



# Key policies for transitioning to carbon-neutrality in Korea's industrial sector

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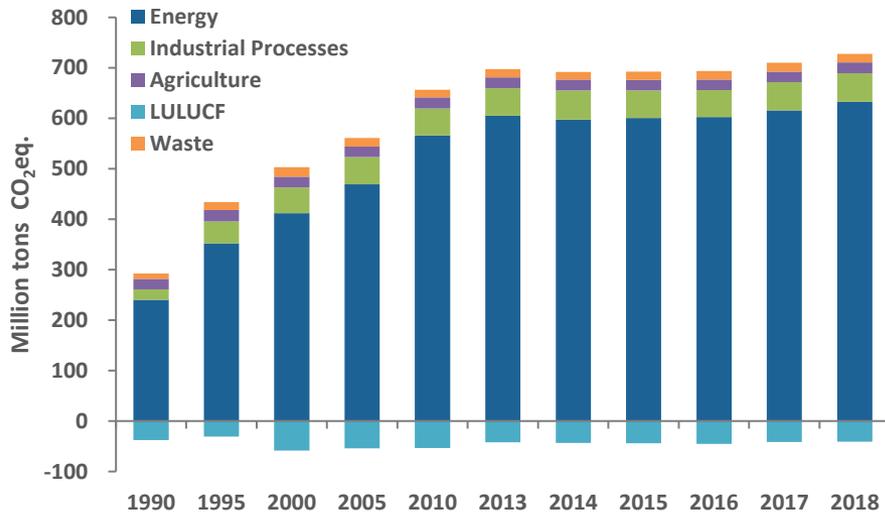
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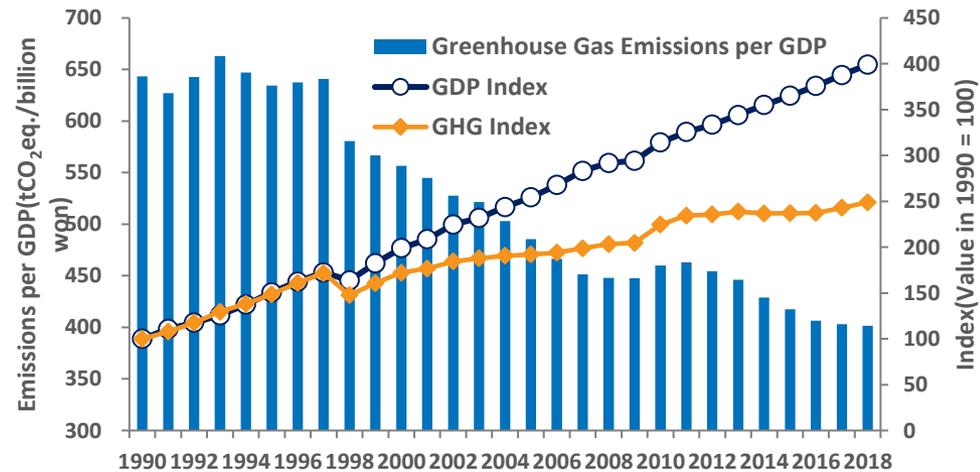
# Current Status and Trend of Emissions in Korea

- Total GHG Emissions in 2018 recorded 727.6 mil. tCO<sub>2</sub>e (net 686.3 mil. tCO<sub>2</sub>e)
  - Emissions skyrocketed until 2010, but emissions remain stable since 2013.
- Energy Sector is the largest contributor to total emissions in Korea.
- Emission Intensity (CO<sub>2</sub>/GDP) has largely decreased since the late 1990's.

