

폐기물처리

오로지 시민 행복,
바로 도시 차고 대구

에코폴리스를 꿈꾸며
저탄소 녹색성장의 전진기지로써
대구광역시 폐기물에너지화(SRF)시설 운영에
최선을 다할 것입니다.

믿고 신뢰 할 수 있는 신재생 선진환경

대구광역시 폐기물에너지화(SRF)시설



 대구그린에너지센터주식회사

대구광역시 달성군 다사읍 다사로 799
TEL. (053) 581-2878 FAX. (053) 581-2876

 대구광역시
DAEGU METROPOLITAN CITY

 대구그린에너지센터주식회사

사업의 개요

■ 목적

매립, 소각 되고 있는 생활 폐기물을 연료화하여 신재생 에너지를 생산하며 정부의 생활 폐기물에너지화 정책에 부응하는 친환경적인 폐기물자원화시설 건설로 처리 비용 절감 및 환경 문제 개선

환경친화적인 폐기물처리를 위한 우리 모두의 약속!

1 발생단계에서

발생량을 최소화 하겠습니다.

쓰레기 종량제를 실시하며, 1회용품 사용자제와 과잉포장 억제를 적극 유도하고 생활폐기물을 자원화·에너지화하는 등 쓰레기 감량화와 분리수거를 권장하고 있습니다.

2 발생된 쓰레기는

철저한 분리수거를 통해 최대한 재활용 하겠습니다.

재활용가능 쓰레기, 음식물류폐기물, 종량제봉투 쓰레기 등을 철저히 분리하여 자원으로 재사용·재활용 하겠습니다.

3 남는 가연성 쓰레기는

신재생 에너지로 사용 하겠습니다.

화석연료대신 대체에너지로 사용함으로써 처리과정에서 발생한 열을 회수하여 온실가스 감축에 앞장서겠습니다.

시설개요

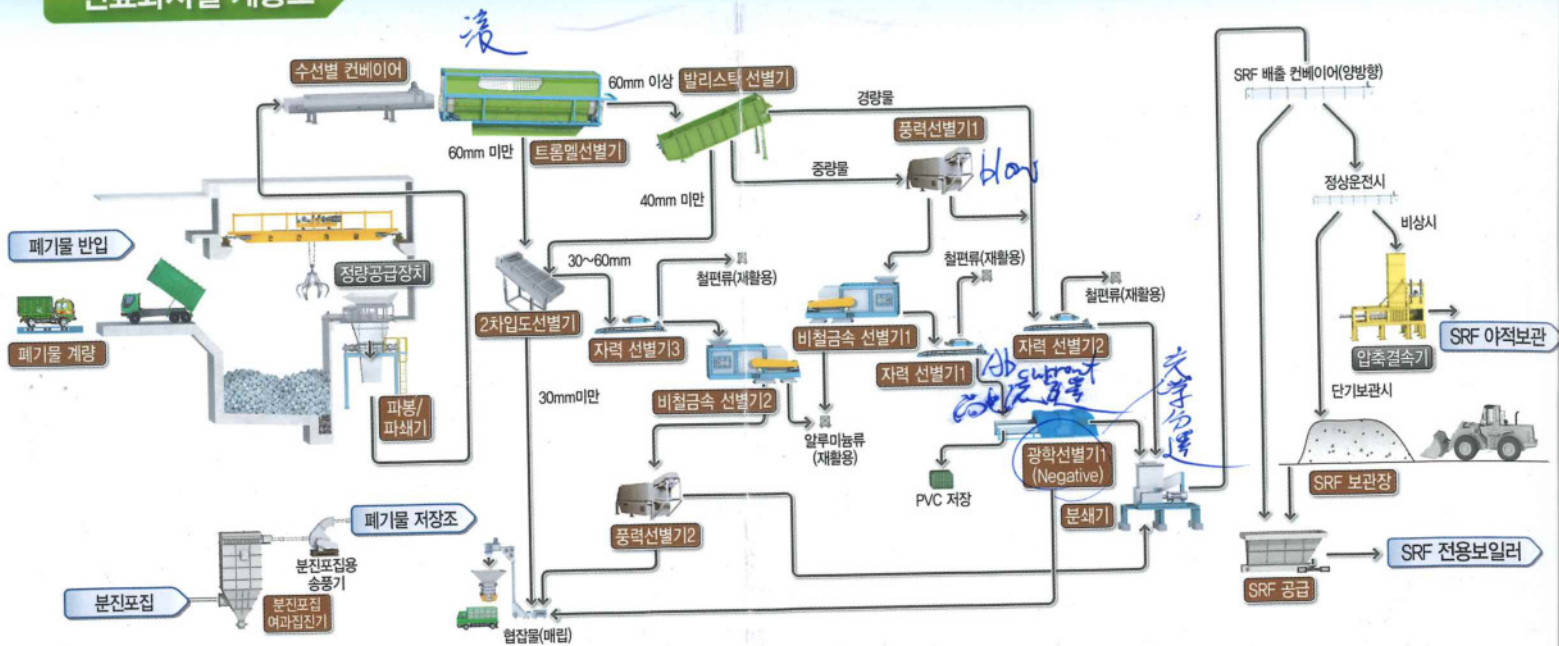
- 위치 : 대구광역시 달성군 다사읍 다사로 799 (환경자원사업소 부지내)
- 면적 : 대지 면적 : 50,132 m²,
건축 면적 : 6,645.91 m² (연면적 : 25,127.61 m²)

