

Innovative renewable energy business model

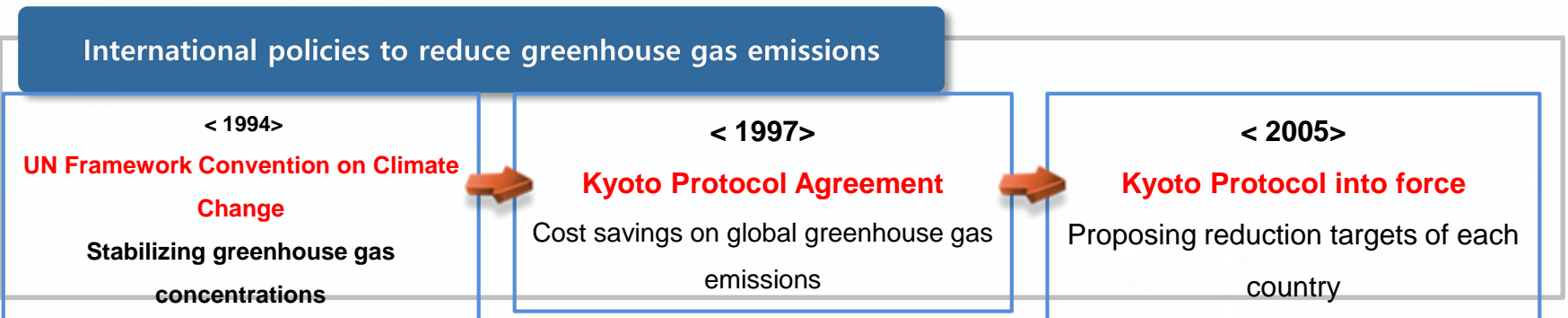
(Production of steam and supply, generation)



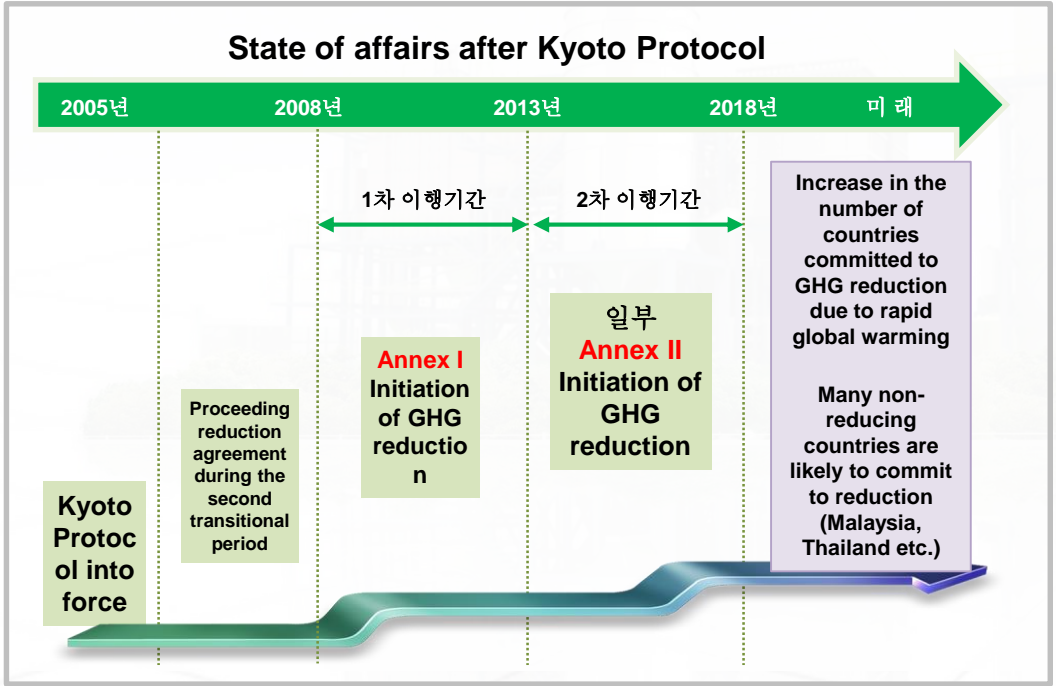
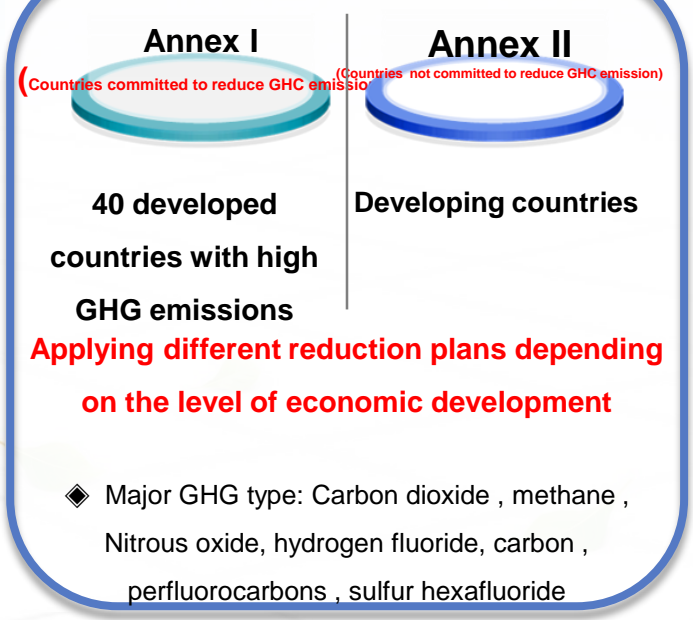
ASEAN-KOREA CENTRE

