



Green Bond Framework for Green and Water Bond issuances

March 15th, 2018

Contents

1.	Background	3
2.	Rationale for K-water to issue a Green Bond	4
3.	K-water Green Bond Framework	7
3.1.	Use of Proceeds	7
3.2.	Process for Project Selection and Evaluation	8
3.3.	Management of Proceeds.....	9
3.4.	Reporting	9
3.4.1.	Allocation report.....	9
3.4.2.	Impact report	9
3.5.	External Review - Second Opinion	10

1. Background

Korea Water Resources Corporation (“**K-water**” or the “**Company**”) is a Government-owned corporation existing under the K-water Act in Korea with the purpose of developing and managing the nation’s water resources and to improve the quality of water. To achieve these objectives, the Company engages primarily in the construction and management of multi-purpose dams and estuary barrages and construction and management of multi-regional and industrial water supply systems including water supply dams, and also in the development of industrial complexes and certain areas designated by the Government as development sites for industrial, commercial and residential use, and in related ancillary businesses, including (i) conducting research in the field of water resources, (ii) providing technological support and education on water resources and water supply, (iii) providing waterworks related services overseas, and (iv) engaging in local waterworks management business and waste water treatment business.

K-water’s main activities include:

- **Water Resources Business:** K-water provides a stable source of raw water supply (unfiltered and untreated water) to local governments and industrial complexes by constructing and managing multi-purpose dams (flood control, water supply and hydroelectric power generation) and estuary barrages.
K-Water oversaw the construction and management of 20 multi-purpose dams and one estuary barrage, representing approximately 65% of total annual raw water supply capacity of dams in Korea. It also oversaw 95% of the total flood control capacity of dams and 61% of total annual hydroelectric power capacity in Korea.
- **Water Supply Business:** K-water is responsible for the construction and management of multi-regional water supply systems, industrial water supply systems and related facilities in Korea. As of 31 December 2017, the Company managed 39 multi-regional water supply systems and 14 industrial water supply systems in Korea, with a combined daily water supply capacity of 17.6 million cubic meters.
- **Waterfront Development Business:** this activity involves the development of such areas for residential, commercial, business and cultural uses in the context of industrial complex development (roads, water, sewage pipelines, electricity power lines etc.). As of 31 December 2017, K-water was engaged in the development of two industrial complexes, two Special Areas and one waterfront areas.
- **Renewable Energy Business:** K-water also operates in the production of renewable energy and accounts a total of 10 macro hydroelectric power generation facilities located at its multi-purpose dams, 51 micro hydroelectric power generation facilities located at its weirs and dams, 30 solar power generators, 3 wind power generation plants and one tidal power generation plant. As of 31 December 2017, K-water had a power generation capacity of 1,352 MW, which represents approximately 15% of the total alternative power generation capacity in Korea.

- **Overseas Business:** alone or in partnership with foreign parties, the Company undertakes waterworks activities overseas. As of 31 December 2017, the Company was engaged in 12 overseas projects in ten countries.

Given the Company's diverse activities, K-water operates under several regulations including the K-water Act, the Water Supply and Waterworks Installation Act, the Act on Construction of Dams, the Special Act on the Utilization of Waterfronts and the supervision of the Ministry of Land, Infrastructure and Transport of Korea ("**MOLIT**").

