



International Seminar on  
Seoul's Decarbonization  
Strategy for Buildings Sector  
2023. 4. 13.(Thur)

---

# Seoul City Building Greenhouse Gas Reduction Project

---

2023. 4.

Seoul Metropolitan Government (Climate and Environment Headquarters)

# Content

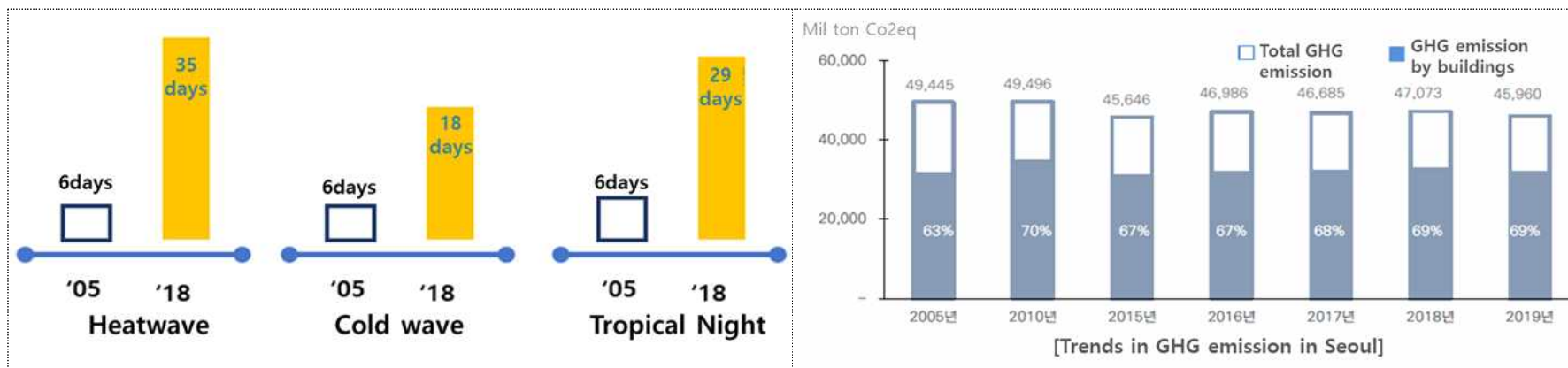
---

<b>I . Background and Current Status .....</b>	<b>1</b>
<b>II . Key tasks by Sector .....</b>	<b>4</b>
<b>III. Detailed Task Implementation Plan .....</b>	<b>5</b>
<b>① New Buildings .....</b>	<b>5</b>
<b>② Public Buildings .....</b>	<b>9</b>
<b>③ Private Buildings .....</b>	<b>15</b>
<b>④ Promotion and System Improvement .....</b>	<b>25</b>
<b>⑤ Citizen Participation and Post-Management .....</b>	<b>29</b>

# 1 Background and Current Status

## □ Stagnation in GHG emission reduction in building sector

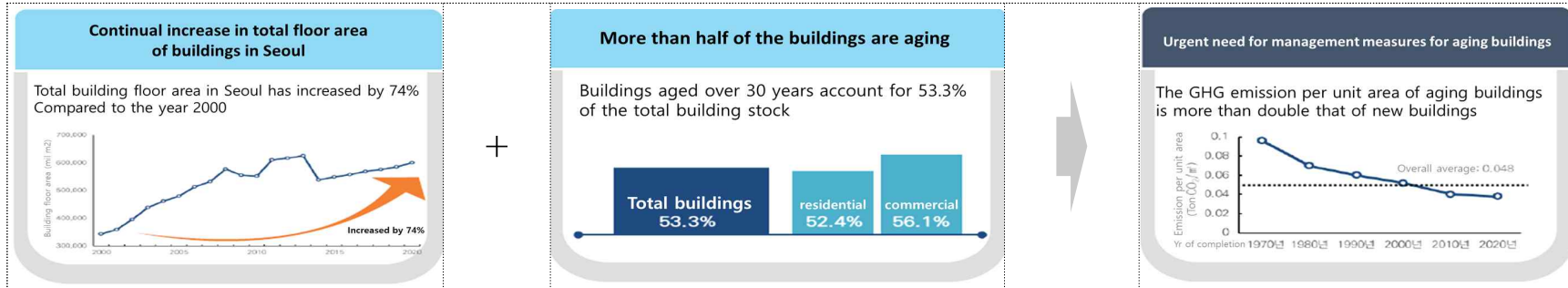
- Increase in average temperature in Seoul. Extreme weather events such as heat waves, tropical nights, and cold waves are occurring.
- Seoul's GHG emissions have been decreasing since the 2000s (with a 7% reduction compared to the 2005 level in 2019); however, the reduction of GHG emissions from the buildings sector has stagnated



☞ Need for intensive management of GHG emissions from the buildings sector, which accounts for about 70% of Seoul's GHG emissions

□ **Large amount of GHG emissions per unit area from small and aging buildings**

- More than half of all buildings are aged (53.3% over 30 years old), and particularly, old buildings emit more than twice as much GHG emissions per unit area as new buildings



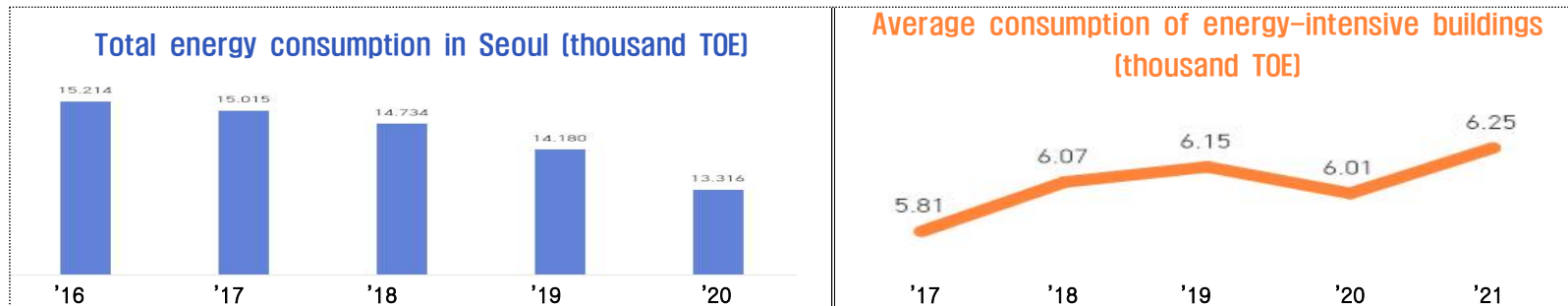
- Small buildings (30 residential units, less than 3,000m<sup>2</sup> non-residential buildings) account for a large proportion of all buildings
  - Residential buildings with less than 30 units account for 56.5% and non-residential buildings with less than 3,000m<sup>2</sup> account for 37%



