

RENEWABLE ENERGY MARKETS ASIA 2024 PANEL DISCUSSION

# MARKET SPOTLIGHT: SOUTH KOREA



**Kate Roh**

Head of Business  
Development  
CnerG



**Dayoon Joo**

Analyst, Corporate  
Engagement Team  
Solutions for our Climate (SFOC)

Monday, 29 April 11:30AM-12:00 PM



**Renewable Energy  
Markets™ Asia 2024**



# CnerG

Clean Energy Market & Solutions

## Korean Renewable Energy Market

---

REM Asia 2024

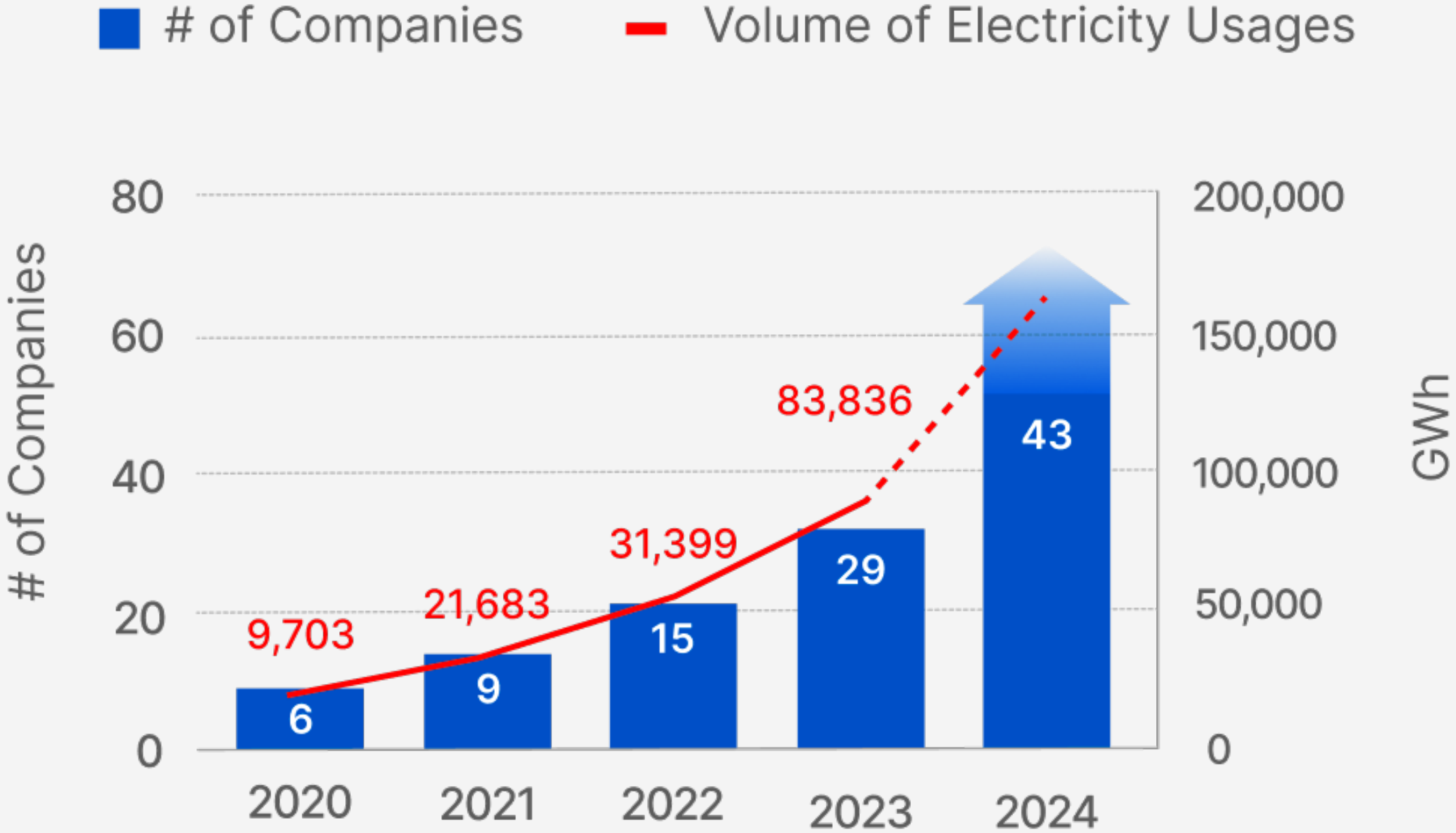


# Korea RE100 Companies: Increase in Participation Rate

The number of RE100 companies and the amount of renewable electricity usage for Korean companies are increasing rapidly - mainly from the global procurement perspective.

How about the domestic renewable electricity supply?

[Korea RE100 Participation]



CDP, RE100 CLIMATE GROUP, RE100 annual disclosure report 2023, Mar 2024  
KoSIF, CDP Korea Climate Change and Water Report 2023, Mar 2024

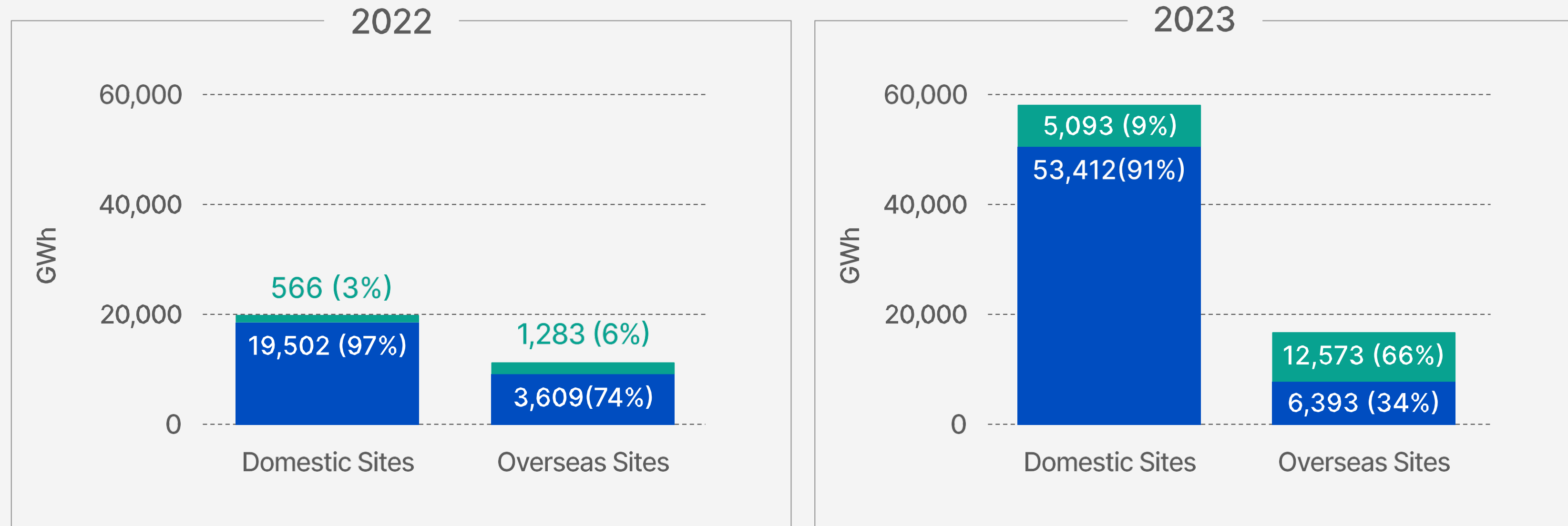
01

---

Renewable  
Energy  
procurement  
of Korean  
companies



# Korea RE100 Companies: Increase in Overseas Renewable Energy Usage



■ RE Usage    ■ Non-RE Usage

New and Renewable One-stop Portal, April 2024 / RE100 Information Platform, April 2024 / Renewable e Usage Management System, April 2024

- \* Significant increase in overseas RE procurement vs domestic RE procurement.
- \* In 2023, overseas procurement was 2.3 times larger than domestic procurement.