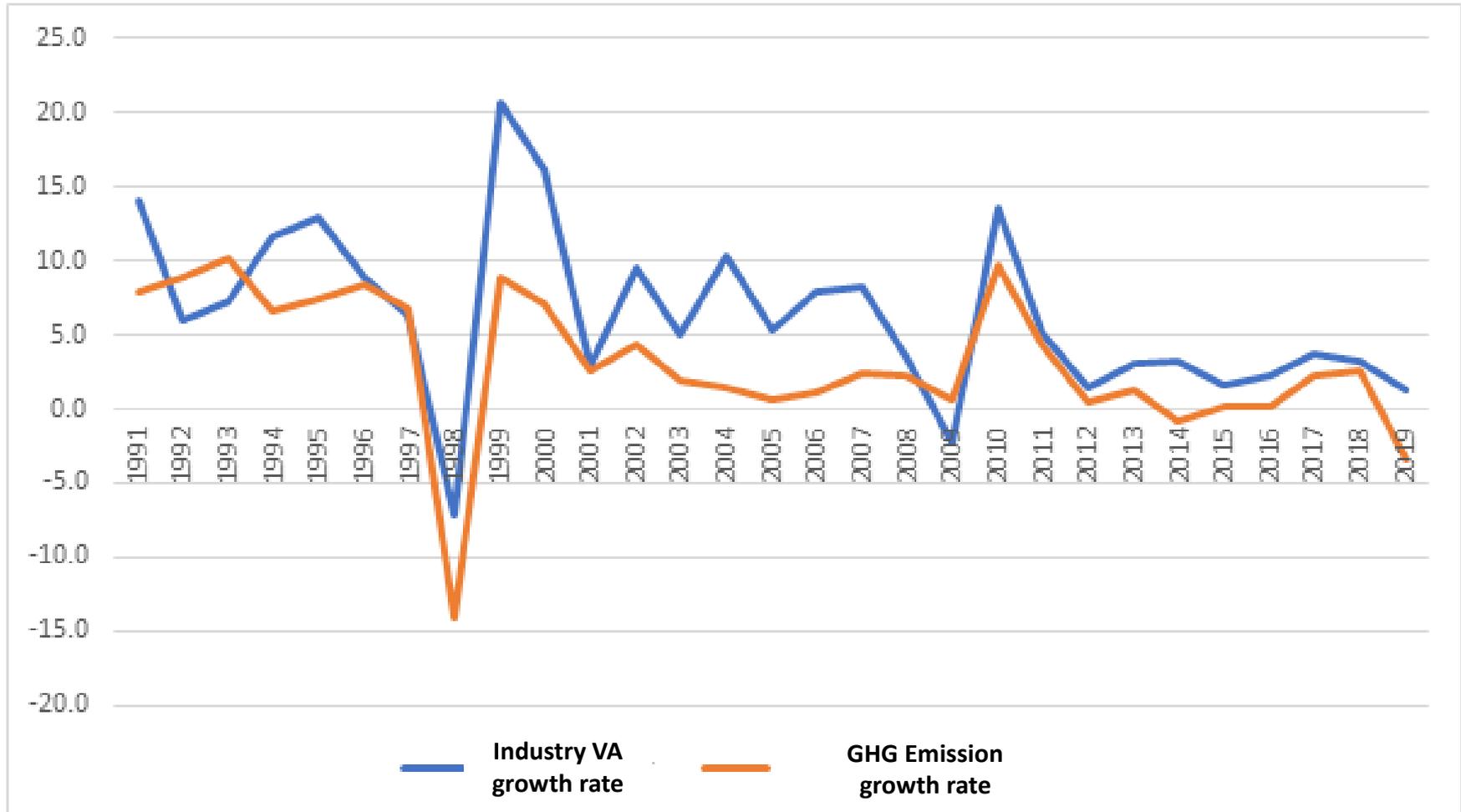
< GHG Emissions (mil. tCO<sub>2</sub>) >



