

Energy & Environment Strategic Planning in China Steel Corporation

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1. Introduction

Innovation

is necessary

- Sustainable development of an enterprise needs to involve economic, environmental and social aspects.
- Only the **continual innovation** can create **differentiation** and make enterprises develop sustainably.

Environmental Protection

is the basis

- To **manage sustainably**, only an enterprise should do is to put much more efforts into the **environmental protection**.

CSC

road to the
energy saving &
environmental protection

- What the **achievements and efforts** in the past have been done.
- What the **environment and challenge** in the future will be.

2. Vision, Targets and Strategies

Vision

- Pursue growth, **Sustain Energy Saving, Environmental Protection**, and **Value-Innovation**.
- Become a Trustworthy Steel Company & Green Enterprise.



Targets

Targets (2020)

Low Carbon

- $< 1.97 \text{ tCO}_2\text{e/ton-crude-steel}$

Low Pollution

- Zero Disposal for Process Waste
- Minimize Wastewater Discharge
- Top Standard of Air Pollution Control

High Value

- Increase Revenue from Sale of Byproducts
- Revenue from District Energy Integration
> 5 Billion NTD/Year

(Two-Low & One-High Policy)

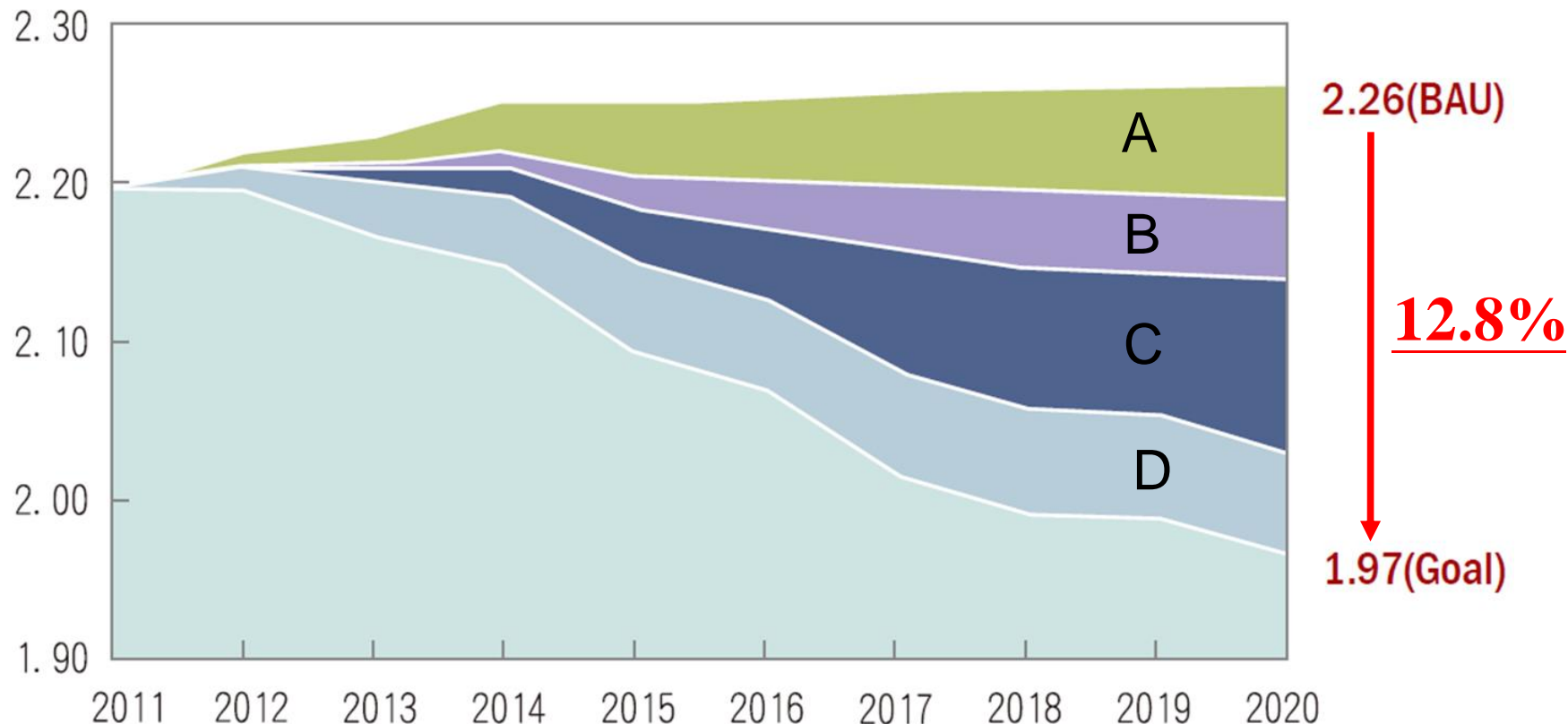
Strategy

1. Take the **international benchmarking** as the performance index and become an **environment friendly enterprise**.
2. Utilize **inner and outer energy and resources** well to reach the best performance.
3. Accelerate the **applications of BAT and renewable energy** to attain the goals of **low carbon, low pollution and high value**.
4. Develop the **products of energy saving & environmental protection**, establish **new green businesses** and promote **green life** to coordinate with the development of low-carbon and green economy.

