
Decarbonization Pathway of Korea

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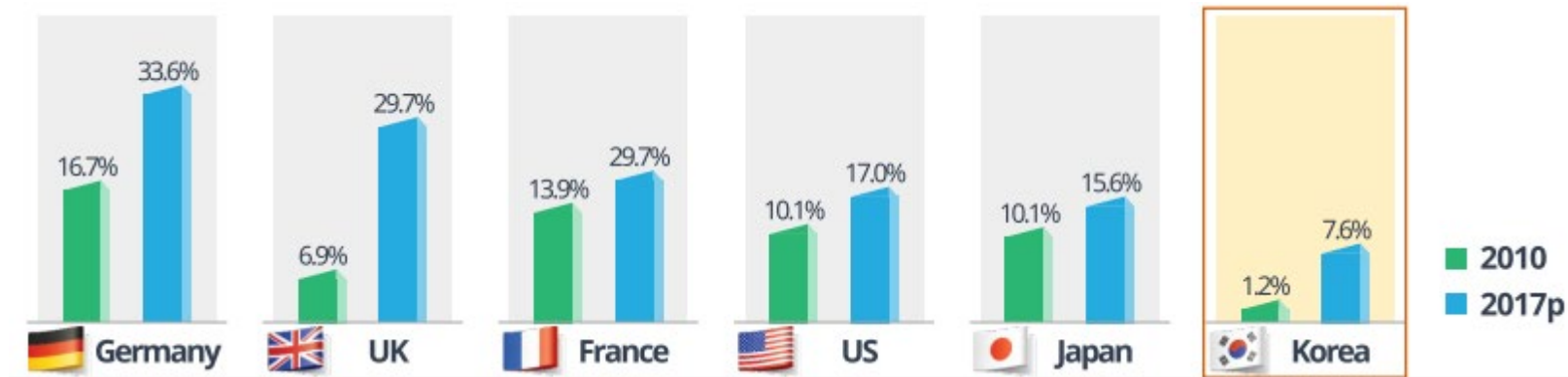
Status of Korea : ENERGY



Energy Policy Challenges in Korea

➤ [Supply] High Dependence on Fossil Fuel → **Low Share of Renewable Energy**

RE share of Power Generation in Major Countries



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

- **Low renewable energy job creation** → **Renewable energy job only reached to 14,000 in 2016**
(Global renewable energy employment reached 10.3mil. in 2016)

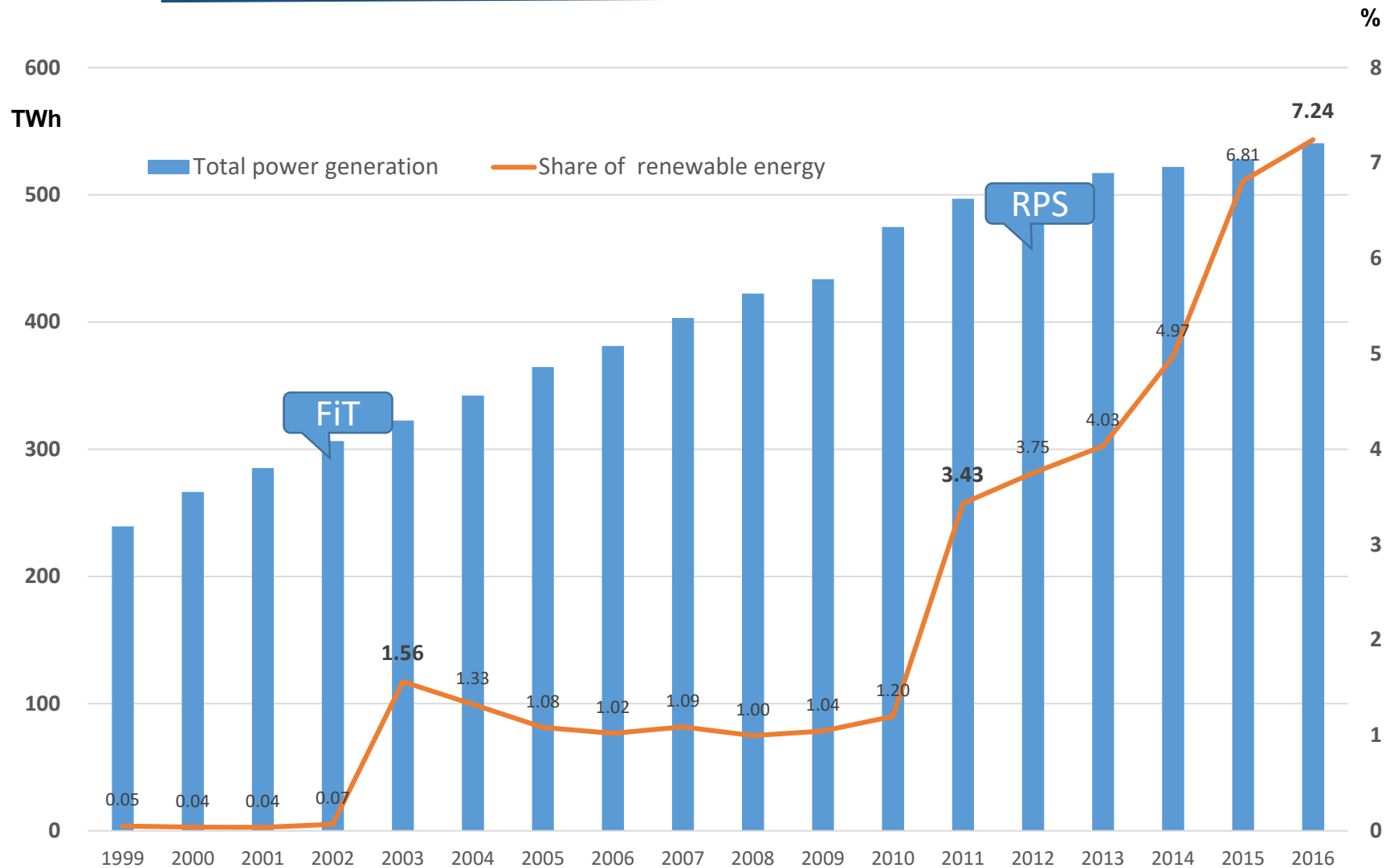
➤ [Demand] Continuous Increase in Energy Demand → **Low Energy Efficiency**

