Carbon Neutral : International co-operation in East Asia

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Economist.com

https://www.economist.com/the-world-this-week/2020/04/23/kals-cartoon

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Global Trend of Energy Use (TPES)

		1990	2000	2010	2018	2019
	Total	81.17	80.30	81.85	81.20	-
World	Coal	25.33	23.09	28.41	26.88	-
(%)	Oil	36.88	36.57	32.13	31.49	-
	Gas	18.96	20.64	21.30	22.84	-
OECD	Total	83.79	82.55	80.68	79.31	78.82
	Coal 🤳	23.74	20.73	20.07	15.91	14.38
(%)	Oil	41.36	39.86	36.29	35.47	35.39
	Gas 🕇	18.68	21.95	24.32	27.93	29.05
Non-OECD (%)	Total	77.26	76.41	81.83	81.46	-
	Coal 🔒	28.41	27.33	36.30	35.15	-
	Oil	28.62	28.73	25.47	25.57	-
	Gas	20.23	20.35	20.05	20.75	-

자료 : IEA, World Energy Balances, OECD iLibrary, https://www.oecd-ilibrary.org/

Dependency of Fossil Energy By Country (TPES)

	% of fossil energy					% of Coal					
	1990	2000	2010	2018	2019	1990	2000	2010	2018	2019	
World	81.2	80.3	81.8	81.2	-	25.3	23.1	28.4	26.9	-	
OECD	83.8	82.5	80.7	79.3	78.8	23.7	20.7	20.1	15.9	14.4	I
USA	86.4	85.9	84.1	82.1	81.8	24.0	23.5	22.7	14.4	12.6	
UK	90.7	88.4	88.1	77.8	77.1	30.6	16.4	15.2	4.6	3.3	
Francs	58.1	52.8	50.1	47.4	47.5	9.0	5.9	4.6	3.7	3.1	
Japan	84.6	80.6	80.6	88.6	88.3	17.5	18.7	23.0	26.9	27.2	
S.Korea	83.8	84.0	82.9	84.5	82.9	27.3	22.3	29.4	28.5	27.5	
Non-OECD	77.3	76.4	81.8	81.5	-	28.4	27.3	36.3	35.1	-	Ī
China	75.8	80.2	91.0	88.2	-	60.7	58.8	70.6	61.9	-	
India	53.8	63.7	70.7	76.3	-	30.3	33.1	39.8	45.1	-	

자료 : IEA, World Energy Balances, OECD iLibrary, https://www.oecd-ilibrary.org/

Net Zero
by 2050A Roadmap for the
Global Energy
Sector

Key suggestions:

- 1. Net zero by 2050 hinges on an unprecedented clean technology push to 2030
- 2. Net zero by 2050 requires huge leaps in clean energy innovation
- 3. Transition to net zero is for & about people
- 4. Energy sector dominated by renewables
- 5. International co-operation is pivotal for achieving net-zero emissions by 2050

https://www.iea.org/reports/net-zero-by-2050

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How about KOREA ?

GHG Emission Trend in Korea (Unit : MtCO2eq)





High fossil energy dependence (TPES) : 83.8%(1990) → 82.9%(2019)

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Status of RE3020

• In December 2017, The Korean Government announced the Renewable Energy 3020 Implementation Plan (RE3020). It sets a goal to produce 20% of its energy from renewable sources by 2030.

	2018			2019			2020			
(GW)	target	outcome	%	target	outcome	%	target	outcome	%	
PV	1.42	2.37	166.4	1.63	3.79	232.2	1.63	4.13	251.1	
Wind	0.02	0.16	80.7	0.65	0.19	29.4	0.65	0.24	34.6	
Others	0.30	0.91		0.12	0.38		0.18	0.38		
Total	1.74	3.44	197.7	2.40	4.36	181.6	2.46	4.75	193.0	

$K-ETS_{PHASE 1} (2015-2017) / PHASE 2 (2018-2020) / PHASE 3 (2021-2025)$

(unit: won/tCO₂e)

	2015	2016	2017	2018	2019	2020
Cumulative trading volume $(1,000 \text{ tCO}_2\text{e})$	1,242	5,107	14,734	17,829	16,959	20,953
Korea Allowance Unit	12,000	19,300	20,000	25,000	38,100	23,000
(growth rate)		(60.8%↑)	(3.6%↑)	(25.0%↑)	(52.0%↑)	(39.6%↓)
Korea Offset Credit	13,700	18,550	20,800	21,800	31,850	-
(growth rate)		(35.4%)	(12.1%↑)	(4.8%↑)	(46.1%↑)	-
Korea Credit Unit	-	18,900	24,000	24,500	39,500	26,000
(growth rate)			(27.0%↑)	(2.1%↑)	(61.2%↑)	(34.2%↓)

Note : i-KCUs and i-KOCs were added in 2019 for distinction of incoming international offset units.

