

# Development of the CREATE inventory in support of integrated modeling of climate and air quality for East Asia

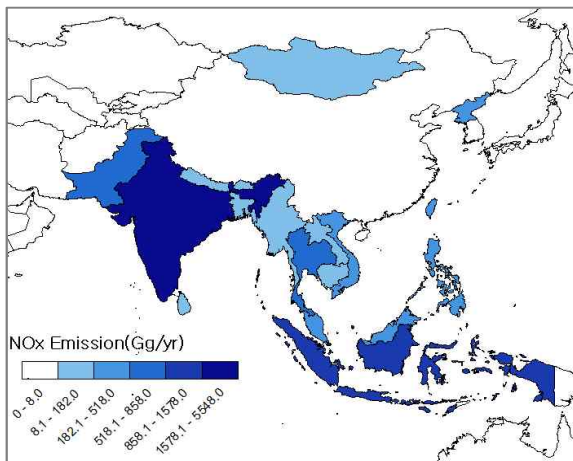
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## Highlights

- A new regional emissions inventory, named **NIER/KU-CREATE**, is developed using an international assessment modeling framework(i.e. GAINS) in support of various research/regulatory needs of Korea and East Asia
- It is designed as a **comprehensive, model-friendly emissions** framework which covers **science-related** as well as **policy-related** and **processing/modeling-related** parameters for anthropogenic, biogenic, and biomass burning
- It will serve as the emissions inventory for upcoming Air Quality Forecasting System(**AQFS**), integrate assessment/management modeling(**GAINS-Korea**), future CC-AQ impact modeling study(**ICAMS-scenario**), aircraft field campaign(**MAPS/GAMBAI**), GEO satellite validation(**GEMS**), and etc.

# Development of a New Asia Inventory : CREATE\* - Framework Design

\* Comprehensive Regional Emissions inventory for Atmospheric Transport Experiments