# Korea RE100 Companies: Increase in Unbundled REC Purchase Overseas

(Unit : GWh)

		2022		2023	
Total Overseas Electricity Volume		4,892		18,966	
Overseas Renewable Energy Volume	On-site generation	0	0%	25	<1%
	PPA	230	18%	123	1%
	REC Purchase	10	1%	10,339	82%
	Green Electricity / Tariff	1,043	81%	2,085	17%
	Subtotal	1,283	100%	12,573	100%

KoSIF, CDP Korea Climate Change and Water Report 2023, Mar 2024

- \* Total RE volume grew 10x due to increase in Direct REC purchase and VPPA transactions
- \* REC purchases increased 1,000x, while the while the Green Electricity / Tariff increased only 2 times



# Korea RE100 Companies: Increase in Unbundled REC Purchase Overseas

(Unit : GWh)

		2022		2023	
Total Overseas Electricity Volume		4,892		18,966	
Overseas Renewable Energy Volume	On-site generation	0	0%	25	<1%
	PPA	230	18%	123	1%
	REC Purchase	10	1%	10,339	82%
	Green Electricity / Tariff	1,043	81%	2,085	17%
	<b>Subtotal</b>	<b>1,283</b>	<b>100%</b>	<b>12,573</b>	<b>100%</b>

KoSIF, CDP Korea Climate Change and Water Report 2023, Mar 2024

- \* Total RE volume grew 10x due to increase in Direct REC purchase and VPPA transactions
- \* REC purchases increased 1,000x, while the while the Green Electricity / Tariff increased only 2 times



# Korea RE100 Companies: Increase in Unbundled REC Purchase Overseas

(Unit : GWh)

		2022		2023	
Total Overseas Electricity Volume		4,892		18,966	
Overseas Renewable Energy Volume	On-site generation	0	0%	25	<1%
	PPA	230	18%	123	1%
	REC Purchase	10	1%	10,339	82%
	Green Electricity / Tariff	1,043	81%	2,085	17%
	Subtotal	1,283	100%	12,573	100%

KoSIF, CDP Korea Climate Change and Water Report 2023, Mar 2024

- \* Total RE volume grew 10x due to increase in Direct REC purchase and VPPA transactions
- \* REC purchases increased 1,000x, while the while the Green Electricity / Tariff increased only 2 times

# Korea RE100 Companies: Global Procurement Example

01. RE procurement of Korean companies

(Unit : MWh)

Example of a Korean MNC (CDP 2023 reporting)

Example of a Korean MNC (CDP 2023 reporting)						
Unbundled REC Purchase	Korea 10,000	China 3,407,000	Vietnam 1,477,000	Turkey 2,000 India 108,000	Poland 90,000 Hungary 17,000	US 1,299,000 US 79,000 (VPPA) Mexico 121,000 Brazil 85,000
Direct Procurement (PPAs)				India 40,000		
Green Electricity / Tariff	Korea 1,937,000				Slovakia 13,000	US 6,000
Self-generated Renewable Energy						

CDP Climate Change 2023, 2024



# Korea RE100 Companies: Global Procurement Example

(Unit : MWh)

Example of a Korean MNC (CDP 2023 reporting)						
Unbundled REC Purchase	Korea 10,000	China 3,407,000	Vietnam 1,477,000	Turkey 2,000 India 108,000	Poland 90,000 Hungary 17,000	US 1,299,000 US 79,000 (VPPA) Mexico 121,000 Brazil 85,000

Global Procurement: 77% is sourced from Unbundled RECs  
 ↳ 6,695,000MWh (USD 6,639,170)

