

2018 탈석탄 친환경 에너지전환 국제 컨퍼런스

2018 International Conference on
Coal Phase-out and Energy Transition

세션 1 - 한국 공적금융기관의 국내외
석탄금융 문제점

주최  충청남도
Chungcheongnam-do

주관  충남연구원
ChungNam Institute

후원  환경부
Ministry of Environment

 KDI 국제정책대학원
KDI School of Public Policy and Management

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Program

일정

10.01 (월)

session 1

'한국 공적금융기관의 국내외 석탄금융 문제점' /
그린피스, 환경운동연합, 기후솔루션

주제 : '한국 공적금융기관의 국내외 석탄금융의 문제점'

KEXIM, KSURE, KDB 등 한국 공적금융의 해외 화석연료투자의 규모는 중국, 일본에 이어 세계에서 세번째로 많은 규모임. 기후 변화와 대기오염 등 국제적인 환경문제가 대두되면서 한국에서도 '해외석탄금융'에 대한 경각심이 고조되고, 인식이 증진되고 있음. 한국이 국내에서는 탈석탄을 선언하고, 신규 석탄발전 금지, 운전 중 석탄발전 환경기준 및 설비강화, 노후석탄발전소 조기폐지 등을 시행하고 있는 상황에서, 해외 석탄발전에 적극적으로 투자하고, 오히려 국내보다 더 낮은 환경기준 등을 용인하는 것은 대기오염과 기후변화, 현지 환경 및 건강 피해 측면에서 문제가 있음. 이에 한국 공적금융의 국내외 석탄금융을 중단할 것을 정부에 요청할 필요가 있음

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Program

일정

10.01 (월)

세션 1 01.Oct (Mon)		
(KST)	Program	Speaker
14:00	오프닝 축사 : 김춘이 부총장, 환경운동연합 사회 : 손민우 캠페이너, 그린피스 국제대기오염팀	
14:20	발제1 : 한국 공적금융의 국내외 석탄투자 현황과 문제점 - 기후솔루션	김주진 대표
14:40	발제2 : 한중일의 해외 석탄공적금융 현황 - NRDC	HAN CHEN 국제기후정책팀 연구원
15:00	발제3 : 한국 공적금융의 석탄투자로 인한 구체적인 피해사례 - WALHI(인도네시아)	DWI SAWUNG 활동가
15:30	커피 브레이크	
15:50	토론 : 석탄금융의 경험과 대안 (60분) (토론좌장 : 김춘이 부총장, 환경운동연합)	(각 10분씩)
	이지연 국장, 환경운동연합 에너지국 송한나 활동가, JACSES(일본) 지속가능개발프로그램팀 빈누 제야쿠마 디렉터, 펌비나연구소(캐나다) 전기프로그램팀 이종오 사무국장, 사회책임투자포럼 장마리 캠페이너, 그린피스 기후에너지팀	
16:50	질의응답	
17:10	시민사회 공동선언문 - 한국정부의 국내외 석탄금융 중단 요구	
17:25	종료	





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발제 1

한국 공적금융의 국내외 석탄투자 현황과 문제점
- 기후솔루션(SFOC)

2018 탈석탄
친환경 에너지전환 국제 컨퍼런스

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Preventing Coal Power Financing by Korean Institutions

Joojin Kim

October 1, 2018

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State of Overseas Coal Financing



January 2018 Statement to National Assembly by Ministry of Trade, Industry and Energy (MOTIE) on Coal Financing

(위원장 : 김상환)

<질 의>
공적금융기관의 석탄화력사업 금융지원 제한에 관한 산업부의 입장

- 국내 공적 금융기관들도 국내·외 투자시 환경, 사회적 책임 및 지배구조 등에 보다 많은 관심을 가져야 한다는 취지에 동참함
- 지난해 말 발표한 8차 전력수급기본계획의 경우, 신규 석탄발전소 건립을 원칙적으로 금지하고 있는 바, 공적 금융기관의 국내 석탄발전 투자에 대한 금융지원 규모는 향후 크게 줄어들 것으로 전망됨
- 아울러, 해외 석탄발전 사업에 대한 금융 지원의 경우, '15.11월 OECD 합의 결과('17.1월 발효)에 따라, 기술수준, 개도국 여부 등의 기준에 맞춰 수출 신용 지원에 제한을 두고 있는 바,
 - 현재 우리나라의 공적 금융기관들도 이에 따르고 있는 것으로 파악됨
- 다만, 해외 석탄사업에 관해 현재 OECD 합의 수준을 넘어서는 수출 신용제한을 두거나 또는 국내 석탄사업에 대해 새로운 금융제한을 마련하는 정책에 관해서는
 - 산업부가 발전사, 건설사 등 관련 업계로부터 현황 및 애로사항을 지속적으로 파악중에 있으며
 - 향후 관련 입법(산업은행법, 수출은행법, 국민연금법 등) 논의과정에서 관계부처(기획재정부, 금융위) 등과 심도있게 협의하고, 추후 종합방안을 마련토록 하겠음

- “As new coal power plants are, in principle, prohibited, public financial institution support for domestic coal projects will significantly reduce”
- Korean public financial institutions are following OECD guidelines
- However, with regard to financing restrictions exceeding the OECD guidelines, MOTIE is currently and constantly looking into concerns and status from power utilities and construction companies, and will deeply consult with relevant ministries (Ministry of Finance, Financial Supervisory Commission etc.) about corresponding measures

Sector Understanding on Export Credits for Coal-Fired Electricity Generation Projects (Nov. 27, 2015) – Eligibility

Table 1
Maximum repayment terms

	PLANT UNIT SIZE (gross installed capacity)	Unit > 500 MW	Unit ≥300 to 500 MW	Unit < 300 MW
초초임계압 (초고효율)	Ultra-supercritical (i.e., with a steam pressure >240 bar and ≥593°C steam temperature), OR Emissions < 750 g CO ₂ /kWh	12 years ¹	12 years ¹	12 years ¹
초임계압 (고효율)	Supercritical (i.e., with a steam pressure >221 bar and >550°C steam temperature), OR Emissions between 750 and 850 g CO ₂ /kWh	Ineligible	10 years, and only in IDA-eligible countries ^{1,2,3}	10 years, and only in IDA-eligible countries ^{1,2,3}
아임계압 (저효율)	Subcritical (i.e., with a steam pressure < 221 bar), OR Emissions > 850 g CO ₂ /kWh	Ineligible	Ineligible	10 years, and only in IDA-eligible countries ^{1,3}

Sector Understanding on Export Credits for Coal-Fired Electricity Generation Projects (Nov. 27, 2015) – Transitional Arrangements

- (1) 완성된 기술타당성보고서 및 환경/사회영향평가에 기초하여 2017. 1. 1. 이전에 RFP(Request for Proposal)가 발급되었고, (2) 해당 사업에 대한 수출신용제공신청이 이루어지고, 해당 신청에 대해 **즉각(expeditiously)** 조치한 경우에 대해서는 적용 제외 (두 가지 조건 모두 충족 필요)
- 수출입은행 등은 해당 사업에 대해 경과규정이 적용된다는 주장을 하나 관련된 명확한 근거를 제시하지 못함

7. TRANSITIONAL ARRANGEMENTS

The terms and conditions of this Sector Understanding are applicable to final commitments for goods and services covered by this Sector Understanding as of 1 January 2017, with the exception of those projects for which a request for proposals was issued prior to 1 January 2017, on the basis of a fully completed technical feasibility study and environmental and social impact assessment, and provided that an application for export credit support for any such project is submitted and acted upon expeditiously.

Recent ten year Coal Power Project Financing by KEXIM (submission to National Assembly, dated Sept. 2018)

Unit: USD million

Country	Project	NDA Date	Non-Binding MOU / LOI Date	Binding LOI Date	Loan Agr. Date	Korean Equity Holder or EPC	Amount Committed	Amount Executed
Indonesia	Cirebon 1	3/7/06	4/13/06	-	3/8/10	KOMIPO, Samtan, Doosan Heavy	238	238
	Cirebon 2	10/21/14	10/24/14	-	4/18/17	KOMIPO, Samtan, Hyundai E&C, Hyundai Engineering	521	1.5
Philippines	Naga	-	-	-	-	-	170	170
Vietnam	Mong Duong 1	7/21/11	-	7/26/11	3/13/13	Hyundai E&C	510	489
	Mong Duong 2	12/2/10	-	12/2/10	7/8/11	POSCO Energy, Doosan Heavy	589	589
	Thai Binh 2	2/21/11	2/21/11	-	12/9/13	Daelim	600	364
	Vinh Tan 4	12/11/12	-	12/24/12	10/29/14	Doosan Heavy	455	286
	Nghi Son 2	7/15/11	-	7/18/11	4/13/18	KEPCO, Doosan Heavy	935	-
	Song Hau	12/23/13	-	12/27/13	9/29/16	Doosan Heavy	480	-
Chile	Nueva Ventanas	3/16/07	-	-	6/8/07	POSCO E&C, Hyundai Engineering	50	49
	Cochrane	3/27/13	-	-	3/27/13	POSCO E&C	100	100
India	Mundra UMPP	11/3/06	-	11/10/06	4/24/08	Doosan Heavy, KEPCO ENC	700	557
Morocco	Jorf Lasfar	10/8/09	10/8/09	-	6/20/12	Daewoo Construction	290	290
Total							5638	

Coal Power Projects in KEXIM Pipeline (submission to National Assembly, dated Sept. 2018)

Country	Project	NDA Date	Non-Binding MOU / LOI Date	Binding LOI Date	Loan Agr. Date
Indonesia	Kalsel	8/31/16	9/12/16	-	-
Botswana	Moropule A	1/26/15	1/28/15	-	-
	Moropule B	1/15/15	-	6/25/15	-
Mongolia	Ulaanbaatar CHP5	3/6/12	11/21/11	-	-
Viet Nam	Vinh Tan 4 Expansion	10/23/14	-	10/24/14	-
	Long Phu 1	11/28/13	-	11/28/13	-
	Nam Dinh 1	2/3/15	12/7/11	2/6/15	-
	Vung Ang 3	1/15/14	-	1/17/14	-
Columbia	Santa Maria Colbun	9/23/09	9/23/09	-	-
Kazakhstan	Balkhash	10/20/08	10/22/08	-	-

- Cirebon 3, Moatize, Quynh Lap 2, Quang Tri 2 all do not appear to be in pipeline

Recent ten year wind / solar financing by KEXIM (submission to National Assembly dated Sept. 2018)

Unit: USD Million

Year	Country	Project	Type	Amount Financed
2016	Jordan	Fujeij	Wind	122

- Practically, only one wind project financed by KEXIM during past five years
- KEXIM renewable financing amount 46 times smaller than amount provided for coal power projects

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Recent ten year record of coal power financing by K-SURE (submission to National Assembly dated September 2018)