[주요시설]

- 연료화 시설 : 800톤/일 (400톤/일 × 2계열)
- SRF전용보일러시설 : 380톤/일 (증기:113,49 ton/hr, 37 bar, 255°C)
- 폐목재 자원화시설 : 40톤/일
- 기타 시설 : 관리동, 경비/계량동, 세차동, 정비동
- 온수 및 증기관로 : 온수배관 (5.74KM), 증기배관(9.34KM)
- 사업시행자 : 대구그린에너지센터주식회사
- 감리사 : (주)경호엔지니어링종합건축사사무소, (주)한백종합기술공사, (주)삼안
- 시공사 : 지에스건설(주), 대성이앤씨(주), 화성산업(주), 대림산업(주)



연료화시설 계통도



전체 처리 계통도

▶ 계량대



Card를 이용 쓰레기중량측정

▶ 생활폐기물 반입장



생활폐기물 저장조로 반입

▶ 크레인



생활폐기물 투입호퍼로 투입

▶ 파쇄 및 파봉 설비



반입되는 폐기물을 200mm이하로 파봉/파쇄

▶ 입도 선별설비



트롬벨선별기

▶ 비중 선별설비



발리스틱선별기

▶ 광학 선별설비



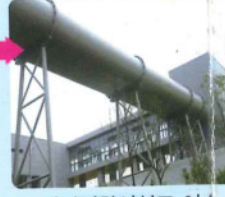
가연물과 불연물 선별

▶ SRF 생산(분쇄기)