☞ Increasing GHG emissions due to increasing building floor area and aging. Old small buildings and low-income households that make up the majority of the building population need intensive support.

## □ Need for intensive management of energy-intensive and city-owned buildings

- Seoul's 316 energy-intensive buildings consume 25.8% of total energy consumption of all buildings
  - While the total energy consumption of Seoul has been continuously decreasing, the average energy consumption of energy-intensive buildings has been on the rise (over 65% year-on-year increase in energy consumption in 2021)



- Out of the 3,750 buildings owned by the city, 498 with 1,000m<sup>2</sup> or more account for 9% of building energy consumption
  - Lack of long-term energy saving measures despite the large amount of energy used by city-owned buildings
- In the case of the main government building, energy efficiency decreases due to aging facilities and changes in the office environments

- ☞ Intensive management of energy-intensive buildings that consume large amounts of energy and are increasing in energy usage
- ☞ Lead the way in reducing GHG emissions through energy efficiency for more than 3,750 building owned by the city

## 2 Focus Projects by Sector

5 Sectors	10 Focus Projects	30 Sub-Projects
New Buildings	1. Promote ZEB for new buildings	·Promoting ZEB by enhancing incentives for eco-friendly buildings
	2. Promote low-carbon buildings	·Promoting eco-friendly wooden architecture and estimating GHG emissions by building material
Public Buildings	3. Transition of city-owned buildings to low-carbon buildings	·Mandatory installation of BEMS in city-owned buildings and promotion of ZEB Transition
	4. Transition of public buildings to low-carbon buildings	·Promoting ZEB transition in senior centers and implementing green remodeling in daycare centers, schools, and government agencies ·Introducing a smart energy management system in senior centers
Private Buildings	5. Intensive Management of energy-intensive buildings	·Introducing the Building GHG Emissions cap-and-trade system, reducing GHG emissions in energy-intensive buildings, and producing/distributing GHG reduction guidelines
	6. Transition of small buildings to low-carbon buildings	·Providing loans for energy efficiency in private buildings, Subsidizing energy efficiency improvements in aging homes, and supporting for installing eco-friendly boilers
	7. Support low-carbon buildings for low-income households	·Promoting 'healthy home repair projects', providing free LED lighting for vulnerable groups, and promoting energy efficiency in public housing
Promo & Institutional Improvement	8. Promotion of transition to low-carbon building	·Operating a low-carbon building certification system, supporting low-carbon building centers and websites, and operating an 'energy doctor team' for low-carbon buildings
	9. Recommendations for improving the low-carbon building transition system	·Promoting mandatory building energy efficiency rating certification and attaching energy evaluation reports when buying and selling real estate ·Property tax reduction for buildings with BEMS installation
Implement & Post-Management	10. Improvement of mileage system and GHG emissions management	·Improving and activating the Eco-Mileage system
		·Operating GHG emission monitoring system

# 3 Action Plan

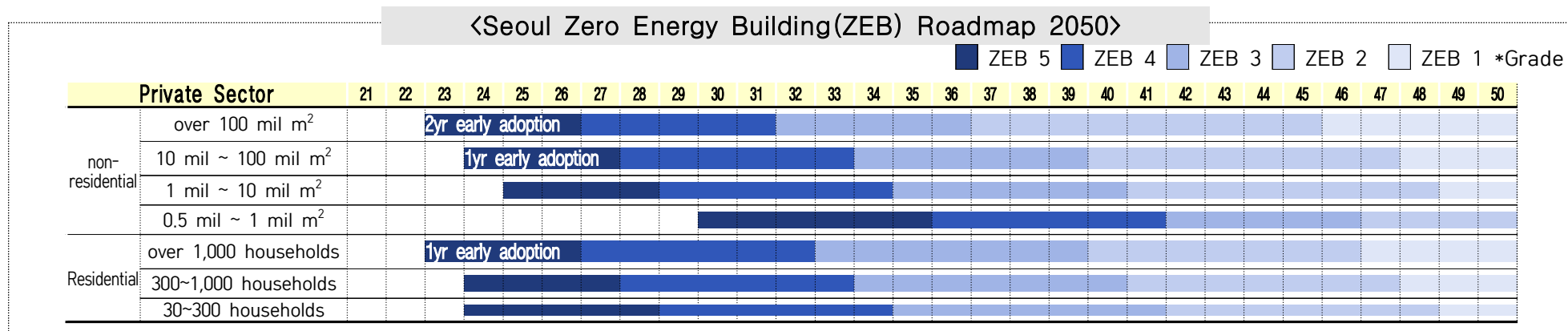
## Sector 1 New Buildings

### 1. Promote ZEB for new buildings

**Early mandatory for Zero Energy Building(ZEB)**

o Mandate ZEB 1 to 2 years earlier than the private sector in Seoul and raise the grade in stage

- Mandatory for new construction of 1,000 residential units and 100,000m<sup>2</sup> or more non-residential units in '23



o Plan('23): Regulatory Planning Review Committee (April), ZEB mandatory for new buildings (July)

## □ Promoting ZEB transition through strengthening incentives for eco-friendly buildings

- Expansion of incentives of the floor area ratio for eco-friendly buildings :

allowable floor area ratio → upper floor area ratio

- Reason for improvement: To induce eco-friendly buildings by reducing the burden on additional construction costs and certification expenses

