



# Financing Dirty Energy

How Korean Public Financial Institutions  
Support Coal Power

January 2018

This Report was researched and written by Joojin Kim and Soyoung Lee of Solutions for Our Climate. Data was collected and analyzed by Juri Kim of SFOC. The authors also thank Sejong Youn of Kim & Chang for providing significant inputs to the report.

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# Executive Summary

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The Korean Government has a profound affection to coal, both domestically and internationally. Domestically, since 2008, it has permitted twenty new coal-fired power plants, representing an almost 80% jump in its coal power capacity compared to 2008. In 2017 alone, eight coal fired power plants, representing more than 7 GW of capacity commenced operation. Internationally, Korea is third in the world, following Japan and China in terms of international coal finance. Among public financial institutions worldwide, Korea Export Import Bank is ranked fifth and Korea Trade Insurance Corporation is ranked ninth, in terms of amount of financial support provided to coal power projects.

SFOC has reviewed the financing by nine major Korean public financial institutions of the following types of coal power plants: ( i ) domestic coal power plants permitted after 2008; ( ii ) coal cogeneration plants commissioned after 2008; and ( iii ) overseas coal fired power plants which have reached financial close after 2008. SFOC mainly relied on submissions made by public financial institutions and utilities to the National Assembly.

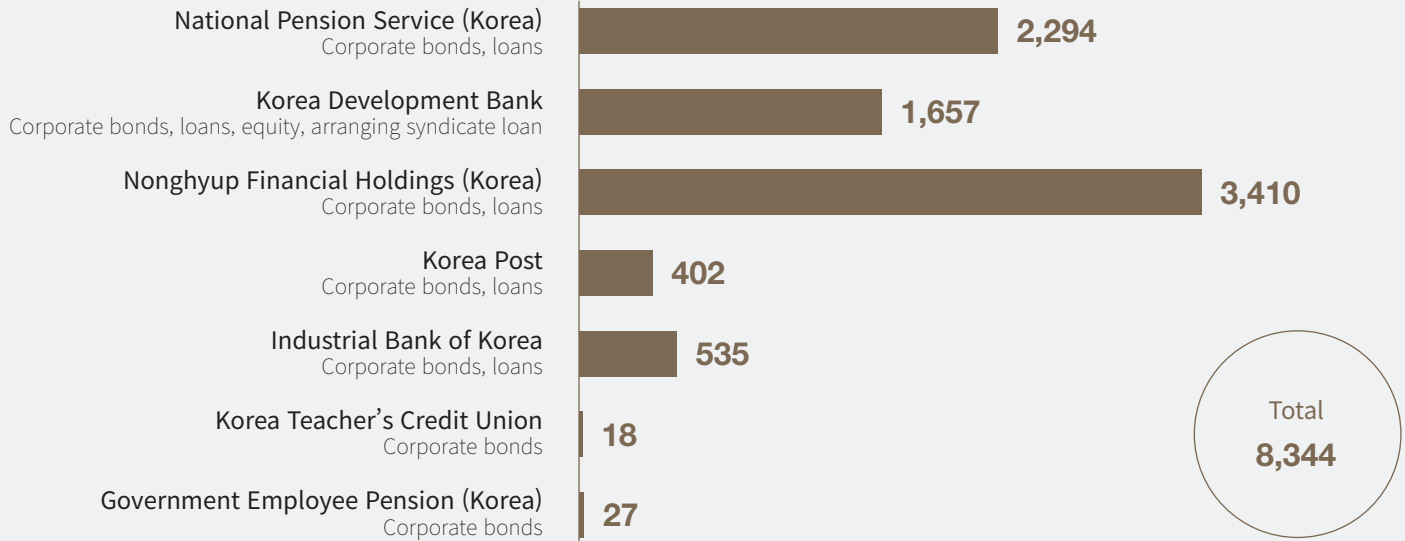
According to our analysis, Korean public financial institutions have provided in total, approximately USD 17 billion of financial support for the coal power projects – about half of which was for coal-fired power plants outside Korea (See Tables A and B).

In order to restrict such kind of financing, bills respectively amending the National Pension Act, the Korea Development Bank Act and the Korea Export Import Bank Act have been proposed to and are pending in the National Assembly. The bills, if passed as proposed, will impose substantial political pressure on the relevant public financial institutions, by sending a clear message to such institutions to stay away from coal power investments.

Going forward, in order to strengthen our efforts to implement policies restricting coal finance, further analysis on ( i ) the additional cost coal should pay in case its climate and air pollution externalities are internalized; and ( ii ) the potential financial impacts coal investments may expose Korean public financial institutions to, especially in case the aforementioned externalities are internalized.

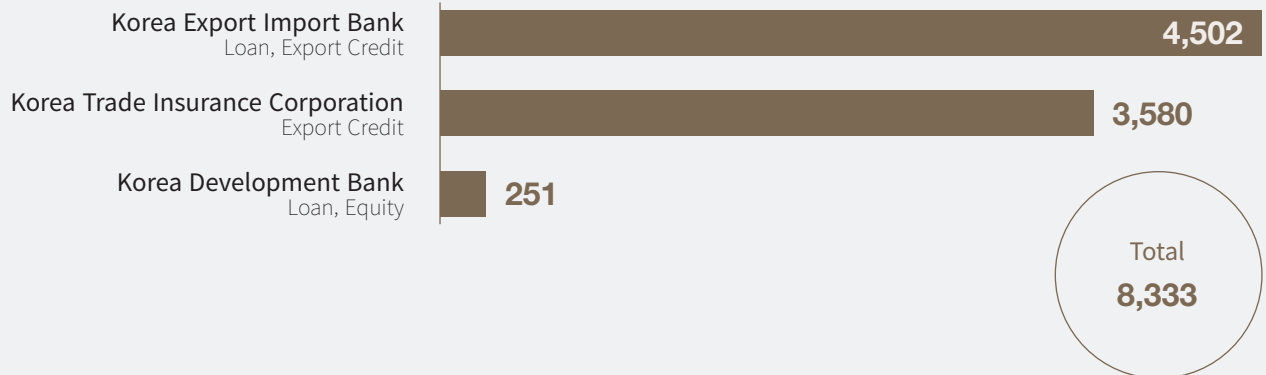
**Table A. Korean Public Financial Institution Support of Domestic Coal Power Plants**