Region	项目	Item	其他洗煤	焦炭	焦炭	其他煤气	其他煤气	原油	汽油	煤油	柴油	煤油	液化石油气	液化石油气	天然气	其他能源
			Other Washed Coal	Briquettes	Coke	Other Gas	Crude Oil	Gasoline	Kerosene	Diesel Oil	Fuel Oil	LPG	Railway Gas	Natural Gas	Other Petroleum Products	
			Pj	Pj	Pj	Pj	Pj	Pj	Pj	Pj	Pj	Pj	Pj	Pj	Pj	
Beijing	总最终消费量	Total Final Consumption	0.50	0.69	40.16	13.64	84.07	0.00	156.61	147.27	102.37	4.54	24.52	34.56	162.74	111.87
	1. 农、林、牧、渔、水利业	Farming, Forestry, Animal Husbandry, Fishery & Water Conservancy	0.00	0.00	0.00	0.00	0.00	0.00	2.21	0.00	2.77	0.00	0.02	0.00	0.02	0.00
	2. 工业	Industry	0.50	0.69	40.16	13.64	84.07	0.00	9.37	0.06	16.33	4.37	1.10	34.56	26.19	111.37
	非能源使用	Non-Energy Use	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.02	0.27	1.71	0.15	0.00	0.00	161.74
	建筑业	Construction	0.00	0.00	0.00	0.00	0.00	0.00	3.67	0.02	15.53	0.08	0.24	0.00	1.82	0.00
	4. 交通运输、仓储和邮政业	Transport, Storage and Post	0.00	0.00	0.00	0.00	0.00	0.00	18.81	147.06	54.82	0.06	0.27	0.00	10.68	0.00
	批发、零售贸易和餐饮业	Wholesale, Retail Trade and Hotel, Restaurants	0.00	0.00	0.00	0.00	0.00	0.00	9.42	0.00	4.17	0.01	3.58	0.00	17.59	0.00
6. 生活消费	Residential Consumption	0.00	0.00	0.00	0.00	0.00	0.00	92.51	0.00	0.21	0.00	1.40	0.00	38.35	0.00	
城镇	Urban	0.00	0.00	0.00	0.00	0.00	0.00	86.45	0.00	0.04	0.00	1.35	0.00	36.79	0.00	
乡村	Rural	0.00	0.00	0.00	0.00	0.00	0.00	6.06	0.00	0.17	0.00	0.05	0.00	1.56	0.00	
7. 其他	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
