KC Cottrell

KC Cottrell

Global Leader in Green Business

- People & Technology keeping our planet sustainable...

2022

MAKE ENVIRONMENT
MAKE TECHNOLOGY

KC Cottrell

Overview on KC Cottrell

Establishment	**November, 27th, 1973**
Business	**EPC/O&M in Environment & Energy**
CEO	**Seo, Dong Young**
Sales ('18)	**KRW 153 Billion (USD 136 Million)**
Working force	**240**

KC Cottrell

History

Foundation

Nov 1973
Chairman Talwoo, Lee Founded Korea Cottrell Industrial Co Ltd (The first environmental company in Korea)

Sep 1979
Established Fabrication Workshop in Incheon

Nov 1990
Renamed to Korea Cottrell Co Ltd

Nov 1994
Listed the Korea Exchange as the first environment related company

Dec 1998
Relocated and Expanded Fabrication Workshop in Anseong (KCMS)

Mar 2009
Renamed to KC Cottrell Co Ltd

Jan 2010
Split with holding company (KC Greenholdings Co Ltd)

Geographical Diversification

Oct 1990
Taiwan branch Foundation

June 2002
Changchun KC Envirotech Co Ltd (Changchun, China)

July 2004
Beijing Representative office

Mar 2005
Acquired Lodge Sturtevant and renamed Lodge Cottrell Ltd (Birmingham, UK)

June 2006
Lodge Cottrell Inc Foundation (Houston, USA, merged by Nol-Tec Systems Inc. in 2015)

Jan 2009
KC Cottrell Vietnam Co Ltd Foundation (Hanoi Vietnam)

KC Cottrell India Pvt Ltd Foundation (Delhi, India)

Aug2010
Acquired Nol Tec Systems Inc (Minnesota, US)

Mar 2012
KC Cottrell Taiwan Co Ltd Foundation (Taipei, Taiwan)

July 2015
KC Energy Technology Co Ltd Foundation (Beijing, China)

Mar 2014
KC Africa Pty Ltd Foundation

Growth

July 1983
Contract signed with Korea Electric Power Company for 500MW Boryeong Thermal Power Plant ESP (Electrostatic Precipitator)

Apr 1996
Contract signed with Korea Electric Power Corporation for 500MW Dangjin Thermal Power Plant FGD (Flue Gas Desulfurization) Project

July 1997
Contract signed with POSCO for Gwangyang Steel Works Blast Furnace ESP Project

June 2003
Contract signed with Korea East-West Power Co Ltdfor Dangjin Thermal Power Station AHS (Ash Handling System) Project

May 2005
Contract signed with POSCO for Gwangyang Steel Works Sinter Plant FGCS (Flue Gas Cleaning System) Project

Aug 2011
Contract signed with KOSEP for Yeongheung thermal power plant (870MW x 2) No.5~6 FGD/ESP/LHS Project

Nov 2012 ~ Oct 2013
Contract signed with Korea Southern Power Co LtdFor SamCheok Green Power (1000MW x 2) ESP/AHS (One of the largest CFB Boilers in the world)

July 2017
Contract signed with Hyundai Rotem for Hyundai steel Dangjin Sinter Plant #1~3 FGCS Project

Sep 2018
Gangneung An-in Thermal Power Plant FGD Project

Challenge

June 1992
Contract signed with Taiwan Power Company for Shenao Thermal Power Station ESP Project in Taiwan

Feb 1998
Contract signed with IHI (Ishikawajima-Harima Heavy Industry Co Ltd) for Nippon Steel Co Ltd Kamaisi Power Plant ESP Project in Japan

Jan 2009
Contract signed with Taiwan Power Company for Hsinta Power No.1~2 Retrofit of FGD, ESP, AHS PJT in Taiwan

Sep. 2010
Contract signed with Doosan Heavy Industry for Gheco Power Plant AHS Project in Thailand

Feb. 2011
Awarding a contract for Gres1 Ekibastuz ESP Project in Kazakhstan

Sep. 2011
Awarding a contract for Krakatau Steel Making Plant Bag Filter Project in Indonesia

Jul. 2013
Contract signed with Hyundai heavy industry for Jeddah South Thermal Power Plant AHS Project in Saudi Arabia

Sep. 2015
Contract signed with Celikler Seyitomer Elektrik Uretim A.S. for FGD Project in Turkey

July 2016
Contract signed with OJSC Power Machine Ltd. for Long Phu 1 Thermal Power Plant ESP/FGD Project in Vietnam

Nov 2018
Contact signed with NTPC for DSI system in India

Takeoff

Nov 2006
Contract signed with Korea South East Power Co Ltdfor 1MW Youngheung Solar Power Station

July 2012
Contract signed with Renault Samsung Motors for 20MWp Solar Power System in Busan, Korea

Nov 2015
Contract signed with Changwon Enertech for Project of Industrial Waste treatment, Incineration, SRF Manufacturing, Steam supply and 2.75MW Power Plant

Apr 2018
Contract signed with Ngodwana Energy for EPC project of 25MW Biomass to Energy Plant in South Africa

From Oct 2018
Contract signed for RTO systems

From Dec 2018
Contract signed for EGCS (De-Sox system for marine engine)

KC Cottrell

Key Business Areas

Air Quality Control Systems

> Particulate Removal System

- Dry Electrostatic Precipitator
- Wet Electrostatic Precipitator
- Bag Filter
- Ash Handling System
- Tunnel ESP
- Hybrid Module Type Precipitator

> Gas Treatment System

- Wet Flue Gas Desulfurization
- Semi Dry/GSA
- SCR/SNCR
- VOCs Control System
- Exhaust Gas Cleaning System
  (For Marine)

