

# Comparison of China, Japan , and Korean ETS And Northeast Asian Carbon Market In the Future

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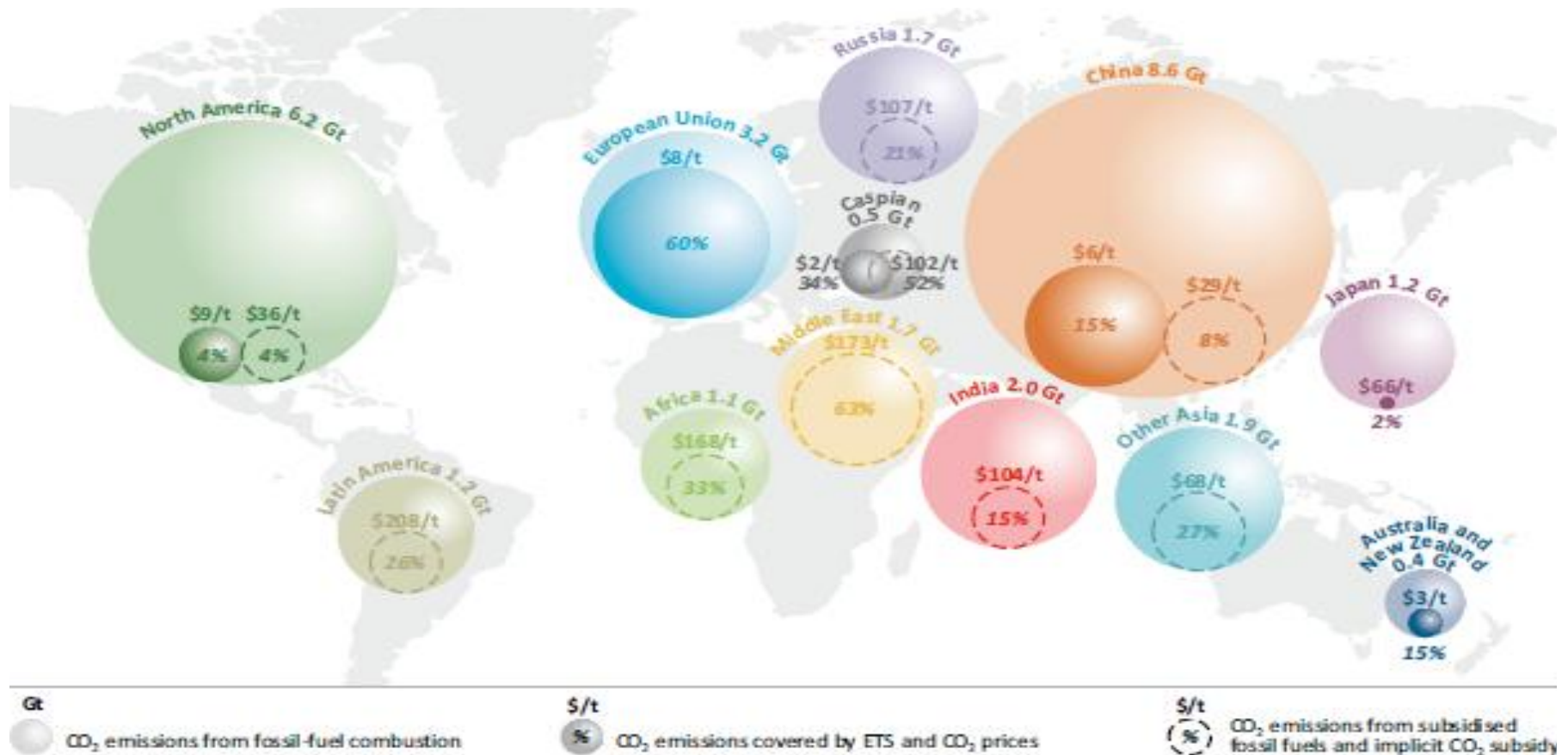
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# 1. Status of World Carbon Emissions and Carbon Price

- China 8.6 Gt(15%), U.S.A. 6,2 Gt(4%), EU 3.2 Gt(60%) India 2 Gt (15%)
- Russia 1.7 Gt(21%), Japan 1.2 Gt (6%) ,
- (%) CO2 emissions covered by ETS and CO2 prices in %

Carbon emission level by region, 2014



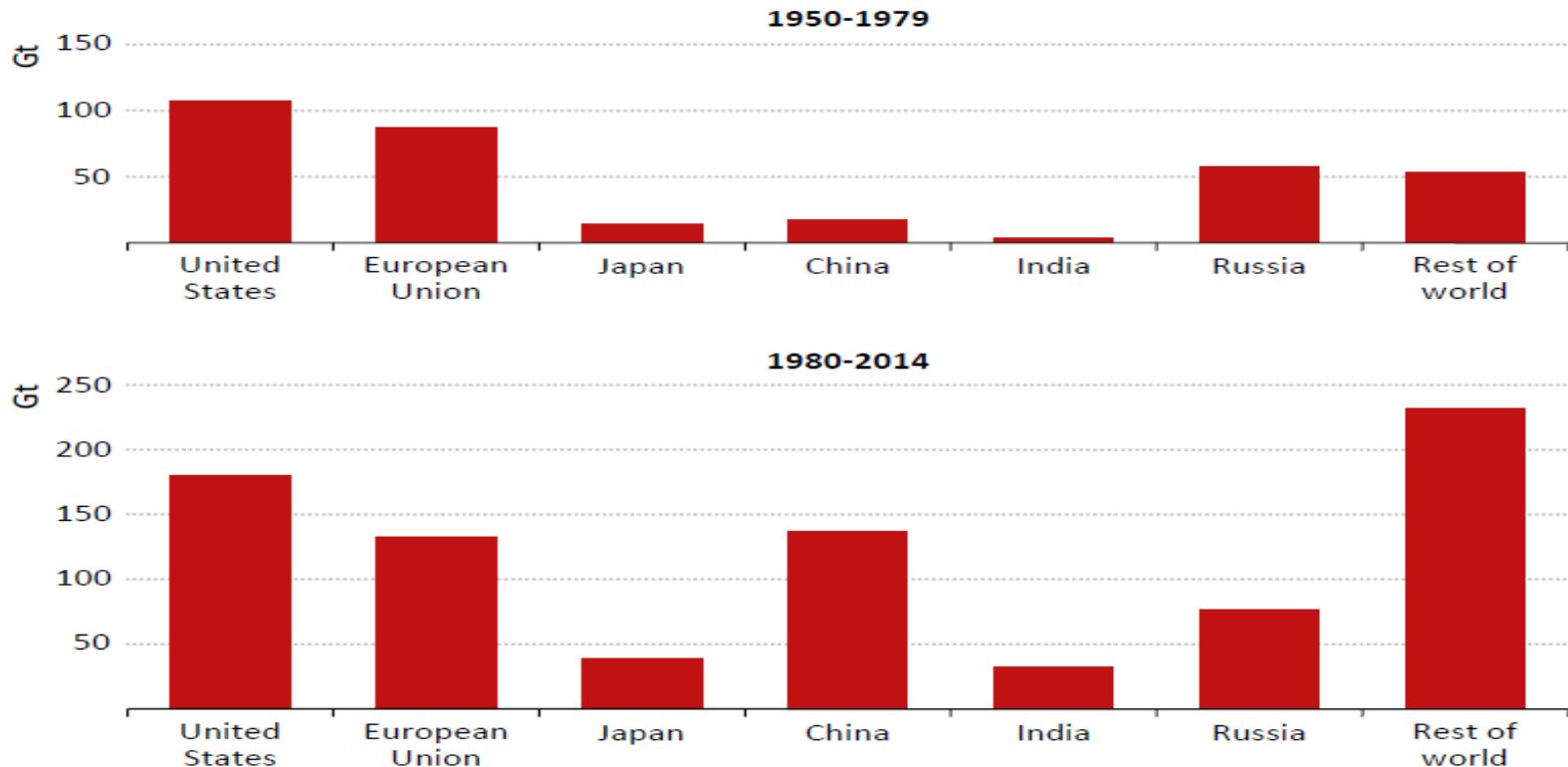
Level and its Share of CO<sub>2</sub> Emissions from Fuel Combustion by Each Country  
(Unit : 1 million tons of CO<sub>2</sub>)

Year Region		1990	1995	2000	2005	2009	2010	2011	2012	Growth Rate (Compared with '90,%)	Share (%)
World		20,974	21,841	23,756	27,494	28,966	30,482	31,345	31,734	51	100.0
OECD		11,140	11,665	12,615	13,005	11,992	12,491	12,326	12,146	9	38.3
1	China	2,278	3,058	3,350	5,444	6,839	7,295	8,000	8,251	262	26.0
2	U.S.A.	4,869	5,139	5,698	5,774	5,182	5,427	5,288	5,074	4	16.0
3	India	580	772	978	1,191	1,675	1,749	1,829	1,954	237	6.2
4	Russia	2,179	1,559	1,497	1,512	1,478	1,580	1,653	1,659	-24	5.2
5	Japan	1,057	1,137	1,171	1,208	1,085	1,134	1,183	1,223	16	3.9
6	Germany	950	868	825	800	730	770	742	755	-20	2.4
7	Korea	233	349	406	461	506	558	585	587	153	1.9
8	Canada	428	461	529	549	520	531	537	534	25	1.7
9	Iran	179	251	315	422	515	508	526	532	198	1.7
10	Saudi Arabia	151	193	236	299	379	415	430	459	204	1.4