总最终消费量	Total Final Consumption	0.50	0.69	40.16	13.64	84.07	0.00	156.61	147.27	102.37	4.54	24.52	34.56	162.74	111.87	
Tianjin	总最终消费量	Total Final Consumption	0.00	0.00	247.00	8.70	177.87	7.10	5.35	0.35	18.57	9.02	2.36	12.72	35.66	30.75
	1. 农、林、牧、渔、水利业	Farming, Forestry, Animal Husbandry, Fishery & Water Conservancy	0.00	0.00	0.00	0.00	0.00	0.00	2.38	0.00	7.96	0.00	0.00	0.00	0.00	0.07
	2. 工业	Industry	0.00	0.00	247.00	8.70	177.87	7.10	5.35	0.35	18.57	9.02	2.36	12.72	35.66	30.75
	非能源使用	Non-Energy Use	0.00	0.00	5.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	建筑业	Construction	0.00	0.00	0.00	0.00	0.00	0.00	4.21	0.25	23.28	0.75	0.84	0.00	0.00	0.09
	4. 交通运输、仓储和邮政业	Transport, Storage and Post	0.00	0.00	0.00	0.00	0.00	0.00	26.91	7.24	45.41	23.07	0.01	0.00	0.55	0.00
	批发、零售贸易和餐饮业	Wholesale, Retail Trade and Hotel, Restaurants	0.00	0.00	0.00	0.00	0.00	0.00	4.20	1.03	9.98	0.35	2.45	0.00	11.45	0.00
6. 生活消费	Residential Consumption	0.00	0.00	0.00	0.00	0.00	0.00	30.66	0.00	7.97	0.00	3.68	0.00	15.03	0.00	
城镇	Urban	0.00	0.00	0.00	0.00	0.00	0.00	28.93	0.00	7.33	0.00	0.69	0.00	15.03	0.00	
乡村	Rural	0.00	0.00	0.00	0.00	0.00	0.00	1.73	0.00	0.64	0.00	3.00	0.00	0.00	0.00	
7. 其他	Other	0.00	0.00	0.00	0.00	0.00	0.00	5.06	0.06	16.31	0.00	0.75	0.00	2.96	0.00	

**GAINS CHINA** Greenhouse Gas - Air

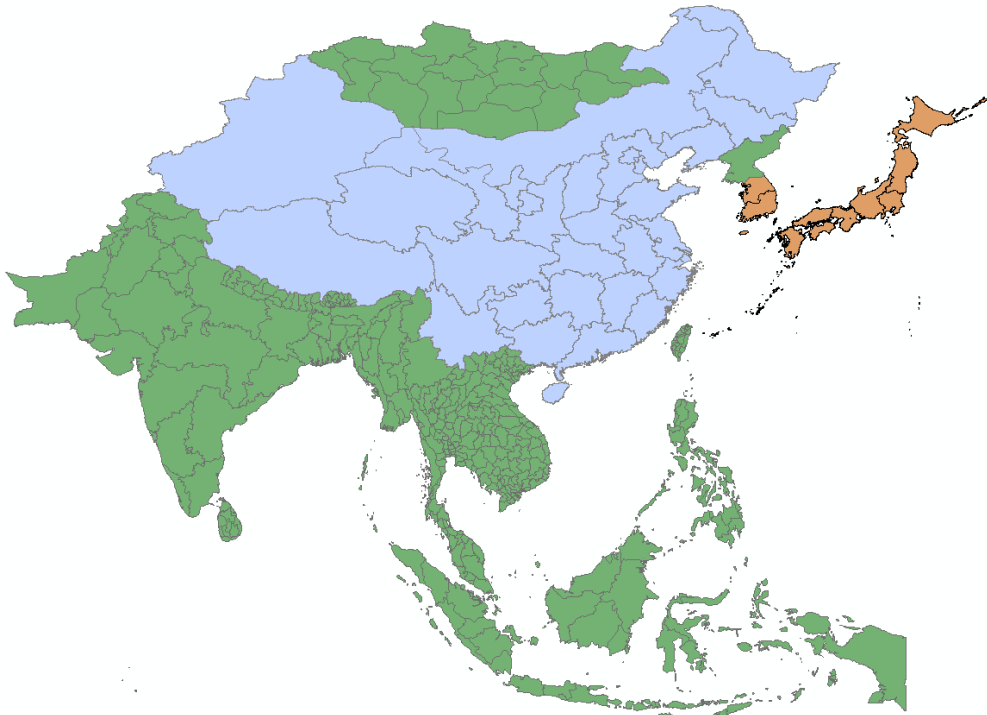
Logout | Glossary | Activity Data | Emissions | Costs | Air Quality & Impacts | Scenario Management | Data Management

