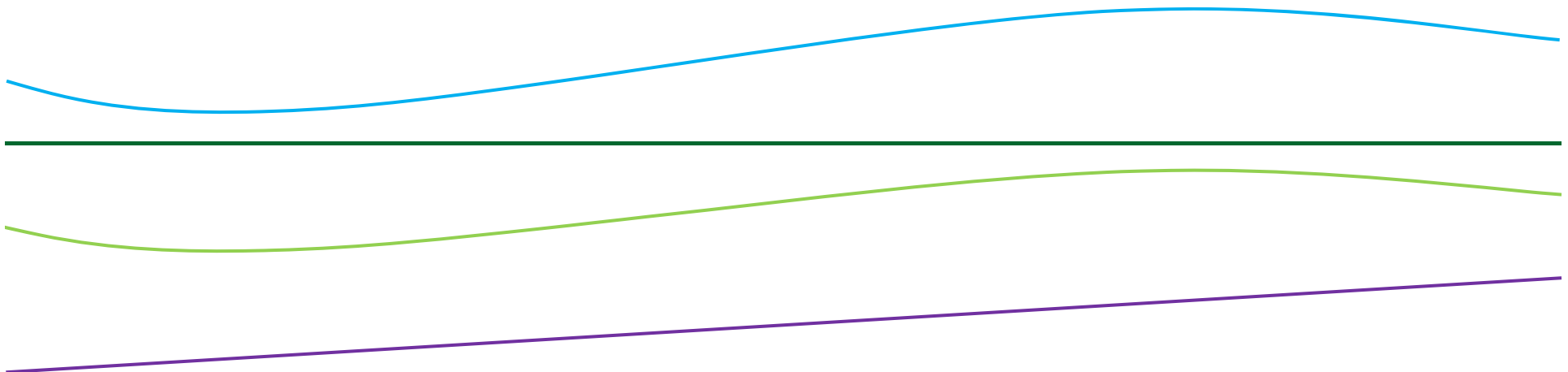


Global Leader in Green Business

KC Cottrell





CONTENTS

COMPANY OVERVIEW

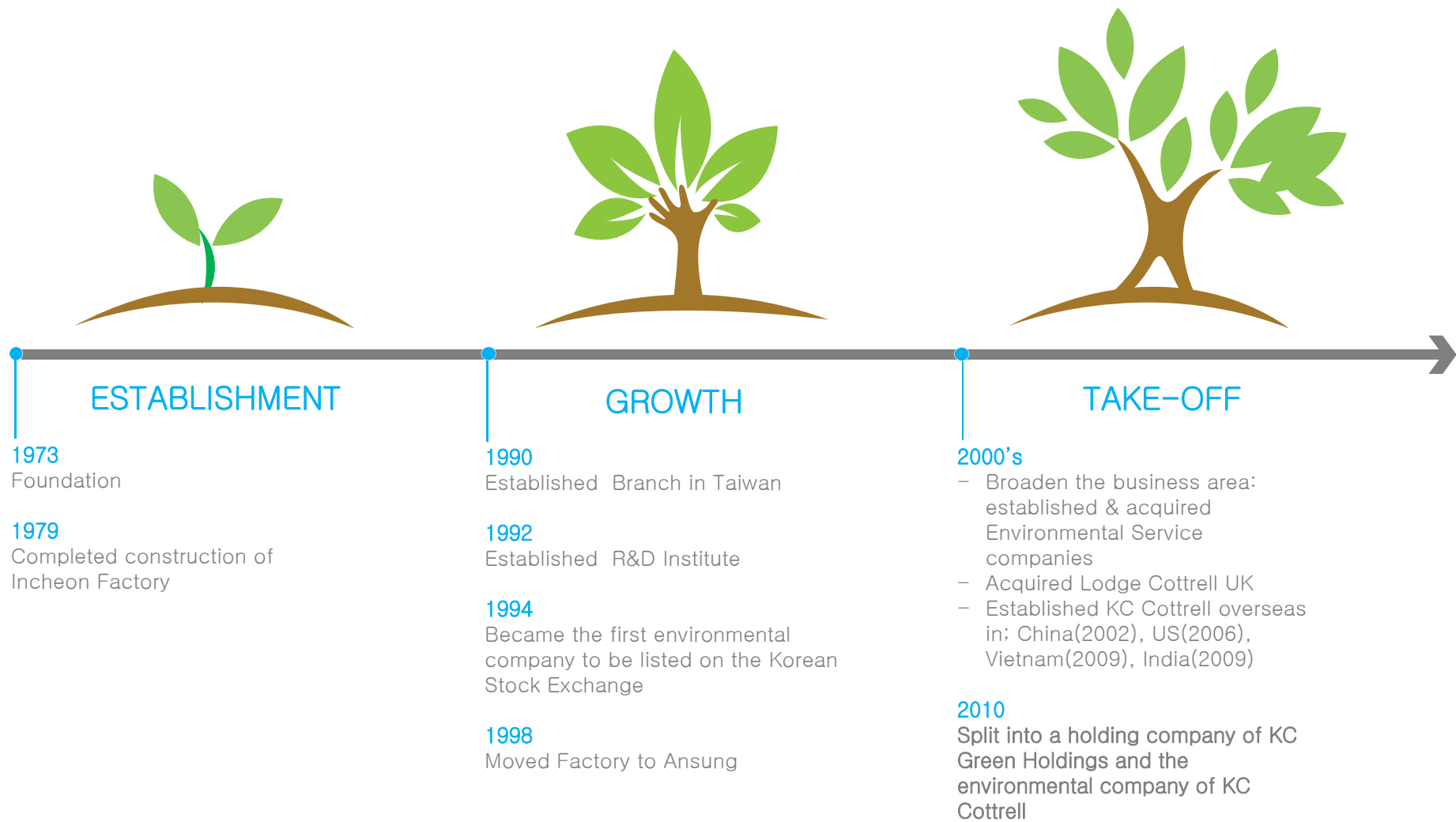
KEY BUSINESS AREA

WORLDWIDE REFERENCES

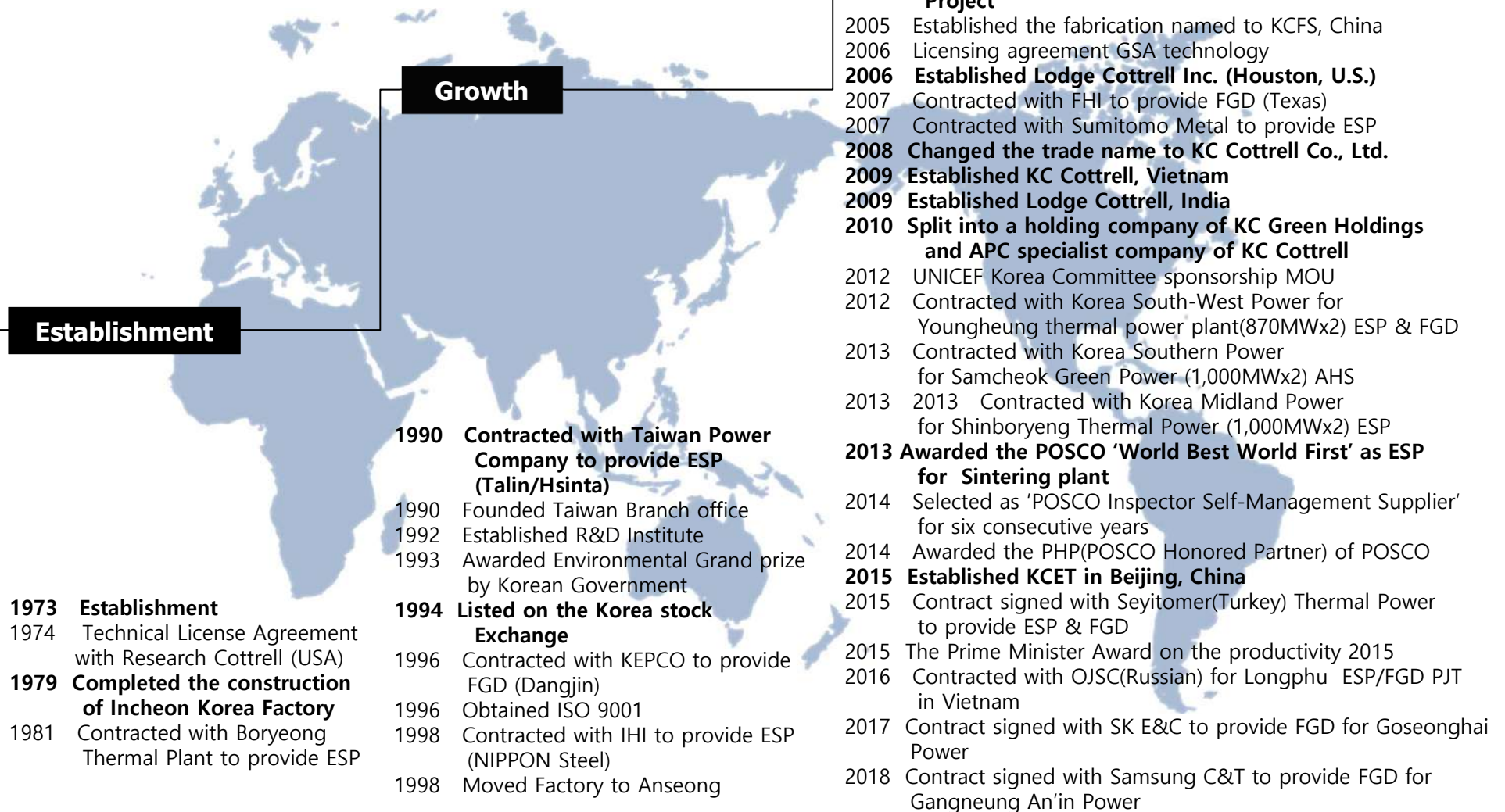
KC NETWORK COMPANIES

RESEARCH & DEVELOPMENT

01 | COMPANY HISTORY



01 | COMPANY HISTORY



02 | COMPANY PROFILE

KC Cottrell



C E O Seo, Dong Young

Founded on November 27th, 1973
(January 1st, 2010 Split into New Company)

Address 12F, Digitalcube, Sangamsan-ro 34, Mapo-gu,
Seoul

Website www.kc-cottrell.com

Main Customer
Electrical Power Company,
