



# Global Partnership of Gwangju for Climate Change

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1. Current Status of Gwangju
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# 1. Current Status of Gwangju

# About Gwangju

Stats	Industry	Climate
Size : 501.25 km <sup>2</sup> Population : 1.489 mil.	GRDP : appr 30 bil. US\$ (2016) Export : 14.7 bil. US\$ (2016)	Annual Temp. 14.5 (Cel.) Annual Precipitation : 936.6 mm



## Democracy, Human Rights, and Peace

Record of May 18(1980) listed as UNESCO Heritage (May, 2011)



## Asia Culture Hub

Gwangju Biennale/Asia Culture Complex



## High Tech Industry

R&D Complex, Basic Science Campus, Photonic Industry  
Samsung, KIA, LG Innotech. etc



## Green City

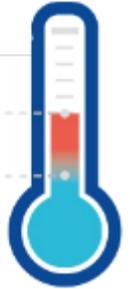
Designated by national govt. as a leading city for climate change



# Climate Change in Gwangju

Increased by **1°C** for the last decade

2015 / 14.6°C  
2005 / 13.6°C



83.9% of Gwangju citizens believe 'Gwangju's heat wave is severe.'



## Heavy Rain / Typhoon

Apr. 15 mil US\$ for damage recovery from heavy rains and typhoons between 2006-2015. Damages on lowland, roads, buildings, etc.



## Heavy Snow

Traffic accidents, falling on ice, etc. and damages on greenhouses, livestock pens, etc.



## Heat Waves

1 died and 91 treated from heat in 2016



## Livestock, Crops

Record-breaking damages 720 thousand livestock, and 9,957ha of crops suffered in 2016.

# Projection

Annual Average Temperature



■ Annual Average Temperature : 2.5°C of difference between RCP 4.5 and RCP 8.5

■ Number of dates of heatwave : 44.7 days of difference between RCP 4.5 and RCP 8.5



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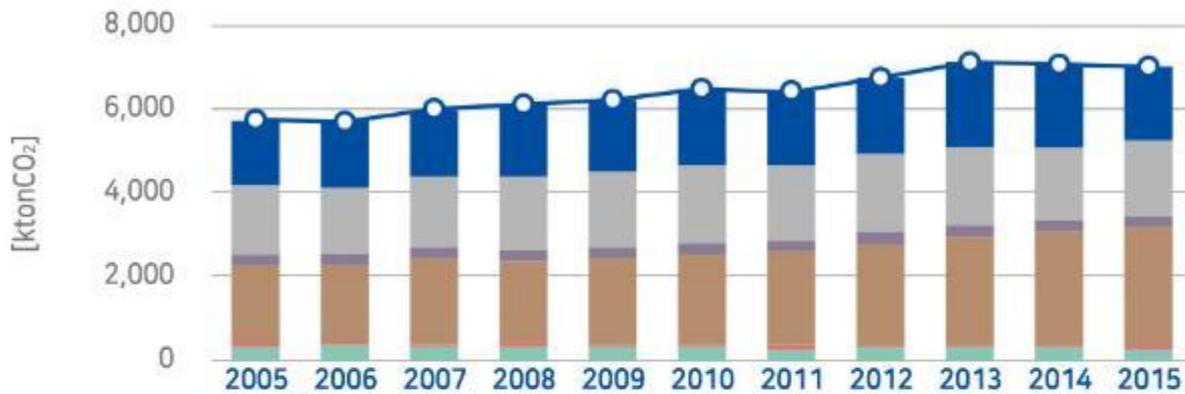
## 2. GHG Emissions : Trend and Projection

# Current Status of GHG Emissions in Gwangju

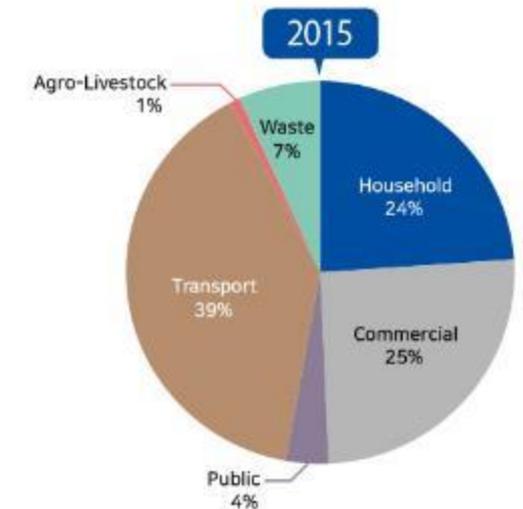
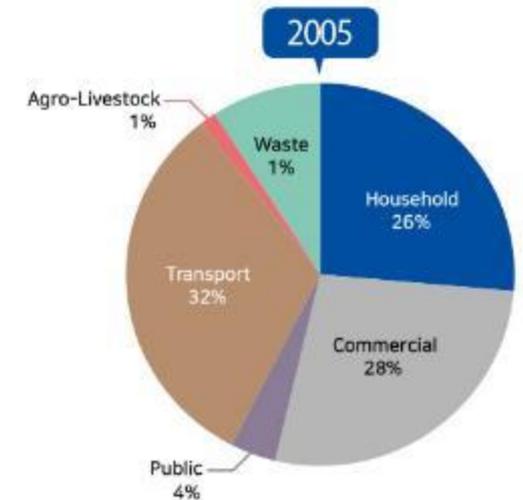
■ Net Emissions : 5,698KtonCO<sub>2</sub> (2005)      6,929KtonCO<sub>2</sub>(2015)