01 Worldwide reduction target of greenhouse gas emissions

Implementation of Kyoto Protocol and regulations regarding greenhouse gas emissions



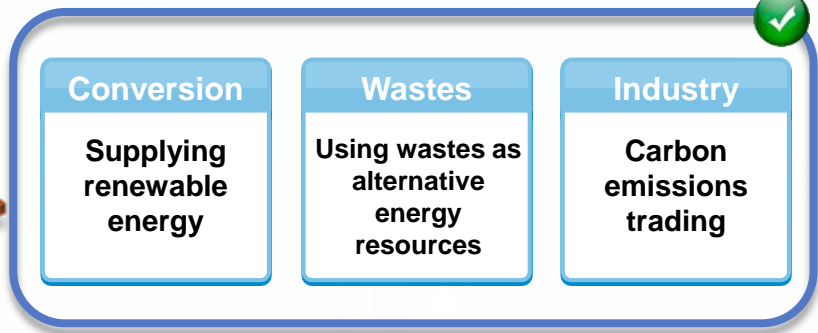
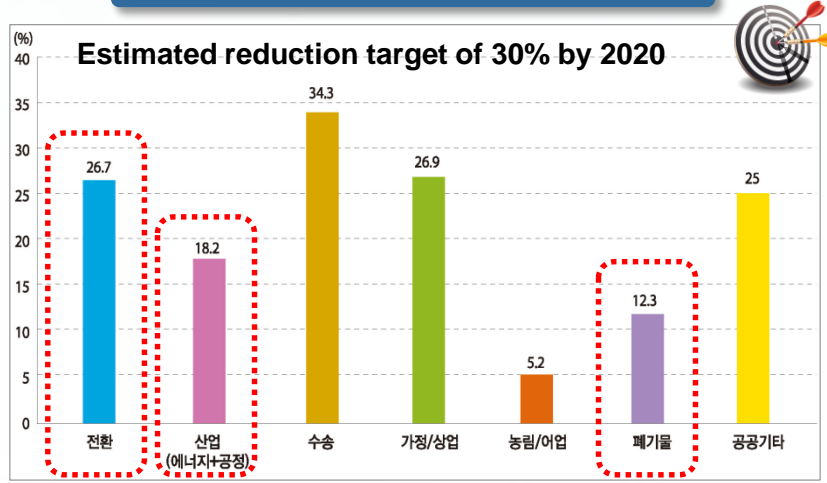
The Kyoto Protocol highlights



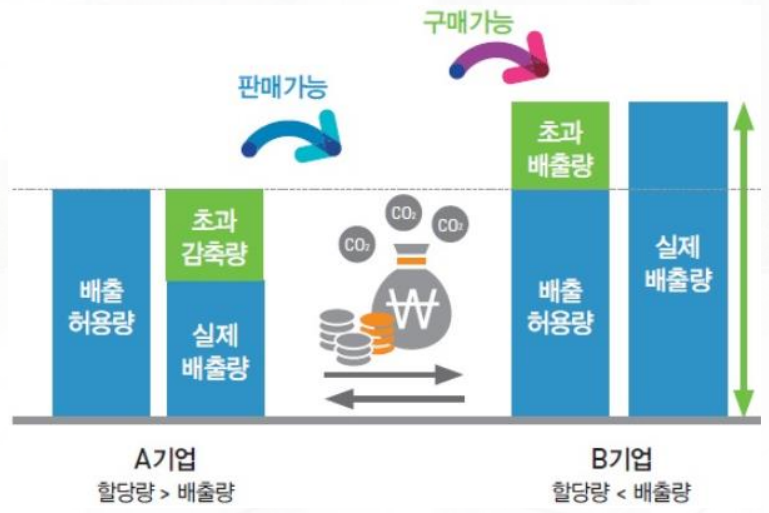
02 Korea's GHG Reduction Plan

Implementation of sector-specific reduction targets and carbon emissions trading

Sector-specific reduction targets



< Korea's carbon emissions trading >



미국	2005년 대비 17% 감축 검토
일본	1990년 대비 25% 감축
유럽연합	1990년 대비 20% 감축(다른 국가가 감축조치하면 30%까지도 가능)
캐나다	2006년 대비 20% 감축
중국	GDP당 온실가스 배출량을 2005년 대비 40~45% 감축
인도	GDP당 온실가스 배출량을 2005년 대비 20~25% 감축
한국	2020년 예상 온실가스배출량 대비 30% 감축

