Experience with Co-benefit Analysis in Korea

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- 2001 Korea IES study
- National Study
- 2002 IES study
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2001_goal

- **Estimating ancillary benefits:**

- **Policy recommendation for UNFCCC and air quality program:**

2001_ Methodology

	[Output]	[D/B]	[Methodology]
Mitigation	S1~S4	MOCIE	Bottom-Up
⬇			
Emission	156 Grid	ICAP	Area coef. - GHG NIER, EPA,
⬇			
Concen.	156 Grid		UR-BAT
⬇			
Health	C-R Function	KNSO, KNHI	Poisson Regression
⬇			
Valuation	COI, WTP	NHS	GIS, Benefit Trans.(Mort.) Opportunity Cost(Morb.)

2001_Scenarios

- Reduction scenario 1 :
  Climate change scenario(MOCIE 1998)
+ High removal efficiency of controls at industrial manufacturing(Air quality control).

- Reduction scenario 2 : MOCIE* (-5%) + CNG Bus

- Reduction scenario 3 : MOCIE* (-10%) + CNG Bus

- Reduction scenario 4 : MOCIE* (-15%) + CNG Bus

2001_Primary findings from the results

» **Modest greenhouse gas reduction scenarios (5-15% reductions in 2020) can result in significant air pollution health benefits through reductions in PM10 concentrations.**

» **These greenhouse gas reduction measures for Korea's energy sector could avoid 40 to 120 premature deaths/yr. and 2800 to 8300 cases/yr. of asthma and other respiratory diseases in the Seoul Metropolitan Area in 2020.**

» **The cumulative value of these avoided health effects is estimated to range from 10 to 125 million US$/yr (in 1999 dollars with annual discounting rate 7.5%).**

» **This is equivalent to a benefit of $10 to $42 per ton of carbon emissions reduced in 2020 for the climate change scenarios**

2001_Policy Implications: Policy Review Meeting in Oct

» The approach and results of this project were very useful for policy making at both local levels (on air quality management) and national levels (on GHG mitigation):.

»Policymakers noted that the project demonstrated the potential for real, positive economic and social ancillary benefits from mitigation scenarios and commended the project efforts activities to provide these estimates.

» An important next step in this process would be to more widely disseminate the outcome and results of this project to achieve greater recognition and understanding of the results in the policy making community and the general public.

National study

Method: adjusted with GDP and geographic factors based on European studies: damage cost = f(emission) with pollutants TSP, NOx, SOx.

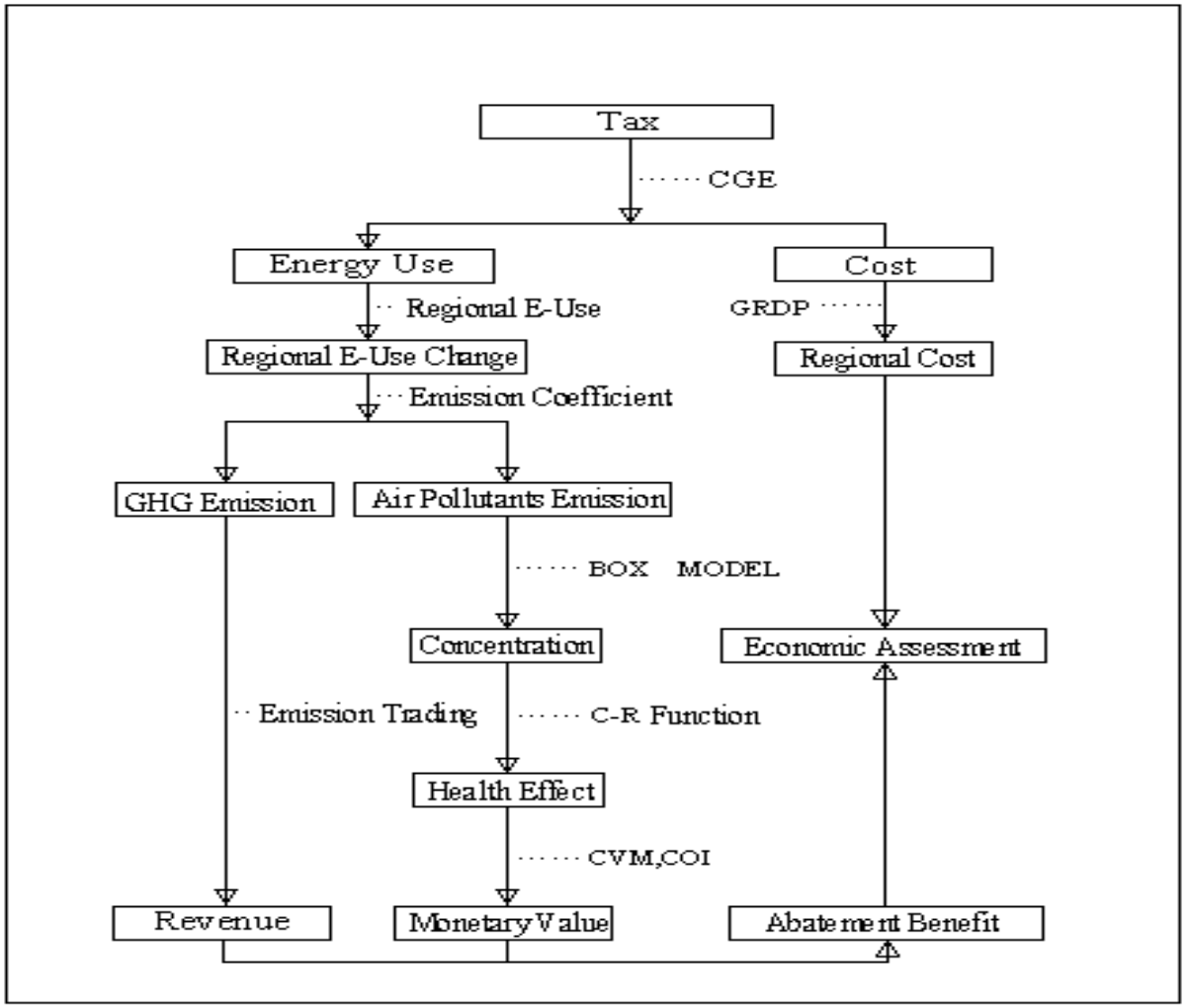
Result : 68% abatement cost or 270$ per TOC reduced in 2015 with 10% mitigation of GHG compared BAU