Country	Project	Export Credit Amount (Unit: million)	Export Credit Agreement Date	Loan Agreement Date	Korean Equity Holder or EPC	Loan Amount Committed	Loan Amount Executed
Indonesia	Kalsel	US\$485	'16.4.29	'16.11.24	East West Power (Equity)	US\$485	US\$354
Viet Nam	Mong Duong 2	US\$839	'11.06.17	'11.7.8	Posco Energy (Equity) Doosan Heavy (EPC)	US\$839	US\$839
	Vinh Tan 4	US\$455	'15.11.27	'14.10.29	Doosan Heavy (EPC)	US\$455	US\$282
	Vinh Tan 4 Extension	US\$341	'16.12.28	'17.4.27	Doosan Heavy (EPC)	US\$341	-
	Long Phu 1	US\$122	'16.12.20	No Loan Agr.	KC Cottrell et al. (EPC)	-	-
	Song Hau	US\$507	'17.12.08	'16.9.29	Doosan Heavy (EPC)	US\$507	-
	Nam Dinh 1	Projects Under Review					
	Quynh Lap 2						
Chile	Angamos	US\$677	'08.08.22	'08.10.	Posco E&C (EPC)	US\$677	US\$622
	Cochrane	US\$250	'12.12.27	'13.3	Posco E&C (EPC)	US\$250	US\$250
India	Mundra UMPP	US\$265	'08.4.16	'08.4.24	Doosan Heavy (EPC)	US\$327	US\$265
Turkey	Tufanbeyli	US\$578	'12.6.7	'12.7.25	SK E&C(EPC)	US\$578	US\$578
Total (Amount Committed)						US\$4459	

Renewable Power Financing by K-SURE (submission to National Assembly dated September 2018)

Country	Project	Type	Export Credit Amount (unit: million)	Date of Export Credit Agreement	Loan Agreement Date	Korean Equity Holder or EPC	Loan Amount Committed (Unit: million)	Loan Amount Executed (Unit: million)
China	Shaanxi	Biomass	US\$40	'10.07.21	'10.09.29	LG Corp. (Equity)	US\$40	US\$39
	Shandong		US\$37	'11.04.04	'12.01.18	GS EPS/ Eco Frontier (Equity)	US\$37	US\$37
Bulgaria	Zlataritsa / Samovodene	Solar	EUR101	'12.2.24	'11.3.9	Korea South East Power / SDN (Equity)	EUR101	EUR101
United Kingdom	Teesside	Biomass	GBP118	'16.8.25	'16.8.10	Samsung C&T (EPC)	GBP118	GBP118
Indonesia	Hasang	Hydro	US\$134	'16.9.28	'16.10	LG Corp. (Equity) Posco E&C (EPC)	US\$134	US\$111
Georgia	Nenskra	Hydro	US\$114	'18.2.27	No loan agreement	K-Water (Equity)	US\$114	-
Jordan	Daehan	Wind	Letter of Interest issued	N/A	N/A	Korea Southern Power / Daelim Energy (Equity)	-	-
	Round 3	Solar	Letter of Interest issued	N/A	N/A	KEPCO (Equity)	-	-
Turkey	Karapinar	Solar	NDA entered into	-	-	Hanwha Q-Cells (Equity)	-	-
Jordan	Ibris	Solar	Under Review					
Nepal	UT-1	Hydro	Under Review					

Specific issues relating to individual projects

- Mundra UMPP project is currently a financial disaster - value of project vehicle is approx. minus USD 1 billion
 - KEXIM and K-SURE state that the lender has been repaying its debts due to the “Sponsor Support Agreement” Tata Power has committed to (i.e., Tata is paying off the project vehicle’s debt)
- KEXIM and KEPCO have not been providing a clear answer on why or why not Nghi Son 2 is in violation of the OECD Sector Understanding
 - KEXIM has been refusing to respond to inquiries on EIA dates
- Cirebon projects have been subject to rumors of PPA adjustment
 - At the same time, the Indonesia Gov’t is sending signals that it will reduce its coal capacity
 - KOMIPO / KEXIM have responded that there have been no PPA amendment discussions

KEXIM / K-SURE project teams may have tried to hide such risks from risk management / legal compliance divisions within organizations – SFOC is trying to inform such divisions and put them in responsible positions



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부제 1

부제 2

부제 3

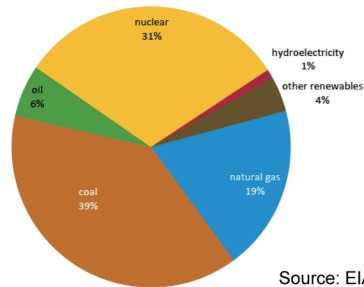
State of Domestic Coal Financing



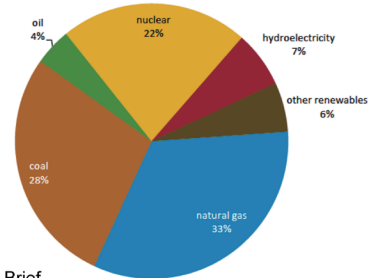
South Korean Power Sector Snapshot

Coal friendly power market environment is one of the reasons Korean bankers have a good impression of coal

Power Generation by Type (2015)



Installed Capacity by Type (2015)

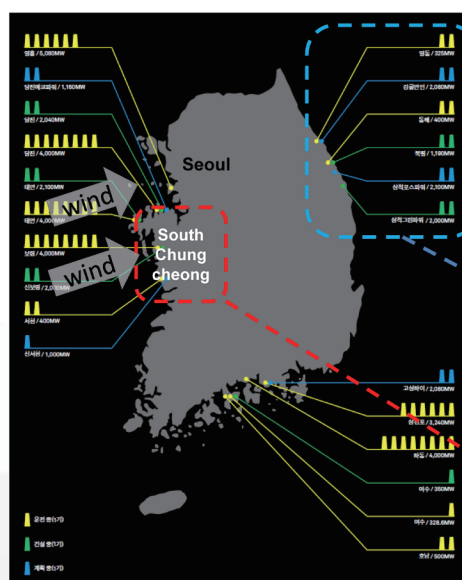


Source: EIA, Korea Country Analysis Brief

- **Expensive LNG:** gas combined plants at risk of becoming stranded
- **Free air pollution:** barely any cost for SO_x, NO_x emissions
- **Neutralized carbon price (K-ETS):** power market operator rules
- **KEPCO horizontal / vertical monopoly:** (i) generates 80% of power (coal, nuclear), (ii) 100% transmission network, (iii) controls power market
- **Consumer prices capped:** tough for renewable subsidies
- **KEPCO may be tempted to reduce renewable subsidies:** if fuel prices soar or its coal / nuclear plants lose dispatch because of solar

Political Economy of Coal in South Korea

As of Jan. 2018, sixty-one units (35 GW) under operation



- High level of air pollution – air pollution is a non-partisan issue
- Public impression of coal has drastically deteriorated in last 5 years
- Less environmental concerns with coal plants on east coast, as air pollutant emissions head towards East Sea – **region where four new coal units are under development**
- Half of coal capacity (thirty units, 18 GW) located in South Chungcheong Province – **strong local resistance against coal / proximity to Seoul**

New Coal Power Plants in Korea (Status as of June 2018)

10GW (11 units, 73MtCO₂e – 14% of 2030 target) added during one year period after Aug. 2016

Power Plan	Plant	Capacity (MW)	Project Owner	(Contemplated) Operation Date	Status
4th	Yeunghung Unit 5	870	Korea South-East Power	2014. 6.	Operating
4th	Yeunghung Unit 6	870		2014. 12.	
4th	Dangjin Unit 9	1,020	Korea East-West Power	2017. 1.	
4th	Dangjin Unit 10	1,020		2017. 5.	
5th	Bukpyung Unit 1	595	GS Donghae Power (GS, Korea East-West Power, Samtan)	2017. 3.	
5th	Bukpyung Unit 2	595		2017. 8.	
5th	Yeosu Unit 1	350	Korea South-East Power	2016. 8.	
4th	Samcheok Green Unit 1	1,022	Korea Southern Power	2016. 12.	
4th	Samcheok Green Unit 2	1,022		2017. 6.	
5th	Taeon Unit 9	1,050	Korea Western Power	2016. 10.	
5th	Taeon Unit 10	1,050		2017. 6.	
5th	Shinboryoung Unit 1	1,000	Korea Midland Power	2017. 6.	Under Construction
5th	Shinboryoung Unit 2	1,000		2017. 9.	
6th	Shinseochon Unit 1	1,000		2020. 3.	Under Construction
6th	Gangreung Anin Unit 1	1,040	Gangreung Eco Power (Samsung C&T, Korea South-East Power)	2022. 6.	Financed
6th	Gangreung Anin Unit 2	1,040		2022. 6.	
6th	Gosung Hai Unit 1	1,040	Gosung Green Power (SK Gas, SK Construction, Korea South-East Power)	2021. 4.	Under Construction
6th	Gosung Hai Unit 2	1,040		2021. 10.	
6th	Samcheok Unit 1	1,050	PosPower (POSCO Energy, Posco Construction, KDB Infra Asset Management)	2021. 12.	Financed
6th	Samcheok Unit 2	1,050		2022. 6.	



7GW (7 units, 50 MtCO₂e – 9% of 2030 target) to be added in early 2020s

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Korea Development Bank and Kookmin Bank Project Financing of New Domestic Coal

(Source: SFOC)

Power Plan	Project	Capacity (MW)	Owner	Project Cost (KRW trillion)	Loan Amount (KRW trillion)	Arranger	Status
5th	Bukpyung	1,190	GS E&R, East West Power, Samtan	2.3	1.55 (67%)	KDB	Under Construction
6th	Gosung Ha-Ee	2,080	SK Gas, SK E&C, Korea Southeast Power, KDB Infra	5.2	4.34 (83%)	Kookmin Bank + Shinhan Bank	
6th	Gangreung An-in	2,080	Samsung C&T, Korea Southeast Power	Approx. 5.5	Approx. 4.5 (82%)	Kookmin Bank	Appears to have been financed, but not much groundwork
6th	Samcheok	2,100	Posco Energy, Posco E&C, KDB Infra	Approx. 4.7	Approx. 3.8 (80%)	KDB	

- More than twenty banks, insurance companies and pension funds lined up to lend money to Gangreung and Samcheok Projects – sourcing KRW 8 trillion (USD 7 billion) is said to have been quite easy



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How such Project Finance takes place Donghae Bukpyung Case

Total Financing (KRW million)	Financier	Amounts financed (KRW million)	Ratio (%)
1,552,400 (KRW 1.5 trillion)	KDB Life	78,000	5.0
	KDB	86,700	5.6
	Nonghyup Life	131,200	8.5
	National Pension Service	82,100	5.3
	Industrial Bank	82,100	5.3
	Dongbu Fire and Maritime	37,800	2.4
	Lotte Insurance	49,100	3.2
	Busan Bank	31,200	2.0
	KB Life	131,200	8.5
	Samsung Life	177,500	11.4
	Samsung Fire and Maritime	128,900	8.3
	Saemaul	131,300	8.5
	Credit Coop	66,500	4.3
	Shinhan Life	10,200	0.7
	Allianze Life	10,200	0.7
	Woori Bank	82,100	5.3
	Hana Bank	82,100	5.3
	Hanwha Life	18,700	1.2
	Hyundai Maritime	37,800	2.4
	Heung-guk Life	68,800	4.4
	Heung-guk Fire	28,900	1.9

KRW 460 billion
(approx. 30%) provided
by public financial
institutions

KDB earned approx. KRW
11 billion as arranging fees

Arranging Fee Status		
Commission Rate	Total Commissions	KDB Commission
0.85%	KRW 13.1 billion	KRW 11.2 billion

KDB Response to National Assembly dated March 2018 on Coal Power Risk related Questions

It's the distorted power
market scheme and the
financier's reliance on such
kind of scheme that is
contributing to easy
financing for coal

박용진위원님께서는 향후 석탄화력의 수익률이 약화될 수 있다는
주장에 대한 산업은행의 견해에 대해 질의하셨습니다.