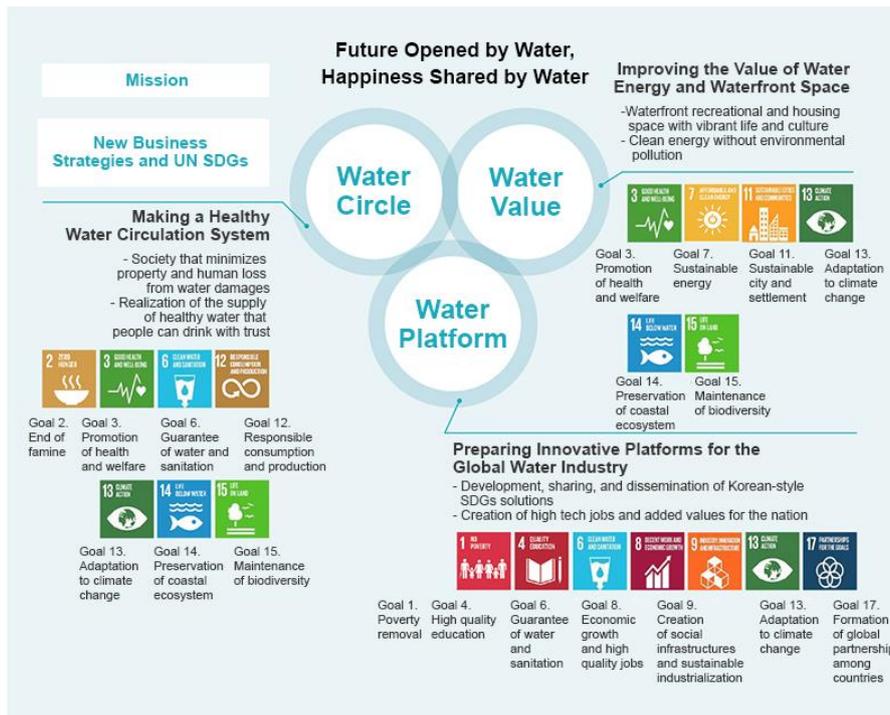
2. Rationale for K-water to issue a Green Bond

K-water seeks to maintain integrated water management for the entire water cycle from water sources to sewage disposal, and is continuously trying to secure sustainable growth for the future. In 2017, in observance of its 50th anniversary, K-water presented its vision for the next 50 years. In addition, the Company laid out a strategy to integrate the **United Nations Sustainable Development Goals ("UN SDGs")**.

Water issues are at the core of UN SDGs, with 11 out of the 17 UN SDGs goals involving water resources management services. In this context, K-water has committed to implement the UN SDGs nationwide.

K-water's ultimate goal is to become both a global water professional and a global hub for water management. To do so, the Company has committed to the following mission: "Opening the Future and Providing Happiness by Sharing Water" which it expects to achieve thanks to the implementation of the UN SDGs.

This mission translates into 3 main strategies, each with specific targets to reach in the next 50 years.



Water Circle

K-water aims at developing optimized water circulation system for all. Climate change results in abnormal weather conditions such as rain and droughts. The Company's goals are to develop a sustainable water cycle system integrating the management of water volume and quality in order to forecast future weather conditions and prevent damages from disasters like floods and droughts.

Future Changes	Targets	Goals		
		2016	2045	2067
Increasing Vulnerability due to Severe Droughts (Water demand slumps/stay flat)	Secure the safe supply of water resources (utilize diverse water resources)	Population prone to droughts: 12% - River 89% - Others 11%	Population prone to droughts : 1% - River 70% - Rainwater & recycled water 16% - Sea & groundwater 14%	Population prone to droughts : 0% - River 60% - Rainwater & recycled water 24% - Sea & groundwater 16%
Increase in Floods Risk (Growing importance of flood control)	Upgrade technology levels for forecasting floods & droughts (Use of drones and satellites)	Strengthen the platform for forecasts, including technology development		Forecast accuracy: 95% Forecast accuracy: 99%
	Minimize flood victims & property damage	Victims		
		7,691(2014)	12,300	zero
		Property damage		
		KRW 147.5 billion(2014)	KRW 236 billion	zero
Technological Advancement (Industry 4.0)	Fusion of operating management with high tech (IoT, drones, satellites)	Tap water drinking rate		
		5%	80%	90%
		Water leakage rate in large cities & local areas*		
Increasing Complexity of Operation/Management		11% (700 million ton)	4%	zero
Deterioration of Water Quality of Rivers	Secure optimum quality of river water	Number of Medium Influence Areas achieving Good Water Grade (II)** or higher		
		95 (2015)	Over 105	Over 105

