Korea's Clean Energy Challenge— Time for a Check Up

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Introduction

The release of South Korea's 8th Basic Energy Plan at the end of 2017 marked a crucial step forward in the evolution of the country's approach to power planning and environmental management with its shift toward clean energy. No power sector policy stands in isolation however. Adjusting the policy settings was a meaningful first step, but it is not enough especially in a region where power market realities are shifting so dramatically.

To be effective, Korea's new policy roadmap must become a catalyst for action by several other institutions, not all of which fall within the narrow confines of the Ministry of Trade, Industry and Energy (MOTIE), which oversees Korea's power sector. Progress by Korea's leading companies, financial institutions and investors will inevitably define how quickly Korea can transition toward clean energy. For the 8th Plan to have real impact, it will be critical for Korea Electric Power Company (KEPCO), South Korea's 51% government-owned power company, and its key investors, the National Pension Service (NPS) and the Korea Development Bank (KDB) to play a leading role in pulling Korea's other pensions and banks in a greener direction.

Table 1: 8th Plan Power Generation Mix

Year	Nuclear	Coal	High Environmental Impact	LNG	Renewable Energy	Other	Low Environmental Impact
2017	30.3%	45.3%	75.6%	16.9%	6.2%	1.3%	24.4%
2030							
Business as Usual (BAU)	23.9%	40.5%	64.4%	14.5%	20.0%	1.1%	35.6%
8th Plan Scenario	23.9%	36.1%	60.0%	18.8%	20.0%	1.2%	40.0%

Source: Ministry of Trade, Industry, and Energy (MOTIE).

The test of a policy initiative as significant as the 8th Plan is whether the institutions that must change to meet stakeholders' goals are up to the challenge. Crucially, do they have the governance disciplines— and commitment to transparency— needed to ensure that all the key players have the information they need to manage the risks and seize the right opportunities? Having the right information matters because Korea's regional and global competitors are embracing new clean energy technologies at an accelerating pace, which raises questions about whether key Korean companies and institutions can keep up with their global peers.

To assess South Korea's progress over the past year, we have performed a health check on the key players in the power and investment sectors to see whether they are making progress evaluating the risks and opportunities that come with an accelerated transition away from fossil fuels to cleaner energy. Our health check focused on KEPCO and its most important domestic stakeholders— NPS and KDB. While KEPCO is the owner and operator of the bulk of South Korea's power system, it is strategically linked to KDB due to the large role that KDB plays as a shareholder and funder of KEPCO's domestic assets and international projects. NPS is a key barometer for long-term public investor interests in KEPCO. In addition, the fund has a new stewardship code and, like its global peers, is expected to join other investors in becoming a more skilled advocate concerning the governance of climate risks on behalf of KEPCO's shareholders.

Table 2: KEPCO Shareholding Yearend 2017

	Shares Outstanding	% of Total
Government	116,841,794	18.2%
Korea Development Bank	211,235,264	32.9%
Sub-Total	328,077,058	51.1%
National Pension Corporation	36,460,422	5.7%
Domestic Investors	84,797,582	13.2%
Foreign Investors	192,639,015	30.0%
Common Shares	156,960,303	24.4%
ADRs	35,678,712	5.6%
Total	**641,974,077**	

Source: KEPCO.

To investigate the readiness of these three groups to adapt, we have identified four key issues that will shape their ability to fulfill their strategic and fiduciary obligations related to implementation of South Korea's energy transition. The issues— governance, transparency, ESG integration, and strategic risk management— are not new to KEPCO, NPS, or KDB. Nonetheless, periods of dynamic market change like this naturally place new demands on institutions to make it clear that they are aware of and adapting to the changing market norms.

KEPCO— Everybody Owns It, But Nobody Loves It

KEPCO's ability to transition smoothly to a leadership role in the clean energy shift will be determined by three crucial capabilities:

1) The ability to develop cost-efficient solutions for the rapid integration of renewable energy as well as the development of new grid management strategies;
2) Pro-active risk management strategies that will improve the company's ability to manage its exposure to high cost independent power producers (IPPs) and polluting fuels; and
3) Greater awareness of the strategic decline of the conventional baseload power technologies that have been the focus of KEPCO's overseas activities.

Addressing these issues will be a considerable challenge for what is still a government-controlled vertically integrated power company that handles the full range of generation, transmission, and distribution services. Although KEPCO has wholly owned generating companies (gencos) and aspects of competition with some IPP generators, design of the grid and virtually all the strategic execution of the 8th Basic Energy Plan rests with KEPCO, MOTIE and their sprawling bureaucracies.