Unit: USD million



**Table B. Korean Public Financial Institution Support of Overseas Coal Power Plants**

Unit: USD million



# I . Introduction

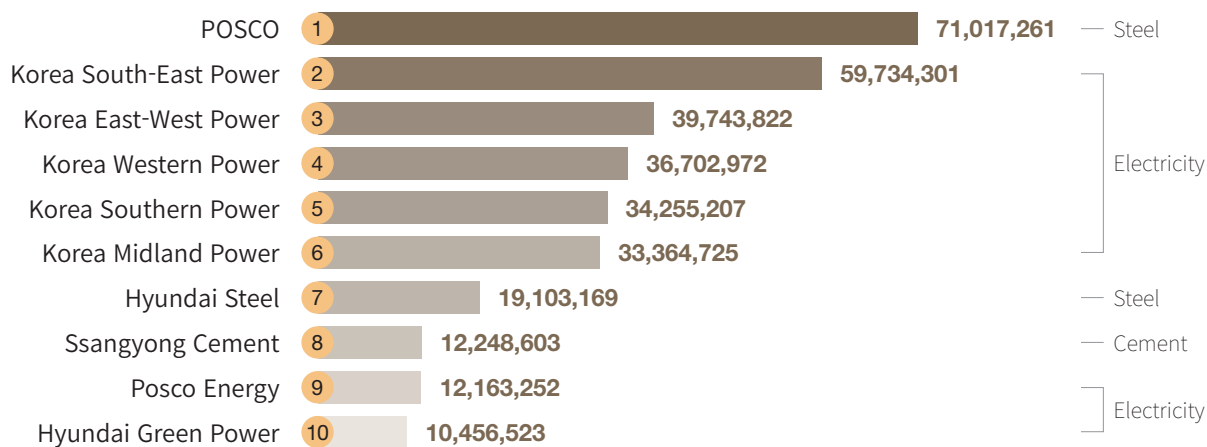
## Coal, a Major Source of Climate Change and Air Pollution

Coal-fired power plants, are the largest sources of both greenhouse gas (“GHG”) and air pollutant emissions, in the Republic of Korea (“Korea”). According to the Korea Energy Economics Institute, in 2013, power sector GHG emissions accounted for approximately 35.8% (250 MtCO<sub>2</sub>e) of Korean national GHG emissions (697 MtCO<sub>2</sub>e). Coal-fired power plant emissions constituted approximately 75% of such power sector GHG emissions.<sup>1</sup>

Research Center (“GIR”), the second to sixth largest GHG emitters are power companies whose main units are coal-fired power plants.<sup>2</sup> Similarly, according to the Ministry of Environment (“MOE”), based on telemonitoring system data available on major air polluting facilities, five among the seven largest air pollutant emitters are coal-fired power plants.<sup>3</sup> According to the Korea Environmental Institute, air pollutant emissions from currently authorized coal-fired power plants, will contribute to approximately 1,144 additional premature deaths per year.<sup>4</sup>

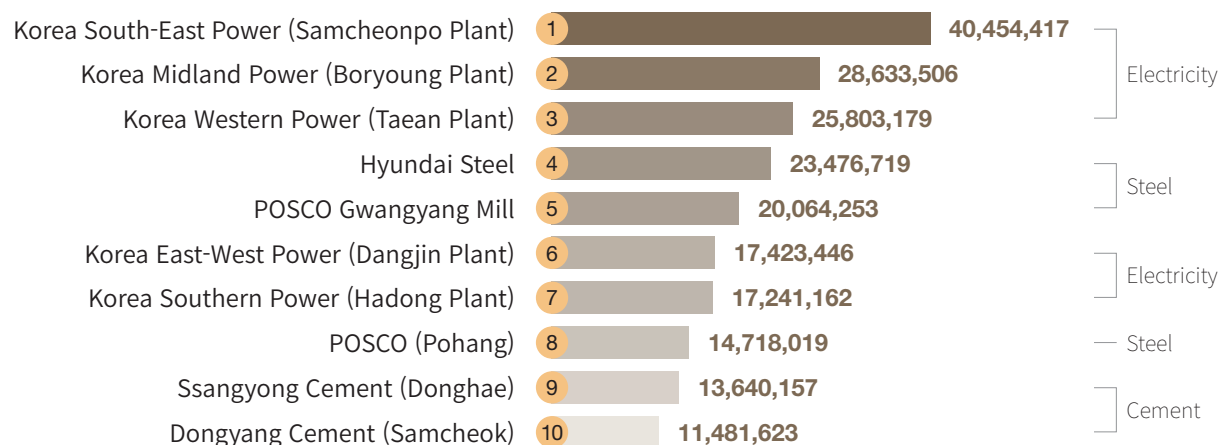
According to the Greenhouse Gas Inventory and

Table 1. Top GHG Emitters - 2016 (GIR, 2017)<sup>5</sup>



1 Korea Energy Economy Institute (2016), Research on Long-Term Greenhouse Gas Target Achievement of the Power Sector  
 2 Based on GHG emission data made available on the website of the GIR (<http://www.gir.go.kr/home/index.do?menuId=37>)  
 3 Ministry of Environment & Korea Environmental Corporation (2017), “State Pollutant Measuring of Businesses with Stack Automated Measuring Devices,” Press Release dated June 26, 2017  
 4 Korea Environmental Institute (2015), Establishment and Operation of Regional Environmental Status Analysis System for the Support of Environmental Assessment  
 5 See GIR website at <http://www.gir.go.kr/home/index.do?menuId=37>

Table 2. Top Air Pollutant Emitting Places of Business - 2016 (MOE, 2017)



### Korea, a Leading Global Coal Financier

Despite the pollution problems, new coal power plant construction has been surging in Korea. The Korean government has permitted twenty new coal power plants, representing almost 20 GW in capacity since 2008.<sup>6</sup> If all constructed, these new coal power plants will represent an almost 80% increase in Korean coal power capacity compared to its 2008 capacity of 23.7 GW.<sup>7</sup> Among those twenty new coal power projects, thirteen are now under operation. In 2017 alone, eight coal fired power plants, representing more than 7 GW of capacity commenced operation (See Chapter II. For plant by plant details).<sup>8</sup>

Korea's pursuit of coal has not been restricted to within its borders. Korea has been one of the top financiers of overseas coal power plants. According to the Natural Resources Defense Council, Oil Change International and the World Wide Fund for Nature,

Korea is third in the world, in terms of international coal finance between 2007 and 2014 (only Japan and China financed more than Korea).<sup>9</sup> Among public financial institutions worldwide, Korea Export Import Bank ranked fifth and Korea Trade Insurance Corporation ranked eighth in terms of amount of financial support provided for coal power projects.<sup>10</sup>

### Overview of Report

Without easily available financing from public financial institutions, such proliferation of coal-fired power plants would not have been possible. SFOC took an in-depth look at the state of Korean coal power financing, analyzing data submitted by such public financial institutions to the Korean National Assembly.

In this report (the "Report") SFOC has analyzed the status of both domestic and overseas financing of coal-fired power projects by the following nine

6 Based on ( i ) Ministry of Knowledge Economy (2008), 4th Power Demand and Supply Framework Plan, ( ii ) Ministry of Knowledge Economy (2010), 5th Power Demand and Supply Framework Plan, and ( iii ) Ministry of Knowledge Economy (2013), 6th Power Demand and Supply Framework Plan.