※ It has been continuously pointed out that the additional construction costs for eco-friendly building certification are significant, while the incentives are insufficient

- Applicable targets : ① ZEB certification

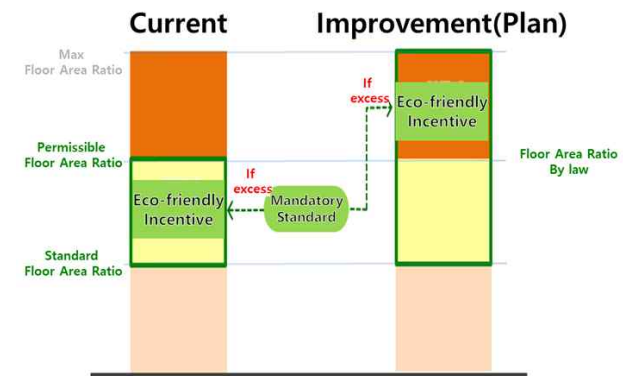
② Green building and building energy efficiency certification

③ Use of recycled building materials

④ Certification for long-life housing

- Target projects: Construction permits and housing construction projects in district unit planning area

- Plan('23) : Incentives for eco-friendly building's floor area ratio (January~)





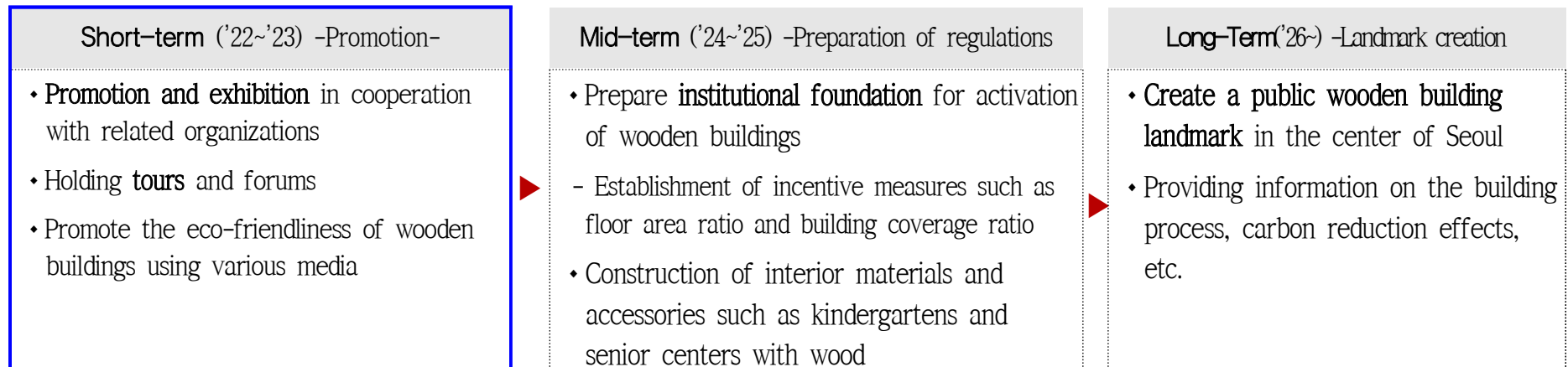
## 2. Promote low-carbon buildings

### □ Promote eco-friendly wooden buildings

※ Wooden buildings have advantages of (1) low GHG emissions, (2) high reuse or recycling rates, (3) resistance to external shocks such as earthquakes, and (4) safe from fire due to slow heat transfer

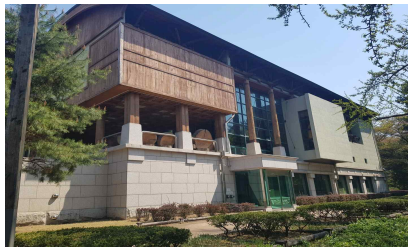
#### ○ Direction of Promotion

- (Short-Term) Focus on publicity so that citizens can become familiar with eco-friendly wooden buildings
- (Mid/Long-Term) Improve the system to revitalize wooden buildings and build landmarks in Seoul



#### ○ Plan('23): Prepare and implement a wooden building tour program (May~) and hold a forum (October)

※ Budget('23): 170 million won (70 million won for tours, 30 million won for forums, 70 million won for PR)



National Institute of Forest  
Science



Inwang 3-Minute  
Forest Shelter



Eungbong Neighborhood Park  
Forest Library



Jongam Square

## □ Estimate and promote GHG emissions by building materials

- Comparison and analysis of GHG emissions for three types of buildings: reinforced concrete buildings, buildings with high-efficiency materials, and wooden buildings
  - Analyze the costs of new construction and remodeling, GHG reduction and energy cost savings, etc.
  - Organize energy bills and etc, so that citizens can easily understand the advantages of low-carbon buildings
- ⇒ Promoted as a commissioned research of Seoul Institute of Technology
- Plan('23): Promotion of research service (March~), promotion of low-carbon building center website (August~)

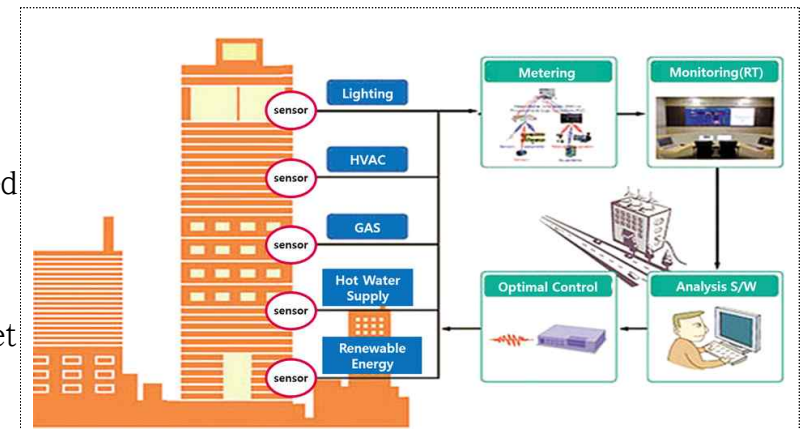
## SECTOR 2 Public buildings

### 3. Transition of city-owned buildings to low-carbon buildings

#### □ Mandatory installation of building energy management system(BEMS)

##### ○ Energy savings through BEMS in city-owned buildings

- Installation of BEMS in Seoul City Hall and Seosomun Building ( '23)
- Complete installation of BEMS or remote control devices in 496 city-owned buildings with a gross floor area of 1,000m<sup>2</sup> or more ( '26)
- ※ Considering early installation in 2026 without large-scale budget investment as an ESCO project



