

SELECTED PSL PROJECTS

PROJECT NAME AND LOCATION	START DATE	GROUP	BRIEF DESCRIPTION
Precision Energy, USA	May-08	Power Boiler	Modeling a fluidizing bed combustor
Nexterra, Canada	May-08	Gasifier	Modeling a packed bed gasifier
GP-Toledo, USA	May-08	Bark Boiler	Optimizing air system design and operation
Quesnel River, Canada	Apr-08	Dryer	Problem solving for a pulp dryer
Rayonier Jesup, USA	Mar-08	Recovery Boiler	Upgrade air system and evaluate air system designs
Northwood, Canada	Feb-08	Recovery Boiler	Upgrade air system and evaluate air system designs
YunJing, China	Jan-08	Recovery Boiler	Upgrade air system and evaluate air system designs
APP Hainan, China	Nov-07	Recovery Boiler	Upgrade air system and evaluate air system designs
CBC Lawrcel, Brazil	Oct-07	Recovery Boiler	Upgrade air system and evaluate air system designs
IP Eastover, USA	Sept-07	Recovery Boiler	Upgrade air system and evaluate air system designs
IP Savannah, USA	May-05	Lime Kiln	Burning syngas from wood gasification in a lime kiln and optimize burner design
GP-Monroe, USA	Aug-07	Recovery Boiler	Upgrade air system and evaluate air system designs
Oji Kushiro, Japan	Jun-07	Recovery Boiler	Upgrade air system and evaluate air system designs
Canadian Gas & Electric, Canada	Jun-07	Power Boiler	Optimizing air system design and operation
NanHua LinChang, China	Aug-07	Recovery Boiler	Upgrade air system and evaluate air system designs
IP Savannah, USA	Jul-07	Recovery Boiler	Upgrade air system and evaluate air system designs
Oji Kasugai, Japan	June-07	Recovery Boiler	Upgrade air system and evaluate air system designs
Sodra Mönsterås, Sweden	June-07	Lime Kiln	Burning biomass in a lime kiln
Georgie-Pacific Naheola, USA	June-07	Recovery Boiler	Upgrade air system and evaluate air system designs
Oji Yonago, Japan	Apr-07	Recovery Boiler	Upgrade air system and evaluate air system designs
Weyerhaeuser New Bern, USA	Mar-07	Recovery Boiler	Study of impact of lignin removal on recovery boiler performance
Domtar Ashdown RB2, USA	Feb-07	Recovery Boiler	Evaluating different air system designs from different vendors
Domtar Ashdown RB3, USA	Feb-07	Recovery Boiler	Evaluating different air system designs from different vendors
Oji Ebetus RB3, Japan	May-07	Recovery Boiler	Upgrade air system and evaluate air system designs
StoraEnso North America, USA	Dec-06	Lime Kiln	Burning syngas from wood gasification in a lime kiln and optimize burner design
StoraEnso North America, USA	Dec-06	Power Boiler	Replacing heavy oil by syngas from wood gasification
Saska Power, Canada	Nov-06	Utility Boiler	Optimizing screen settlement in upper boiler to eliminate ash fouling
Ence Huelva, Spain	Dec-06	Recovery Boiler	Upgrade air system and evaluate air system designs
Lafarge Alpena, USA	Nov-06	Waste Heat Boiler	Improving boiler efficiency
Hainan Jinhai, China	Nov-06	Recovery Boiler	Optimization of air system designs
Klabi Correia, Brazil	Nov-06	Recovery Boiler	Upgrade air system and evaluate air system designs
APP Cambi, Indonesia	Sept-06	Power Boiler	Design new OFA system for a multi-fuel fluidized bed boiler
GP Toledo, USA	June-06	Recovery Boiler	Upgrade air system and evaluate air system designs

