Golder Associates

August 24, 2010

093-87660

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AIR REGULATION

Mr. A. A. Linero, Program Administrator
Special Projects Section
Florida Department of Environmental Protection
2600 Blairstone Road
Tallahassee, Florida 32399-2400

RE: SOUTHEAST RENEWABLE FUELS, LLC
DEP FILE NO. 0510032-001-AC (PSD-FL-412)
ADVANCED BIOREFINERY PERMIT APPLICATION
RESPONSE TO LETTER DATED AUGUST 6, 2010

Dear Mr. Linero:

Thank you for your letter dated August 6 regarding the status of the Southeast Renewable Fuels, LLC, (SRF) air permit application for the sweet sorghum to ethanol advanced biorefinery to be located in Hendry County, Florida. We sincerely appreciate the Florida Department of Environmental Protection's (FDEP) efforts to-date on reviewing the application.

SRF would like once again to stress the importance of this project to the state of Florida and the nation in furthering its energy independence, reduction in oil consumption, and use of annually renewable resources. The project will also result in the creation of new jobs, expansion of agriculture in the state, and increased tax revenues for the state during this time of economic recession.

We continue to be very concerned; however, that potential imposition of unproven control technology could render the project economically infeasible and prevent closing on the financial funding of the plant. We realize, of course, that economic feasibility is not the sole criteria. We respect the need to structure a permit that ensures adequate environmental protection. We believe this can be accomplished with control technologies we have proposed. For example, certain air pollution control technologies were not required on a recent permit issued by FDEP for another ethanol plant (Highlands Ethanol), but may be forced on the SRF facility.

In response to the August 6 letter, we provide the following comments/additional information:

1. SRF has proposed two options in its application for the bagasse boiler: spreader stoker and bubbling fluidized bed. However, FDEP appears to be applying a "one emission limit fits all" approach to permitting the SRF facility. By imposing a single NO_x limit on the facility, the FDEP is not taking into account the significant differences in emissions between these two boiler technologies. The spreader stoker technology results in inherently higher uncontrolled NO_x emissions compared to the fluidized bed boiler. Best available control technology (BACT) rules require that each "process" technology proposed be evaluated on its own merits. Respectfully, we suggest that it is not appropriate to impose a single emission limit on two dissimilar technologies based on only what is achievable by one of the technologies.

2. FDEP indicates that the capital and operating costs of selective catalytic reduction (SCR) could be significantly less than estimated by SRF because SRF's costs assumed totally independent suppliers, high molar/NO_x ratio and a need for reheat when avoiding dusty side catalyst installation. SRF does not believe this to be the case, and stands by its submitted cost estimates. An SCR provided by a supplier independent of the supplier of the electrostatic precipitator/dry sorbent injection (ESP/DSI) system may only be marginally more expensive compared to one supplier for all. However, an independent supplier also may have advantages in terms of operating experience, which is a very critical factor in selection, and we believe this to be the case for SRF.

Golder Associates Inc.
6026 NW 1st Place
Gainesville, FL 32607 USA
Tel: (352) 336-5600 Fax: (352) 336-6603 www.golder.com

At FDEP's suggestion, we further contacted a vendor to obtain cost and guarantee information on a combined ESP/DSI/SCR system for PM, acid gas, NO_x and CO control. We have received their quote, which is for a hotside ESP and SCR installation (see attached Confidential Business Information). This means that the air preheater on the boiler must be relocated to downstream of the ESP/SCR (to avoid costly flue gas reheat). We have compared it to the quote previously received from the same vendor in February 2010 for only the ESP/DSI equipment. The difference in these two quotes would presumably represent the cost of the SCR system. This difference is approximately $1,500,000. However, the SCR cost leaves out several necessary items, including:

- Economizer bypass duct system and controls
- SCR bypass duct and controls
- Ducts from and to the SCR system
- Urea or aqueous ammonia storage system and piping
- Flue gas booster fan (due to additional pressure drop across SCR)
- Relocating the air preheater to after the SCR system
- Additional foundations, structural steel, piping, wiring, etc.
- The cost quote for installation is too low to be realistic, based on standard cost factors

It is also noted that the vendor is only guaranteeing the catalyst life to be 8,400 hours, arguably based on lack of experience of this equipment with biomass in general and sweet sorghum bagasse in particular.

In addition to these deficiencies in the proposal, it is noteworthy that this vendor is quoting much lower costs than other reputable vendors that have much more experience with SCR.

Moreover, the vendor was also asked to provide a list of experience with SCR projects. Based on the vendor's response, they have no operating experience utilizing SCR on a biomass-fired boiler, let alone on bagasse. We understand they are currently constructing an SCR system on a wood-fired boiler in Texas; however it is not yet operational.