**Scenario Management** Manage Emission Scenarios

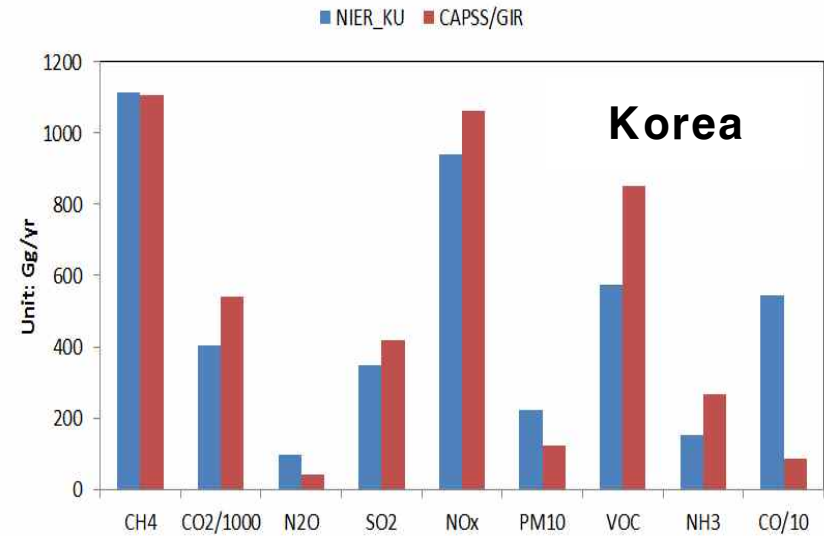
Scenarios | View Structure of Emission Scenarios | This option allows you to edit, import, define, and delete emission scenarios u

1. Emission Inventory : Improve GAINS-Asia emissions using updated national data, MEGAN/BlueSky emissions model
2. Year 2009/2010, Asia regions, ~10000 source categories
3. Pollutants: CO<sub>2</sub>, CH<sub>4</sub>, NO<sub>x</sub>, N<sub>2</sub>O, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, VOC, NH<sub>3</sub>, CO, BC, OC, Mercury
4. Anthropogenic, Biogenic, Biomass burning
5. SMOKE, KU-EPS (Windows based) Emissions processing