Roadmap of Carbon Reduction

(Take the Low Carbon Target for Example)

Ton CO₂e / ton of crude steel



A. Internal energy saving and carbon reduction

B. Optimal use of self-produced fuel gases

C. New energy

D. District energy integration

3.CSC's Action Plans on Energy Saving & Environmental Protection

■ Start with Ourselves

- CSC continues emphasizing the influences of energy consumption, air, water and waste on the operators and nearby residents for a long time.
- CSC continues pursuing the balanced development among the economy, energy, environment and society.
- CSC continues improving through the PDCA procedure.

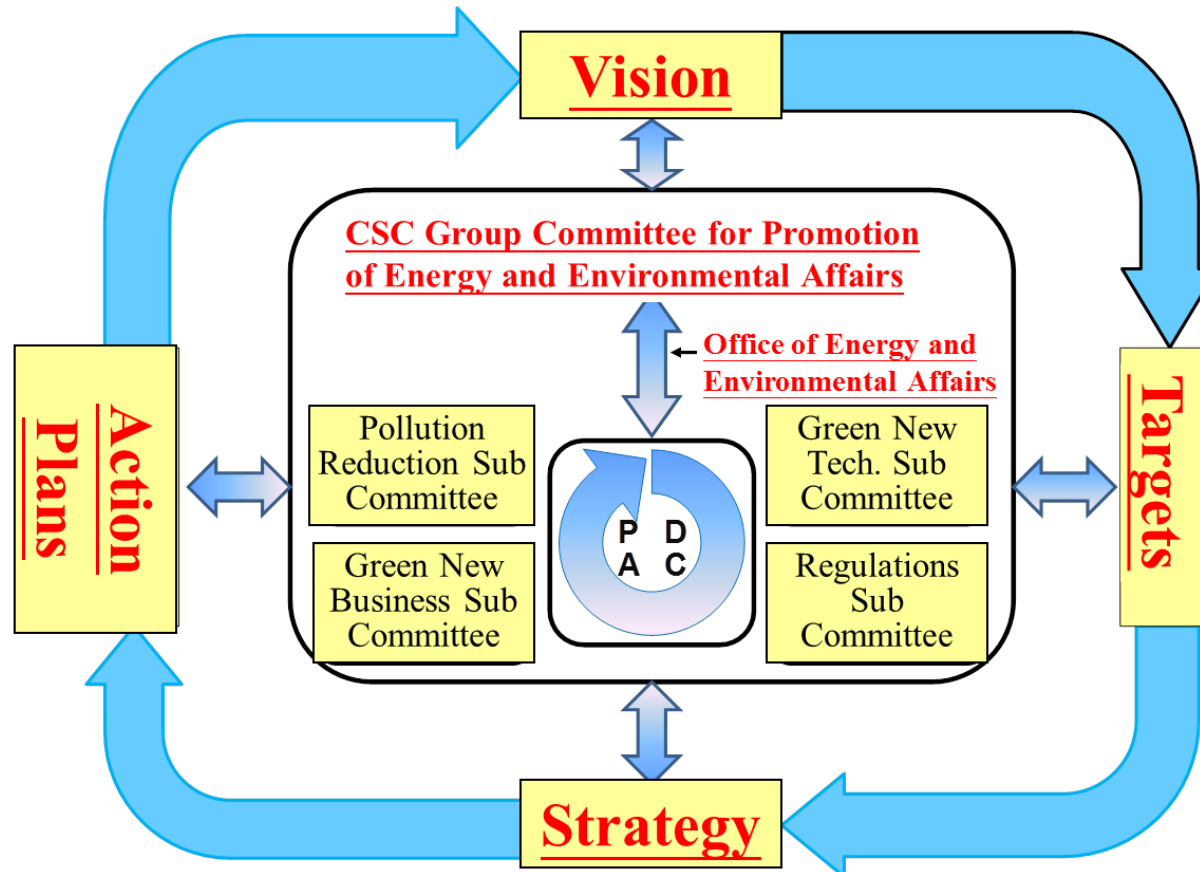
■ Focus on Green Development and Link to 5G