- Transport accounts for the biggest share(39%) in 2015
- Buildings(in Household, Commercial, Public sector) accounts for the biggest share(53%)

■ Emissions Increased in '05~'13, reduced and remain stable since '13

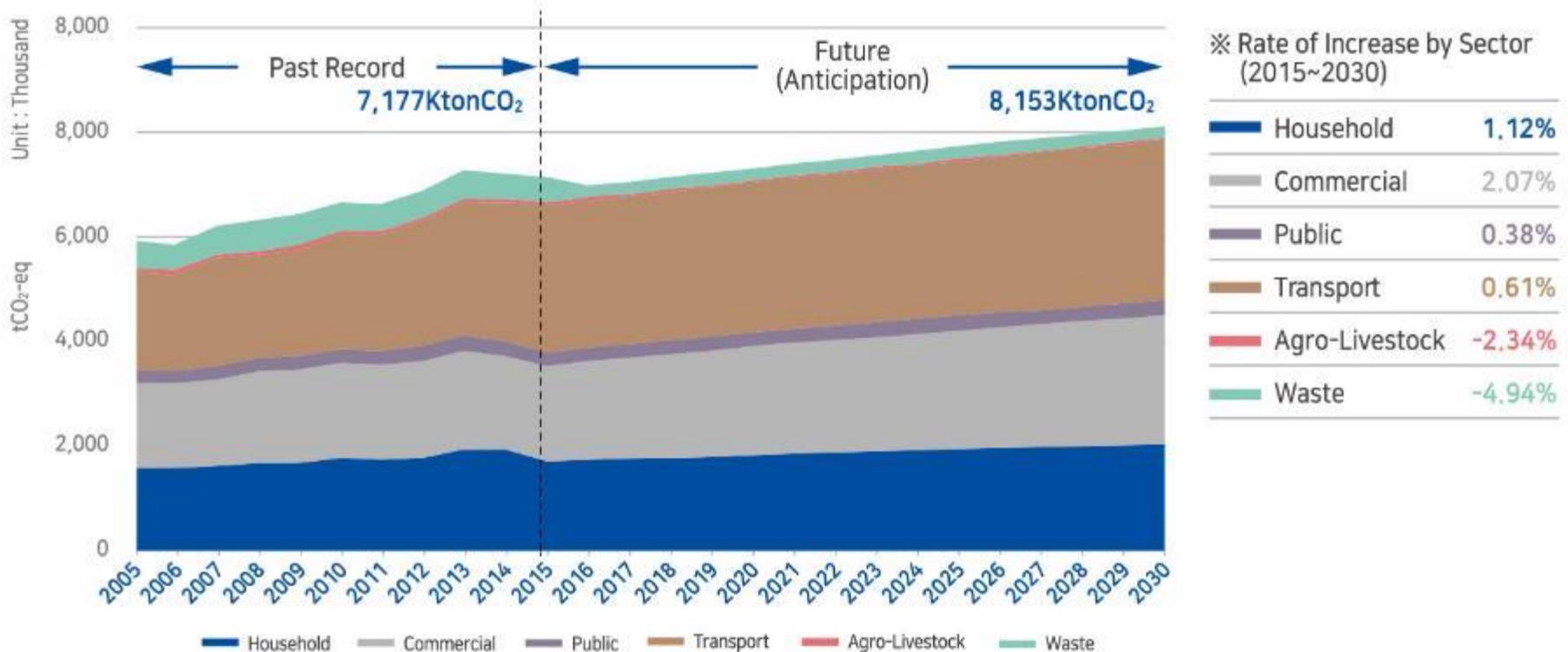


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Household	1,573	1,561	1,593	1,673	1,667	1,759	1,745	1,779	1,947	1,940	1,708
Commercial	1,640	1,627	1,676	1,745	1,795	1,831	1,808	1,852	1,862	1,772	1,827
Public	236	240	252	278	275	279	271	280	301	290	266
Transport	1,884	1,867	2,080	1,964	2,047	2,189	2,229	2,422	2,583	2,696	2,824
Agro-Livestock	80	80	82	76	71	64	65	59	59	59	60
Waste	284	303	257	282	259	259	242	251	263	250	244
Sum	5,698	5,678	5,940	6,018	6,115	6,382	6,359	6,644	7,014	7,006	6,929



# Projection of GHG Emissions in Gwangju

- Rate of Increase in Annual Emissions : anticipated to increase 0.32% in 2030, compared to 2015
- 0.03% in 2015 and 0.05% of increase anticipated, compared to 2015
- Gradual increase in Transport and Buildings(in household, commercial and public sector)
- Gradual decrease in Waste and Agro-Livestock





## **3.Efforts for Climate Change Response**

# Gwangju's efforts for Climate Change Response



# Key Plans of National Government and Gwangju

## ■ Korean Government

	Green Growth 5-Year Plan	Energy Basic Plan	Emission Trade Scheme Basic Plan	Climate Change Adaptation Plan	Climate Change Response Basic Plan
Current Status	Phase 2 ('14.6) : '14~'18	Phase 2 ('14.1) : '14~'35	Phase 1 ('14.1) : '15~'24	Phase 2 ('15.12) : '16~'20	Phase 1 ('16.12) : '17~'36
Planning Period	Every 5 years by 2050	Every 5 years for 20 years	Every 5 years, by decade	Every 5 years	Every 5 years for 20 years
Organizer	Government Policy Coordination Office	Ministry of Trade, Industry, and Energy	Ministry of Strategy and Finance	Ministry of Environment	Government Policy Coordination Office

