

Seoul to become a Global Climate-Friendly City by 2030:

- Reduce Carbon by 40%, Create 1 million Green jobs

- First Korean city to announce “Human-Oriented,” “Green Design” 『Master Plan for Low-Carbon, Green Growth』
- Implementation plan for overall green urban innovation for various sectors including buildings, urban planning, and transportation
- Targets to transform into 『Climate Friendly City』 『Green Growth City』 『Advanced Adaptation City』
- By 2030, reduce greenhouse gases by 40%, increase new/renewable energy supply by 20%
- Create 1 million green jobs by promoting 10 major Green Technologies suitable for Seoul, such as hydrogen fuel cell
- Establish pre-emptive adaptation ground considering climate change impacts such as heat wave, water shortage and infectious diseases

- Seoul is the first city in Korea to establish and announce the 『Master Plan for Low Carbon Green Growth』, which is a long-term green policy that provides a blueprint for Seoul to transform itself into a low-carbon green city 20 years later.
- The Master Plan, which is consisted of 22 major challenges, is noticeable as it has set aggressive goals compared to those stated in Eco-Friendly Energy Declaration which was announced in April 2007. According to the Master Plan, plans set for 2020 were elongated to 2030 and greenhouse gas reduction targets were raised to 40%, new/renewable energy supply to 20% from 10%, and energy consumption reduction to 20% from 15%.
- Seoul is planning to realize all-around green innovation ranging from building, urban planning and transportation to daily life by 2030 to become a city with world leading green competitiveness.
- Based on the Master Plan, Seoul is willing to spearhead green policy paradigm shift that will take place over the next 2 decades in a fast pace. To become a leader, Seoul is placing a critical value on realization of 『Green Design City』, which re-designs not only buildings, transportations and urban area but also the functions of the city reflecting low-carbon, low-energy and resource recovery aspects, and realization on 『Human-

Oriented City」 which enables people to live on green jobs with higher salaries.

- Civilization transformations due to reaching peak point in fossil fuel use and advent of extreme aged society are expected to unfurl over the next 2 decades. In addition, 「Low-carbon Green Growth」 is highlighted as the main political issue from in and out of Korea. In particular President Lee Myung-bak of Republic of Korea has announced visions for low-carbon green growth in Korea.

○ In the Master Plan, Seoul plans to invest in a total of 45 billion USD, including private investment by 2030, to reduce greenhouse gases by 40% compared to that of 1990 level, create 1 million green jobs and develop the city to adapt to climate change in advance.

- The newly announced Master Plan suggests visions and action strategies suitable for Seoul's low-carbon green growth including green growth and climate adaptation measures as the Mayor of Seoul, Oh Se-hoon has been emphasizing environment-friendly governance since he took the office. Seoul's plan shares the 'Low- Carbon Green Growth' vision set by the Korean government.
- Under the circumstances that Korea is highly likely to be included as one of those nations obliged to cut emissions under Post-Kyoto era, Seoul's aim to reduce GHG by 40%, reflects the city government's commitment to enhance its adaptation ability to meet new international standards. The Seoul Metropolitan Government explains that the target can be achieved if the city improves the current energy excessive consumption pattern, focuses on intense investment, and puts in strenuous efforts.

<Improving energy consumption structure at building & transportation sector, Reducing GHG by 40% by 2030>

○ By 2030 the city of Seoul is planning to reduce GHG by 40% and energy consumption by 20%, and raise new/renewable energy use by 20%.

○ Considering the fact that more than 90% of greenhouse gases are emitted from building and transportation sectors rather than from industry sector while most of the energy is supplied from the outside (only 0.4% of the power consumed is self-generated) Seoul will emphasize new/renewable energy supply suitable to Seoul, improve energy efficiency, and concentrate on saving energy.

○ In order to achieve this goal, Seoul is planning to:

- Transform 10,000 buildings larger than 2,000 m² into green building
- Make it mandatory for all new buildings to acquire green building certificates
- Transform all public transportation into green vehicles

- Expand public transportation ridership rate to 70%
- Create 207km long bike-only lanes at main roads to increase bike ridership rate up to 10%

<Develop 10 major green technologies suitable for Seoul such as hydrogen fuel cells to create 1 million new green jobs>

○ Seoul will accelerate its efforts to create green-growth city. The Seoul Metropolitan Government will make best use of the most appropriate infrastructures in the city including world best technologies such as IT (Information Technology), NT (Nano Technology), and BT (Bio Technology), talented human resources, and densely located venture startups in order to develop 10 major green technologies suitable for Seoul, create 1 million green jobs and establish a green market of 170 billion USD in scale.

○ 10 major Green Technologies selected by the Seoul Metropolitan Government:

1. Hydrogen Fuel Cell
2. Solar Cell
3. IT Electricity
4. Green Building
5. LED lighting
6. Green IT
7. Green Cars
8. Urban Environment Recovery
9. Recovering Waste into Resource
10. Climate Change Adaptation Technology

Seoul is planning to invest around 2 million USD (an average of 100 million USD annually, 20,000 USD per technology) in R&D by 2030 to establish a foundation for research and development of each green technology stated above and to provide systematical financial support.