Green Process, Green Product, Green Business,

Green Partner and Green Life

Start with Ourselves

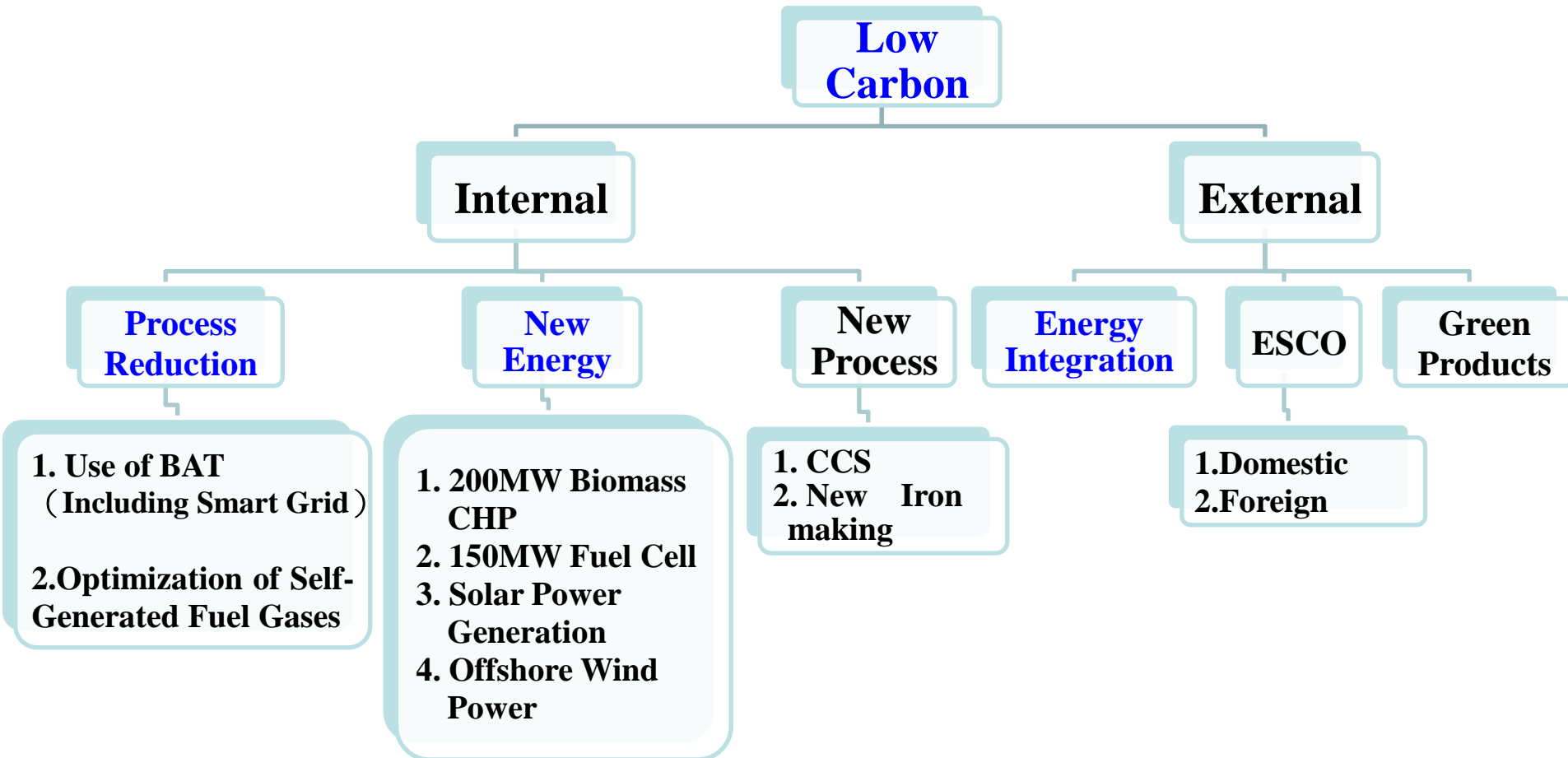
Management System



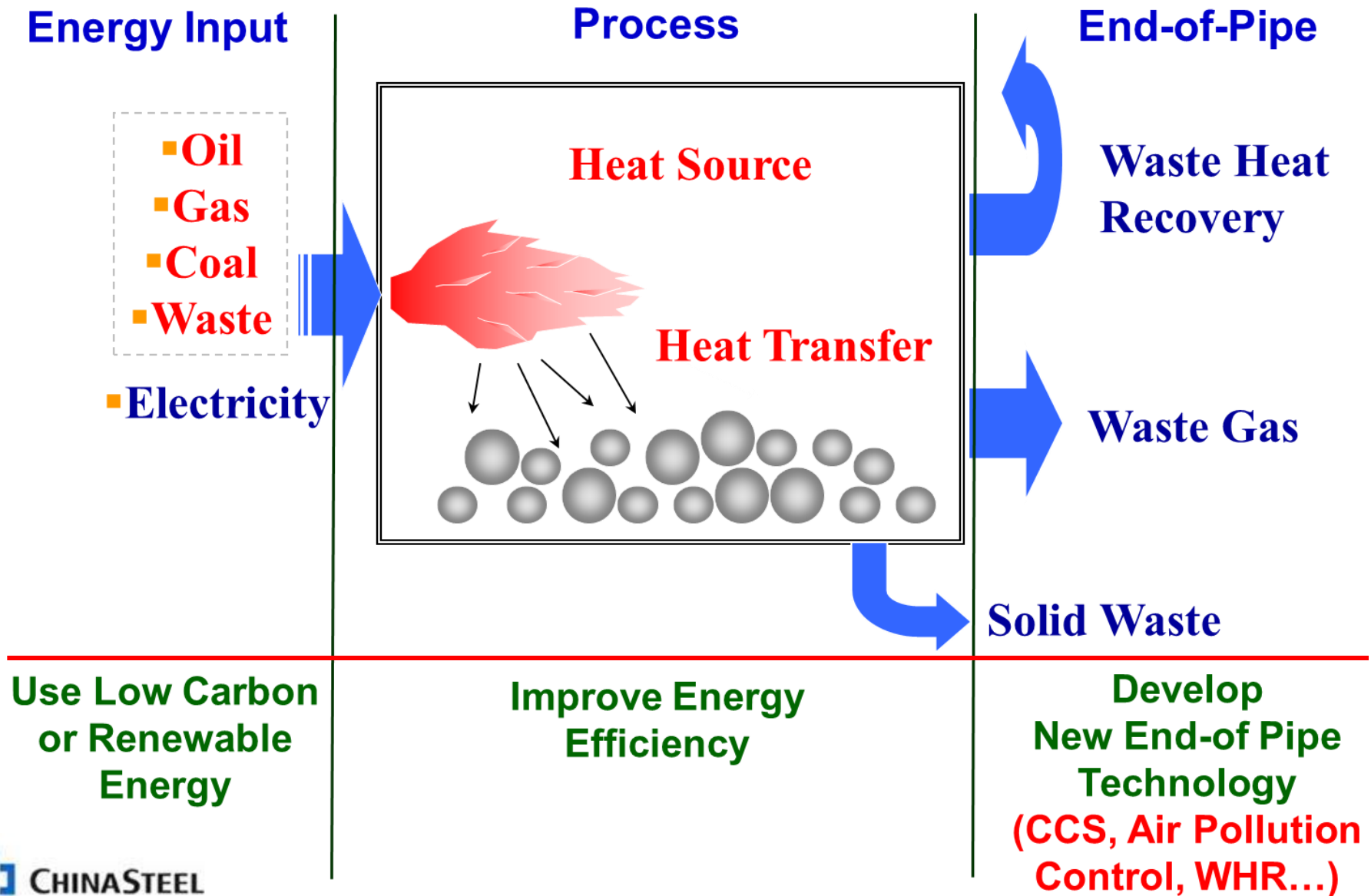
- 2011.03.01 **CSC Office of Energy and Environmental Affairs** Established
- 2011.04.06 **CSC Group Committee for Promotion of Energy & Environment Affairs** Established

Action Plans

(Take **low-carbon** target for example)