## ■ Gwangju Metropolitan City

Gwangju Climate Action Plan (2017)

	Green Growth General Plan	Local Energy Plan	Climate Change Response General Plan	Climate Change Adaptation Plan	Climate Change Response Basic Plan
Organizer	Phase 2 ('14.12.) : '15 ~ '19 / 5Yrs.	Phase 4 ('14.11) : '15~'20 / 6Yrs.	Phase 2 ('15.12) : '16~'20 / 5 Yrs.	Phase 2 ('16.12) : '17~'21 / 5Yrs.	Optional

# Gwangju's Response to Climate Change

## ■ Gwangju Climate Action Plan (2018-2030)

<b>Vision</b>	Gwangju, a sustainable climate action city backed by civic efforts														
<b>Goals</b>	<p><b>Mitigation</b> - To cut down GHG emissions by 30% from 2010 levels by 2030</p> <p><b>Adaptation</b> - To build a resilient city with reduced climate change risks</p>														
<b>Directions</b>	<ul style="list-style-type: none"> <li>• Leading and effective public-sector climate action</li> <li>• Citizens and communities involved in climate action</li> <li>• Proactive/voluntary climate action by businesses</li> </ul>														
<b>Sectoral targets</b>	<table border="1"> <tr> <td>Building</td> <td>Convert all buildings into zero energy buildings</td> </tr> <tr> <td>New/renewable energy</td> <td>Raise the share of new/renewable energy sources in energy mix</td> </tr> <tr> <td>Transportation</td> <td>Shift to an eco-friendly transport system</td> </tr> <tr> <td>Resource circulation</td> <td>Transition into a resource circulation city through a virtuous cycle of waste management</td> </tr> <tr> <td>Agriculture/animal husbandry</td> <td>Reduce GHG emissions by buying locally grown food</td> </tr> <tr> <td>Parks</td> <td>Expand green cover to bring down urban temperatures</td> </tr> <tr> <td>Adaptation</td> <td>Build a resilient city with reduced climate change risks</td> </tr> </table>	Building	Convert all buildings into zero energy buildings	New/renewable energy	Raise the share of new/renewable energy sources in energy mix	Transportation	Shift to an eco-friendly transport system	Resource circulation	Transition into a resource circulation city through a virtuous cycle of waste management	Agriculture/animal husbandry	Reduce GHG emissions by buying locally grown food	Parks	Expand green cover to bring down urban temperatures	Adaptation	Build a resilient city with reduced climate change risks
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## Implementation Strategies

- Develop climate action plan under the new climate regime and revise existing energy and climate change policies
  - Set new reduction goals and renew sectoral targets
  - Achieve 2030 goals and prepare a transition into a low-carbon society through climate change mitigation/adaptation
- Incorporate the action plan into the city's sectoral policies and improve outcomes
  - Implement reduction goals to enhance policy effectiveness
  - Priority given to policies linked to reduction/adaptation
  - Identify links with existing plans
- Lay the groundwork for low-carbon action engaging citizens and businesses
  - Encourage citizen and community involvement in implementation
  - Engage businesses (industries) in GHG offset campaigns
- Strengthen a governance-based drive to implement climate action plan
- Develop an annual GHG inventory
  - Review reduction goals and reprioritize projects

# Structure of Gwangju's Climate Change Response

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## Background

- Gwangju Ordinance of Climate Change Response,
- Gwangju Ordinance of Low Carbon Green Growth and Sustainable Development



## Implementation Structure

- Review : Citizen Council for Climate Change Response(about 30 people)
- Department in Charge : Climate and Air Department, Environment Ecology Bureau, Gwangju
- Implementation : International Climate and Environment Center



## Evaluation Structure

- Submit (5-year) Implementation Plan, every year by each department  
(Estimate emission reductions by each project implemented)
- Categories of Projects : GHG Reduction, GHG Offset, Climate Change Adaptation, Green Life  
\* Only Reduction and Offset was included when estimating the reduction goals
- Project Progress Evaluation(2 times a year) : Review by Citizen Council → Performance Analysis for given year (Reduction compared to previous plan)
- Calculation of emission (detailed) and analysis → Inventory Report, Emission information by each district