< GDP and Emissions/GDP >



# Coupled growth: Industry value added vs. GHG Emissions



**Korea (Green) New Deal (Jul. 2020)**



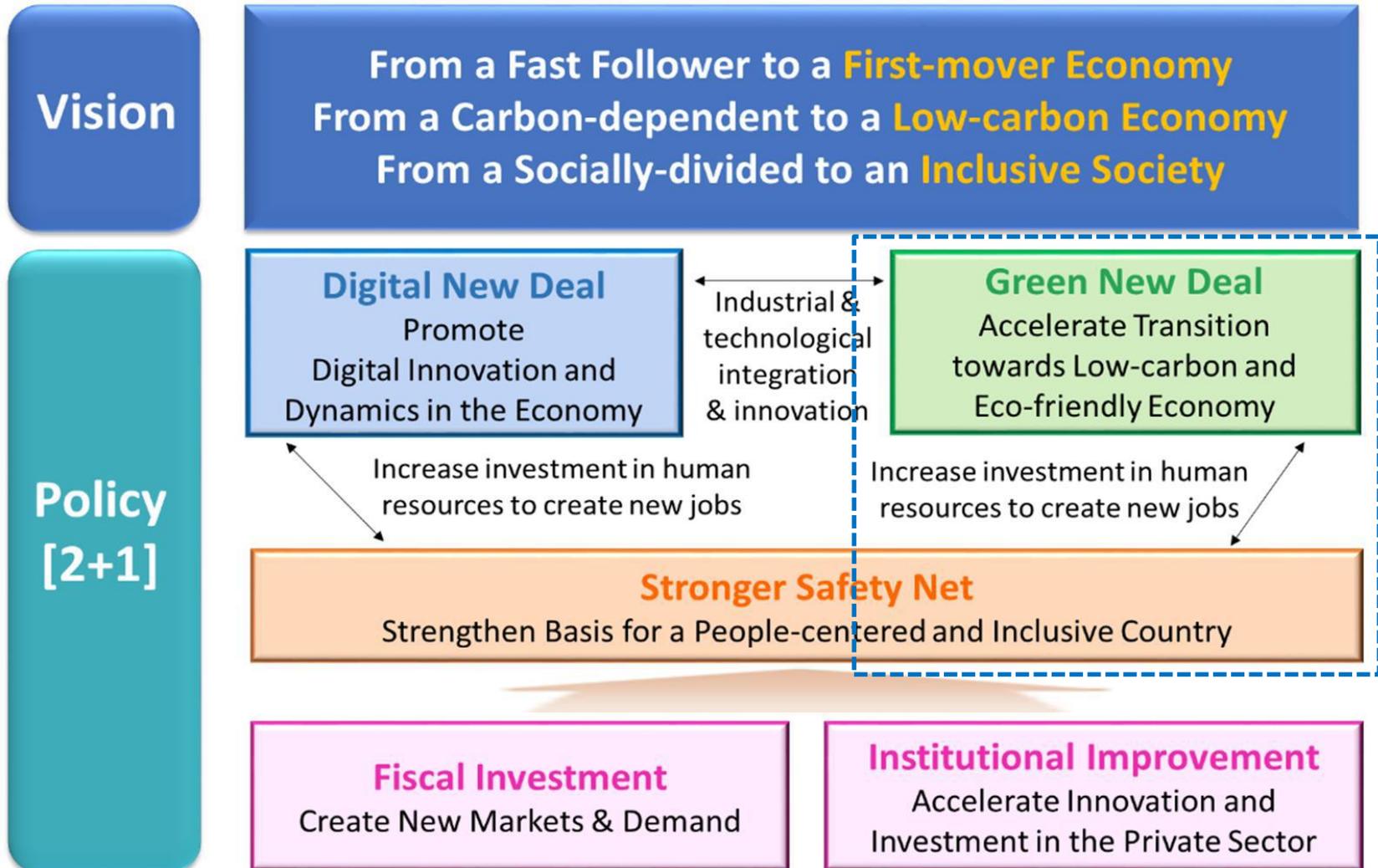
**Declaration of 2050 Carbon Neutrality (Oct. 2020)**