Action Plan - Carbon Reduction of Process



Action Plan – Installation of PV System

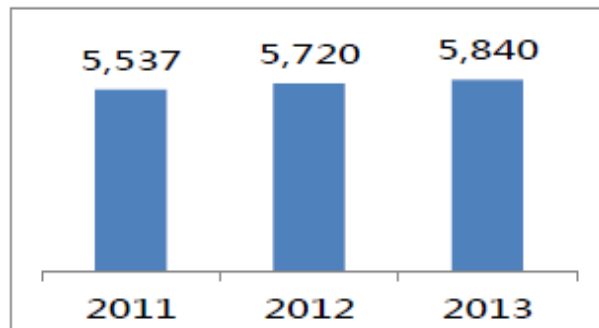


509 kWp solar panels have been installed in CSC

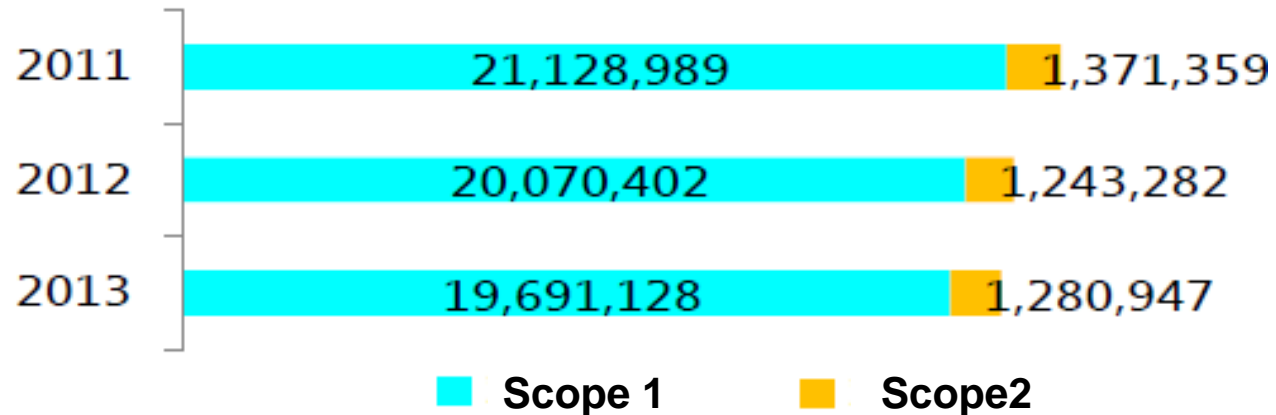
Energy Consumption and GHG

- CSC continues adopting BAT. Although the **energy consumption per ton crude steel** slightly increases owing to the production expansion from 2011~2013, but it is still **approaching the world's top standard**.
- GHG emission gradually decreases.

Energy Consumption
per ton crude steel
(Unit: Million Calories)



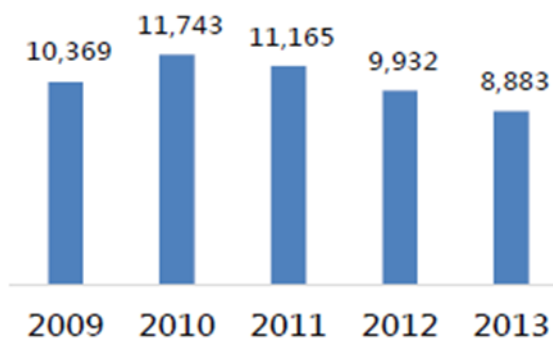
GHG emission
(Unit : ton-CO₂e)



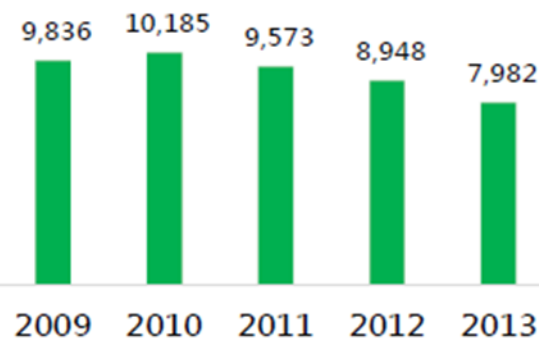
Air

- CSC continues enhancing the performance of facilities and **installing high efficient exhaust gas management system** to reduce the emission of air pollution gradually.
- Air pollution emissions are all complied with the promising standard of EIA.

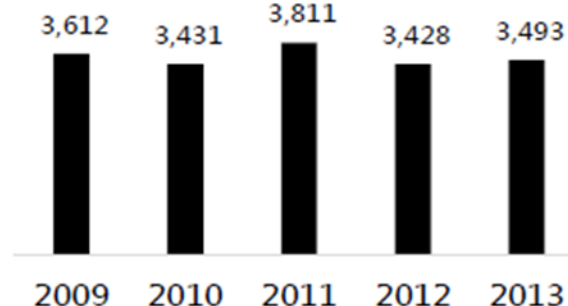
SOx emission
Unit: ton/year



NOx emission
Unit: ton/year



Particulate Matter emission
Unit: ton/year



Water Resource

- Recycling rate of process water in 2013 > 98%.
- Water consumption reduced from 10.33m³ to 5.24m³ per ton crude steel .
- CSC's hot-rolled coil products has passed the SGS verification and awarded a Water Footprint Certificate which is the first Taiwanese steel product to earn one.