## 4. GHG Reduction : Goals and Current Status

# Gwangju's Reduction Goals

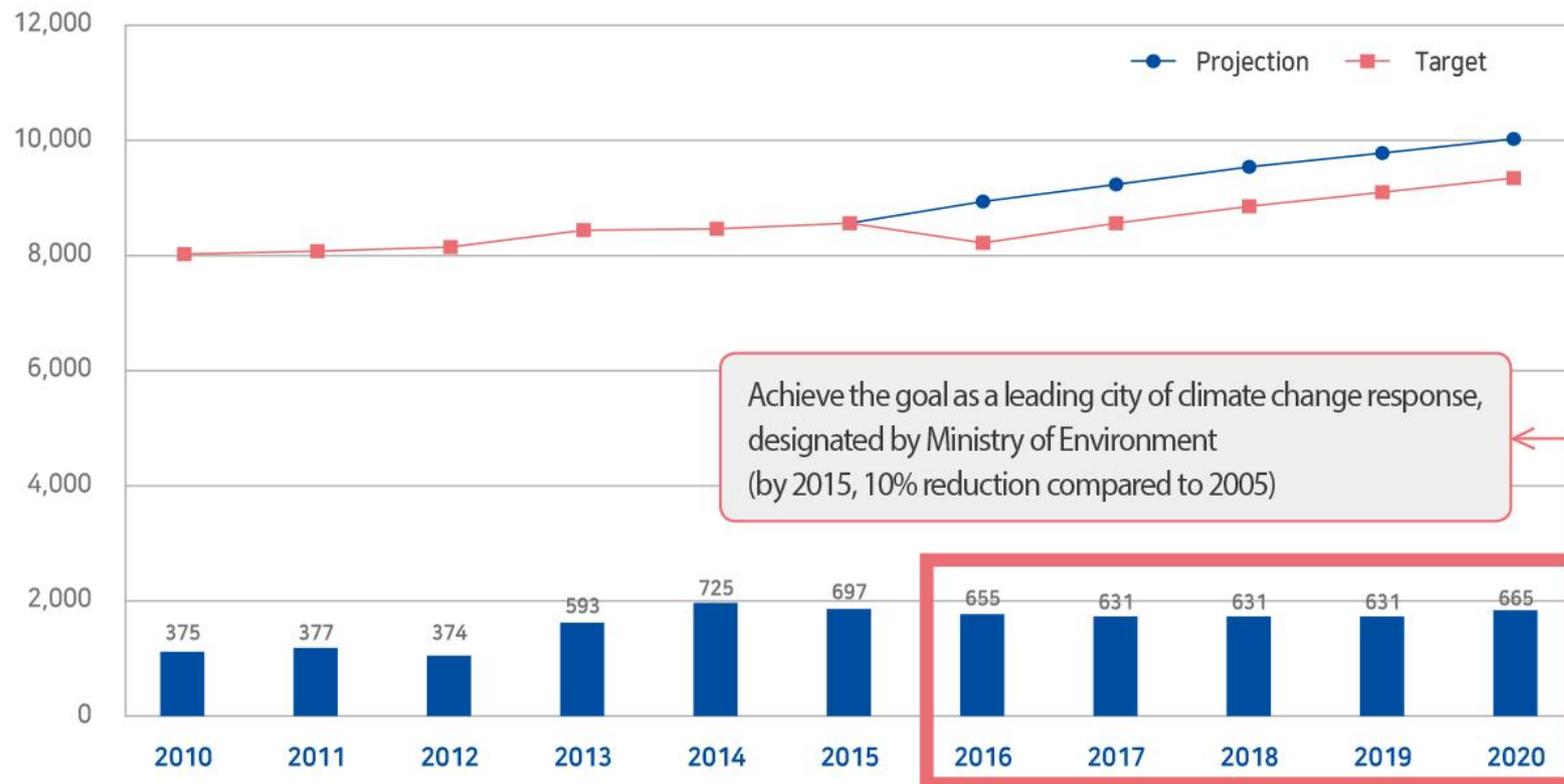
## Leading Low-Carbon City by 2030, Carbon Neutral City by 2050

- Quantitative Reduction Goal : 30% by 2020, 40% by 2030, compared to BAU
- Projects : 74 Initiative in 4 Sectors
  - Reduction(55) : Carbon Bank, Collective Energy, Electric Cars, NOx Reduction, LED, etc.
  - Offset(6) : Carbon Neutral Program on Environment Infra, Emission Trade, Parks, etc.
  - Adaptation(4) : Vulnerability in Forest, Monitoring on Illness, Prevention of Infection
  - Green Life(9) : Low Carbon Apartment, Save Water, Local Food, Green Goods, etc.
- Expenditure in 2018 : 13 bil. US\$
  - ※ 6.7 bil.(Reduction), 3.9 bil(Offset), 25 mil(Adaptation), 37 mil(Green Life)
- Duration : 2016 ~ 2020(5 years)

2030 Gwangju GHG Reduction Roadmap on Progress (2018)

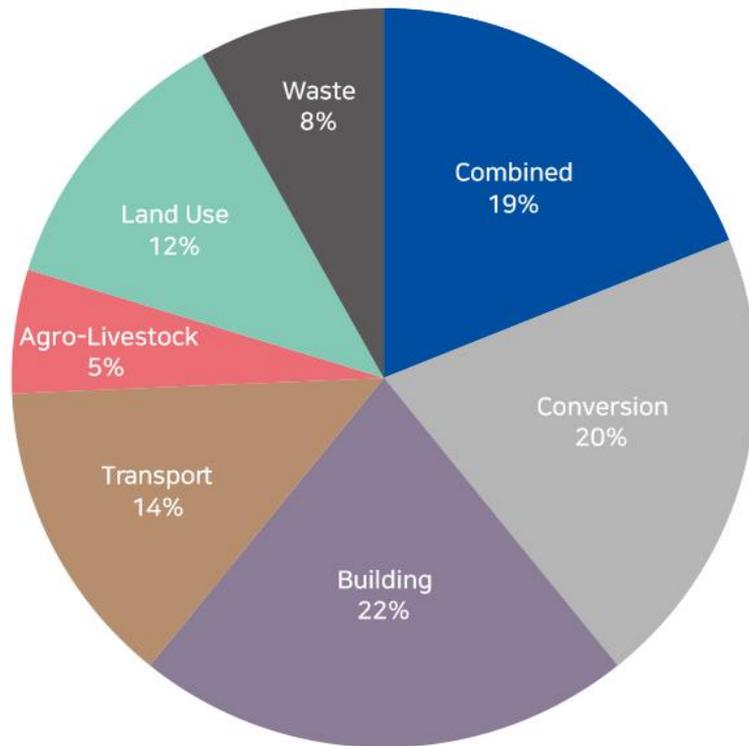
# GHG Reductions in Gwangju

- Various projects have been implemented since 2008 when the reduction target was set.
- As of 2015, 697ktonO<sub>2</sub>eq has been reduced through these projects, which is already more achievement than the reduction target of 2020 (665ktonCO<sub>2</sub>eq, 6.65% of projected amount)