**2050 Long-term Low Emission Development Strategy (Dec. 2020)**  
**2050 Carbon Neutrality Strategy (Dec. 2020)**



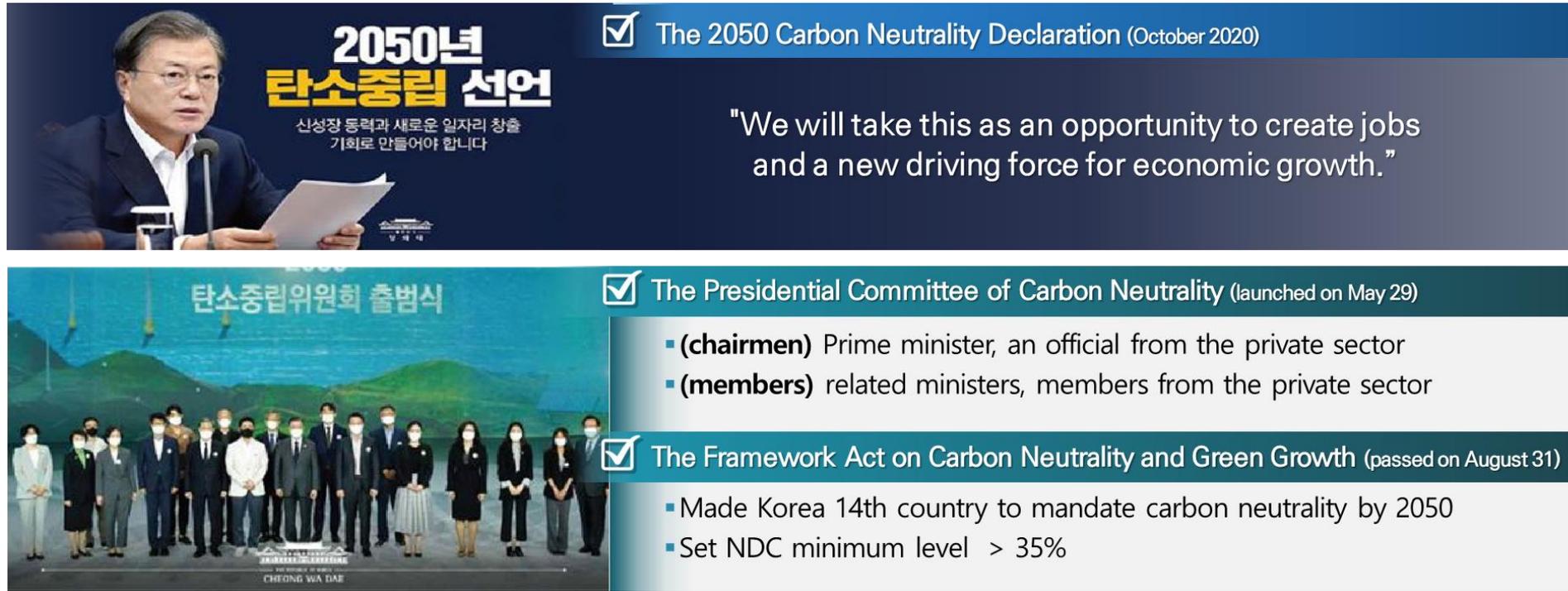
**Presidential Panel on Carbon Neutrality (May 2021)**  
**2050 Carbon Neutrality Scenario (Oct. 2021)**  
**Sectoral 2050 Carbon Neutrality Strategies (Dec. 2021)**



# Declaration of 2050 Carbon Neutrality

- Carbon Neutrality by 2050 (Oct. 2020).