- Energy Intensity : **Korea 0.159**, US 0.123, JAPAN 0.089, **OECD 0.105** (toe/1,000USD, '17)
- Electricity has substituted the consumption of other energy sources

➤ [Market/System] Market System

- **Social/environmental costs** are not fully reflected to the energy price.
- **Low price level, Monopolistic supply structure** → **Impeding new energy service and saving consumption**

Trend in Renewables Supply in Korea

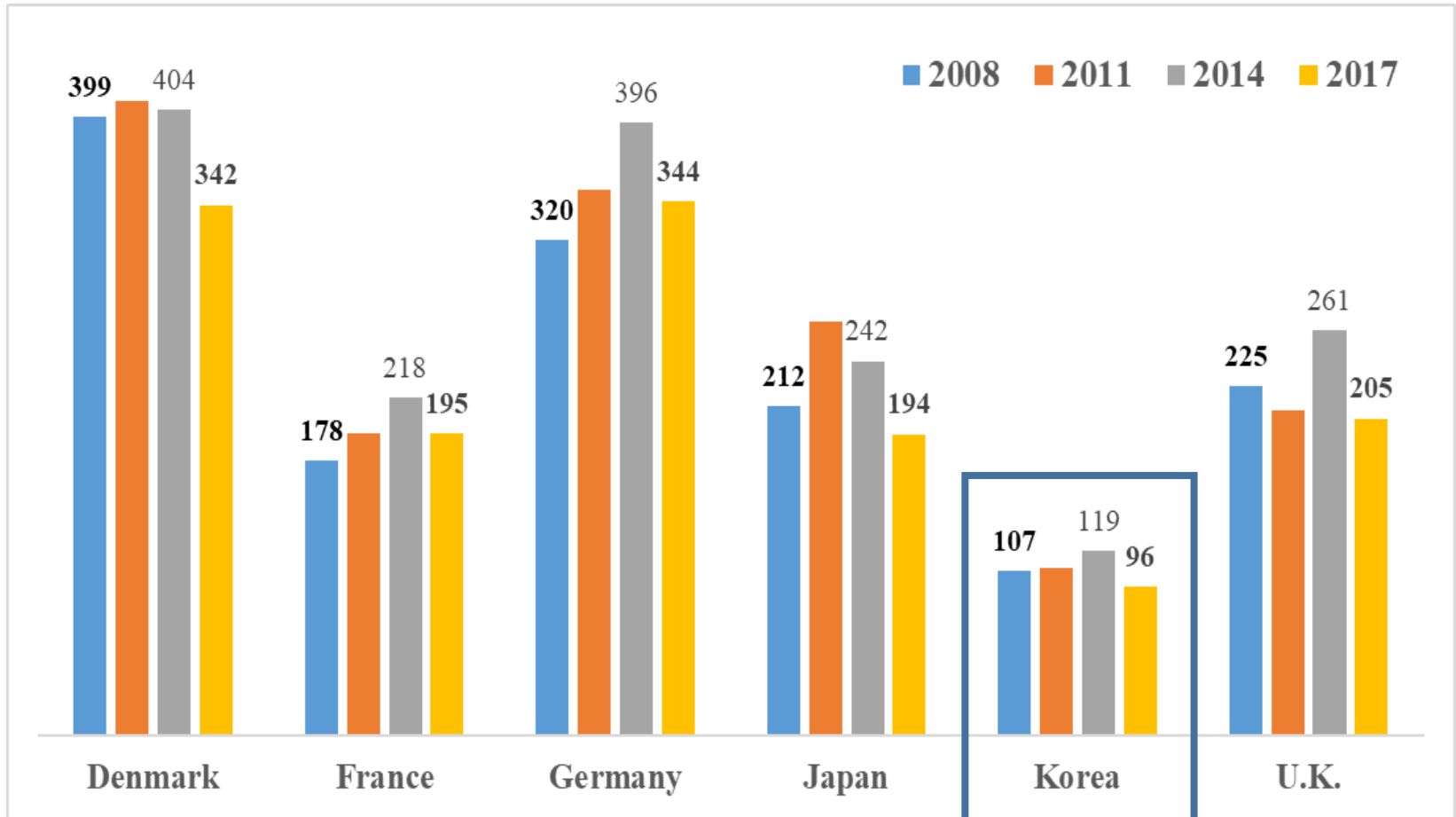


Note: Renewable energy does not include new energy, fuel-cell and IGCC.