# Reduction Projects

- Categories : 74 Initiatives  
(including 48 direct reduction)

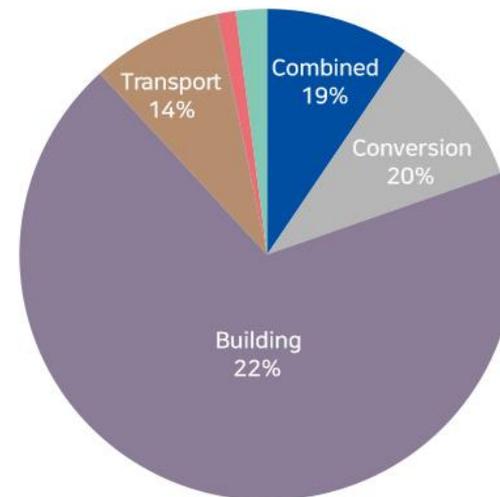


- Combined (19%) / Conversion (20%) / Building (22%)
- Transport (14%) / Agro-Livestock(5%) / Land use (12%) / Waste (8%)

- Reduction by sector  
(data of 2016 ~ 2017 combined)

Unit : ktCO<sub>2</sub>eq

Com- bined	Conver- sion	Build- ing	Trans- port	Agro- Livestock	Land Use	Waste	Total
219	464	118	74	3	112	70	1,602





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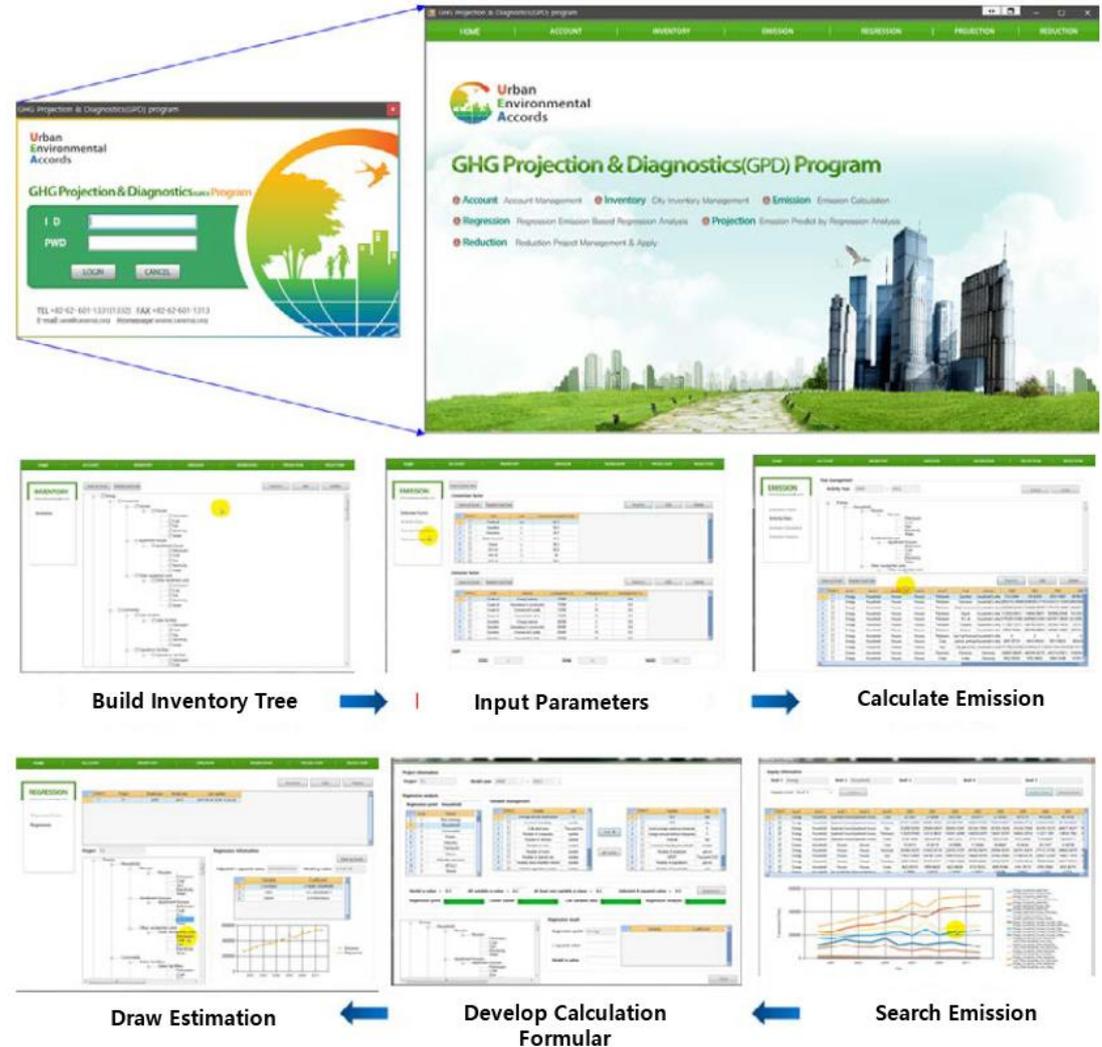
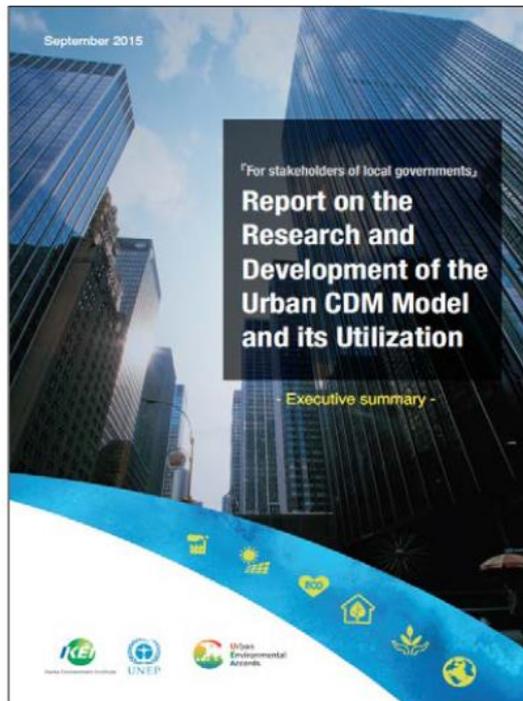
## 5. Policy Case on City's Carbon Management