##### ○ Plan('23): BEMS installation (May ~ July), operation and effectiveness analysis (August~)

- ※ Budget('23): City Hall Main Office and Seosomun Office = KRW 1,000 million (Climate Response Fund)

## □ Promote ZEB transition of city-owned buildings

Goal: ('22) 174 → ('23) 224 → ('26) 544

### ○ Status of city-owned public buildings

- There are 1,702 buildings over 20 years old with low energy efficiency, **accounting for 45% of all buildings**

Year	Total	under 10	10 ~ 20	20 ~ 30	30+
# of buildings	3,748	984	1,062	786	916

### ○ ZEB transition of city-owned public buildings

- **Seoul Institute of Technology and Education:** ZEB transition (KRW 2,500 million for construction cost in 2023)
- **Fire station:** Pilot transition of fire station low-carbon building (transition of fire station to low-carbon building scheduled for remodeling)
  - ※ Collaborating organizations : Climate Change Center, Korea Institute of Civil Engineering and Building Technology, and relevant fire stations
- **City-owned buildings:** Presentation of energy performance plans and construction costs through energy performance consulting for transition of city-owned buildings to low-carbon buildings (※ 13 welfare centers in 2023, Seoul University, etc.)



### ○ Plan('23): ZEB transition for Seoul Institute of Technology and Education (Main Building)

(construction contract in May, completion in December)

- ※ Budget('23): KRW 2,500 million (2,400 million won for construction, 100 million won for supervision fees)

□ **Reducing GHGs by preparing an optimal operation plan for city-owned buildings**

- Status of city-owned buildings by size (※more than 70% of non-residential buildings are less than 1,000m<sup>2</sup>)

Total	non-residential						residential
	sub-total	under 500 m <sup>2</sup>	500~1,000 m <sup>2</sup>	1,000~3,000 m <sup>2</sup>	3,000~5,000 m <sup>2</sup>	over 5,000 m <sup>2</sup>	
3,748	2,520	1,450	325	348	168	229	1,228

- For the 3,750 city-owned buildings that are not subject to ZEB transition, it is necessary to prepare an optimal operation plan to save energy and reduce GHGs
  - (Research Name) Research contract for developing optimal operating plan for city-owned buildings
  - (Contents) Classification of building by size, type, and aging, development of optimal operating plans such as installation of BEMS or remote control devices, analysis of required budget and GHG reduction effect, etc.
  - (Expected Effect) Establishment of a long-term vision for GHG reduction for all city-owned buildings
- Plan('23): Establishment of a plan and promotion of commissioned researches (2nd half)

## 4. Transition of public buildings to low-carbon buildings

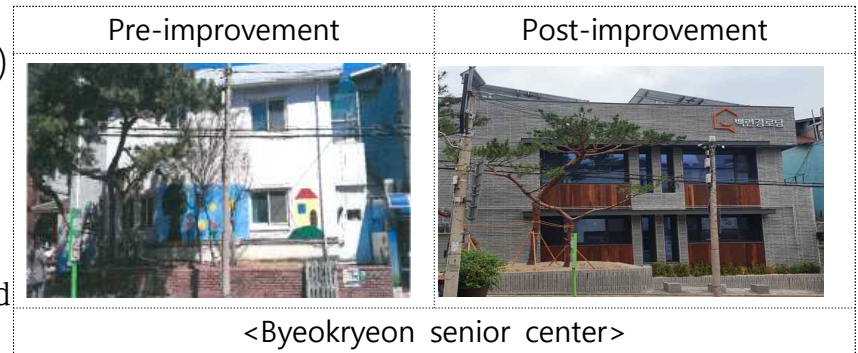
### < Goal of the transition of public buildings to low-carbon buildings >

Year	~ 2022	2023		2026
		Annual	Cumulative	
Total	275	267	542	1,580
Elderly facility	41	30	71	321
Kindergarten	203	87	290	628
Public Buildings (eg. school)	31	150	181	631

### □ Promote energy efficiency in district buildings

#### ○ Energy efficiency for **senior centers**(321 centers over 15 years by 2026)

- (Project name) Zero Energy Transition Project for Senior centers
- (Target) 321 centers with 15 years or more out of 3,745 centers
- (Contents) Improving energy performance by more than 30% and creating a pleasant settlement environment



#### ○ Plan('23) Target sites selection (January), efficiency projects (March~)

※ Budget('23): KRW 1,650 million (30 centers × 55 million won)

○ Energy Efficiency for **daycare centers** (628 locations over 10 years by 2026)

- (Project name) Green Remodeling Project for Public Buildings
- (Target) 628 locations out of 1,821 public daycare centers that are over 10 years old
- (Contents) Implementation of remodeling work to improve energy performance by 30% or more

○ Plan( '23): Government and municipal subsidy grant for green remodeling project (January), design and construction implementation (February~)

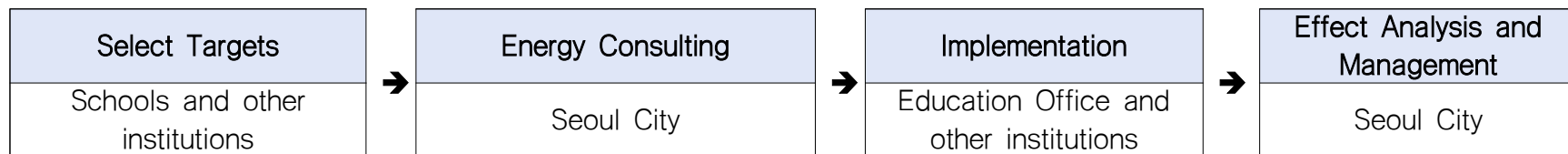
※ Budget(' 23): KRW 15,600 million (87 centers × KRW 180 million)