7 According to Ministry of Knowledge Economy (2008), 4th Power Demand and Supply Framework Plan, Korea's coal power capacity as of 2008 was 23,705 MW.

8 Taeon Unit 10, Samcheok Green Unit 2, Bukpyung Units 1 and 2, Shinboryoung Units 1 and 2, Dangjin Units 9 and 10 are such plants.

9 Natural Resources Defense Council, Oil Change International and World Wide Fund for Nature (2015), "Under the Rug: How Governments and International Institutions Are Hiding Billions in Support to the Coal Industry."

10 ibid

Korean government owned financial institutions and their affiliates (collectively, “Korean Public Financial Institutions”): Korea Export Import Bank (“KEXIM”), Korea Trade Insurance Corporation (“K-SURE”), Korea Development Bank (“KDB”), National Pension Service (“NPS”), Nonghyup Financial Holdings (“NFH”), Industrial Bank of Korea (“IBK”), Korea Post, Korea Teacher’s Credit Union (“KTCU”) and Government Employee Pension (“GEP”). We have also provided a short overview of ongoing efforts to restrict the financing of coal, at the end of this Report.

The KRW to USD exchange rate applied in this Report is KRW 1,130 per USD, which is the 2017 average basic rate of exchange announced by Woori Bank.<sup>11</sup>

11 See <https://spot.wooribank.com/pot/Dream?withyou=FXXRT0016>



# II . Scope of Database and Research

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## Power Plants Covered in this Report

We have reviewed the financing of the following coal power plants (“Target Coal Power Plants”): ( i ) domestic coal power plants authorized by the 4th (2008), 5th (2010) and 6th (2013) power demand and supply framework plans (i.e., domestic power plants permitted after 2008) (See Table 3.)<sup>12</sup>; ( ii ) coal cogeneration plants commissioned after 2008 (See Table 4.) and (iii) overseas coal fired power plants, which, KEXIM, KDB and K-Sure disclosed to have financially supported and reached financial close after 2008 (See Tables 14., 16. and 17.).

### a. Domestic Coal Power Plants Covered

Twelve of the twenty new coal power plants that have been authorized after 2008, have been developed by subsidiaries of Korea Electric Power Corporation (“KEPCO”): Korea South-East Power, Korea East-West Power, Korea Midland Power, Korea Southern Power, and Korea Western Power (collectively, “KEPCO Genco(s)”) (See Table 3.).<sup>13</sup> KEPCO Genco plants have been financed by corporate bonds, due to the fact that these companies currently own and operate major power plants, and thus have a consistent cash flow. Meanwhile, private companies, which until recently,

did not have experience in coal power generation,<sup>14</sup> must rely on project finance, instead of issuing corporate bonds.

### b. Domestic Coal Cogeneration Plants

Table 4. below describes the coal cogeneration plants commissioned after 2008, the financing of which we reviewed for this Report.<sup>15</sup>

### c. Overseas coal power plants

We have also reviewed the financing of fifteen overseas coal power plants, which, according to disclosures by KEXIM, KDB and K-Sure, received financial support from such financial institutions and have reached financial close after 2008 (See Tables 14., 16. and 17.).

## Korean Public Financial Institutions Covered in this Report

The financial institutions covered in this report and a brief description, including how such institutions have been incorporated and why they are considered as governmental institutions, is as follows.<sup>16</sup>

## List of National Assembly Submissions Reviewed

Our research is based on submissions made by

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12 We did not cover the 7th Power Demand and Supply Framework Plan, announced in July 2015 and the 8th Power Demand and Supply Framework Plan, announced in December 2017, in our review, as no coal power plants were decided to be added under this power plan.

13 Although not included in the 4th, 5th or 6th power demand and supply framework plans, the financing of the Yeosu Unit 2 plant fuel switch project, which was a conversion of the said plant from a heavy oil power plant to a 350MW coal power plant project was covered in our analysis.

14 The Bukpyung coal fired power plant which commenced commercial operation in March 2017, is known as Korea’s first private coal power plant.

15 In addition to the coal cogeneration plants described above, Kumho Petrochemical has commissioned a coal cogeneration plant in 2009. However, as it was difficult to distinguish between Kumho Petrochemical’s financing in relation to its existing business and the same related to its coal cogeneration business, the financing of this unit was not reviewed in this Report.

16 In addition to the institutions listed in Table 5., the National Assembly has also requested data on the financing of coal projects covered in this Report to the Police Mutual Aid Association, Korea Scientists and Engineers Mutual-Aid Association and the Teacher’s Pensions. However, these institutions have responded that they have not provided financing to the coal projects covered in this Report, and thus are not separately covered in this Report.

Table 3. New Coal Power Plants Authorized after 2008

Power Plan	Plant	Capacity (MW)	Project Owner (Major Shareholders)	(Contemplated) Operation Date	Status	KEPCO Genco	Type of Financing
4th	Yeunghung Unit 5	870	Korea South-East Power	June 2014	Operating	O	Corporate Bond Financing
4th	Yeunghung Unit 6	870		Dec. 2014			
4th	Dangjin Unit 9	1,020	Korea East-West Power	Jan. 2017			
4th	Dangjin Unit 10	1,020		May 2017			
5th	Bukpyung Unit 1	595	GS Donghae Power (GS, Korea East-West Power, Samtan)	Mar. 2017		X	Project Financing
5th	Bukpyung Unit 2	595		Aug. 2017			
5th	Yeosu Unit 1	350	Korea South-East Power	Aug. 2016			
4th	Samcheok Green Unit 1	1,022	Korea Southern Power	Dec. 2016			
4th	Samcheok Green Unit 2	1,022		June 2017			
5th	Taeon Unit 9	1,050	Korea Western Power	Oct. 2016		O	Corporate Bond Financing
5th	Taeon Unit 10	1,050		June 2017			
5th	Shinboryoung Unit 1	1,000	Korea Midland Power	June 2017			
5th	Shinboryoung Unit 2	1,000		Sept. 2017			
6th	Shinseocheon Unit 1	1,000		Mar. 2020	Under Construction		
6th	Gangreung Anin Unit 1	1,040	Gangreung Eco Power (Samsung C&T, Korea South-East Power)	June 2022	Permitting		
6th	Gangreung Anin Unit 2	1,040		June 2022			
6th	Gosung Hai Unit 1	1,040	Gosung Green Power (SK Gas, SK Construction, Korea South-East Power)	April 2021	Under Construction		
6th	Gosung Hai Unit 2	1,040		Oct. 2021			
6th	Samcheok Unit 1	1,050	PosPower (POSCO Energy)	Dec. 2021	Permitting		
6th	Samcheok Unit 2	1,050		June 2022			
Total Capacity		18,724	MW				