Source: Calculation based on KESIS, www.kesis.net, KEEI

Power Price of Residential

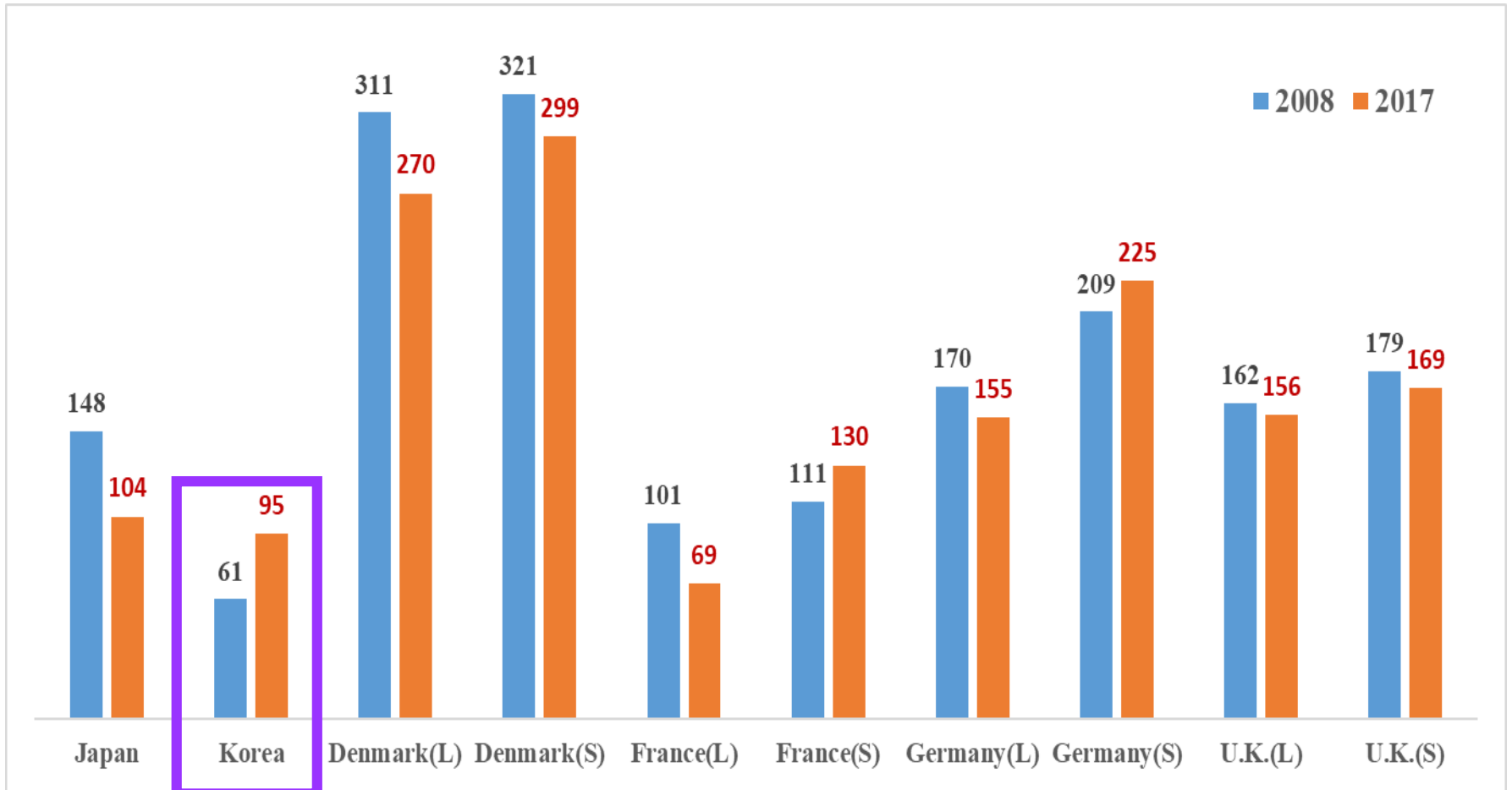
(unit: US\$/MWh)



Source: Bloomberg NEF

Industrial Power Price

(unit: US\$/MWh)



Source: Bloomberg NEF

Energy Transition Policy of Korea

➤ Nuclear Power phase out

- To Stop the building of new reactors, Not to permit the extension of reactor's operation.
 - To stop the building of new 6 reactors (8.6GW)
 - Not to permit the operation extension : In 2030, expected to phase out 11 reactors (9.3GW)