※ Ocean & aviation bunkering is included in the “World” category

※ Source : CO<sub>2</sub> Emissions from Fuel Combustion(IEA, 2014), National GHG Inventory Report (2014)

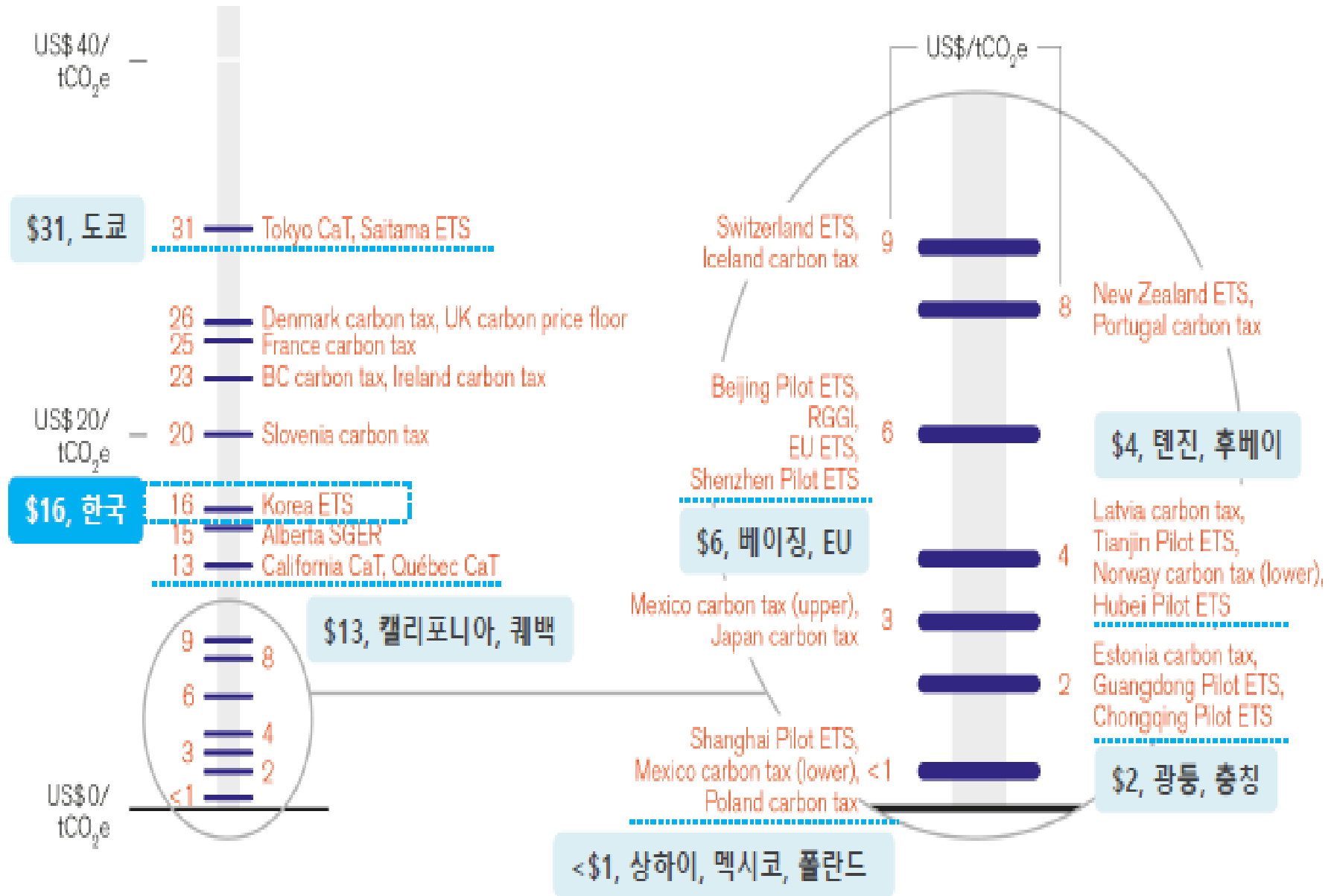
- World CO<sub>2</sub> emission has increased 50% over the past 25 years
- Average of 1.2% has increased during 2010s
- 2.3% has increased annually 2000-14, and especially the most in coal power sector
- World; 4 times, China; 6 times, Japan; 2.5 times, India; 4 times more during the 1980-2014 compared to the 1950-1979 level



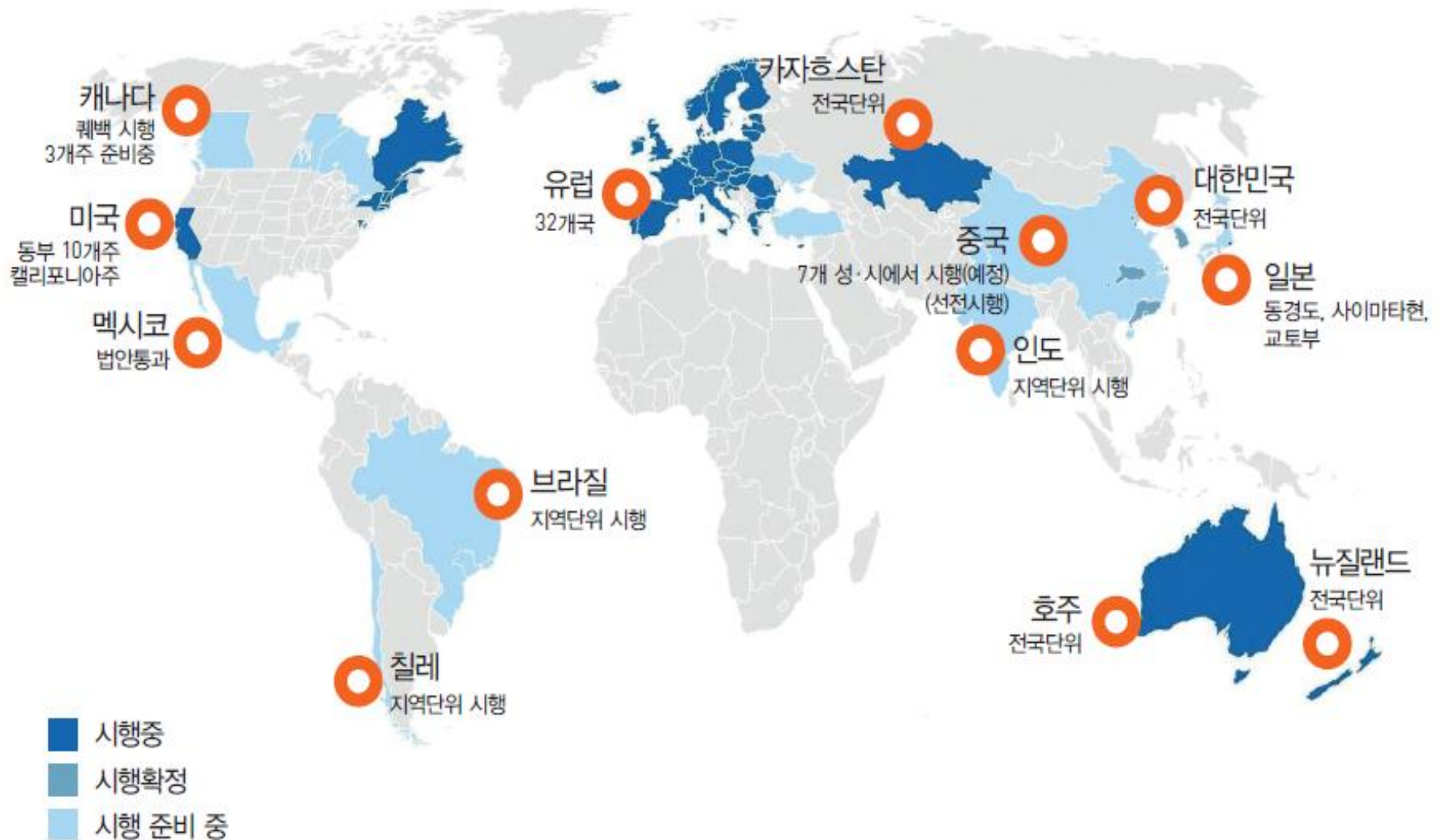
Notes: Emissions for the European Union prior to 2004 represent the combined emissions of its current member states. Emissions for Russia prior to 1992 represent emissions from the Union of Soviet Socialist Republics. Rest of world includes international bunkers.

Sources: Marland, Boden and Andres (2008) and IEA (2014a).