02

---

Korea  
Renewable  
Energy Supply  
Overview



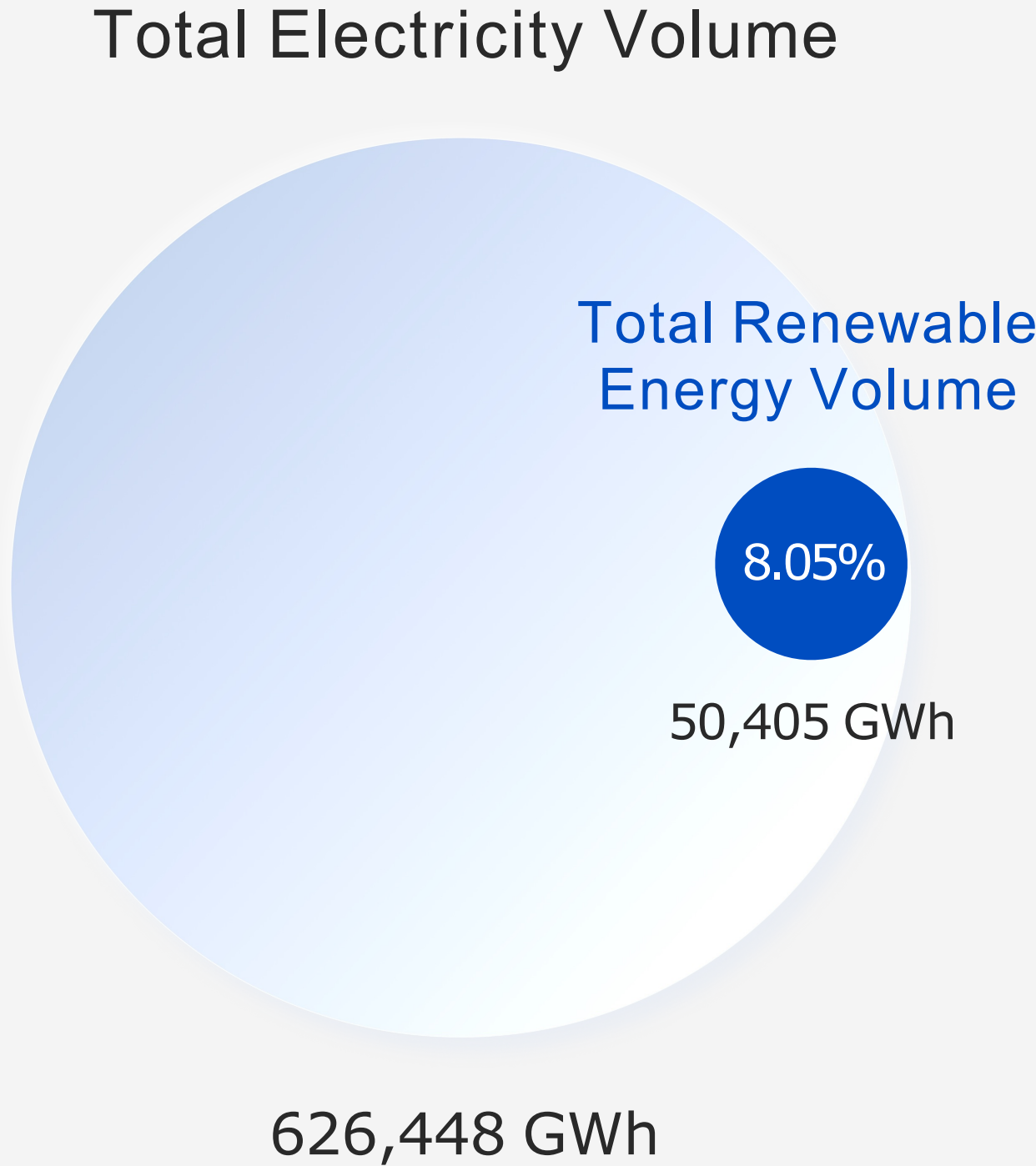
Total Electricity Volume



626,448 GWh

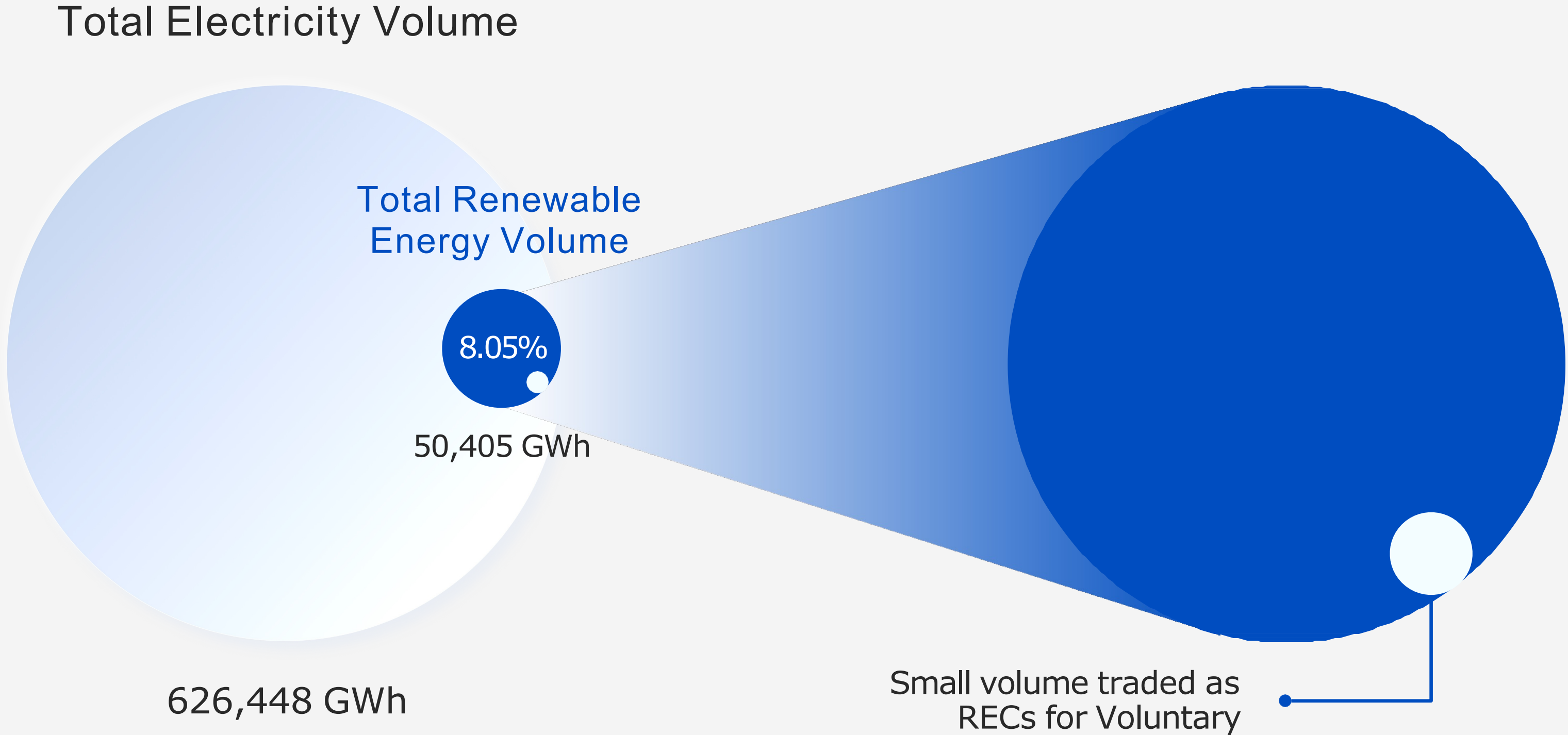
Korea Energy Agency, Apr 2024

# Scarce Renewable Energy Supply in Korea





# Scarce Renewable Energy Supply in Korea



Korea Energy Agency, Apr 2024

#	Method	Description
01	Green Premium (Green Electricity / Tariff)	Electricity bill + Renewable energy usage premium
02	REC Purchase	Unbundled REC Procurement
03	PPA	Power purchase agreement - 3rd party PPA / Direct PPA
04	Self-consumption	Direct installation



# Korea RE100 Companies: Domestic Procurement Method Breakdown

(Unit : GWh)

		2022		2023	
Total Domestic Electricity Volume		20,068		58,505	
Domestic Renewable Energy Volume	On-site generation	11	2%	32	1%
	PPA	0	0%	16	0%
	REC Purchase	14	2%	1,082	21%
	Green Electricity / Tariff	541	96%	3,964	78%
	<b>Subtotal</b>	<b>566</b>	<b>100%</b>	<b>5,093</b>	<b>100%</b>

KoSIF, CDP Korea Climate Change and Water Report 2023, Mar 2024

- \* Total RE volume increased 9 times.
- \* REC purchases has increased dramatically, competing with the Green Electricity / Tariff

# Korea RE100 Companies: Domestic Procurement Method Breakdown

(Unit : GWh)

		2022		2023	
Total Domestic Electricity Volume		20,068		58,505	
Domestic Renewable Energy Volume	On-site generation	11	2%	32	1%
	PPA	0	0%	16	0%
	REC Purchase	14	2%	1,082	21%
	Green Electricity / Tariff	541	96%	3,964	78%
	<b>Subtotal</b>	<b>566</b>	<b>100%</b>	<b>5,093</b>	<b>100%</b>

KoSIF, CDP Korea Climate Change and Water Report 2023, Mar 2024

- \* Total RE volume increased 9 times.
- \* REC purchases has increased dramatically, competing with the Green Electricity / Tariff

# Korea RE100 Companies: Domestic Procurement Method Breakdown

(Unit : GWh)

		2022		2023	
Total Domestic Electricity Volume		20,068		58,505	
Domestic Renewable Energy Volume	On-site generation	11	2%	32	1%
	PPA	0	0%	16	0%
	REC Purchase	14	2%	1,082	21%
	Green Electricity / Tariff	541	96%	3,964	78%
	Subtotal	566	100%	5,093	100%

KoSIF, CDP Korea Climate Change and Water Report 2023, Mar 2024

- \* Total RE volume increased 9 times.
- \* REC purchases has increased dramatically, competing with the Green Electricity / Tariff

