



7<sup>th</sup> International SCO<sub>2</sub> Power Cycles Symposium  
Industry Panel Session – Steps to Commercialization

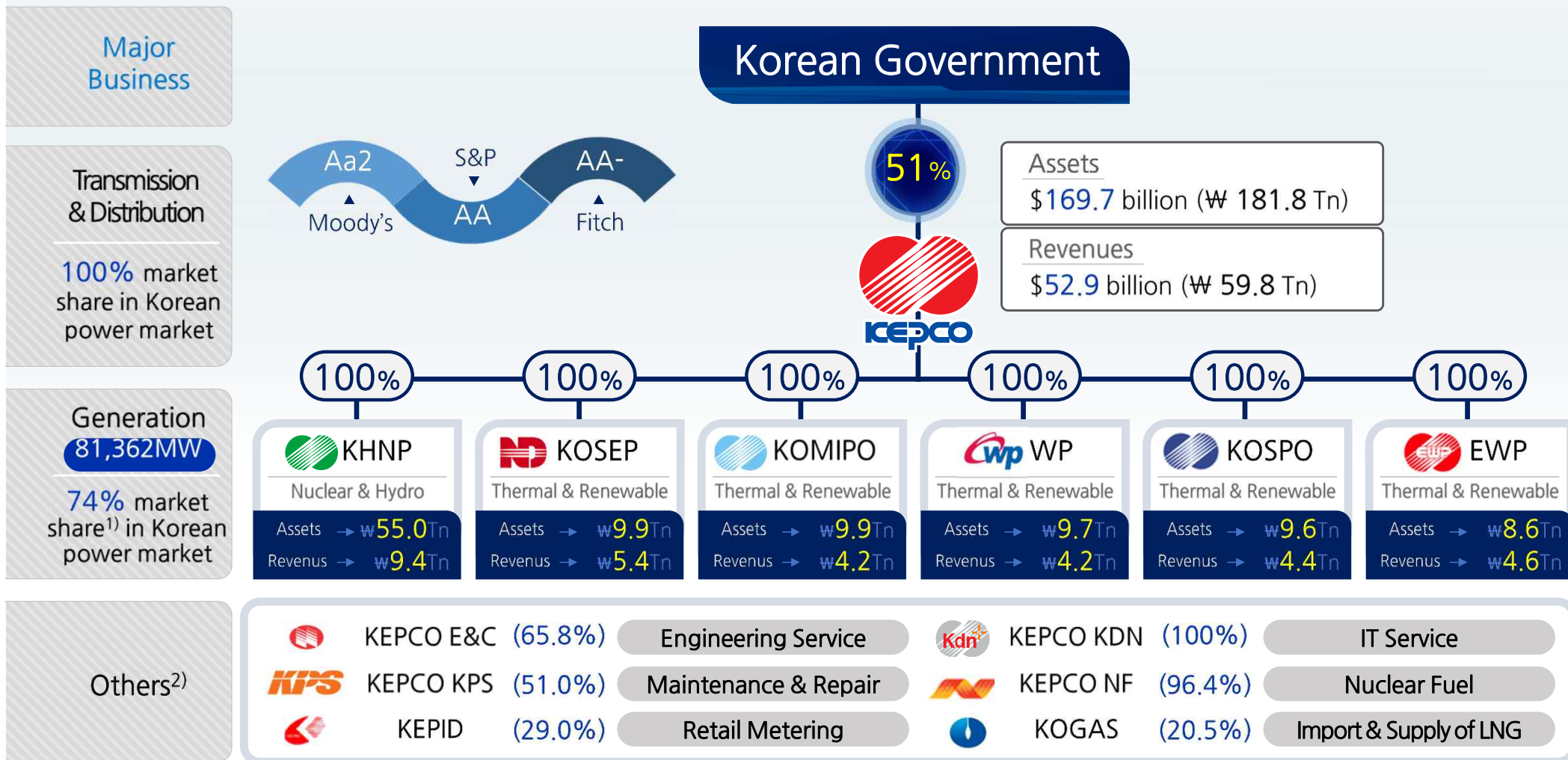
# KEPCO SCO<sub>2</sub> R&D Status

2022.2.22

Beomjoo Kim



# Overview : Key Player in Korea



1) Electric Power Trading Volume for 2018 : 74% or 361,835GWh by 6GENCOs, and 26% or 126,136GWh by IPP&PPA