# GHG Projection and Diagnostics(GPD) Program



## Background

A Universal inventory tool for both developing and developed country cities to manage and monitor GHG emission reduction (e.g. CDM projects)



# Urban Carbon Management System(UCMS)



## Background

A Universal inventory tool for both developing and developed country cities to manage and monitor GHG emission reduction (e.g. CDM projects)



## Characteristics

- Inventory categories fit for urban planning
- Detailed inventory by lot(block)
- Link building information(e.g. type of buildings) to emission resources and energy source.
- Link emission/energy information and spatial data
- Build city's carbon management evaluation system

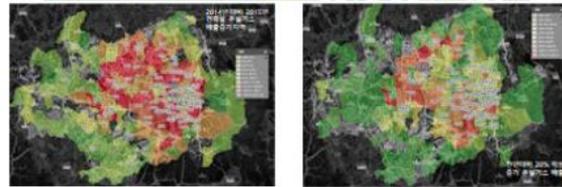
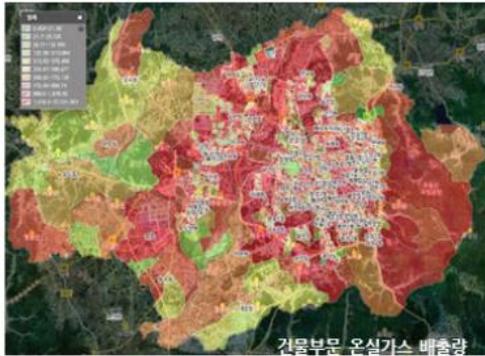


## Utilization(How to Use)

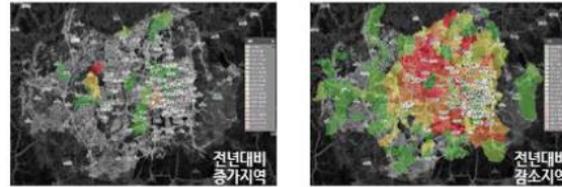
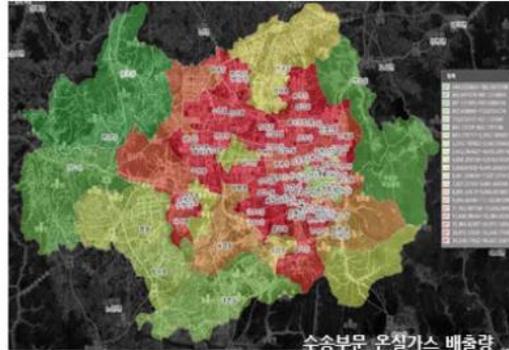
- Taylor-made policies (for each district)
- Taylor-made initiatives
- Background information for policy making
- Linkage between environmental info and climate vulnerability index



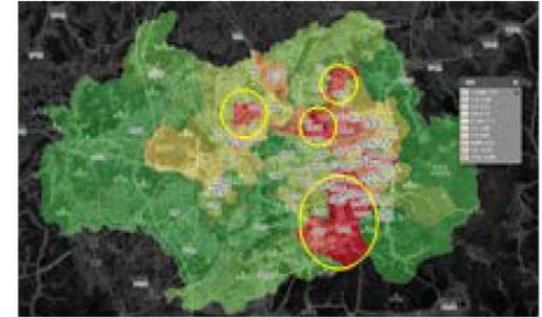
# CCMS (GIS based)



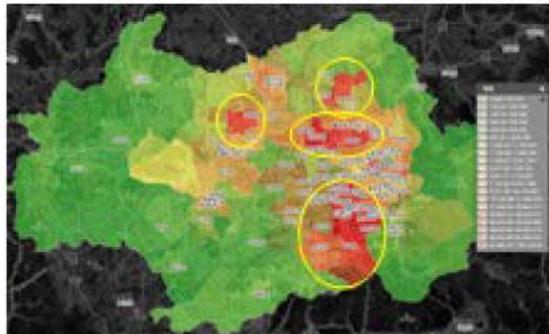
Current emissions and comparison (to last year) in building sector