# Comparing Carbon Price, 2016.5



## 2. Trend of Foreign ETS

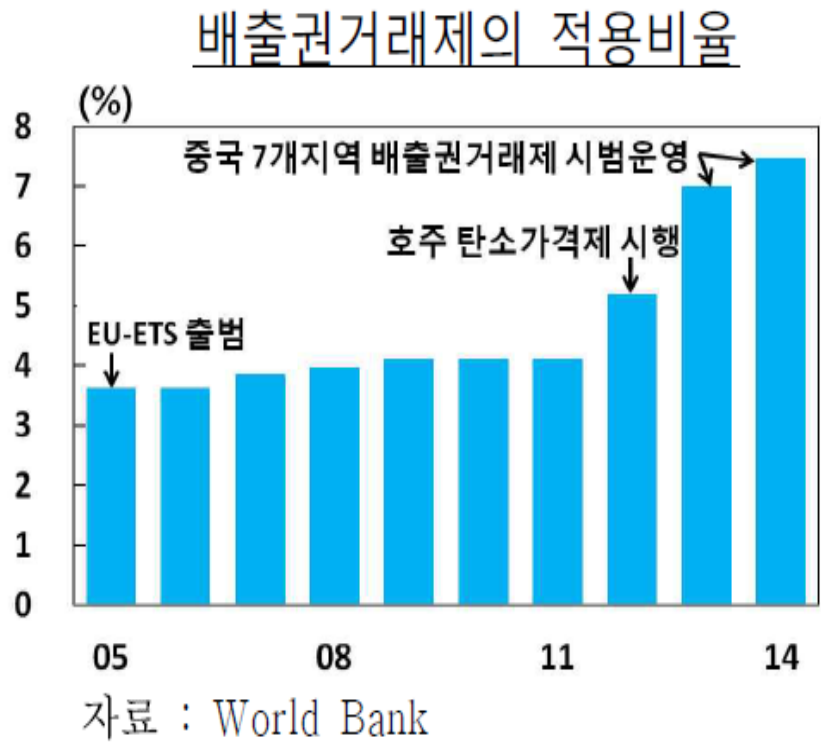
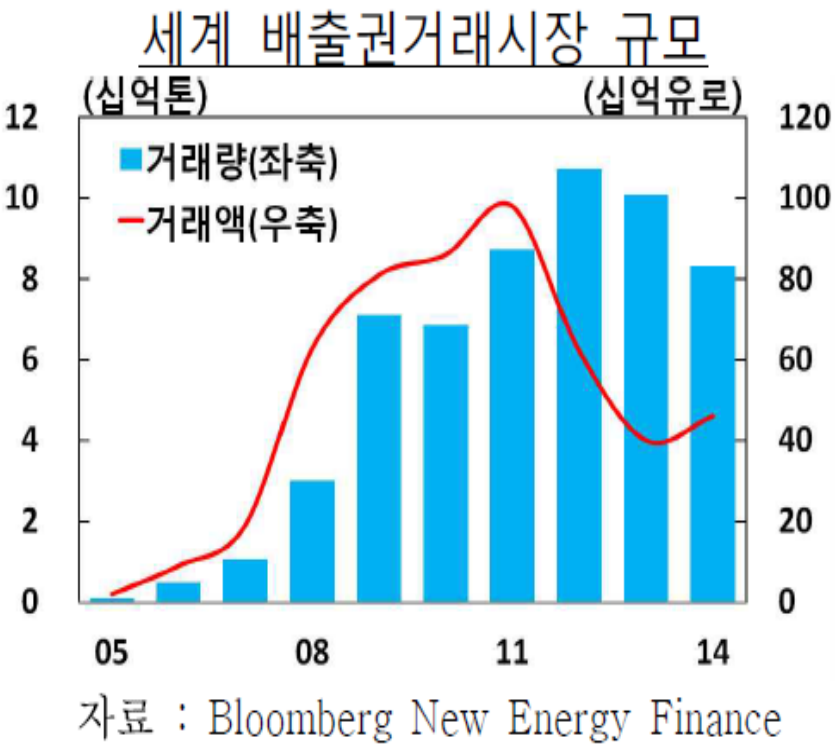


# Trend of ETS in Major Countries

- New Zealand (National Level), U.S.A. (Sum of 9 Eastern-States), Japan (Tokyo, Saitama)
- Switzerland, Kazakhstan (National Level), U.S.A. (California), China(Guangdong, Hubei, Beijing, Shanghai, Shenzhen, Tianjin, Chongqing) have adopted ETS during 2013~14, and China is expected to expand it nationally in 2017 (but, limited to some industrial sector)
- 11 ET Markets have been newly established in 5 different countries like Canada (Quebec)
- 7 Countries (Russia, Turkey, Ukraine, Brazil, Chile, Mexico, Thailand) are pushing ahead ETS in a national level
- Japan is under the consideration of expanding ETS in certain regions to a national level
- China(Hangzhou), Canada(British Columbia, Manitoba, Ontario), Brazil(Rio de Janeiro, San Paulo), are reviewing the adoption of ETS in a local governmental level



- **ETS: Making a rapid growth globally**
- 11 years after the first ETS was launched in EU,
- Share of ETS-adopted countries in the Global GDP held 40% in 2015
- And hold 48% in 2016



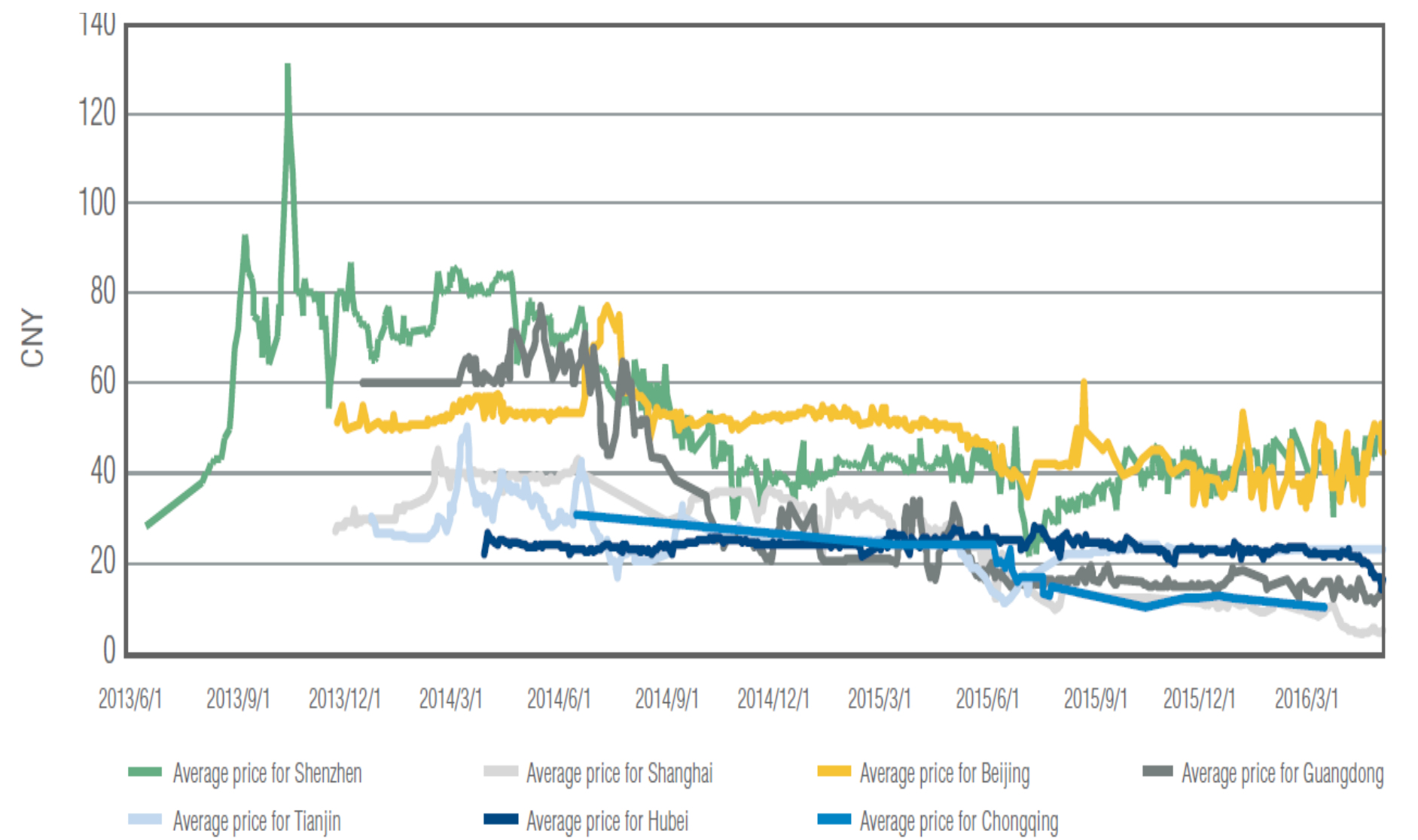
### 3. Status and Problems of China's ETS