The additional costs imposed by SCR could potentially render the project infeasible based on economic impacts. Lending institutions are not willing to lend significant amounts of capital for unproven technology configurations. At the very least, SCR would put SRF at a significant cost disadvantage compared to Highlands Ethanol, which will be producing the exact same product as SRF – ethanol from biomass- but without having to bear this additional cost.

Additionally, in a recent permit application submitted to FDEP (Palm Beach Renewable Energy Facility), the estimated cost of SCR for one unit was $20 million capital cost and $3.9 million annual operating cost, based on a flue gas volume of 184,000 acfm. The proposed bagasse boiler for SRF has a flue gas flow rate of 180,500 acfm, therefore the size of these SCR systems are very comparable, although the Palm Beach facility is a municipal waste combustor facility. In our PSD application, we estimated regenerative SCR to cost $14.5 million in capital costs, and $3.1 million in annual costs. We believe our cost figures to be realistic, even low, compared to numbers being stated for other projects and by other vendors.

We therefore have to disqualify the attached vendor quote as being unrealistic, and not based on proven operating experience.

3. SRF is concerned that its project is being compared to other dissimilar biomass projects, rather than the U.S. Sugar Boiler No. 8 which is the most recently installed bagasse boiler in the state of Florida. U.S. Sugar Boiler No. 8 is directly comparable to SRF's proposed boiler. Boiler No. 8 burns bagasse with high moisture content (50-55 percent), and employs selective non-catalytic reduction (SNCR), which is now well proven on bagasse boilers. Sweet sorghum bagasse will similarly have a high moisture content (50-55 percent). Like U.S. Sugar Boiler No. 8, SRF will combust bagasse, not low-moisture stillage. We

recognize that Boiler No. 8 was permitted several years ago and respect the Department's desire to impose improved emission controls (and SRF has responded by proposing lower NO_x limits compared to Boiler No. 8), but we believe the strongest factor for comparative analysis of comparable facilities should be the relevant feedstock and conversion technology.

Conversely, the following is a list of other facilities that have been used as a comparison to SRF in our conversations with the FDEP. We believe these facilities are significantly distinguishable from SRF as follows:

FBEnergy

FBEnergy is a minor PSD source and not subject to BACT; therefore, this was not a BACT determination. This is a wood-fired facility, which is a fuel much different than bagasse (in terms of moisture content, 30-50 percent, and other constituents), and for which a great deal of information is available (in terms of constituents such as ash and chemical constituents, and how they vary over time). FBEnergy sought to obtain a permit for a facility that could be built anywhere in the country, including nonattainment areas. Therefore, they voluntarily proposed SCR. SCR also was proposed in order to avoid being a major source of hazardous air pollutants (HAPs), which would require a case-by-case MACT analysis. This is also purely a power production facility, with economics much different than SRF. We do not believe this facility is a valid comparable to SRF.

ADAGE

Adage is a minor PSD source and not subject to BACT; therefore, this was not a BACT determination. ADAGE proposed a bubbling fluidized bed boiler, which is the same as SRF's fluidized bed boiler option, but much different than SRF's spreader stoker boiler option. This is also a wood-fired facility and a large power production facility (much larger boiler), with economics much different than SRF. Adage voluntarily proposed SCR, in part to avoid being a major source of HAPs and case-by-case MACT review. We do not believe this facility is a valid comparable to SRF

American Renewables

American Renewables (GRU) is a major PSD source and subject to BACT. GRU proposed a bubbling fluidized bed boiler, which is the same as SRF's fluidized bed boiler option, but much different than SRF's spreader stoker boiler option. This is also a wood-fired facility and a large power production facility (with much larger boiler), with economics much different than SRF. GRU voluntarily proposed SCR as BACT. We do not believe this facility is a valid comparable to SRF

Geoplasma

The Geoplasma project will utilize plasma-arc technology to gasify municipal solid waste producing a low Btu syn-gas. Due to the nature of this project, they must obtain a permit prior to getting financing. This plant will more than likely never be built, based on economics. We do not believe this facility is a valid comparable to SRF.

Ineos

Ineos project is another gasifier project. We do not believe this facility is a valid comparable to SRF.