Retrofit & Maintenance

- Air Quality Control System Retrofit
- Technical Service
- Feasibility Study

Manufacturing Services

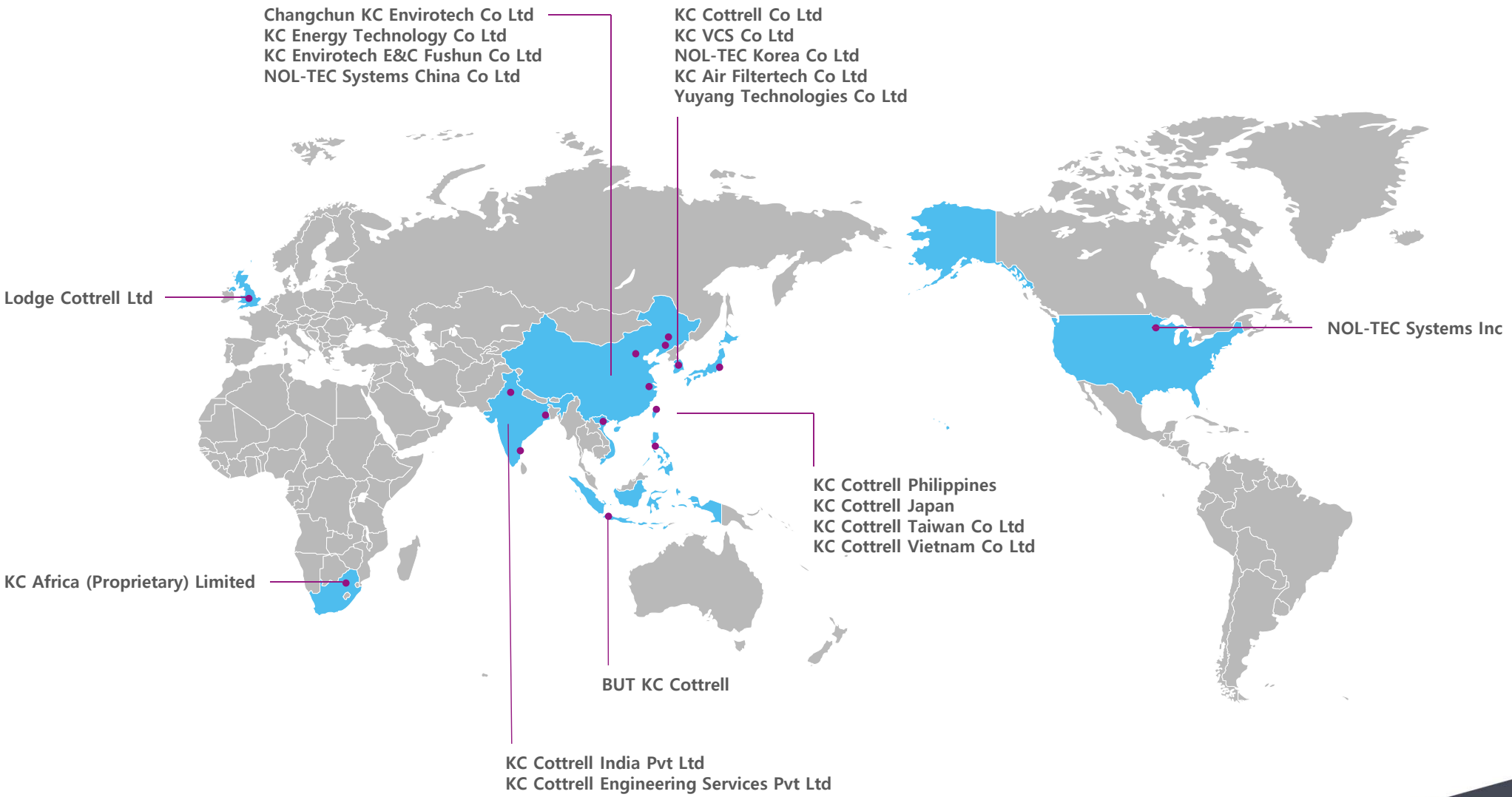
- Dampers
- Steel Work

New & Renewable Energy

- Solar Power System
- Biomass & Waste to Energy

KC Cottrell

KC Cottrell Global Network



KC Cottrell

Organization

CEO

COO

General Division

- Strategy & Planning
- HR/General Affairs
- Strategic Procurement
- Financing & Accounting
- Research
- Quality Control

EPC and O&M Division on Environment and Energy

Air Qulaity Control

- Sales (Domestic/Overseas)
- Engineering (Domestic/Overseas)

Repair & Maintenance

- Technical Service Engineering

Iron & Steel

- Sales
- Pohang Office
- Gwangyang Office
- Dangjin Office

Energy Plant

- Sales
- Engineering

Smart Energy

- Smart Energy
- New business

KCMS

- Sales
- Operation
- Manufacturing

KC Cottrell

KCMS | KC Manufacturing Service

KC Cottrell

KCMS | Indoor Shop

KC Cottrell

KCMS Test Tower | FGD

1 Stage Perforated Plate

2 Stage Perforated Plate

Mist Eliminator

Overall view of FGD test equipment

Reaction Tank and Pump

KC Cottrell

KCMS Test Tower | ESP

MIGI rapper

Hammer rapper

View from the bottom side

Connecting rod

Top side of connection area

Bottom side of connection area

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KCMS Test Tower | Fabric Filter System

Round Bag | Cone Bag | Oval Bag | Pleated Bag

KC Cottrell

CERTIFICATES ISO 9001 | 14001 | KOSHA 18001

ISO 9001

IQNet®

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

KFQ as an IQNet Partner hereby states that the organization

KC COTTRELL CO., LTD.

- FACTORY : 16-180, Seounsingi-gil, Seoun-myeon, Anseong-si, Gyeonggi-do, Korea (Zip code : 17606)
- HEAD OFFICE : 34, Sangamsan-ro, Mapo-gu, Seoul, Korea (Zip code : 03909)

for the following scope

- DESIGN, DEVELOPMENT, PRODUCTION, INSTALLATION AND SERVICING OF DUST COLLECTOR, ASH HANDLING SYSTEM, PHOTOVOLTAIC SYSTEM, GAS TREATMENT SYSTEM, INCINERATOR, BIOMASS TO ENERGY PLANT & WASTE TO ENERGY PLANT, WASTE HEAT ELECTRICITY GENERATION PLANT, MICRO-GRID SYSTEM AND ENERGY STORAGE SYSTEM
- OPERATION AND MAINTENANCE WORK FOR ENERGY PLANT
- DESIGN AND DEVELOPMENT AND PRODUCTION OF PRESSURE VESSEL

has implemented and maintains a
Quality Management System
which fulfils the requirements of the following standard
ISO 9001:2008

Issued on : 2017-08-20
First Issued on : 2002-08-20

For the validity date, please refer to the original certificate* issued by KFQ

Registration Number : KR - 03130

Michael Drechsel
President of IQNet

Dae Hyeoun Nam
President & CEO of KFQ

IQNet Partners**:
AENOR Spain AFNOR Certification France Vinçotte Belgium APCER Portugal CCC Cyprus
CISQ Italy CQC China CQM China CQS Czech Republic Cro Cert Croatia DQS Holding GmbH Germany
FCAV Brazil FONDONORMA Venezuela ICONTEC Colombia IMNC Mexico Inspecta Certification Finland INTECO Costa Rica
IRAM Argentina JQA Japan KFQ Korea MIRTEC Greece MSZT Hungary Nemko AS Norway NSAI Ireland PCBC Poland
Quality Austria Austria RR Russia SIGE México SII Israel SIQ Slovenia SIRIM QAS International Malaysia
SQS Switzerland SRAC Romania TEST St Petersburg Russia TSE Turkey YUQS Serbia
IQNet is represented in the USA by: AFNOR Certification, CISQ, DQS Holding GmbH and NSAI Inc.

* This attestation is directly linked to the IQNet Partner's original certificate and shall not be used as a stand-alone document.
** The list of IQNet partners is valid at the time of issue of this certificate. Updated information is available under www.iqnet-certification.com

ISO 14001

CERTIFICATE

ENVIRONMENTAL MANAGEMENT SYSTEM

kfq® Korean Foundation for Quality

KC COTTRELL CO., LTD.