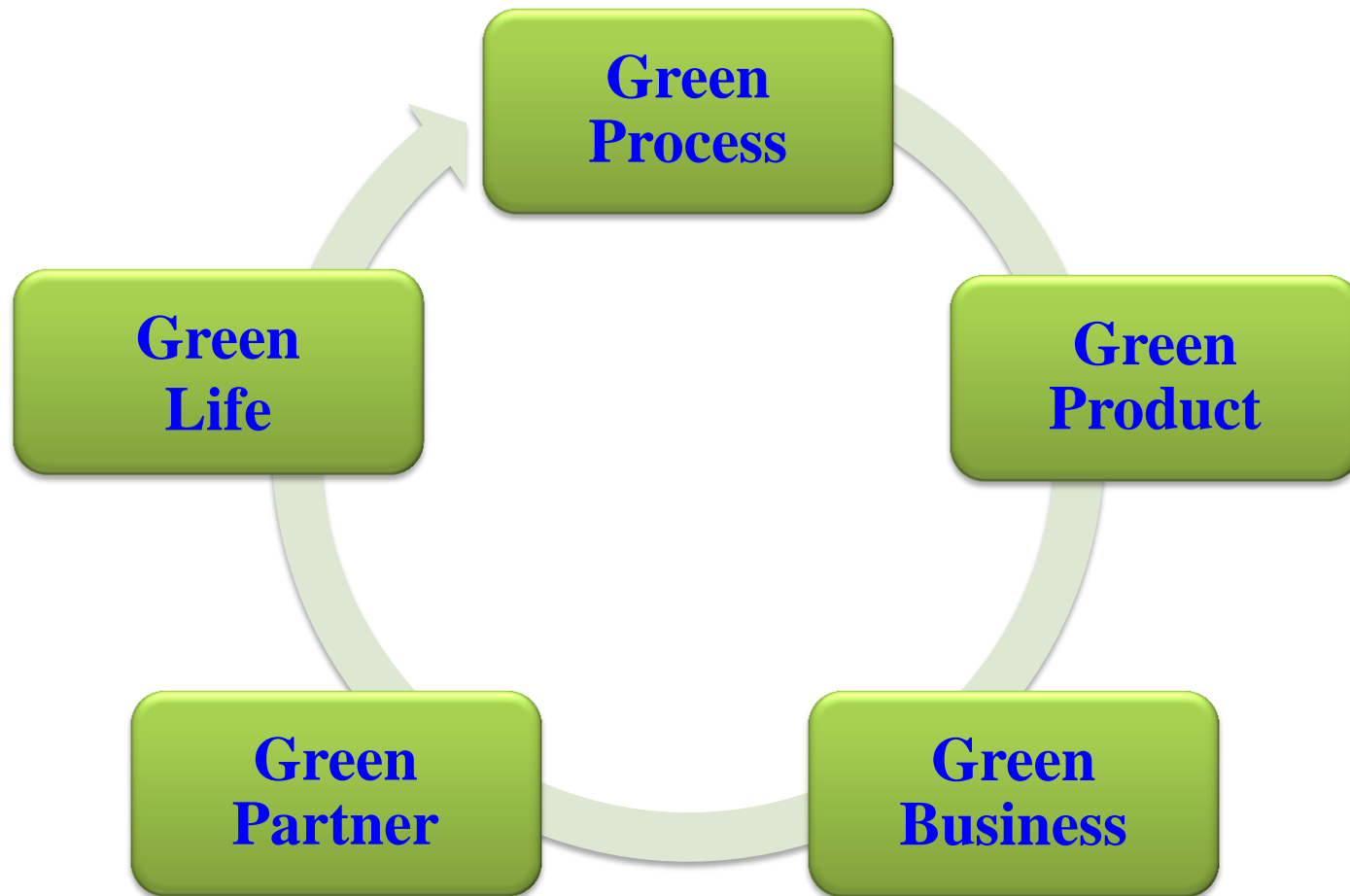
By-Products

- Zero solid waste to landfill has achieved since 2001.
- Excellent performance in the district energy and resources integration.
- Reuse of by-products.