4. Comparison with Highlands Ethanol.

- Highlands Ethanol provides the closest comparison to SRF's bubbling fluidized bed boiler option, but not the spreader stoker boiler option. SNCR, rather than SCR, was accepted by FDEP for the Highlands Ethanol permit. Accordingly, SRF requests the same treatment.
- Highlands Ethanol, in their application, specified a fluidized bed boiler and SNCR to achieve a NO_x limit of 0.075 lb/MMBtu. FDEP, in their permit, specified 0.075 lb/MMBtu (exactly what Highlands Ethanol had proposed), which could be met through either SNCR or SCR. But SCR was not required by the permit, and SCR is not necessary to meet the permit limit. This permit was issued only 6 months ago, after SRF had submitted its application.
- Highlands Ethanol's permit clearly states that they generate their own process steam by combusting biomass with stillage cake (as low as 35 percent moisture) being their primary fuel and tree wood chips/bagasse/or energy crop material listed as supplemental boiler fuel. Combusting stillage from these type components is not a proven technology on a commercial scale, with the exception of perhaps a few corn ethanol plants. FDEP has recognized this as shown by the following statement in the Highlands Ethanol permit addressing a question from EPA: "*The [backup boiler] operation will be progressively reduced as the cellulosic manufacturing process and associated biomass combustion technologies are proven*". Just as FDEP recognized that burning ethanol stillage is not commercially proven... so too, FDEP should recognize that certain technologies for combustion of sweet sorghum bagasse are similarly not proven. SCR applied to sweet sorghum bagasse (or any type bagasse) is unproven. SRF cannot commit to limits with equipment that is not proven.

In the TE&PD for the Highlands Ethanol final permit, FDEP states:

> *The applicant proposes to achieve its proposed BACT NOX limit by SNCR with performance that will almost match the guarantees listed for the RSCR system. In that case, the marginal cost-effectiveness of RSCR compared with SNCR may be substantial because the additional reduction in emissions of NOX (on the order of 10-20 TPY per boiler) will be achieved at a relatively high additional capital cost.*
>
> *The applicant will burn stillage (basically the remaining lignin from the process) rather than woody biomass. Stillage may contain more fuel nitrogen because the crops contain more nitrogen than woody biomass and because nutrients such as urea are introduced to cultivate enzymes and fermentation microorganisms. Thus it may form more fuel NOX when combusted than typical woody biomass.*
>
> *The Department notes that there is little information available about grain ethanol stillage (distiller's grain) combustion, let alone cellulosic ethanol stillage combustion. Most distiller's grain is used as animal feed or fertilizer. Combustion optimization of the cellulosic ethanol stillage is one subject of on-going research at the Highlands Ethanol pilot and demonstration plants in Jennings, Louisiana.*
>
> *Based on the foregoing discussion, the Department will set a limit of 0.075 lb NOX/mmBtu on a 30-day rolling basis achievable by combustion in a BFB boiler incorporating SNCR or SCR. Compliance shall be demonstrated by a continuous emission monitoring system (CEMS).*

- SRF's project is basically the same as this, except that sweet sorghum bagasse will be burned instead of stillage. SRF has tested sweet sorghum for various constituents, and has conducted a trial burn with a combination of sweet sorghum and sugarcane bagasse. The trial burn was very successful, and the sweet sorghum did not alter the character of

emissions compared to burning sugarcane bagasse alone. There are no significant questions regarding sweet sorghum and the operation of the control technologies that SRF has proposed. There are, however, significant questions with the operation of an SCR or RSCR system on bagasse (sugarcane or sweet sorghum), because such systems have never been used or demonstrated on a bagasse-fired boiler. This lack of operating experience with SCR/RSCR was a major factor in the Highlands Ethanol BACT determination, and is a major factor for SRF.

- Highlands Ethanol's NO_x limit for the fluidized bed boiler is acceptable to SRF. However, if this limit were required for the spreader stoker boiler, it would force SRF to use SCR to meet the NO_x limit. SCR is relatively unproven on biomass, with no experience on bagasse. It would not be appropriate to require SRF to now bear the cost of an SCR system, especially since there is no operating experience on bagasse. RSCR technology has been ruled out as inappropriate by the control equipment vendors. SCR, while unproven, would be very costly and render the project economically infeasible. It would not be appropriate to require SRF to now bear the cost of an SCR or RSCR system, especially since there is no operating experience on bagasse. The cost impact alone of RSCR would likely make the SRF project cost-prohibitive. This would also put SRF at a significant cost disadvantage compared to Highlands Ethanol, which will be producing the exact same product as SRF- ethanol from biomass.
- Lack of operating experience with SCR/RSCR was a major factor in the Highlands Ethanol BACT determination for NO_x, and is a major factor for SRF.