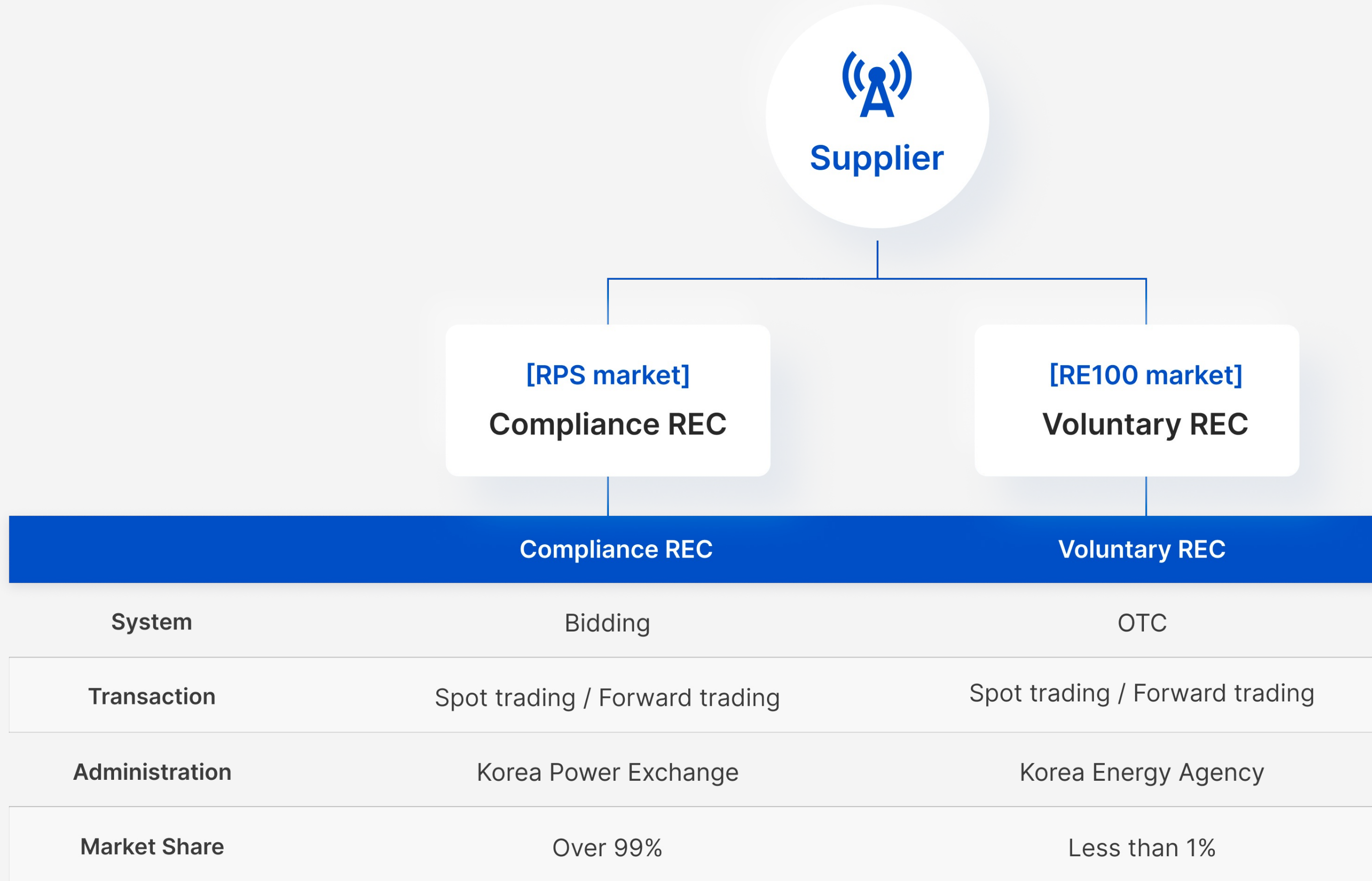


03

---

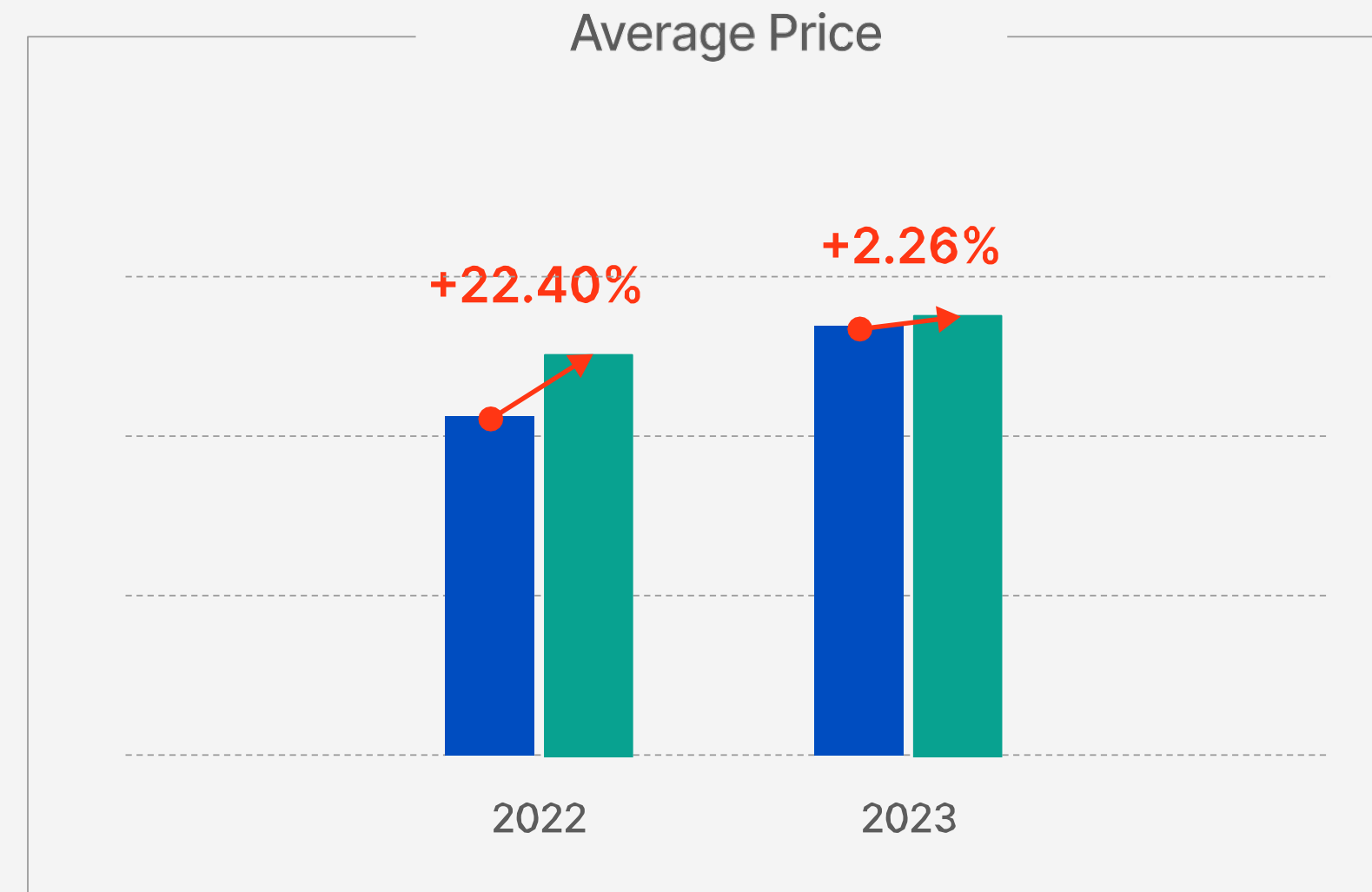
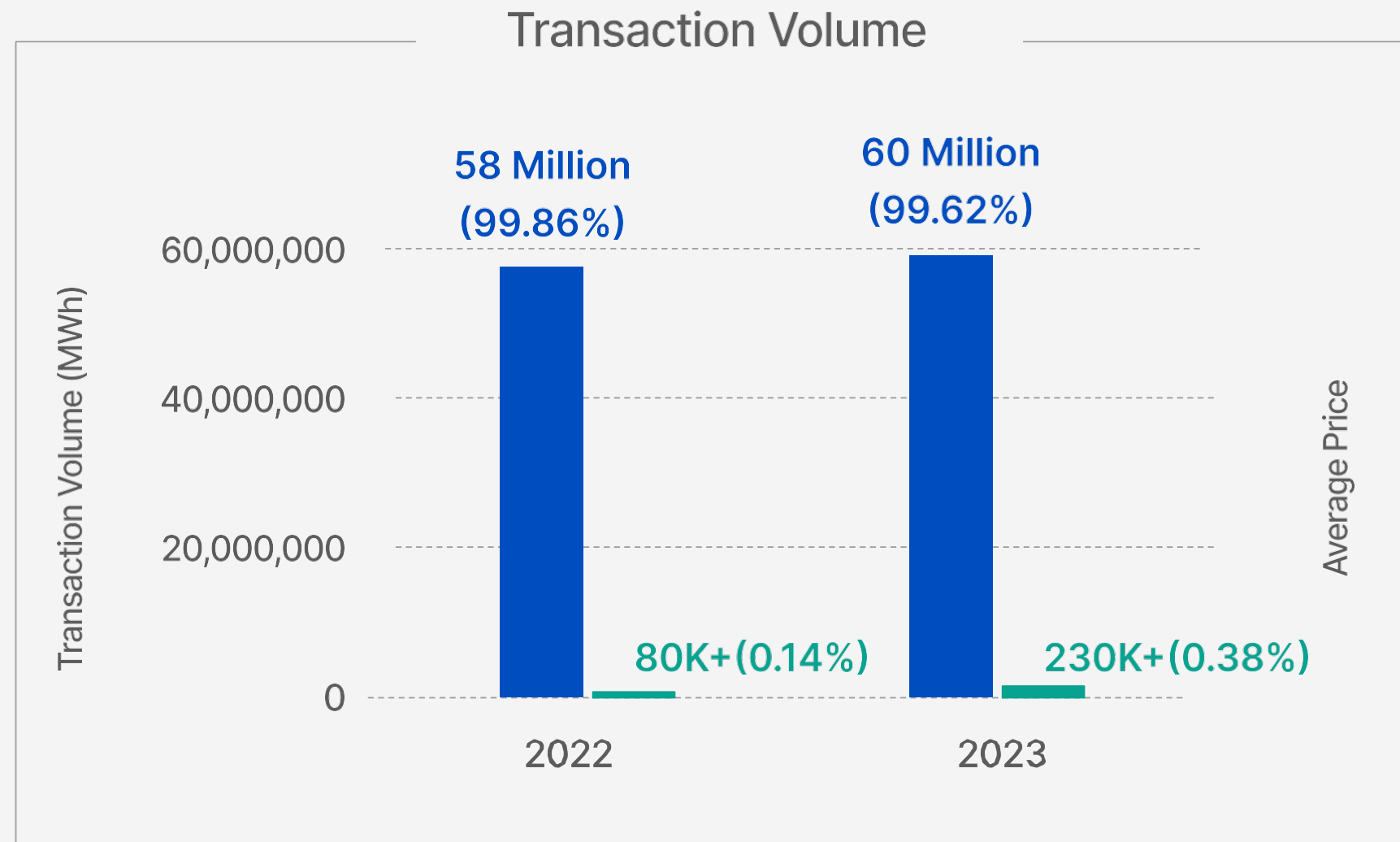
# REC Market in Korea