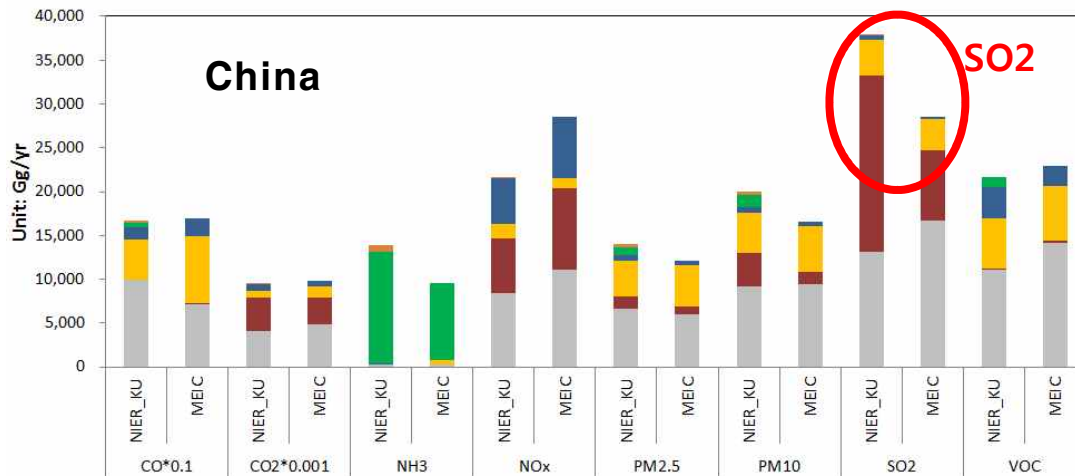
# Development of a New Asia Inventory : CREATE - Emissions Estimation Result



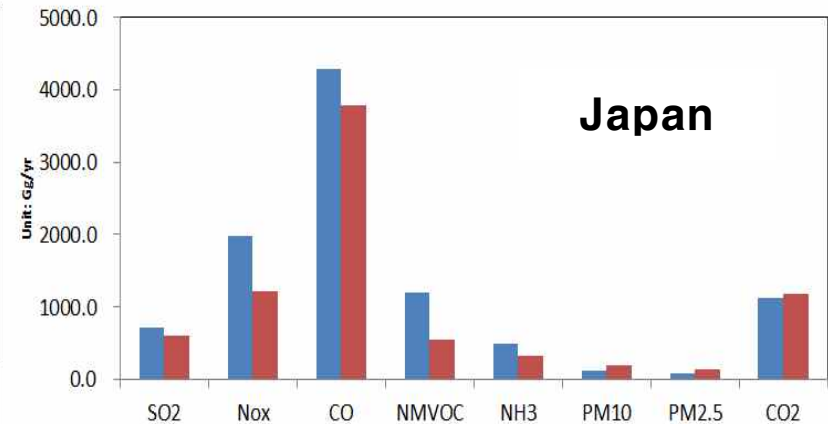
### NIER\_KU vs. CAPSS/MICS-Asia



Legend for China emissions: industry (grey), power (dark red), residential (yellow), transportation (blue), agriculture (green), Waste management (orange)

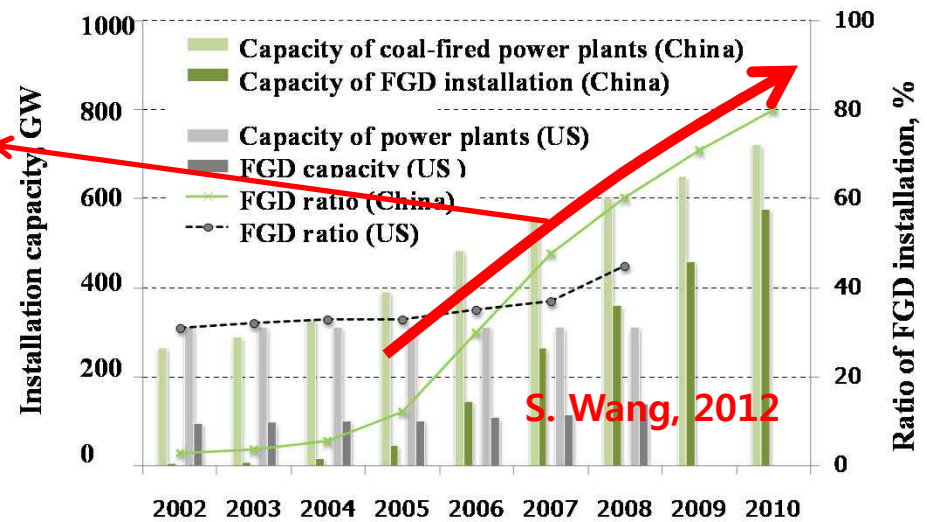
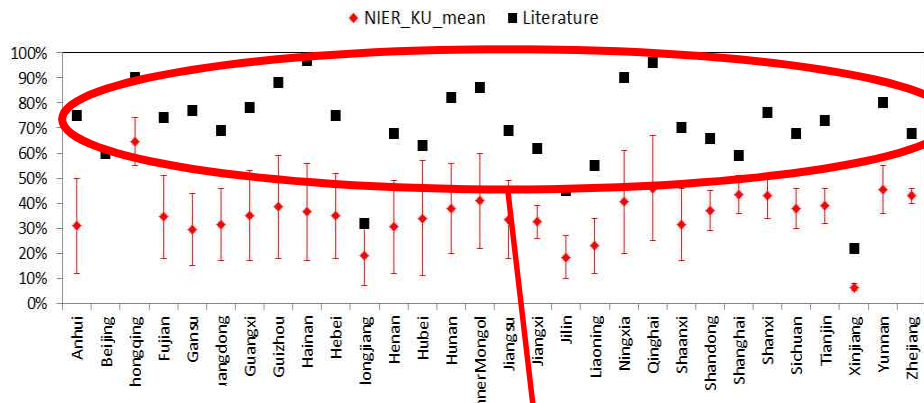