Table 4. New Coal Cogeneration Plants covered in this Report

Company	Unit	Capacity (MW)	Operation Date
Hyundai Energy	Yeosu Cogeneration	48.4	2013
Hanwha Energy	Yeosu Coal Cogeneration	250	2010
	Gunjang Coal Cogeneration	123 (To be expanded to 222MW)	2011
Gunjang Energy	Gunjang Energy	86 (To be expanded to 395 MW)	2008
Gimcheon Energy Service	Gimcheon Coal Cogeneration	59	2013
OCI SE	Saemangeum Coal Cogeneration	303	2016
GS Pocheon Green Energy	Pocheon Coal Cogeneration	169.9	2018 (contemplated)
Total		1,039.3 (excluding expansions)	

Table 5. List of Korean Public Financial Institutions covered in this Report

Name	Relevant Affiliates covered in this Report	Basis of Incorporation (Establishing Act) or Government Ownership	Major Roles
National Pension Service (“NPS”)		NPS established pursuant to National Pension Act NPS manages National Pension Fund (“NPF”) pursuant to same act	Collection and distribution of pension Operation of NPF
Korea Development Bank (“KDB”)	KDB established pursuant to Korea Development Bank Act 100% shares owned by Korean Government		Supply and management of funds for promotion of industrial development and establishment of infrastructure etc.
	KDB Infrastructure Investments Asset Management Co., Ltd. (“KIAMCO”)	KDB holds 84.16% of KIAMCO shares	
Nonghyup Financial Holdings (“NFH”)	National Agricultural Cooperative Federation (“NACF”)	NACF established pursuant to Agricultural Cooperative Act NACF is 100% shareholder of NFH	The purpose of the Agricultural Cooperative Act is in enhancing the economic, cultural and social status of farmers, and the competitiveness of agricultural activities
	NFH established by NACF pursuant to Agricultural Cooperative Act		
	NH Investment Securities (“NHIS”)	NFH holds 49.11% of NHIS shares, and NPS holds 8.76% of NHIS shares	
	Nonghyup Bank (“NH Bank”)	NFH holds 100% of NH Life shares	
	Nonghyup Life (“NH Life”)	NFH holds 100% of NH Life shares	
	Nonghyup Property and Casualty Insurance (“NH Insurance”)	NFH holds 100% of NH Insurance shares	
Korea Post		Pursuant to the Special Act on the Operation of Postal Services, Korea Post is a sub-organization within the Ministry of Science, Technology and Communications (i.e., the Korean Government)	The provision of postal services
Industrial Bank of Korea (“IBK”)		IBK is established by the Small and Mid Size Enterprise Bank Act	Provision of loan etc. to small and mid size enterprises
Korea Teacher’s Credit Union (“KTCU”)		KTCU is established by the Korea Teacher’s Credit Union Act	Provision of a credit system for educational officials and public school teachers etc.
Government Employee Pension (“GEP”)		GEP is established by the Government Pension Act	Provision of pensions to retired or deceased government employees
Korea Export Import Bank (“KEXIM”)		KEXIM is established by the Korea Export Import Bank Act	Provision of finance for export, import, overseas investments and overseas natural resource development
Korea Trade Insurance Corporation (“K-SURE”)		K-SURE is established by the Trade Insurance Act	Provision of trade insurance and export credits

Korean Public Financial Institutions or KEPCO Gencos to the National Assembly, pursuant to data requests made by the National Assembly. According to the Act on Testimony and Expert Examination etc. at the National Assembly, public officials may not refuse to submit materials or documents requested by an assemblyman / assemblywoman, except when such material is related to military, diplomatic or North Korea, and refusal to do so may lead to criminal sanctions.<sup>17</sup> Table 6. is a list of the submissions made by Korean Public Financial Institutions and KEPCO Gencos.

### How We Analyzed the Data

Based on the data and research coverage described above, we have analyzed data received as follows.

### a. Power Plants financed by Corporate Bonds

Coal fired power plants developed by KEPCO Gencos have been financed by issuing corporate bonds. As most of the KEPCO Gencos own not only coal power units but also gas combined or renewable units, we needed to specify which bonds were issued to finance the construction of new coal power plants. In order to do so the National Assembly ( i ) first, requested KEPCO Gencos to disclose how the relevant new coal power plants have been financed and which bonds were used for such financing; and ( ii ) thereafter, requested Korean Public Financial Institutions to disclose whether they had subscribed any of the aforementioned bonds and, if so, how much.

However, for certain coal cogeneration plants partly financed by corporate bonds (Hanwha Energy and

[Table 6. List of National Assembly Submissions](#)

Financial Institution / KEPCO Genco	Submission Date	Assembly Member Requesting Data
NPS	Feb. 2017 (First Submission) Sept. 2017 (Second Submission)	Assemblyman Jungbae Chun
KDB	July 2017	Assemblywoman Baesook Cho
NFH and its affiliates	Sept. 2017	
Korea Post	July 2017	
IBK	July 2017	
KTCU	July 2017	
GEP	July 2017	
KEXIM	Sept. 2017	
K-SURE	July 2017	
Korea South-East Power	Oct. 2016	
Korea Southern Power	Oct. 2016 Oct. 2017 (Second Submission)	
Korea East-West Power	Oct. 2016 Oct. 2017 (Second Submission)	
Korea Western Power	Oct. 2016 Oct. 2017 (Second Submission)	
Korea Midland Power	Oct. 2016 (First Submission) Sept. 2017 (Second Submission)	

<sup>17</sup> Article 4, Paragraph 1 of the Act on Testimony and Expert Examination etc. at the National Assembly

Gunjang Energy's coal cogeneration plants) we were not able to obtain data from power plant companies specifying which bonds were used to finance the construction of the relevant coal cogeneration plant. In these cases, we relied on information provided in bond issuance disclosures uploaded in the DART system managed by the Financial Supervisory Service.

**b. Project Financed Coal Projects (Domestic and Overseas)**

With regard to coal fired power plants financed by project finance, regardless of whether such plant is in Korea or overseas, the National Assembly asked Korean Public Financial Institutions whether the institution has invested in equity or provided loans to the relevant project company which owns the coal power project reviewed, and, if so, how much was invested or lent. For overseas coal power projects, we have also asked whether such Korean Public Financial Institutions provided export credits for the relevant project. Given the nature of project financing, we assumed that all of such funds invested in or lent to such project company was used for construction of new coal power plants.