- 향후 석탄화력발전사업의 수익률이 약화될 수는 있으나, 현재
석탄화력발전사업은 변동비반영전력시장(CBP, Cost-Based
Pool) 하에서 발전원가가 상대적으로 저렴하여 가동률이 높
으며, "정산조정계수" 제도에 따라 일정 투자보수로 수익률을
보상받고 있습니다. 이에 따라 시장에서는 석탄화력발전사업을
저위험 저수익 사업으로 인식하고 있습니다.

**You have asked our opinion on arguments that profitability of coal power can
deteriorate.**

Although there is a possibility that the profitability of coal fired power plants may
deteriorate in the future, in the current cost-based pool market, (i) generation costs of
coal power projects are relatively low, and thus have a **higher dispatch rate**; and (ii)
due to the "settlement adjustment factor" coal plants are compensated at a **fixed
return rate**. Therefore, **the market considers coal fired power projects as low risk,
low return projects.**

Specific issues pursued

- Korean Banks do not K-ETS carbon prices when financing coal, on the basis that the Korean power market separately compensates utilities of such prices
 - However, the 8th Power Plan dated Dec. 2017 clearly states that such prices will be reflected in power dispatch
- Korean banks rely on the fixed rate compensation guarantee scheme (정산조정계수제도) made available under the Power Market Operation Rules
 - The rate available under the scheme is determined only after the power plants are constructed (e.g., 2022), and there is no assurance that the scheme will exist as is in the future
 - Nevertheless, KDB has responded that 'plants in the past had no problem being financed under the scheme and thus it is safe for it to finance new coal plants'
 - It is questionable whether KEPCO, the power purchaser, will be willing to resume such scheme if cheaper power sources become more and more available

KEPCO GenCo New coal power plants are mainly financed by corporate bonds

(Source: SFOC)

Company	Unit Name	Total Financing for Unit	National Pension Service Bond subscription		Nong-Hyup Bond subscription		Korea Post Bond subscription		Industrial Bank of Korea Bond subscription	
			Amount	Ratio(%)	Amount	Ratio(%)	Amount	Ratio(%)	Amount	Ratio(%)
Korea Southeast Power	Young-Heung 5	25,213	4,400	12.5	6,764	18.9	1,486	4.2	1,107	3.1
	Young-Heung 6	6,955								
	Yeosu 1	3,536								
	Yeosu 2	3,536								
Korea East West Power	Dangjin 9	15,730	4,100	20.2	9,755	62.0	760	4.8	1,388	8.8
	Dangjin 10	15,730								
Korea Southern Power	Samcheok Green 1	36,777	7,600	22.7	8,350	22.7	203	0.6	403	1.1
	Samcheok Green 2	36,777								
Korea Western Power	Tae-an 9	13,700	2,800	20.4	1,500	10.9	200	1.5	600	4.4
	Tae-an 10	13,700								
KOMIPO	Shin Boryoung 1	22,700	4,597	21.7	852	3.7	300	1.3	700	3.0
	Shin Boryoung 2	22,700								
	Shin Seocheon 1	596								
Total		123,805	23,497	18.98%	31,122	24.9%	3,692	3.0%	4,198	3.4%

(Unit: KRW 100 million)

2018 탈석탄 친환경 에너지전환 국제 컨퍼런스

2018 International Conference on Coal Phase-out and Energy Transition

KEPCO Gencos are usually rated AAA, mainly due to implied Korean Gov't guarantee (Excerpt from East West Power disclosure)

1. 모집 또는 매출에 관한 일반사항

회차 : 19-1

(단위 : 원, 주)

채무증권 명칭	무보증사채	모집(매출)방법	공모
권면총액	100,000,000,000	모집(매출)총액	100,000,000,000
발행가액	100,000,000,000	권면이자율	3.16
발행수익률	3.16	상환기일	2016년 07월 26일
원리금 지급대행기관	하나은행 삼성역기업센터지점	(사채)관리회사	한국증권금융(주)
신용등급 (신용평가기관)	AAA / AAA (한국신용평가(주)/NICE신용평가(주))		

인수인	증권의 종류	인수수량	인수금액	인수대가	인수방법
대표	케이비투자증권	-	2,000,000	인수수수로 : 0.20%	총액인수
인수	우리카자증권	-	3,000,000	인수수수로 : 0.20%	총액인수
인수	신한금융투자	-	2,000,000	인수수수로 : 0.20%	총액인수
인수	대우증권	-	1,000,000	인수수수로 : 0.20%	총액인수
인수	미래에셋증권	-	1,000,000	인수수수로 : 0.20%	총액인수
인수	아이비케이투자증권	-	1,000,000	인수수수로 : 0.20%	총액인수

- Very safe assets from investor perspective

Climate Risk Disclosure

How does KEPCO disclose its climate / environmental risks in the US (Securities and Exchange Commission)?

Listed companies are subject to risk factor disclosure requirements under relevant regulations

As filed with the Securities and Exchange Commission on April 28, 2017

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 20-F

Mark One

☐ REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR (g) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2016

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

☐ SHELL COMPANY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
Date of event requiring this shell company report
For the transition period from to

Commission File Number: 001-13372

KOREA ELECTRIC POWER CORPORATION
(Exact name of registrant as specified in its charter)

N/A
(Translation of registrant's name into English)

55 Jollyeok-ro, Naju-si, Jeollanam-do, 58217, Korea
(Address of principal executive office)

Yoon Hye Cho, +82 61 345 4213, yoonhye.cho@kepcor.co.kr; +82 61 345 4299
(Name, telephone, e-mail and/or facsimile number and address of company contact person)

Securities registered or to be registered pursuant to Section 12(b) of the Act:

Title of each class:
Common stock, par value Won 5,000 per share
American depositary shares, each representing one-half of share of common stock

Name of each exchange on which registered:
New York Stock Exchange*
New York Stock Exchange

KEPCO disclosure on market competition risks (incl. by renewable energy companies) dated April, 28, 2017

An increase in electricity generated by and/or sourced from private power producers may erode our market position and hurt our business, growth prospects, revenues and profitability.

As of December 31, 2016, we and our generation subsidiaries owned approximately 74.7% of the total electricity generation capacity in Korea (excluding plants generating electricity for private or emergency use). New entrants to the electricity business will erode our market share and create significant competition, which could have a material adverse impact on our financial condition and results of operations.

민간발전사업자에 의한 또는 이를 통한 전력생산증가는 우리의 시장에서의 위치를 침식할 수 있고, 우리의 사업, 성장전망, 수익 및 수익성을 해칠 수 있다.

2016년 12월 31일 현재, 당사 및 당사의 발전자회사는 한국 전체 발전용량의 약 74.7%를 소유하고 있다 (사적 또는 긴급용 발전소 제외). 발전사업에의 신규 진입자는 우리의 시장점유율을 침식할 수 있고 상당한 경쟁을 유발할 것인바, 이는 우리의 재정상황과 운영결과에 상당히 부정적인 영향을 미칠 수 있다.

KEPCO disclosure on climate and environment related risks (incl. by renewable energy companies) dated April, 28, 2017

We are subject to various environmental regulations and related government initiatives, including in relation to climate change, which could cause significant compliance costs and operational liabilities.

We are subject to national, local and overseas environmental laws and regulations, including increasing pressure to reduce emission of carbon dioxide from our electricity generation activities as well as our natural resource development endeavors overseas. Our operations could expose us to the risk of substantial liability relating to environmental, health and safety issues, such as those resulting from the discharge of pollutants and carbon dioxide into the environment and the handling, storage and disposal of hazardous materials.

기후변화와 관련된 사항을 포함하여, 우리는 다양한 환경 규제 및 관련 정부 시책의 적용을 받는바, 이는 상당한 준수비용 및 운영상 책임을 초래할 수 있다.

우리의 발전활동에서 이산화탄소 배출을 감축하라는 압력을 포함하여, 우리는 전국, 지역 및 해외에서의 환경법 및 규제의 적용을 받는다. 우리의 운영은, 환경으로의 오염물질 및 이산화탄소의 배출과 유해물질의 취급, 저장 및 처리에 기인하는 것을 비롯하여, 환경, 건강 및 안전 문제와 관련된 상당한 책임의 위험에 우리를 노출시킬 수 있다.

KEPCO's disclosure to the Korea Exchange (KRX) Currency risks are practically the only risks disclosed



Type of market risk : Currency risk

- Foreign currency bonds amount may fluctuate depending on currency
- Fuel import prices may change due to currency risk

[화력발전부문] / 대상회사 : 한국남동발전(주), 한국중부발전(주), 한국서부발전(주), 한국남부발전(주), 한국동서발전(주)

가. 주요 시장위험의 내용 및 영향

- 시장위험의 유형 : 환 위험
- 시장위험의 내용
 - 환율변동에 따른 외화차입금액 증감
 - 원재료(유연탄 등) 수입관련 환율변동에 따른 리스크 등
- 회사의 손익에 미치는 영향
 - 환율변동에 따른 외화부채 증감은 통화스왑 헤지로 손익 영향 최소화
 - 원재료 입고시 환율등락에 따른 연료가격 급등은 회사의 영업이익에 영향
 - 원재료 대금 결제시 환율등락에 따른 결제금액의 변동은 당기순이익에 영향을 줄수있음
- 나. 위험관리방식 등

위험관리의 일반적 전략	·위험을 최소화하는 보수적 환위험 관리 ·외환관련 세미나, 교육을 통해 외환 전문 역량 강화 ·외환전문가 감사 초빙 자문 ·관련부서 업무 공유로 외환거래 헤지 등
위험관리조직(방법)	·매분기 환위험관리위원회 개최(사외위원 포함 7~10명) ·헤지전략 및 헤지비용 등 환위험관리 계획 의결
파생상품과 관련 거래(규모) 제한 등	·환위험관리지침 및 환위험관리위원회가 의결한 헤지비용 범위 내에서 선물환 등 거래

KEPCO submission to National Assembly dated Feb. 19, 2018, re insufficient climate / environment risk disclosure

□ 국내 상장주식 관련내용, 특히 환경규제 및 기후변화 리스크 관련 내용을 미국 증권거래소 공시에 준하는 내용 후속 조치계획

- 2018년 3월말에 공시예정인 '17년도 사업보고서 공시부터 미국 증권거래위원회(SEC) 공시수준에 맞춰 국내에도 환경규제 및 기후변화 리스크 등을 포함하여 공시하겠습니다.
- 해외공시는 미국 증권거래법(SEC ACT)에 의거 투자자보호와 공정거래를 위해 투자판단에 미칠수 있는 중요한 사항을 포함하여 별도의 항목으로 공시하도록 되어 있으며, 국내공시는 리스크 관련 항목에 대한 강제조항이 없고, 자본시장법 및 기업공시 작성기준에서 요구하는 수준으로 작성하여 공시하고 있음.
- 국내공시의 경우 해외공시 연차보고서(Form-20F)내용의 한글요약본을 매년 4월말 동일한 내용으로 공시하고 있으며, 여기에는 정부정책, 환경규제, 금융상품 투자위험 등 리스크 관련 투자위험 내용이 사업내용 및 투자자보호 항목에 포함되어 있음.