Major by-products in 2013:

Category	Coal Tar	Crude Light Oil	Granulated BF slag	Air-Cooled BF slag	BOF slag	Iron Oxide Powder	Desulfurization Slag
Production (1,000 ton)	17.28	6.21	236.95	23.06	103.91	2.87	2.46
							

Focus on Green Development and Link to 5G



Green Process

- Apply BAT to enhance the system efficiency and reduce carbon emission. EX: **Coke Dry Quenching (CDQ), Waste heat recovery of sinter plant, 100% Continuous Casting of Steel...etc.**
- Develop the innovative new iron making and new steel making processes, such as **Direct Iron Making (Paired Straight Hearth, PSH) & Continuous Steel Making Process (CSMP).**



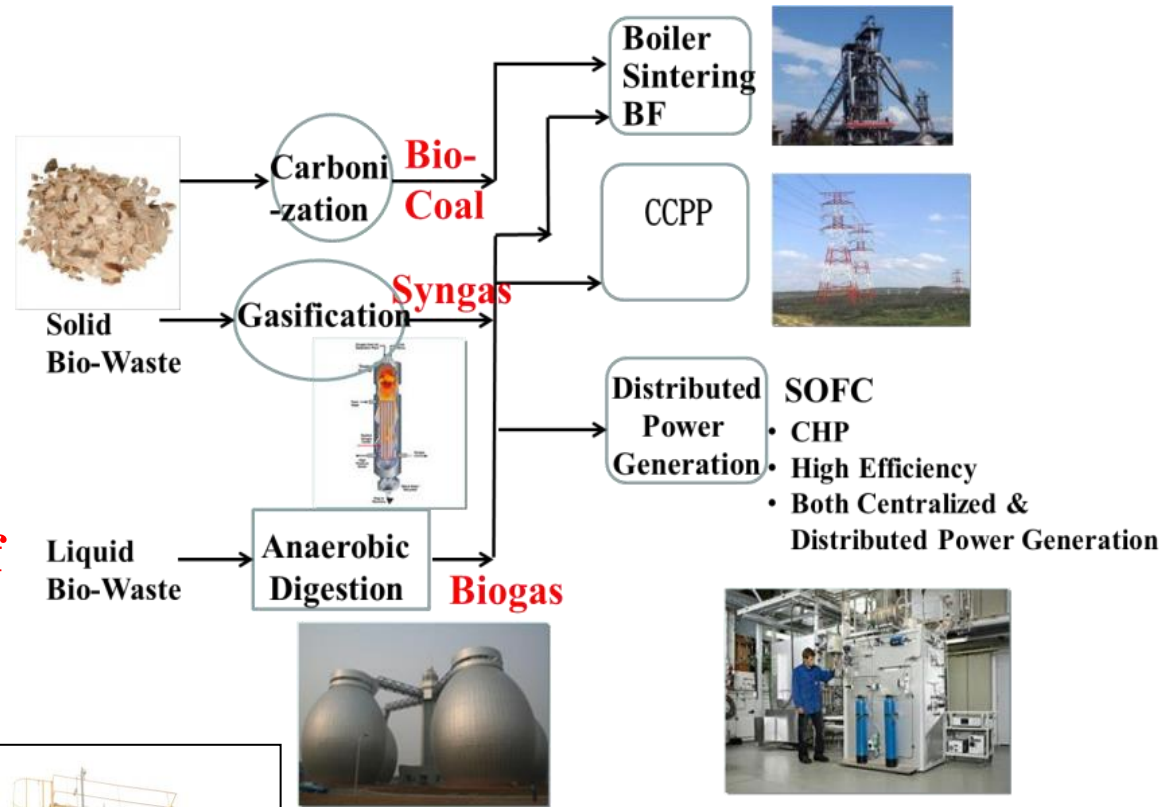
Green Product

- Develop **energy-saving steels** and **green by-products** (ex: coal tar, light oil, granulated BF slag...etc.)
- Apply **LCA methodology** to evaluate the potential of external carbon reduction for the green steel products.

Green product	Potential for carbon reduction in life cycle (CO ₂ e (ton)/ steel (ton))	Life cycle (year)	Potential for carbon reduction / steel (ton) year(CO ₂ e (ton)/ steel (ton) year)
High strength steel	3.1	10	0.31
Electrical steel (low energy consumption)	300	20	15
Process-saving steel	0.3	1	0.30
Corrosion-resistant steel	3.92	300	0.013