# III. Korean Public Financial Institution Support of Domestic Coal Power Plants

## 1. National Pension Service

NPS has financially supported the construction of the Target Coal Power Plants by subscribing corporate bonds or extending loans amounting, in total, approximately KRW 2.6 trillion (approximately, USD 2.3 billion). Most of such support was made by subscribing KRW 2.3 trillion of KEPCO Genco bonds, which represents approximately 19% of the total

financing KEPCO Gencos sought to construct the Target Coal Power Plants (See Table 7.).

## 2. Korea Development Bank

### A. Loans

KDB and KIAMCO have financially supported the construction of the Target Coal Power Plants by either subscribing corporate bonds or extending

Table 7. NPS Financing of Domestic Coal Power Plants

(Unit: KRW billion)

Type of Company	Company Name	Unit	Capacity (MW)	NPS Bond Subscription	NPS Loan	Total Third Party Financing	NPS Financing Ratio (%)
KEPCO Genco	Korea Southern Power	Samcheok Green Unit 1	1,022	760	-	3,350	23
		Samcheok Green Unit 2	1,022				
	Korea Western Power	Taeon Unit 9	1,050	280	-	1,370	20
		Taeon Unit 10	1,050				
	Korea South-East Power	Yeunghung Unit 5	870	440	-	3,511	13
		Yeunghung Unit 6	870				
		Yeosu Unit 1	350				
		Yeosu Unit 2	350				
	Korea Midland Power	Shinboryoung Unit 1	1,000	460	-	2,120	22
		Shinboryoung Unit 2	1,000				
		Shinseocheon Unit 1	1,000				
	Korea East-West Power	Dangjin Unit 9	1,020	410	-	2,030	20
		Dangjin Unit 10	1,020				
	Total				2,350		12,381
Private Power Company	GS Donghae Power	Donghae Bukpyung Unit 1	595	-	82	1,552	5
		Donghae Bukpyung Unit 2	595				
Coal Cogen.	Hyundai Energy	Yeosu Cogen.	48.4	-	100	N/A	N/A
	Hanwha Energy	Yeosu Coal Cogen.	250	60	-	N/A	N/A
		Gunsan Coal Cogen.	123 ⇔ 222		-		
Sub-total				2,410	182	-	-
Total				2,592 (USD 2,294 million)		-	-

loans amounting, in total, approximately KRW 1.9 trillion (approximately, USD 1.7 billion) (See Table 8.). KDB mainly supported new coal power plants by extending project finance loans to private companies. Whereas the NPS financially supported new coal power plants mostly by subscribing KEPCO Genco bonds, KDB or KIAMCO has not invested in KEPCO Genco bonds.

Despite its extensive investments in coal power, KDB, at the same time, is an accredited entity of the Green Climate Fund, since December 14, 2016. Nevertheless, on December 27, 2016, less than two weeks after being accredited, KDB entered into financing agreements providing project finance loans for the Gosung Hai power plant (2,080 MW). As can be seen in Table 8., KDB and KIAMCO lent KRW 30 billion (USD 26.5 million) and KRW 350 billion (USD 309.7 million), respectively, to Gosung Green Power

Co., Ltd., the owner of the aforementioned project. In addition to the loans and bond subscriptions described above, 'KIAMCO Power Energy Private Placement Special Asset Investment Trust No. 3,' a fund operated by KIAMCO, holds 97.7% equity of Gosung Green Power Co., Ltd., the project company developing the Gosung Hai coal power plant (2,080 MW).

## B. Arranging Loans

Further to supporting coal-fired power plants through loans and bonds, KDB has been active in arranging (i.e., facilitating and leading a group of lenders in a syndicated loan) syndicated loans for such projects, and has collected large arrangement fees for such activities (See Table 9.). In total, KDB has arranged approximately KRW 3.8 trillion (approximately USD 3.4 billion) of finance for the Target

Table 8. KDB and KIAMCO Financing of Domestic Coal Power Plants

(Unit: KRW billion)

Company	Unit	Capacity (MW)	KDB		KIAMCO		
			Bond	Loan	Bond	Loan	
Private Power Company	GS Donghae Power	Donghae Bukpyung Unit 1	595	-	77	-	-
		Donghae Bukpyung Unit 2	595				
	Gosung Green Power	Gosung Hai Unit 1	1,040	-	30	-	350
		Gosung Hai Unit 2	1,040				
	Total			-	107	-	350
						457	
Coal Cogen.	Hyundai Energy	Yeosu Cogeneration	48.4	-	55	-	-
	Hanwha Energy	Yeosu Coal Cogeneration	250	90	269	-	-
		Gunsan Coal Cogen.	123 ⇔ 222				
	Gunjang Energy	Gunjang Cogeneration	86 ⇔ 395	-	749	-	-
	Gimcheon Energy Service	Gimcheon Coal Cogen.	59	-	86	-	18.5
	OCI SE	Saemangeum Coal Cogen.	303	-	17	-	-
	GS Pocheon Green Energy	Pocheon Cogeneration	160	-	12	-	120
	Total			90	1,187	-	139
						1,415	
Sub-total			90	1,294	-	489	
Total			1,873 (USD 1,657 million)				

Table 9. List of Target Coal Power Projects arranged by KDB

Company	Project	Total Finance Provided (KRW billion)	(Initial) Loan Close Date	Arrangement Fees			
				Fee Rate	Total Fees (KRW million)	Fees Allocated to KDB (KRW million)	
Private Power Company	GS Donghae Power	Donghae Bukpyung	1,552	2014. 8. 21.	0.85%	13,195	11,215
Coal Cogeneration	Hyundai Energy	Yeosu Cogen.	390	2011. 7. 29.	1.10%	4,950	4,547
	Gunjang Energy	Gunjang Cogen.	400	2014. 6. 30.	0.65%	2,600	2,210
	Gimcheon Energy Service	Gimcheon Coal Cogen.	175	2012. 2. 8.	1.10%	1,923	1,534
	OCI SE	Saemangeum Cogen.	443	2013. 12. 27.	0.50%	2,213	1,788
		Saemangeum Cogen. Refinancing	443	2015. 10. 20.	0.45%	1,575	1,575
	GS Pocheon Green Energy	Pocheon Coal Cogen.	400	2016. 12. 22.	0.50%	2,000	2,000
Total Arranged Amount		3,802 (USD 3,365 million)	Total Arrangement Fee			24,869 (USD 22 million)	

Coal Power Projects.

### 3. Nonghyup Financial Holdings Affiliates

NFH's affiliates have financially supported the construction of the Target Coal Power Plants by either subscribing corporate bonds or extending loans amounting, in total, approximately KRW 3.9 trillion (approximately, USD 3.4 billion) (See Table 10.). The amount funded by NHF was the largest among amounts funded by Korean Public Financial Institutions. Among the NHF affiliates, financial support by NHIS was particularly high. NHIS subscribed KRW 2.6 trillion (USD 2.3 billion) of bonds issued in Korean Won, and USD 86 million of bonds issued in US dollars, which in total is approximately USD 2.4 billion (KRW 2.7 trillion), for the construction of the Target Coal Power Plants.