• **KEPCO will disclose at the level equivalent to SEC disclosures beginning with its 2017 business report to be disclosed in Mar. 2018**

• KEPCO has made disclosures pursuant to the Korean Capital Markets Act, which does not have compulsory requirements on risk factors

• With regard to domestic disclosures, KEPCO discloses a Korean summary of its Form 20-F by the end of April each year, which includes environmental regulation, gov't policy related risks

SEC Interpretive Guidance on Disclosure related to Business or Legal Developments regarding Climate Change (January 2010)

The guidelines may be something the Financial Supervisory Service or the KRX might be able to consider

- 법률 및 규제에 의한 영향 (Impact of Legislation and Regulation)
- 국제협약으로 인한 영향 (Impact of International Accords)
- 규제 및 사업경향의 간접적 영향 (Indirect Consequences of Regulation or Business Trends) – 예를 들어 온실가스 다배출 사업의 수요 감소 등(석탄화력!)
- 기후변화의 물리적 영향 (Physical Impacts of Climate Change)

SEC Issues Interpretive Guidance on Disclosure Related to Business or Legal Developments Regarding Climate Change

FOR IMMEDIATE RELEASE
2010-15

Washington, D.C., Jan. 27, 2010 – The Securities and Exchange Commission today voted to provide public companies with interpretive guidance on existing SEC disclosure requirements as they apply to business or legal developments relating to the issue of climate change.

Federal securities laws and SEC regulations require certain disclosures by public companies for the benefit of investors. Occasionally, to assist those who provide such disclosures, the Commission provides guidance on how to interpret the disclosure rules on topics of interest to the business and investment communities. The Commission's interpretive releases do not create new legal requirements nor modify existing ones, but are intended to provide clarity and enhance consistency for public companies and their investors.

The interpretive release approved today provides guidance on certain existing disclosure rules that may require a company to disclose the impact that business or legal developments related to climate change may have on its business. The relevant rules cover a company's risk factors, business description, legal proceedings, and management discussion and analysis.

"We are not opining on whether the world's climate is changing, at what pace it might be changing, or due to what causes. Nothing that the Commission does today should be construed as weighing in on those topics," said SEC Chairman Mary Schapiro. "Today's guidance will help to ensure that our disclosure rules are consistently applied."

Specifically, the SEC's interpretive guidance highlights the following areas as examples of where climate change may trigger disclosure requirements:

- **Impact of Legislation and Regulations:** When assessing potential disclosure obligations, a company should consider whether the impact of certain existing laws and regulations regarding climate change is material. In certain circumstances, a company should also evaluate the potential impact of pending legislation and regulation related to this topic.
- **Impact of International Accords:** A company should consider, and disclose when material, the risks or effects on its business of international accords and treaties relating to climate change.

2018 탈석탄
친환경 에너지전환 국제 컨퍼런스

2018 International Conference on Coal Phase-out and Energy Transition



Thank you!
www.forourclimate.org

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답
제 1

답
제 2

답
제 3





2018 탈석탄 친환경 에너지전환 국제 컨퍼런스

2018 International Conference on Coal Phase-out and Energy Transition

세션 1 - 한국 공적금융기관의 국내외 석탄금융 문제점

발제 2

한중일의 해외 석탄공적금융 현황 - NRDC

Natural Resources Defense Council

Supporting a Global Shift to Low-Carbon Energy Financing



Han Chen
hchen@nrdc.org

Our Work

We undertake three major types of work to make progress against environmental challenges



SHAPING GLOBAL AGREEMENTS



DRIVING NATIONAL POLICY & IMPLEMENTATION



LEVERAGING THE PRIVATE SECTOR

3

NRDC International Work



SHAPING GLOBAL AGREEMENTS

- UNFCCC, Paris Agreement
- Montreal Protocol on HFCs
- Minamata Convention on Mercury
- High Seas treaty



DRIVING NATIONAL POLICY & IMPLEMENTATION

- China Coal Cap and Oil Cap
- Green Finance and Green Banks
- Restrictions on Biomass CCS
- India Renewable Energy



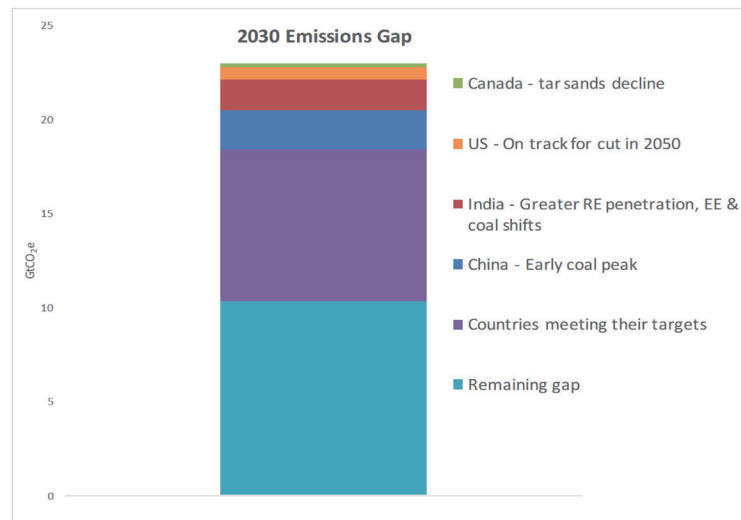
LEVERAGING THE PRIVATE SECTOR

- Boreal forest protection
- Clean By Design – supply chain
- HFCs
- Combat wildlife trade

4

A Strategy to Get on Track by 2030

- Progress in key countries & sectors can make a huge difference



5

A Moment of Opportunity (and Risk)

Opportunities

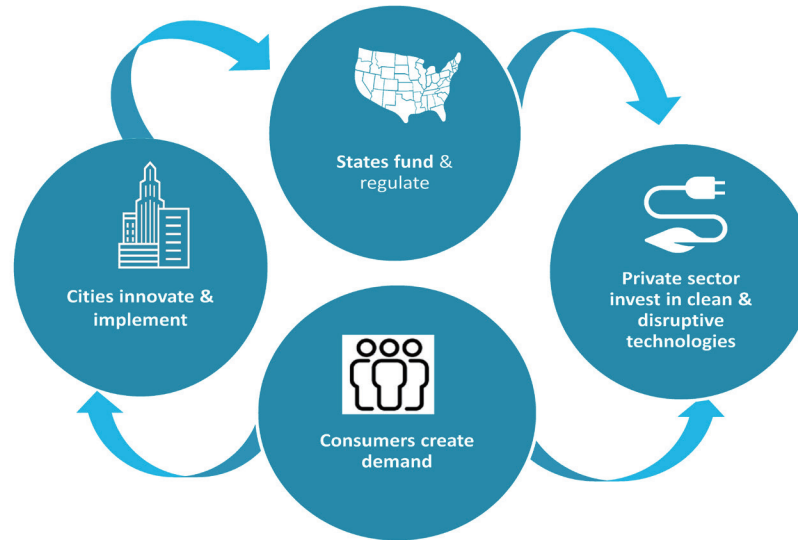
- Historic progress, public support and partner capacity reflected in Paris Agreement
- Major transformations in global energy sector (cheaper renewables, shifting economics of coal, and new transformations in energy efficiency)
- We have effective interventions at the city, state, and national levels
- Low-carbon is being mainstreamed by companies, investors, states/provinces, and cities
- Progress at US city, local, & business level

Risks and Barriers

- We need more aggressive action by all stakeholders (Paris targets not enough).
- U.S. climate inaction could slow motivation for domestic action in key countries
- Fossil fuel forces still trying to pull in opposite direction
- Massive coal power plant build-out still envisioned in many countries
- Financial investments aren't yet "Paris compatible"
- Next tranche of climate policies becomes harder

6

NRDC US Subnational Work

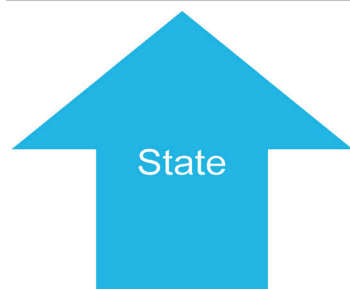


7

부제 1

부제 2

Policy & Market Alignment



Leverage cities and local partners for state-level renewables/energy efficiency policy advocacy and power-building on issues like:

- energy efficiency programs and investment
- renewable portfolio standards & procurement
- vehicle standards & EV infrastructure
- State & regional carbon markets
- Rate design & utility business models



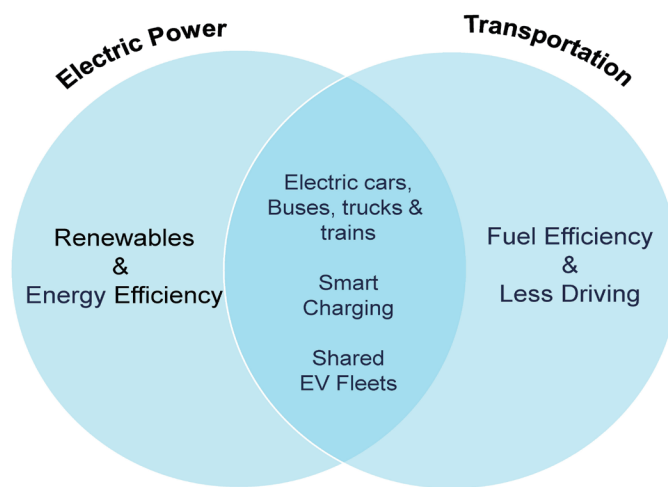
Build capacity and demand locally to create sustained change in areas cities can lead:

- Solar on municipal buildings; renewables procurement
- Utility-led or community renewables programs
- Deep energy efficiency retrofits
- Solar equity programs for disadvantaged communities

8

부제 3

Integrating Power & Transportation Efforts



9

Partnerships & Collaboration at Multiple Levels Local, State, Regional and Federal