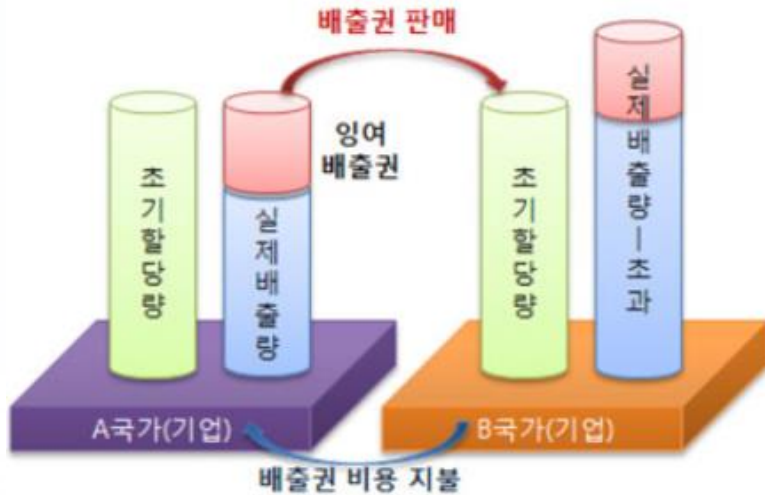


03

Vitalization of Korea's carbon emissions trading

Increase in carbon emissions trading and expanding market

< Cross-national emissions trading >



<Increasing trend of carbon emission trading >



- Carbon emissions trading as a key means to reach GHG reduction targets
- Providing incentives for GHG reduction over the target.
- Allowing trading or carrying over of remaining emission credits



04 Carbon Emissions Trading and Development of Renewable Energy

Reducing GHG emissions by developing renewable energy

Countries regulating GHG emissions

58 countries around the world including China, US, India, Russia, Japan, Germany, South Korea, Canada, Indonesia and Mexico

Accounting for more than 90% of world GHG emissions



Increase in the number of countries regulating GHG emissions

Increase in the number of countries committed to GHG reduction due to rapid global warming

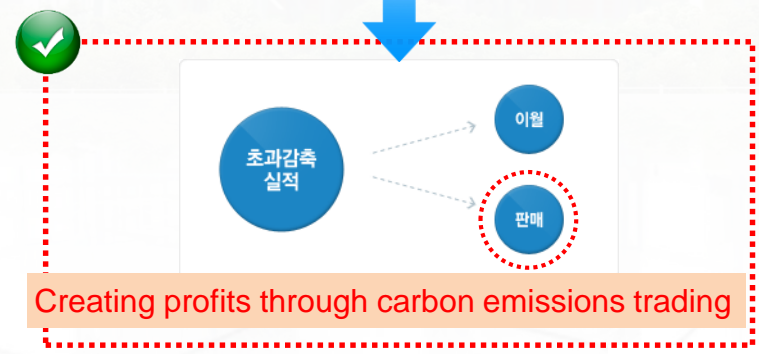
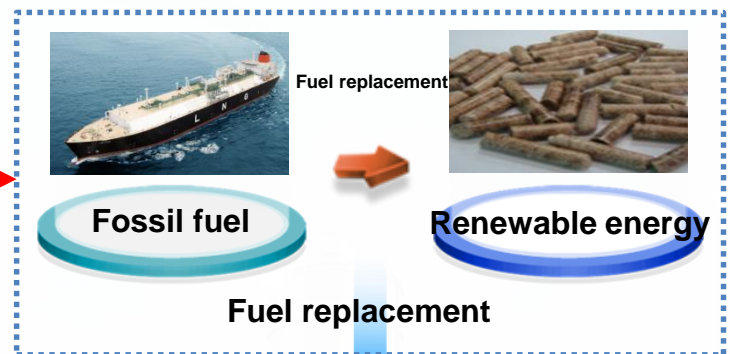
In parallel with the global trend, Thailand and Malaysia will be designated as countries regulating GHG emissions



Thailand and Malaysia's preparations

Seeking plans to reduce GHG emissions

Reducing GHG emissions by replacing current fossil fuel-centered energy resources by renewable energy resources
Preparing to maximize revenues through carbon emissions trading



01 Innovative renewable energy business model

Business structure process

Business structure



1. Boiler, order system
2. Construction
3. Maintenance control
4. Repayment fund

Support the securing of renewable fuel sites
Support the attaining of business licenses