Steel & Chemical & Cement Plant,
Biomass Plant and etc.

Business Content

Major Equipment

- De-Dust System
 - Wet & Dry ESP, Fabric Filter, eBF
- De-SOx System
 - SDR, Wet & Dry FGD, GSA, DSI
- De-NOx System
 - SCR, SNCR
- VOC Control System
 - RTO, Catalyst
- Ash Handling System
 - Bottom & Fly Ash Handling
- Technical Consulting, O & M

New Office, Seoul



De-NOx system, Dangjin Thermal Power Plant



Electrostatic Precipitators, Taean Thermal Power Plant



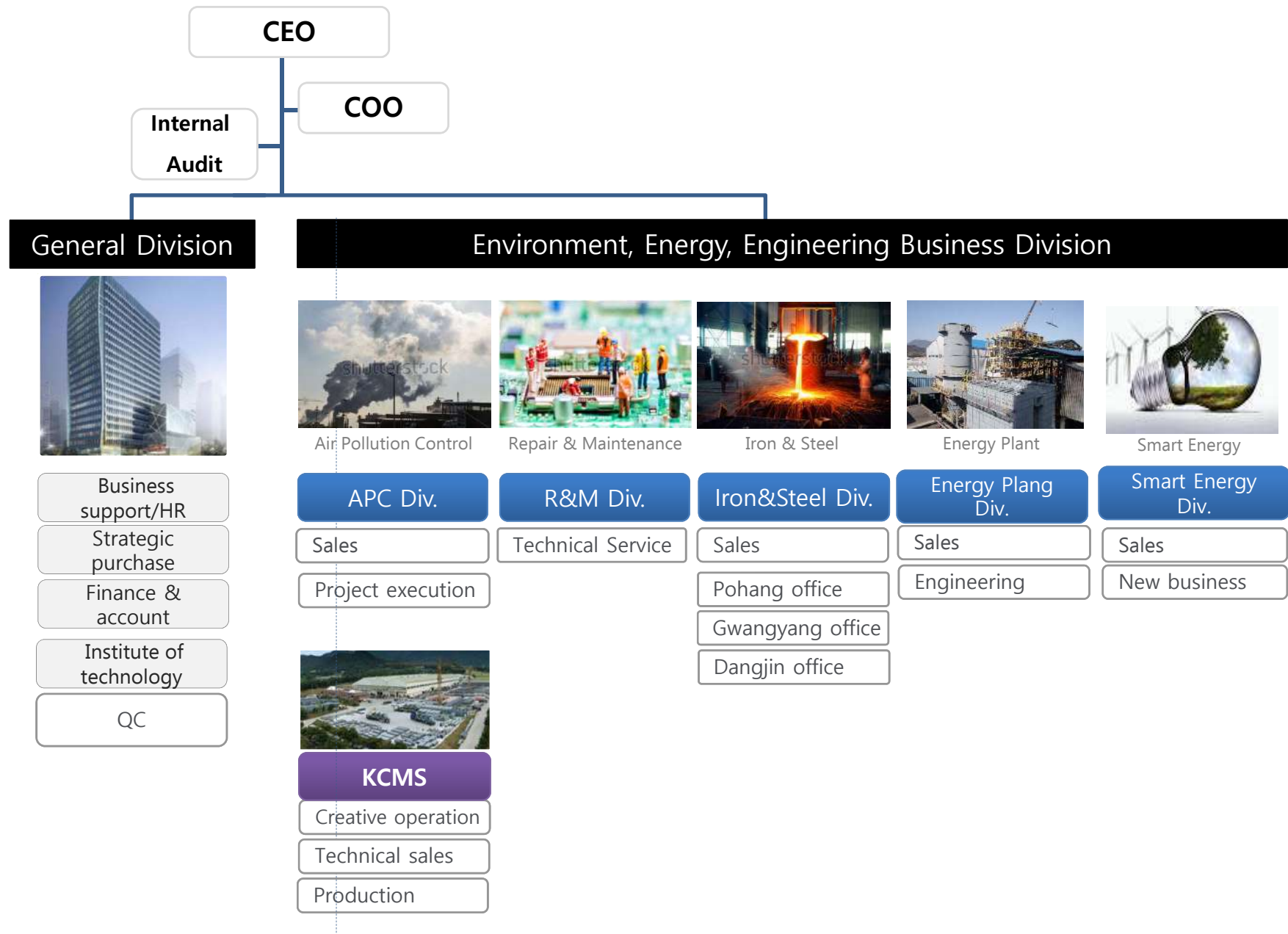
Ash Handling System



Factory, Anseong



02 | ORGANIZATION



03 | KC's Mission and Vision

THINK THE GREEN [KC COTTRELL]