Current emissions and comparison (to last year) in transport sector



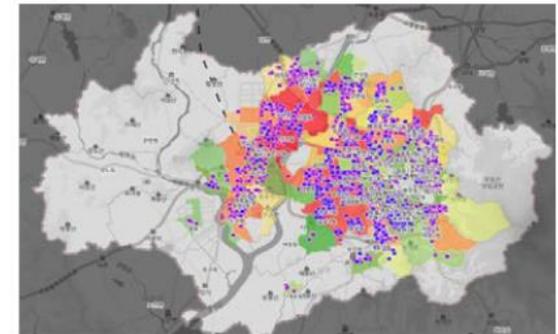
Applied analysis on climate Vulnerability-Resilience Index(VRI)



Co-relation between buildings' emission and VRI (Integrated approach between adaption and mitigation)



Applied analysis (heatwave+tropical nights+heat index+actual measurement)



Foodwaste discharge in multi-unit residences

# Information Sharing on Gwangju's GHG emission

## My town's GHG Info Center

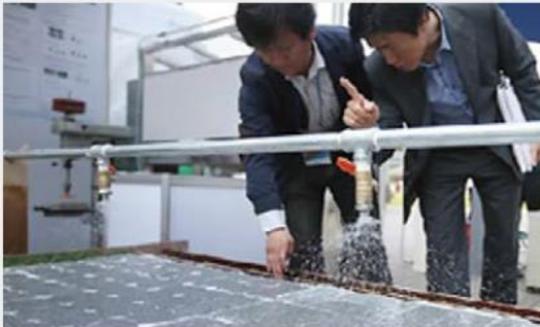
- GHG emissions : trend and projection
- Emissions information by district/town
- Provide GHG database in town/city
- GHG emission calculator, etc.

## GHG Inventory Report(annual)

- Gwangju's GHG emission trend and projection
- Characteristics of GHG emission by sector related to urban planning (building, transport, green area)
- GIS-based GHG emission map

순위	자치구	총 배출량	1인당 배출량	그래프
1위	북구	996,777	2.08	
2위	광산구	830,389	2.02	
3위	서구	741,625	2.42	
4위	남구	434,236	1.86	
5위	동구	321,016	3.26	

# Citizen-friendly climate policies in Gwangju



## [Heat Wave Response]

Making cool green city  
with citizens

**Making Gwangju 1°C  
Cooler Project**



## [Energy Saving]

Incentives for energy saving  
in household, school, institution, etc.

**Carbon Bank**



## [GHG Reduction]

Support reduction activities in  
multi-residence unit

**Low-Carbon Green  
Apartment Project**

# Gwangju's Climate Policies led by Citizen

Citizens directly involves in solving environmental issues in town.

## [Together Green] Project (also stands for 'high-value green' in Korean)



# Gwangju's Response to Climate Change

## Climate change education and awareness projects



### I Laying the groundwork for climate/environment education (3 projects)

- 1-1 Prepare for the creation management of the climate environment education belt
- 1-2 Encourage visits to the Climate Change Education Center
- 1-3 Run a climate change education network



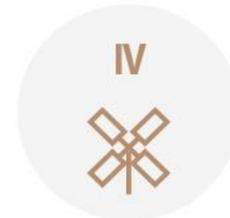
### II Strengthening climate/environment education (4 projects)

- 2-1 Develop/distribute content for climate/environment education
- 2-2 Strengthen the role of information hub in climate/environment education
- 2-3 Develop programs tailored to a flexible semester in middle school
- 2-4 Run a teachers' research group on climate change



### III Reinforcing climate/environment education (9 projects)

- 3-1 Gwangju Climate School for Children
- 3-2 Climate/environment education for citizens
- 3-3 Green leader training
- 3-4 Climate change adaptation education
- 3-5 Daycare center staff training
- 3-6 Environment teacher training
- 3-7 Society/environment teacher training
- 3-8 GHG consultant training
- 3-9 Climate/environment education promotion



### IV Promoting low-carbon, green lifestyles (5 projects)

- 4-1 Low-carbon, green campaigns
- 4-2 Musicals on climate/environment
- 4-3 GHG assessment/consulting
- 4-4 GHG assessment/support
- 4-5 Low-carbon, green apartment buildings



### V Providing information on green jobs (1 project)

- 5-1 'Climate/Energy Job Seminar'

# Education and Campaign



## [Culture Program]

Raise awareness through musical show

**Climate and Environment Musical**



## [Improve Knowledge]

Quiz show for elementary school students

**Climate Golden Bell Quiz Show**



## [Campaign]

Climate March Day, Green Practice, etc.

**Reply, Climate Actions**

# Climate Change Education



## [Education for Children]

Play and learn from hands-on experiences

**Climate Change Experience Center**



## [Training Program]

Training for teachers, instructors, climate consultants, etc.