Business operator (Founded by SPC)

Guarantee Repayment
Financial loan

Finance (Bank)



Free installation
Pay fee

Customers (Source of demand)

Confirm installation

Overseas energy business of technique supply and investment condition

- Guarantee purchase generation and energy by country (government)
- Support of the policy for new renewable energy
- Handling licensing (Land, facilities etc)



1. Provision of installation site
2. Selection of Raw material
3. Supply and demand of Steam and generation
4. Payment of costs

02 Innovative renewable energy business model

Bioenergy (wood chip) boiler facility installation cases

[Gyeonggi-do Icheon Styrofoam molding factory

Design capacity : Steam 4ton/hour X 24hours/day X 365days

**B/C oil
Boiler**



**Wood Chip
Boiler**



Bio energy
(Wood Chip)



Fuels supply
(Belt conveyer)



Automatic biomass
water spray complex boiler



Bio energy steam supply
system



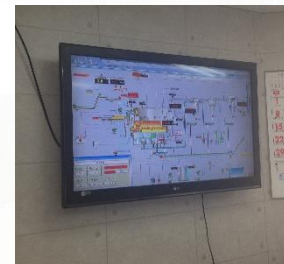
Electric control
(PLC MCC)



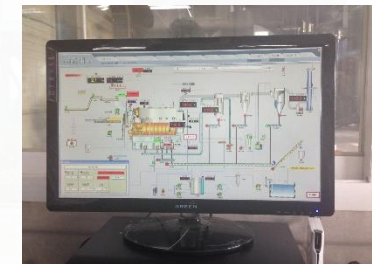
Operation
wattage



Boiler steam
flowmeter



All-source situation
control
(LCD DISPLAY)



Remote control
(PC Control System)

- Currently **operating** highly efficient **wood chip boiler** after **pulling down** the **previously existed B/C oil boiler.**

03 Innovative renewable energy business model



New renewable fuels (SRF) usage energy operation case

DESANG Co., Ltd. Gunsan factory



Usage	Renewable energy (SFR)
Produce steam	15 ton/hr × 3 units, 3 MW generation
Site	Soryoung-dong, Gunsan-si, Jeollabuk-do, Korea
Institution capacity(SRF)	1.8 ton/hr × 3 units
Steam condition	22 kg/cm ² , 218 °C
Date of completion of work	2008year, January

HANSOLHOMEDECO Iksan factory



Usage	Renewable energy (SFR)
Produce steam	13 ton/hr × 2 units
Site	Palbong-dong, Iksan-si, Jeollabuk-do, Korea
Institution capacity(SRF)	1.8 ton/hr × 2 units
Steam condition	22 kg/cm ² , 218 °C
Date of completion of work	2010year, October

04 Innovative renewable energy business model



New renewable fuels (SRF) usage energy operation case (Continue)

CJ Incheon factory



Usage	Renewable energy (SFR)
Produce steam	17 ton/hr × 2 units
Site	Siheung-dong 2-ga, Jung-gu, Incheon, Korea
Institution capacity(SRF)	1.9 ton/hr × 2 units
Steam condition	12 kg/cm ² , 191 °C
Date of completion of work	2013year April

Hwasung SRF generation project



Usage	Renewable energy (SFR)
Produce steam	17 ton/hr × 3 units
Site	Paltan-myeon, Hwasung-si, Gyeonggi-do, Korea
Institution capacity(SRF)	2.07 ton/hr × 3 units
Steam condition	10 MW
Date of completion of work	Process

05 Innovative renewable energy business model

Bioenergy (wood chip) boiler facility installation case

Cost savings after replacement

Division	Before (B/C Oil)	After (Wood Chip)	Remark
Steam usage(assume)	4 ton/h X 24h/d X 265day/y = 25,440ton/year	Same as left	Standard is 5 working days
Steam usage fee	25,440ton/y X 62,937won/t = 1,601million won/y	25,440ton/y X 46,000won/t = 1,170million won/y	Saving 27% Saving cost 431 million won/y
Personal expenses	2 people X 40 million won = 8million won/year	Possibly change position if want	Saving cost 80 million won/y
Boiler electric fee	150ten thousand won/Month X 12months = 18million won/y	Heat supply operator's portion	Electricity saving cost 18 million won/y
Boiler clear fee during a year	Year once X 3million won	Operate spare boiler	Saving cost 3 million won
Boiler clear fee during a month	100thousand won X 12months = 12million won	Operate spare boiler	Saving cost 12 million won
Total saving cost	1,714 million won	1,170 million won	544 million won (Saving 32% compare to before changing the boiler)

• Saving up to **32% of energy** and **personal expenses and electricity fee** after initiating the Heat supply business



“Now new renewable energy business
is mandatory **not optional**”

Thank you