□ **Cooperation Projects with other organizations such as schools**

○ Promote cooperation projects with **other organizations** (631 buildings over 15 years by 2026)

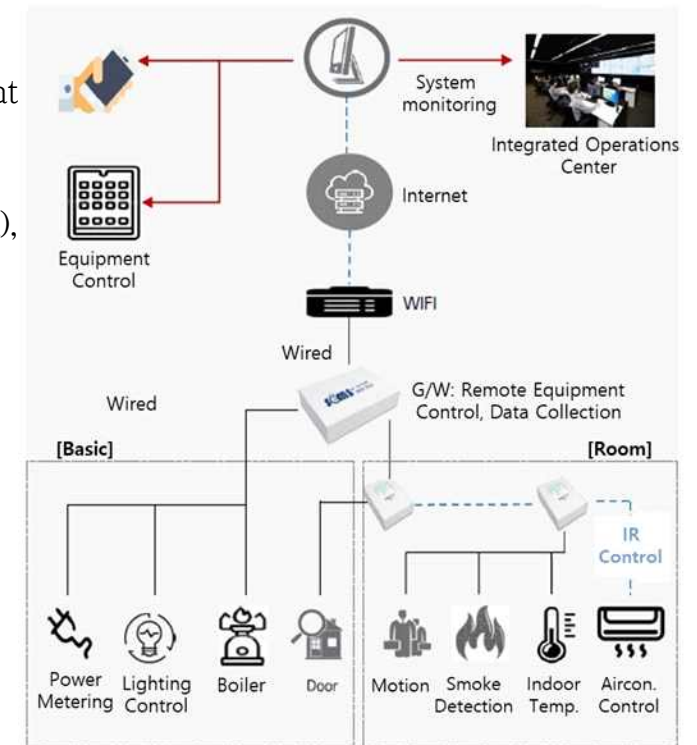
- (Seoul City) Support for energy efficiency evaluation, suggestion of improvement plans, and analysis of the effectiveness
- (Education Office) Share current status, remodeling, new construction, and facility improvement plans and results



○ Plan('23): Implementation of school energy performance improvement consulting(20 schools) and energy efficiency assessment (150 schools) (April~)

## □ Introduction of Smart Energy Management System (SEMS) in senior center

- Reduce energy consumption at senior centers where energy management is insufficient due to lack of managers (expanding to all 3,745 centers by 2026)
  - Automatic remote adjustment of air conditioners, lighting, heating devices, etc at the integrated operation center through indoor movement detection
  - 750 locations in 2023 (KRW 1.6 million per center, a total of KRW 1,186 million), Pilot installation and operation
  - Estimated energy savings of 30%, creating a pleasant settlement environment
- ※ Autonomous adjustment of heating equipment in winter through pattern analysis
- Plan('23): Establishment of SEMS installation plan (February), Completed installation and operation (July~)





## **SECTOR 3 Private Buildings**

### **5. Intensive management of energy-intensive buildings**

#### **□ Introduction of building GHG emission cap system**

##### **○ Concept**

- (Background) Buildings over 3,000m<sup>2</sup> (13,000 buildings), 21.1% of all buildings, account for 26.5% of GHG emissions in the building sector, requiring intensive management.
- (System) Provide standard emissions\* for each building type and manage GHG emissions for each building
  - \*Standard emissions: Buildings are classified into 12 types according to their purpose under the Building Act, and the average GHG emissions from 2017 to 2019 are estimated for each type
- (Types) Classification of building code uses into 12 types (business, accommodation, medical, and cultural facilities. etc.)
- (Target) Public: 1,000m<sup>2</sup> or more in gross floor area, Commercial: 3,000m<sup>2</sup> or more in gross floor area, about 13,000 buildings
- (Goal) Reduce emissions by 87% compared to standard emission criteria by 2050

##### **○ Plan('23): Promotion of commissioned researches for model development(March), enactment of enforcement ordinance(2nd half)**

※ Budget('23): KRW 700 million (KRW 600 million for model development research, KRW 100 million for PR expenses)

## □ Reducing GHG emissions from energy-intensive buildings

### ○ Promote energy efficiency innovation for Top 100 energy-intensive buildings

- (Working Group) TOP building energy managers working group (8.11, 21 companies)
- (Current status) Participation in the GHG cap-and-trade program, sharing best practices for energy-saving (LG Science Park), etc
- (Project) Production and distribution of energy-saving guidelines by type, including universities (Oct. '23)

#### <CASE - LG Science Park Energy Saving Technology>

- (BEMS) Reduced heating and cooling by 20% by managing energy sources and costs
- (Automatic lighting control) 30% energy savings compared to general LEDs
- (Energy facilities) 626.3kwp solar power, high-efficiency ESS, geothermal, etc.

⇒ Save about 40% compared to general office buildings in Seoul



### ○ Conducting heating temperature for energy-intensive buildings in winter (Dec. ~ Mar. every year)

- Inspection contents: Compliance with heating temperature of 20° C and request for voluntary participation

※ Results of inspection(2021): 234 compliant buildings (82.1%), 51 non-compliant buildings (17.9%)

### ○ Disclosure of ranking such as total energy use and energy use per unit area (Oct. each year)

※ Disclosed energy usage as of 2021 and distributed a press releas (Oct. '22)

## □ **Production and distribution of GHG reduction guidelines by type**

### ○ Prioritized production of guidelines for universities → Spread to other types

- Energy use patterns such as usage time and set temperature differ depending on the major and purpose, such as lecture halls, laboratory buildings, and dormitories, so we propose efficiency measures based on this analysis.
- Propose general measures to improve energy performance for buildings that have a significant impact on the environment (research and laboratories, IT facilities)

⇒ Developed guidelines through the building greenhouse gas emission cap-and-trade system implementation model project ('23)