Green Business

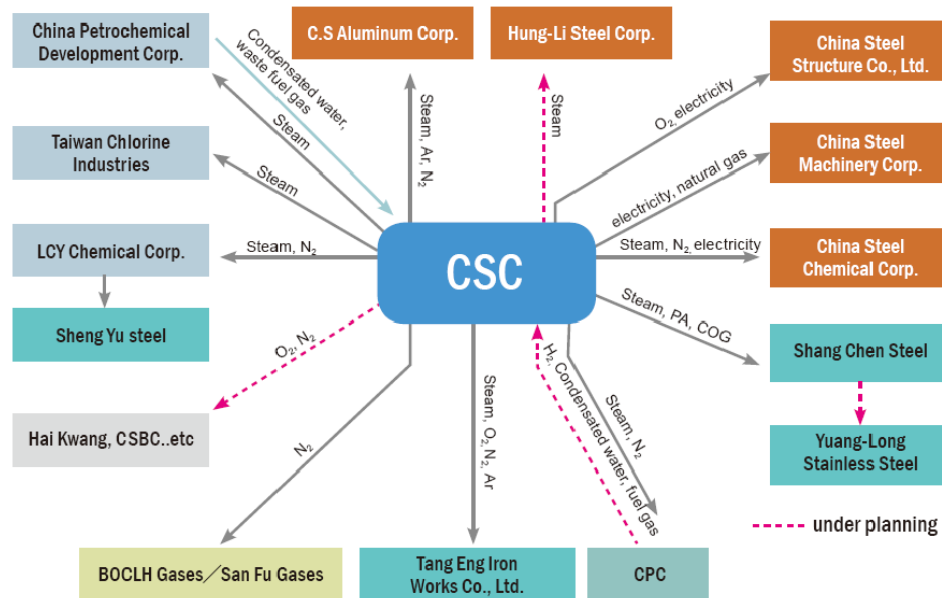
- ① Biomass energy
- ② PV power generation
- ③ Medium-to-low temperature heat recovery
- ④ Enhance the utilization of self-produced fuel gases
- ⑤ Offshore wind power
- ⑥ Fuel cell technology



Green Partner

① District Energy Integration

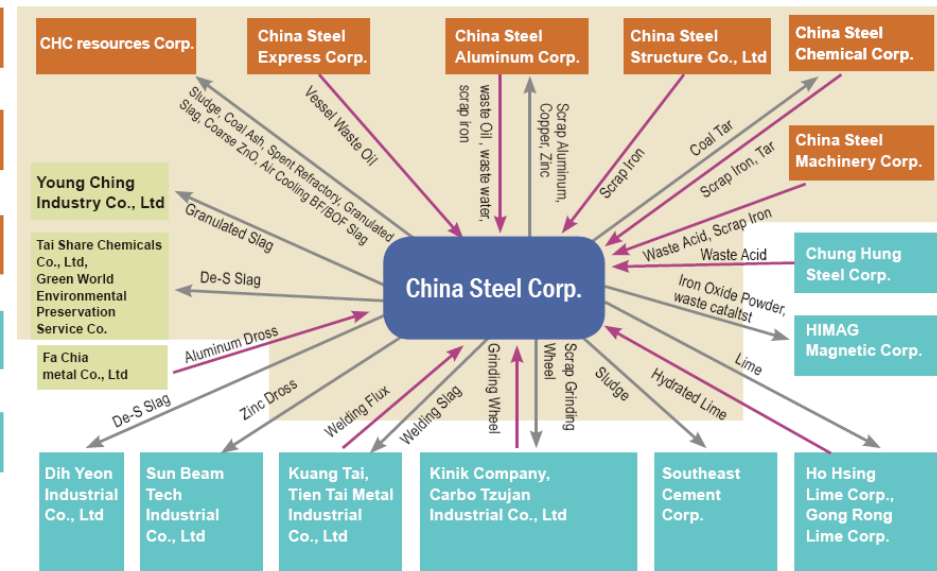
Significantly reduce carbon emissions in the neighbor of CSC under a mutual benefit. In 2013, the CO₂ reduction was around **504** thousand tons.



District Energy Integration in Linhai Industrial Park

② District Resource Integration

CSC's District Resources Integration System helped CSC to reach the target of **Byproducts Zero Disposal in 2001**.



Integrated Resources Recycling System at CSC

Green Life

① Low Carbon Life Calculator

Encourages employees to reduce carbon emission in daily life.

② Steel Forest

Increase biodiversity in the steel plant.

③ Green Transportation

Invest in MRT, donate public bikes and bus transfer station, and subsidize employees for using MRT.

④ Low Carbon Eco-city

Green education by circulation buses and summer camps.

⑤ Green Building

CSC Group New Headquarters



Low Carbon Life Calculator



4. Conclusion

- (1) **Sustainability** and **carbon reduction** have become unneglectable social responsibility and competitive restriction.
- (2) CSC will continue focusing on the balanced development of **energy** (wind power, biomass...), **environment** (pollution control, resources conservation) and **industry** (green production, green products, green economy...) °
- (3) Welcome to visit the website of **CSC's Corporate Sustainability Report**. The website address is as follows:

<http://www.csc.com.tw/csc/hr/csr/index.htm>

Thank You for Your Attention!