KC Cottrell started its business as Korea Cottrell in 1973 as an air pollution control specialist and has world-wide presence with more than twenty (20) sister companies under KC Green Holdings

MISSION

Global Green Business Company

Global Leader of environmental industry with the recognition for its transparent and sound management

VISION

Fostering creative human resources and spirit of challenge to the best technologies and services will create sustainable corporate value and contribute to the development of humanity

- Create synergy through sharing and spreading
- Win-win management through bi-directional networks
- Expand to new markets and new industries
- Build Corporate culture of self-motivated participation and mutual-respect

04 | Business Area

Air Pollution Control

Environmental Services

Renewable Energy

Eco-friendly Manufacturing

KC Green Holdings



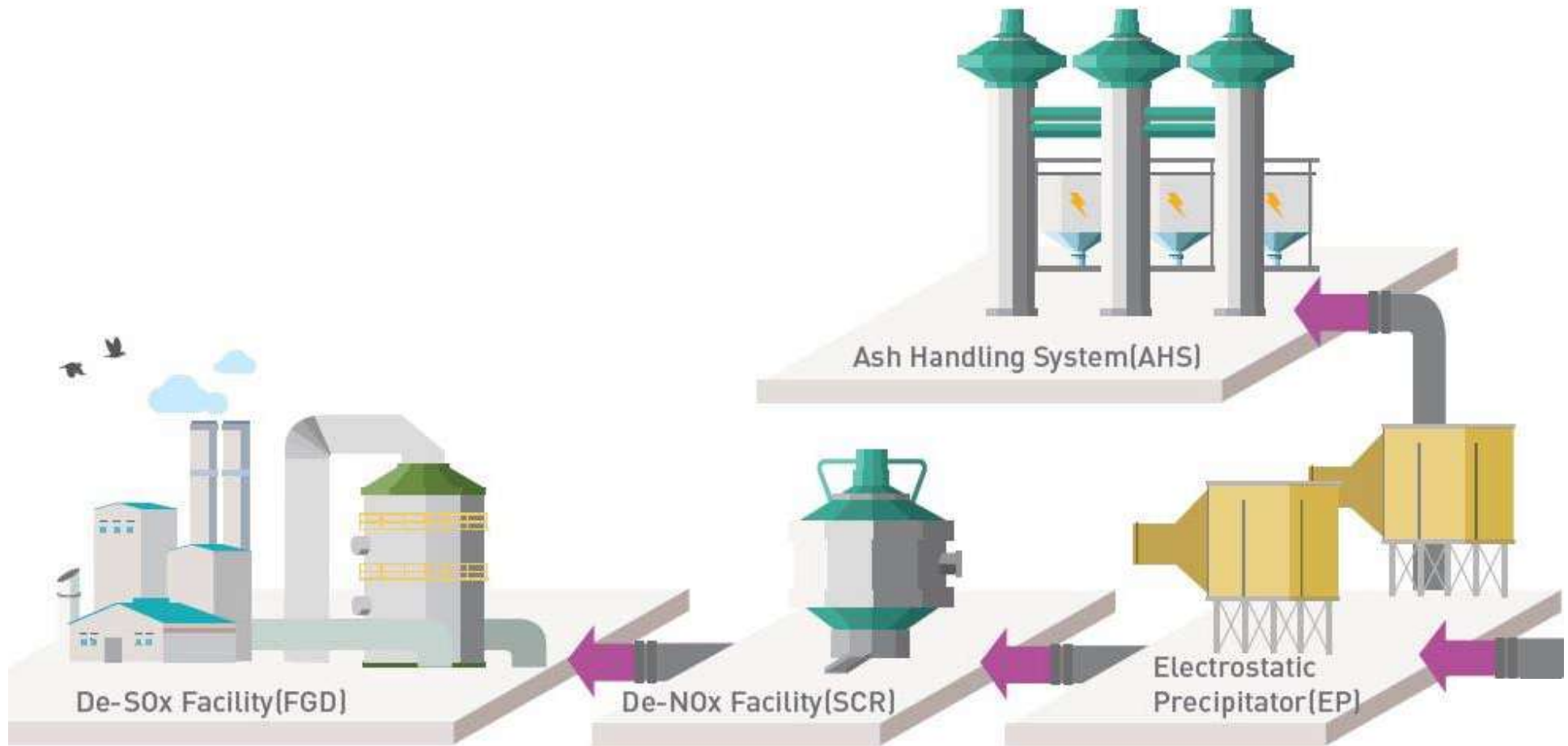
05 | ORGANIZATION

KC Green Holdings operates its subsidiary companies not only in Korea, but around the world such as the UK, the US, China, Vietnam, India and Taiwan. It pursues various environmental businesses including air pollution control businesses, recycling of wastes and waste to energy, and renewable energy.



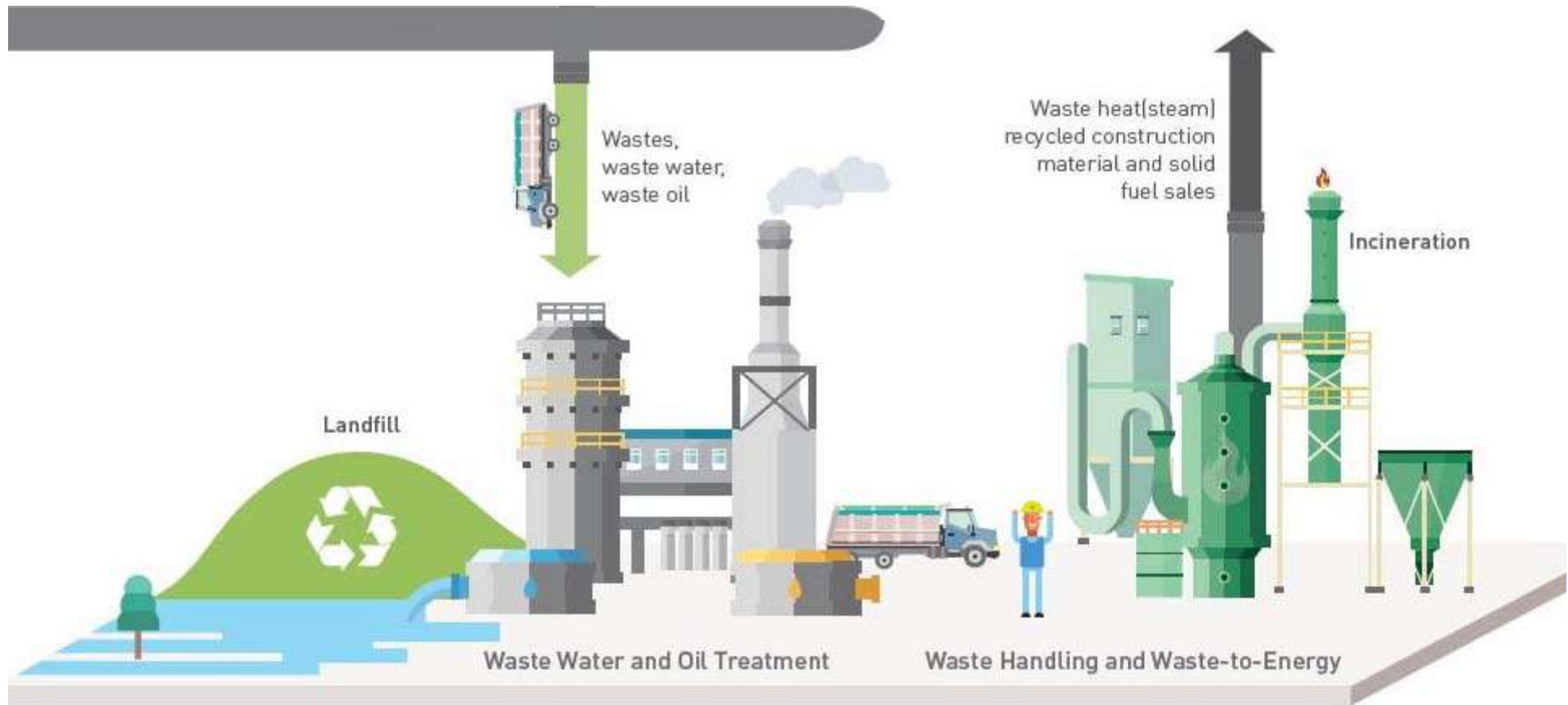
Our growth, Green growth, & Sustainable future of global society