### ○ Plan('23): Guideline development (March~), Guideline distribution (October)

#### ※ Reason for selecting universities as a priority

- ◆ **Necessity**) Ranked 2nd in average emission (GHG emissions/number of locations) in 2020 and 1st in emissions in increase rate
- ◆ **Feasibility**) Good construction conditions, such as having a vacation period, compared to hospitals related to medical activities and department stores that require consultation with multiple tenants for construction.
- ◆ **Effectiveness**) As a top educational institution, a significant effect can be expected from the leadership of internal members

## 6. Private Small Buildings

< Goal of transition in private building to low-carbon building >

Year	~ 2022	2023		2026
		annual	culumative	
Total	9,098	1,500	10,598	14,020
Private BRP	7,799	600	8,399	9,810
Subsidize energy efficiency	1,299	900	2,199	4,210
Eco-friendly boiler	403,647	115,000	518,647	772,196

### Promote energy efficiency in private buildings

- Dramatically expand BRP interest-free financing support by raising market interest rates
  - (Target) Houses or buildings that have been completed for more than 10 years
  - (Contents) Long-term financing support for energy performance improvement projects in private buildings
    - ※ Interest-free financing for energy efficiency improvements up to 2 billion won for buildings and 60 million won for houses
  - (Conditions) 0% annual interest, equal installment repayment within 8 years
- Plan('23): Announcement of loan project and business presentation (January), acceptance of loan application (January~)
  - ※ Budget('23): KRW 12,000 million (20 buildings, 400 houses)

<BRP Financing Case - Energy efficiency improvement in private buildings>

- (Target) Mother's Medical Center in Seocho-gu
- (Improvements details) Insulated windows, external insulation replacement, and waste heat recovery device installation
- (Energy savings) 29.68 TOE per year → 23.90 TOE (3.90 TOE ↓)  
⇒ Expected to save 19% of annual energy consumption



□ Promoting ‘Seoul Energy Efficiency House Linkage Project’

- Within the housing performance improvement support, subsidize energy efficiency improvement construction costs (up to KRW 3.4 million)
  - (Target) Users of high-efficiency equipment among those supported by Seoul Energy Efficiency House Linkage Project\*
    - \*Seoul Energy Efficiency House: Single-family, multi-family, and townhouse houses over 20 years old in the housing performance improvement support area
  - (Contents) 10% additional support for construction cost of high-efficiency equipment (window grade 2, roof insulation grade, etc.)
    - ※ New development of online application system ('23), expansion of home repair experts (106 → 200)
  - (Support) Single-family (up to KRW 2.4 million), multi-family (up to KRW 3.4 million for shared use, up to KRW 1 million for exclusive use)
- Plan('23): Acceptance of application (March), subsidy payment (July)
  - ※ budget('23): KRW 630 million (0.7 million won × 900 houses)

## □ Dissemination of eco-friendly boilers for households

- Support for replacement (general boilers → eco-friendly boilers\*), reducing energy and GHGs

\* Boilers with less than 0.1 tons of evaporation per hour  
(Products certified by Korea Institute of Environment and Industrial Technology)

- (Target) Citizens who replace the previous general boilers with an eco-friendly boilers before April 3, 2020

※ Priority support for low-income groups, private senior centers, daycare centers, and other underprivileged

- (Details) KRW 100,000 per unit (KRW 600,000 for low-income groups)

※ National expenses (Ministry of Environment): Seoul City expenses = 6:4

- Plant('23): Establishment of eco-friendly boiler distribution plan (January), boiler replacement support (January~)

※ Budget('23): KRW 12,000 million (1,000 units for low-income households, 114,000 units for the general public)



## 7. Support low-carbon building for low-income households

< Goal of support low-income households (unit: household)>

Year	~2022	2023		2026
		annual	cumulative	
Total	48,480	30,213	79,693	152,000
Healthy Home Repair	-	2,000	2,000	12,000
LED lighting	6,974	4,319	11,293	20,000
Equipment replacement for public rental housing	41,506	23,894	66,400	120,000

### □ Accompanying the vulnerable to climate change “Healthy Home Repair”

- Promote ‘Healthy Home Repair’ project for low-income people vulnerable to climate change
  - (Target) Residents (owners, tenants) of old houses with a market value of 300 million won or less and over 15 years old
  - (Scale) Free consultation with experts, support up to KRW 50 million (within 80% of construction costs)
  - (Effects) energy costs ↓, GHG emissions ↓, health ↑



\* Comprehensive consulting consisting of architects, interior designers, and others to improve energy efficiency, prevent condensation, improve air quality through ventilation, and improve indoor interiors so that you can lead a healthy life

- Plan('23): Organization of home repair doctors (February), appropriation of funds (March), project announcement (April)

※ Budget('23): KRW 3,000 million (KRW 150,000 × 2,000 households)

## Promotion of low-cost and simple construction of old buildings

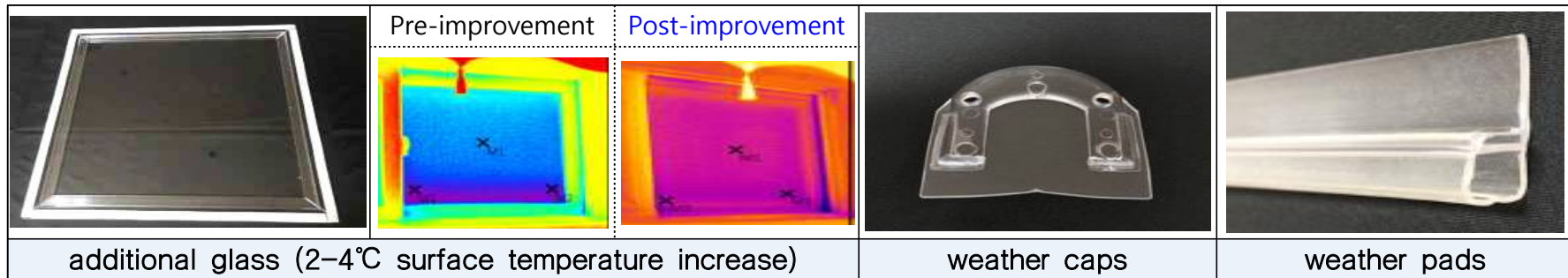
### ○ Background

- Most of the energy-vulnerable groups are unable to remodel after complete demolition due to problems such as structural safety.
- Most of the energy-vulnerable groups are tenants (renters) and do not have the right to decide on remodeling, and cases of inevitable migration occur due to rising rents after the actual remodeling.