SRF has not yet selected the boiler type (either spreader stoker or bubbling fluidized bed). We believe that while FDEP must specify the control technology that represents BACT, on a case-by-case basis, we believe it is beyond the scope of FDEP to dictate the boiler technology. As such, the FDEP must issue separate limits for the fluidized bed boiler and for the spreader stoker boiler. The spreader stoker is well proven technology for combustion of bagasse. U.S. Sugar's Boiler 8 is the latest such example. This boiler achieves relatively low CO emissions (0.38 lb/MMBtu or about 400 ppmvd on a 30-day rolling average) compared to other bagasse boilers, while the SNCR system has operated well while achieving NO_x emissions of less than 0.14 lb/MMBtu. SRF has proposed an even lower NO_x limit of 0.12 lb/MMBtu for its spreader stoker boiler, while proposing 0.080 lb/MMBtu for the BFB boiler.

5. SRF has lowered its proposed NO_x emissions limit

- SRF has lowered the proposed NO_x emissions limit (with SNCR) from 0.14 to 0.12 lb/MMBtu for the spreader stoker boiler, and from 0.10 to 0.08 lb/MMBtu for the fluidized bed boiler. This will require modification to the boiler design to achieve the lower NOx levels. Initial estimates for engineering and capital are $600,000 additional.

6. We recognize FDEP's continued concern about hydrogen chloride (HCl) emissions and SRF's claim to be a minor source of HAPs emissions. We are confident that the minor source criteria (10 TPY of HCl and 25 TPY) can be met. SRF has proposed to install a dry sorbent injection (DSI) system to control HCl emissions with at least 95 percent control. SRF will commit to a requirement that all fuel material brought in from the fields with the sweet sorghum (sorghum leaves and tops) will undergo the same washing process as the sorghum processed into ethanol. SRF will commit to a requirement that none of the vegetative matter brought in with the sweet sorghum will bypass the ethanol process washing.

- SRF requests that FDEP recognize test data from a newer sugarcane bagasse boiler supporting the view that the SRF project will be a minor source for HAPs. Sorghum bagasse will be very similar to sugarcane bagasse. The sorghum is a grass similar to sugarcane. It will be grown on similar lands and will undergo very similar processing including shredding and extensive washing. Sorghum will emit HCl very similar to a sugarcane bagasse boiler, which emits very low HCl. SRF's proposed HCl emission rate is based on testing of boilers burning sugarcane bagasse with no HCl control technology, and does not account for the added removal of the DSI system SRF is proposing.

- The revised vendor quote guarantees 95 percent HCl removal at an HCl inlet loading of 0.135 lb/MMBtu. The guaranteed emission rate is 0.0067 lb/MMBtu. However, SRF expects the HCl inlet loading to be much lower than the basis of this guarantee, assuring SRF's proposed emission limit will be met.
- We are confident that we can demonstrate the acceptable HCL limit through stack testing. Of course, compliance can be a condition of the permit.

Summary:

- SCR technology is unproven on a bagasse-fired boiler. The project cannot be financed with unproven, costly technology. We therefore ask that the FDEP issue the permit based on SNCR.
- We request that FDEP issue the permit with a NO_x limit for the fluidized bed boiler the same as Highlands Ethanol - 0.08 lb/MMBtu. This can be achieved with SNCR.
- We request that FDEP issue the permit with a NO_x limit of 0.12 lb/MMBtu for the spreader stoker boiler. This can be achieved with SNCR.
- We are confident that SRF will not be a major source of HAPs. The permit can specify this as a condition.
- We request that FDEP issue the permit with an HCl emission limit that must be demonstrated through stack testing.

Thank you for considering this information. If you have any questions, please do not hesitate to call me at (352) 336-5600.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David A. Buff, P.E., Q.E.P.
Principal Engineer

cc: Don Markley, SRF
Carlos Rionda, SRF

Attachments

DB/tlc

PPC Industries

3000 East Marshall Longview, TX 75601
903-758-3395 Fax 903-758-6487

For your information, PPC's business philosophy is "to provide our customers with a superior quality electrostatic precipitator at an installed price below that of our competitors". Since we never advertise or attend trade shows, most people know little about us. We usually find new clients by direct telephone contact or by referral from satisfied customers.

PPC has over 500 precipitator installations in a wide variety of industries (petroleum, cat crackers, coke ovens, coal fired boilers, municipal incinerators, recovery boilers, medical waste incinerators, bagasse boilers, etc.) We have more experience on biomass boilers than any other electrostatic precipitator manufacturer. Operating from the same location since 1967, we provide an experienced management team with an average of 20+ years working for PPC.