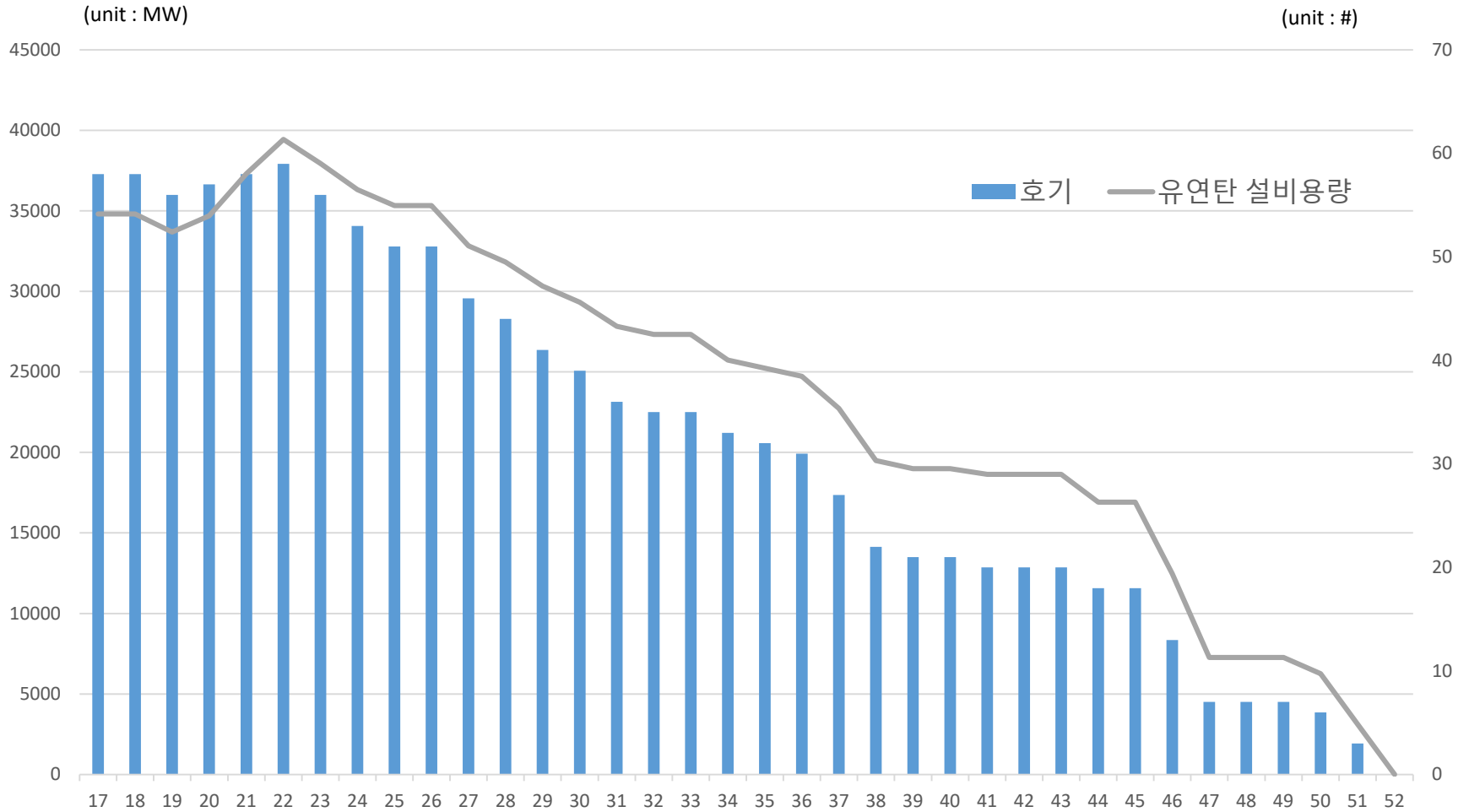
➤ Reducing reliance on coal and putting stricter regulation on emission

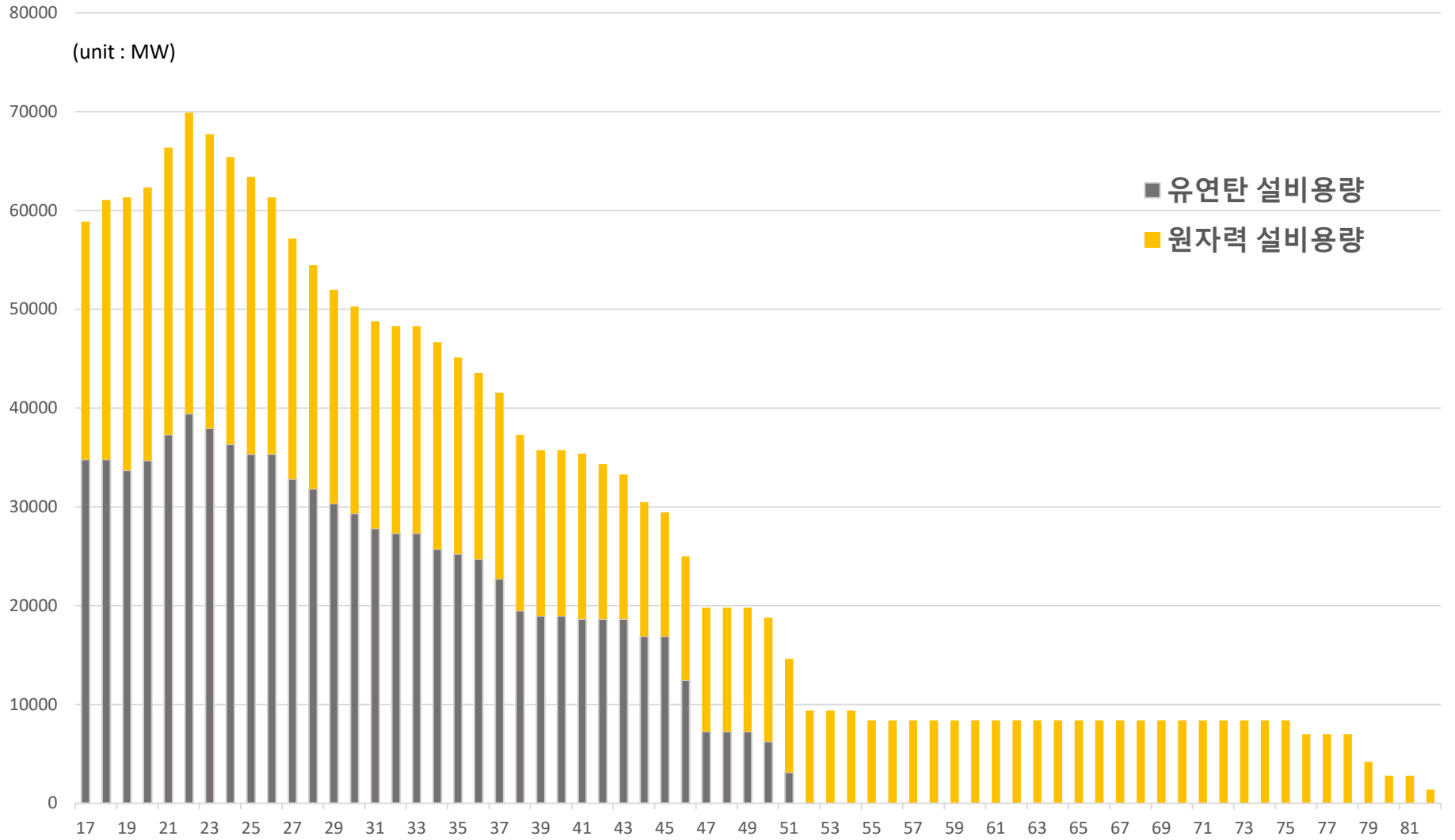
- Strengthen emission regulation (direct regulation, fuel tax)
 - **Temporary shut down coal-fired** power plants
 - Reforming fuel tax system to reflect environmental cost
- To stop construction of new coal power plants and shut down old plants
 - To Switch planned coal power plants to LNG
 - Shut down 10 old coal-fired power plants (3.3GW)