○ (Tentative) Operation of 'Energy Seoul Accompaniment Group and Promotion of Simple Construction'

- (Detail) Ultra-simple and high-efficiency simple construction (installation of additional glass, etc.) to improve energy efficiency for energy vulnerable people
- (Target) 5,000 households in energy-vulnerable populations (an average of KRW 600,000 per household)



※ Indoor temperature increases by 2~4°C due to the insulation effect through the formation of an air layer on the window (Source: Korea Institute of Civil Engineering and Building Technology)

- (Team) Linked with the Seoul Companion Jobs Project, 150 people will be hired (5 days a week, 6 hours a day)

※ Targeted area exploration (energy-vulnerable population), ultra-simple construction (customized manufacturing and construction after site inspection)

※ In response to the 'Accompanying the vulnerable' initiative, support will be provided for "vulnerable groups" who are the both project participants and beneficiaries of the project.

○ Plan('23): Selection of 'Energy Seoul Accompaniment Team' (June), Launching Ceremony (July), Promotion of Simple Construction (July~)

- Budget( '23): Total KRW 4.8 billion (KRW 1.5 billion for labor costs, KRW 0.25 billion for office management costs, KRW 0.05 billion for overhead expenses, and KRW 3 billion for material costs)

□ **Free distribution of LED lights to low-income households**

- Realize energy welfare by replacing LED lights for low-income people and welfare facilities for free

- (Target) Basic beneficiaries, permanent rental housing, social welfare facilities
- (Details) Replace existing lights with high-efficiency LEDs (support of KRW 100,000 per LED)



- Plan('23): Grant of autonomous districts and SH projects (March), LED replacement project (March~)

※ Budget('23): KRW 2,724 million (4,098 low-income households, 221 welfare facilities)

□ **Improving the living environment of low-income households through the facility improvement project of old public rental housing**

- Replacement with high-efficiency equipment in public housing for low-income residents

- (Target) Public housing for permanent and 50-year rentals (over 15 years after construction)
- (Details) Replacement of existing equipment in public housing, with eco-friendly boilers, LED lights, and elevator power recovery devices, etc.

- Plan('23): Establishment of a facility improvement project plan (January), implementation of projects (February~)

※ Budget('23): KRW 32,743 million (eco-friendly boilers for 1,181 households, LED lighting for 12,660 households, 53 elevators)

## SECTOR 4 Promotion and Institutional Improvement

### 8. Promotion of low-carbon building transition

#### □ Low-carbon building certification system

- Development of certification and support measures for low-carbon buildings in Seoul
  - Seoul Institute of Technology is conducting a research on establishing low-carbon building management standards (Research period: Sep.'22 ~ May.'23)
- Plan('23): Development of low-carbon building certification system (May), implementation of certification (July)
  - ※ budget('23): KRW 33 million for low-carbon building certification (KRW 30,000 per sign x 100 buildings)



#### □ Low-carbon building support center

- Operate a dedicated support center to provide comprehensive guidance on low-carbon buildings
  - (Location) Seosomun Office Building 1, 1<sup>st</sup> floor (within the Energy Information Center)
  - (Staff) 2 permanent consultants (using retired public officials) and 15 professional consultants (such as architects)
  - (Function) Dedicated support center for spreading 1 million low-carbon buildings
  - (Website) Construction and operation of low-carbon building policy communication platform (Jan. '23 ~)
- Plan('23): Production of low-carbon PR material(March), production of center exhibits (March)
  - ※ budget('23): KRW 127 million (including the production of promotional materials and cooperation with the media)

□ Low-carbon building field support group "Energy Doctors" (30 people)

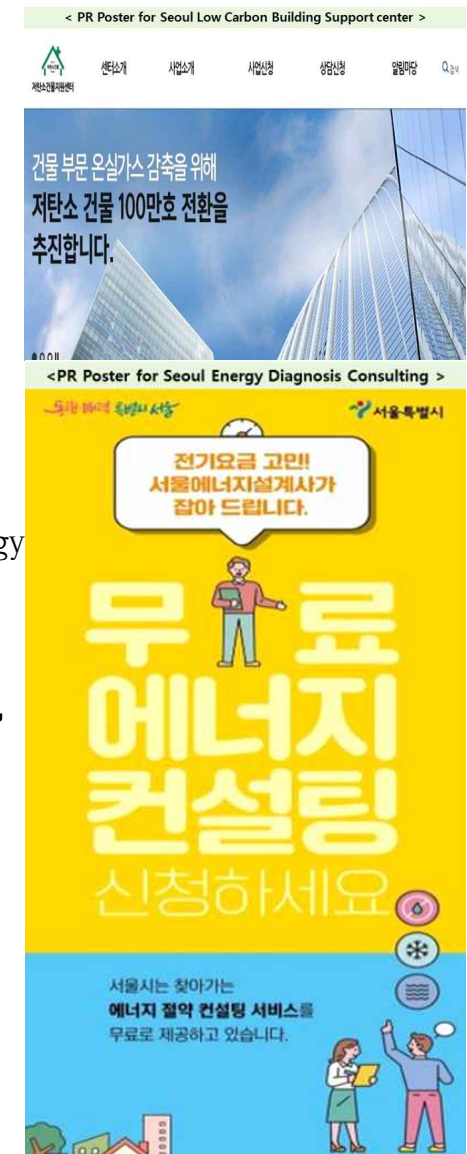
○ Improvement and spread of building energy efficiency through reorganization of existing energy designers

- (Title) 'Energy Designer' (~'22) → 'Energy Doctor' ('23~)