- FACTORY : 16-180, Seounsingi-gil, Seoun-myeon, Anseong-si, Gyeonggi-do, Korea (Zip code : 17606)
- HEAD OFFICE : 34, Sangamsan-ro, Mapo-gu, Seoul, Korea (Zip code : 03909)

Registration Date	2016-07-12
Expiration Date	2018-09-14
Initial Registration Date	2007-12-18
Revision Date	2016-07-12
Certificate Number	EAC - 04563

Korean Foundation for Quality certifies that The Environmental Management System of the above organization has been audited and has complied with the requirements of the following standard

Standard: ISO 14001:2004/KS I ISO 14001:2009

Scope of certification

- DESIGN, DEVELOPMENT, PRODUCTION, INSTALLATION AND SERVICING OF DUST COLLECTOR, ASH HANDLING SYSTEM, PHOTOVOLTAIC SYSTEM, GAS TREATMENT SYSTEM, INCINERATOR, BIOMASS TO ENERGY PLANT & WASTE TO ENERGY PLANT, WASTE HEAT ELECTRICITY GENERATION PLANT, MICRO-GRID SYSTEM AND ENERGY STORAGE SYSTEM
- OPERATION AND MAINTENANCE WORK FOR ENERGY PLANT
- DESIGN, DEVELOPMENT AND PRODUCTION OF PRESSURE VESSEL

IQNet

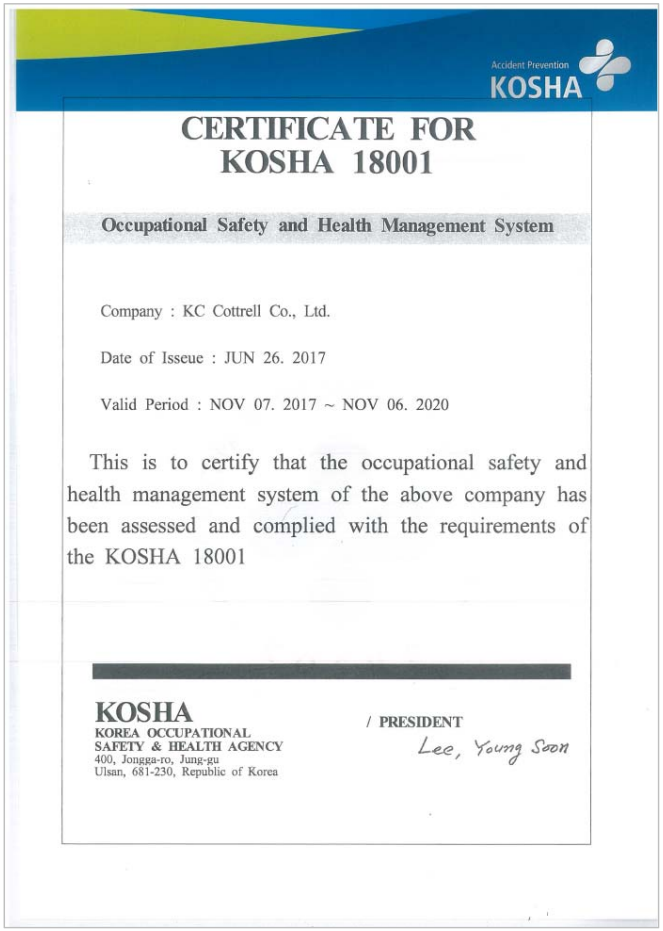
KAB IAF

The use of Accreditation Mark indicates accreditation in respect of those activities covered by the KAB(Accreditation Certificate Number KAB-EC-01)

Dae Hyeoun Nam
President & CEO of KFQ

www.kfq.or.kr
13F, Woolim Lion's Valley Bldg. B, 168, Gasan digital 1-ro, Geumcheon-gu, Seoul, 153-786, Korea

KOSHA 18001



Accident Prevention KOSHA

CERTIFICATE FOR KOSHA 18001

Occupational Safety and Health Management System

Company : KC Cottrell Co., Ltd.

Date of Isseue : JUN 26. 2017

Valid Period : NOV 07. 2017 ~ NOV 06. 2020

This is to certify that the occupational safety and health management system of the above company has been assessed and complied with the requirements of the KOSHA 18001

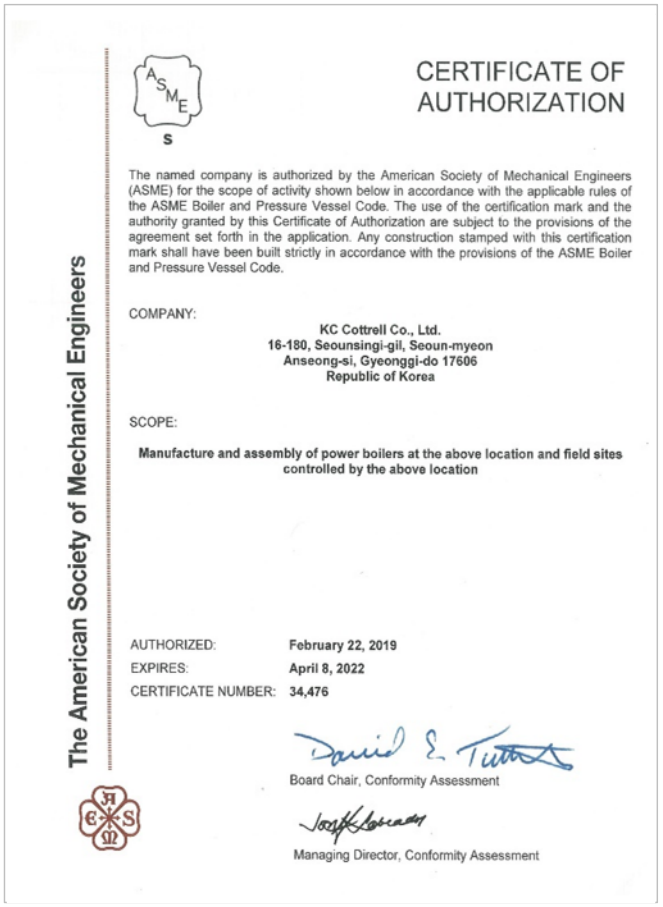
KOSHA
KOREA OCCUPATIONAL SAFETY & HEALTH AGENCY
400, Jongga-ro, Jung-gu
Ulsan, 681-230, Republic of Korea

/ PRESIDENT
Lee, Young Soon

KC Cottrell

CERTIFICATES ASME S | U

ASME S



The American Society of Mechanical Engineers

S

CERTIFICATE OF AUTHORIZATION

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the certification mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this certification mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

KC Cottrell Co., Ltd.
16-180, Seounsingi-gil, Seoun-myeon
Anseong-si, Gyeonggi-do 17606
Republic of Korea

SCOPE:

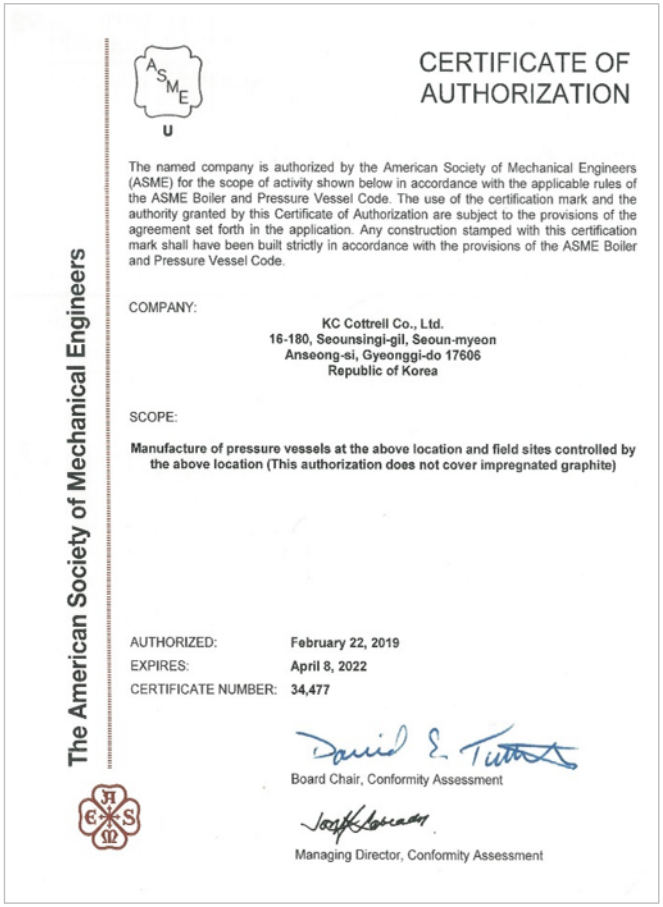
Manufacture and assembly of power boilers at the above location and field sites controlled by the above location

AUTHORIZED: **February 22, 2019**
EXPIRES: **April 8, 2022**
CERTIFICATE NUMBER: **34,476**

Board Chair, Conformity Assessment

Managing Director, Conformity Assessment

ASME U



The American Society of Mechanical Engineers

U

CERTIFICATE OF AUTHORIZATION

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the certification mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this certification mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

KC Cottrell Co., Ltd.
16-180, Seounsingi-gil, Seoun-myeon
Anseong-si, Gyeonggi-do 17606
Republic of Korea

SCOPE:

Manufacture of pressure vessels at the above location and field sites controlled by the above location (This authorization does not cover impregnated graphite)

AUTHORIZED: **February 22, 2019**
EXPIRES: **April 8, 2022**
CERTIFICATE NUMBER: **34,477**

Board Chair, Conformity Assessment

Managing Director, Conformity Assessment

CERTIFICATES POSCO

POSCO Inspection Self-Management Supplier

posco

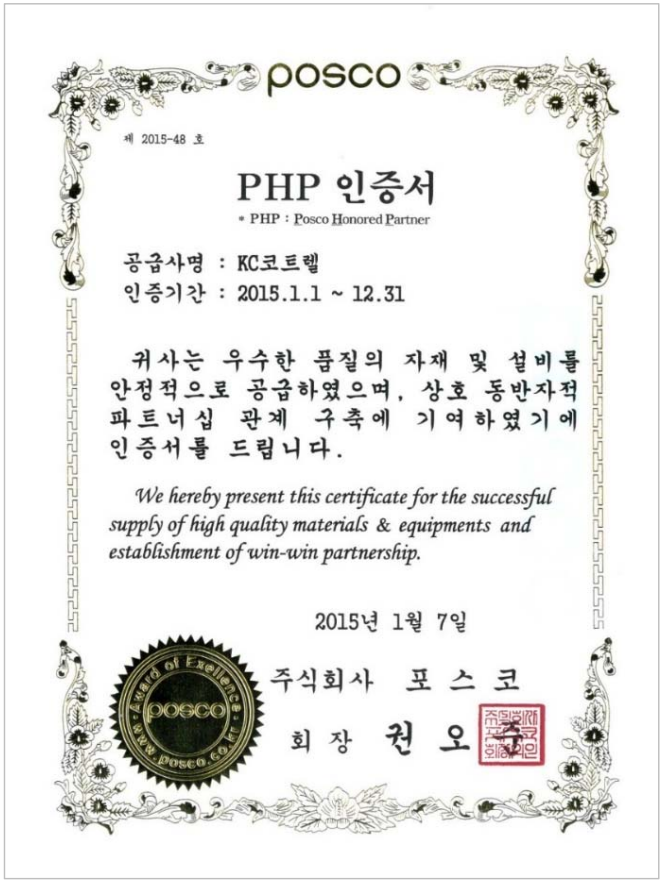
POSCO Inspection
Self-Management Supplier

Supplier name: KC COTTRELL Co.,Ltd.
Products supplied: Dust Collection System
Certification period:
October 1, 2014 ~ September 30, 2015

This certifies that your company has been selected as a inspection self-management supplier based on POSCO's analysis of inspection results, having supplied excellent-quality equipment and materials in a stable manner.

Kwon Oh-Joon
Chairman & CEO of POSCO

POSCO Honored Partner



posco

제 2015-48 호

PHP 인증서

* PHP : Posco Honored Partner

공급사명 : KC코트렐
인증기간 : 2015.1.1 ~ 12.31

귀사는 우수한 품질의 자재 및 설비를 안정적으로 공급하였으며, 상호 동반자적 파트너십 관계 구축에 기여하였기에 인증서를 드립니다.

We hereby present this certificate for the successful supply of high quality materials & equipments and establishment of win-win partnership.

2015년 1월 7일

주식회사 포 스 코
회 장 권 오 [illegible]

MAKE ENVIRONMENT

MAKE TECHNOLOGY

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Air Quality Control Systems

Dust Collection System

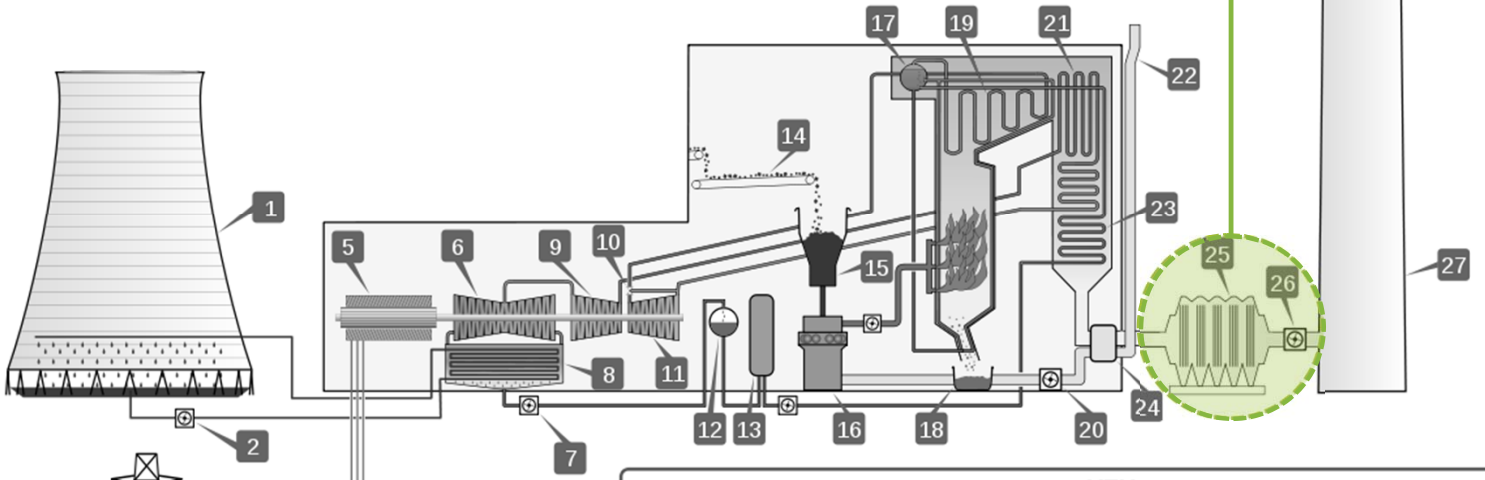
ESP, eBF, De-Tar ESP, Fabric Filter,
Wet Scrubber