	Guangdong	Hubei	Shanghai	Tianjin	Chongqing	Beijing	Shenzhen
Initial Year	2013	2014	2013	2013	2013	2013	2013
Reduction Target	Carbon Intensity (19.5%)	Carbon Intensity (17%)	Carbon Intensity (19%)	Carbon Intensity (19%)	Carbon Intensity (17%)	Carbon Intensity (18%)	Carbon Intensity (21%)
Sector of Application	<b>Industrial Sector, Development</b>	<b>Industrial Sector</b>	<b>Industrial Sector, Transportation, Building, Other Service Industries</b>	<b>Industrial Sector, Development, Public Buildings</b>	<b>6 Industrial Sectors*</b>	<b>Development, Heating, Manufacturing, Transportation, Public Building</b>	<b>Development, Public Building, Industrial Sector</b>
Target of Application	More than 20,000t CO <sub>2</sub> e Annually	Development and Heavy Industrial Sector	More than 20,000tCO <sub>2</sub> e Annually (Industrial Sector)	More than 20,000t CO <sub>2</sub> e Annually	More than 10,000t CO <sub>2</sub> e Annually	More than 10,000t CO <sub>2</sub> e Annually	More than 20,000tCO <sub>2</sub> e Annually
Targeted Companies (Expected Number)	800	107	197	100	N/A	600	635
Offset	CCERs	CCERs Forestry Carbon Offset Credits	CCERs	CCERs	CCERs Forestry Carbon Offset Credits	CCERs	CCERs

\* Electrolytic aluminum, ferroalloy, calcium carbide, caustic soda, cement and steel

Source : Bloomberg New Energy Finance , ""China emissions trading: facts and figures" 2013.01

# Price Fluctuations Trend in China's ETS (3013.6.1 – 2016.3.31)



Source: ICIS, “Carbon Market Almanac, 2016; Global Developments & outlook,” 2016.5  
[/www.tanpaifang.com/](http://www.tanpaifang.com/)

–Beijing, Shanghai, Shenzhen, and Guangzhou, exclusive of Tianjin, have completed their commitment;

**Beijing** 543 corporations participating in the ETS, 128 more than last year, including 6 cement corporations;

– Commitment rate of 2014 – 97%, Commitment rate of 2016, **100%**.

**Guangzhou** 1 out of 184 participating corporations in 2014 did not commit, but reached 100% of commitment before the deadline; commitment rate of corporations in 2014 98.9%, allocated commitment rate 99.97%.

**Shenzhen** 636 corporations participated in 2015, 2 corporations have failed;

– Commitment rate **99.7%**; 4 out of 645 corporations failed last year.

**Tianjin** postponed the commitment period in 2014; 111 out of 112 corporations have committed

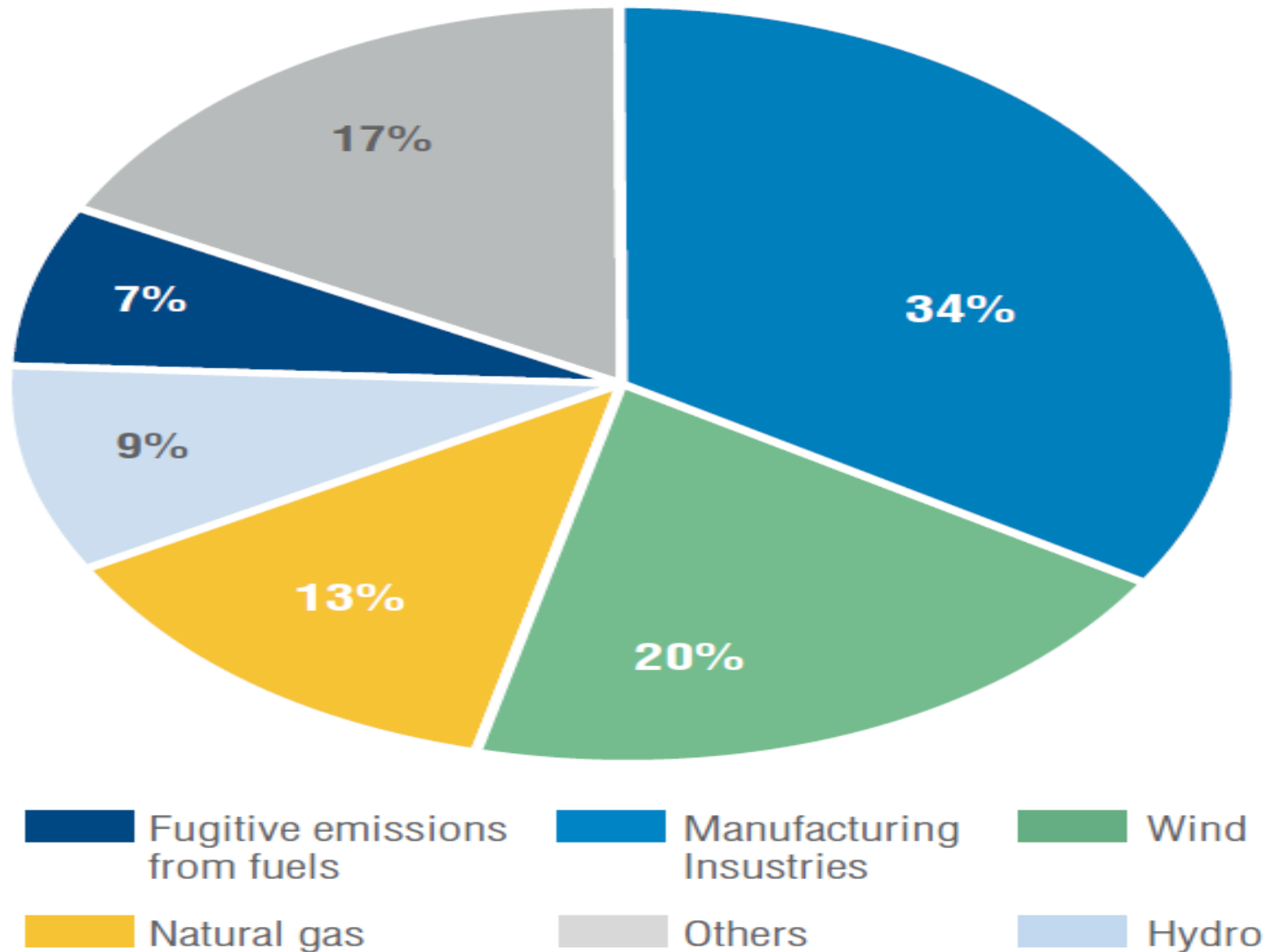
– Commitment rate **99.1%**. Commitment rate became 96.5% as 110 out of 114 corporations have been committed;

**Hubei** postponed commitment period by 1 month; 112 out of 138 corporations have fulfilled in July 10,

– Corporate commitment rate **81.16%**.

**Chongqing** committed during the merged period of 2013 and 2014 and the statistical data are being derived.

## Categories of CCER (China Carbon Emission Reduction)



## Status of China's ETS (During 2015.7.16– 2016.4.30)

Name	Amount (10 Thousand Tons) 15.7.16	Amount (10 Thousand Tons) 16.4.30	Value (100 Million Yuan) 15.7.16	Price (16.4.30) Yuan/Ton	CCER Amount (10 Thousand Tons) 15.7.16
Hubei	1619	2565	4	17.3	96.7
Beijing	527	263	2.36	21.53	190
Shenzhen	414	542	2.05	38.65	142
Shanghai	415	395	1.27	4.25	241
Guangzhou	600	561	1.49	15.01	91
Tianjin	203	108	0.36	23.5	125
Chongqing	24	30	0.0631	10	N/A
Sum	3802		11.60		885.7

- Sichuan added emission exchange. It is not an exchange pilot city
- Eco-friendly energy castle; providing 1/5 of China's eco-friendly energy of hydropower, natural gas, wind power, and solar power
- Non-fossil fuel consumption is 30% of the total primary energy consumption
- Designated as a new carbon exchange since it has high potential for carbon resource development

# Prospect of China's Integrated ETS

- Carbon emission is expected to amount 3 billion – 4 billion tons after national carbon exchanges are integrated
- The volume of the spot market is expected to become 1.2~30 billion Yuan, and 60~400 billion Yuan if futures market is included
- The volume of nationwide carbon trading market after 2020 will be 1 trillion Yuan
- Approximately 2000 corporations are currently involved in 7 ETS, and 20~30 thousand corporations are expected to participate after the integration.
- 2016 Nationwide ETS participants: (6+2)
- Expected 7 major industries; incase in case of nationwide integration
- Traditional corporations: electricity, oil, steel, cement, paper and chemical industry
- New corporations: civil aviation and renewable energy automobile
- Excessive cement (reduction prioritized corporations) cement production of China in 2014: 2.48 billion tons, approximately 3500 corporations.