- Government Networks
- Public Health Advocates and Professionals
- Social Equity and Environmental Justice Organizations
- Academic Partners
- Businesses and Industry trade associations
- Labor Unions
- Transit and Active Transportation Organizations
- Efficiency and Renewable Energy Organizations
- Environmental Justice Groups
- Clean Energy Groups & Coalitions
- Power Companies
- Consumer Advocates and Groups
- NGO Coalitions
- Utility Coalition

10

Shifting Financial Flows in the Energy Sector Globally

Public Finance Institutions



REPORT

POWER SHIFT:

SHIFTING G20 INTERNATIONAL PUBLIC FINANCE FROM COAL TO RENEWABLES

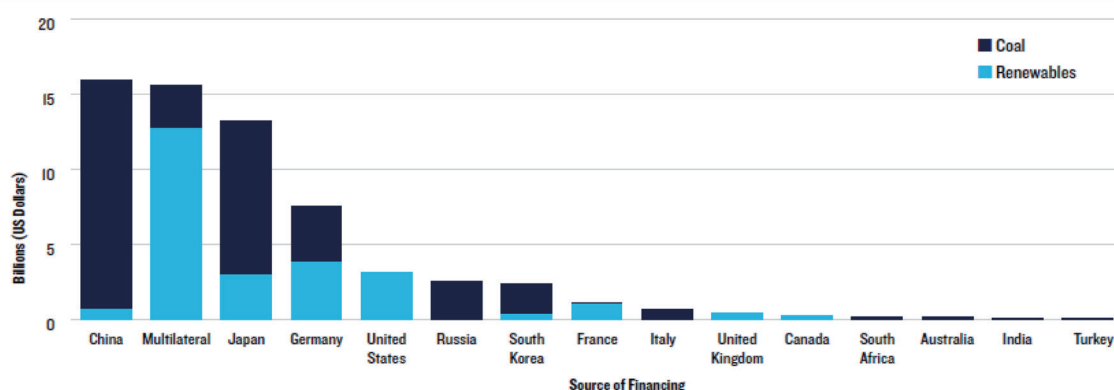
부제 1

부제 2

부제 3

Financing for Overseas Coal and Renewables (2013-2016)

FIGURE ESI: FINANCING BY G20 COUNTRIES FOR COAL AND RENEWABLE ENERGY PROJECTS ABROAD (2013-2016)



Source: NRDC Consolidated Coal and Renewable Energy Database 2017, based on data from various sources; since some of the public financial institutions involved do not fully disclose energy financing data, these figures could be underestimates; see Methodology section for further details.

- Multilateral includes ADB, AIIB, WB, EIB, EBRD, IDB

Multilateral Banks Support Mostly Renewables

Institution	Projects	Examples
World Bank:	125 solar and wind projects 3 coal projects	Enel Wind Portfolio (342MW) [Brazil] Luz del Norte Solar PV Plant (141MW) [Chile] Ngonye Solar PV (34MW) [Zambia] Amakhala Emoyeni Wind (134.4MW) [S. Africa]
Asian Development Bank	28 solar and wind projects 1 coal project	Sarulla Geothermal Plant (330MW) [Indonesia] Thatta Wind (150MW) [Pakistan] Burgos Wind Farm (150MW) [Philippines]
European Bank for Reconstruction and Development	36 solar and wind projects 0 coal projects	Khalladi Wind Farm (120MW) [Morocco] PEPSA Wind Farms (104MW) [Poland] Lake Turkana Wind Farm (300MW) [Kenya] Gabal El Zeit Wind Farm (200MW) [Egypt] Tsetsii Wind Farm (50MW) [Mongolia]
European Investment Bank	19 solar and wind projects 0 coal projects	Megalim Solar (121MW) [Israel] VIOTIA Wind (48.6 MW) [Greece]
Inter-American Development Bank	28 solar and wind projects 0 coal projects	Los Loros Solar PV Plant (54MW) [Chile] Sky Solar's PV (69.9MW) [Uruguay]
African Development Bank	9 solar and wind projects 0 coal projects	Ouarzazate Thermal Solar (160MW) [Morocco] Lake Turkana Wind Farm (300MW) [Kenya] Xina Solar One PPP (100MW) [S. Africa]

Data covers projects financed 2013-2016

Korean Financial Institutions Support Mostly Coal

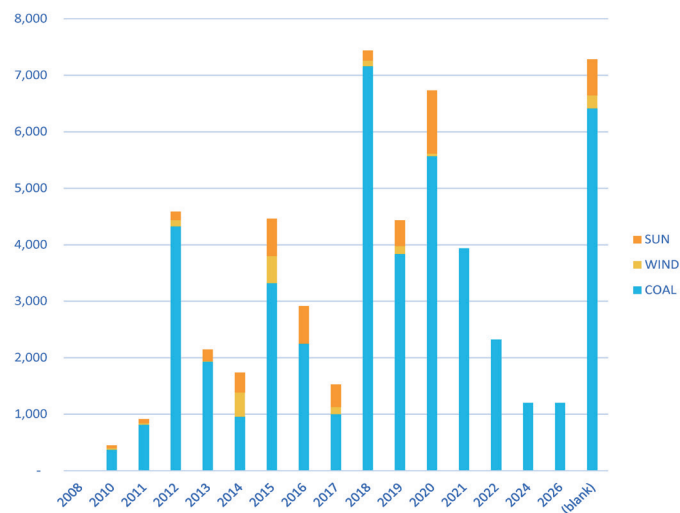
Institution	Projects (2013-2017)	Examples
Export-Import Bank of Korea	\$1,500 million for coal \$64 million solar/wind Ratio: under 5% financing for solar and wind versus 90%+ coal	Song hau 1 Power Plant (1200MW) [Vietnam] Vinh Tan 4 Coal-Fired Power Plant [Vietnam] Thai Binh 2 Coal Power Plant [Vietnam] Al Fujeij Wind Farm (89.1MW) [Jordan]
Korea Development Bank	\$87 million coal \$309 million solar/wind	KaSel (Tabalong) Coal Plant (200MW) [Indonesia] La Bufa Wind Farm (130MW) [Mexico] El Pelicano Solar PV Power Plant (100MW) [Chile]
Korea Trade Insurance Corporation (K-sure)	\$908 million coal \$0 wind/solar	Song hau 1 Power Plant (1200MW) [Vietnam] KaSel (Tabalong) Coal Plant (200MW) [Indonesia]

Data covers projects financed 2013-2016

15

New Global Power Projects

Global Projects involving Korean Companies



16

부제 1

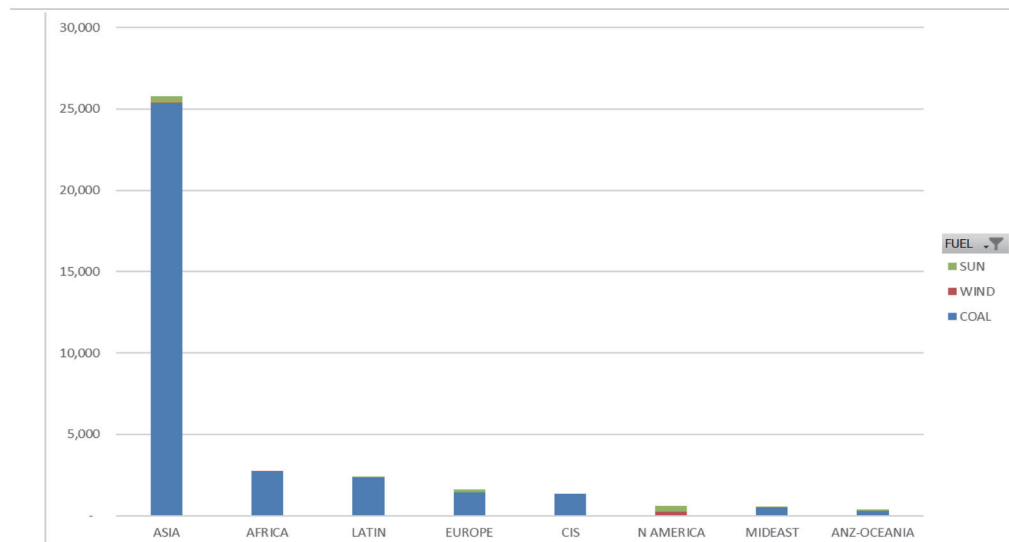
부제 2

부제 3

2018 탈석탄 친환경 에너지전환 국제 컨퍼런스

2018 International Conference on Coal Phase-out and Energy Transition

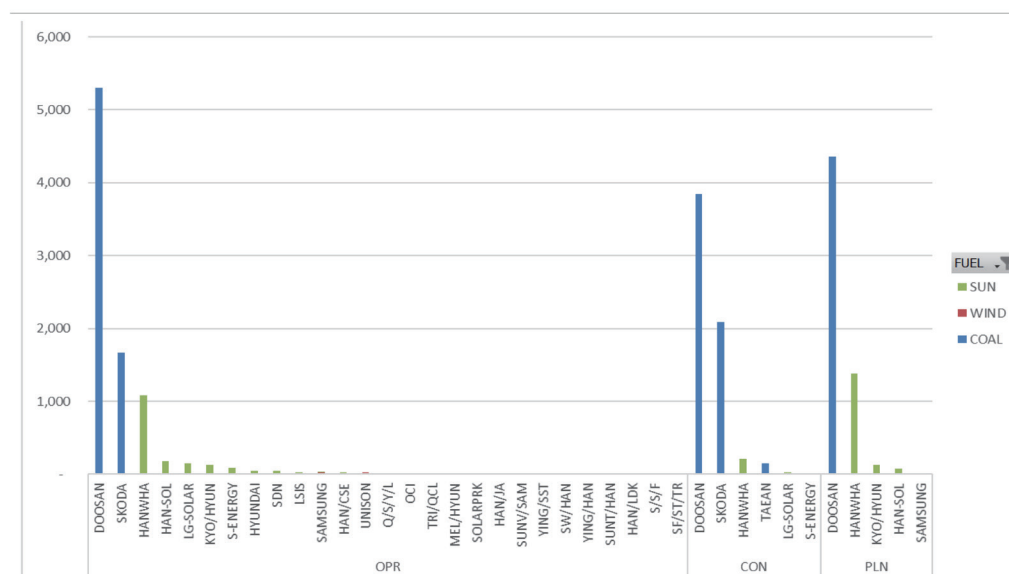
Regional Distribution of Korean Projects



Note: data estimates from Platts are not comprehensive, as coverage for coal about 70%, wind coverage is only around 50% and for solar only around 14%. This dataset is most accurate for new projects, and is more accurate for coal rather than solar/wind. May not fully represent acquisitions of existing projects, mainly in OECD countries.