06 | KEY BUSINESS AREA – Air Pollution Control



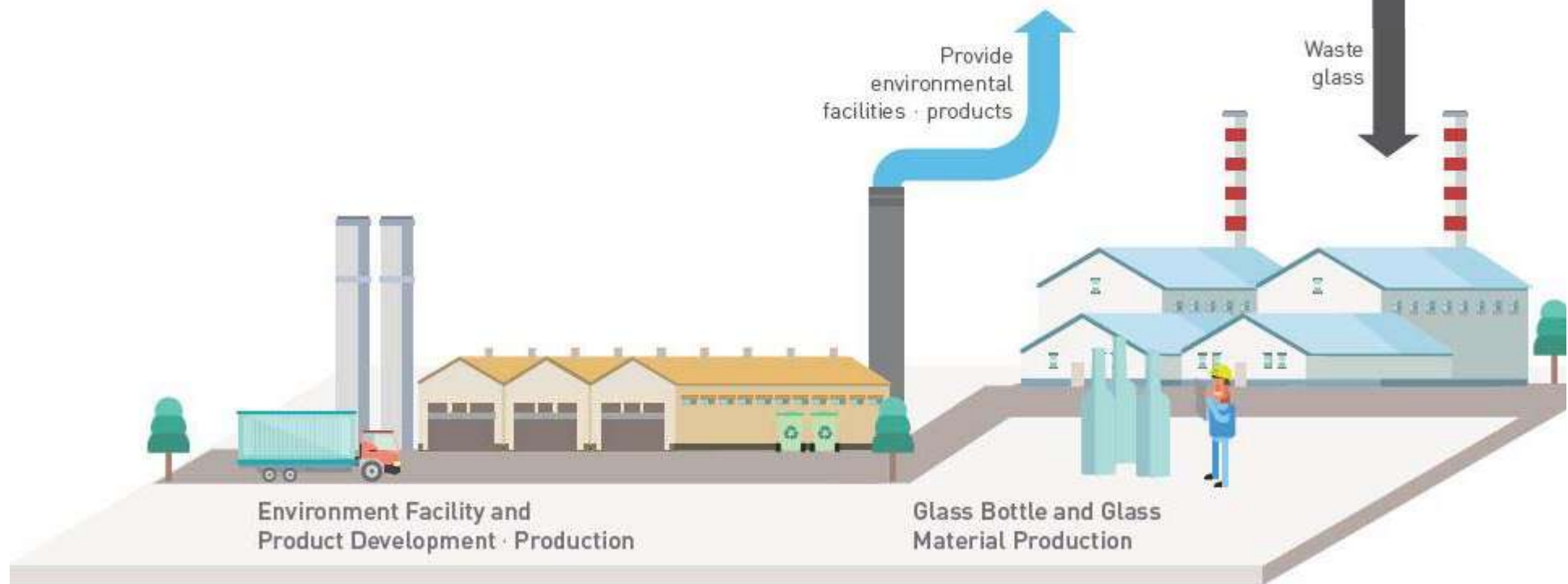
The Air Pollution Control business sector provides high quality environmental facilities based on accumulated technological expertise and experience to protect the health of humanity and to manage and preserve pleasant environments sustainably. Especially with the global interest and demands on more stringent control over air and water pollution, we are designing a future to contribute in the development of the environmental industry through close cooperation with KC subsidiaries around the world.

06 | KEY BUSINESS AREA – Environmental Services



Wastes are mainly treated by incineration or landfill and some of them are recycled. Not only does it cost a lot, but it can also cause secondary environmental pollution by contaminating the soil, water or air. Thus, environmental services sector is focusing on safe and lawful treatment of wastes, as well as turning wastes into valuable resources through recovering heat to steam energy, using waste discharges as fuel, and recycling waste catalysts.