➤ Expansion of Renewable Energy

- To increase up to **20%** of renewable energy (of electricity generation) by **2030** (➔ **RE3020**)
- To expand distributed energy resources
- To increase gas-fired generating capacity

유연탄 발전설비용량 변화 추이





Paradigm shift of Energy Policy in Korea

➤ “Energy Transition”

energy supply optimization + reforming energy consumption structure + new energy industry from the perspective on innovation-based growth

[Supply] **Sustainable energy mix**, not only diversify the power mix; energy supply optimization in electricity sector as well as gas and heating

[Demand] Development of **new energy industry** and **new growth engine** through **transition of energy consumption structure** in the sector of industry, building and transportation Energy

[Market/System] **Reform of institutional system** accommodating **market oriented energy system**.

Progress of Energy Transition in Korea

8th Basic Plan for Long-term Electricity Supply and Demand (Dec. 2017)



Renewable Energy 3020 (Dec. 2017)



Revised 2030 GHG Reduction Roadmap (Jul. 2018)



Consistency



3rd Energy Master Plan (expected Mar. 2019)



9th Basic Plan for Long-term Electricity Supply and Demand (2019)



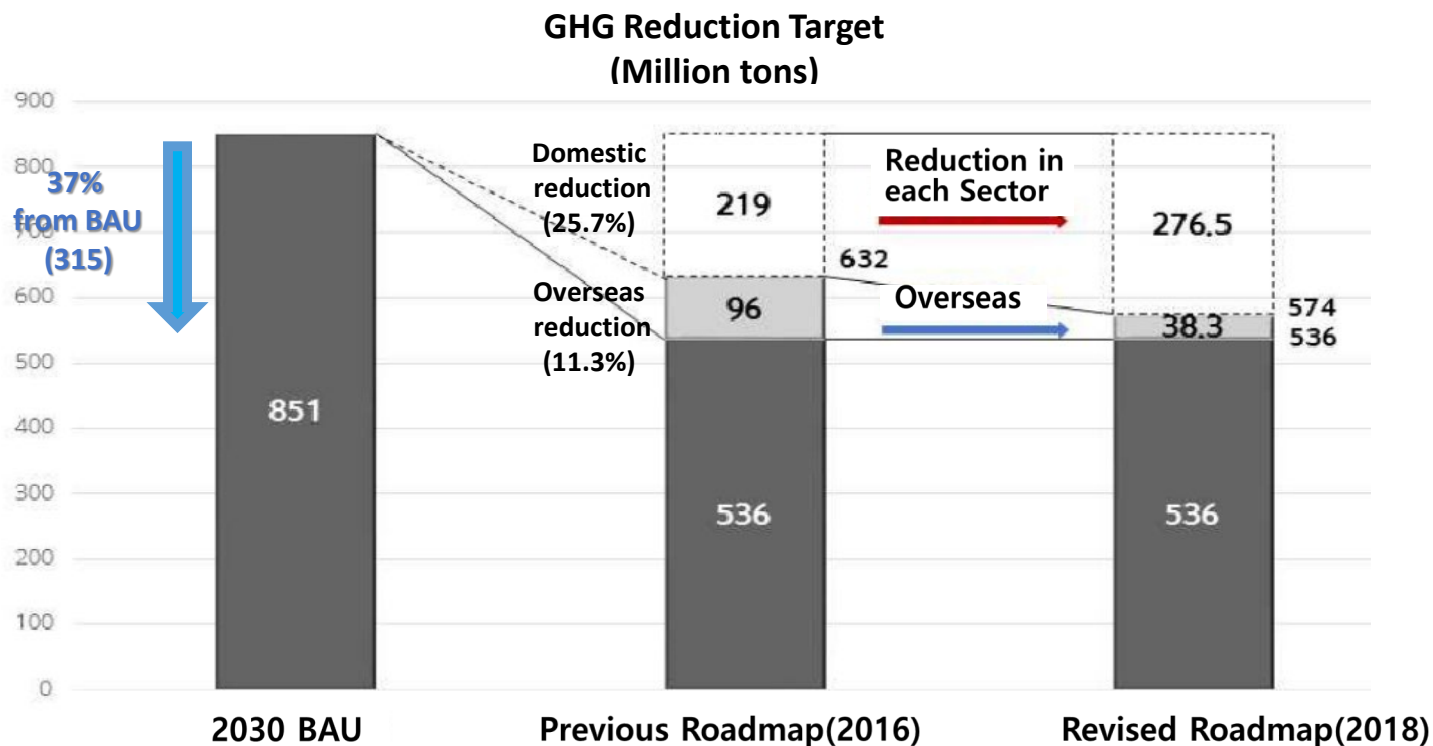
Decarbonization Target in Korea

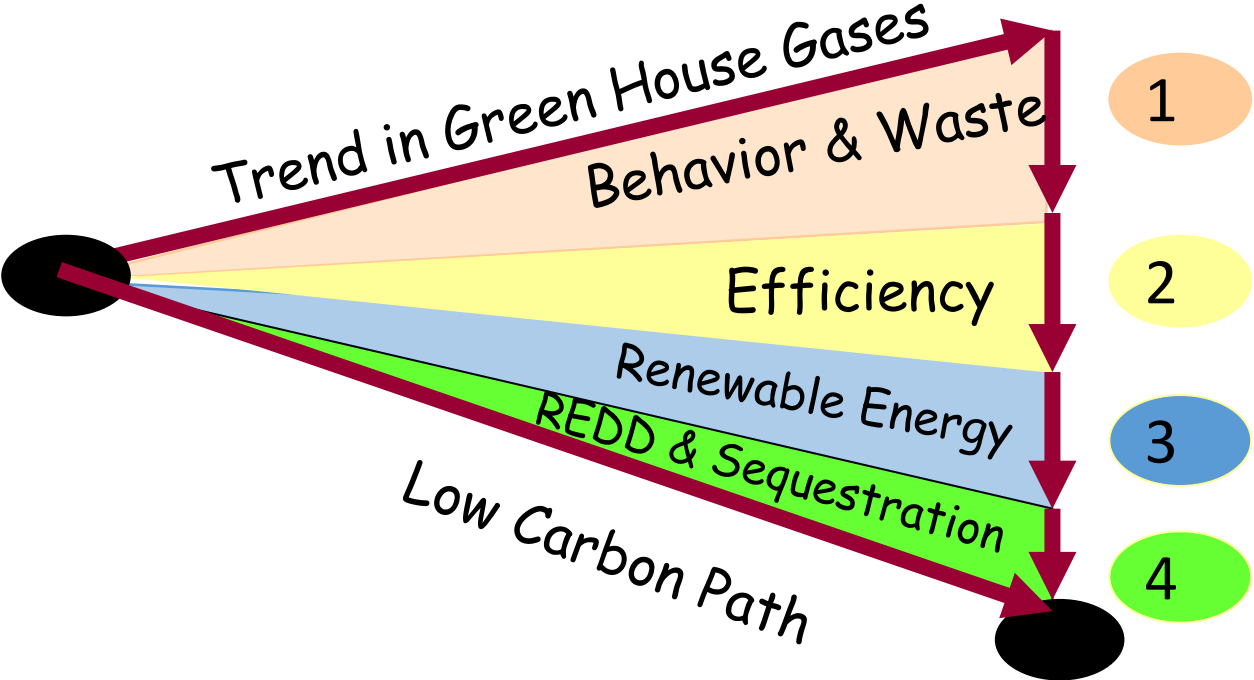


Revised 2030 GHG Reduction Roadmap

➤ Revised 2030 GHG Reduction Roadmap

- To reduce GHG emissions by **37%** from BAU levels.
- To reduce additional 57.4 mil. ton domestically. (domestic target: 632 mil. Ton → 574 mil ton)
- To minimize the use of international mechanism (SDM etc.) from the target.