The following is a partial list of electrostatic precipitators we have supplied to the biomass industry:

Wood Fired Boiler Installations (excluding cogeneration plants and power boilers)

	Company	Location	Boiler pph
1.	Guy Bennett Lumber	Clarkston, WA	30,000
2.	Norbord, Inc.	Deposit, NY	30,000
3.	Chilkoot Lumber Company	Haines, AK	60,000
4.	Georgia-Pacific Corporation	Bay Springs, MS	40,000
5.	Louisiana-Pacific Corp.	Oroville, CA	90,000
6.	Hammond Cedar	Vancouver, B.C.	40,000
7.	Louisiana-Pacific Corp.	Oroville, CA	40,000
8.	Potlatch Corp.	Bemidji, MN	25,000
9.	Plum Creek Timber	Kalispell, MT	90,000
10.	Webster Lumber	Bangor, WI	20,000
11.	Temple-Inland	Thomson, GA	35,000
12.	Idaho Forest (DeArmond)	Coeur d'Alene, ID	60,000
13.	Idaho Forest (Atlas Plant)	Coeur d'Alene, ID	60,000
14.	Crown Pacific	Coeur d'Alene, ID	50,000
15.	Plum Creek Manufacturing	Columbia Falls, MT	170,000
16.	Georgia-Pacific Corporation	Taylorsville, MS	100,000
17.	Potlatch Corporation	Cook, MN	60,000
18.	Weyerhaeuser Company	Wright City, OK	120,000
19.	Boise-Cascade Corporation	Island City, OR	35,000
20.	Riley Creek Lumber	Laclede, ID	30,000
21.	Potlatch Corporation	Pierce, ID	80,000
22.	Deltic Farm & Timber	Waldo, AR (three units)	40,000
23.	Power Sources	Loudon, TN	65,000
24.	Weyerhaeuser Company	Raymond, WA	80,000
25.	Georgia-Pacific Corporation	Hawthorne, FL	120,000
26.	Georgia-Pacific Corporation	Holley Hill, SC	185,000
27.	Georgia-Pacific Corporation	Peterman, AL	140,000
28.	Stimson Lumber Co	Libby, MT	80,000
29.	Temple-Inland	Monroeville, AL	40,000
30.	Plum Creek Mfg.	Pablo, MT	60,000
31.	Weyerhaeuser Microboard	Moncure, NC	80,000
32.	Power Sources, Inc.	Lenoir, NC	35,000
33.	Georgia- Pacific Corporation	Warrenton, GA	60,000
34.	Georgia-Pacific Corporation	Claxton, GA	60,000

35.	Pope & Talbot	Spearfish, SD	60,000
36.	Deltic Timber	Ola, AR	60,000
37.	Hoge Lumber Company	New Knoxville, OH	40,000
38.	Bruce Hardwoods	Oneida, TN	20,000
39.	Evans Forest Products	Golden, B.C.	60,000
40.	Crown Pacific	Port Angeles, WA	40,000
41.	Langdale Forest Products	Valdosta, GA	60,000
42.	Riverside Forest Products	Armstrong, B.C.	140,000
43.	Precision Energy	Cedar Rapids, IA	60,000
44.	SDS Lumber	Bingen, WA	60,000
45.	Louisiana-Pacific Corporation	Clayton, AL (two units)	40,000
46.	Columbia Forest Products	Cuthbert, GA	20,000
47.	Rayonier, Inc.	Baxley, GA	40,000
48.	Georgia-Pacific Corporation	Belk, AL	60,000
49.	Swords Veneer	Rock Island, IL	20,000
50.	Bruce Hardwood	Jackson, TN	40,000
51.	Robbins Hardwood	Warren, AR	40,000
52.	Potlatch Corporation	Post Falls, ID	40,000
53.	Louisiana-Pacific Corp.	Dawson Creek, BC	100,000
54.	Georgia-Pacific Corporation	Bay Springs, MS	50,000
55.	Mannington Wood Floors	Epes, AL	20,000
56.	Superior Lumber Company	Glendale, OR	70,000
57.	Stimson Lumber Company	Gaston, OR	100,000
58.	Wilsonart International	Temple, TX	40,000
59.	Weyerhaeuser Company	Mountain Pine, AR (two units)	80,000
60.	Georgia-Pacific Corporation	Madison, GA	200,000
61.	Weyerhaeuser Company	Zwolle, LA	60,000
62.	Armstrong Wood Products	Beverly, WV	60,000
63.	Windset Nurseries	Ladner, B.C.	20,000
64.	Boise-Cascade	Elgin, OR	80,000
65.	Pacific Inland Resources	Smithers, B.C.	60,000
66.	Wilsonart International	Fletcher, NC	20,000
67.	Gulf States Paper	Moundville, AL	70,000
68.	West Fraser Mills	Quesnel, B.C.	70,000
69.	Blue Ridge Lumber	Blue Ridge, ALB	70,000
70.	Roseburg Forest Products	Coquille, OR	50,000
71.	Roseburg Forest Products	Riddle, OR	80,000
72.	Georgia-Pacific Corporation	Crossett, AR	150,000
73.	Archer Daniels Midland	Valdosta, GA	80,000
74.	West Fraser Mills	Williams Lake, B.C.	80,000
75.	Sundre Forest Products	Sundre, ALB	70,000
76.	Boise Building Solutions	LaGrande, OR	40,000
77.	Georgia-Pacific Corporation	Monticello, GA	160,000
78.	Consolidated Grain	Mt. Vernon, IN	80,000
79.	Corrugated Services	Forney, TX	117,000
80.	New South Companies, LLC	Conway, Corrigan, SC	50,000
81.	New South Companies, LLC	Graham, NC	40,000
82.	Dept. of Energy	Savannah River, SC	40,000
83.	Decorative Panels	Alpena, MI	220,000