It's notable that the process for formulating the plan was innovative, with the involvement of a diverse 70-person expert working group of technical and policy experts. This is in stark contrast to KEPCO's board governance history, which has been characterized by a rapidly shifting cast of executive and independent directors, who appear to have had little ability to exert oversight concerning the many changes that are now reshaping the global power sector. (See Appendix I.) The short tenure of directors and audit committee members— averaging 2.4 and 2.5 years respectively— is inconsistent with the responsibilities of a board overseeing decisions concerning investments in power assets that often have useful lives of more than 30 years. Indeed, the laws

limiting appointments to two years and rapid rotation has severely limited the board's ability to provide accountable oversight on behalf of stakeholders.

The many policy changes that accompanied the 8th Plan have resulted in some small but noteworthy improvements in KEPCO's governance. Kim Jong Kap, who was appointed CEO in 2017, previously had been CEO of Siemens Korea, a role that should have familiarized him with the rapid value destruction facing the major global equipment suppliers from the ongoing clean energy transition. In his inaugural speech to KEPCO staff in May 2018, Kim said KEPCO needs to gain more support from the public to navigate the energy transition and therefore must "be able to make more accurate projections, based on factual data and analysis" to guide future investments. This insight matters because one of the most important policy changes in the 8th Plan was an overdue reset of MOTIE and KEPCO's overly optimistic demand forecasting methodology to address the reality of lower demand growth as well as the potential of more cost-effective demand-side management strategies.

In keeping with the national policy focus on the "Fourth Industrial Revolution", KEPCO's 2018 sustainability report confidently aligns the company's strategy with a number of buzzwords related to an integrated "smart energy" approach to new technology. Intriguingly the report states that "we have established the concept of 'KEPCO 4.0' as the digital utility that leads to the Fourth Industrial Revolution and defined the vision for digital revolution. Through this, we will take a proactive approach to the changing market environment and gain competitive advantages in the global market through technological innovation and enhancement of business competency."

This new digital focus is not without its challenges, however, as Kim acknowledged: "It is not an easy task to make projections about the new technological trends like digital transformation and new energy sources like renewable energy." Still, this is just one pressure point the company must address. Kim said he also is prepared to invest in more R&D and to accelerate KEPCO's focus on technology exports, with the caveat that he does see the merits in "fully taking into account different political and policy risks in different countries where we invest."

These are worthy sentiments and highlight several key areas where investors like NPS and KDB as well as their foreign counterparts will want to focus their governance and engagement priorities. Indeed, a review of KEPCO's recent financial and sustainability reports confirms that this is a company that would benefit from more active engagement by a range of skilled investors. Financially, KEPCO is at an awkward inflection point as it navigates the shift in its generation mix away from old nuclear and high-polluting coal toward renewables and gas while keeping tariffs down. In the short-term, this has hurt the company's results— with 1H2018 results showing a net loss— as slow revenue growth has been hit by a sharp increase in purchases from IPPs as well as a jump in imported coal and LNG prices.

At the same time, KEPCO's most recent sustainability report and disclosures to the CDP project suggest that the company has become a more willing, if formulaic, reporter. Unfortunately for stakeholders, many of the statements made in the disclosures lack strategic context and do not necessarily relate to the most material decisions that the management and board will need to make over the next two years concerning the implementation of the 8th Plan. As a result, investors will have a valuable opportunity to monitor the following issues:

- **Board skill mix and tenure:** Based on information in KEPCO's 2018 sustainability report, a small but positive improvement in board composition is evident with the inclusion of one independent director with renewable energy experience. This is a modest but positive step given the expected increase in capital spending linked to renewables. Nevertheless, the

reliance on short tenures limits the board's ability to query significant spending and technical decisions or to assess fully the company's risk management disciplines. KEPCO should expect to be asked which board members are responsible for overseeing the company's climate risk.

- **Improved key performance indicators and realistic targets:** While the sustainability report provides adequate disclosure of risk management processes and strategically important areas of activity, the KPIs that are highlighted are generally one-dimensional volume metrics. As a result, they offer little insight into the relative strategic importance of the decisions the company currently faces. At a time when management is balancing profitability pressures with important investment decisions that will shape KEPCO's medium-term transition potential, it would make sense for stakeholders to have a clearer sense of management's strategic priorities and any potential trade-offs that may influence decision-making about stated goals.