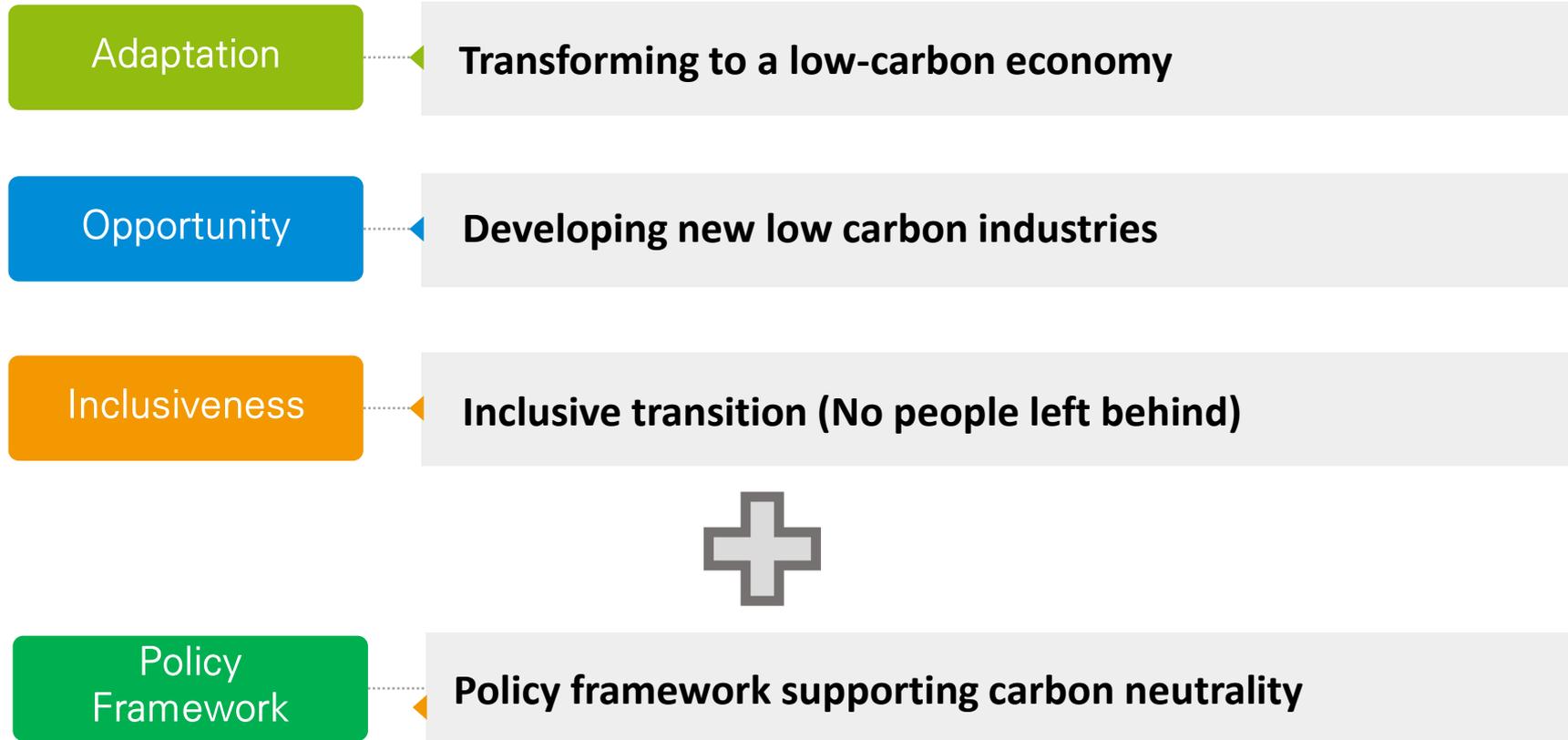
*“Together with the international community, we will actively respond to climate change and target carbon neutrality by 2050.”*



- ✓ The 2050 Carbon Neutrality Declaration (October 2020)

*“We will take this as an opportunity to create jobs and a new driving force for economic growth.”*
- ✓ The Presidential Committee of Carbon Neutrality (launched on May 29)
  - **(chairmen)** Prime minister, an official from the private sector
  - **(members)** related ministers, members from the private sector
- ✓ The Framework Act on Carbon Neutrality and Green Growth (passed on August 31)
  - Made Korea 14th country to mandate carbon neutrality by 2050
  - Set NDC minimum level > 35%

## From “Adaptive Reduction” to “Proactive Response”



**To achieve carbon neutrality, economic growth, and improvement of quality of life**

# Transforming to a low-carbon economy

## Accelerating Energy Transition

Enhancing energy system through **innovation in energy supply, power system and industry**