06 | KEY BUSINESS AREA – Eco-friendly Manufacturing



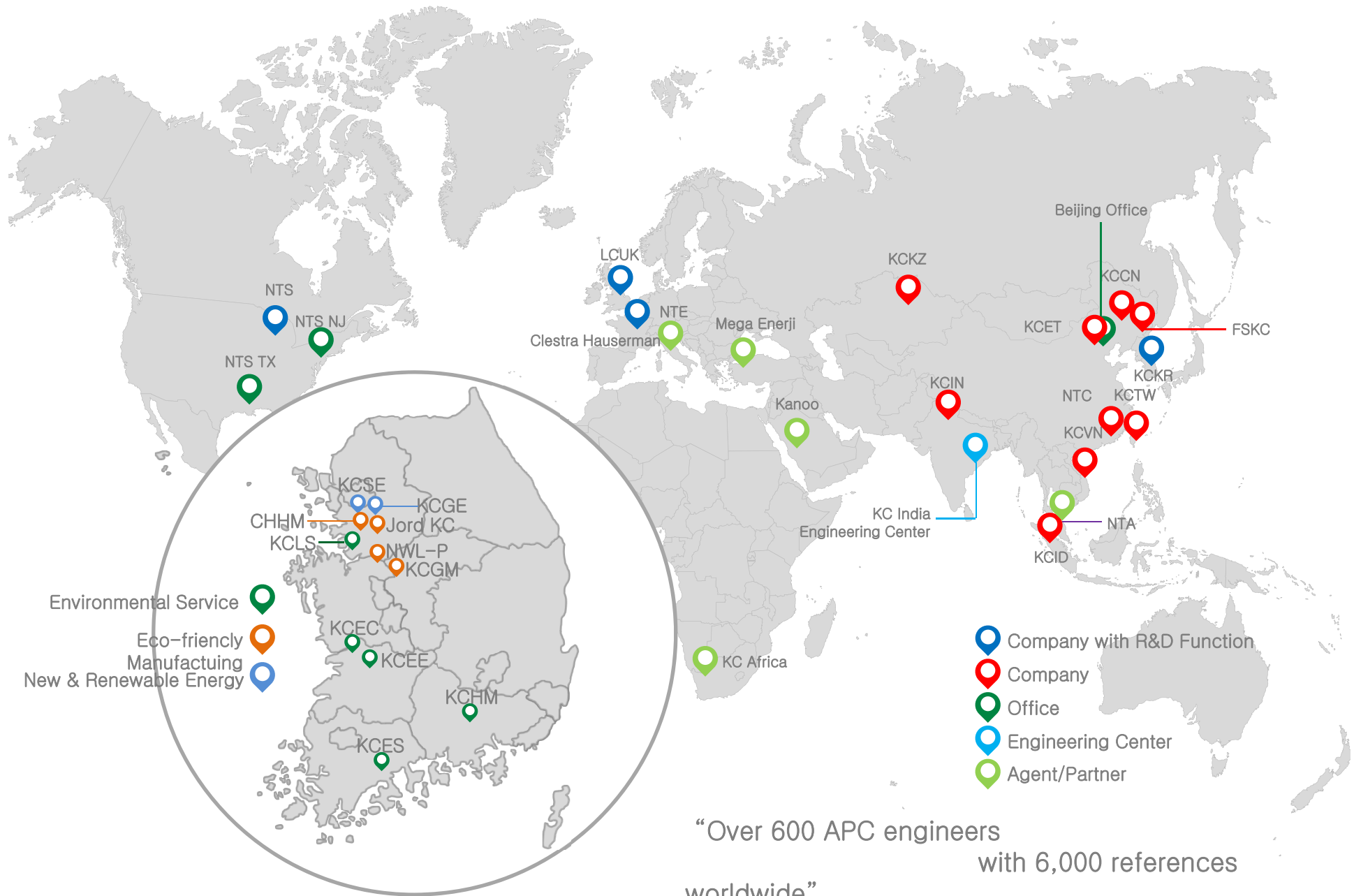
KC Green Holdings is working on developing technologies and manufacturing products for environmental protection together with excellent overseas partners through its environmental manufacturing sector. In addition, we encourage cooperation among KC network companies to become a leading company in the environmental manufacturing sector that realizes high level of satisfaction by paying attention to needs of the market and customers.

06 | KEY BUSINESS AREA – Renewable Energy



Renewable energy is the focal point of attention as a solution of environmental issues and as a new source of energy. In its efforts to meet this business environment change, the renewable energy sector is concentrating on technology R&D that can utilize environment-friendly energy resources.

07 | KEY BUSINESS AREA – Worldwide Presence



APC & EPC

Key Customers



SIEMENS

BWSC



posco



中鋁集團



中龍鋁鐵



SUMITOMO METAL MINING CO., LTD.



Air Pollution Control Worldwide Reference



A Global Leader in Air Pollution Control
– People & Technology Keeping Our Planet



Ash Handling System

Bag Filters


De-SOx System

Electrostatic Precipitators

De-NOx System

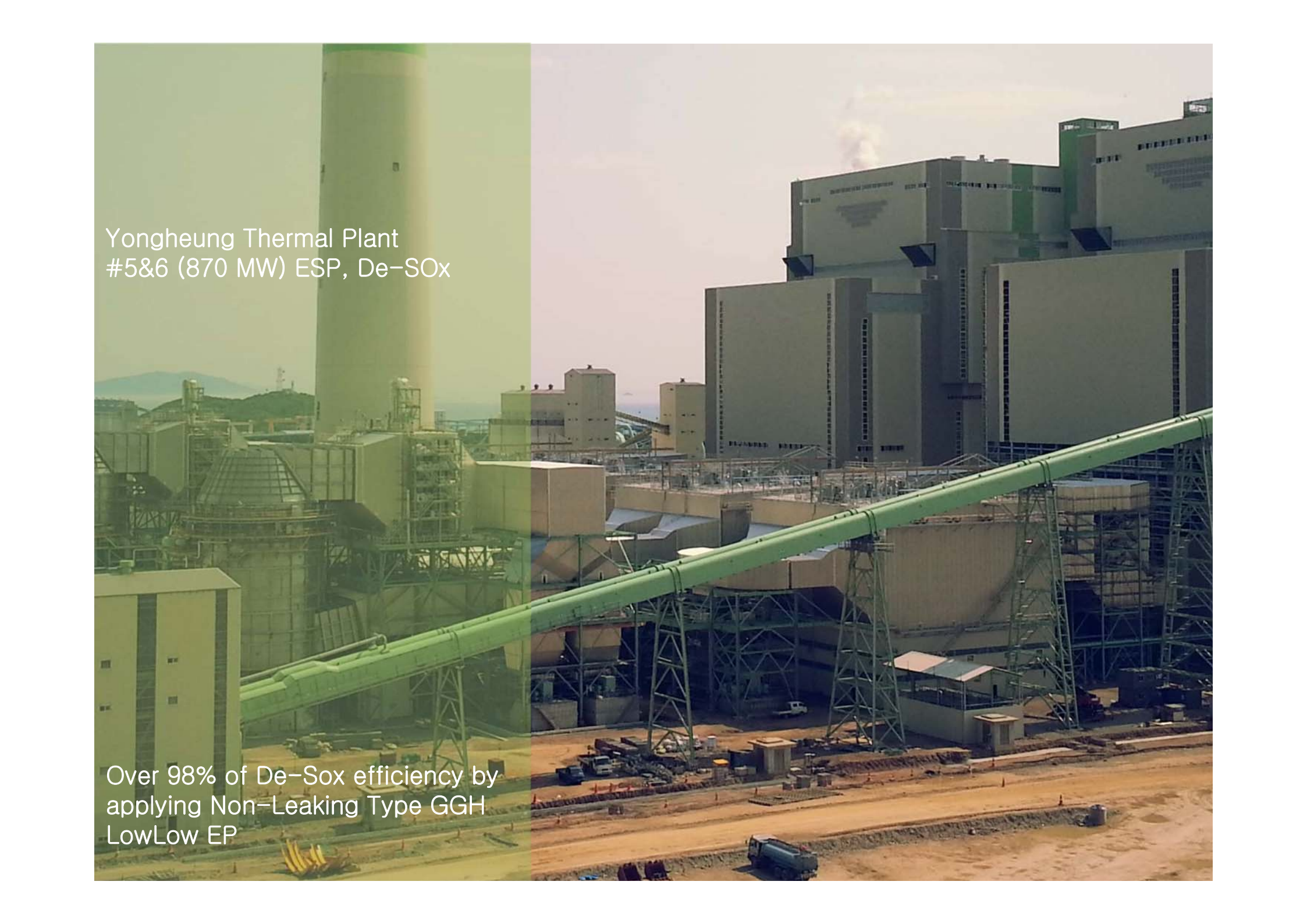
Environmental Machinery

Renewable Energy

A photograph of the Dangjin Thermal Plant, showing a large industrial structure with a tall chimney and various processing units. The sky is blue with some clouds. The foreground shows a yellowish ground surface.