Wood Fired Thermal Oil Systems

	Company	Location	MMBTU/hr
1.	Canadian Forest Products [Konus System]	Vancouver, BC	24
2.	Weyerhaeuser Canada, Ltd. [Volcano System]	Drayton Valley, Alb.	40
3.	Trus Joist MacMillan [GEKA System]	Buckhannon, WV	80
4.	Weyerhaeuser Canada, Ltd.[Volcano System]	Edson, Alberta	40
5.	Malette Industries [GEKA System]	Timmins, Ontario	52
6.	Louisiana-Pacific Corporation	Swan River, Manitoba	86
7.	Georgia-Pacific Corporation	Sault-Ste.-Marie, Ont.	80
8.	Norbord Industries	Val D'Or, Quebec	32
9.	Pope & Talbot	Castlegar, B.C.	75
10.	Del-Tin Fiber L.L.C.	El Dorado, AR	270
11.	Norbord Industries	Kinards, SC	300
12.	Georgia-Pacific Corp.	Grenada, MS	40
13.	Norbord Industries	Lanett, AL	300
14.	Tolko Industries	High Prairie, Alb.	120
15.	Temlam	Amos, Quebec	80
16.	Hardel Mutual Plywood	Chehalis, WA	60
17.	Norbord Industries	Jefferson, TX	300
18.	Georgia-Pacific Corporation	Hosford, FL	80
19.	Martco	Chopin, LA	116

Wood Fired Boilers for Cogeneration Plants

	Company	Fuel	Size
1.	Corn Products Company, Winston-Salem, NC	Wood/Coal	15 MW
2.	Sierra Power, Terra Bella, CA	Wood	7.5 MW
3.	Multitrade Group, Martinsville, VA	Wood/Coal	20 MW
4.	Koppers Company, Montgomery, PA	Cross-Ties	7.5 MW
5.	Biomass One, Medford, OR	Wood	25 MW
6.	Potlatch Corporation, Warren, AR	Wood Waste	15 MW
7.	Potlatch Corporation, Bemidji, MN	Wood Waste	12 MW
8.	Ryegate Associates, Ryegate, VT	Wood Waste	20 MW
9.	Midwesco Energy, Lyonsdale, NY	Wood	21 MW
10.	Northland Power, Cochrane, Ontario	Wood Waste	19 MW
11.	Multitrade Group (3 units), Altavista, VA	Wood (250,000 pph boilers)	80 MW
12.	Roseburg Forest Products, Weed, CA	Wood	12 MW
13.	BFC Electric, Cedar Rapids, IA	Wood Waste	6 MW
14.	Timber Energy Resources, Telogia, FL	Wood Waste	15 MW
15.	Corn Products Company, Winston-Salem, VA	Wood Waste	7.5 MW
16.	CoGen Co, Riddle, OR	Wood Waste	10 MW
17.	CoGen II- Prairie City, OR	Wood Waste	10 MW
18.	Mount Lassen Power, Westwood, Ca	Wood	12 MW
19.	KTI Energy, Martinsville, VA	Wood/Coal	20 MW
20.	Riverside Forest Products, Armstrong, BC	Wood	12 MW
21.	Cinergy, St. Paul, MN	Wood	20 MW
22.	Canadian Gas & Electric, Grande Prairie, ALB	Wood	15 MW
23.	Sierra Pacific Industries, Aberdeen, WA	Wood	15 MW
24.	Sierra Pacific Industries, Mt. Vernon, WA	Wood	20 MW
25.	Anderson Windows, Bayport, MN	Wood	5 MW
26.	Intrinergy Wiggins, MS	Wood	???
27.	Mesquite Fuels, LLC	Wood	3 MW
28.	Evergreen Community Power	Wood/RDF	40 MW