- Organization of experts in environment, energy, architecture, and electricity (strengthening expertise through in-depth training)

- (Function) Consulting focused on saving energy costs → Support for improving building energy efficiency

○ Plan('23): Recruitment and selection of Energy Doctors participants (February), Operation of Energy Doctors program (April~)



## 9. Recommendations for improving the low-carbon building transition system

### □ Promote mandatory building energy efficiency rating certification for existing buildings

#### ○ Mandatory building energy efficiency rating certification for existing buildings

- Amendment to Article 12, Paragraph 2 of the Enforcement Decree of ‘the Green Building Development and Support Act’

**Current)** Public institutions with new buildings over 1,000m<sup>2</sup> → **Amended)** Expand to all buildings annually

#### ○ Proposal to Introduce measures to restrict real estate transactions of buildings with the lowest energy efficiency rating

- Proposed measures to restrict real estate transactions for buildings with an unqualified rating
- Amendment to Article 18, Paragraph 2 of ‘the Green Building Development and Support Act’

#### ※ Energy Efficiency Rating system in UK(EPC, Energy Efficiency Rating)

- Rating: Rating from A to G based on evaluations of wall (insulation), roof (insulation), window (double-glazing), lighting (high-efficiency), fuel, etc.
- Cost: Around £60 to £120 (approximately KRW 96,000 to 192,000) for an EPC evaluation
- Obligation: EPC information is required when selling or leasing a property (only properties with a rating of E or higher are eligible for lease)

## □ **Mandatory attachment of building energy assessment in real estate transactions**

- Current Status: Building energy evaluation reports are created and disclosed on the MOLIT's green building portal
- Problem: Not utilized because it is not mandatory to attach an energy evaluation report in real estate transactions
- Proposed: Mandatory attachment of building energy assessment through revision of the Real Estate Brokerage Act
- Plan('23): Proposal to revise the Real Estate Brokerage Act

(City → the Ministry of Land, Infrastructure and Transport) in February

## □ **Reduction of property taxes for buildings with Building Energy Management Systems (BEMS)**

- Inducing the installation of BEMS to reduce GHG emissions through efficient management of private buildings
  - (Effect) On average, energy costs can be reduced by 15%
  - (Installation obligation) Targeted for Environmental Impact Assessment in Seoul (Sept. 2016, for buildings over 100,000m<sup>2</sup>), new or reconstructed public buildings over 10,000m<sup>2</sup>(2017), and Zero Energy Building Certification (2020)
  - (Additional benefits) Reducing GHGs by inducing BEMS installation through property tax reduction
    - ※ Existing benefits: Investment tax credit (1~7% income or corporate tax deduction), energy diagnosis exemption
- Plan('23): Refinement of incentives and proposal to the Ministry of Interior and Safety (first half)

## Sector 5 Citizen action and post-management

### 10. Mileage system reorganization

#### - Reducing 1 ton of CO<sub>2</sub> per person -

Integrated Eco Membership: 2.43 mil ('22) ⇒ 3.50 mil ('26), GHG reduction : 2.27 mil tons of CO<sub>2</sub>('22)  
⇒ 3.50 mil tons of CO<sub>2</sub> ('26)

#### ☐ Completely reorganized the system to motivate energy-savings Revision

##### ○ Introduction of Maintenance Mileage (paid even when maintaining below a certain standard)

- (Eco) Paid only when reducing energy consumption by 5% or more compared to the average of the previous two years

5% or more	10% or more	15% or more
10,000	30,000	50,000

→ (Changed) Mileage will be paid even if the reduction is less than 5% for 2 consecutive reductions (10,000 miles)



- **(Passenger Car)** Pay only for reductions of 0% or more from the previous year
  - (Change) Mileage will be paid even when driving below the average mileage in Seoul
    - \* Eliminate fatigue of receiving mileage only by continuously saving every year

○ **Integration of eco and passenger car mileage (2022.12.27.) and expansion of mileage usage**

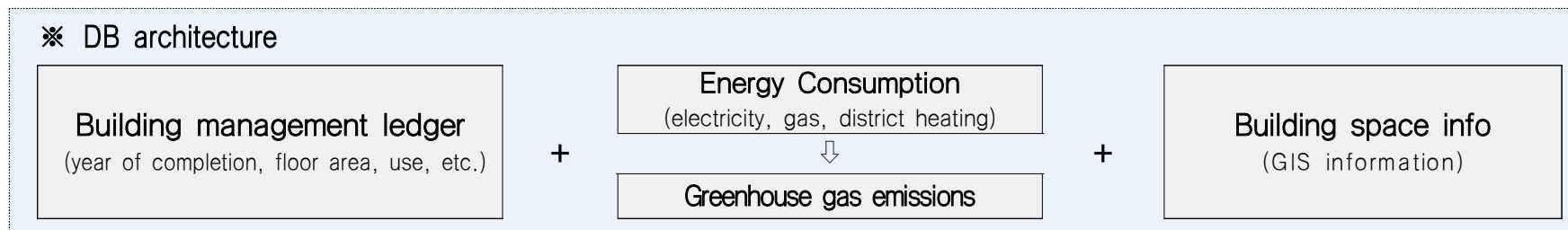
- Improving the convenience of use for citizens through the integration of eco and car mileage member websites
- (Use) ETAX, Onnuri gift certificates, cultural gift certificates, donations
  - (Expanded) Apartment management fee payment, Seoul Love gift certificate, etc.



## 11. Greenhouse Gas Monitoring

### □ Greenhouse Gas emission monitoring system

- (Concept) Monitoring of GHG emissions by building and computerization of GHG inventory
  - Establishment of building management ledger and GHG and energy DB by building (about 570,000 buildings)
  - Computerize Seoul's GHG inventory, utilize monthly activity data, etc. to estimate emissions
  - Management of GHG and energy information for buildings subject to the building GHG cap-and-trade system



### ○ Plan('23)

- Quarterly update of building GHG and energy data (January~), consultation with relevant agencies (Real Estate Agency, and Ministry of Land, Infrastructure and Transport) to improve data reliability.