# Financial Means of China's Carbon Trading Mechanism

## (1) Carbon Fund:

- China CDM Fund: Established in Sept, 2010, enhancing the ability to combat climate change and supporting industries
- China Green Carbon Fund: Established in 2007, special fund for financing afforestation projects

## (2) Carbon Bank:

- Carbon financing task by commercial banks
- Increase in green, low-carbon loans and the innovation of green financial offerings.
- EPS compliance (EPS; Earning Per Share) ; the larger the better
  - $EPS = \text{Net income} / \text{Number of Shares}$

## (3) Insurance, Securities

- In the stage of initiation. Beijing Environmental Exchange and VPVP per form joint development of "China Low Carbon Index" in 2010
- Interconnection among insurance, securities, and low carbon finance is yet loose, but it is highly likely to develop in the future



#### (4) Carbon Spot Trading

- Pilot region is preparing for the ways of pilot implementation.
- No national level system for market management and supervision

#### (5) Carbon Futures

- Operating 23 commodity futures. However, only one financial futures (stock index futures)
- <Futures Trading Management Ordinance> prohibits OTC futures transaction
- Carbon futures, as a new financial product, is easy to trade and has numerous traders.
- Currently on its initial research stage

After running carbon allowance market in the pilot region, we are anticipating research and development of carbon futures products through carbon spot trading market.

# Problems of China's ETS

- Problems associated with the pilot market;
  - (1) Lacks of gradual participation of small to mid size corporations
  - (2) Existence of carbon offset project is possible even if it is proceeded in 2017 as it was planned.
  - (3) Attempt to introducing diverse financial product market other than spot market
    - Futures market product was first introduced by Guangzhou exchange in March, 2016
  - (4) No decision has been made on using early reductions during the pilot period.
    - NDRC decision (discussion on entire & partial use and etc.)
  - (5) Direction of Fund's policy is clear, but lacks flexibility and activeness of commercial operation
  - (6) Requires stronger fund's absorption capability
- Future improvement plans
  - (1) Disclosure on regional emission, carbon credit size, implemented industry
  - (2) Analysis on extreme price difference of carbon credit among regions
  - (3) Establishing sophisticated MRV system
  - (4) Simultaneously starting free allocation and auction – Prioritize strict free allocation
  - (5) Propelling compliance as a form penalty and actively supporting finance
  - (6) Research on carbon finance method and introduce futures market

## 4. Status of Korean ETS and Problem

Phase I ('15~'17)	Phase II ('18~'20)	Phase III ('21~'25)
<ul style="list-style-type: none"> <li>•Set ETS</li> <li>•Flexible Operation</li> <li>•Accumulate Infrastructure and Experience</li> <li>•<b>100% Free Allocation</b></li> </ul>	<ul style="list-style-type: none"> <li>• Considerable Emission Reduction</li> <li>• Expand Application Sectors</li> <li>• Advance Allocation Method</li> <li>• <b>97% Free Allocation</b></li> </ul>	<ul style="list-style-type: none"> <li>• Proactive Emission Reduction</li> <li>• Expand Allocation Auctioning</li> <li>• Expand Flexibility</li> <li>• Set Allocation Method</li> <li>• <b>Less than 90% Free Allocation</b></li> </ul>

### 100% Free Allocation for EITE Entities (EITE : Emission Intensive Trade-Exposed)

- ❖ >5% of Production Cost Intensity + >10% of Trade Exposed Intensity
- ❖ >30% of Production Cost Intensity
- ❖ >30% of Trade-Exposed Intensity

### GHG Emission Forecast & 2020 Target

- ❖ 2020 National Emission BAU Forecast at **776.1 MT CO<sub>2</sub>e** (net calorific value)
  - Industry (**439 MT CO<sub>2</sub>e**), Building (**168 MT CO<sub>2</sub>e**), Transportation (**100 MT CO<sub>2</sub>e**)
- ❖ 2020 National Reduction Target Set at **30% from BAU**
  - Transportation (**34.3%**), Building (**26.9%**), Power (**26.7%**), Industry (**18.5%**)

Ex-Ante Total Allowances and Allowances by Sector

Sector	Industry	Compliance Year			Total Amount during Phases (1000 KAU (Korean Allowance Unit))
		'15	'16	'17	
Total		573,460	562,183	550,906	1,686,549
	Reserve	88,822			
	Ex-ante Allowance	543,227	532,576	521,924	1,597,728
Conversion	Power & Energy	250,190	245,284	240,379	735,853
Public & Waste	Waterworks	766	751	736	2,254
	Waste	8,920	8,745	8,570	26,234
Building	Building	4,017	3,938	3,860	11,815
	Tele-communication	3,089	3,029	2,968	9,086
Trans.	Aviation	1,290	1,264	1,239	3,793



**Reserving Part of the Allowances in Case Where Allowances Cannot be Used Completely in Pre-Allocation for Liquidity Management of ETS**

**Use**

Market Stabilization	❖Additional Allowance for ETS Market Stabilization
Early Action	❖Additional Allowance for Early Action
New or Additional Installation	❖Unexpected Opening of New or Additional Installation ❖Merge of Installations ❖Change in Production Line or Business Plan ❖Additional Allowance for Increase in Emission Due to Restriction on Development

	Market Stabilization	Early Action	Other Purposes	Total
Allowances	14,316	41,392	33,114	88,822

Note: 1000KAU(Korean Allowance Unit)

# Total Allowances and Allowances by Sector

Note : 1000KAU(Korean Allowance Unit)

Sector	Industry	Compliance Year			Total Amount during Phases
		'15	'16	'17	
Industry	Mining	245	241	236	722
	Food & Drink	2,535	2,485	2,435	7,455
	Textile	4,701	4,609	4,517	13,828
	Lumber	384	377	369	1,130
	Paper	7,630	7,481	7,331	22,443
	Oil-Refining	19,153	18,778	18,402	56,334
	Petrochemistry	48,857	47,899	46,941	143,698
	Glass & Ceramic	6,264	6,141	6,018	18,423


# Total Allowances and Allowances by Sector

Note : 1000KAU(Korean Allowance Unit)

Sector	Industry		Compliance Year			Total Amount During Phases
			'15	'16	'17	
Industry	Steel	Non-process	103,285	101,259	99,234	303,778
		F-gas process	675	662	649	1,986
	Nonferrous		6,888	6,753	6,618	20,260
	Machinery		1,416	1,388	1,361	4,165
	Semiconductor	Non-process	8,253	8,091	7,929	24,273
		F-gas process	2,202	2,159	2,116	6,477
	Display	Non-process	6,705	6,574	6,443	19,722
		F-gas process	2,438	2,390	2,343	7,171
	Electric & Electronic		2,877	2,821	2,765	8,463
	Automobile		4,243	4,160	4,076	12,479
	Shipbuilding		2,683	2,631	2,578	7,892

## Basic Method For Allocation


### Allocation Based on Past Emission : Grandfathering

- ❖ Allocate **Same or Less** Amount of Allowances Based on **Past Emission Records**
  - ❖ Apply in Early Stages of ETS for **Well-Adaptation**
- 

### Allocation Plan of Phase I

**Grandfathering : Most Industries**

### Allocation Based on Past Performance : Benchmarking

- ❖ Allocate Allowances Based **on Past Performance Records of Each Industry** and **Installation Efficiency**
  - ❖ Use **Benchmarking Coefficient** to Reflex **Installation Efficiency** in Allowances
- 