SRF의 균질화

▶ SRF 저장 및 이송



에너지화시설로 이송

▶ 연소로



SRF 연소

▶ 연소 가스처리 설비



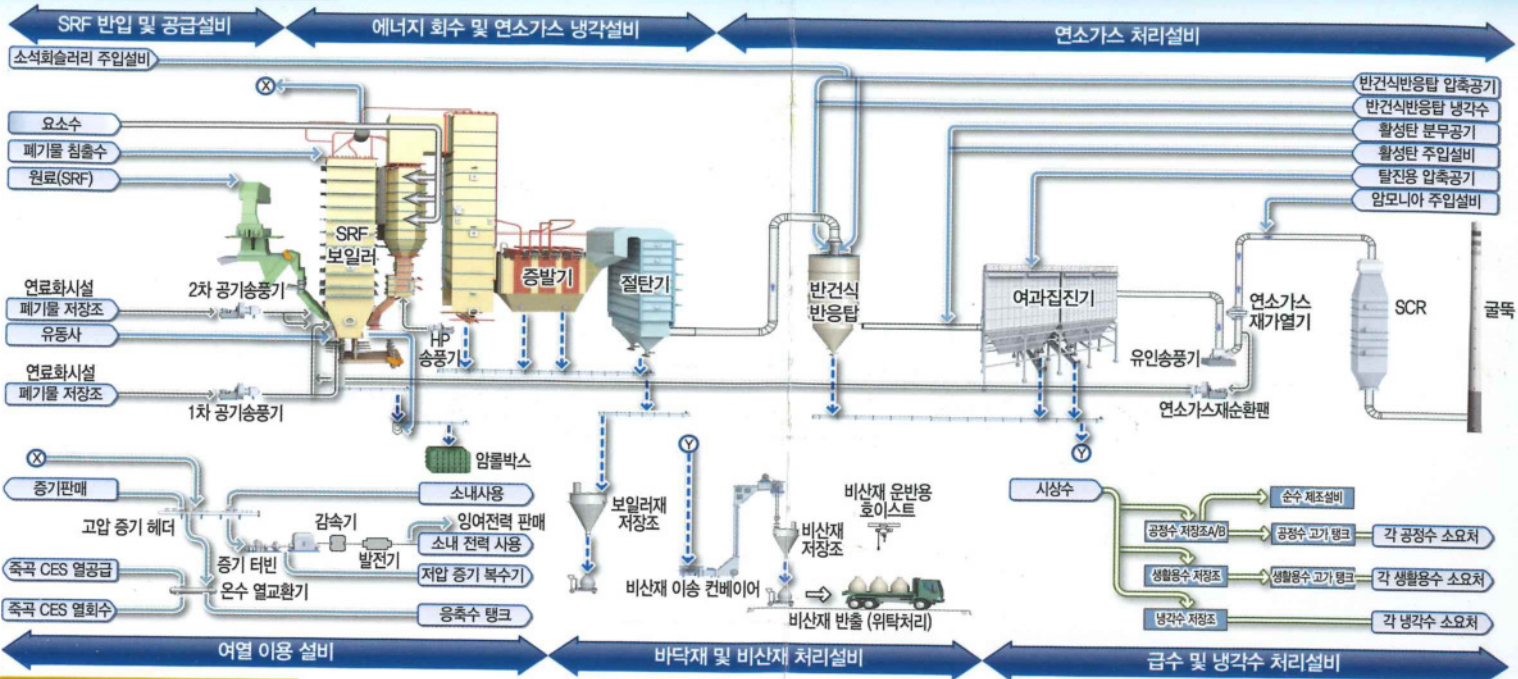
오염물질 제거

▶ 재 처리 설비



(바닥재, 보일러재, 비산재)

에너지화시설 계통도



환경오염 방지시설

연소가스 처리설비

▶ 질소산화물 저감설비(SNCR)

Selective Non-Catalytic Reduction
요소수를 소각로 내에 직접 분사시켜 질소산화물을 질소 성분과 물로 분해하여 제거하는 설비

반건식반응탑(Semi-Dry Reactor)

소각하는 과정에서 발생하는 연소가스 중 SOx, HCl, HF 등을 제거하는 설비

여과집진기(Bag Filter)

분진을 함유한 연소가스가 여과포(FILTER BAG)를 통과하므로써 분진(DUST)과 가스를 분리시켜 청정가스를 대기중으로 방출하는 설비

SCR(선택적 촉매 환원탑)

촉매의 최적 활성화 온도인 190~205°C에서 저온촉매에 의한 NOx 및 다이옥신을 제거하는 2차 설비

공해감시 / 측정설비

▶ Clean SYS 연소가스 감시시스템

▶ 대기오염물질 배출현황 전광판

이산화황(SO₂) 11월 10일 12시현재
0.5 ppm
환경기준 30 ppm

▶ 실험실

악취제거 / 폐수처리시설

▶ 악취제거탑

반입장의 악취저단, 외부유출방지

▶ 폐수처리시설(순수역세수)

배출기준내 처리후 방류

▶ 오폐수처리시설

매립장 연계처리

Samcheok Green Power Project

A new era in clean coal technology



Project summary

Location: Samcheok, S. Korea
 Customer: Korea Southern Power Company
 Duration: 2011-2015
 Scope: Design and supply of four CFB boilers

After over a year of careful study and evaluation, KOSPO selected our advanced CFBs to power its green power project in Samcheok, Korea.