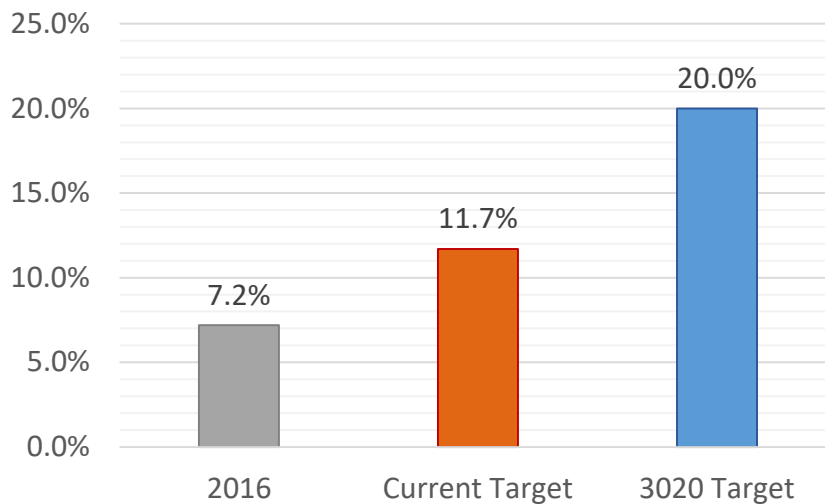


Renewable Energy 3020

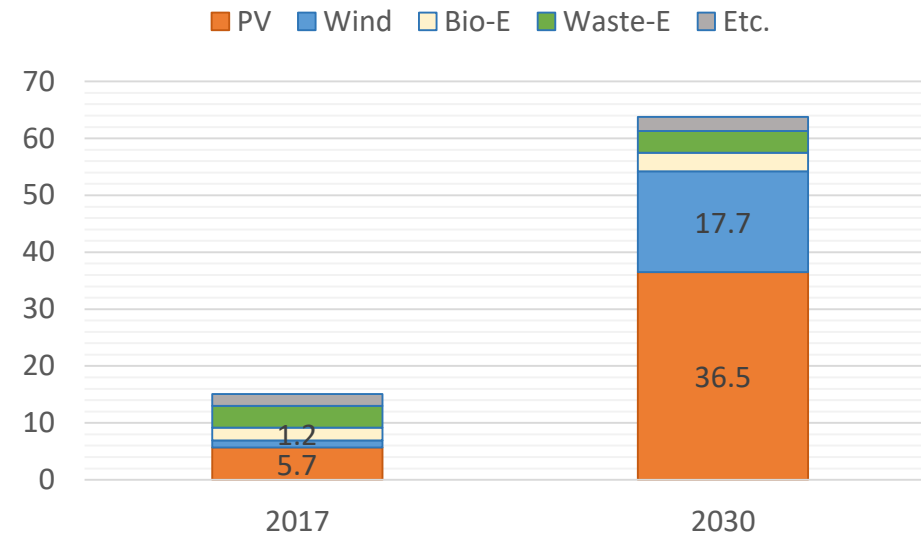
➤ Target for RE 3020

- To increase current share of renewable energy generation to 20% by 2030
- To deploy **36.5GW of PV** and **17.7GW of wind** power generation by 2030

Current and New Targets for Renewable Energy (%)



Targets for Renewable Energy Mix by Source (cumulative, GW)



3rd Energy Master Plan

➤ Target for 3rd Energy Master Plan (Working Group Recommendation)

		2017	2030	2040
Demand	Total Final Energy Consumption (mil. toe)	176.0	179.5	176.6
	Energy Intensity (toe/mil. KRW)	0.113	0.084	0.072
Supply	Share of Renewable Energy in elec. Generation (%)	7.6 (est.)	20	25~40
Environment	GHG missions from fuel combustion (mil. ton)	601.0 ('15)	536.5	
	PM emissions in power sector (thousand ton)	34	13	
	PM emission in transportation sector (thousand ton)	34	27	21
Participation	Renewable energy power plants (ten thousand)	43	471	611~1,039

This is recommendation by Working Group.

The 3rd Energy Master Plan is under further consideration by the government.

Korea Initiative on Energy Efficiency (under consultation)

➤ 'Efficiency First' Policy direction

- Transition from supply oriented to demand oriented energy policy
- Recognize the value of energy efficiency

➤ 3 Key direction to reform of energy consumption structure

- To promote 'Market Transformation' (promoting high efficiency product and appliances)
- To optimize energy use and strengthen management skills through 'Platforms'
- Policy harmonization between regulations and incentives