Paper Mill Power Boilers

Company	Location	Boiler-pph
1. Manistique Paper	Manistique, MI (two units)	60,000
2. Louisiana-Pacific Canada Ltd.	Chetwynd, B.C.	150,000
3. Canadian Forest Products	Prince George, B.C.	180,000
4. Spruce Falls, Inc.	Kapuskasing, Ontario	180,000
5. Tembec Industries	Smooth Rock Falls, Ontario	250,000
7. Weyerhaeuser Company	Rothschild, WI	85,000
8. Interstate Paper	Riceboro, GA	150,000
9. Abitibi Consolidated	Grand Falls, New Foundland	200,000
10 Weyerhaeuser Company	Longview, WA	400,000
11. Rayonier Performance Fibers	Fernandina Beach, FL	350,000
12. Propal Paper	Cali, Colombia	150,000
13. Abitibi Consolidated	Fort Frances, Ontario	400,000

A new use of PPC electrostatic precipitators is on wood burning direct fired dryers. These units operate at a relatively high temperature. The units installed to date are as follows:

Direct Fired Dryer Units

Company	Location	Flow - acfm
1. Plum Creek Timber	Columbia Falls, MT	125,000
2. Columbia Plywood	Klamath Falls, ID	65,000
3. Langboard, Inc.	Willacoochee, GA	254,000
4. Scotch Plywood	Fulton, AL (two units)	150,000
5. Georgia-Pacific Corp.	Eugene, OR	20,000
6. Norbord Industries	Jefferson, TX	250,000
7. Huber Engineered Woods	Easton, ME	220,000
8. Boise Building Solutions	Medford, OR	77,000

Bagasse Fired Units

Company	Location	Flow - acfm
1. U.S. Sugar Corp.	Clewiston, FL	432,000
2. State of Louisiana	Lacassine, LA	139,000
3. Rio Grande Sugar	Santa Rosa, TX	280,000

Also, PPC recently began building units for ethanol plants:

Ethanol Production Units

Company	Location	Flow - acfm
1. Poet Ethanol	Chancellor, SD	124,519

PPC has been supplying HCL removal systems for the medical waste industry since 1988. Recently, this has been expanded to include SO_2 removal from high sulphur flue gas streams. This system is all dry and is economical to both install and operate.

SO_2 Removal Units

Company	Location	Size pph
1. Weyerhaeuser Company	Longview, WA	200
2. Decorative Panels	Alpena, MI	2@ 100 lbs/ea
3. Poet Ethanol	Chancellor, SD	900
4. Evergreen Com. Power	Reading, PA	900