- ▶ The CFB's wide fuel range gives KOSPO the widest fuel procurement flexibility and the ability to save millions of dollars in fuel cost over the plant's life
- ▶ The CFBs didn't require back-end flue gas desulphurization equipment for SOx control saving KOSPO hundreds of millions of dollars to build this plant
- ▶ The unique low temperature CFB combustion process coupled with ultra supercritical steam technology provided KOSPO with high plant efficiency and low emissions including carbon emissions

Plant Electrical Output (Gross/Net)	4 x 550 / 4 x 520 MWe	
Net Plant Efficiency (LHV/HHV)	42.4%/38.8%	
Net Plant Heat Rate (LHV/HHV)	8053/8800 btu/kWh	
Unit Steam Flow (SH/RH)	1573/1282 tph	3461/2820 kpph
Steam Pressure (SH/RH)	257/53 barg	3728/783 psig
Steam Temperature (SH/RH)	603/603°C	1117/1117°F
Feedwater Temperature	297°C	567°F
Fuel	High-Moisture Indonesian Coal and biomass	

Metsänneidonkuja 8
FI-02130 Espoo, Finland
T +358 (0) 10 393 11

Relanderinkatu 2
FI-78201 Varkaus, Finland
T +358 (0) 10 393 11

ul. Staszica 31
41-200 Sosnowiec, Poland
T +48 (0) 32 368 1300

ul. Chmielna 85/87
00-805 Warsaw, Poland
T +48 (0) 22 581 00 36

Lindövägen 75
602 28 Norrköping, Sweden
T +46 (0) 11 285 330

Petersstrasse 120
47798 Krefeld, Germany
T +49 151 108 51366

53 Frontage Rd, PO Box 9000
Hampton, NJ 08827 USA
T +1 908 713 2700

8th Floor, UC Tower
500 Fushan Rd
Pudong New Area
Shanghai 200122 China
T +86 (0) 21 5058 2266

20th Floor Bhiraj Tower
at EmQuartier, 689 Sukhumvit Rd
Klongton Nuea, Wattana
Bangkok 10110 Thailand
T +66 (0) 2 0417140 3

Suite 706-708, 7th Floor, Central Bldg
31 Hai Ba Trung St
Hanoi, Vietnam
T +84 (0) 4 39393809

7th floor, 621, Yeong-dong-daero,
Gangnam-gu, Seoul, Korea 06087
T +82 2 3446 8325

Room 901A, 9th Floor
Vicente Madrigal Bldg, Ayala Ave
Makati City 6793, Philippines

ThinkPark Tower, 1-1 Osaki 2-chome
Shinagawa-ku, Tokyo 141-6025, Japan
T +81 (0) 3 6737 2000

We are the premier global supplier of innovative circulating fluidized bed (CFB) technologies, providing sustainable value to our customers through our relentless drive for environmentally sound and reliable power solutions while we grow.



Sumitomo
SHI FW

The Power of Sustainable Energy Solutions



Metsänneidonkuja 8
FI-02130 Espoo, Finland
T +358 (0) 10 393 11

Relanderinkatu 2
FI-78201 Varkaus, Finland
T +358 (0) 10 393 11

ul. Staszica 31
41-200 Sosnowiec, Poland
T +48 (0) 32 368 1300

ul. Chmielna 85/87
00-805 Warsaw, Poland
T +48 (0) 22 581 00 36

Lindövägen 75
602 28 Norrköping, Sweden
T +46 (0) 11 285 330

Petersstrasse 120
47798 Krefeld, Germany
T +49 151 108 51366

53 Frontage Rd, PO Box 9000
Hampton, NJ 08827 USA
T +1 908 713 2700

8th Floor, UC Tower
500 Fushan Rd
Pudong New Area
Shanghai 200122 China
T +86 (0) 21 5058 2266