<p>Water Value</p> <p>K-water's goal is to provide new value thanks to creative use of water. As a consequence of global warming, the availability of waterfront space is rising while global demands for clean energy are also increasing. K-water aims to recreate waterfront spaces as new living spaces for residential, waterfront and cultural activities and further develop its renewable energy business such as photovoltaic power, water-thermal power and tidal energy.</p>	<table border="1"> <thead> <tr> <th rowspan="2">Future Changes</th> <th rowspan="2">Targets</th> <th colspan="3">Goals</th> </tr> <tr> <th>2016</th> <th>2045</th> <th>2067</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Demand for Waterfront Development Rises</td> <td rowspan="2">Cultivate waterfront-oriented lives</td> <td colspan="3">Waterfront space</td> </tr> <tr> <td>89,100,000 m²</td> <td>151,800,000m²</td> <td>198,000,000m²</td> </tr> <tr> <td rowspan="2">Increase Leisure Time</td> <td rowspan="2">Develop spaces for leisure and culture</td> <td colspan="3">Number of waterfront space visitors</td> </tr> <tr> <td>4.2 million</td> <td>9.9 million</td> <td>19 million</td> </tr> <tr> <td rowspan="4">River Water Quality Deterioration</td> <td rowspan="4">Recovery of river ecosystem</td> <td colspan="3">Biological indicator species</td> </tr> <tr> <td>Catfish, Carp, etc. (bad)</td> <td>Chinese Minnows, Sweetfish, etc. (good)</td> <td>Sancheona, etc. (very good)</td> </tr> <tr> <td colspan="3">Dispersal sewage disposal rate</td> </tr> <tr> <td>1%</td> <td>40%</td> <td>100%</td> </tr> <tr> <td rowspan="4">Expansion of New & Renewable Energy</td> <td rowspan="4">100% use of available water related energy sources</td> <td colspan="3">Water-thermal power development</td> </tr> <tr> <td>4,000RT</td> <td>393,000RT</td> <td>Maintenance</td> </tr> <tr> <td colspan="3">Floating photovoltaic power development</td> </tr> <tr> <td>SMW</td> <td>Maintaining</td> <td>Maintaining</td> </tr> </tbody> </table> <p>* RT (Refrigerating Ton): Signifies the cooling & heating volume using water thermal energy</p>	Future Changes	Targets	Goals			2016	2045	2067	Demand for Waterfront Development Rises	Cultivate waterfront-oriented lives	Waterfront space			89,100,000 m ²	151,800,000m ²	198,000,000m ²	Increase Leisure Time	Develop spaces for leisure and culture	Number of waterfront space visitors			4.2 million	9.9 million	19 million	River Water Quality Deterioration	Recovery of river ecosystem	Biological indicator species			Catfish, Carp, etc. (bad)	Chinese Minnows, Sweetfish, etc. (good)	Sancheona, etc. (very good)	Dispersal sewage disposal rate			1%	40%	100%	Expansion of New & Renewable Energy	100% use of available water related energy sources	Water-thermal power development			4,000RT	393,000RT	Maintenance	Floating photovoltaic power development			SMW	Maintaining	Maintaining
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<p>Water Platform</p> <p>K-water's objective with the new management strategy is to provide water security and prosperity for the whole world thanks to its expertise in the water sector, its network built over the years and by implementing new technology for effective water usage and infrastructure.</p>	<table border="1"> <thead> <tr> <th rowspan="2">Future Changes</th> <th rowspan="2">Targets</th> <th colspan="3">Goals</th> </tr> <tr> <th>2016</th> <th>2045</th> <th>2067</th> </tr> </thead> <tbody> <tr> <td rowspan="3">New Technology Market Formation</td> <td rowspan="3">Promotion of high-tech-based water industry</td> <td colspan="3">Number of global ventures promoted</td> </tr> <tr> <td>0</td> <td>120</td> <td>220</td> </tr> <tr> <td colspan="3">Creation of high-tech jobs</td> </tr> <tr> <td rowspan="2">Global Infrastructure Market Expansion</td> <td rowspan="2">Global market expansion</td> <td colspan="3">Number of countries that K-water advances to</td> </tr> <tr> <td>26</td> <td>110</td> <td>193 -UN member countries</td> </tr> <tr> <td rowspan="2">Inter-Korea Exchange Expansion</td> <td rowspan="2">Establish Korean peninsula integrated water management</td> <td colspan="3">Building of Infrastructure</td> </tr> <tr> <td><Reconciliation stage> Set up DB Strengthen business base Reinforce network</td> <td><Comprehensive development> Establish long-term plans for development of N. Korean water resources</td> <td>Maintaining</td> </tr> </tbody> </table>	Future Changes	Targets	Goals			2016	2045	2067	New Technology Market Formation	Promotion of high-tech-based water industry	Number of global ventures promoted			0	120	220	Creation of high-tech jobs			Global Infrastructure Market Expansion	Global market expansion	Number of countries that K-water advances to			26	110	193 -UN member countries	Inter-Korea Exchange Expansion	Establish Korean peninsula integrated water management	Building of Infrastructure			<Reconciliation stage> Set up DB Strengthen business base Reinforce network	<Comprehensive development> Establish long-term plans for development of N. Korean water resources	Maintaining																	
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K-water is launching its Green Bond Framework in order to reinforce its ability to achieve these commitments, thus realizing its vision of "Opening the Future and Providing Happiness by Sharing Water". Under this Green Bond Framework, K-water may issue Water Bond to explicitly finance water-related assets ("Water-related Assets" as defined in the Use of Proceeds section) and/or Green Bond in case the bond finances both water-related assets and other green assets ("Other Green Assets" as defined in the Use of Proceeds section).