IES_2002(goal)

- **Estimate health benefits obtainable from reduction of energy use due to introduction of fuel tax and carbon tax.**

- **Quantify potential synergy effects achievable from integrated polices compared to air and GHG policy implemented in separate way.**

IES_2002 _methodology



model type

- multi-region :Seoul, Inchon, and Kyonggi
- hybrid : top-down(CGE)

  + bottom-up(impact path way)
- Dynamic : 2000 – 2030
- Status : preliminary results(2002 KEI project)

Result_Fuel_Health

Area	Symptom	2005	2010	2015	2020	2025
Seoul	Asth.	187	501	792	935	915
	Resp.	47	179	378	640	888
	MRT	133	395	667	914	1041
Inchon	Asth.	45	113	170	223	244
	Resp.	9	34	72	127	200
	MRT	26	78	135	194	236
Kyonggi	Asth.	252	641	956	1258	1369
	Resp.	42	157	330	587	921
	MRT	121	372	650	953	1166

Result_Fuel_BCR

	Area	2005	2010	2015	2020	2025
Fuel taxes	Seoul	0.290	0.472	0.536	0.563	0.438
	Inchon	0.204	0.267	0.249	0.222	0.193
	Kyonggi	0.324	0.531	0.589	0.578	0.529
Fuel + Carbon taxes	Seoul	0.295	0.479	0.543	0.570	0.445
	Inchon	0.214	0.281	0.263	0.236	0.205
	Kyonggi	0.333	0.543	0.601	0.589	0.540

Result_Carbon_Health

Area	Symptom	2005	2010	2015	2020	2025
Seoul	Asth.	67	166	560	780	768
	Resp.	16	57	254	509	713
	MRT	45	122	441	715	820
Inchon	Asth.	17	42	142	223	245
	Resp.	3	12	56	119	188
	MRT	9	28	108	185	226
Kyonggi	Asth.	105	280	938	1450	1570
	Resp.	15	57	262	550	866
	MRT	45	139	540	935	1145

Result_Carbon_BCR

	Area	2005	2010	2015	2020	2025
Carbon taxes	Seoul	0.069	0.108	0.246	0.284	0.219
	Inchon	0.051	0.070	0.138	0.137	0.117
	Kyonggi	0.086	0.147	0.339	0.366	0.330
Fuel + Carbon taxes	Seoul	0.071	0.110	0.251	0.289	0.224
	Inchon	0.054	0.075	0.149	0.148	0.128
	Kyonggi	0.089	0.151	0.349	0.376	0.339

policy experience(1/3)

- **Uncertainty: Some policymakers in environment side are not active to emphasize significance of ancillary benefits, mainly due to data credibility ➔more robust data are required**

policy experience(2/3)

- **Policy decisions in this issue are science + political consideration → need a strategic coordination among experts, policy makers, citizens, and press**

  and internationally(i.e.IES, Korea-China co-work)

policy experience(3/3)

- **Future IES is positive: as a means to solve air quality problem, GHG control will be gaining more attention, resulting in policy integration of air +GHG**

Thanks!