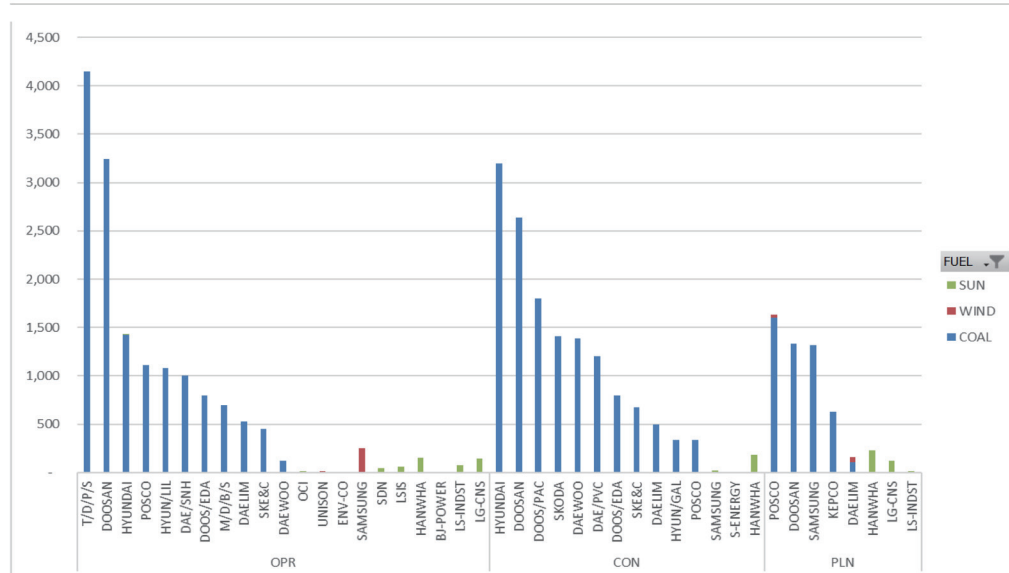
17

Equipment Manufacturer



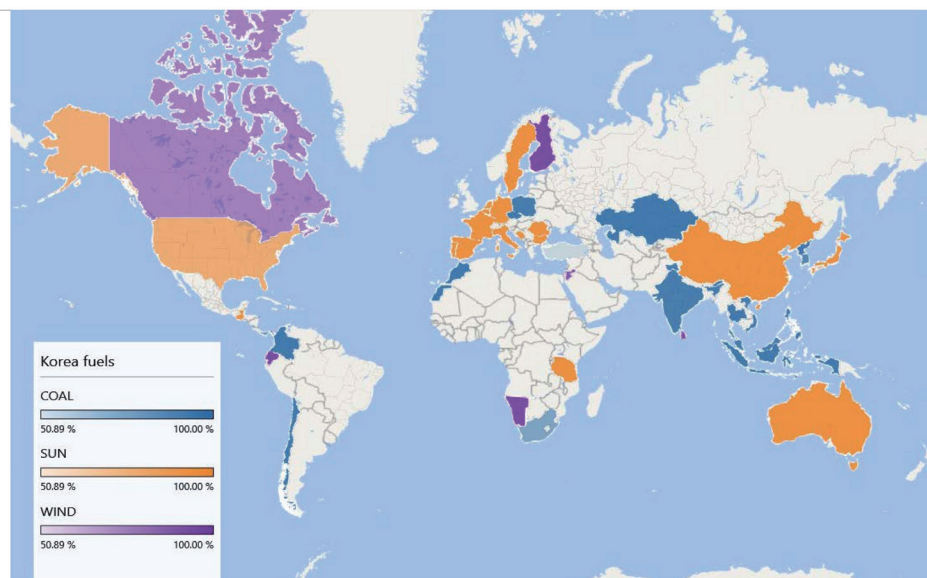
18

Korean Construction



19

Current Trends in Korea Projects Overseas



Projects Operational, Under Construction and Planned

20

부제 1

부제 2

부제 3

21

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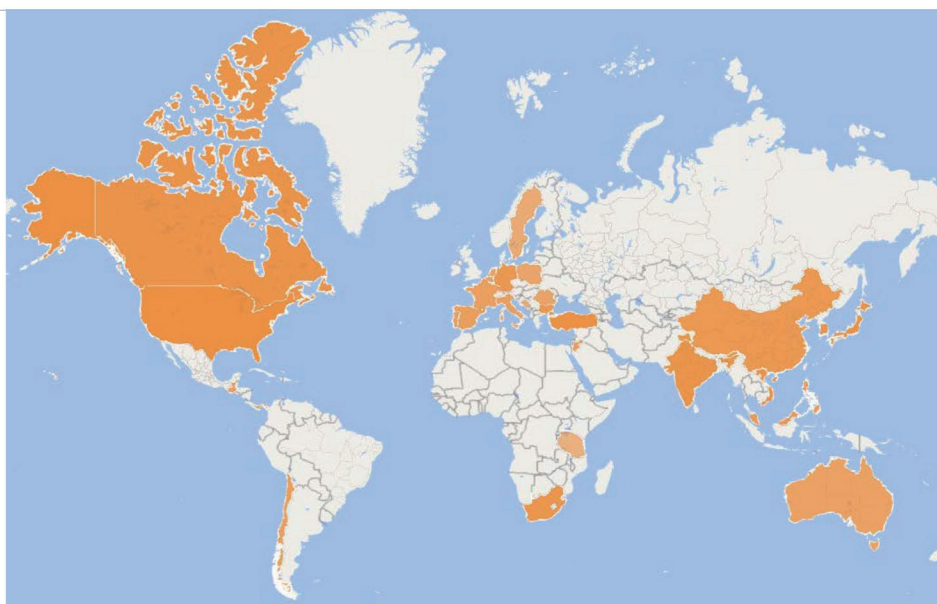
Coal: Regional Distribution



21

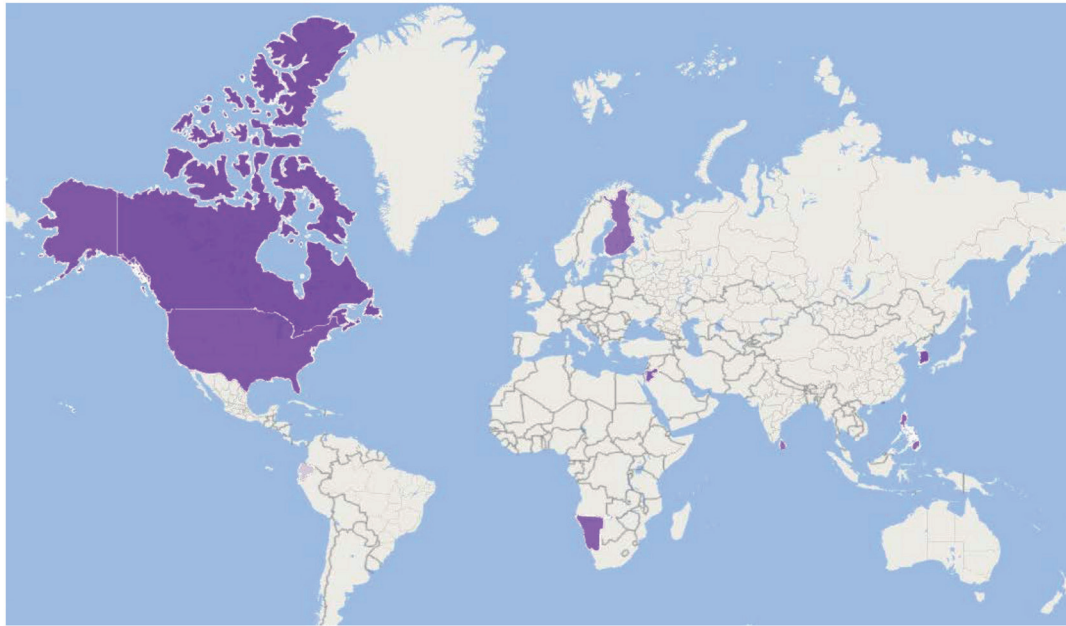
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Solar: Regional Distribution

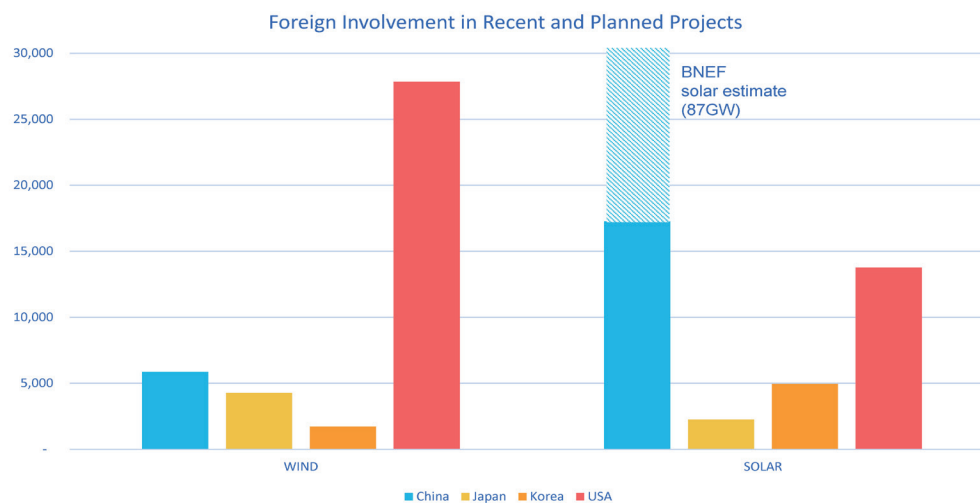


22

Wind: Regional Distribution



Global Renewable Energy Development



Note: data estimates from Platts are not comprehensive, as coverage for coal about 70%, wind coverage is only around 50% and for solar only around 14%. In comparison, wind capacity estimates similar between BNEF and Platts, but BNEF has a higher-end estimate of China solar PV exports reaching 87GW between 2015-2017 alone)

Communities reject clean coal, call for renewables



Hanwha:

- solar supplier for BCG Thanh Hoa project in Vietnam, 100MW
- solar supplier for Perlis Solar project, 48MW



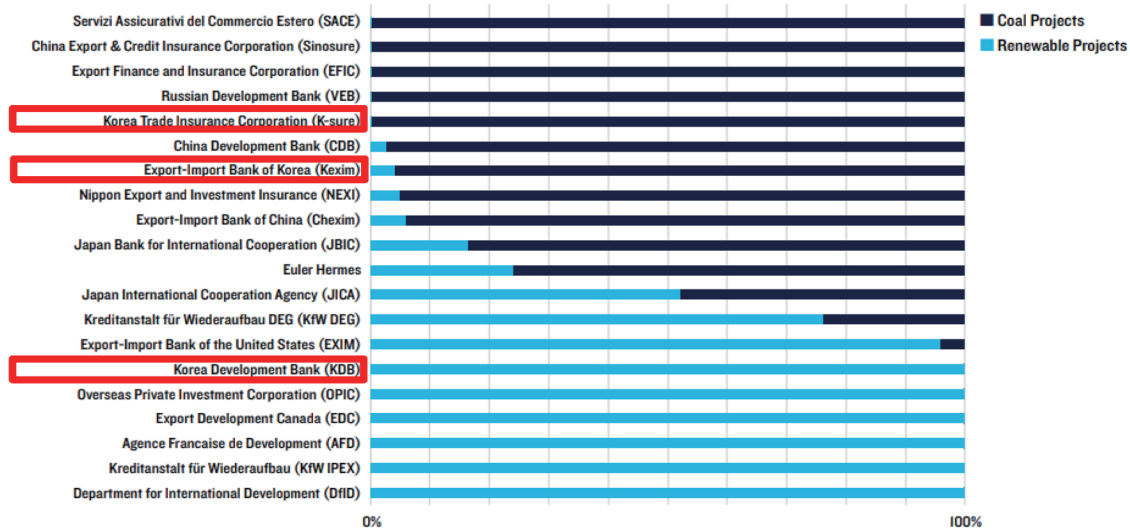
[Additional information can go here](#)