KPX, Apr 2024 Renewable e Usage Management System, Apr 2024

# Compliance REC vs Voluntary REC in Korea



■ Compliance ■ Voluntary

New and Renewable One-stop Portal, April 2024 / RE100 Information Platform, April 2024 / Renewable e Usage Management System, April 2024

- Due to the significantly limited supply relative to demand in the Korean market, suppliers hold the negotiating power.
  - From the supplier's perspective, selling in the Compliance market is much more convenient, so almost all volumes are absorbed in the Compliance market, with only a very small portion going to the Voluntary market.
- Ex) In cases when a certain buyer is willing to pay noticeably higher prices for the Voluntary REC.
- As a result, prices in the Voluntary market are higher than those in the Compliance market.



Carbon neutrality

### SK Chemicals signs VPPA contract with SK E&S

With this virtual power purchase agreement, the company plans to shift 10% of Ulsan factory power to solar energy

Oct 12, 2023 (Gmt+09:00) | 1 Min read

### 루트에너지, 더캠프 'RE100' 이행...탄소중립 병행문화 시작

조성구 기자 | 승인 2022.12.05 08:38 | 댓글 0

### 현대모비스, 현대건설과 VPPA 계약 체결... RE100 전환 속도

최용구 기자 | 승인 2023.10.16 08:30 | 댓글 0

### Amorepacific Signs MOU on Renewable Energy Supply with SK E&S for Carbon Neutrality

Sustainability | 2021-12-08

### 미래에셋증권, 피브이에너지와 3MW 규모 태양광 VPPA 체결

최용구 기자 | 승인 2023.11.01 16:15 | 댓글 0

### 모햇, SK E&S 통해 SK케미칼에 VPPA로 재생에너지 공급

이상복 기자 | 입력 2023.10.23 11:28 | 댓글 0

ESG

### Chanel Korea to power its stores with renewable energy

The luxury fashion house plans to source 100% of its annual electricity consumption from renewable energy by 2025

By Jeong-Cheol Bae Feb 09, 2023 (Gmt+09:00) | 1 Min read

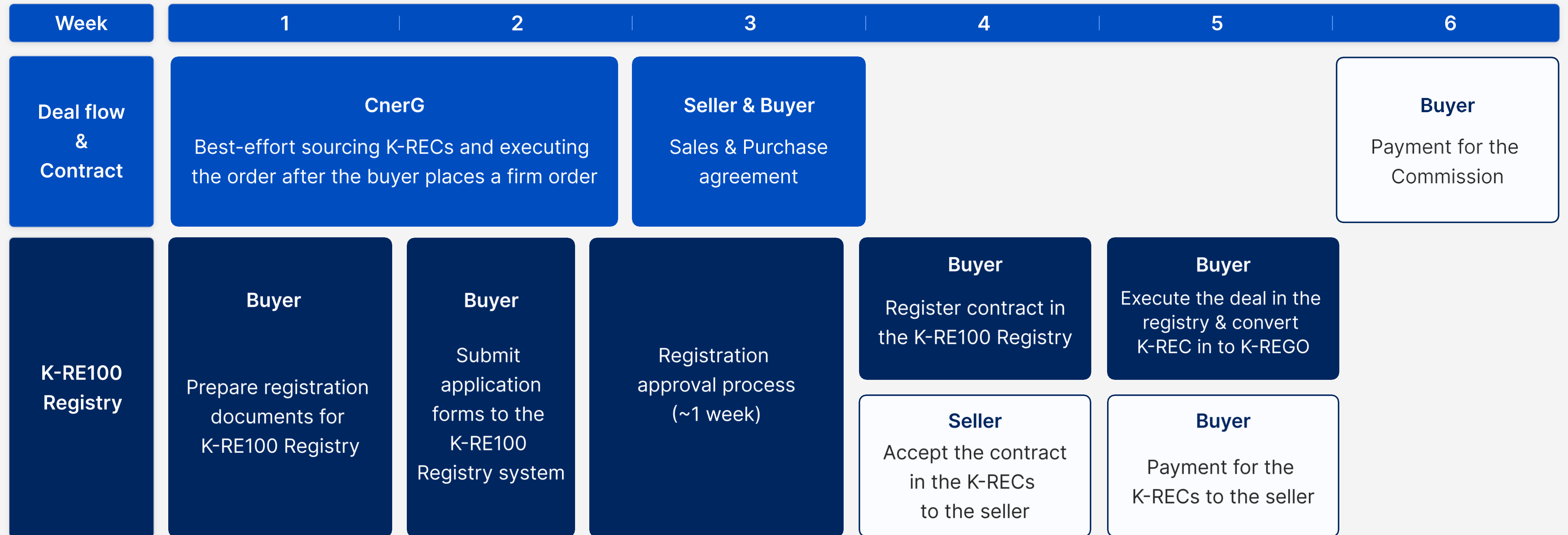
# Total # of VPPA contract

2 → 5

(In 2022)

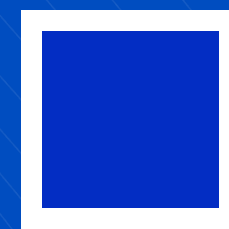
(In 2023)

# Korea Voluntary REC Purchase Process



- \* There's no secondary market in Korea REC - traders cannot take positions.
- \* End buyer (Korean entity) needs to open an account / settle contracts / pay for trade directly to the supplier
- \* Trade flow takes around 5 weeks

CnerG,  
Making Net Zero a Reality  
Thanks!