**Expert Training Program**



## [Textbook, teaching aid]

Developed by Climate Change Teachers' society

**Contents for Climate Change Education**



## 6. Global Partnership

# 1. UEA(Urban Environmental Accords)



## What is UEA?

- Collective of cities committed to environment issues
- 156 Member cities from 52 Countries
- 9 Executive Committee Members



## What is offered to UEA Members?

- Opportunities to apply to UEA City Award
- Opportunities to join joint projects
- Presentation of best practices during UEA Summits



## 7 Categories of the UEA Green Cities Declaration



Energy



Waste Reduction



Urban Design



Urban Nature



Transportation



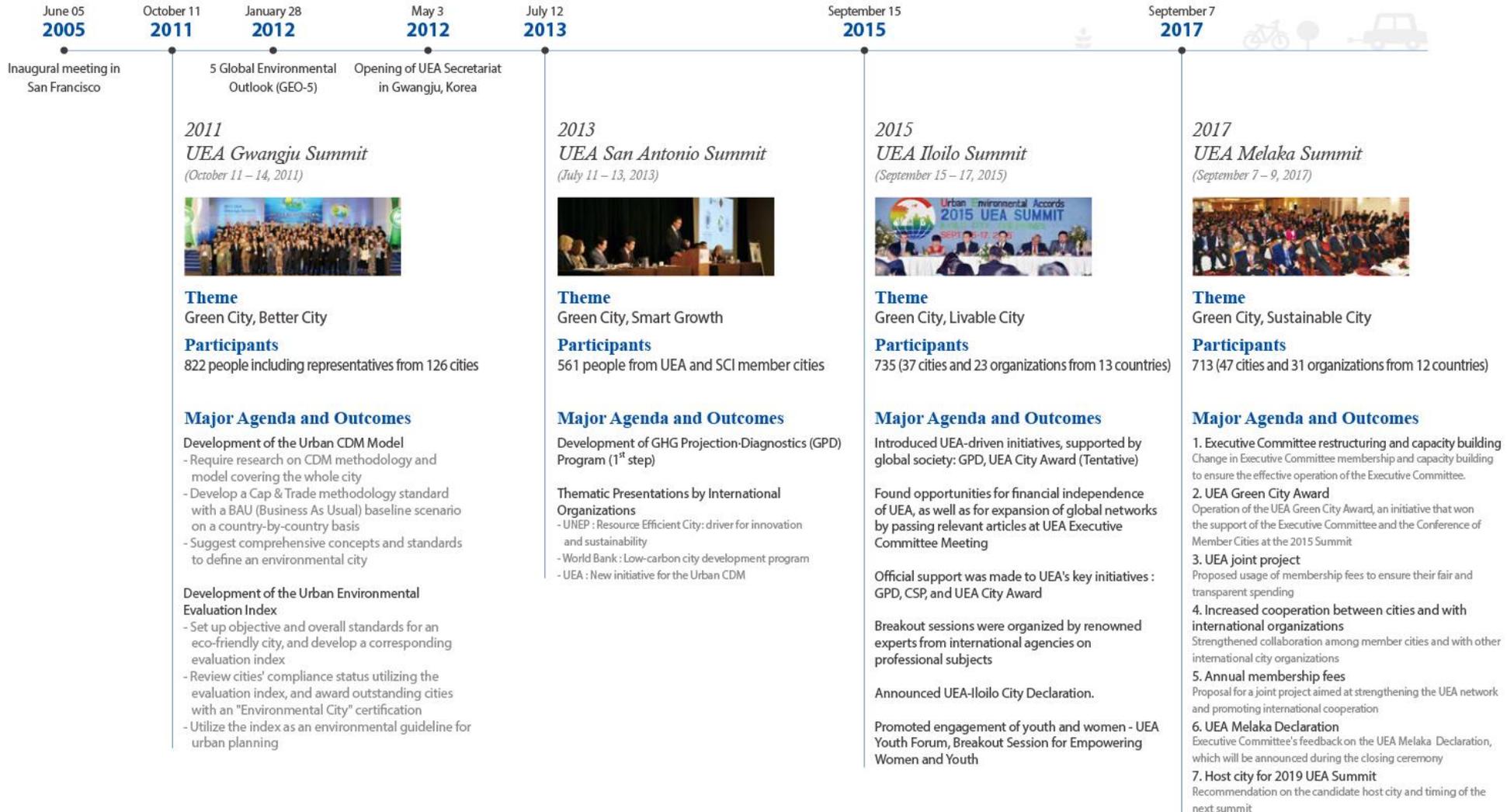
Environmental Health



Water



# History / Previous UEA Summits



## 2. ICEC-EU Joint Workshop

### “Toward a Low-Carbon City”



#### Organizer

- Gwangju Metropolitan City
- European Union
- IUC (International Urban Cooperation)
- ICEC (International Climate and Environment Center)



#### Purpose

- Sharing Ideas for building a low carbon city
- Collaborating new projects



#### Participants

- First Half : City government staff in Korea
- Second Half : City Government staff in the world



# 3. Global Training Program with KOICA

## “Sustainable Water Resources Management for Climate Change”



### What's KOICA?

- Korea International Cooperation Agency
- Mission : Leave no one behind with People-centered Peace and Prosperity
- Vision : Korea's leading development cooperation agency to achieve global social values



### Target of Global Training Program

- under-developing countries which need capacity building  
against climate change by improving water resources management



### Main Subjects

- Water Resources Management
- Water Resource Management Action Plan
- Capacity Building
- Education and Training, Case Studies and Workshop
- Inter-governmental cooperation



### Expected Outcome

- Dissemination of training/education outcomes to related fields and departments of the national/local governments
- Capacity Building in the field of Water Resource management
- International cooperation through triangular network via UEA
- Support for the follow-up project  
(e.g. alumni program in each country/city)



**Thank you**

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