3. K-water Green Bond Framework

K-water’s Green Bond Framework (“**Green Bond Framework**” or “**Framework**”) is presented in line with the Green Bond Principles 2017 and their four key pillars:

1. Use of proceeds
2. Process for project evaluation and selection
3. Management of proceeds
4. Reporting

3.1. Use of Proceeds

K-water Bonds will be used to finance and/or re-finance, in whole or in part, new or existing projects (“**Eligible Project**”) from any of the eligible project categories (“**Eligible Project Categories**” as defined below).

Eligible Project Categories

Eligible Green Categories	Use of Proceeds	Example Projects
1-Water-related assets as defined below (“Water-related Assets”)		
Climate Change Adaptation	<ol style="list-style-type: none"> 1. Flood protection: Improve infrastructure in order to prevent/ avoid Probable Maximum Flood (“PMF”) 2. Waterway: Protect and manage waterways and their adjoining foreshores, so that their physical condition and ecological health are maintained 	<ol style="list-style-type: none"> 2. build embankment; reinforcement work on existing embankments; improve other existing structures on waterways
Sustainable Water Supply	<ol style="list-style-type: none"> 1. Improvement in water supply infrastructure in order to increase efficiency and accessibility of water delivery system 2. Wastewater treatment 	<ol style="list-style-type: none"> 1. adjust/redistribute water supply by constructing water transmission pipelines, water purification plant and pumping station; improve and stabilize water supply system by renewing/ replacing old water facilities (i.e. old pipelines) and upgrading single pipeline into multi-pipeline/ multiple waterways
Renewable Energy	<ol style="list-style-type: none"> 1. Tidal power 2. Small Hydro Power with an installed capacity of 25 MW or less 	
Water Management	<ol style="list-style-type: none"> 1. Improvement in water management for local waterworks (water supply) and sewerage 	<ol style="list-style-type: none"> 1. replacement of old facilities; improvement of water flow rate by replacing dysfunctional measuring apparatus; establishment of automation systems; construction of public sewage facility

2- Other green assets as defined below (“Other Green Assets”)		
Other Renewable Energy Assets	1. Solar/ photovoltaic power 2. Floating solar/ photovoltaic power 3. Solar Power – Energy Storage System	

3.2. Process for Project Selection and Evaluation

The Process for Project Selection and Evaluation will implicate the following teams within the K-water organization:

- The Investment Committee,
- The Finance Department,
- The Corporate Sustainability Management team, and
- The Investment and Funding Review Committee.

The Investment Committee is involved in investment decisions on projects related to K-water’s core/ main business, which includes: ① Water Resources Business such as dam construction, construction process, upgrading flood control capacity, waterway management etc., ② Water Supply Business such as multi-regional waterworks, local waterworks management, wastewater treatment etc., ③ Waterfront Development Business, ④ Energy Business, ⑤ Renewal & Replacement on Water related Facilities, ⑥ Consignment, or any projects providing management or technical service, where in both cases a project’s total amount exceeds KRW3bn (approximately USD 2.7m). This committee is composed of maximum of 10 people (including the committee chairperson, who is the Vice President of K-water), all of whom are at above level 2 in terms of ranking/ pay grade (or senior members) or when needed, could invite external counsel/ expert. For projects smaller than KRW3bn, the Working Committee, which is a sub-committee under the Investment Committee, makes the decision. Thus, all water-related project investment decisions are made by the Investment Committee.

Once the project has been approved by the Investment Committee, the Finance Department of K-water will analyze if the contemplated project is in line with this Framework and will request the Corporate Sustainability Management Team’s opinion to confirm the compliance with the Framework.