<https://www.cnerg.net/resources/contact-us>

[trading@cnerg.net](mailto:trading@cnerg.net)



Market Spotlight:  
**Corporate Renewable Energy  
Procurement in South Korea**

**Event & Date** REM Asia (Singapore) | April 29, 2024

**Speaker** Dayoon Joo, Corporate Engagement Analyst



# SFOC *Solutions for Our Climate* is

an international climate advocacy organization founded in 2016 dedicated to **aligning emissions trajectories with the goals of the Paris Agreement.**

We leverage our extensive networks and diverse talent pool to drive change through **research, strategy, and collaborative platforms.**

By harnessing the **power of our networks** in the media, legal community, diplomatic circles, and civil society partners,

SFOC shifts policymakers, financiers, and businesses to phase out fossil fuels, end their finance, enable the **development of genuine renewables, and accelerate industrial decarbonization.**



# Contents

- Corporate RE procurement
- Barriers to corporate RE expansion
- Policy recommendations

# Corporate RE Procurement

RE share must exceed 30% of power mix by 2030 to meet corporate demand

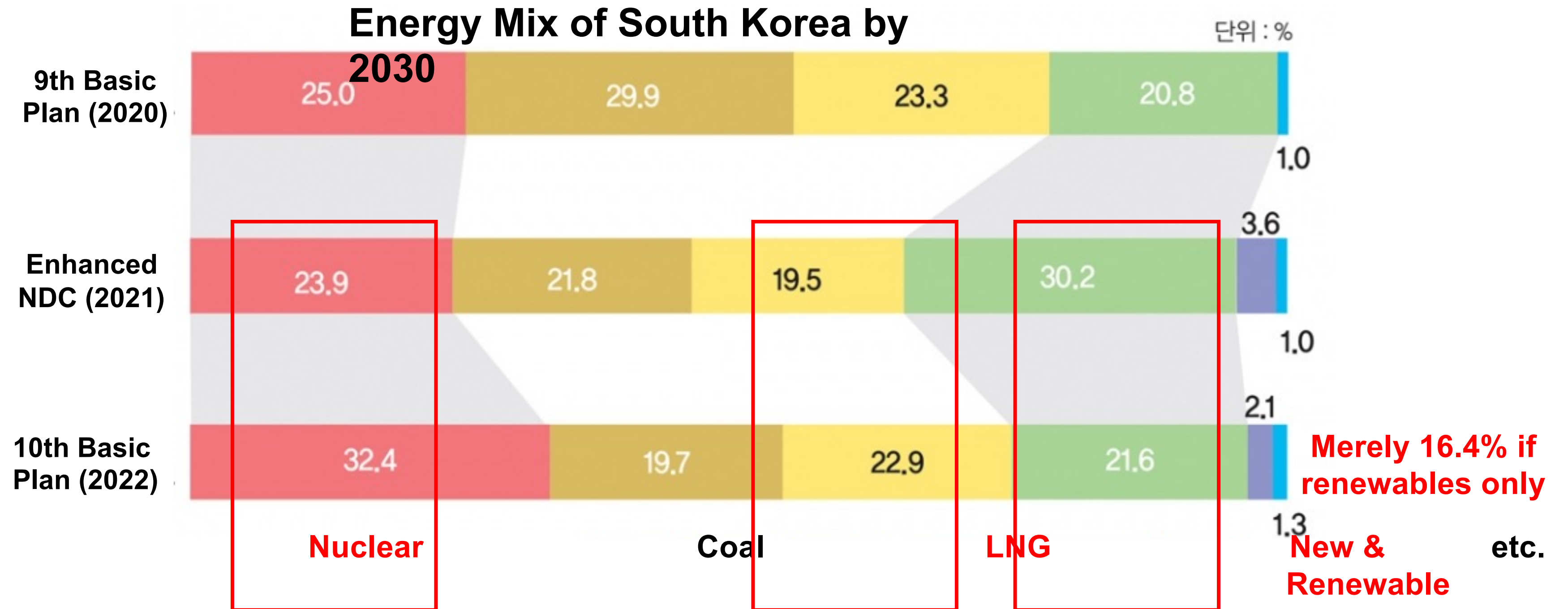
Source: Plan 1.5 & KoSIF

2030 Scenario	RE Demand	Green Premiums	Total Demand (percentage of power mix)
Voluntary Targets: 236 Companies with operations in South Korea	98.4 TWh	Overlap of 16.2 TWh	172.4 TWh (30%) (must exceed 40% by 2030 to achieve net zero by 2050)
RPS* Obligations: 27 Generators with over 500 MW capacity <small>* Renewable Portfolio Standard</small>	90.2 TWh (25%)		



# Corporate RE Procurement

National targets inadequate for projected corporate RE demand



Source: MOTIE (data),  
Electric Power Journal (graphic)

# Corporate RE Procurement

The corporate favorite: low additionality Green Premiums

**Green Premiums  
occupy majority  
(87.5%)**

Option	Consumption (MWh)	# of Corporates
Green premium	6,824,887 (87.5%)	99
REC	962,979 (12.3%)	63
Third-party PPAs	2,798 (0.04%)	2
Direct PPAs	-	-
Self- generation	9,361 (0.12%)	24
Sum	7,800,025 (100%)	167

Source: [Korea Energy Agency, 2023. 02.](#)

# Corporate RE Procurement

## Obstacles for procuring higher additionality options

Option	Cost in KRW per kWh	Managing Agency	Advantages	Limitations
Green premium	10.9 + Electricity Price	KEA	Cheap, accessible	<b>Limited additionality, No GHG reduction effect</b>
REC	60 + Electricity Price	KEA	Higher additionality than GPs, More accessible than PPAs	Unpredictable price
Third-party PPAs	~180-190	KEPCO	Highest additionality, Long term stability w/ lower upfront cost	<b>High ancillary costs, overlapping network fees, complex procedure</b>
Direct PPAs	~180-190	-		
Self-generation	unknown	-	Highest additionality, Long-term stability	High upfront cost, Requires technical expertise

# Barriers to RE Expansion

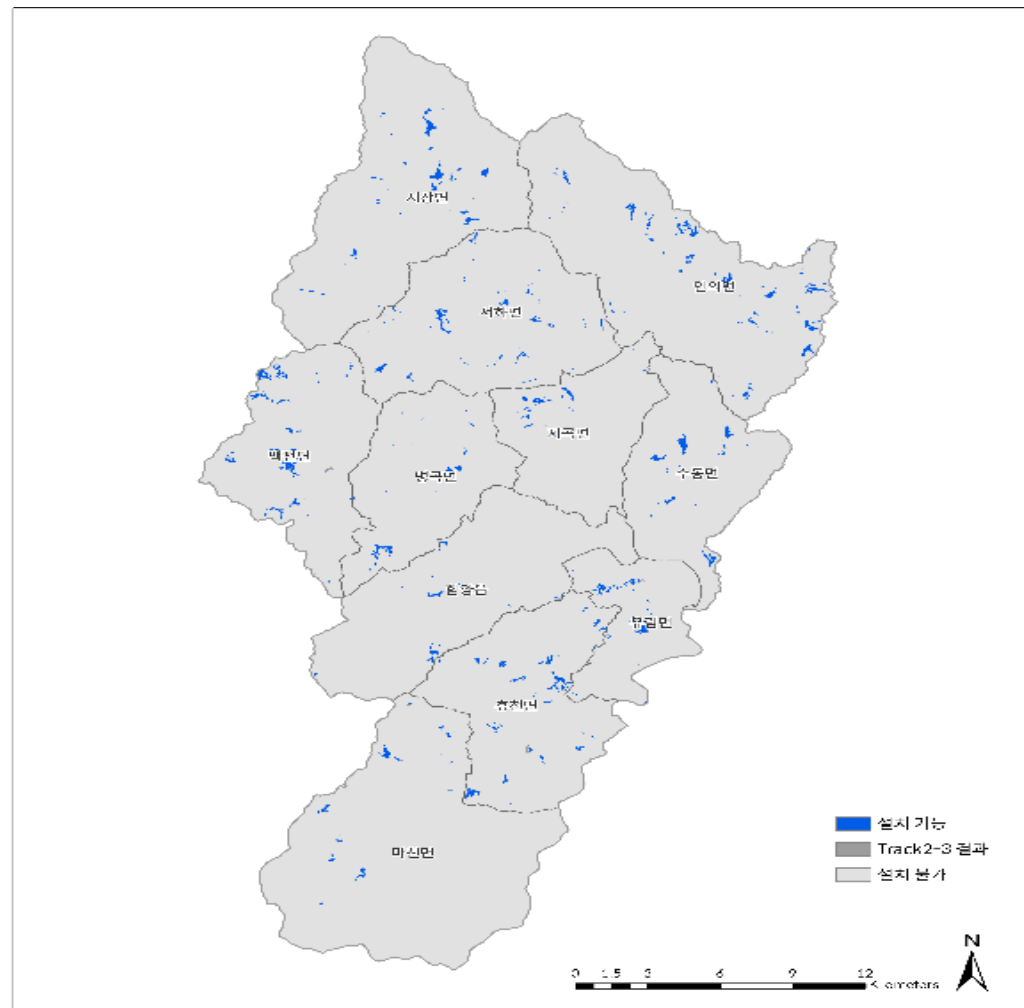
- **Renewables permitting challenges**
- **Monopolistic KEPCO oriented power market**
- **The power system's lack of institutional independence**