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Klabin Telemaco, Brazil	June-06	Recovery Boiler	Upgrade air system and evaluate air system designs
Propal Cali, Columbia	May-06	Recovery Boiler	Upgrade air system and evaluate air system designs
VCP Jacarei RB4, Brazil	May-06	Recovery Boiler	Upgrade air system and evaluate air system designs
Americana Ripasa, Brazil	April-06	Recovery Boiler	Upgrade air system and evaluate air system designs
Weyerhaeuser Kamloops, Canada	April-06	Lime Kiln	Burning syngas in a kiln and optimization of dual burner design
Catalyst Paper at Elk Falls, Canada	Mar-06	Recovery Boiler	Optimization of boiler operation
VCP Jacarei RB3, Brazil	Mar-06	Recovery Boiler	Upgrade air system and evaluate air system designs
GP Palatka, USA	Dec-05	Recovery Boiler	Upgrade air system and evaluate air system designs
Siam Pulp Mill at Kanchanaburi, Thailand	Dec-05	Recovery Boiler	Upgrade air system and evaluate air system designs
McBurney Power Boiler, USA	Oct-05	Bark Boiler	Predict thermal profile in the furnace
IP Franklin Recovery Boiler, USA	Sep-05	Recovery Boiler	Upgrade air system and evaluate air system designs
Chitianhua Recovery Boiler, China	Aug-05	Recovery Boiler	Optimization of air system designs
Siam Pulp Mill at Ratchanburi, Thailand	July-05	Recovery Boiler	Upgrade air system and evaluate air system designs
Buckeye Technologies, USA	May-05	Fiber	Simulation of airlaid fiber motion through screen apertures
Oji Paper Recovery Boiler, Japan	May-05	Recovery Boiler	Upgrade air system and evaluate air system designs
IP Siallit Recovery Boiler, France	July-05	Recovery Boiler	Upgrade air system and evaluate air system designs
Potlach McGeHee Recovery Boiler, USA	May-05	Recovery Boiler	Upgrade air system and evaluate air system designs
Arauco Recovery Boiler, Brazil	Jun-05	Recovery Boiler	Upgrade air system and evaluate air system designs
Calhoun Recovery Boiler, USA	Jan-05	Recovery Boiler	Upgrade air system and evaluate air system designs
Weyerhaeuser Lagoon Optimization	Jan-05	Lagoon	Evaluate different aeration strategies on lagoon performance
G.P. Brunswick Boilers (2),USA	Apr-05	Recovery Boiler	Upgrade air system and evaluate air system designs
Thunder Bay Bark Boiler, Canada	Mar-05	Bark Boiler	Upgrade air system and evaluate air system designs
Skookumchuck Lime Kiln, BC, Can.	Jan-05	Lime Kiln	Evaluate alternative fuels in terms of lime kiln performance
Lafarge Pre-Calciner, Can.+USA	Mar-05	Cement Kiln	Develop a model of pre-calciner including meal calcination and multi-fuel combustion. Analyze pre-calciner performance.
Lafarge NOx reduction, Can.+USA	Nov-04	Cement Kiln	Develop technology to reduce NOx in rotary cement kiln (2 year project)
Weyerhaeuser, DOE project, USA	Oct-04	Gasifier	Optimize design of burner and reactor of New Bern gasifier (2 year project)
St. Francisville Mill, USA	Sep-04	Recovery Boiler	Upgrade air system and evaluate air system designs
Skookumchuck Bark Boiler, BC, Canada	Sep-04	Bark Boiler	Upgrade air system and evaluate air system designs
Lafarge Swirl, Joppa, MD, USA	Aug-04	Cement Kiln	Analysis of the effect of burner air swirl on kiln operations.