### 4. Korea Post

Korea Post has financially supported the construction of the Target Coal Power Plants by

subscribing corporate bonds or extending loans amounting, in total, approximately KRW 455 billion (approximately, USD 402 million) (See Table 11.). In addition to the amount mentioned above, Korea Post invested in 'KIAMCO Power Energy Private Placement Special Asset Investment Trust No. 3,' which holds 97.7% equity in the Gosung Hai coal power plant (2,080 MW).

### 5. Industrial Bank of Korea

IBK has financially supported the construction of the Target Coal Power Plants by either subscribing corporate bonds or extending loans amounting, in total, approximately KRW 604 billion (approximately, USD 535 million) (See Table 12.).

### 6. Korea Teacher's Credit Union

KTCU has subscribed KRW 20 billion (approximately, USD 17.7 million) of Korea Western Power bonds issued for the construction of a new coal power plant.



Table 10. NHF Affiliate Financing of Domestic Coal Power Plants

Company	Unit	Domestic Bond Subscription (KRW billion)				International Bond Subscription (USD million)	Loan (KRW billion)			
		NH Life	NH Bank	NH Insurance	NHIS	NHIS	NH Life	NH Bank	NACF	
KEPCO Genco	Korea Southern Power	Samcheok Green Unit 1	150	-	10	675	-	-	-	-
		Samcheok Green Unit 2								
	Korea Western Power	Taeon Unit 9	-	-	-	150	-	-	-	-
		Taeon Unit 10								
	Korea South-East Power	Yeunghung Unit 5	10	-	20	634	11	-	-	-
		Yeunghung Unit 6								
		Yeosu Unit 1								
		Yeosu Unit 2								
	Korea Midland Power	Shinboryoung Unit 1	40	-	10	380	40	-	-	-
		Shinboryoung Unit 2								
		Shinseocheon Unit 1								
	Korea East-West Power	Dangjin Unit 9	90	50	30	766	35	-	-	-
Dangjin Unit 10										
Private Power Company	GS Donghae Power	Donghae Bukpyung Unit 1	-	-	-	-	-	131	-	-
		Donghae Bukpyung Unit 2								
	Gosung Green Power	Gosung Hai Unit 1	-	-	-	-	-	290	-	-
		Gosung Hai Unit 2								
	Gangreung Eco Power	Gangreung Anin Unit 1	-	-	-	-	-	100	-	-
		Gangreung Anin Unit 2								
Coal Cogen.	Hanwha Energy	Yeosu Coal Cogen.	-	-	-	-	-	-	5	-
		Gunsan Coal Cogen.								
	Gunjang Energy		-	-	-	-	-	-	102	-
	Gimcheon Energy Service	Gimcheon Coal Cogen.	-	-	-	-	-	9	-	10
	OCI SE	Saemangeum Coal Cogen.	-	-	-	-	-	10	20	-
	GS Pocheon Green Energy	Pocheon Cogeneration	-	-	-	-	-	26	39	-
Sum		290	50	70	2,605	86	566	166	10	
Sub-total		3,015				86 (KRW 97 billion)	742			
Total		KRW 3,854 billion (USD 3,410 million)								

**Table 11. Korea Post Financing of Domestic Coal Power Plants**

(Unit: KRW billion)

Company		Unit	Capacity (MW)	Bonds	Loan
KEPCO Genco	Korea Southern Power	Samcheok Green Unit 1	1,022	95	-
		Samcheok Green Unit 2	1,022		
	Korea Western Power	Taeon Unit 9	1,050	20	-
		Taeon Unit 10	1,050		
	Korea South-East Power	Yeunghung Unit 5	870	149	-
		Yeunghung Unit 6	870		
		Yeosu Unit 1	350		
		Yeosu Unit 2	350		
	Korea Midland Power	Shinboryoung Unit 1	1,000	30	-
		Shinboryoung Unit 2	1,000		
		Shinseocheon Unit 1	1,000		
	Korea East-West Power	Dangjin Unit 9	1,020	76	-
Dangjin Unit 10		1,020			
Private Power Company	Gosung Green Power	Gosung Hai Unit 1	1,040	-	1
		Gosung Hai Unit 2	1,040		
Coal Cogen.	Hyundai Energy	Yeosu Cogeneration	48.4	-	19
	Hanwha Energy	Yeosu Coal Cogeneration	250	50	-
		Gunsan Coal Cogen.	123 ⇔ 222		
Sub-Total				419	35
Total				455 (USD 402 million)	

## 7. Government Employee Pension

GEP has financially supported the construction of the Target Coal Power Plants by subscribing corporate bonds amounting, in total, KRW 30 billion (approximately, USD 26.5 million) (See Table 13.).

Table 12. IBK Financing of Domestic Coal Power Plants

(Unit: KRW billion)

Company	Unit	Capacity (MW)	IBK Affiliates	IBK		
			Bonds	Bonds (incl. USD bonds)	Loans	
KEPCO Genco	Korea Southern Power	Samcheok Green Unit 1	20	20	-	
		Samcheok Green Unit 2				1,022
	Korea Western Power	Taeon Unit 9	1,050	60	-	-
		Taeon Unit 10	1,050			
	Korea Southeast Power	Yeunghung Unit 5	870	71	40	-
		Yeunghung Unit 6	870			
		Yeosu Unit 1	350			
		Yeosu Unit 2	350			
	Korea Midland Power	Shinboryoung Unit 1	1,000	60	10	-
		Shinboryoung Unit 2	1,000			
		Shinseocheon Unit 1	1,000			
	Korea East-West Power	Dangjin Unit 9	1,020	30	109	-
		Dangjin Unit 10	1,020			
	IPP	GS Donghae Power	Donghae Bukpyung Unit 1	-	-	82
Donghae Bukpyung Unit 2			595			
Coal Cogen.	Gunjang Energy	Gunjang Cogen.	86 ⇔ 395	10	-	-
	Gimcheon Energy Service	Gimcheon Coal Cogen.	59	-	-	38
	OCI SE	Saemangeum Coal Cogen.	303	-	-	55
Sub-Total			251	179	175	
Total			604 (USD 535 million)			

Table 13. GEP Financing of Domestic Coal Power Plants

Company	Unit	Capacity (MW)	Operation Date
Korea Midland Power	Shinboryoung Unit 1	1,000	20
	Shinboryoung Unit 2	1,000	
	Shinseocheon Unit 1	1,000	
Korea East-West Power	Dangjin Unit 9	1,020	10
	Dangjin Unit 10	1,020	
Total			30 (USD 27 million)

# IV. Korea Public Financial Institution Support of Overseas Coal Power Plants

## 1. Korea Export Import Bank

KEXIM has financially supported the construction of overseas coal power plants by extending project finance loans amounting, in total, approximately USD 4.5 billion (approximately, KRW 5.1 trillion) (See Table 14.). This amount is not inclusive of the amount of financial support provided as export credits.<sup>18</sup>

This is by far the largest amount of funding provided to support new coal power plants among Korean Public Financial Institutions.