**Benchmarking : Few Industries  
(Cement, Oil-Refining, Aviation)**

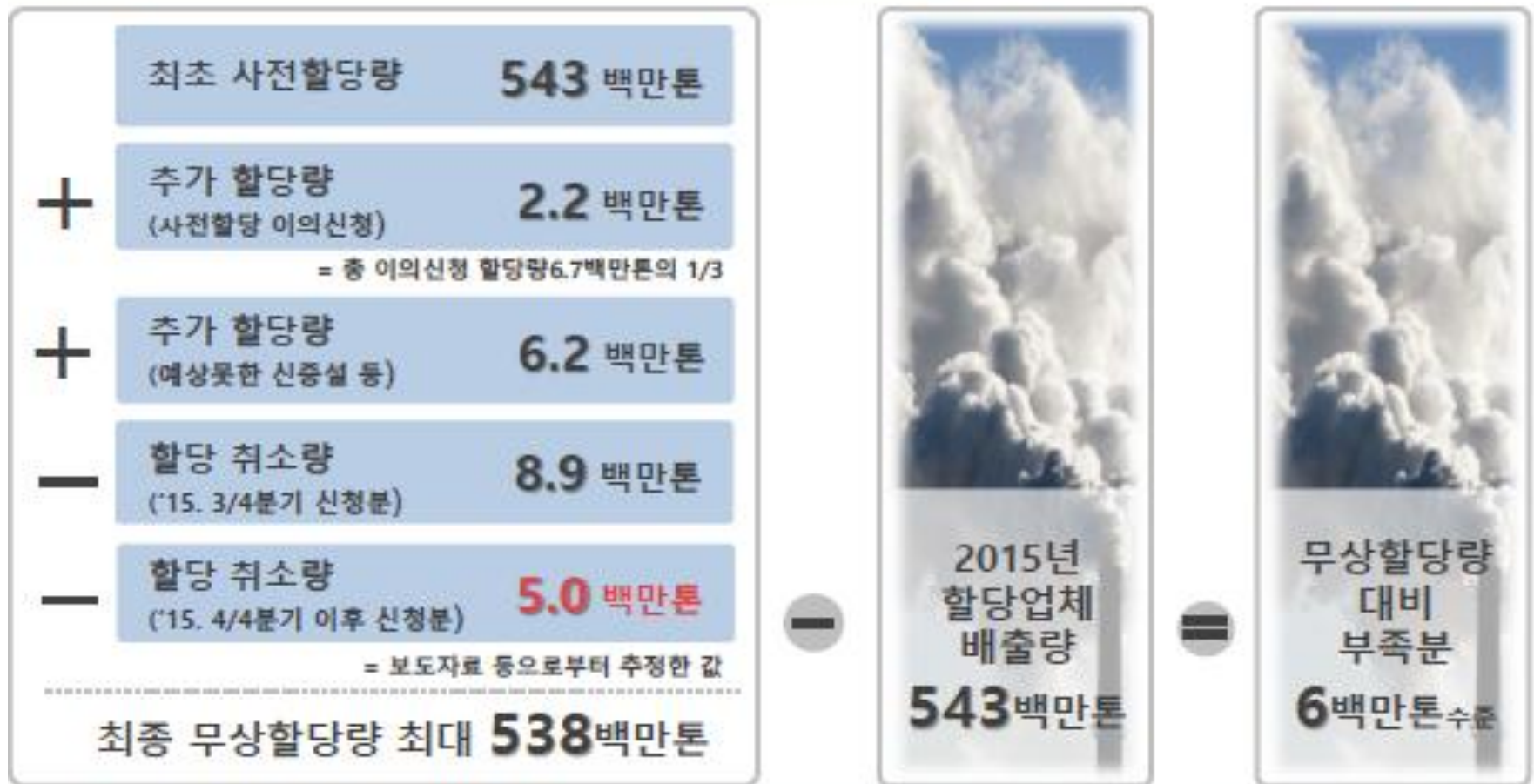


Incumbent regulator	The Korean Ministry of Environment
Succeeding regulator	The Korean Ministry of Strategy and Finance
Trading unit (equivalent to 1 tonne CO <sub>2</sub> e)	<ul style="list-style-type: none"> <li>• Korean Allowance Unit (KAU)</li> <li>• Korean Credit Unit (KCU)</li> <li>• Korean Offset Credit (KOC)</li> </ul>
Covered entities/sectors <sup>0</sup>	<ul style="list-style-type: none"> <li>• 570 entities and installations (44 new entrants added)</li> <li>• 23 sectors (power &amp; energy, steel, nonferrous metal, petrochemical, oil refinery, ceramic &amp; glass, cement, automotive, buildings, telecommunication, food &amp; beverage, machinery, mining, paper, timber, semiconductor, display, electronics, shipbuilding, textile, aviation, waste and waterworks)</li> </ul>
Compliance periods (CP)	<ul style="list-style-type: none"> <li>• CP1: 2015-2017</li> <li>• CP2: 2018-2020</li> <li>• CP3: 2021-2025</li> </ul>
Reduction target ETS	<ul style="list-style-type: none"> <li>• Different emissions reduction targets apply to each compliance sector (indirect emissions double-counted)</li> <li>• 2020 ETS emissions cap is expected to be in the range of 533m tonnes CO<sub>2</sub>e to 560m tonnes CO<sub>2</sub>e, unless the existing sectoral emissions reduction targets and BAU emissions until 2020 are revised</li> </ul>
Reduction target country	<ul style="list-style-type: none"> <li>• Currently, the national emissions reduction target is set as 30% below 2020 BAU emissions by 2020, but the target would soon be replaced with 37% below 2030 BAU emissions by 2030.</li> </ul>
Plans post-2020	<ul style="list-style-type: none"> <li>• Participation of financial services sector and other non-compliance entities is scheduled to be allowed from 2021 (CP3 and beyond)</li> <li>• The use of emissions reduction from overseas offset projects is also scheduled to be allowed from 2021 (CP3 and beyond)</li> </ul>

Covered emissions	<ul style="list-style-type: none"> <li>• 567m tonnes CO<sub>2</sub>e in 2012</li> <li>• 573m tonnes CO<sub>2</sub>e in 2013</li> <li>• 581m tonnes CO<sub>2</sub>e in 2014</li> </ul>
Cap (available allowances)	1,687m tonnes CO <sub>2</sub> e between 2015 and 2017 (CP1), including both indirect emissions and reserves
Auctions	During the CP1, the volume of allowances equivalent to the ETS emissions cap less reserve was allocated to ETS covered entities free of charge (100% free allocation). Nevertheless, 14m KAUs of market stability reserve are expected to be auctioned via Korea Exchange (KRX) (the reserve volume subject to a downward revision due to the recent regulation amendment).
Banking/Borrowing	No limits apply to banking, while only up to 10% of historical emissions are allowed to be covered with borrowed allowances from the next compliance year (borrowing only allowed within the same compliance period)
Offsets	10% of historical emissions are allowed to be covered with offset credits. The use of overseas offset credits is only allowed from 2021, but no more than 5% of historical emissions is expected to be covered with such credits.
Penalties	Three times the yearly historical price of allowances, but less than ₩100,000

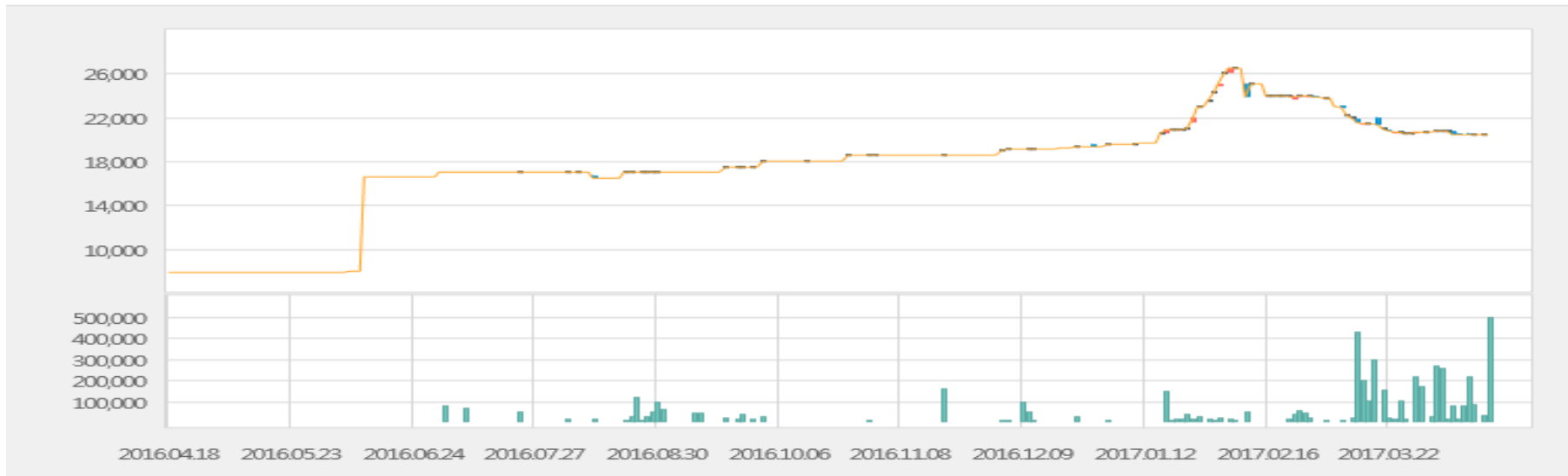
- 1<sup>st</sup> year (2015–2016) Result of Trading ;
- Lack of 6 Million Ton ; Demand > Supply
  - Complain about the EARLY Reduction and
  - Require for the allocation of New Facilities

2015년 할당업체 전체 무상할당량 대비 과부족 (ITC 내부 검토자료)



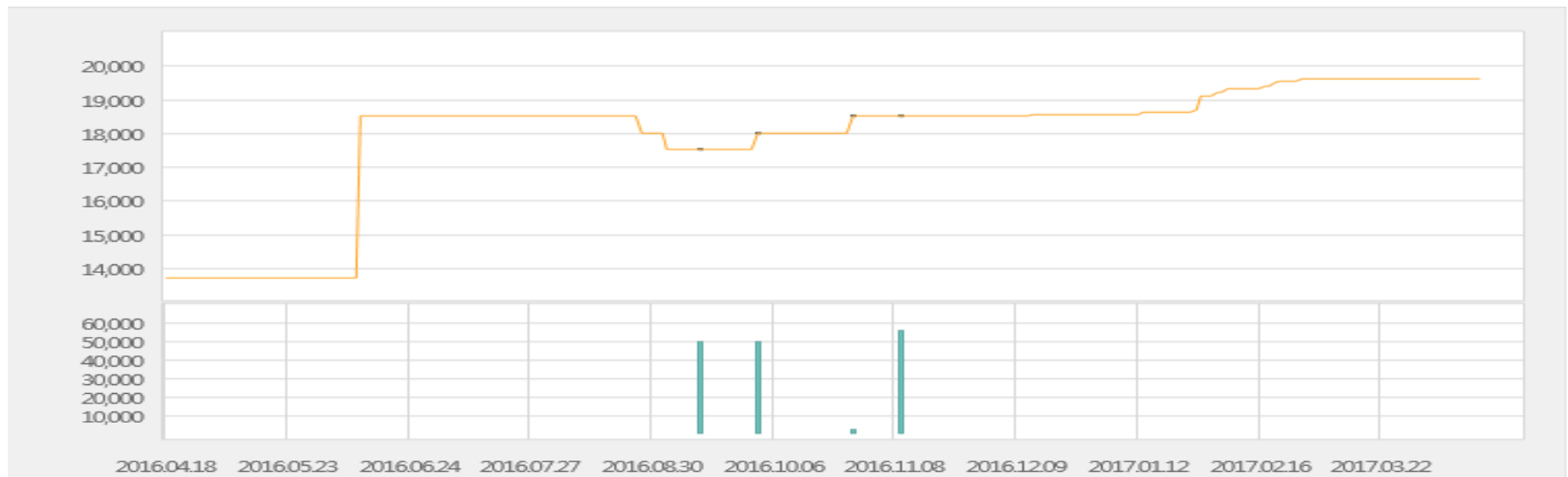
## KAU16 ; Trend of Price and Volume (2016.4.~2017.4)– Korean Allowance Unit