Legend for Japan emissions: MICS-Asia (blue), NIER\_KU (red)

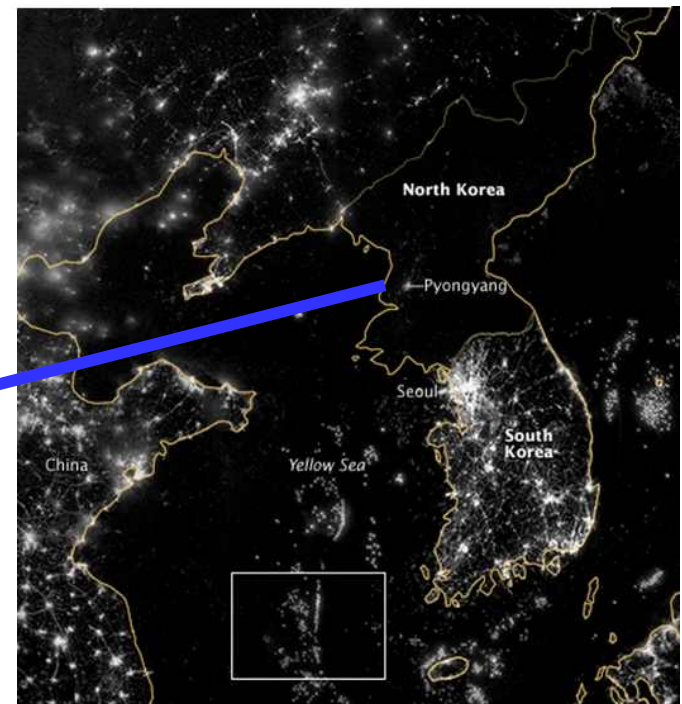
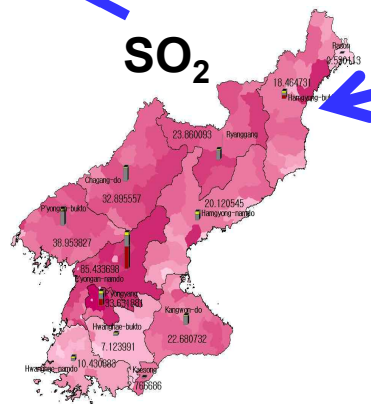
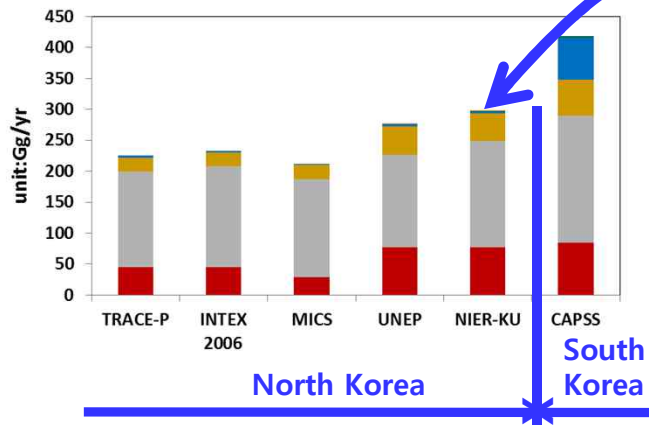
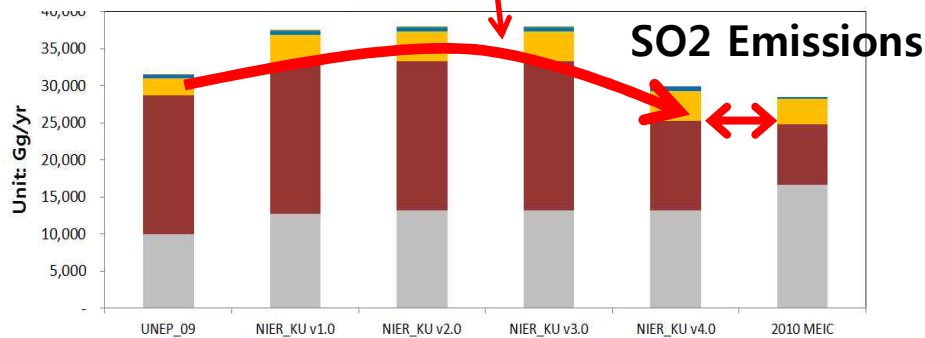