- **More coordination between domestic and overseas strategy development:** One obvious disconnect in KEPCO's strategy discussions emerges in the disclosures related to the company's overseas activities. KEPCO, like its Chinese and Japanese counterparts, continues to view overseas markets as a profit opportunity even as the economics of traditional baseload projects are eroding and political risk on the ground is rising. The narrative of profitable power technology exports ignores obvious questions concerning the long-term profitability of large-scale fossil-fuel projects in developing power markets that will inevitably be repriced as cheaper, deflationary renewables gain market access. Thanks to the aggressiveness of China's pursuit of its Belt and Road Initiative (BRI), which seeks to capitalize on power opportunities in developing markets, we are now observing active push-back from countries increasingly concerned that these high cost coal IPPs with North Asian technology and subsidized finance may be little more than future stranded assets. The dynamic around large-scale nuclear facilities in the Middle East may be different, but it is clear that KEPCO with its "energy belt" strategy is being asked to meet both financial and geo-strategic goals without acknowledging that these projects have unique risks that will require a new level of governance awareness.

Investor Activity is Rising— Will NPS Lead or Follow?

The governance questions highlighted above are significant because 2019 promises to be a year of heightened engagement by investors with KEPCO. One catalyst for this increased focus on KEPCO's performance is the company's inclusion in the Climate Action 100— a global initiative whose 289 participating investors from 29 countries collectively manage US$30 trillion in assets.[1]

KEPCO is one of only three Korean companies on the Climate Action list along with POSCO and SK Innovation. As a result, the company can expect that global investors will be more active in seeking relevant disclosure from the company through requests and meetings in the coming year. First, there likely will be focused questions about how KEPCO's implementation of the 8th Plan relates to a credible 2-degree scenario stress test. In the case of Korea, given the country's technology potential in battery storage and renewables, it would also be smart to stress test the value of the company's existing domestic and international asset portfolio through 2040 against the possibility of early closure for high-emitting facilities. Second, KEPCO should expect tough

[1] Climate Action 100.

questions about its involvement in controversial overseas projects like the Nghi Son 2 1200MW coal-fired IPP in Vietnam and its investment in the still-undeveloped but 100% owned Bylong coal project in Australia. Both projects will require meaningful additional investment and have repeatedly raised red flags as project fundamentals come under increased scrutiny given rapid changes in coal power markets.

Climate Action 100+ Statement

We believe that engaging and working with the companies in which we invest – to communicate the need for greater disclosure around climate change risk and company strategies aligned with the Paris Agreement – is consistent with our fiduciary duty and will contribute to achieving the goals of the Paris Agreement.

The initiative aims to secure commitments from the **boards and senior management** to:

Implement a strong governance framework which clearly articulates the board's accountability and oversight of climate change risk and opportunities.

Take action to reduce greenhouse gas emissions across their value chain, consistent with the Paris Agreement's goal of limiting global average temperature increase to well below 2-degrees Celsius above pre-industrial levels.

Provide enhanced corporate disclosure in line with the final recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and, when applicable, sector-specific Global Investor Coalition on Climate Change Investor Expectations on Climate Change [1] to enable investors to assess the robustness of companies' business plans against a range of climate scenarios, including well below 2-degrees Celsius, and improve investment decision-making.

Working through partner organisations, Asia Investor Group on Climate Change (AIGCC); Ceres; Investor Group on Climate Change (IGCC); Institutional Investors Group on Climate Change (IIGCC); and Principles for Responsible Investment (PRI), we will together monitor the progress that companies make towards these goals. We are committed to working collaboratively through this initiative, using a range of engagement approaches to ensure fulfilment of the above-mentioned goals.

While the largest global investors will be seeking better answers from KEPCO on climate-related issues, it is natural to ask how Korea's leading pension fund, NPS, will be enhancing its engagement with KEPCO. NPS only recently adopted a stewardship code that has the potential to formalize the fund's expectations of listed companies and influence the governance practices of other Korean pension funds as well as the leading domestic asset managers. The code has raised many sensitive issues in Korean political and business circles concerning NPS' interactions

with the largest family-controlled business groups.[2] This makes it likely that NPS will take a step-by-step approach to engaging with companies like KEPCO. Nonetheless, stakeholders will benefit if NPS' responsible investment team, which was created in 2013, is able to enhance its risk management capacity by adopting a more active stewardship stance.[3] As the third largest global pension fund with many long-term holdings, NPS would effectively be at a competitive disadvantage to other investors without the ability to evaluate and vote on a range of governance issues.[4]