Most of such investments were made, despite the

outdated and environmentally harmful technologies applied to the plants. Table 15. provides details of the air pollution prevention standards applied to such plants. The environmental design standards applied to the Cirebon I and II power plants in Indonesia were more than ten times higher than those applied to power plants in Korea, which means that such plants would emit that much more pollutants compared to new coal power plants in Korea. The National Assembly has requested KEXIM several times to disclose the air pollutant emission

Table 14. KEXIM Financing of Overseas Coal Power Plants

Country	Project Name	Export Credit Provided	Export Credit Amount	Loan Agr't Executed	Parties participating in project	Total Loan (contemplated) Amount (USD million)
Indonesia	Cirebon 1	0	Not disclosed	0	Doosan Heavy, KOMIPO, Samtan	238
	Cirebon 2	0	Not disclosed	0	Hyundai Const., KOMIPO, Samtan	522
Vietnam	Mong Duong 1	0	Not disclosed	0	Hyundai Construction	510
	Mong Duong 2	0	Not disclosed	0	Doosan Heavy, PoscoPower	589
	Thai Binh 2	0	Not disclosed	0	Daelim Corporation	600
	Vinh Tan 4	0	Not disclosed	0	Doosan Heavy	455
	Song Hau	0	Not disclosed	0	Doosan Heavy	480
Chile	Cochrane	0	Not disclosed	0	POSCO E&C	100
India	Mundra UMPP	0	Not disclosed	0	Doosan Heavy	700
Morocco	Jorf Lasfar	0	Not disclosed	0	Daewoo E&C	EUR 260 million (USD 308 million)
<b>Total</b>						<b>USD 4,502 million (KRW 5.1 trillion)</b>

<sup>18</sup> Despite the National Assembly's request to KEXIM to disclose the amount of export credits provided to the Target Coal Power Plants, KEXIM has not disclosed such amounts.

standards applied to coal power plants financed by KEXIM other than those described in Table 15., but KEXIM has refused to do so.

Furthermore, some of such investment decisions were made despite certain legal conditions for the project were not met. Namely, KEXIM entered into the financing agreement for the Cirebon 2 project on April 18, 2017, just one day before the Bandung Administrative District Court ruled to revoke the environmental permit issued by the BPMPT (West Java Regional Government) for such plant. In connection thereof, the National Assembly has requested KEXIM certain data, including a copy of the Bandung Administrative District ruling on the validity of the aforementioned permit, but has not yet received any responses thereto.

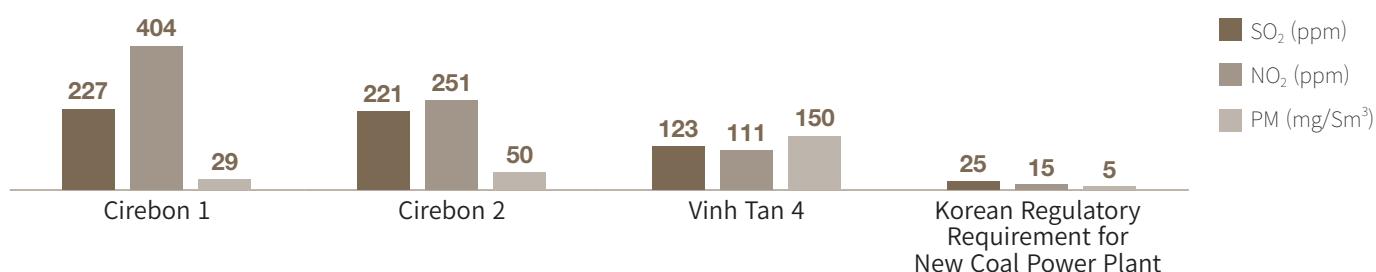
## 2. Korea Trade Insurance Corporation

K-SURE has financially supported the construction of the overseas coal power plants by providing trade insurance amounting, in total, approximately USD 3.6 billion (approximately, KRW 4 trillion) (See Table 16.). This is the second largest amount of financial support provided by an individual public financial institution for new coal power plants.

## 3. Korea Development Bank

KDB and KIAMCO have financially supported the two overseas coal power plants described in Table 17, by providing loans or investing in equity, in total, approximately USD 251 million.

**Table 15. Air Pollutant Emission Design Standards Applied to KEXIM financed Coal Power Plants**



**Table 16. K-SURE Financing of Overseas Coal Power Plants**

Country	Year	Project Name	Project Company	Export Credit Amount (USD million)	Participating Korean Companies
Vietnam	2010	Mong Duong 2	AES VCM Mong Duong Power Company	671	Doosan Heavy (EPC) POSCO Power (equity)
	2013	Vinh Tan 4	EVN	455	Doosan Heavy (EPC)
	2016	Long Phu 1	PVN	122	KC Cottrell & 5 other companies (EPC)
	2015	Song Hau 1	PVN	518	Doosan Heavy (EPC)
Chile	2008	Angamos	Empresa Electrica Angamos SA	677	POSCO E&C(EPC)
	2012	Cochrane	Empresa Electrica Cochrane SA	249	POSCO E&C(EPC)
India	2008	Mundra UMPP	Coastal Gujarat Power Ltd	310	Doosan Heavy (EPC)
Turkey	2012	Tufanbeyli	Enerji SA	578	SK E&C(EPC)
<b>Total</b>				<b>USD 3,580 million (KRW 4 trillion)</b>	

Table 17. KDB Financing of Overseas Coal Power Plants

Feature	KDB	KIAMCO
Country	Indonesia	Australia
Project	Kalsel-1 Coal Power Project	Millmerran Coal Power Project
Capacity	200 MW	851 MW
Loan or Investment Date	Nov. 24, 2016	Nov. 11, 2013
Type of Support	Loan	General Partner of Equity-holding Fund
Amount of Support	USD 189 million	KRW 70 billion (approximately USD 62 million)
Total	USD 251 million	

# V . Bills Restricting Coal Finance Pending in National Assembly

Korean Public Financial Institutions have extensively financed both domestic and overseas coal fired power plants. Such state of financing has led to active discussions within the National Assembly to introduce restrictions on coal financing by Korean public financial institutions. For example, during the recent National Assembly audit of the aforementioned Korean Public Financial Institutions,

the following discussions on financing coal projects took place.