G-P Mill at Brunswick, USA	Aug-04	Recovery Boiler	Upgrade air system and evaluate air system designs
Helsey Mill, USA	Aug-04	Recovery Boiler	Upgrade air system and evaluate air system designs
Norske Canada Mill at Crofton	Jul-04	Bark Boiler	Upgrade air system and evaluate air system designs
Thunder Bay Recovery Boiler, Canada	Jul-04	Recovery Boiler	Upgrade air system and evaluate air system designs
Norske Canada Mill at Elk Fall, Can	Jun-04	Precipitator	Optimize design and location of perforate plate; evaluate system imbalance

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Nettingsdorf Mill, Austria	May-04	Recovery Boiler	Upgrade air system and evaluate air system designs
ORNL DOE project, USA	Apr-04	Recovery Boiler	Investigation of airport cracking, mid-furnace & tube bank corrosion (3 year)
Weldwood Mill at Hinton, Canada	Apr-04	Bark Boiler	Upgrade air system and evaluate air system designs
Stora Mill, Portugal	Apr-04	Recovery Boiler	Upgrade air system and evaluate air system designs
Laja Mill, Brazil	Feb-04	Recovery Boiler	Upgrade air system and evaluate air system designs
Suceava Mill, Romania	Feb-04	Recovery Boiler	Upgrade air system and evaluate air system designs
Nekoosa Mill, USA	Jan-04	Recovery Boiler	Upgrade air system and evaluate air system designs
ORNL DOE project, USA	Jan-04	Gasifier	Model black liquor gasifier and extend refractory life
Suzano Mill, Brazil	Dec-04	Recovery Boiler	Upgrade air system and evaluate air system designs
Riau Prima Mill, Indonesia	Jan-04	Recovery Boiler	Upgrade air system and evaluate air system designs
Mead Mahrt Mill, USA	Dec-03	Recovery Boiler	Upgrade air system and evaluate air system designs
Grande Prairie, Alberta, Canada	Dec-03	Lagoon	Modeling of aerated Lagoon.
Luiz Antonio Mill, Brazil	Nov-03	Recovery Boiler	Upgrade air system and evaluate air system designs
IP Mill at Hinton, Canada	Oct-03	Recovery Boiler	Upgrade air system and evaluate air system designs
Inland Mill at Rome, USA	July-03	Recovery Boiler	Upgrade air system and evaluate air system designs
Domtar Mill at Red Rock, Canada	May-03	Recovery Boiler	Upgrade air system and evaluate air system designs
Bowater Catawba Mill, USA	Feb-03	Lime Kiln	Optimization of Andritz kiln burner for Catawba lime kiln
Canfor Intercon, BC, Canada	Apr-03	Lime Kiln	Optimization of kiln operation
Lafarge Cement Kiln	July-03	Cement Kiln	Parametric study and trainer development
Canfor Prince George Mill	May-03	Bark Boiler	Convert recovery boiler to bark boiler
Canfor Prince George Mill	May-03	Recovery Boiler	Low odor conversion
Arauco Recovery boiler, Chile	Jan-03	Recovery Boiler	Upgrade air system and evaluate air system designs
Kenbra Recovery Boilers, Brazil	Nov-02	Recovery Boiler	Upgrade air system and evaluate air system designs
Klabin Pulp Mill, Brazil	Oct-02	Recovery Boiler	Upgrade air system and evaluate air system designs
Canfor Intercon, BC, Canada	May-02	Recovery Boiler	Optimization of air system
Coal Creek Power, North Dakota, USA	Jul-02	Precipitator	Applying Skewed Gas Flow Technology
Nova Scotia Power, Canada	Jun-02	Precipitator	Applying Skewed Gas Flow Technology
Airport cracking, DOE, USA	Feb-02	Recovery Boiler	Investigating root causes of airport cracking in recovery boilers
Advanced Agro Public Company, Thailand	Jan-02	Bubbling Fluidized Bed	Air system retrofit modeling to reduce flue gas temperature in the superheater to achieve design target
International Paper Georgetown, South Carolina	Jan-02	Lime Kiln	Burner upgrade modeling and training package
Lafarge North America	Dec-01	Cement Kiln	Lafarge cement kiln burner trainer
International Paper, Kwidzyn. Poland	Oct-01	Recovery Boiler	Upgrade air system and evaluate air system designs
Willamette, USA	Sep-01	Recovery Boiler	Evaluate new air system design
Weyerhaeuser Columbus Recovery Boiler, Columbus, Ohio, USA	Jun-01	Recovery Boiler	Develop corrosion model to predict sulfur based corrosion attack on the water tubes in the lower furnace
Weyerhaeuser Prince Albert	Sep-01	Headbox	Model entire Valmet headbox and determine causes of the formation problems
Weyerhaeuser Longview	Oct-01	Lime Kiln	Determine using advanced modeling the swirl effect of the satellite cooler

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Weyerhaeuser Gasifier, New Bern, North Carolina, USA	May-01	Gasifier	Propose redesign of gasifier and model new design.