Price & Volume Trend of KAU21 in Phase 3



Source: Korea Exchange database (http://ets.krx.co.kr/main/main.jsp)

Report of the Bank of Korea (2021.09)

- 2 scenarios
 - 1st : cut carbon emissions from 670 Mt in 2020 to 200 Mt by 2050 to limit the global temperature increase between 1.5 and 2 degrees
 - 2nd : achieve 100 % net-zero by 2050 to limit the warming to 1.5 degrees.
- Main results
 - Carbon tax would have a negative impact on the economic growth & inflation in the long run unless there are remarkable technological development to switch to low-carbon power generation or clean energy sources like solar, wind and green hydrogen.
 - Carbon tax would weigh down GDP by 0.08~0.32 %p & raise the consumer price by 0.02~ 0.09 % annually by 2050.
 - Meanwhile, if the government spends a certain percent (*more than 1 % of GDP*) of the carbon tax revenue that will increase every year, the negative effects could significantly decrease.



Key areas for Investment

• Clean electricity generation, network infrastructure, end-use sectors

- Transmission and distribution grids
- Public charging points for EVs
- Battery production for EVs
- Green steel
- Hydrogen and CCUS : CO₂ pipelines and hydrogen-enabling infrastructure

International co-operation

- The unprecedented international co-operation on innovation & investment is pivotal for achieving net-zero emissions by 2050.
 - Asian ETS & carbon market
 - Asian Super Grid
 - Green H2 network
 - Technical and financial support

Ilementing the EU ETS. The system starts with a that increases annually.	China Fully launched its national power sector ETS in 2021 bringing the world's largest carbon market		China National ETS	Korea ETS	Japan - Tokyo
C Kazakhstan	preparation. Sakhalin (Russia)	Overall GHG emissions (excluding LULUCF)	12,301 MtC0 ₂ e (2014)	727.7 MtC0 ₂ e (2018)	63.9 MtC0 ₂ e (2018)
Pakistan @	Saitama Tokyo © Republic of Korea	Covered emissions	40% (CO ₂)	74% (6 GHGs)	20% (CO ₂)
Chinese Pilots • Beijing • Chongqing • Fujian • Fujian	 Third trading phase will commence in July 2021 extending the scope, increasing auctioning and intro- ducing financial intermediaries to its market. 	number of covered entities	2,225 (2021)	685 (2021)	~1,200 facilities:
 Guangdong Hubei Shanghai Shenzhen Tianjin Source: https://icapcarbonaction.com/en 	n/ets-map	Links with other systems	n.a.	No linkage	Linking with the Saitama Prefecture ETS

Asia ETS : opportunities & challenges

• Opportunity

- China, South Korea, Japan already have various types of carbon markets at the national/subnational level.
- Common goal of achieving carbon neutrality → provide an incentive to collaborate in using market mechanisms/carbon pricing to address emissions

• Obstacles

- Carbon markets differ in size, structures, design & different stages of development
- Inclusion of 'indirect' emissions → raising special accounting and MRV challenges

• Challenges

- Linking is complex & tends to take time.
- Starting with 'compatible' designs & openness to stepwise linking make progress more likely.
- ETS linking between Korea and China appears more feasible, given the many similarities between the national schemes.

Source: Fridtjof Nansen Institute, Linking Asian carbon markets: opportunities and barriers, Feb. 2021.

Paradigm Shift on Supergrid

- Unevenly distributed renewable energy resources in Northeast Asia region.
- The area rich in renewable energy resources is remote from demand areas
- Paradox: "MORE renewable energy resources, LESS demand"
- Overcome a mismatch between supply (Mongolia, Russia) and demand (S. Korea, Japan, China)



Source: Softbank(2017), "Asia super grid concept and update

Asia Supergrid : opportunities & challenges

Opportunities

- Desire for renewable energy development forms a common denominator for China, Japan, and S. Korea, while Mongolia and the Russian Federation are endowed with large renewable energy resources.
- This mutual interest in renewable energy can help reduce the political barriers to interconnection arising from concerns over energy security and the geopolitical aspects of electricity interconnection.

• Obstacles

• There is no regional economic co-operation organization that could act as the wellspring for electricity interconnectivity and associated institutional development for the NEA region.

• Challenges

• The institutionalization of regional interconnection development is a necessary step forward.

Thank You

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