# Barriers to RE Expansion

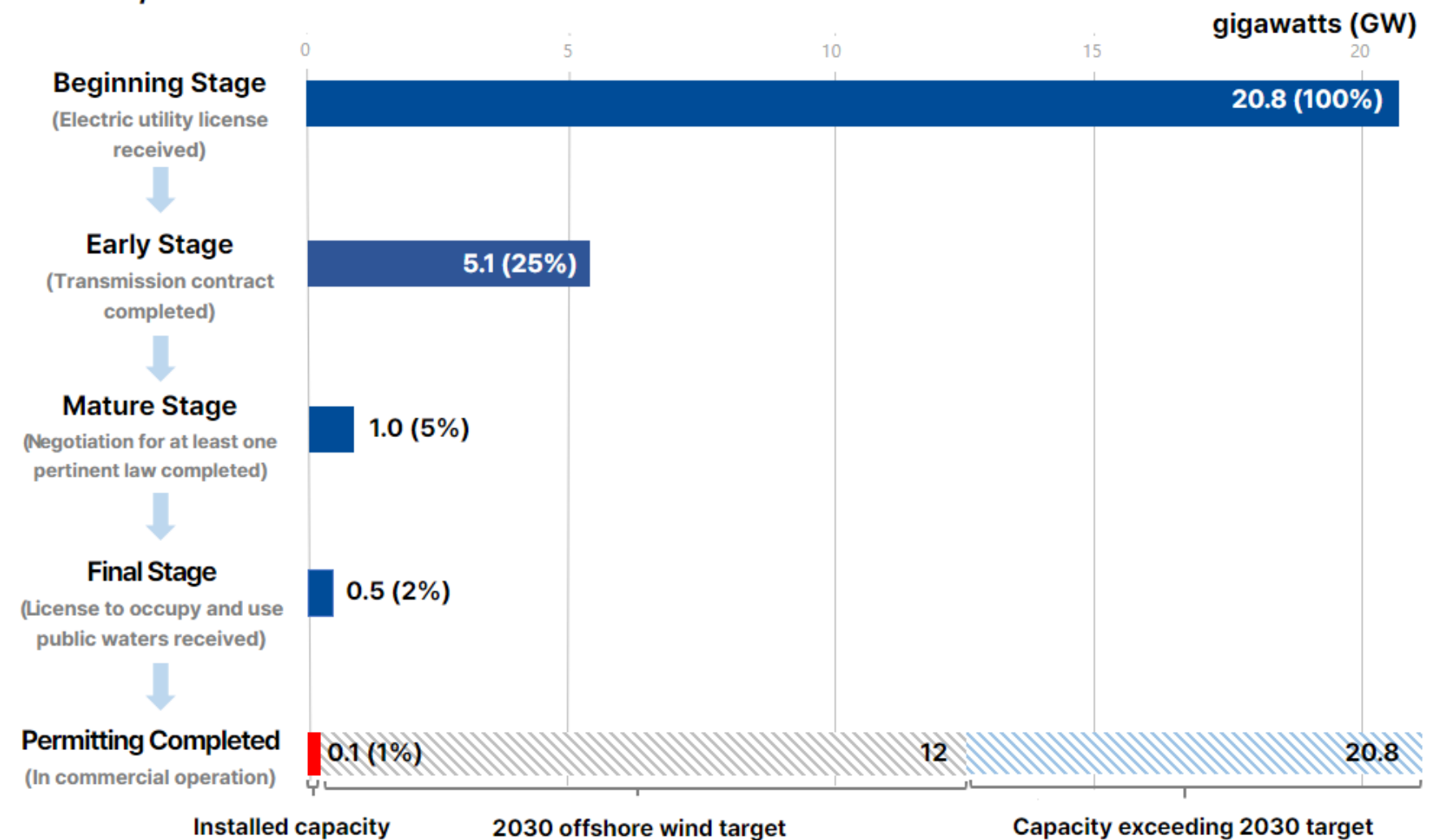
## Renewables permitting challenges

The blue area is where solar power plants can be built (0.6% of area)



Source: SFOC, "Nowhere to Go: How South Korea's Siting Regulations are Strangling Solar" 2020  
 Hamyang-gun, Gyeongsangnam-do