Once this analysis has been performed, the project will be analyzed by the “Investment and Funding Review Committee”. This committee is composed of a maximum of 15 people (including the committee chairperson) being experts in various sectors / fields, including investment, finance, accounting, legal etc. The personnel should have experience of at least 5 years in the respective field and is appointed by the CEO for one year, although it is possible to serve consecutive times. The Investment and Funding Review Committee will give its final approval for the financing of the project through the Green or Water Bond.

3.3. Management of Proceeds

In the event that K-water's bond only finances Water-related Assets as defined in the Use of Proceeds section, the bond will be labelled "Water Bond" whereas, if it also finances Other Green Assets as defined in the Use of Proceeds section, the bond will be labelled "Green Bond".

The net proceeds of the Green or Water Bonds shall be allocated for the financing and / or refinancing of existing or new assets or projects under the Eligible Project Categories. K-water's treasury team will track internally the proceeds raised from the Green or Water Bonds to be allocated to Eligible Assets.

For the refinancing part, the Green or Water Bond proceeds could be used for Eligible Projects completed in the two full years prior to the Green or Water Bond issuance year (for instance, for a 2018 bond issuance, K-water can consider the refinancing of Eligible Projects having a completion year of 2016, 2017 and 2018).

Pending the full allocation of the proceeds, the balance of unallocated proceeds shall be earmarked and held in the form of temporary sustainable cash or cash equivalent investment instruments in line with K-water treasury management.

3.4. Reporting

The reporting will include allocation reporting and impact reporting and will be publicly available on K-water website (English version).

3.4.1. Allocation report

The allocation reporting will be available to investors within approximately one year from the date of the bond issuance, and yearly thereafter until the bond proceeds have been fully allocated. It will be available on K-water website (English version).

- Allocation per Eligible Asset Categories
- Example of projects financed by the proceeds, including their description (date, location, category, progress) and the corresponding allocated amount (in US\$)
- Allocated amount vs. total amount (in %)
- Portion of financing and refinancing
- Weighted average of the project being financed or refinanced by the Water or Green Bond issuance

3.4.2. Impact report

On an annual basis, until full allocation, K-water will provide an impact reporting, whereby, for each category of Eligible Projects, and where feasible, K-water will report on relevant impact metrics.

Examples of relevant metrics could include:

Eligible Green Categories	Use of Proceeds	Reporting Indicators
1-Water-related Assets		
Climate Change Adaptation	<ol style="list-style-type: none"> 1. Flood protection: Improve infrastructure in order to prevent/ avoid Probable Maximum Flood (“PMF”) 2. Waterway: Protect and manage waterways and their adjoining foreshores, so that their physical condition and ecological health are maintained 	<ul style="list-style-type: none"> • Flood control capacity in billion cubic meters • Number of waterways and length • Resilience indicators (number of reduced floods, or expected decrease of flooding probability)
Sustainable Water Supply	<ol style="list-style-type: none"> 1. Improvement in water supply infrastructure in order to increase efficiency and accessibility of water delivery system 2. Wastewater treatment 	<ul style="list-style-type: none"> • Million of cubic meters • Number of people and cities served
Renewable Energy	<ol style="list-style-type: none"> 1. Tidal power 2. Small Hydro Power with an installed capacity of 25 MW or less 	<ul style="list-style-type: none"> • Installed capacity in MW; • Annual GHG emissions avoided in tons of CO2 equivalent; and • Annual renewable energy production in MWh
Water Management	<ol style="list-style-type: none"> 1. Improvement in water management for local waterworks (water supply) and sewerage 	<ul style="list-style-type: none"> • Million of additional cubic meters • Number of people and cities served • Number of additional people and cities served • Decrease of pollution concentration
2- Other Green Assets		
Other Renewable Energy Assets	<ol style="list-style-type: none"> 1. Solar/ photovoltaic power 2. Floating solar/ photovoltaic power 3. Solar Power – Energy Storage System 	<ul style="list-style-type: none"> • Installed capacity in MW; • Annual GHG emissions avoided in tons of CO2 equivalent; and • Annual renewable energy production in MWh

3.5. External Review - Second Opinion

Sustainalytics was appointed as an independent third party to provide assurance on K-water Green Bond Framework and its alignment with the Green Bond Principles 2017. The opinion from Sustainalytics (“**Second Party Opinion**”) will be made available on K- water’s website (English version)