시고저:종가(단위/원) 거래량(단위/톤)



## KCU16 ; Trend of Price (2016.4.~2017.4) – Korean Carbon Off Unit

시고저:종가(단위/원) 거래량(단위/톤)

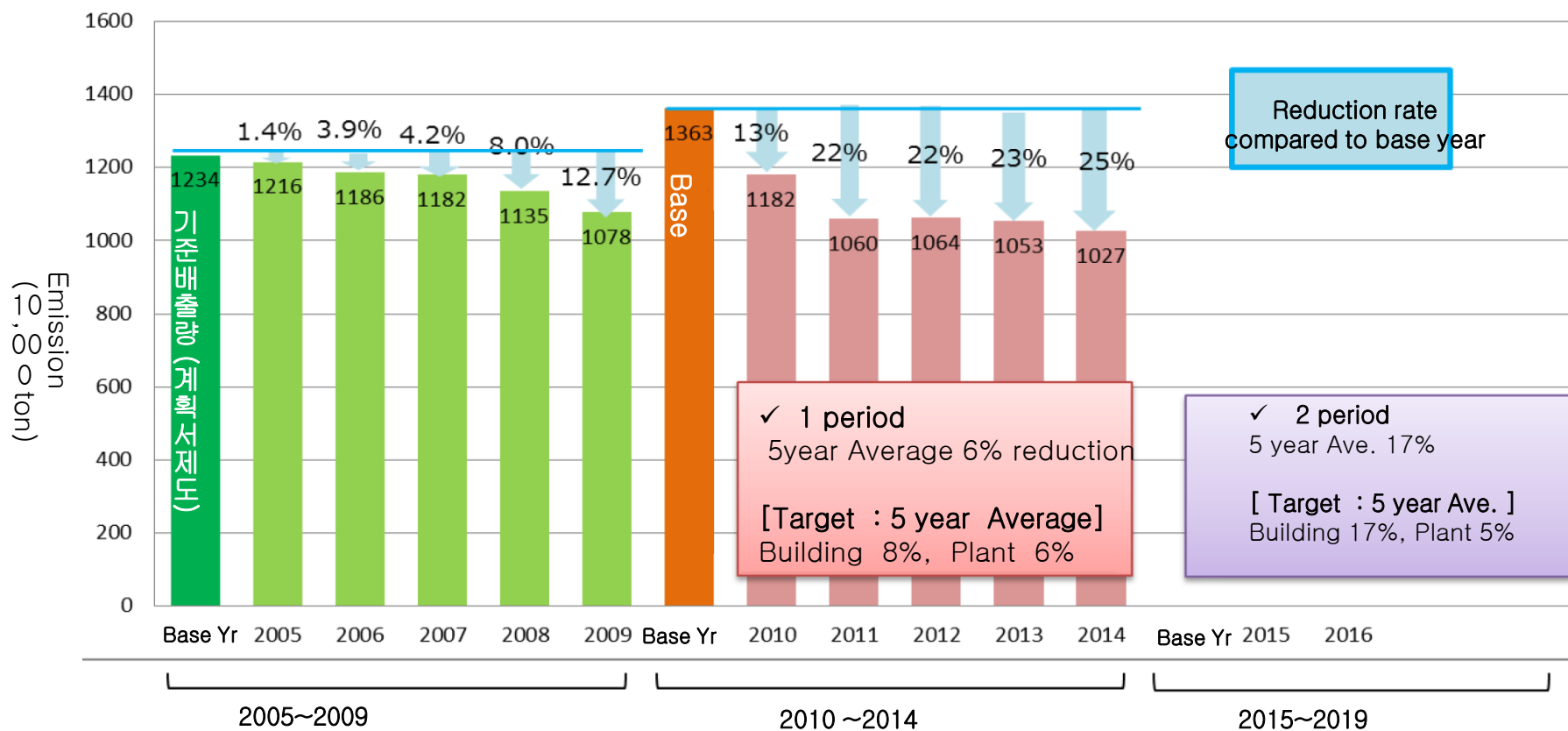


# Problems of Korean ETS

- Lacks of Participants from SME
- Uncertain about Price Signal
- Lack of Financial Market ; Future's Market
- Lacks of Market flexibility and activeness of commercial operation
- Lack of equal allocation method among industry
- Dispute about the Permit of Early Credit
- Design is not perfect (banking and borrowing, new facilities, etc)
  - Banking allows only 20% in the next year. (before unlimited)
- Small Trading Volume
- A little high price compared to the other EA market
- Lack of Adoption for Carbon Offset
  - 20% accept in the second phase (before 10%, 3rd)

## 4. Status of Japanese ETS and Problem

- ✓ Tokyo ; 『Reduce 25% of GHGS until 2020 Compared to 2000』
- ✓ Start 2010. 4. 『Law of GHG Emission Reduction and ETS』
  - ▷ 1 Period (2010년 ~ 2014년) : 8% or 6% reduction
  - ▷ 2 Period (2015년 ~ 2019년) : 17% or 15% reduction



Participants	Unit	Site
	condition	✓ Use more than 1,500kL(toe)/year - 3 consecutive years ✓ Number of sites ; 1,300 (2013)
Gases		✓ CO2 ✕ the other GHGs ; Should be reduced voluntary
Period		✓ 1 <sup>st</sup> : 2010 ~ 2014 ✓ 2 <sup>nd</sup> : 2015 ~ 2019 , ✓ 3 <sup>rd</sup> ; every 5 year ✓ Base year : 2002 ~ 2007 and consecutive 3 years

	✓ Cap and Trade	
Reduc. Level	❖ 2011 ~ 2014	
	< 20% of CHP Energy Use in Office Building	8 %
	> 20% of CHP Energy Use in Office Building	6 %
	Other site such as Plant, Drinking Water facilities, Waste Treatment	6 %
	❖ 2015 ~ 2019	
	< 20% of CHP Energy Use in Office Building	17 %
	> 20% of CHP Energy Use in Office Building	15 %
	Other site such as Plant, Drinking Water facilities, Waste Treatment	15 %
	✕Base Year ; 2002 ~ 2007, Any 3 consecutive years in average	
	✕ Excellent reduction site ; Reduction % will be 1/2 or 3/4	