2) Others include major subsidiaries and affiliates of KEPCO other than 6GENCOs

# History

▶ Since the foundation of Hansung Electric Company in 1898, KEPCO has stably supplied electric power for 120 years through countless changes and innovations.



Hansung Electric Co. was founded (predecessor of KEPCO)

1898



Completed Power network construction for rural areas

1979



KEPCO shares listed on the New York Stock Exchange

1994



Won the first overseas nuclear plant contract(UAE)

2009



Held Bitgaram International Exposition (BIXPO)

2015

1900~1980s

1961

Korea Electric Co. (KECO) was established



1990s

1982

KECO was renamed Korea Electric Power Corp. (KEPCO)



2000~2010s

1995

Won the Malaya ROMM project in the Philippines



2013

Held the World Energy Congress (WEC)



# Presence by Country

42 Projects in 27 countries



Nuclear

1 Project



Thermal

12 Projects



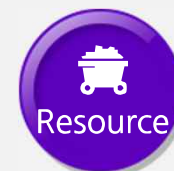
Renewable

7 Projects



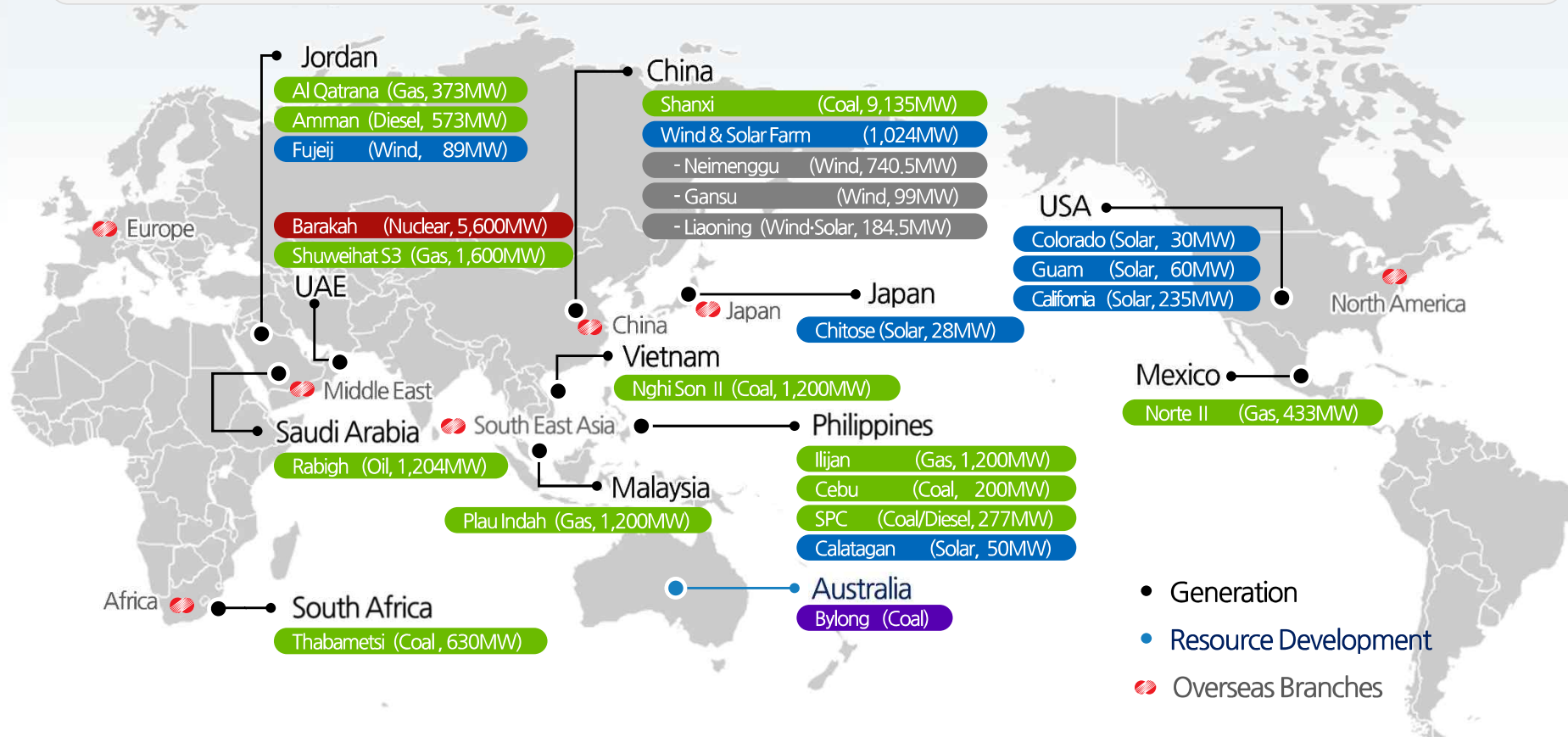
T&D/New

21 Projects



Resource

1 Project



# KEPCO SCO2 Project List

Indirectly Heated	<b>2MW SCO2 Power System Development Using Waste Heat</b>
	Subscription to 10MW U.S.DOE STEP JIP
	The Design of SCO2 Power Cycle Using 5MW Biogas Turbine Waste Heat
	The Basic Design of 15MWth OXY-PFBC (Pressurized Fluidized Bed Combustion)
	3MWth CLC (Chemical Looping Combustion) Development
Directly Heated	OXY-Combustion Gas Turbine Development
	The Development of a Sensor System to Measure Chemical Compositions