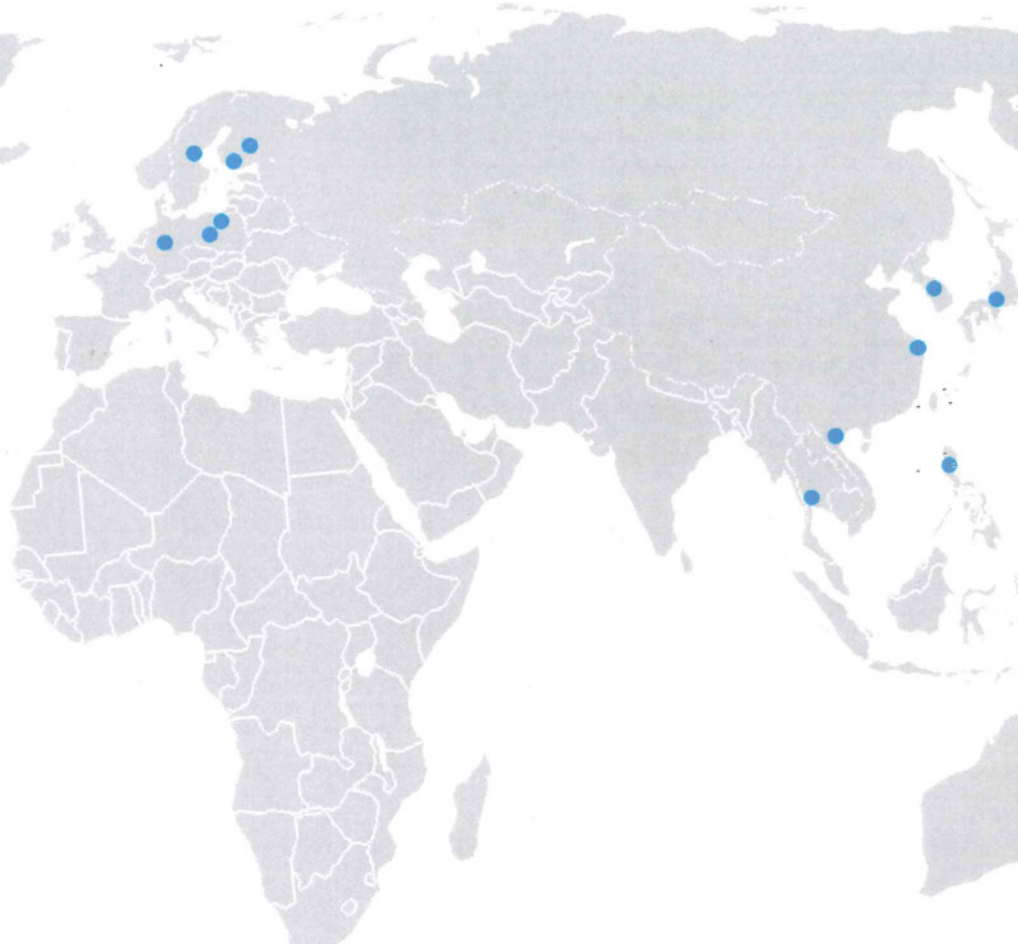
20th Floor Bhiraj Tower
at EmQuartier, 689 Sukhumvit Rd
Klongton Nuea, Wattana
Bangkok 10110 Thailand
T +66 (0) 2 0417140 3

Suite 706-708, 7th Floor, Central Bldg
31 Hai Ba Trung St
Hanoi, Vietnam
T +84 (0) 4 39393809

7th floor, 621, Yeong-dong-daero,
Gangnam-gu, Seoul, Korea 06087
T +82 2 3446 8325

Room 901A, 9th Floor
Vicente Madrigal Bldg, Ayala Ave
Makati City 6793, Philippines

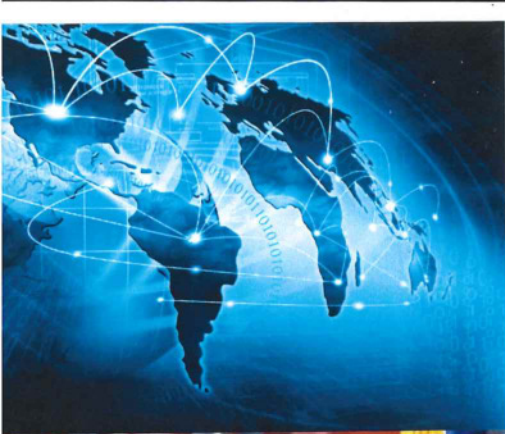
ThinkPark Tower, 1-1 Osaki 2-chome
Shinagawa-ku, Tokyo 141-6025, Japan
T +81 (0) 3 6737 2000



We are the premier global supplier of innovative circulating fluidized bed (CFB) technologies, providing sustainable value to our customers through our relentless drive for environmentally sound and reliable power solutions while we grow.