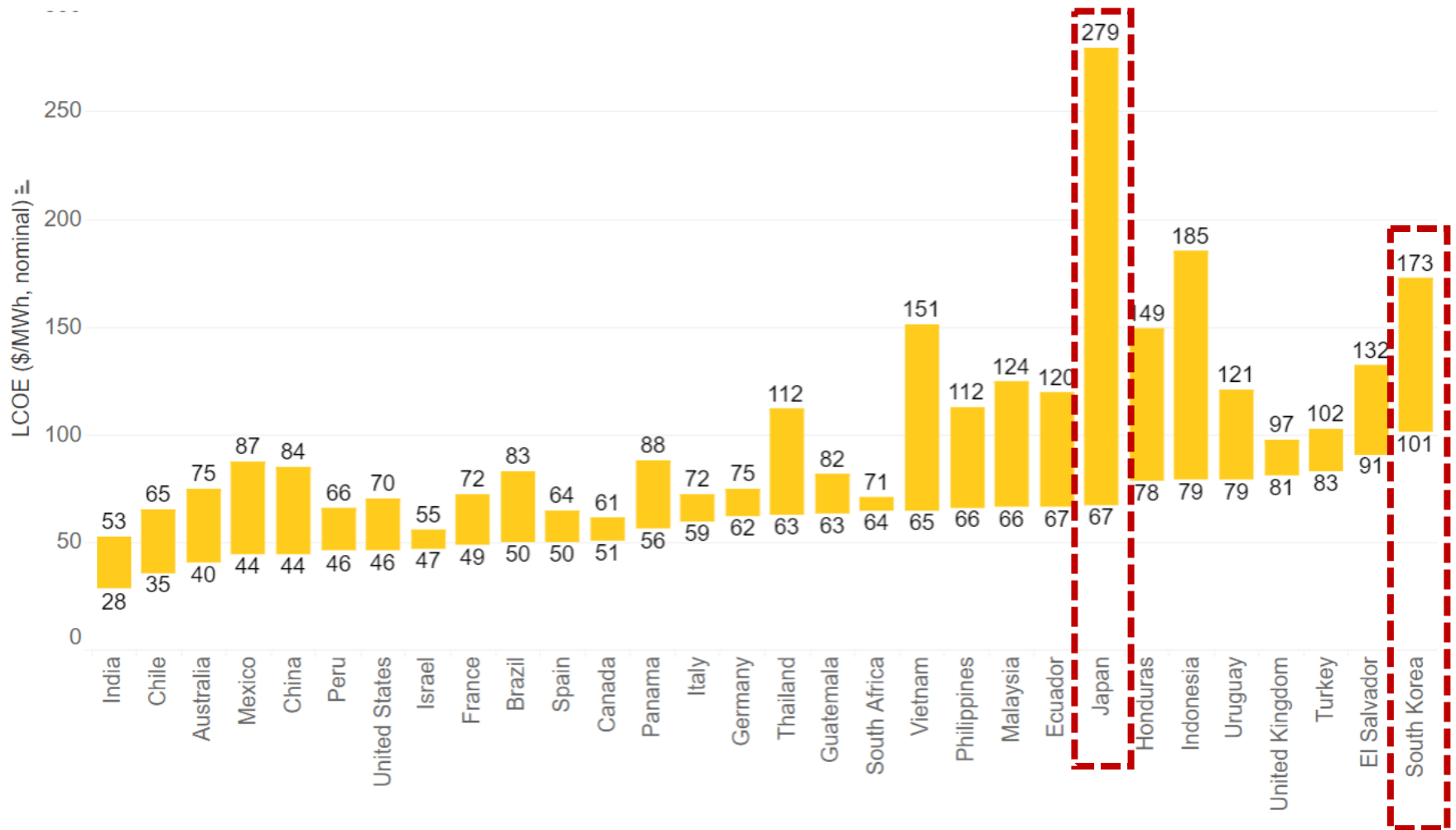
➤ 5 Main Sectors & 12 Core Tasks

Market Transformation	① Top runner initiative, ② smart mobility
Platform	③ EMS, ④ National Energy Information Integrated Platform, ⑤ Energy Innovation Community, ⑥ Community based Platform
Statistics	⑦ Benchmark in industry sector, ⑧ Benchmark in building sector