### Korean offshore wind projects stalled in each permitting stage as of Sept 2022



Source: KPX, EIASS, KEPCO

- (1) offshore wind site government-led auction
- (2) one-stop shop system

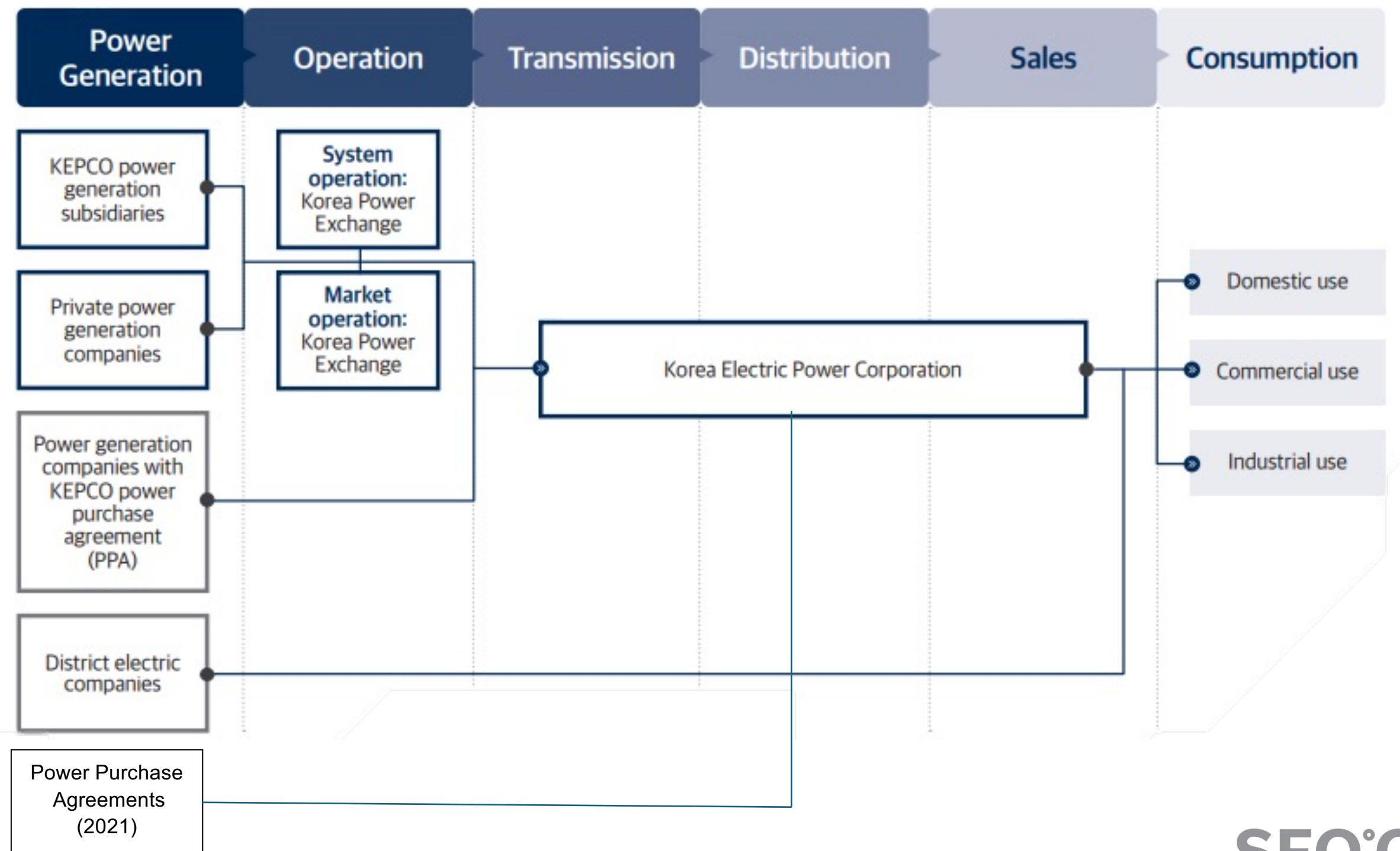
# Barriers to RE Expansion

## Monopolistic KEPCO oriented power market

The Korea Electric Power Corporation (KEPCO) has a **de facto monopoly** over the power market system.

- 6 Generation subsidiaries of KEPCO produce about 70% of Korea's power, **less than 3% of which is Renewable.**
- Heavily relies on **fossil fuel and nuclear-based assets**
- Government funded generation subsidiaries have higher credit rating and **makes it easier for renewable generators to bank their projects.**

[Figure 1] Structure of Korean Electric Power Industry



# Barriers to RE Expansion

## Conflict of interest between KEPCO and system operator (KPX)



As of Sept. 2023, among the 12 directors of the KPX Board, **3 were vice presidents** of KEPCO or its wholly-owned generation subsidiaries.

These three KPX committees wield great influence over profits of market participants.

Rule Revision Committee

Cost Evaluation Committee

Grid Evaluation Committee

Among the combined 32 members, **7 were employed** by KEPCO or its subsidiaries and **9 had received payments** from KEPCO or its subsidiaries for consultation or research projects since 2018.

# Policy Recommendations

## **Increase supply**

1. Alleviate separation distance regulations for solar panels by strengthening the procedural participation of residents
2. Implement a national strategy where the government takes leadership in offshore site zoning, environmental assessment, and community acceptance

## **Enhance distribution (PPA) system**

3. Foster a competitive power market by diversifying market actors and expanding their role (esp. in direct PPAs)
4. Reduce unnecessary costs (ancillary costs, overlapping network fees, etc.) by ensuring transparency of the pricing system



## Q&A

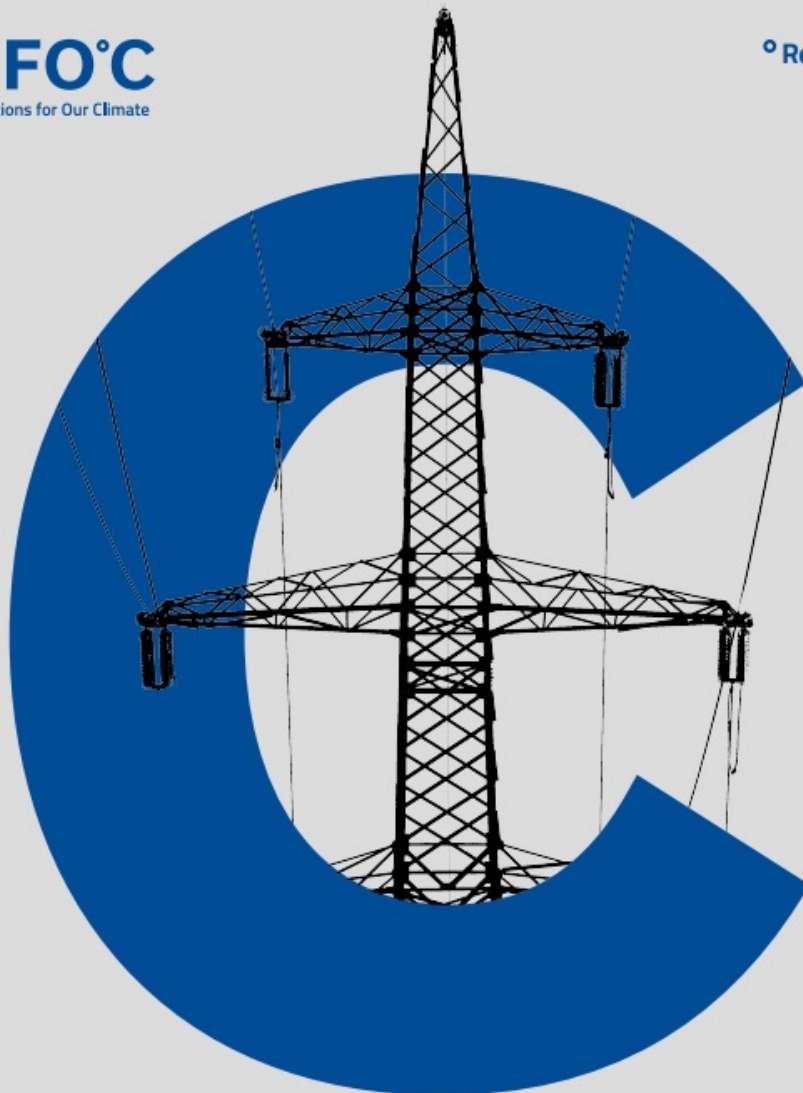
What can I do to help increase RE availability and usage in South Korea?

If you and your supply chain are not already in touch with SFOC, please contact us to be kept up to date on activities and opportunities to make your voices heard.



**SFO°C**  
Solutions for Our Climate

Report



**Current Issues in KPX's Governance and Policy Proposal for Sustainable Change**

**Accelerating Corporate Renewable Electricity Procurement in Korea**

Prepared By Solutions for Our Climate (SFOC)  
28th June, 2022

Justine Holmes [justine.holmes@forourclimate.org](mailto:justine.holmes@forourclimate.org)  
Janghyeok Lim [janghyeok.lim@forourclimate.org](mailto:janghyeok.lim@forourclimate.org)




**SFO°C**  
Solutions for Our Climate

**12 Key Issues That Will Define Offshore Wind's Success in Korea**



**SFO°C**  
Solutions for Our Climate

Issue Brief



**SFO°C**  
Solutions for Our Climate

**The Unlevel Playing Field:**  
How the Power Market Structure Discriminates Against Demand Response to Favor Gas Power Generation

**Speaker** **Dayoon Joo, Corporate Engagement Analyst**  
*[dayoon.joo@forourclimate.org](mailto:dayoon.joo@forourclimate.org)*



RENEWABLE ENERGY MARKETS ASIA 2024 PANEL DISCUSSION

# MARKET SPOTLIGHT: SOUTH KOREA



**Kate Roh**

Head of Business  
Development  
CnerG



**Dayoon Joo**

Analyst, Corporate  
Engagement Team  
Solutions for our Climate (SFOC)

Monday, 29 April 11:30AM-12:00 PM



**Renewable Energy  
Markets™ Asia 2024**



# SINGAPORE

29 - 30 APRIL 2024



**Renewable Energy  
Markets Asia 2024**