Sumitomo
SHI **FW**



A full range of technology solutions

Our goal and purpose is to provide sustainable, affordable and reliable energy solutions for all types of applications. To do this, we employ among the most talented people with the deepest know-how and experience for producing steam, power, heat, syngas, and clean stack gas from the widest range of affordable fuels and waste materials.

Technologies we provide

- ▶ Circulating Fluidized Bed (CFB) and Bubbling Fluidized Bed (BFB) Steam Generators and Gasifiers
- ▶ CFB Scrubbers
- ▶ Metallurgical Waste Heat Boilers (MWHB)

Sectors we serve

- ▶ Utility Power
- ▶ Industrial Steam and Power
- ▶ Combined Heat and Power
- ▶ District Heating
- ▶ Waste-to Energy

We are the premier provider of steam generators, gasifiers and acid gas scrubbers which we have been advancing for over 40 years tracing back to our Foster Wheeler and Ahlstrom Pyro-Power origins. We have used our vast operating experience along with our R&D to deliver the most reliable equipment on the market today. We pride ourselves in being able to cleanly and reliability convert the widest range of low quality fuels, waste materials and waste heat into affordable sustainable power and steam for our clients.

Unmatched Fuel Experience

Coal | Lignite | Petroleum coke | Waste coal | Oil shale | Peat | Demo wood
Saw dust | Forest residue | Bark | Sludges | Paper | Plastic | Bagasse | Rice husk
Straw | Palm kernel shell | Wood chips | Hog fuel | Olive pits | Agricultural waste
Sunflower seed hulls | MSW | RDF | Broom corn refuse

Our network of expertise

Our talented people are an important part of our overall global delivery network made up of offices, shops, service centers and licensees located across the globe. It is an efficient and highly competitive network proven by hundreds of successful projects with scopes ranging from basic equipment supply to turn-key boiler, scrubber and power plant deliveries and a full spectrum of aftermarket services. Our network allows us to deliver our equipment and services at the lowest cost with flexible scopes and schedules to bring the highest value to our clients in all parts of the world.

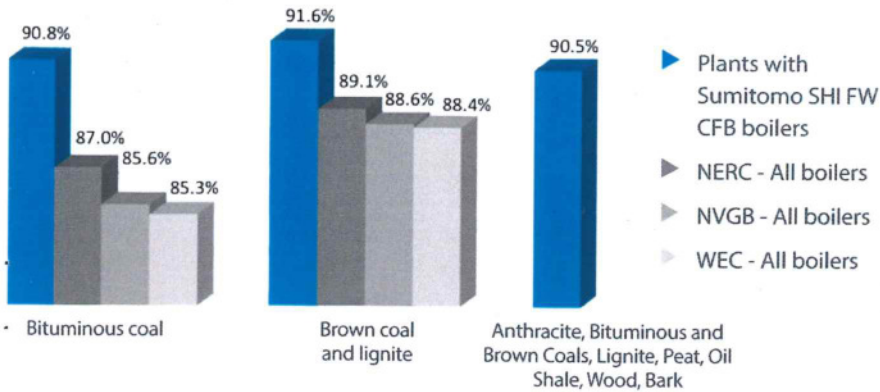
Our Global Network

- ▶ Espoo, Finland
- ▶ Varkaus, Finland
- ▶ Sosnowiec, Poland
- ▶ Warsaw, Poland
- ▶ Norrköping, Sweden
- ▶ Krefeld, Germany
- ▶ Clinton, NJ, USA
- ▶ Shanghai, China
- ▶ Bangkok, Thailand
- ▶ Chonburi, Thailand
- ▶ Hanoi, Vietnam
- ▶ Seoul, South Korea
- ▶ Makati City, Philippines
- ▶ Niihama, Japan
- ▶ Tokyo, Japan



AVERAGE ANNUAL PLANT AVAILABILITY*

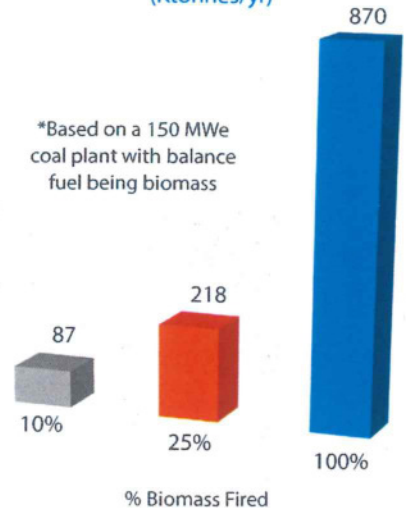
% of 8760 hours



*Note: Availability means total time plant is available to run accounting for both planned and unplanned downtime. Sumitomo SHI FW CFB values based on client supplied data reported over 2000-2008 period for units mainly located in Europe. PC values based on client supplied data over 2002-2011 period for units mainly located in Europe and reported in VGB PowerTech Report, TW103Ve, published in 2012