Cooling/Heating	⑨ Diversifying cooling/heating resources ⑩ Korea Heat Plan
Minimizing energy loss	⑪ Enhance Network Efficiency ⑫ Minimizing loss in each sector

Barriers

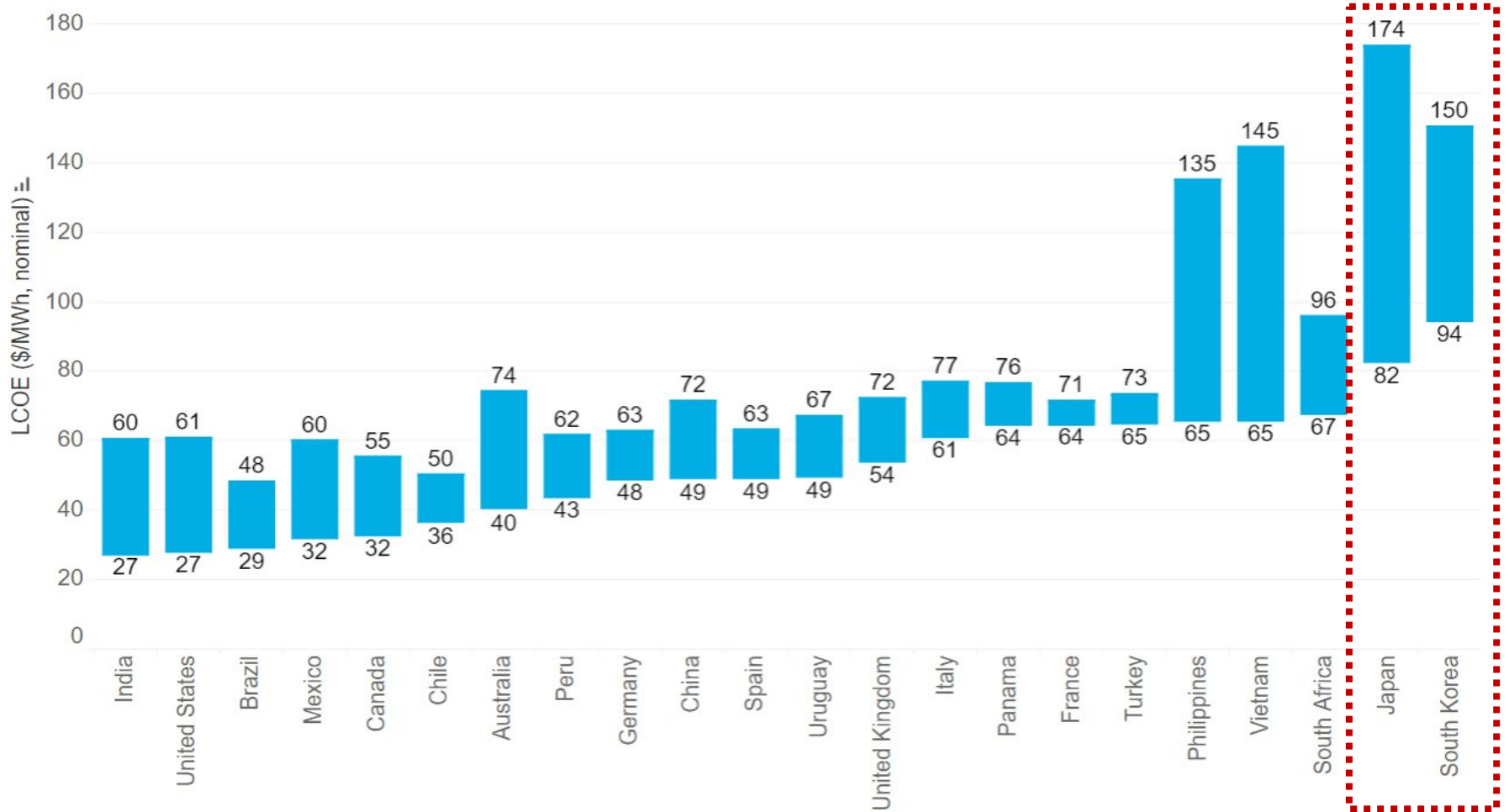
LCOE Range : PV Non-tracking

(unit: \$/MWh, nominal)



LCOE Range : Wind Onshore

(unit: \$/MWh, nominal)



Thank you

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