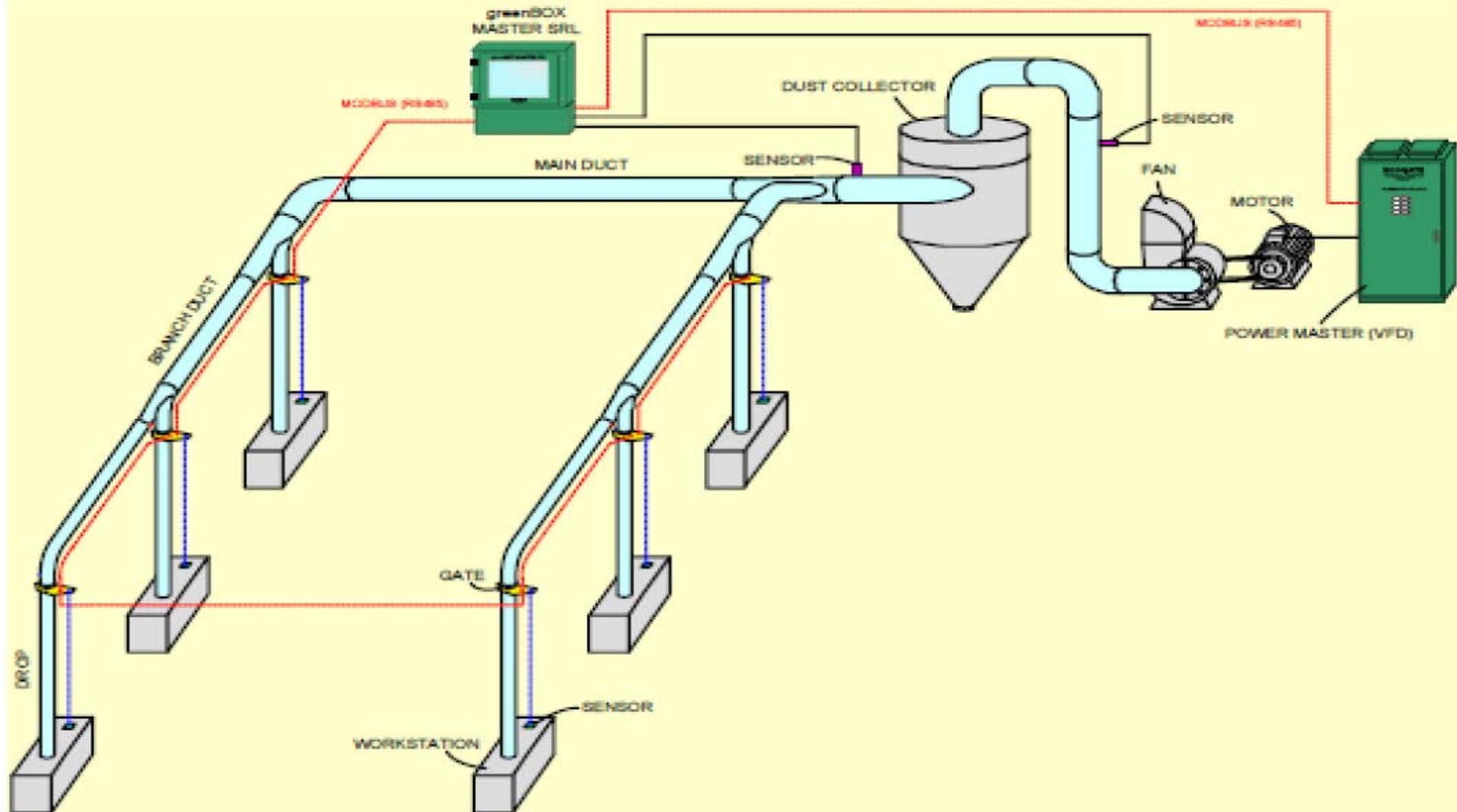
- 7221: 6": 1 Powerm
- 7282: 10": 5 Slipcor
- 7299: 14": 8 DMC 4
- 7273: 6": 10 Steghan
- 7228: 4": 13 DMGA #
- 7292: 7": 16 Balestrir
- 7236: 5": 19 Router f
- 7225: 4": 21 Saw Sto
- 7285: 6": 24 Vbonoo
- 7286: 6": 28 Vbonoo
- 7272: 6": 31 Vbonoo
- 7261: 6": 34 Vbonoo
- 7249: 5": 37 SCMI TI
- 7250: 5": 45 Unique
- 7207: 4": 48 Balestrir
- 7291: 7": 2 Unique 2
- 0726: 6": BLUM RTR
- 7202: 4": 3 SCMI TI
- 7281: 10": 6 Slipcor
- 7203: 12": 8 DMC 4
- 7214: 4": 11 Cimnico
- 7289: 7": 14 Balestrir
- 7295: 7": 17 Balestrir
- 7268: 5": 22 Pistorius
- 7278: 6": 22 Pistorius
- 7275: 6": 26 Vbonoo
- 7230: 6": 29 SCMI SI
- 7254: 6": 35 Vbonoo
- 7289: 5": 39 SCMI TI
- 7283: 5": 42 SCMI TI
- 7241: 5": 46 Unique
- 7257: 4": 49 Larik Fr
- 7205: 4": 13 Powerm
- 7224: 4": Posermatic
- 7231: 4": 4 Makita
- 7295: 14": 8 DMC 4
- 7296: 16": 9 DMC 4
- 7267: 6": 12 Pistorius
- 7209: 4": 15 Balestrir
- 7262: 5": 18 Pistorius
- 7222: 4": 20 Pistorius
- 7253: 6": 23 Zero Des
- 7240: 5": 27 SCMI SI
- 7229: 5": 30 Router f
- 7215: 4": 33 Vbonoo
- 7266: 6": 36 Vbonoo
- 7259: 6": 40 Vbonoo
- 7260: 5": 44 SCMI TI
- 7204: 4": 47 SCMI S
- 7236: 5": 50 SCMI S
- 7206: 4": 5 Cross C
- 7279: 6": Stegher S

C: Torit Day 100 HP

- 7278: 10": 1 Northac
- 7237: 4": 4 EDOBN
- 7284: 9": 7 Erat BF
- 7287: 10": 10 KOMO
- 7232: 4": 13 BLUM R
- 7283: 8": 2 WSM GF
- 7233: 4": 5 Vbonoo
- 7223: 4": 8 Davis S
- 7300: 12": 11 Shida
- 7220: 4": 13 BLUM R
- 7274: 9": 3 TS WUR
- 7235: 4": 6 EDOBN
- 7208: 4": 9 Powerm
- 7227: 4": 12 Powerm



Sample Dust Collection System with Advanced Control Technologies





Brentwood Corporation

- Advanced Control of Air Pollution System
- \$515,300 project cost
- 257,600 Energy Trust cash incentive
- 1,310,600 est. annual kWh saved
- \$86,000 est. annual energy cost savings
- 3 Year Simple Payback based on energy savings & cash incentive

“This is one of the most compelling capital projects we have ever completed because it offers real dollar savings in electricity and is not dependent on changing market or business demands that can diminish the savings of many projects over time.”

- Dan Wagner, plant engineering manager and maintenance manager



Thank you for attending and
for all you do to keep our
water and our air clean!

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