## Innovation in carbon intensive industry structure

**Transition away from carbon intense industry structure (Manufacturing Renaissance 2.0); Supporting SME's low carbon transition**

## Transition to future mobility

Accelerating shifts from **internal combustion to eco-friendly vehicles**; Promoting innovation in overall mobility including public transportation, railroads, and ships

## Low carbon cities and land

Promoting **carbon-neutral city and national land planning**; Promoting low-carbon agriculture, forestry and marine ecosystem

## Fostering New Industries

Fostering **low carbon new industries** (e.g. batteries, green hydrogen) and **climate-related industries** (green service, CCUS)

## Innovation ecosystem

**Promoting innovative ventures and start-ups that lead the green economy;** Regional industry reorganization and expansion of special regulation-free zones

## Circular Economy

Decoupling economic growth and resource use by enhancing **product sustainability** and **establishing waste resource circulation networks** for each sector

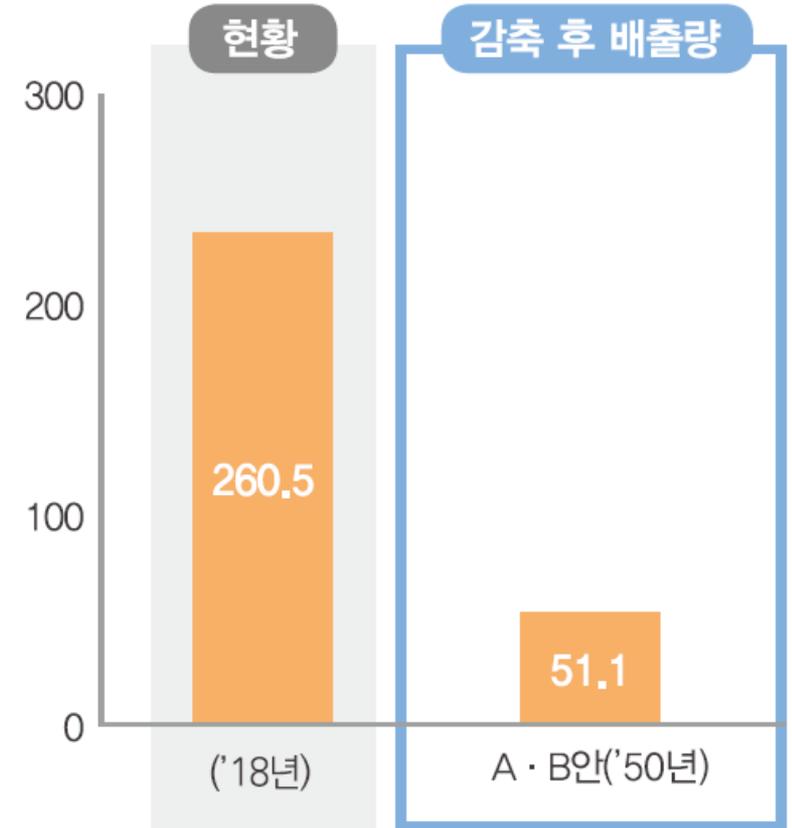
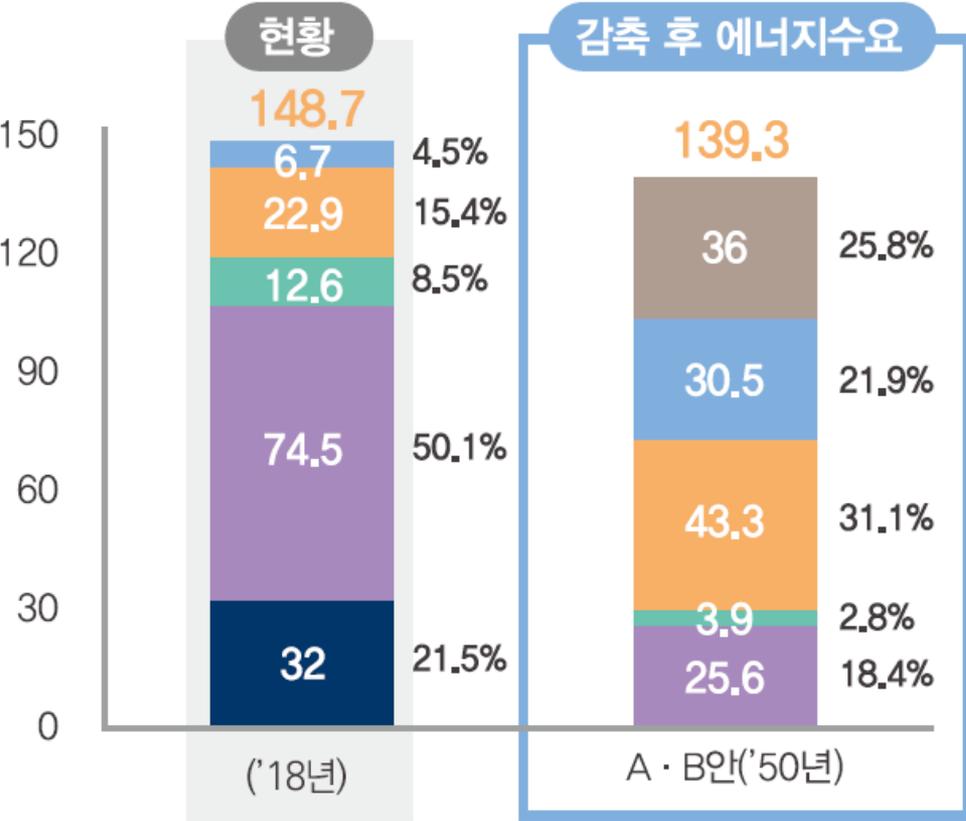
# 2050 Carbon neutrality scenario: Industry (Oct. 2021)

