

## Chapter 16

# **Mutual impact on Economic and Environment by ETS and carbon tax scenarios between Japan and Korea.**

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# Aims of this chapter

- This chapter explores carbon policy implications for environmentally-sustainable growth in Japan and Korea.
- It also makes recommendations for coordination of carbon reduction policy among the two countries

# Backgrounds and Outline(1)

- Recently Japan and Korea set the mid-term GHG emission reduction goals. In 2012 Japan became the first Asian country to introduce a carbon tax in the form of an additional tax on oil, coal, and natural gas. The tax rate is set at 289 JPY per ton of CO<sub>2</sub> (around \$3/tCO<sub>2</sub>) and the revenue is not explicitly designed for lowering other existing taxes in Japan.
- South Korea will implement an emissions trading scheme in 2015. Moreover, the Korean government review is now under way to assess the feasibility of a levy on carbon emissions where the tax rate is about 3,000 KRW per ton of CO<sub>2</sub> (around \$3/tCO<sub>2</sub>). Such policies could help provide economic incentive to achieve a low-carbon economy in both countries.

# Backgrounds and Outline(2)

- This chapter analyzes the impacts on economy and environment of the carbon tax and/or ETS policies in Japan and Korea, using CGE. By comparing the cases in which the two countries do and do not coordinate their carbon reduction policies, it examines the effects on GDP growth, employment, trade flows, and carbon emissions in Japan and Korea.
- This study then suggests a desirable carbon policy design and cooperation in the two countries to contribute sustainable low-carbon economy in this area.

# Using GTAP-E

- Basic Model is GTAP-E
- Refer to KERI and CGE of GIR
- Use GTAP in GAMS/MPSGE
- Data version 8

# Base line scenario

- Period : 2007~2020
- The latest Global data : GTAP v8 (2007)
- GDP growth late

unit : %

	KOR	JPN	USA	EU	CHN	OAN	ROW
CAGR(%)	3.5	1.1	2.5	1.5	6.4	2.7	4.1

- Energy & Emission Coefficient
  - Coal(3.0), Refined Oil(2.7), Natural Gas(2.1)
- Base year Energy data : GTAP v8

# Policy Scenario

## 1. Japan: BAU, Korea is

S1k→ GHG 30% reduction in 2020 comparing to BAU

S2k→ GHG 10% reduction in 2020 comparing to 2005( carbon tax rate for this target)

S3k→ GHG 15% reduction in 2020 comparing to 2005

## 2. Korea: BAU, Japan is

S1j→GHG 3.8% reduction in 2020 comparing to 2020

S2j→ GHG 10% reduction in 2020 comparing to 2005( carbon tax rate for this target)