As NPS builds its governance capacity, it would also be natural for the company to extend its evaluation of climate-related risks to their fixed income portfolio. Based on a January 2018 report by Solutions for Our Climate, NPS has significant exposure to KEPCO's debt, with bond holdings related to coal-fired power units held by the gencos totaling KRW2.4 trillion or US$2.1 billion. [5] From a governance standpoint, NPS' dual, equity and fixed income, exposure to KEPCO raises questions about risk management. Based on NPS' annual transparency report for the UN Principles for Responsible Investment initiative, it's notable that NPS neither integrates its ESG analysis into its fixed income portfolios, nor engages with fixed income issuers.[6] This is surprising as pension funds typically have significant fixed income portfolios that increasingly are coming under scrutiny as investors examine bond durations more carefully through a climate risk lens. Indeed, investors are already observing shifts in fixed income markets as more forward-looking fixed income investors take steps to shed climate risks in their portfolios, a step that may ultimately reduce liquidity and hurt pricing for issuers like KEPCO.

KDB Needs a Refresher Course on Risk

There is a good case to be made that KDB, like NPS, also needs to upgrade its responsible investment capacity. A state-owned bank, KDB is a classic development finance institution and also provides a safety net in the event of systemic risk events. KDB's holdings in KEPCO are an important part of its balance sheet, accounting for 10.6% of assets at yearend 2017. While this exposure is meaningful and it's appropriate to hope that they can push for better performance from KEPCO, observers of Korea's financial sector also will want to monitor KDB's active posture in project finance as a lender and arranger.

Based on a review of KDB's most recent annual report, it is clear that KDB, like KEPCO, is operating in support of new Fourth Industrial Revolution initiatives including a range of offshore infrastructure projects involving Korean companies. What is less obvious is why KDB has been slow to implement a more mature set of sustainability risk management practices. KDB has long enjoyed a prominent position in the Korean financial sector and prides itself on its global standing. As a result, it's surprising to see that top management is playing catch up on well understood precautionary due diligence practices related to sustainability issues that may affect project outcomes.

Disclosures in KDB's 2017 annual report indicate that the bank only adopted the Equator Principles in 2017 did not even have environmental and social guidelines until 2016.[7] The seeming

[2] Yonhap News Agency. NPS to shun investments in 'bad companies' under stewardship code. July 15, 2018; and https://www.ft.com/content/bf53706e-93b3-11e8-b67b-b8205561c3fe
[3] National Pension Service. National Pension Fund Annual Report 2017. June 2018.
[4] Asian Investor. AI300: Korea's pension funds see feast turn to famine. August 1, 2018.
[5] SFOC. Financing Dirty Energy: How Korean Public Financial Institutions Support Coal Power. January 2018.
[6] NPS UN PRI Transparency Report 2017.
[7] KDB 2017 Equator Principles Report.

lack of familiarity with material sustainability risks associated with the bank's activity in project finance sits in awkward contrast to recent steps to move into green finance and to issue a US$300 million green bond in June 2017. These are welcome steps and it is notable that KDB has proudly disclosed an estimate of avoided CO2 emissions that can be attributed to its new US$355 million renewable portfolio.

What's missing? There is no sign of a meaningful effort to put these avoided emissions in the context of KDB's asset portfolio and lending activities, including its 32.9% holding in KEPCO, which is one of Asia's larger carbon emitters. Based on disclosures in KEPCO's 2017 CDP Project disclosures, KDB's avoided emissions would offset less than 0.5% of KDB's share of KEPCO's annual 2016 emissions. In addition, it would be prudent for KDB's risk management team to consider what the bank's climate-risks might look like if considered according to the norms referenced by the Task Force on Climate-related Financial Disclosures (TCFD).[8] It's reasonable to assume that the many financial regulators, central bank officials, and banks that have become signatories to TCFD will become increasingly influential in the next five years as power asset stranding becomes a bigger systemic risk factor for a range of financial institutions. As a result, a reputation-sensitive institution like KDB may want to prepare now to meet common expectations.

If KDB management is uncertain about why steps to fill this knowledge gap should be taken with more urgency, they need only look to recent market events in Singapore. Temasek, Singapore's sovereign wealth fund, and a consortium of regional and global banks including Standard Chartered and DBS, HSBC, MUFG and SMBC just issued a US$458 million collateralized loan through Clifford Capital.[9] What's unusual about this issue is that the underlying loans represent a diversified portfolio of project finance loans, including a healthy slice of power project debt, much of which is likely to be from coal-fired power projects.