2018 (Mtoe)

2050 (Mtoe)

2018 (mil. tCO<sub>2</sub>e)

2050 (mil. tCO<sub>2</sub>e)



■ 석탄   ■ 석유   ■ 도시가스   ■ 전력   ■ 신재생   ■ 수소  
 Coal   Oil   Gas   Electricity   Renewable   Hydrogen

▶ Change in GHG Emissions (mil. tCO<sub>2</sub>eq) : ('18) 260.5 → ('50) 51.1 (△80.4%)

- Future Technologies in Hard-to-Abate Sectors

- (Steel) **Hydrogen reduction** steelmaking, Electric arc furnace with scrap metal
  - ✓ Demonstrating and developing the technologies from 2025
  - ✓ R&D and **clean and reliable infrastructural base for a large-volume of hydrogen** and energy production is critical
- (Cement) 100% **fuel conversion** (coal → waste, hydrogen etc.) **and raw material conversion** (limestone → slag, etc.)
- (Chemical) **Fuel conversion** (electric heating furnace) and **raw material conversion** (pet. naphtha → bio, hydrogen)
  - ✓ **Large-volume hydrogen supply chain** is required

▶ **Change in GHG Emissions (mil. tCO<sub>2</sub>eq) : ('18) 260.5 → ('50) 51.1 (△80.4%)**

- (Others) **Electrification** + Efficiency improvement + **Hydrogen**
  - Electricity demand: 22.9 Mtoe ('18) → 43.3 ('50)
  - Electricity consumption increases as **electricity replaces a significant portion of oil, coal, and city gas** in the industrial sector.
  - Hydrogen demand: 0 Mtoe ('18) → 36 ('50)
- Industrial Process Emissions
  - (Semiconductor, Display) Emission control technology (scrubbers) , **F-gas substitutes with low GWP**
  - (Auto, Electronics) **low GWP refrigerant**

('21.12.10)

- **Korea's first comprehensive strategy to achieve carbon neutrality in the industry and energy sector**
- **Various policy measures including tax benefits, finance, and regulatory innovation for firms**