VCP Recovery Boiler, Jacarei, Brazil	Apr-01	Recovery Boiler	Worked with VCP and Anthony-Ross in the design of a new air system for a new boiler to be commissioned in 2002. Modeled base MHI/CBC boiler design and proposed modifications.
Weyerhaeuser Headbox at Springfield, Oregon, USA	Mar-01	Headbox	Headbox validation model for SP1 and experimental program.
Potlatch Clarifier, Lewiston, Idaho	Feb-01	Clarifier	Analysis of Potlatch Clarifier to find cause of high turbidity. Based on findings, redesigned feedwell and bustle pipe to significantly reduce turbidity.
Domtar Recovery Boiler, Quevillon, Quebec, Canada	Feb-01	Recovery Boiler	Analysis of Primary Air Port Cracking in the recovery boiler.
Bark Boiler Optimization Research Project, Vancouver, Canada	Jan-01	Bark Boiler	NRC co-funded Bark Boiler 2 year program to look into the optimization of bark boilers. Also to develop advanced simulation and training software specific to Bark Boilers.
Canfor Recovery Boiler, Prince George, BC, Canada	Dec-00	Recovery Boiler	Modeling and analysis of the Intercon recovery boiler. Evaluation of proposed modifications to the combustion air system in order to increase capacity by 10%.
Weyerhaeuser Lime Kiln, Grande Prairie, Canada	Dec-00	Lime Kiln	Analysis of the air flow and combustion process in the kiln. Goal was to gain an understanding of the physical processes to reduce the thermal fatigue on the brick liner and also to analyze the calcination process.
Pacifica Recovery Boiler, Powell River, BC, Canada	Oct-00	Recovery Boiler	Modeling and analysis of a new tertiary air system and incineration system for DNCG gases. Investigate designs to increase load and reduce emissions.
CMPC Recovery Boiler, Nacimiento, Chile	Oct-00	Recovery Boiler	Develop a new air system for a Mitsubishi recovery boiler air system built by CBC.
Willamette Bark Boiler, Campti, Louisiana, USA	Oct-00	Bark Boiler	Worked with IAE to validate and optimize a proposed four level air OFA system for a gasification bark boiler.
International Water-Guard Ultraviolet Disinfection Unit, Burnaby, BC, Canada	Sep-00	Flow Device	Develop a model to simulate the operation of IWG's proposed modification of standard inline water disinfection unit. After analysis, PSL proposed further modifications that increased efficiency a further 10%.
Gasmaster Water Boiler	Aug-00	Water Boiler	Consulting services for the design of a 4,000,000 Btu/hr boiler.
Weyerhaeuser Gasifier, New Bern, North Carolina, USA	Aug-00	Gasifier	Phase II of 3 phase project. Addition of wall model to Phase I model. Parametric analysis of operations. Preliminary redesign proposals.
Weyerhaeuser Digester, Kamloops, BC, Canada + other locations to be specified	Jul-00	Digester	DOE funded project to develop a complex 3D model for the physical processes in a continuous digester. Work in conjunction with Weyerhaeuser paper company and Oakridge National Labs to look into the corrosion of continuous digesters.
Celgar Clarifier, Castlegard, BC, Canada	Jul-00	Clarifier	Model convection flows in Clarifier. Redesign of the bustle pipe and feedwell to reduce turbidity.
Creo Thermal Printer	Jun-00	Flow Device	Modeling and analysis of the effect of operating at high drum speed on the debris removal efficiency for the new Thermal II head under design. Modeling involves particulate tracking and the effects of multiple air jets and air curtain. Validation with experimental results.