Flue Gas Treatment System

Flue Gas Desulphurization ,Semi Dry Reactor
Dry Injection, De-Dioxin, De-Nox

Ash Handling System

Bottom Ash
Fly Ash
Bulk Material Handling System



KEY

1. Cooling tower	8. Condensor	15. Coal hopper	22. Air intake
2. Cooling water pump	9. Intermediate pressure turbine	16. Pulverised fuel mill	23. Economiser
3. Pylon (termination tower)	10. Steam governor	17. Boiler drum	24. Air preheater
4. Unit transformer	11. High pressure turbine	18. Ash hopper	25. Precipitator
5. Generator	12. Deaerator	19. Superheater	26. Induced draught fan
6. Low pressure turbine	13. Feed heater	20. Forced draught fan	27. Chimney stack
7. Boiler feed pump	14. Coal conveyor	21. Reheater	

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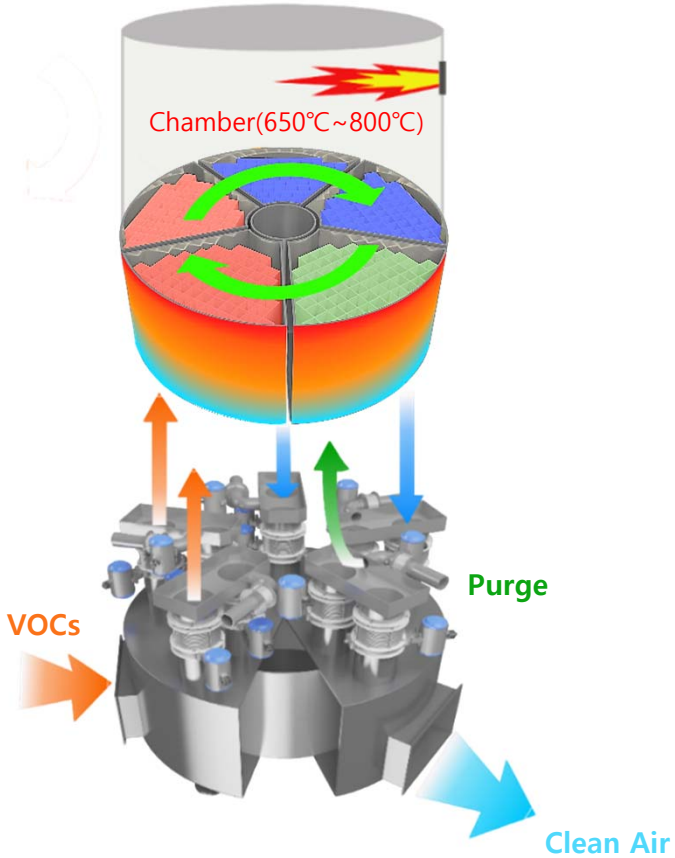
Air Quality Control Systems

Odor Removal System - Valve Rotary RTO (Regenerative Thermal Oxidization) system

More than 99.5% VOC can be removed




Terawon Printing Factory, Wonju

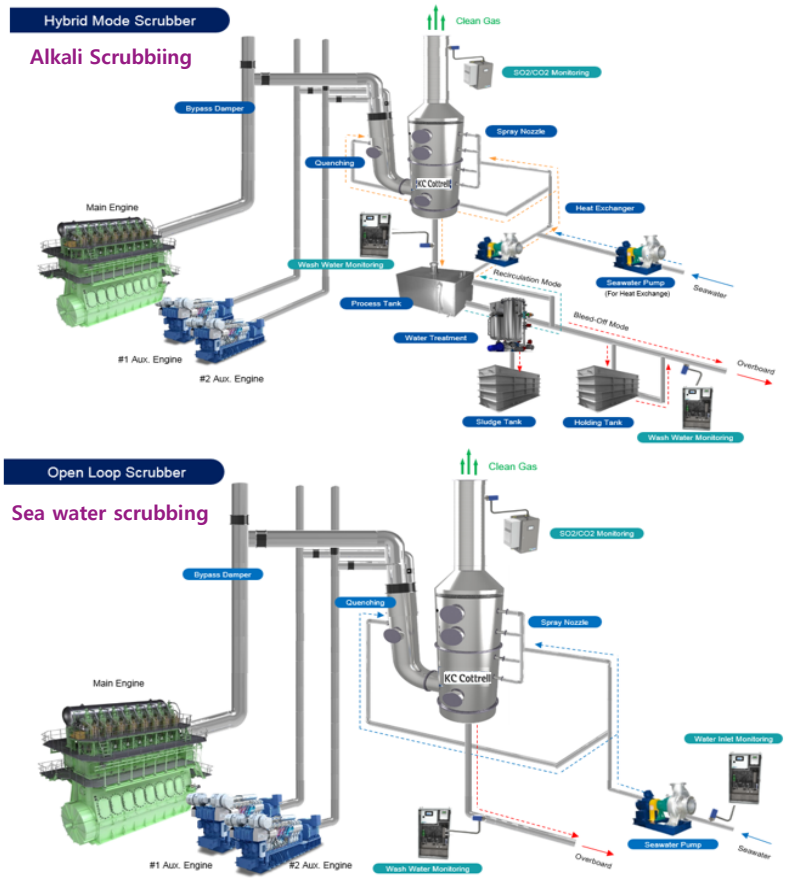
- Higher removal efficiency (99%) than competitors (98%)
- Vale type → the system can sealed tightly
  → part replacement is possible (cheaper)
- 95% heat can be reused by thermal bed

KC Cottrell

Air Quality Control Systems

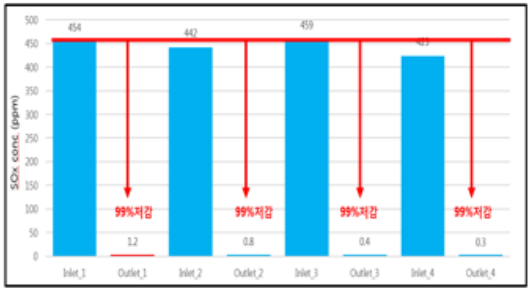
Exhaust Gas Cleaning System for Marine Vessels