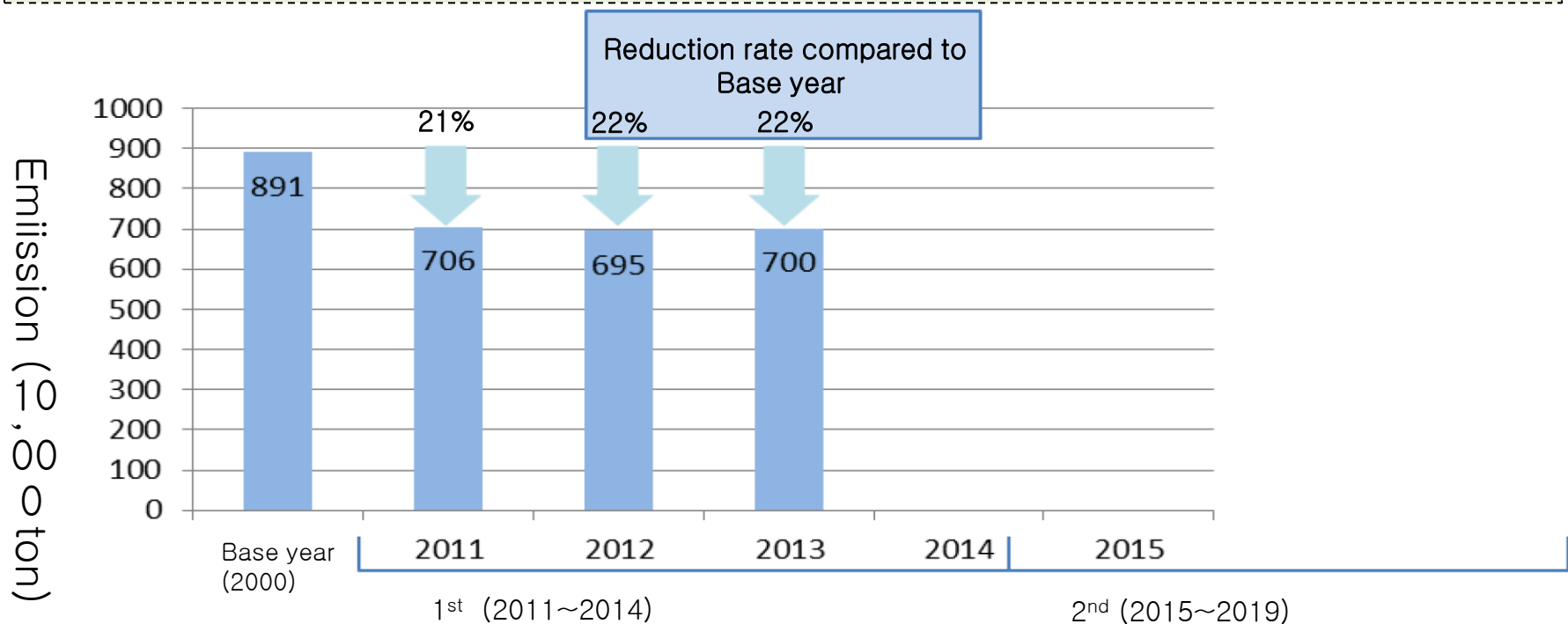
Usable Credit		
Credit	Type	✓ Inside Tokyo SME Credit (or inside credit) ✓ Renewable energy(RE) credit (conversion rate for the env. Value and other reduction ) ✓ Outside credit ✓ Shaithama credit
	Cap	✓ outside credit : only can use 1/3 of Cap ✓ Other credit; unlimited
banking		✓ Allowed ; unlimited ✓ But can not bank into 3 <sup>rd</sup> phase.
borrowing		✓ No allowed

Record of credit				
Type of credit	2014. 4~2015. 3		2015. 4 ~ 2016. 1	
	amount (t-CO2)	# of trade	Amount (t-CO2)	# of trade
Less than Cap	641,257	115	540,066	114
Tokyo inside SME	7,929	144	11,723	254
RE Credit (conversion for the env.;)	8,636	2	133	1
RE credit (other reduction)	13,725	14	21,772	11
Out side credit	0	0	0	0
Shaitama credit	0	0	1,298	2
Other non CO2 reduction	0	0	8,300	2
Total	671,547	275	583,292	384



# Shaitama Prefecture

- ✓ Target; 『25% reduction until 2020 based on 2000년』
- ✓ 2011 ; Begin "Target based ETS". At 2015 ; " 25% reduction until 2020 " .
- ✓ ▷ (2011년 ~ 2014년) : 8% or 6%
  - ▷ 제2계획기간 (2015년 ~ 2019년) : 15% or 13%
- ✓ Mutual credit system with Tokyo .
- ✓ Use more than 1500kL/year site (3 consecutive years)
- ✓ # of Sites; 600 (2013)



	✓ Cap and Trade	
Reduc. Level	❖ 2011 ~ 2014	
	< 20% of CHP Energy Use in Office Building	8 %
	> 20% of CHP Energy Use in Office Building	6 %
	Other site such as Plant, Drinking Water facilities, Waste Treatment	6 %
	❖ 2015 ~ 2019	
	< 20% of CHP Energy Use in Office Building	15 %
	> 20% of CHP Energy Use in Office Building	13 %
	Other site such as Plant, Drinking Water facilities, Waste Treatment	13 %
	※Base Year ; 2002 ~ 2007, Any 3 consecutive years in average	
	※ Excellent reduction site ; Reduction % will be 1/2 or 3/4	

Usable Credit		
Credit	Type	✓ Inside shitama SME Credit (or inside credit) ✓ Renewable energy(RE) credit (conversion rate for the env. Value and other reduction ) ✓ Forestry absorption credit ✓ Outside credit ✓ Tokyo credit
	Cap	✓ 都外 (outside credit) : only can use 1/3 of Cap and 1/2 for the plant ✓ Other credit; unlimited
banking		✓ Allowed ; unlimited ✓ But can not bank into 3 <sup>rd</sup> phase.
borrowing		✓ No allowed

# of Trading		
Types	2016. 1	
	(t-CO2)	#
Less than Cap	841,164	107
Inside SME credit	0	0
RE credit	0	0
RE credit (other )	0	0
Outside credit	0	0
Forestry absorption (shithama ceertified )	0	0
Forestry absorption (J-VER)	0	0
Tokyo credit	0	0
Non- co2 reduction	1,050	0
Total	842,214	1

# Problems of Japanese ETS

- Lacks of Participant (non-Building)
- Price is too low
- Lack of Financial Product Market ; Future's Market
- Lacks of Market flexibility
- Lack of active commercial operation
- Not cover the nation wide site
- Design is not perfect (only CHP and partial Plant based energy reduction)
- Small Trade volume
- Lack of Adoption for Carbon Offset

## 6. Establishing NE Asian Carbon Market in the Future

- Korean Case is very strong and relatively good design
  - Make Standard MRV (monitoring, reporting and verify)
  - Review Each Countries MRV Process
- Japan shows good Carbon Offset project
  - study carbon-offsetting projects among Northeast Asia
  - and find out prototype project
- Pilot Study for the Bench Marking Industry (Steel, Cement, Auto?)
  - allocation and auction, technology
- Pilot Study for Building sector
  - Easy to control (electricity, gas and water) for MRV
  - Use ICT technology will even better

- Joint Study for the Forestry carbon offset ; REDD plus
- Organize professional network, joint workshop, and periodic symposium through the establishment of ETS KSP(knowledge sharing platform) among Northeast Asian countries
- Core agreement ; Allocation Rule, Banking, Borrowing, auction, financial mechanism(future)
- **Review Financing Source for research budget**
  - Tripartite Environment Ministers Meeting (Korea, China, and Japan )
  - Try Korea Foundation, Japan Foundation
- Personal carbon trading (EV or Fuel cell – Valued weighted)

# Reference

Environment Forum – Enforcement Status and Implications of ETS in Major Countries VOL.18 NO.7

The Bank of Korea International Economics Department – Status and Issues of ETS in Major Countries

Korea Legislation Research Institute– Policy Analysis on Non-European ETS

Hyundai Research Institute – Lessons learned from 10 years after adopting EU ETS

Lim YuJin (Economics, Yonsei University)–

The issues of the EU emissions trading scheme and the implication for the Korean ETS

Greenhouse Gas Inventory and Research Center -

<http://www.me.go.kr/home/file/readDownloadFile.do?fileId=97929&fileSeq=1&openYn=Y>

Ministry of Environment -

<http://www.me.go.kr/home/file/readDownloadFile.do?fileId=105557&fileSeq=1&openYn=Y>

ICAP - [https://icapcarbonaction.com/ko/?option=com\\_attach&task=download&id=233](https://icapcarbonaction.com/ko/?option=com_attach&task=download&id=233)

KIM, Jeongin, Chang Sukwon " Water-energy-Food Nexus," K-Water policy Forum presentation paper, 2013.11

KIM, Jeongin, "Green Growth Main Features and Key Progress: Green Growth Policy of Korea," IETC, CIFAL, 2013.4.4

KIM, Jeongin,, " The Energy Self-Reliance Village **in Korea,**" Eco-town; kawasaki-UNEP workshop, ,2013.9 12-13

KIM, Jeongin,, "Resource Constraints in ASIA and It's Impact ," BASF Asia-Pacific Region workshop, 2014.10.28

Deloitte, Water/UK, " Tapping into growth; economic Impact of the Water and sewage sector in the UK," 2014.3

Frontier Economic, HSBC, " Exploring the links between water and economic growth ; A report prepared for HSBC  
by Frontier Economics: Executive Summary," June 2012.

Global Water Partnership, "Water in the Green Economy, " PERSPECTIVES PAPER, 2012.6

KIM, Jeongin, Chang Sukwon " Water-energy-Food Nexus," K-Water policy Forum presentation paper, 2013.11

KIM, Jeongin, "Green Growth Main Features and Key Progress: Green Growth Policy of Korea," IETC, CIFAL, 2013.4.4

KIM, Jeongin,, " The Energy Self-Reliance Village **in Korea,**" Eco-town; kawasaki-UNEP workshop, ,2013.9 12-13

KIM, Jeongin,, "Resource Constraints in ASIA and It's Impact ," BASF Asia-Pacific Region workshop, 2014.10.28

Marie-Agnes Jouanjean, Josephine Tucker, Dirk Willem te Velde, " Understanding the effects of resource degradation on socio-economic outcomes in developing countries," 2014.3

SEI, "Understanding Nexus," 2012.10

Shah, M., " Water: Towards a Paradigm Shift in the Twelfth Plan," Special Article, *Economic and Political Weekly*, Vol 03. 2013

[www.gwptoolbox.org](http://www.gwptoolbox.org)

[www.odi.org](http://www.odi.org)





**Thank You**

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