S3j→ GHG 15% reduction in 2020 comparing to 2005

## 3. Korea and Japan

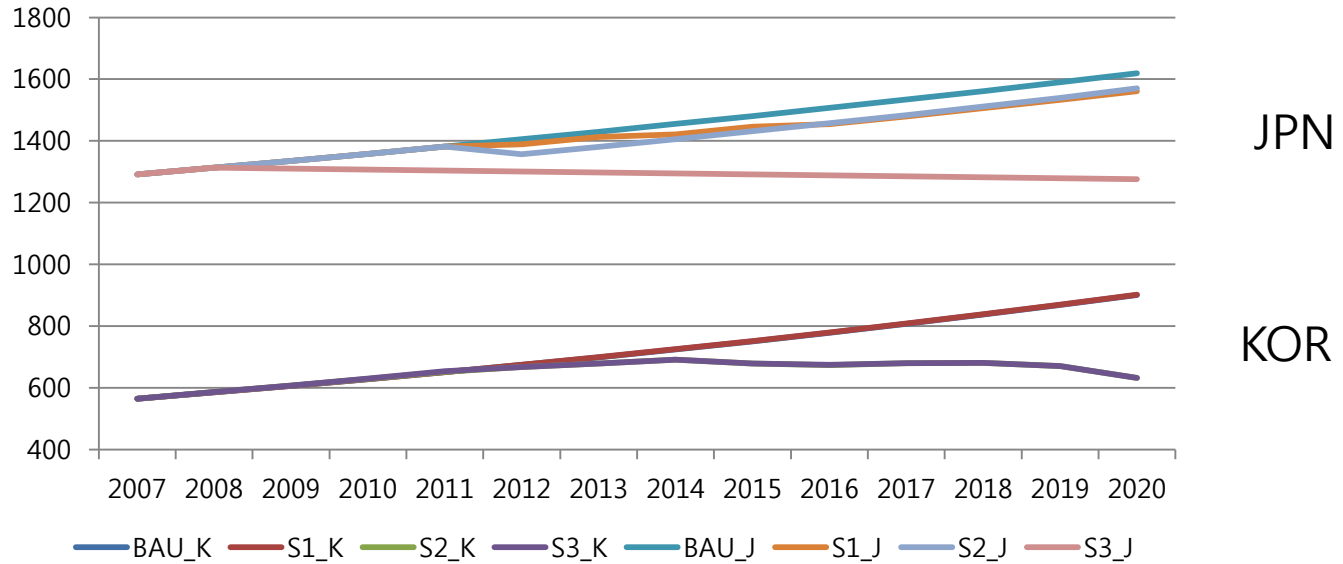
S1a →S1k and S1J

S2a →S2k and S2J

S3a →S3k and S3j

<reference>

- 국가별 시나리오별 배출량

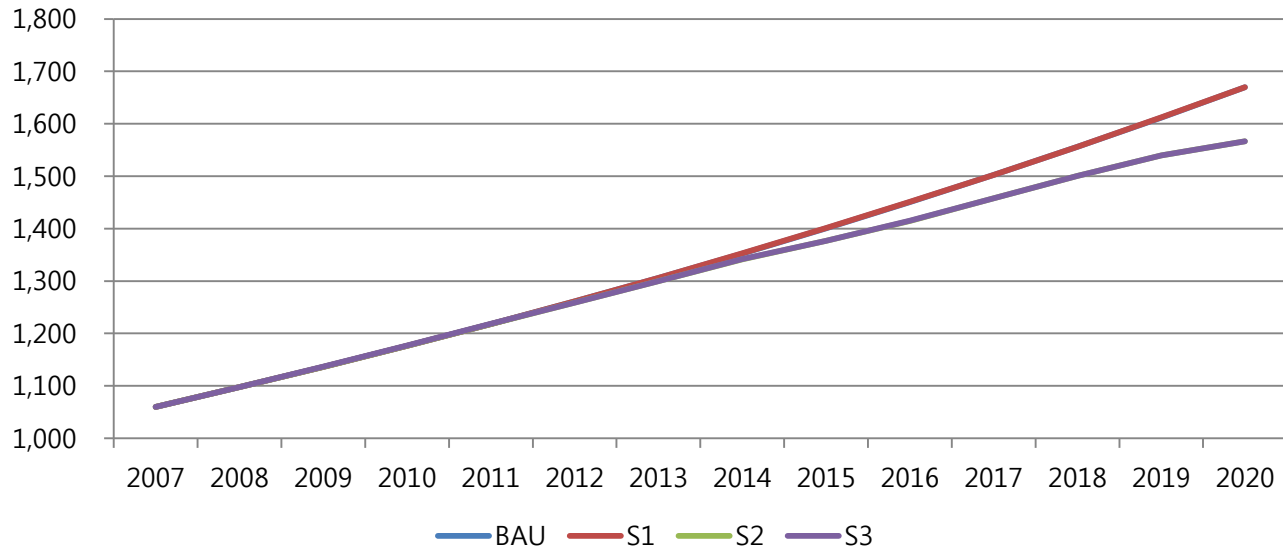


	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
S1_K	0.00%	0.00%	0.00%	0.00%	0.00%	0.06%	0.06%	0.12%	0.12%	0.18%	0.18%	0.17%	0.17%	0.17%
S2_K	0.00%	0.15%	0.15%	0.15%	0.15%	-1.09%	-2.80%	-4.62%	-9.57%	-13.41%	-15.83%	-18.66%	-22.80%	-29.76%
S3_K	0.00%	0.15%	0.26%	0.36%	0.46%	-0.98%	-2.80%	-4.62%	-9.57%	-13.40%	-15.82%	-18.65%	-22.79%	-29.75%
S1_J	0.00%	0.00%	0.00%	0.00%	0.00%	-1.17%	-1.18%	-2.34%	-2.35%	-3.52%	-3.54%	-3.56%	-3.58%	-3.60%
S2_J	0.00%	0.00%	0.00%	0.00%	0.00%	-3.43%	-3.42%	-3.41%	-3.34%	-3.29%	-3.26%	-3.23%	-3.16%	-3.03%
S3_J	0.00%	0.03%	-1.87%	-3.75%	-5.60%	-7.43%	-9.26%	-11.02%	-12.77%	-14.49%	-16.20%	-17.88%	-19.55%	-21.19%