# 2MWe (net) KEPCO SCO<sub>2</sub>

## 2MWe (net) SCO<sub>2</sub> Power System Development using Waste Heat (since 2016)

- System Design, Control Philosophy Design, and HAZOP have been completed
- The production of major components has been completed
  - Heat Exchangers (PHX, recuperator, cooler), Turbomachinery, Process Skid, Gas Supply
- FAT has been completed
  - Mechanical Run Test, Performance Test, NDT, Hydro, Leak



PHX



Cooler



Recuperator



Process Skid



Turbomachinery

# Application

## ▪ Bottoming Cycle

- Reciprocating Engine
  - Engine Power Plant
  - Ship
- Gas Turbine (including Hydrogen)

## ▪ Industrial Waste Heat

- Steelmaking
- Cement
- Waste Incinerator

## ※ Considerations for Heat Sources

- Heat Capacity, Flowrate, Draft loss
- Material, Pollution



KEPCO Jordan EPP (573MW)



KOMIPO Jeju EPP (80MW)



Steelmaking Factory

# Challenges for Commercialization

- **Technical**

- Performance, Operability, Safety, Standardization

- **Environmental**

- Net Zero, ESG, RE100

- **Economic**

- LCOE

- ※ **Public-Private Cooperation**

- Policy Support, Financial Support, Infrastructure Support
- Develop Commercial Models & Risk-Sharing Initiatives
  - ✓ Joint Venture, Public-Private Partnerships, Long Term PPAs



# Derisking Approach

## Industrial Clusters via Net-Zero Challenge

### Ecosystem for Low-Carbon Distributed Power & Energy Self-Sufficiency

- System Efficiency, Circularity (including Waste Heat)
- Renewable
- Hydrogen
- CCUS



Korean Industrial Clusters

Open the way to the future with



Thank You!

[sco2@kepco.co.kr](mailto:sco2@kepco.co.kr)  
[sco2power@naver.com](mailto:sco2power@naver.com)