Weyerhaeuser Lime Kiln, Springfield, Oregon, USA.	Jun-00	Lime Kiln	Worked with Weyerhaeuser on developing advanced technologies for the interactive real-time simulation of lime kilns.
Weyerhaeuser Recovery Boiler, Dryden, Ontario, Canada	May-00	Recovery Boiler	Analysis of bed instabilities, and high unburned carbon, high sloughing on rear wall, noisy spouts. Propose redistribution of combustion air to resolve problems.
Coal-fired 1025T/H Utility Boiler, China	Apr-00	Utility Boiler	Investigation of causes of mid-furnace corrosion and optimization of tangential air system design
Weyerhaeuser Recovery Boiler, Plymouth, North Carolina, USA	Mar-00	Recovery Boiler	Modeling and analysis of current recovery boiler at the Plymouth mill. Modeling of proposed new boiler design under different operating conditions and high load.
Recovery Boiler	Jan-00	Recovery Boiler	Joint research project between PSL, Paprican, and RWDI to validate the recovery boiler model in terms of gas flow patterns, heat flux, and temperature.
Weyerhaeuser Gasifier, New Bern, North Carolina, USA	Nov-99	Gasifier	Phase I of 3 phase project. Develop a model for the air flow and gasification process for the malfunctioning gasifier. Analyze preliminary results.
Trans Canada Power Heat Recovery Unit, Calgary, Alberta, Canada	Oct-99	Recovery Boiler	Develop a method to analyze and predict the effect of flows entering a heat recovery boiler unit in which both the magnitude of the flow varies with time

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			and for a flow with a strong swirling component.
Shang Dong Power Generation Coal Boiler, Huangtai, China	Aug-99	Power Boiler	Development of a custom model for coal-fired utility boiler. Focus of project was to solve issues of high temperature corrosion in the lower boiler near the burners.
Weyerhaeuser Lime Kiln, Springfield, Oregon, USA	Jul-99	Lime Kiln	Apply a newly developed model for lime kilns to the Springfield kiln. Validate model in terms of temperatures and emissions. Examine secondary air flow from hood and recommend operating conditions based on findings.
Weyerhaeuser Recovery Boiler, Flint River, Michigan, USA	Apr-99	Recovery Boiler	Evaluate different strategies for incinerating NCG and DNCG gases in the recovery boiler.
Weyerhaeuser Baffle Tank, Tacoma, Washington, USA	Jan-99	Flow Device	Analyze flow problems within a baffle tank. Propose design changes.
Simulator Phase II – Core Design	Jan-99	Simulator	Advanced Real-Time Modeling System. Developed internally by PSL and co-funded by IRAP.
Weyerhaeuser Power Boiler Heater, Grande Prairie, Alberta, Canada	Jan-99	Power Boiler	Model the ducting and heating section of the preheater downstream of the power boiler. Propose design changes to make the air flow more uniform to reduce plugging and corrosion.
Weyerhaeuser Recovery Boiler, Grande Prairie, Alberta, Canada	Nov-98	Recovery Boiler	Analysis of a new tertiary air system that will allow a 10% increase in steam production without significantly increasing pluggage.
Weldwood Recovery Boiler, Hinton, Alberta, Canada	Nov-98	Recovery Boiler	Modeling of the #2 Weldwood Hinton Recovery Boiler. Evaluation of air system upgrades including a new secondary air system and a high-capacity tertiary air fan.
Weyerhaeuser Bark Boiler, Valliant, Oklahoma, USA	Oct-98	Bark Boiler	Modeling study to reduce NOx emissions at Valliant.
Weyerhaeuser Recovery Boiler, various locations	Sep-98	Recovery Boiler	Modeling and analysis of various windbox dampers. Evaluate performance of each windbox damper.
Tasman Pulp Recovery Boiler, Tasman, New Zealand	Aug-98	Recovery Boiler	Subcontract to Anthony-Ross to model proposed retrofits to the existing air system in order to increase load and at the same time reduce emissions, specifically TRS.