## Vision

**No.4 Industrial powerhouse to lead low-carbon economy**  
(Manufacturing Renaissance 2.0)

## Objectives

1. Share of renewables

3.6 ('18) → 70.8% (increase by 20 times)

2. Self-sufficiency rate of clean hydrogen

0 → 60%

3. Share of high value-added, eco-friendly items

16.5 → 84.1% (increase by 5 times)

4. Carbon intensity in the manufacturing industry

496 → 68tCO<sub>2</sub>eq/KRW billion (decrease by 86%)

5. Export ranking

6<sup>th</sup> (Jul. '20) → 4<sup>th</sup> in the world

# Carbon Neutrality Vision and Strategy for Industry and Energy:

## 5 Strategies

에너지경제연구원



### Transforming to low-carbon industrial structure

- Reorganize industrial R&D based on carbon neutrality
- Provide full-fledged support in tax + KRW 35 trillion policy financing
- Build a customized institutional system for the carbon neutrality transition

### Building a carbon-neutral ecosystem

- Secure a stable clean energy supply system
- Create a market reflecting carbon value (price)
- Seamless carbon-neutral supply chain management

### Fostering carbon neutral new industries

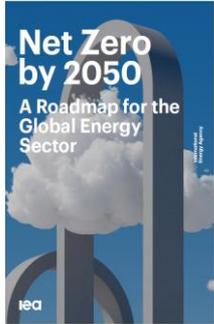
- Boost new growth engines
  - ✓ i) environment-friendly infrastructure; ii) low-carbon materials, parts and equipment; iii) green engineering

### Achieving fair transition to leap forward together

- (SMEs) provide support for business innovation
- (traditional) Preemptive transformation of traditional industries and manpower
- (regional) Promote green local economy for balanced growth

### Establishing carbon neutral transition governance

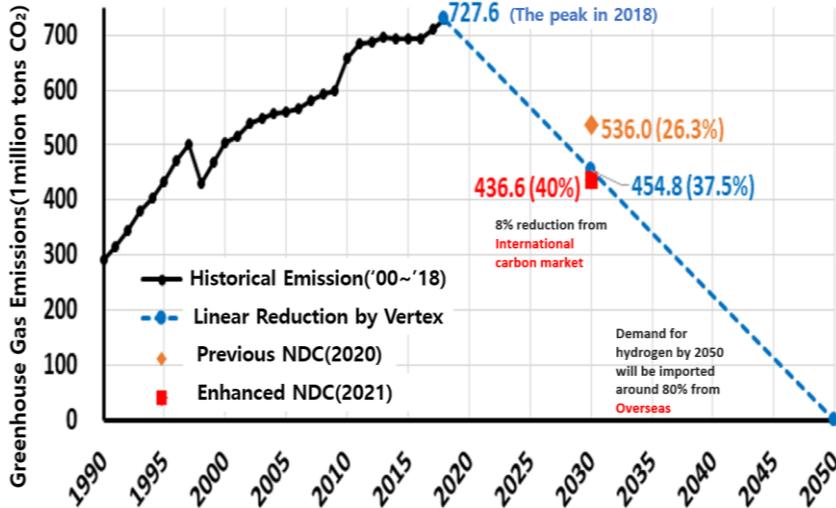
- Enact 「Special Act on Industrial Transformation to Carbon Neutrality」
- Build agile policy management system



“The pathway to net-zero emissions by 2050 will require an unprecedented level of **international cooperation** between governments. This is not only a matter of all countries participating in efforts to meet the net zero goal, but also of all countries working together in an effective and mutually beneficial manner”



“**International cooperation** plays a role in the improvement of 1.5-S over PES, more strongly felt during the first decade”



## <Agendas for International Cooperation>

- Sharing Energy Transition policies and know-how
- How to create and utilize the international carbon market
- Discovering overseas reduction measures for GHG
- Carbon neutral related technology cooperation (joint R&D, mutual investment, etc.)

Thank you.

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