AVOIDED CO2 EMISSIONS

(Ktonnes/yr)



Aftermarket services

Our aftermarket service is focused on improving plant operation, performance, maintenance and life of the plant starting with the boiler and air pollution control equipment. We provide a full range of services from basic maintenance to technology modifications and upgrades, as well as long term service partnerships or agreements. Our Smart Boiler solution connects your plant to us 24-7, so our experts can provide smart maintenance schedules, remote diagnostics and fast on-

Aftermarket Services

- ▶ Performance & compliance tuning
- ▶ Outage & emergency services
- ▶ Long Term Service Agreements
- ▶ Engineered pressure parts upgrades
- ▶ Off-the-shelf replacement parts
- ▶ Inspection & specialist services
- ▶ Spare part services
- ▶ Fuel range expansions & conversions
- ▶ Capacity upgrades & process improvements
- ▶ BFB & CFB retrofits
- ▶ CFB scrubber, DSI & fabric filter retrofits
- ▶ Biomass gasifiers retrofits
- ▶ Plant upgrade & refurbishment
- ▶ Weld overlays & refractory upgrades
- ▶ Construction services

RECENT PROJECTS



Samcheok Green Power Plant
CFB boiler

Location: Samcheok City, Gang Won Do, S. Korea
Customer: Korean Southern Power Co., Ltd
Start-Up Year: 2017
Capacity: 4 x 550 MWe
Fuel: Coal, Biomass



Polaniec Power Station
CFB boiler

Location: Polaniec, Poland
Customer: GDF Suez Energia
Start-Up Year: 2012
Capacity: 190 MWe
Fuel: Biomass (Wood/ 20% Agro Waste)



Green Energy Centre
CFB boiler

Location: Daegu, S. Korea
Customer: GS Engineering and Construction
Start-Up Year: 2016
Capacity: 23 MWe
Fuel: Waste - RDF



SINOPEC Projects
CFB boilers

- SINOPEC purchased 26 units from us in past 15 years
- Unit sizes: 50-100 MWe
- Oldest units operating since 1999
- Units fire both petcoke and coal, firing 80-100% petcoke over life



Soma Kolin Thermal Power Plant
CFB boiler and scrubber

Location: Soma, Turkey
Customer: Harbin Electric Co Ltd
Start-Up Year: 2018
Capacity: 2 x 255 MWe
Fuel: Lignite
Reactor: 2 x 716,000 ACFM
Gas Flow: (2 x 1,217,200 m³/hr)



Biomasa de Cantabria at Reocin
BFB boiler

Location: Reocin, Spain
Customer: Ingeteam Power Plants, S.A.
Start-Up Year: 2012
Capacity: 10 MWe
Fuel: Biomass



Kazzinc New Metallurgy
Waste heat boiler

Location: Ust - Kamenogorsk, Kazakhstan
Customer: Xstrata Technology Pty Ltd, Australia
Start-Up Year: 2011
Capacity: Saturated steam 29 tph (64 kpph)



Basin Electric Dry Fork Station
CFB scrubber

Location: Gillette, WY, USA
Customer: Nooter Erikson
Start-Up Year: 2011
Capacity: 420 MWe
Fuel: PRB Coal
Reactor: 1,800,000 ACFM
Gas Flow: (3,060,000 m³/hr)



NSE Biofuels Oy Ltd.
Biomass gasifier

Location: Varkaus, Finland
Customer: Stora Enso Oyj & Neste Oil Corp.
Start-Up Year: 2009
Capacity: 12 MWth
Fuel: Biomass, forestry residues



TSE Naantali
SCR retrofit

Location: Naantali, Finland
Customer: TSE Oy
Start-Up Year: 2015
Capacity: 110 MWe
Fuel: Coal