As we noted in our July 2018 report, "there is every reason to believe that these issuers are conscious of these global trends [related to climate risk] and are therefore looking to reposition their loan portfolios. Indeed, smarter banks and investors like Temasek are under pressure to re-assess their concentration risk exposures to heavily coal exposed markets like Australia, Indonesia, and Vietnam. At the same time, offering up a little non-power debt to start paring carbon-risk impacted paper could be a way to discreetly reduce risk before other Southeast Asian investors wake up and the liquidity associated with these exposures becomes worse."

KDB has been reluctant to turn its back on high climate-risk funding opportunities in the past, including two coal-fired projects in Indonesia and Australia in the past five years with an estimated value of US$251 million. It may be time for the various teams with KDB who are responsible for risk management, project finance and green finance to consider whether it would be more logical to use some TCFD-style scenario analysis to establish a more holistic analysis of the bank's financial risks and opportunities. It's reasonable to believe that if a skilled player like Temasek is actively investing in renewables and also stealthily selling down its coal debt that other market players may be way ahead of KDB in assessing material trends. It may be time for KDB to catch up.

[8] Task Force on Climate-related Financial Disclosures.

[9] Melissa Brown (IEEFA). A Bad Month for the Southeast Asian Coal Power Juggernaut. August 2, 2018.

Appendix I

Table 3: KEPCO Board Composition

	# of Standing Directors	# of Non-Standing Directors	Total	Academics/ Other	Renewable Energy	Trade/Foreign Ministry	Politicians	Lawyers, Prosecutors, Accountants
2018	6	8	14	6	1			1
2017	5	8	13	6		1		1
2016	6	8	14	4		1	2	1
2015	7	7	14	3		1	2	1
2014	7	8	15	4		1	2	1
2013	7	8	15	3			4	1
2012	7	7	14	4		1	2	
2011	7	7	14	3		2	2	
2010	7	7	14	5		1	1	
2009	7	8	15	4			2	1
2008	7	8	15	4		1	1	1
	% of Total	% of Total		% of Total		% of Total	% of Total	% of Total
2018	42.9%	57.1%		42.9%	7.1%			7.1%
2017	38.5%	61.5%		46.2%		7.7%	0.0%	7.7%
2016	42.9%	57.1%		28.6%		7.1%	14.3%	7.1%
2015	50.0%	50.0%		21.4%		7.1%	14.3%	7.1%
2014	46.7%	53.3%		26.7%		6.7%	13.3%	6.7%
2013	46.7%	53.3%		20.0%			26.7%	6.7%
2012	50.0%	50.0%		28.6%		7.1%	14.3%	
2011	50.0%	50.0%		21.4%		14.3%	14.3%	
2010	50.0%	50.0%		35.7%		7.1%	7.1%	
2009	46.7%	53.3%		26.7%			13.3%	6.7%
2008	46.7%	53.3%		26.7%		6.7%	6.7%	6.7%
Average Years of Service:								
Directors	2.4	2.4						
Committee	2.5	2.5						

Source: KEPCO U.S. SEC filings.

Appendix II

Table 4: KEPCO- First Half 2018 Financial Results

KRW bn	2017 1H	2018 1H	YOY % Change
Sales of electric power	25,649	27,131	5.8%
Revenues from other businesses	2,423	1,912	-21.1%
Operating revenue	**28,072**	**29,043**	**3.5%**
Fuel	7,660	9,708	26.7%
Purchased power	6,944	9,013	29.8%
Depreciation	4,251	4,621	8.7%
Maintenance	945	1,015	7.4%
Commissions	546	550	0.7%
Research & development	318	328	3.1%
Other operating expenses	5,098	4,623	-9.3%
Operating expenses	**25,762**	**29,858**	**15.9%**
Operating income (loss)	**2,310**	**(815)**	
Other revenues	193	179	-7.3%
Other expenses	66	98	48.5%
Other income (loss)	153	(631)	
Finance income (loss)	(723)	(870)	
Equity income (loss) of affiliates	106	272	156.6%
Income before income tax	**1,973**	**(1,962)**	
Income tax expenses	714	(793)	
Net income (loss)	**1,259**	**(1,169)**	

Source: KEPCO August 2018 Investor Presentation.

Institute for Energy Economics and Financial Analysis

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