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Policy Solutions

Increase Loans to Renewable Energy Projects

FIGURE ESG: RATIO OF COAL TO RENEWABLES INVESTMENTS BY BILATERAL FINANCE INSTITUTIONS (2013-2016)

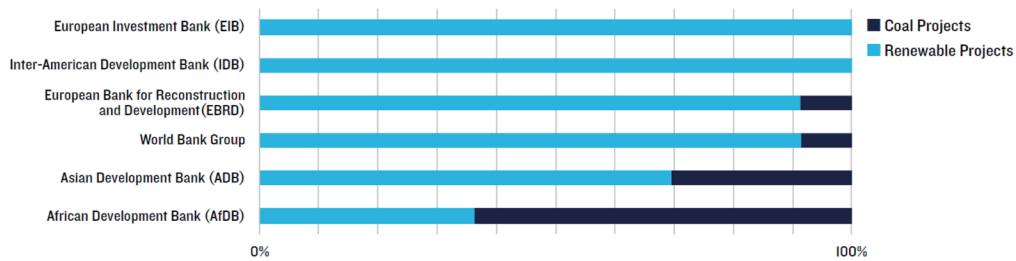


Source: NRDC Consolidated Coal and Renewable Energy Database 2017.

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Continue Collaborations with Multilateral Banks

FIGURE ES5: RATIO OF COAL TO RENEWABLES INVESTMENTS BY MULTILATERAL DEVELOPMENT BANKS (2013-2016)



Source: NRDC Consolidated Coal and Renewable Energy Database 2017.



Successful co-financing in the past:
Al Maktoum Solar Project (800MW) in United Arab Emirates.
Korean Development Bank and Islamic Development Bank

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부제 1

부제 2

부제 3

Questions for Consideration

- What is a reasonable target for increasing Korean financing for solar and wind projects?
- Do Korean financial institutions need a “carbon limit” to help encourage more projects in solar and wind?
- How can Korea increase bilateral energy cooperation and planning with developing countries with a strong renewables component?
- How can policy and commercial banks strengthen overseas renewables investment goals?
- How can Korea’s strong power planning and financing capacity help Korean companies expand abroad?
- How can Korea increase the receptiveness to renewable energy in host countries, and reduce worries about risk and expense?

Working Together

NRDC's Work

- Provide consolidated data, research and analysis on global trends in coal finance and renewables finance.
 - Reports like Power Shift, Carbon Trap – collaborate efforts
 - Would welcome cooperation on reports, suggestions for report topics, co-authored reports
- Collaborate with groups in countries with a pipeline of upcoming coal plants
 - Information-sharing
 - Media amplification
 - Influencers and messaging
 - Provide relevant data or analysis or strategy/recommendations
- US Congress – limiting US coal financing through policy advocacy on Capitol Hill and with government agencies

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Areas for Collaboration

- Ending Support for Coal
 - Global Coal Finance Map
 - Improving the OECD Guidelines for Export Credits' Coal Understanding
 - Containing US coal interests; ASEAN+3 coal [Japan, China, Korea]
 - Refute "HELE" coal to the right audiences (channels, not content issue)
- Paris Commitments
 - Collaborate on increasing ambition of NDCs
- Energy Transition
 - Identifying collaboration opportunities in renewable energy, battery storage, etc.;
 - sharing U.S. and China experiences in clean energy development;
 - City Energy Project; Green Banks: Potential for Korean city commitments on RE?
- Can collaborate in the form of reports, meetings, workshops, information exchange

Global Coal Finance Tracker



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Thanks

Han Chen
hchen@nrdc.org

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답제 1

답제 2

답제 3





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2018 International Conference on Coal Phase-out and Energy Transition

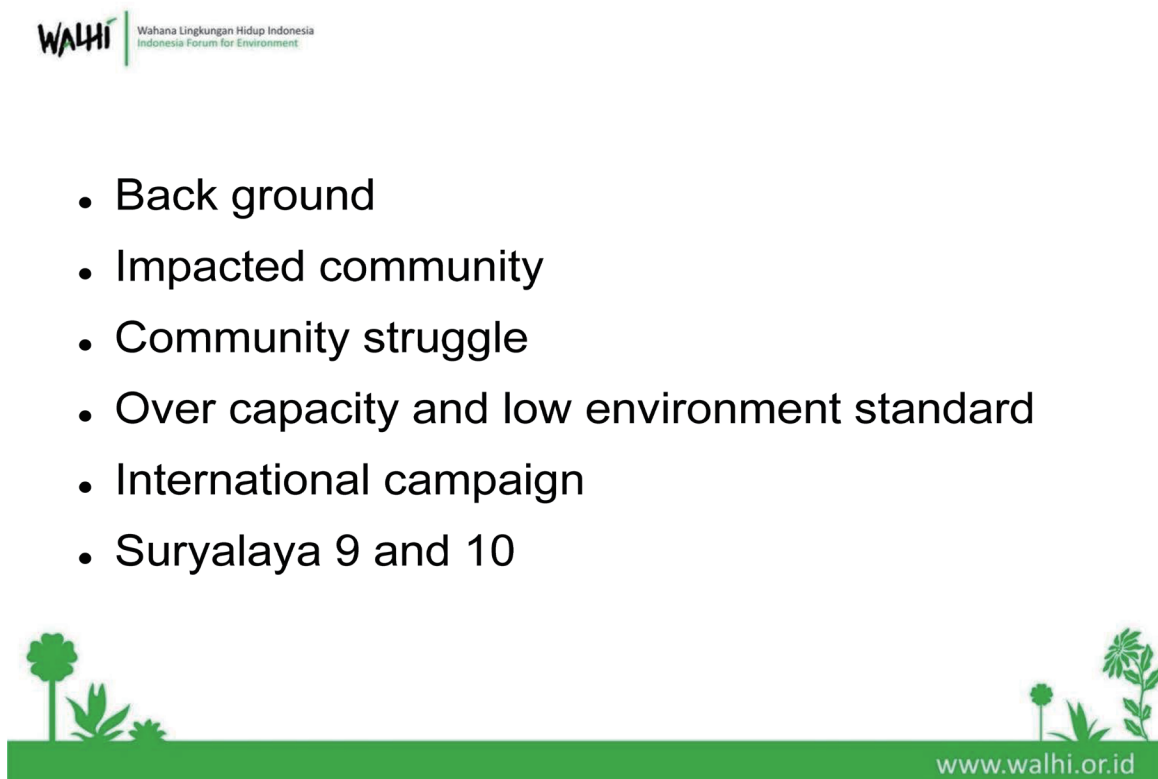
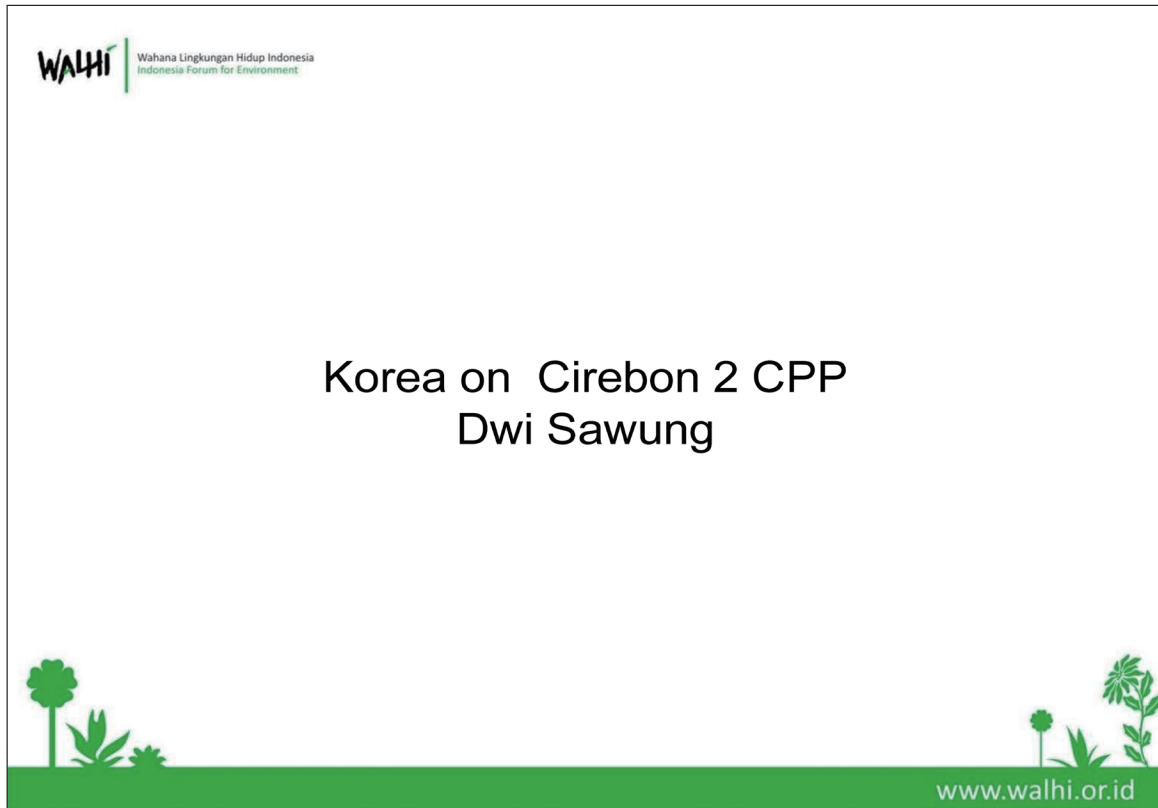
세션 1 - 한국 공적금융기관의 국내외 석탄금융 문제점


발제 3

한국 공적금융의 석탄투자로 인한
구체적인 피해사례 (인도네시아 시민단체 초청)
WALHI-Dwi Sawung(인도네시아)

2018 탈석탄
친환경 에너지전환 국제 컨퍼런스

2018 International Conference on Coal Phase-out and Energy Transition







Wahana Lingkungan Hidup Indonesia
Indonesia Forum for Environment

Background

- USC 1000MW
- US\$2.175 billion
- Marubeni Corporation (35%), Samtan (20%), IMECO (18.75%), Korea Midland Power (10%), JERA – a joint venture between Tokyo Electric Power and Chubu Electric (10%), Indika Energy (6.25%)
- Japan Bank for International Cooperation (JBIC): \$730.8m; Export–Import Bank of Korea (Kexim): \$417.6m; Bank of Tokyo–Mitsubishi UFJ: \$155.68m; Mizuho Bank: \$155.68m; Sumitomo Mitsui Banking Corporation (SMBC): \$155.68m; ING Bank: \$124.55m