# • 국가별 시나리오별 GDP

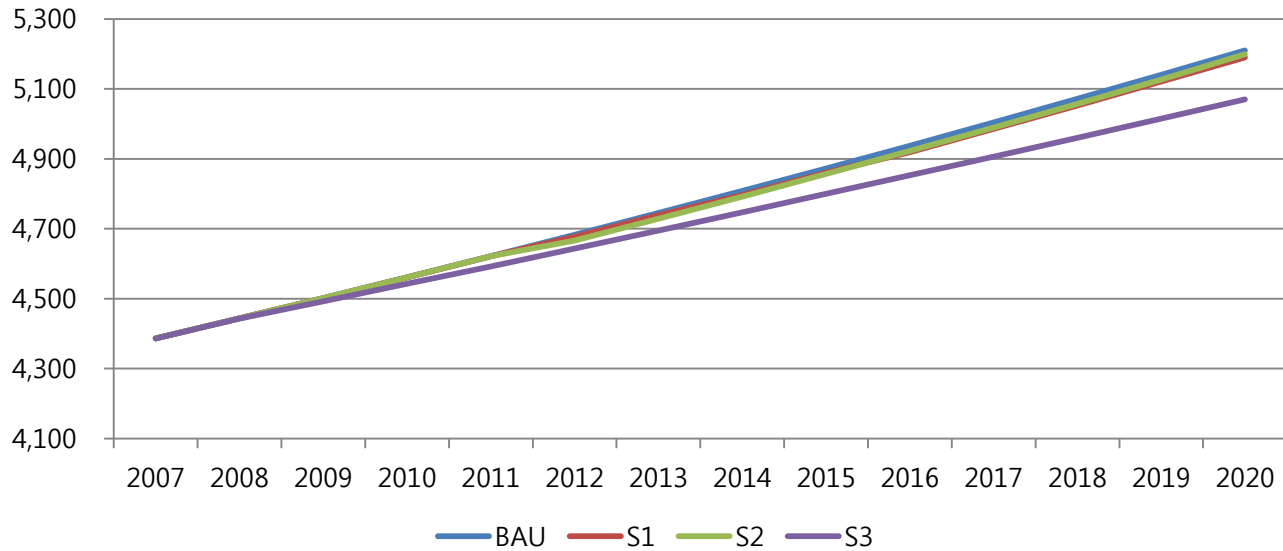
## – KOR



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
S1_K	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.02%	0.02%	0.04%	0.03%	0.03%	0.03%	0.03%
S2_K	0.00%	0.01%	0.01%	0.01%	0.01%	-0.19%	-0.49%	-0.80%	-1.71%	-2.45%	-2.94%	-3.54%	-4.46%	-6.15%
S3_K	0.00%	0.01%	0.03%	0.05%	0.07%	-0.17%	-0.48%	-0.79%	-1.70%	-2.45%	-2.94%	-3.54%	-4.47%	-6.17%

# • 국가별 시나리오별 GDP

## – JPN



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
S1_J	0.00%	0.00%	0.00%	0.00%	0.00%	-0.12%	-0.12%	-0.24%	-0.24%	-0.37%	-0.37%	-0.37%	-0.38%	-0.38%
S2_J	0.00%	0.00%	0.00%	0.00%	0.00%	-0.35%	-0.35%	-0.34%	-0.32%	-0.30%	-0.29%	-0.27%	-0.25%	-0.21%
S3_J	0.00%	-0.01%	-0.21%	-0.41%	-0.62%	-0.83%	-1.05%	-1.27%	-1.49%	-1.71%	-1.95%	-2.19%	-2.44%	-2.68%

- 문제점 및 향후 방향

- 국제 데이터는 각 국가가 제공하는 자료로 작성되지만, 통계간 특성과 경제이론적을 만족시키기 위해 가장 규모가 큰 국가를 기준으로 다른 국가를 조정하여 균형을 도출하기 때문에 실측데이터와 차이 있음

- 특히 GTAP 데이터는 공신력이 있다기 보다는 유일한 글로벌 데이터이기 때문에 사용하는 것임을 주의해야 함

- 사용된 자료와 모형이 완전한 것이 아니며, 수정을 통해 정교함을 증가시킬 수 있을 것임

- 국가별 배출량, 에너지 data와 파라미터

- 향후 일정

- 시나리오 보완 및 확정

- 파라미터 및 시나리오 데이터 보완(시나리오 확정시)

- 정책 분석을 위한 필요한 결과 도출

- 시나리오 확정이 9월에 가능하다면, 10월 모형작업 완료 가능