In relation to such discussions, Assemblywoman Baesook Cho has proposed bills amending the National Pension Act,<sup>19</sup> the Korea Development Bank Act<sup>20</sup> and the Korea Export Import Bank Act,<sup>21</sup> all of which are currently pending in the National Assembly. Details of the amendment bills can be

Table 18. Comments on Coal Finance Raised during 2017 National Assembly Audit

Date	Assembly Member	National Assembly Committee	Audited Organization	Summary of Discussions
Oct. 12, 2017	Baesook Cho	Industry, Trade and Energy etc. Committee	Ministry of Trade, Industry and Energy (“MOTIE”)	Assemblywoman Cho criticized the state of financing of coal power plants, and requested MOTIE to discuss the issue at the Economy Related Ministers Meeting. Woonkyu Paik, the Minister of Trade, Industry and Energy, responded that the support by public financial institutions of coal projects will be reduced and that the matter will be referred to the aforementioned meeting.
Oct. 19, 2017	Jungbae Chun	Welfare and Health Committee	NPS	Assemblyman Chun stated that it is inappropriate for the NPS to invest in coal, referring to how CalPERS and the Norwegian Government Pension Fund Global are reducing their coal investments. Wonhee Lee, Chairman of NPS stated that she would seriously look into the relevant status.
Oct. 23, 2017	Kwanyoung Kim	National Policy Committee	KDB	Assemblyman Kim stated that it is inappropriate for KDB, which at the same time is a GCF Accredited Entity to invest in coal. Dong-Geol Lee, Chairman of KDB agreed and responded that he would determine whether to invest or not depending on government instructions.
Oct. 24, 2017	Juhyeon Park	Strategy and Finance Committee	KEXIM	Assemblywoman Park requested to reduce KEXIM’s financing of coal projects referring to research results indicating Korean public financial institutions as one of the top financers of coal power. Seungsoo Eun, Chairman of KEXIM, agreed to such request.

19 Agenda No. 2007080, Draft Amendment to National Pension Act (May 30, 2017)  
 20 Agenda No. 2007078, Draft Amendment to Korea Development Bank Act (May 30, 2017)  
 21 Agenda No. 2007079, Draft Amendment to Korea Export Import Bank Act (May 30, 2017)

found in Table 19.

More specifically, the National Pension Act amendment bill obliges the NPS to consider the environment when making certain types of investment decisions, and reflect how it will consider such factors in its Fund Management Guidelines. Similarly, the Korea Development Bank Act and Korea Export Import Bank Act amendment bills require KDB and KEXIM to consider the environment when making investment decisions,

and reflect such in its internal business guidelines. Although the aforementioned amendment bills do not literally prohibit the three banks from financing coal power projects, they impose substantial political pressure on the relevant public financial institutions, by sending a clear message that future investments in coal power projects will be scrutinized and may lead to stronger restrictions on coal power investments.

Table 19. Amendment Bills Restricting Coal Finance

Legislation	Current Provision	Provision in Amendment Bill
National Pension Act	<p>Art. 102. (Management and Operation of the Fund)</p> <p>Para. 4. When managing and operating the Fund pursuant to Paragraph 2, Item 3, factors such as the environment, society and governance etc. relating to the investment target may be considered for the long term and stable increase of profits.</p>	<p>Art. 102. (Management and Operation of the Fund)</p> <p>Para. 4. When managing and operating the Fund pursuant to Items 1 to 3 and Item 7 of Paragraph 2, factors such as the environment, society and governance etc. relating to the investment target etc. shall be considered for the long term and stable increase of profits.</p>
	<p>Art. 105. (NPS Management Guidelines)</p> <p>Para. 1. The Management Committee shall annually establish National Pension Fund Management Guidelines covering the following items in order to maximize the rights and profits of pensioners.</p> <p>Item 6. &lt;New Item&gt;</p>	<p>Art. 105. (NPS Management Guidelines)</p> <p>Para. 1. The Management Committee shall annually establish National Pension Fund Management Guidelines covering the following items in order to maximize the rights and profits of pensioners.</p> <p>Item 6. Standards and means to consider environment, society and governance etc. pursuant to Art. 102, Para. 4.</p>
Korea Development Bank Act	<p>Art. 18 (Business)</p> <p>Para. 4. &lt;New Paragraph&gt;</p>	<p>Art. 18 (Business)</p> <p>Para. 4. When performing the businesses between Items 1 to 3, and Item 9 of Para. 2, factors such as the environment, society and governance etc. shall be considered pursuant to the business standards determined by the Presidential Decree.</p>
	<p>Art. 18 (Business)</p> <p>Para. 8. &lt;New Paragraph&gt;</p>	<p>Art. 18 (Business)</p> <p>Para. 8. When KEXIM performs the businesses provided in Items 1 to 3 and Item 9 of Para. 2, Paras. 5 and 7, factors such as the environment, society and governance etc. related to the area the finance is supplied shall be considered and the relevant business standards shall be determined in the Presidential Decree.</p>
	<p>Art. 21. (Approval of Business Plans)</p> <p>Para. 2. The Business Plan stated in Para. 1. shall include a fund supply plan and a fundraising plan.</p>	<p>Art. 21. (Approval of Business Plans)</p> <p>Para. 2. The Business Plan stated in Para. 1. shall include a fund supply plan reflecting the business standards provided in Art. 18, Para. 8. and a fundraising plan.</p>



# VI. Conclusions

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Our analysis clearly shows that Korean Public Financial Institutions have been a strong financial supporter of dirty coal power plants both domestically and internationally. Korean Public Financial Institutions have provided in total, approximately USD 16.7 billion of financial support for the aforementioned coal power projects – respectively, approximately USD 8.3 billion for both domestic and overseas coal power projects. Given the negative air pollution and climate change impacts of coal power, the falling cost of renewables, and the significant decline in global investments in coal, it is financially prudent for Korean Public Financial Institutions to move away from coal power. The passage of the three amendment bills may provide a clear signal to Korean Public Financial Institutions to do so. In future research, SFOC plans to conduct further analyses, including the following, to help persuade Korean Public Financial Institutions to refrain from financing coal power projects.

- **Analysis on potential cost impacts to coal power if climate and air pollution externalities are internalized.** One of the most important reasons coal power could prosper in Korea was weak air pollution and climate regulations. We plan to study the additional cost coal power should pay in case such externalities are reflected into the power pricing system.
- **Analysis on the potential negative impact of coal investments on Korean Public Financial Institutions.** Although there has been a lot of discussion on the negative impacts of coal, there has not been much discussion on how Korean Public Financial Institutions can be financially affected by investing in coal, especially if the externalities discussed above are reflected into the power market.



SFOC is a non-profit based in Seoul, Korea, advocating stronger climate and air policies. SFOC is led by climate change related legal, economic and financial experts, with deep expertise in the power sector, decarbonization and in environmental policy.

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