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




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

Under Construction



Formosa Plastic CFBC Boiler (USA)
GSA

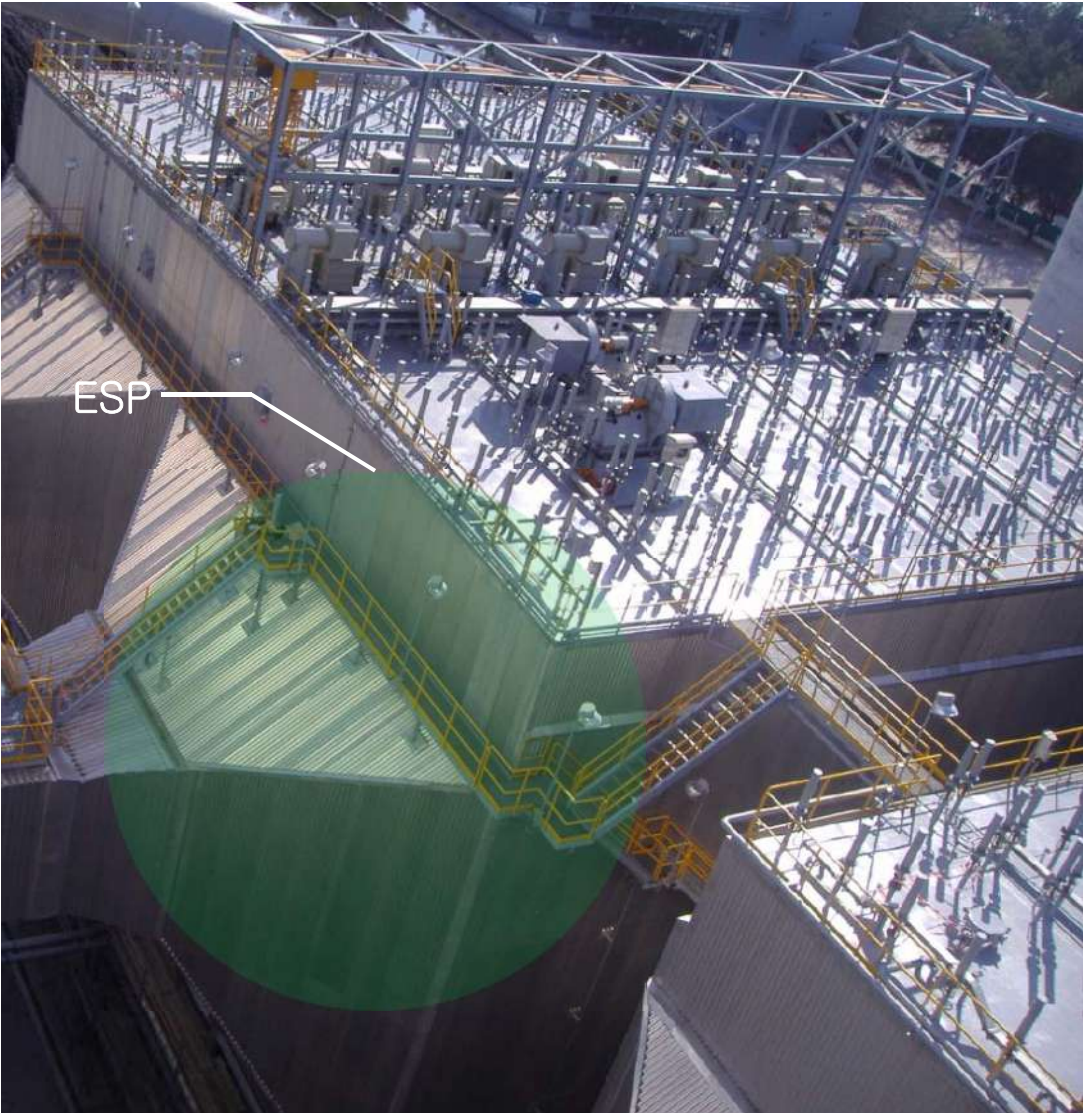
First GSA project in USA

Petron Bataan Refinery CFBC Boiler
(Philippine)
GSA ,BF



Gheco Power Plant (Thailand)

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





Gwangyang
#1~5 Sintering Plant
DISEC

Co-applied for a patent with POSCO



Gwangyang
#4 Hot Rolled Steel Plant
Circular ESP

Success in first localizing
Dry type Circular ESP
Contract Technology Agreement
with POSCO E&C



SNNC, Fe-Ni
Environmental Facility

The top half of the image shows a large industrial facility with a prominent blue building and a massive, curved, insulated pipe structure. A green semi-transparent banner is overlaid on this section, containing the project name.

EPC Turn-key supply of Air-pollution control facility



The bottom half of the image shows a different view of the industrial facility, featuring a complex network of pipes, scaffolding, and several large cylindrical and rectangular structures. A tall, thin tower is visible on the right side.



POSHIMETAL, Fe-Mn
Environmental Facility

EPC Turn-key supply of Air-pollution control facility



Mong Duong 2 Thermal Power Plant (Vietnam)
Ash Handling System revamping 2 Unit*600MW

Ha Tinh Steel Mill Plant (Vietnam)

6 Unit*Bag filter, 1 unit*WET ESP – First project which is apply long bag in Vietnam



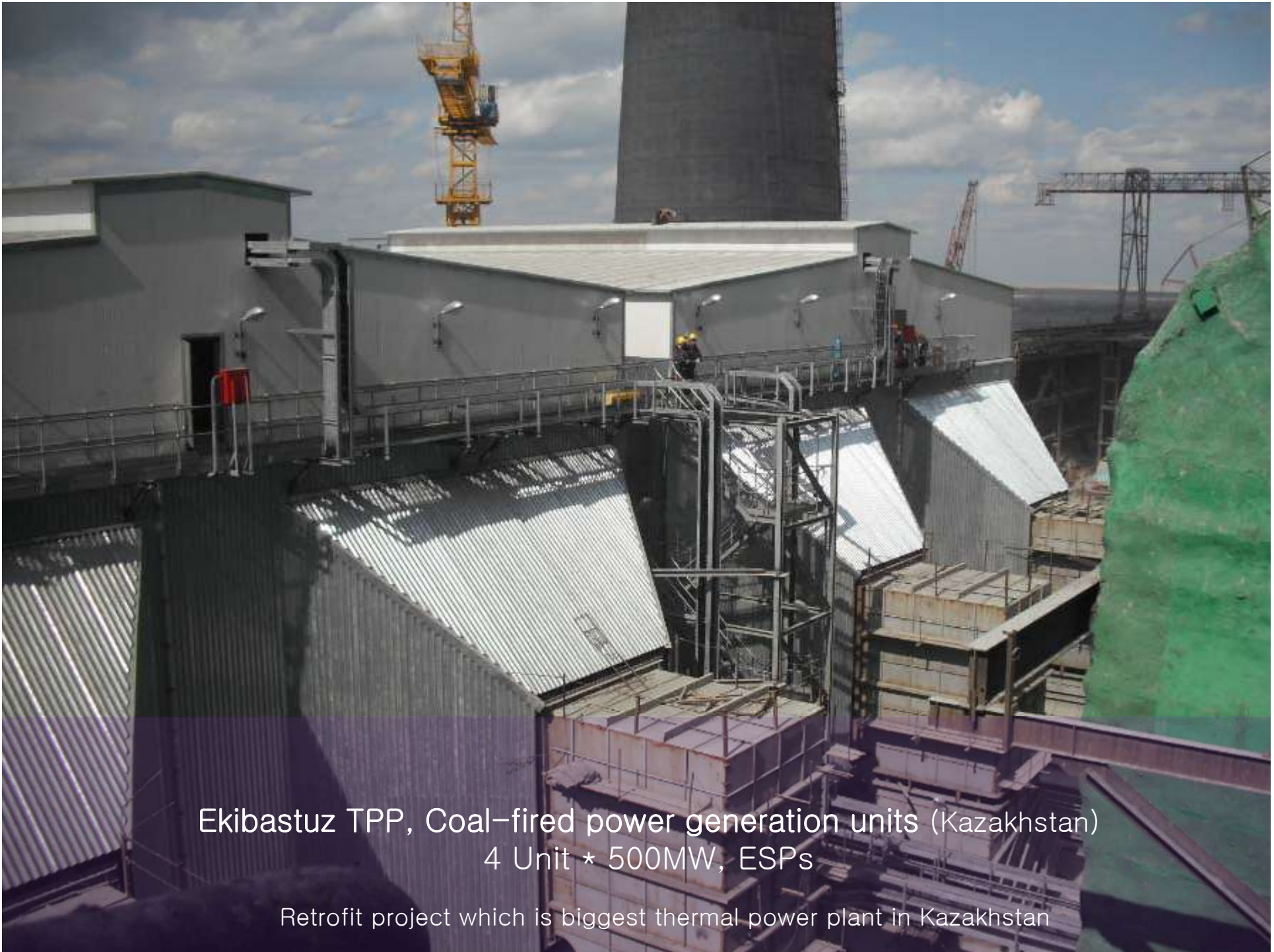
Taiwan Power Station (Taiwan)