# Development of a New Asia Inventory : CREATE

## - Control Tech(China) and Emissions (North Korea)

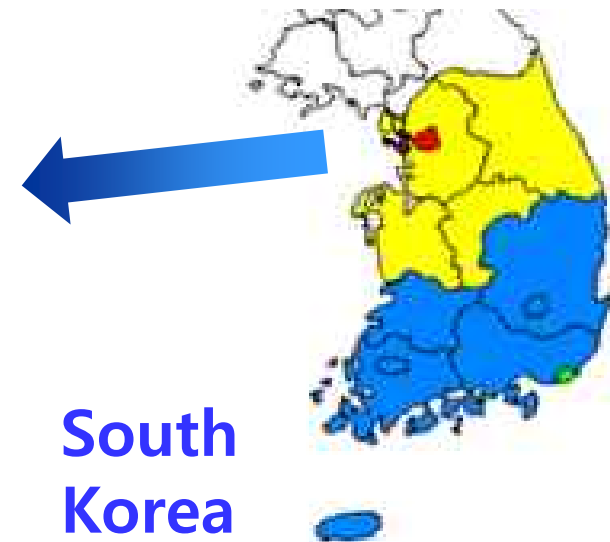
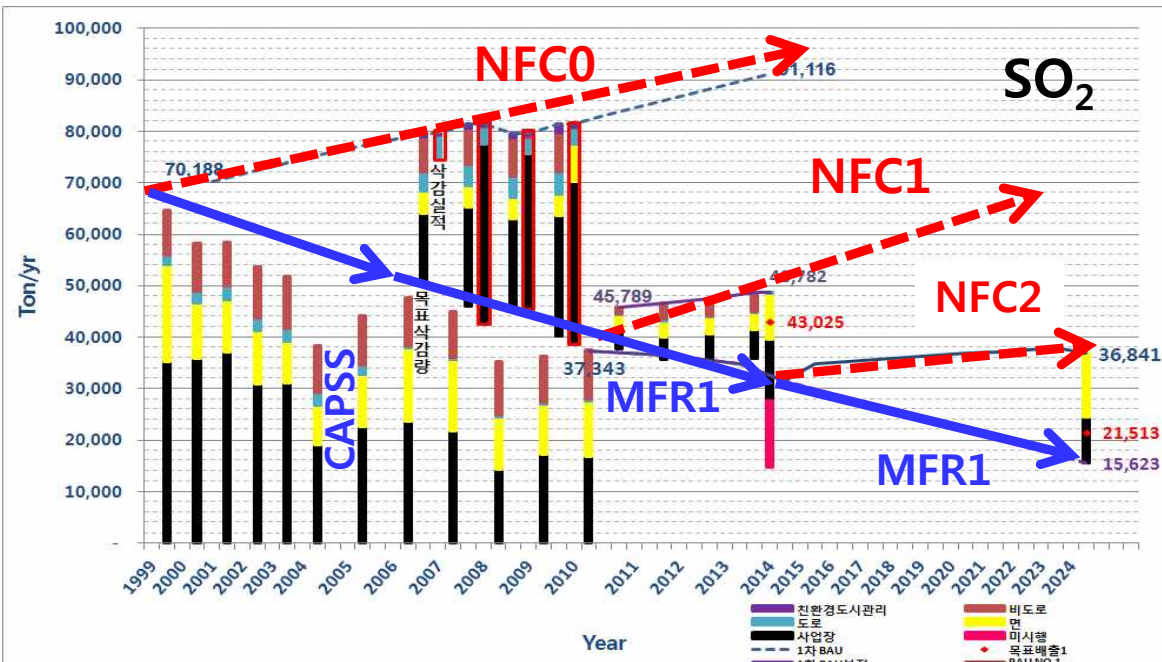
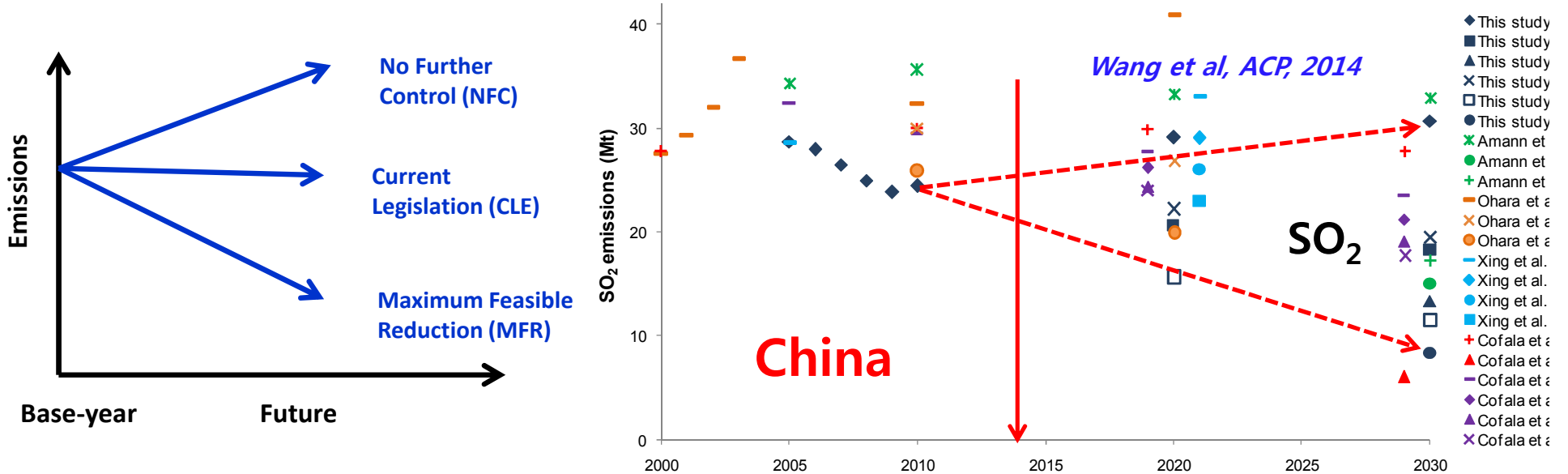


### FGD Penetration



# Development of a New Asia Inventory : CREATE

## - Emission Pathways (China and South Korea)



# Development of a New Asia Inventory : CREATE - Challenges and Opportunities