Weyerhaeuser Mid-South Recovery Boiler,	Apr-98	Recovery Boiler	Preliminary evaluation of Kvaerner & Ahlstrom air system upgrades for the Mid South boiler.
Weyerhaeuser Kamloops #1 Recovery Boiler, Kamloops, BC, Canada	Apr-98	Recovery Boiler	Investigation of pluggage in the #1 recovery boiler.
Weyerhaeuser Plymouth Recovery Boiler, Plymouth, North Carolina, USA	Apr-98	Recovery Boiler	Investigation of frequent pluggage of the Plymouth boiler.
Weyerhaeuser Prince Albert Bark Boiler, Prince Albert, Saskatchewan, Canada	Feb-98	Bubbling Fluidized Bed	Develop a bubbling bed model to assist Weyerhaeuser engineers to evaluate options to, a) convert the existing recovery boiler to a bubbling fluid bed bark boiler, b) construct a new bubbling fluid bed boiler, and c) evaluate the characteristics of air systems by Kvaerner and B&W.
Ahlstrom Lime Kiln Burner, Ahlstrom	Dec-97	Lime Kiln	Ahlstrom lime kiln burner fouling study.
Simulator Phase I – Proof of Concept	Sep-97	Simulator	Development of simulator concept and start research into the topic. The project consists of developing the simulator idea explored during the proof of concept work done with Weyco and Oakridge.
Weyerhaeuser New Prince Albert Recovery Boiler, Prince Albert, Saskatchewan, Canada	Sep-97	Recovery Boiler	Model and evaluate the proposed new Prince Albert recovery boiler. The new boiler must support high loads without excess heat or carryover problems.
Weyerhaeuser Kamloops #1 Recovery Boiler, Kamloops, BC, Canada	Sep-97	Recovery Boiler	Modeling and analysis of proposed upgrades to the air system on the Kamloops Number 1 Recovery Boiler.
Weyerhaeuser Headbox Modeling, Tacoma, Washington, USA	Sep-97	Headbox	Project to develop 3D CFD models for Weyerhaeuser's Springfield and North Carolina mill headboxes.
Weyerhaeuser Columbus Recovery Boiler, Columbus, Ohio, USA	Jul-97	Recovery Boiler	Columbus Tertiary Air port evaluation and optimization.
Weyerhaeuser Longview Recovery Boiler, Longview, Washington	Jun-97	Recovery Boiler	Optimization of the Longview air system using two/four wall firing and completion of swirl.
Weyerhaeuser Grande Prairie Bark Boiler, Grande Prairie, Alberta, Canada	Jun-97	Bark Boiler	Modeling and optimization of the Grande Prairie bark boiler combustion air system.
Weyerhaeuser Prince Albert Recovery Boiler Startup, Prince Albert, Saskatchewan, Canada	May-97	Recovery Boiler	Analysis of the startup conditions. In particular, analyze the heat flux distribution to the floor tubes during startup, and compare to results for Kamloops #2.

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Weyerhaeuser Columbus Upper Furnace Study, Columbus, Ohio, USA	Feb-97	Recovery Boiler	Modeling and analysis of the Columbus upper furnace to determine the reason for plugging at the entrance to the generating bank.
Canfor Recovery Boiler, Prince George, BC, Canada	Dec-96	Recovery Boiler	Modeling and analysis of the Canfor Recovery Boiler combustion air system. Proposed operational changes to reduce mechanical carryover.
Canfor Power Boiler, Prince George, BC, Canada	Dec-96	Power Boiler	Investigation of the Intercon Power Boiler. Evaluation of the air and fuel distribution systems.
Weyerhaeuser Valliant Bark Boiler, Valliant, Oklahoma, USA	Sep-96	Bark Boiler	Modeling of the Valliant bark boiler. Evaluate airflow patterns, fuel distribution patterns, and heat and combustion in the boiler. Validate with temperature and emission measurements.
Weyerhaeuser Valliant Modeling Study, Valliant, Oklahoma, USA	Feb-96	Recovery Boiler	Parameter modeling study of the air system for the Valliant recovery boiler.