WOOD FIRED BOILERS REFERENCE LIST

Jack Daniel Distillery Hwy. 55 Lynchburg, TN 37352 Mr. Bill Spraggins 931-759-6108	Roseburg Forest Products P.O. Box 1088 Roseburg, OR 97470 Mr. Robin Styers 530-938-2721	Plum Creek Manufacturing 500 12th Avenue - West Columbia Falls, MT 59912 Mr. Jack Hinman 406-892-6324
McBurney Corporation PO Box 1827 Norcross, GA 30091 Mr. Blake McBurney 770-925-7100	Plum Creek Manufacturing 75 Sunset Drive Kalispell, MT 59903 Mr. Jerry Gibbs 406-752-4024	Corn Products Company P.O. Box 12939 Winston-Salem, NC 27107 Mr. Tom Vannoy 336-785-0850
Weyerhaeuser 2792 Orbie Zwolle, LA 71486 Mr. Larry Lonadier 318-645-6124	Georgia-Pacific Flakeboard 657 Baseline Sault Ste. Marie, Ontario Mr. Dave Gooderham 705-253-0770	Sigma Thermal 200 N. Cobb Parkway Suite 409 Marietta, GA 30062 Mr. Eric Dessecker 678-324-5727
Norbord Industries P.O. Box 26 Deposit, NY 13754 Mr. Tom Weirs 607-467-2600	Webster Lumber Company County Hwy. U Bangor, WI 54614 Mr. Paul Schwartz 608-486-2341	Georgia-Pacific Corp. P.O. Box 555 Taylorsville, MS 39168 Mr. Barry Green 601-785-4721
Mauna Loa Macadamia Nut HC 01, Box 3 Hilo, HI 96720 Mr. Dennis Maeda 808-966-8628	Potlatch Corporation 810 W. Pine Warren, AR 71671 Mr. Don Spraggins 870-226-1196	Georgia - Pacific Corp. Gordon-Chapel Road Hawthorne, FL 32640 Mr. Mike Lee 352-481-4311
Elementis Pigments 1525 Wood Avenue Easton, PA 18042 Mr. Bill Kocker 610-250-3789	SDS Lumber PO Box 266 Bingen, WA 98605 Mr. Fred Olson 509-493-6103	Deltic Farm & Timber P.O. Box 409 Waldo, AR 71770 Mr. Jerry Coats 870-693-5555
District Energy St. Paul, Inc. 76 Kellogg Blvd. West St. Paul, MN Mr. David Parenteau 651-297-8955	Guy Bennett Lumber Co. 175 Elm Street Clarkston, WA 99403 Mr. Gene Casper 509-758-7242	Weyerhaeuser Company 51 Ellis Street Raymond, WA 98577 Mr. Paul Hanson 360-942-2442
Georgia-Pacific Corp. PO Box 1190 Holley Hill, SC 29059 Mr. Chuck Stevens 803-496-5022	Koppers Power Company P.O. Box 189 Montgomery, PA 17752 Mr. Bill Evans 717-547-6270	Hammond Cedar 20580 Maple Crescent Maple Ridge, B.C. Mr. Rudy Maros 504-681-3221
Abitibi-Consolidated Co. of Canada 145 Third Street West Fort Frances, Ontario P9A 3N2 Mr. Wayne Wilton 807-274-5311	Georgia-Pacific Corp. Hwy. 15 South Bay Springs, MS 39422 Mr. John Gamble 601-764-3193	Crestbrook Forest Industries Mill Road Skookumchuck, BC Mr. Ray Joncas 250-422-3993
Boise - Cascade	Riverside Forest Products	Potlatch Corporation

1917 Jackson Street LaGrande, OR 97850 Mr. Travis Tandy 541-962-2029	820 Guy Street Kelowna, B.C. Mr. Brent Rodgers 250-861-6914	Route 3, Box 530 Bemidji, MN 56601 Mr. Jim Gray 218-751-6144
Langdale Industries PO Box 1088 Valdosta, GA 31607 Mr. Bill Gay 912-333-2513	Weyerhaeuser Canada Ltd. 2509 Aspen Drive Edson, Alberta Mr. Harry Quinn 403-723-6963	Weyerhaeuser Canada Ltd. Highway 22 South Drayton Valley, Alberta Mr. Arvo Leilop 403-542-8071
Wilsonart International 2400 Wilson Place Temple, TX 76504 Mr. Greg Reynolds 254/207-6714	Trus Joist Macmillian Rt. 5, Box 50 Buchannon, WV 26201 Mr. Cletus Wamsley 304-472-8564	Grant Forest Products Rt. Hwy 101 West Timmins, Ontario Mr. Scott Pearson 705-268-6211
Co-Gen Co PO Box 340 Prairie City, OR 97869 Mr. Jim Munyon 541-820-3751	Mount Lassen Power PO Box 1390 Westwood, CA 96137 Mr. Gary Pritchard 530-256-3155	Spruce Falls, Inc. PO Box 100 Kapuskasing, Ontario P5N 2Y2 Mr. Dave Measor 705-337-9740
CPM Consultants P Box 5399 Cary, NC 2512 Mr. Gary Gosda 919-481-1084	Northland Power 506 4th Street East Cochrane, Ontario Mr. Dan Raimondo 705-272-5297	
Langboard MDF PO Box 430 Willacoochee, GA 31650 M. Johnny Davis 912-564-5959	Norbord Industries 1, Rue des Panneaux, C.P. 190 Val-D'Or, Quebec Mr. Louis-Pierre Dionne 819-825-1373	
Louisiana-Pacific Canada 1221 10th Ave. North Golden, B.C. Mr. Ken Anderson 250-344-8848	Louisiana-Pacific Canada Ltd. Box 189 Minnetonas, MB Mr. Kevin Warkentin 204-525-2479	
Riverside Forest Products Bag Service 5000 Armstrong, B.C. V0E 1B0 Mr. Ben VanRhyn 250-546-2241	Temple-Inland 700 Borden Drive Diboll, TX 75941 Mr. Barry Malone 936/829-1836	
Del-Tin Fiber 757 Newell Road El Dorado, AR 71739 Mr. Barry White 870-309-3164	Hoge Lumber Company PO Box 159 New Knoxville, OH 45871 Mr. John Hoge 419-753-2263	