#1 & #2 550MW — First oversea retrofit project which is over 500MW





Taiwan Cement Ho-Ping Power Station Retrofit
660MW, FGD upgrading



Ekibastuz TPP, Coal-fired power generation units (Kazakhstan)
4 Unit * 500MW, ESPs

Retrofit project which is biggest thermal power plant in Kazakhstan

New product & technology development :
New SCR catalyst, ship exhaust gas treatment technology

Performance improvement of existing facility (electric dust collector, desulfurization facility, etc) and fine dust treatment technology development

Development of new technologies to enter resource recycling market

KC Cottrell

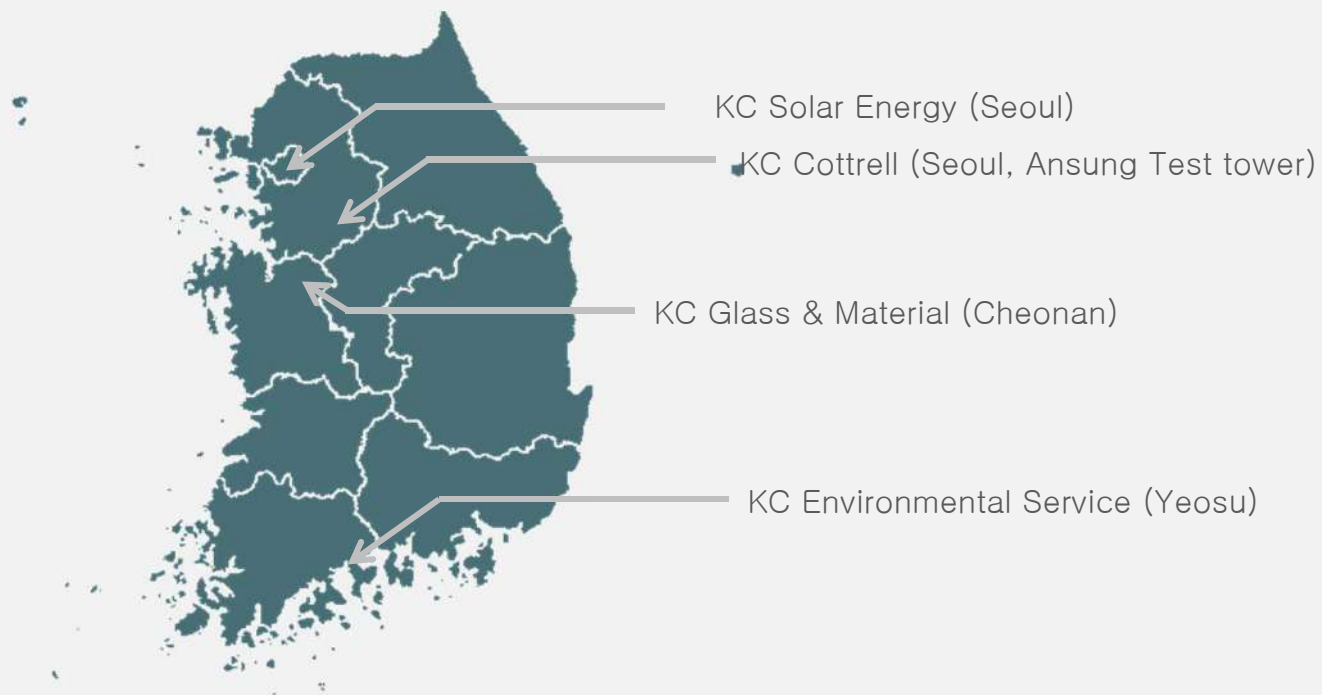
Research & Development

KC Network companies pursue technology development from a company-wide aspect. Diverse R&D activities are being carried out to differentiate technologies from other competitors. Furthermore, KC Network companies are developing joint R&D projects with clients to identify customer needs proactively and to keep up our technologies to the ever-changing market demands.

R&D in Korea

Two major goals

One is to create more value by expanding its own technologies in existing fields
The other is to pioneer new technologies in the new market for environmental industries.



Research &
Development



TEST TOWER

R&D



Set up 1000MW WET FGD Design program & Ensure efficient design technology



TEST TOWER



CARBON CAPTURE & STORAGE



TUNNEL ESP



RHDS



De-Sox Facility
Performance improving program

□ Supplying 500MW of drying CO2 capture plant by 2020

- 1 Post Combustion CO2 capture process(Linkable Technology)
- 2 Utilizing dry sorbent(Fluidized bed reactor)
- 3 Core Application: Power Plant
- 4 Currently 10MW of plant construction completed(facility design & installation)
→ 2014.10~2017.09_10MW of drying CCS facility is expected to continue the operation

□ Technology that captures CO2 through the procedure of solid sorbent circulating the two fluidized bed reactors, which leads the absorption, separation, emission of CO2. between

● TEST TOWER

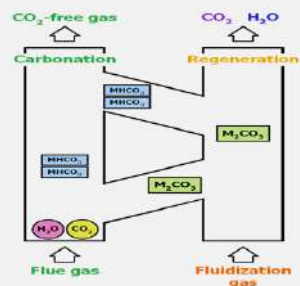
● CARBON CAPTURE&STORAGE

● TUNNEL ESP

● RHDS

● De-Sox Facility Performance Improving program

CCS outline



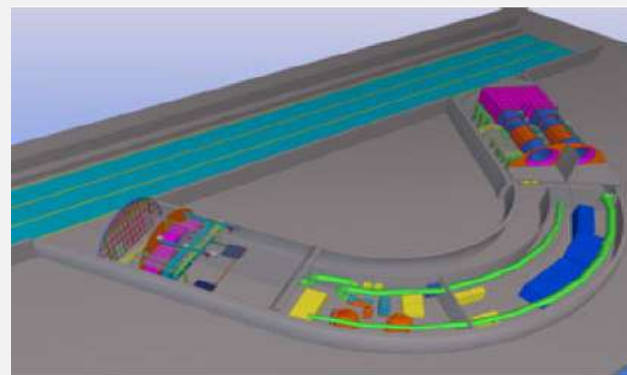
0.5MW CCS plant



10MW plant completed



KOSEP World Class Research & Development
Development & Management of Electrostatic Precipitator system installed in tunnels
– Development of compact-sized ESP module – Application of Electrostatic Precipitator