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부제 1

부제 2



Wahana Lingkungan Hidup Indonesia
Indonesia Forum for Environment

Impacted community

- Environment impact from existing Cirebon 1
 - fishing ground destroyed
 - increasing respiratory diseases
 - Harvest decreasing
- Social impact
 - Unemployment
 - Distrust society




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부제 3

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WALHI
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Indonesia Forum for Environment

West side cirebon cpp



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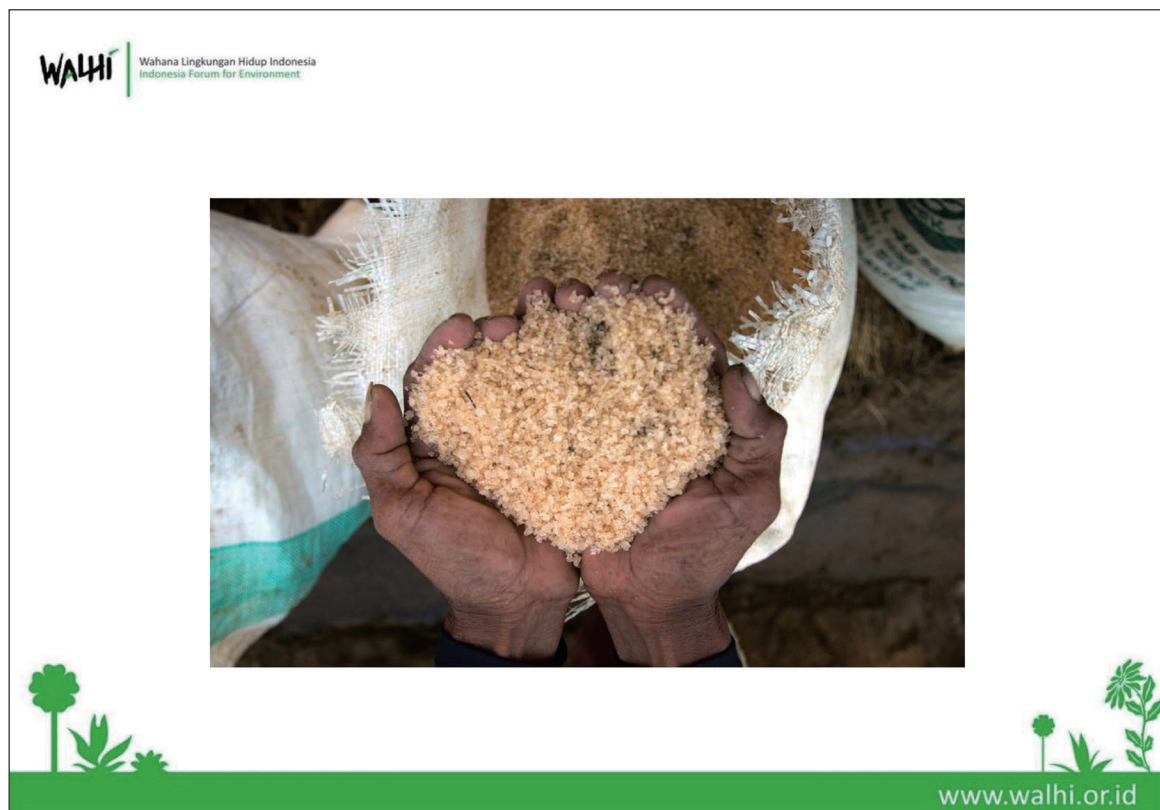


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탈제 1

탈제 2



탈제 3



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Community Struggle

- Lawsuit Environment permit in Dec 2016
- Win on the court May 2017, Financial closing one day before the verdict
- The government and company appeal
- The new permit during the appeal process
- Second lawsuit in Dec 2017
- Lost the second because the judge said the new permit part of first lawsuit decision
- Now appealing on Supreme Court



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Current Situation

- National electricity demand growth 2017 : 3,57%
- Reserve shutdown Bekasi Power start jan 2018
- Bekasi Power Gas PP 118,8MW AF 80%
- No more CPP in java-bali system (MoEMR)
- Java bali system 33 GW peak demand 25GW, reserve margin 33%-40%
- Big surpluses Java-Bali, Sumatra, Batam, etc



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 Indonesia Forum for Environment

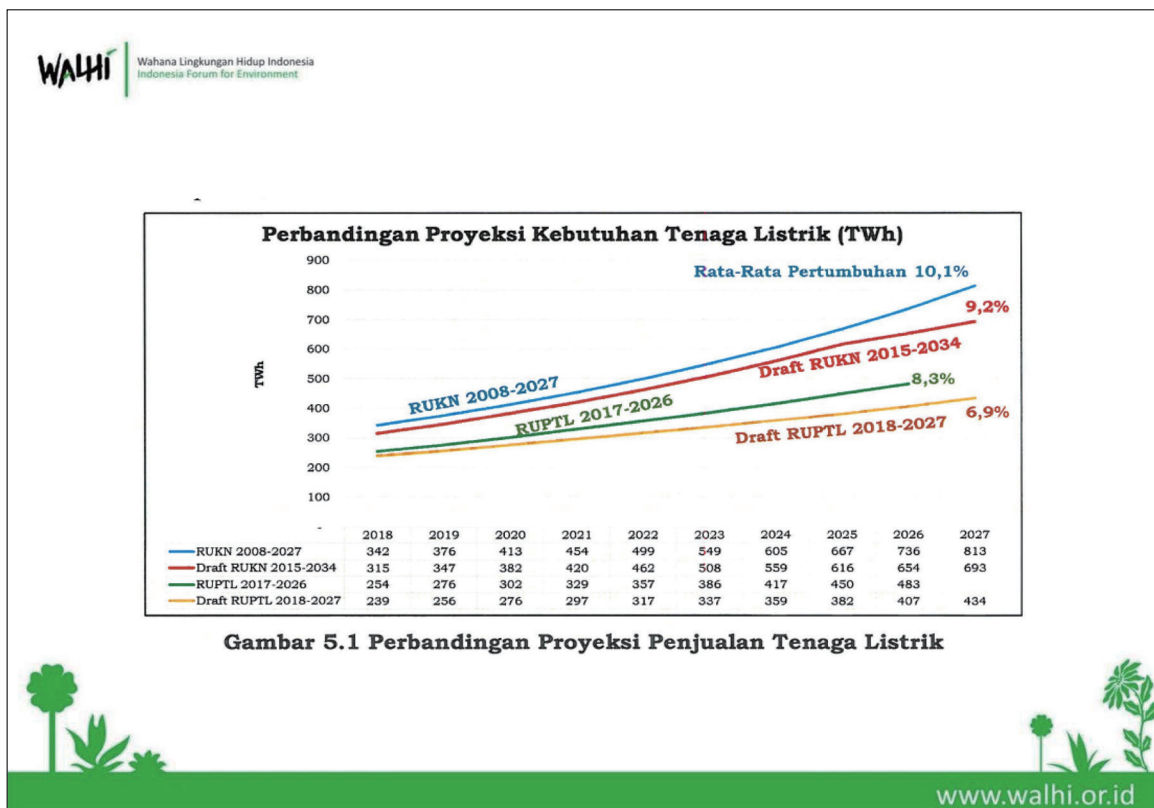
Analysis on RUPTL 2018

- Economic growth 2018-2027: 6,2%.
- Economic growth 2017-2026: 6%
- Demand growth 2018-2027: 6,86%
- Demand growth 2017-2026: 8,3%
- Total power plant 2018-2027: 56 GW
- Total power plant 2017-2026: 78 GW
- source: RUPTL PLN

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탈재 1

탈재 2



탈재 3

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Air pollution standar

	PM	NO		CO		Hg
		New	Existing	New	Existing	
EU	50-100	200	400	200 (after 2015)	500 (2015)	0.03
US A	22.5	160 (after 2005)	160 (1997-2005)	117	117 (after 2005) 160 (1997-2005)	0.001- 0.006
China	30	100	200:400*	100	100(2004- 2011) 200(before 2004)	0.03
India	100(2003); 50(2014- 2015); 30	100	600(<500MW) 200(<=500 MW)	100	600(till 2003) 300(2004- 2016)	0.03
Indonesia	150-100	750	750	850	750	None

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Air Pollution Standar Rev

RANCANGAN BAKU MUTU EMISI PEMBANGKIT

BAKU MUTU EMISI PEMBANGKIT LISTRIK TENAGA UAP (PLTU)

NO	Parameter	Operasi Sebelum 1 Desember 2008		
		Batubara (mg/Nm ³)	Minyak Solar (mg/Nm ³)	Gas (mg/Nm ³)
1	Sulfur Dioksida (SO ₂)	550	650	50
2	Nitrogen Oksida (NO _x)	550	450	320
3	Total Partikulat (PM)	75	100	30
4	Mercuri (Hg)	0,03	-	-

No	Parameter	Perencanaan mulai beroperasi setelah 1 Januari 2009 s.d 31 Desember 2020		
		Batubara (mg/Nm ³)	Minyak Solar (mg/Nm ³)	Gas (mg/Nm ³)
1	Sulfur Dioksida (SO ₂)	400	450	40
2	Nitrogen Oksida (NO _x)	300	350	200
3	Total Partikulat (PM)	50	100	20
4	Mercuri (Hg)	0,03	-	-

No	Parameter	Operasi setelah 1 Januari 2021		
		Batubara (mg/Nm ³)	Minyak Solar (mg/Nm ³)	Gas (mg/Nm ³)
1	Sulfur Dioksida (SO ₂)	100	350	25
2	Nitrogen Oksida (NO _x)	100	250	100
3	Total Partikulat (PM)	30	50	10
4	Mercuri (Hg)	0,03	-	-

Catatan :

- Volume gas diukur pada keadaan standar (25°C, 1 atm) dalam keadaan kering.
- Semua parameter dikoreksi dengan: O₂ sebesar 7% untuk bahan bakar batubara.
- wajib memenuhi BME minimal 95% waktu operasi normal selama tiga bulan.

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The latest draft

	Perencanaan dan/atau operasi sebelum Permen ini ditetapkan	Perencanaan dan/atau operasi sesudah Permen ini ditetapkan
SO2 (mg/Nm3)	550	200
NO2 (mg/Nm3)	550	200
PM (mg/Nm3)	100	75
Hg (ug/Nm3)	30	30

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발제 1

발제 2

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International Campaign

- Call bank/corporation to divest; Credit Agricole divest. Marubeni announce to divest from coal, but still funded Cirebon 2 :(.
- Paralel action
- Letter to the bank and insurance
- Shaming Japan on COP23

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발제 3

Suryalaya 9 &10

- USC 2x1000MW
- Groundbreaking before Financial close
- IPP; PLN(state owned company-Barito pasific)
- Tender win by Hutama Karya and Doosan
- Japan with better air pollution control loose because of price and Indonesian low air pollution standard

Thanks
sawung@walhi.or.id

답제 1

답제 2

답제 3