SYSTEM CONFIGURATION

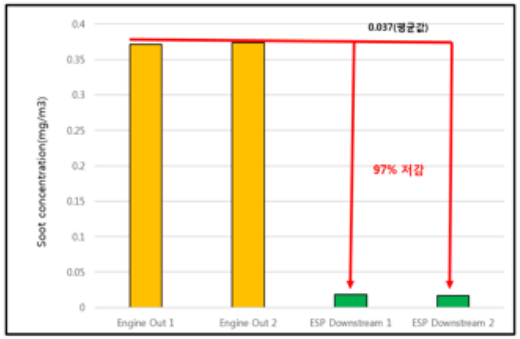


PERFORMANCE

SO_X > 99%



PM/BC > 97%



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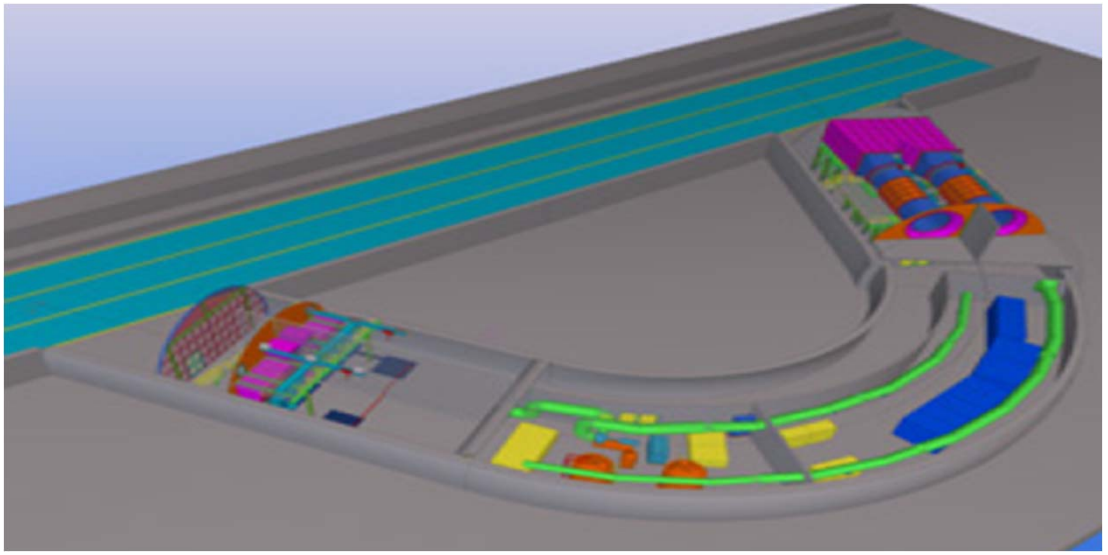
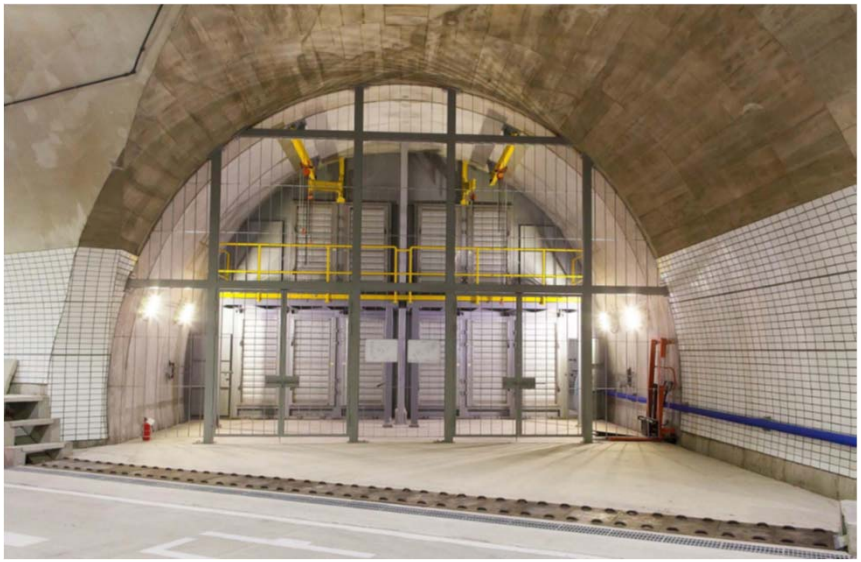
Air Quality Control Systems

ESP for Tunnel





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New and Renewable Energy

Waste and Biomass To Energy

Waste Incineration Plant, Changwon Enertech

Fuels fo Biomass to energy plant

Overall view of Sappi Paper Plant
(Site of Ngodwana Biomass Power Plant, South Africa)

New and Renewable Energy

Photovoltaic Power Generation

Factory of Renault Samsung at Busan, 26MWp

KC Cottrell

SUMMARY of MAJOR REFERENCES

MARCH 2019

	Project	Unit
1. FLUE GAS TREATMENT SYSTEM	**124**	**207**
1.1 FGD(Flue Gas Desulphurization) System	**37**	**70**
1.2 SDR(Semi Dry Reactor) System	**22**	**29**
1.3 DI(Dry Injection) System	**14**	**23**
1.4 De-Dioxin System	**10**	**18**
1.5 De-Nox System	**43**	**67**
2. DUST COLLECTION SYSTEM	**752**	**902**
2.1 EP(Electrostatic Precipitator) - Dry Type	**464**	**577**
2. 1.1 Power Plant	112	180
2. 1.2 Steel Plant	68	82
2. 1.3 Cement Plant	71	80
2. 1.4 Industrial Boiler	159	180
2. 1.5 Glass Plant	37	39
2. 1.6 Incineration Plant	18	18
2. 1.7 Road Tunnel	2	2
2.2 EP(Electrostatic Precipitator) – Wet Type	**37**	**37**
2.3 eBF™ (electrostatic Bag Filter)	**13**	**16**
2.4 De-Tar ESP	**3**	**4**
2.5 Fabric Filter	**141**	**156**
2.6 Wet Scrubber	**20**	**26**
2.7 Mechanical Cyclone Collector	**22**	**22**
2.8 Exhaust Fume Collectors Cold Rolled Mill	**2**	**4**
2.9 Flue Gas Conditioning System SO_3 and NH_3	**7**	**16**
2.10 Spray Cooling Tower Glass Furnace and Cement Kiln Gas Cooling	**40**	**40**
3. INCINERATION SYSTEM	**14**	**14**
4. ASH HANDLING SYSTEM	**48**	**70**
Power Plant(ESP Fly Ash & Boiler Bottom Ash)		
Industrial Boiler		
Cement Plant		
5. DAMPERS & EXPANSION JOINT	**51**	**51 (885Ea)**
Total	**991**	**1,244**