- TEST TOWER
- CARBON CAPTURE & STORAGE
- TUNNEL ESP
- RHDS
- De-Sox Facility Performance Monitoring program

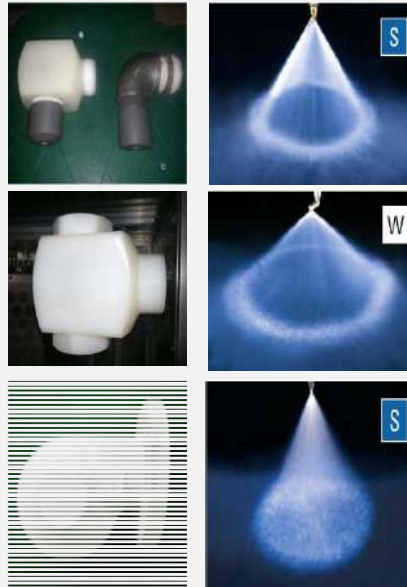


- Designing 99% efficiency de-Sox system applied 1000MW power plant / modeling KC-type absorption tower (MK-99)

Construction Test Facility



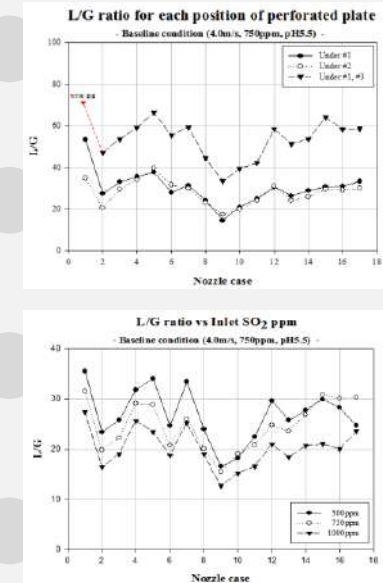
Performance test by nozzle type



Performance test by combination of nozzles



Test by different operating conditions



Combination of nozzles : By turning on and off 5 spray banks, spray slurry by 17 different kinds of combination

Operating conditions : slurry pH(5.2~5.8), flue gas SO₂ concentration(500~1,000ppm), velocity of flue gas(3.5~4.5m/s)

De-Sox Facility Performance improving program



Development of field evaluation method for assessing solar module efficiency, life span, and performance

Standardization of criteria for assessing solar module performance

Proposition of IEC TC 82 field evaluation standard for solar module life span & performance

On-site testing of solar power station (operated by participating agencies)



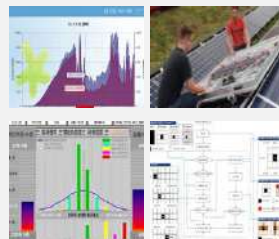
Provision of On-site data



Development of Management System



Developing On-site evaluation method



Monitoring Real-time operating performance

Providing various data from different environmental condition for absolute credibility





Technical Necessity

- Infrared optical system design & Achieving competitive advantage through mass production technology of lens
- Producing lens materials with good transmittance based in domestic technology (MIR 3~5 μm)
- Products(auto night-vision, military equipment, medical infrared thermal imaging system) with potential to

Social Necessity

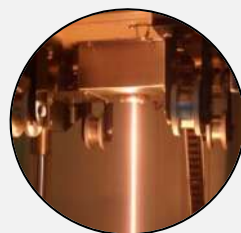
- Preventing Night-time auto accidents(car night-vision) & crimes(night surveillance camera)
- Promoting higher employment rate in various business fields

Optical Glass Manufacturing Process



Batch

Primary Ingredient
Silica, Borax,
Lanthanum oxide,
Germanium, Barium



Liquefaction

Melting temp.
1200 ~ 1400 $^{\circ}\text{C}$



Sorting

Air-cooling
Inspection
-Homogenization
-Cord



Forming

Cutting
Metal Mold
Pressing



Lens

Type
- Aspherical lens
- Prism
- Micro lens
- array



Cryogenic Expansion Glass – Ceramics:

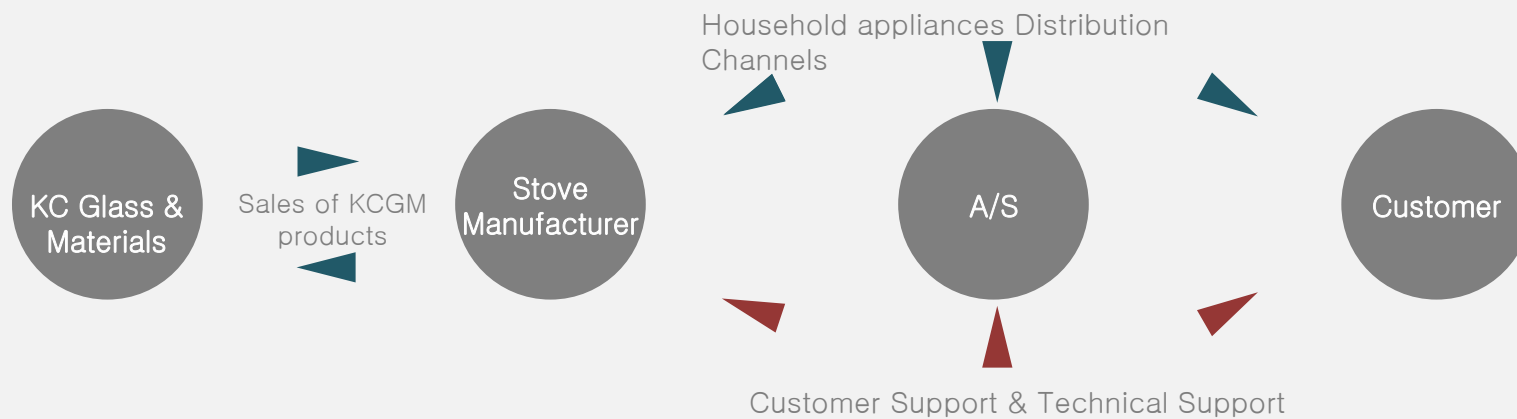
Specially designed glass(Lithium-Alumino-Silicate) with resistance to thermal contraction and expansion

□ R&D Background

- ① Multiple accidents due to gas stove top breakage
- ② The health hazards of toxic gases from gas stove
- ③ Increase in indoor temperature due to the heat generated from the gas stoves

□ Marketing & Sales Strategy

Commercialization : Cryogenic Expansion Glass-Ceramics Board
Main Markets : Domestic induction cooking & appliance manufacturers



Building sales network of induction cooking & electric appliances manufacturers through utilizing the current business network
Business Expansion (fire-resistant glass, industrial machinery materials)

Thank You!

APC OVERSEAS MARKETING & SALES TEAM
inquiry@kc-Cottrell.com

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