주요 고객

SK 건설
Formosa Plastics
台塑關係企業 FORMOSA PLASTICS GROUP
Taiwan power company
DRAGON STEEL 中龍鋼鐵
Marubeni CORPORATION
中鼎工程股份有限公司 CTCI CORPORATION
Techno Electric and Engineering Co. Ltd.
एनटीपीसी NTPC
台灣苯乙烯工業股份有限公司 Taiwan Styrene Monomer Corporation
AES the power of being global
KOEN 한국남동발전
SUMITOMO METAL MINING
HYUNDAI STEEL
GE Energy
KAZAKHMYS
KRAKATAU
SIEMENS
BWSC
wp 한국서부발전㈜
한국남부발전㈜
CEMEX
posco
ATOM TEK
kepco
首钢集团 SHOUGANG GROUP
MITSUBISHI HEAVY INDUSTRIES, LTD.
सेल SAIL A Maharatna Company
KOMIPO 한국중부발전
TVA
正隆股份有限公司 CHENG LOONG CORP.
中国华电集团公司 CHINAHUADIANCORPORATION
Always with you capro
capro
TAIWANGLASS GROUP
Raipur Power And Steel Limited
HUAYANG ELECTRONIC TECHNOLOGY 华扬科技
RINL VIZAG STEEL Pride of Steel A Navratna Company
الشركة السعودية للكهرباء Saudi Electricity Company
한국동서발전㈜
Shell

REFERENCES

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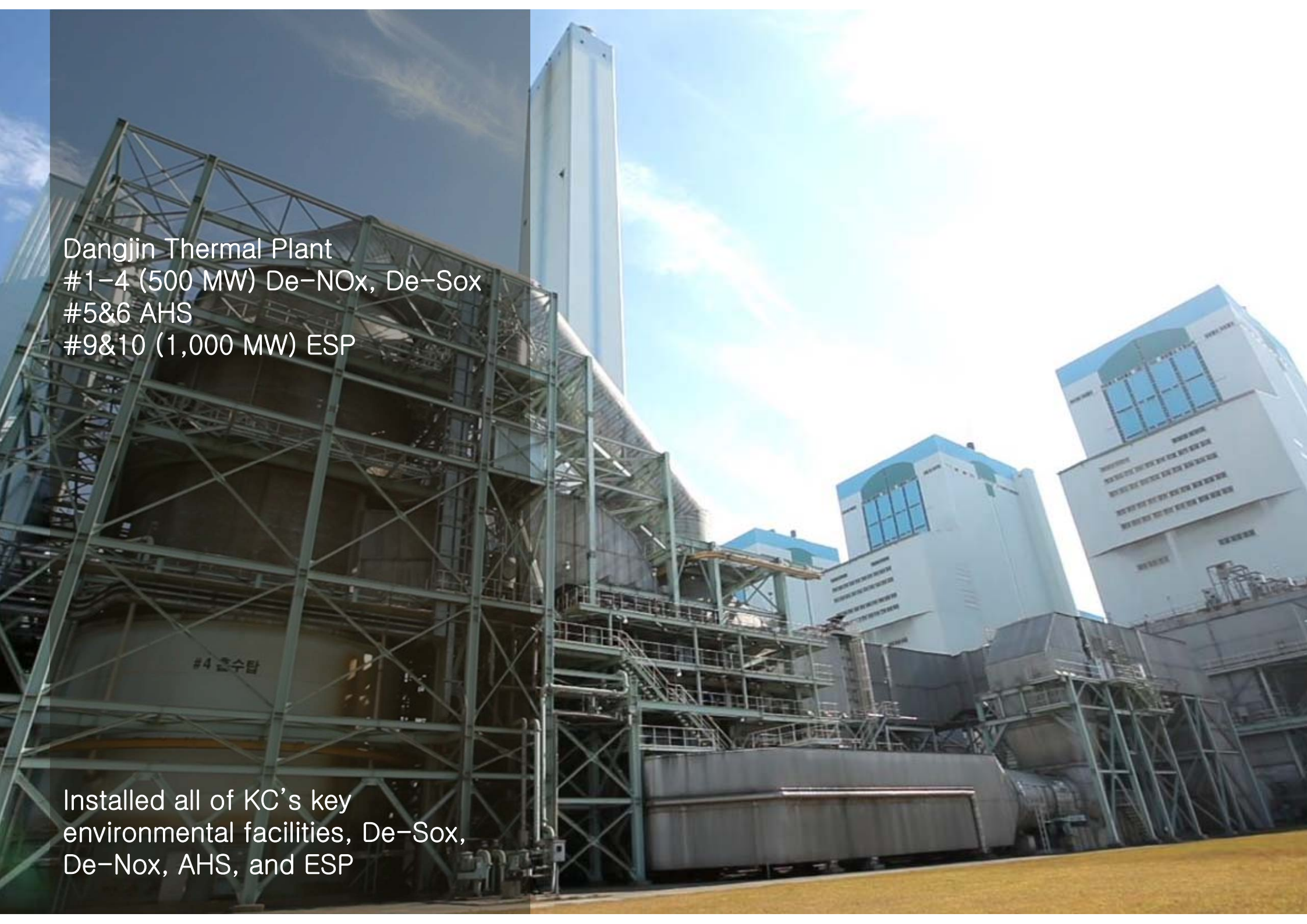

Dangjin Thermal Plant
#1-4 (500 MW) De-NOx, De-Sox
#5&6 AHS
#9&10 (1,000 MW) ESP
Installed all of KC's key
environmental facilities, De-Sox,
De-Nox, AHS, and ESP


Samcheonpo Thermal Power
#1-4 (500 MW) De-NOx, De-Sox


Yongheung Thermal Plant
#5&6 (870 MW) ESP, De-SOx
Over 98% of De-Sox efficiency by
applying Non-Leaking Type GGH
LowLow EP

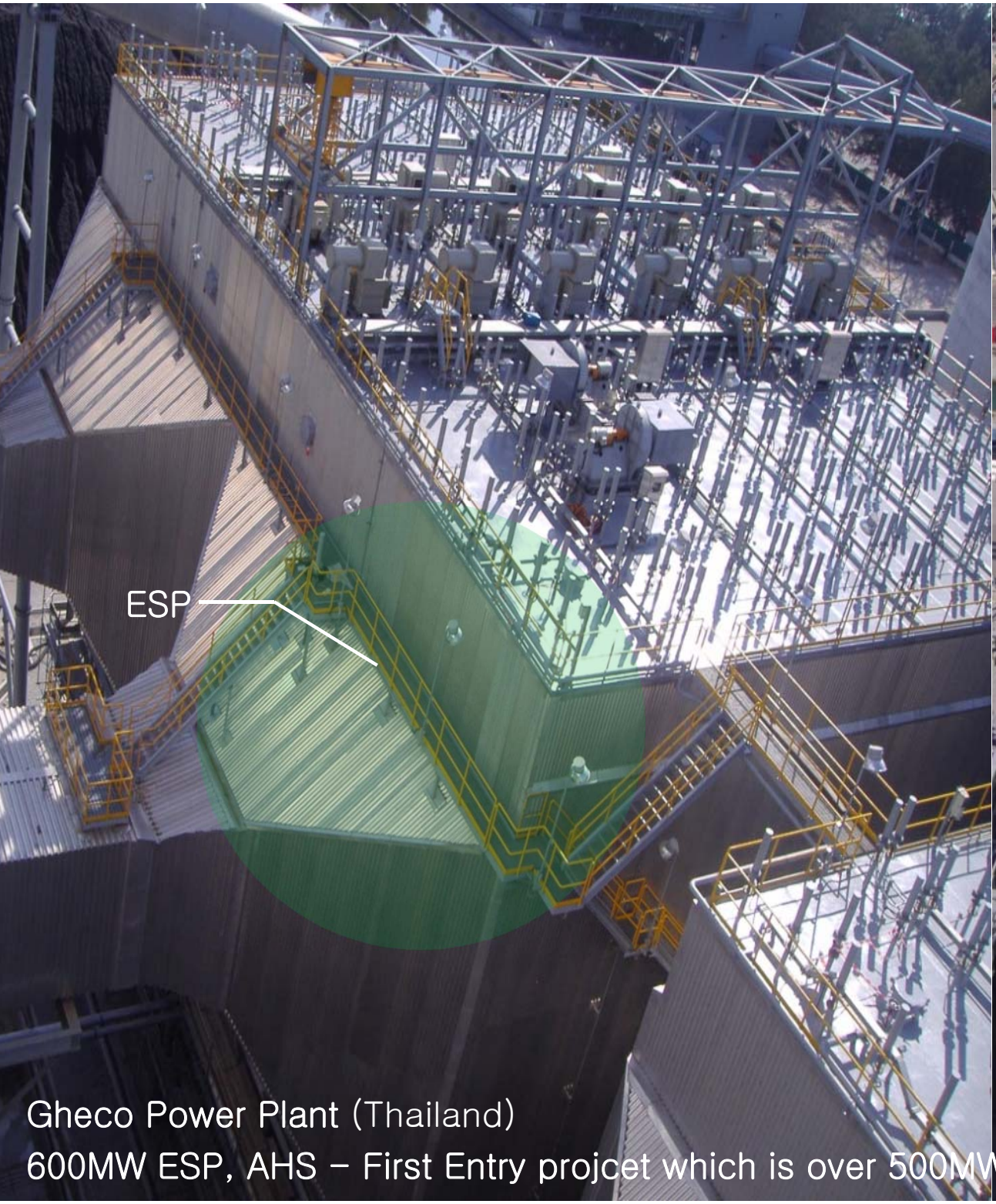
Duyen Hai 3 Extension
(688 MW) Seawater FGD

Collaboration with TSK
Under Construction

Formosa Plastic CFBC Boiler (USA)
GSA

First GSA project in USA

Petron Bataan Refinery CFBC Boiler
(Philippine)
GSA ,BF



Gheco Power Plant (Thailand)

600MW ESP, AHS – First Entry projcet which is over 500MW in Thailand

KC Cottrell

Ash Handling System

Submerged Drag Chain Conveyor (SDCC)
Gheco Thermal Power Plant Unit No.1 (700MW x 1), Thailand

Boryeong TPP Unit 7 & 8 (500MW x 2)

Bottom & Fly Ash
Dangjin TPP (500MW x 2)

ESP/AHS
Samcheok Greenpower TPP (1,000MWx2)

KC Cottrell

Tunnel ESP

Gangnam highway section 7-1, 7-2
(By-pass type)

Tunnel at Cheonma
Mt.Busan (Roof type)

KC Cottrell

Photovoltaic Power Plant

KC Glass Factory

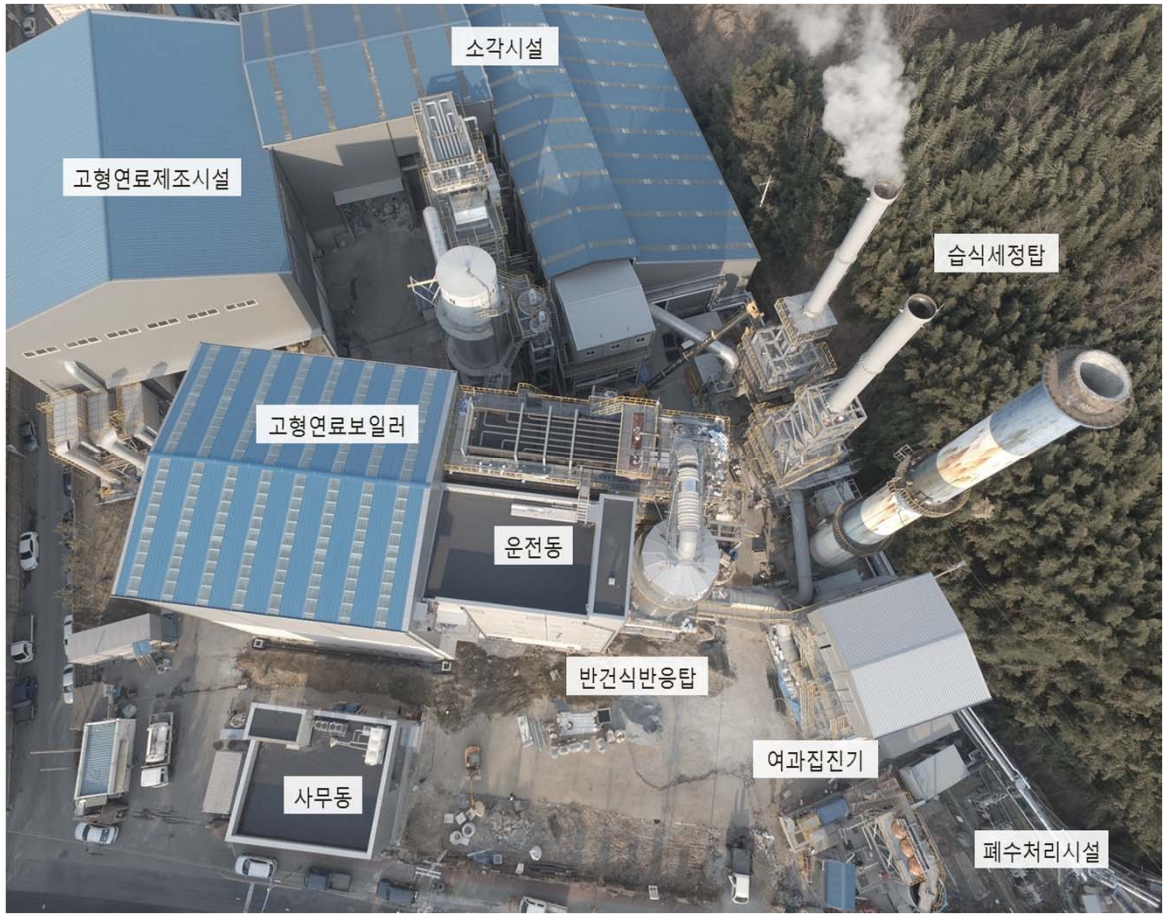
Salt Pont, 11MWp

Factory of Renault Samsung Motor at Busan, 26MWp

Factor of General Motor at Masan, 11.5MWp

KC Cottrell

New & Renewable Energy | Waste To Energy



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New & Renewable Energy | Biomass To Energy

Sappi Paper Production Plant

Thank you

Global Leader in Green Business

- People & Technology keeping our planet sustainable...

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