<Urban Management Considering Climate Impacts such as Heat Wave, Water Shortage & Infectious Diseases>

○ The average temperature rise in Seoul was twice higher than that of Korea and three times higher than the average rise of the Earth. Given that Seoul is in dire situation of addressing climate change, the climate adaptation measures will be reinforced to tackle the current problems in pre-emptive and preventive manner in order to minimize the damages affecting citizens.

○ To evaluate climate change impacts and the vulnerability, the Seoul Metropolitan Government will establish comprehensive countermeasure system. In addition, we will supply customized medical device to protect the public from climate impacts such as heat wave and yellow dust. At the same time, the city government will set standards for urban planning and development considering climate impacts to lay a foundation for climate-friendly urban management.

○ In particular, Seoul will select 5 major areas - infectious diseases, temperature rise such

as heat wave, climate-related disasters, water shortage and disruption in ecosystem - that are vulnerable to climate change for intensive management. At the same time, Seoul will establish effective disaster countermeasure system.

- The city of Seoul has reorganized its structure to effectively implement the Master Plan that embraces comprehensive green policies for overall city administration. Under the leadership of the Assistant Mayor for Environmental Protection Headquarters, divisions were established for dedicated efforts to promote climate-friendliness, advanced adaptation, and green growth.
- The city of Seoul is planning to prepare practical ground for promotion of the master plan, such as enacting relevant ordinances and organization of local green growth committee to connect the plan with the central government's low-carbon green growth strategies and action plans. In addition, Seoul will disclose detailed comprehensive action plans by the end of this year based on additional opinions from citizens, experts and relevant institutions.
 - Seoul will establish a cooperative network with the central government, local authorities, civic societies and the international community and concentrate all its efforts to promote the plan. In addition, the Master Plan will be an 'Open Plan' that flexibly reflects changes from technical development and market conditions and will develop by applying new concepts.

Climate Friendly City

- ⇒ Reduce GHG by 40% (compared to 1990 level) by 2030
- ⇒ Increase new/renewable energy supply by 20%, reduce energy use by 20% (compared to 2000 level)

The energy generation and consumption structure in Seoul shows that most of the energy used in the city is produced from outside whereas only 0.4% of total energy consumed is generated within the city. Given that more than 90% of GHG is emitted from buildings and transportation sector rather than from businesses including manufacture sector, the Seoul city government will concentrate on expanding distribution of new/renewable energy, building retrofit projects and energy saving policies customized to Seoul.

- ① Increased distribution of new/renewable energy suitable for Seoul
(From energy consuming city to energy producing city)
 - By 2030, we will distribute more new/renewable energy such as hydrogen fuel cells, PVs, geothermal facilities which are appropriate for Seoul where buildings are densely located, and will lay a foundation for self-generation of energy by using walls and roofs of the buildings.
 - ※ Hydrogen Fuel Cell: 47.6%, PV: 15.5%, Geothermal: 16.5%, Other (Waste, etc.): 20.4%

- ② Focus on GHG reduction in building and transportation sectors
 - Seoul is planning to transform 10,000 buildings larger than 2,000m² into green buildings (by 2030), make new buildings to acquire green building certificate mandatorily (by 2030), transform public transportation completely into green vehicles, increase public transit ridership rate to 70% (by 2020), and create 207km long bike-only lane at main roads to raise bicycle ridership rate to 10% (by 2020)

- ③ Replace Seoul's light sources with LED, establish IT based energy management system
 - We are planning to replace all street lights and indoor lights at public buildings with LED (by 2020), establish and operate IT based energy efficiency management system such as Building Energy Management System (BEMS) and Smart Grid system for buildings and district units in the process of urban development projects including construction of large buildings and New Towns.

- ④ Introduction of new system such as carbon reducing 『Energy City Planning』
 - 1) Apply CPDP (Climate Positive Development Project) principles which Magok project is adopting when conducting environmental impact evaluation or construction consultations on constructing large buildings
 - 2) Establish green building standards for existing buildings and apply differentiated grades- Green, Greener, Greenest.
 - 3) Mandatory energy auditing and consulting for buildings older than 20 years.
 - 4) Introduction of 『Open Information System of Energy Efficiency Grades』
 - 5) Expand RPS (Renewable Portfolio Standard) application for developers to include energy consumers who use more than 2,000 TOE.
 - 6) Participation of climate and energy experts when establishing various urban plans such as New Town, and consulting construction approvals.
 - 7) Participation of climate energy experts as commissioners at urban planning committee, construction committee etc.
 - 8) Introduction of comprehensive energy management system based on a new concept (discuss and consult with Korean government) such as establishment of urban plans from eco-friendly, low-energy perspective for production, distribution and consumption of energy.

- ⑤ Establish 『Complete Circulating』 resource management system
 - We will promote 100% resource management system that recycles and reuses waste resource repeatedly as long as waste can be re-used as a resource by encouraging industries related to repair & reuse of resources, recovering energy resource from waste, promoting urban mining project, and pursuing maximum use of water resources.

- ⑥ Low-carbon citizen movement for “Rational Inconvenience” and concentrate on education
- Energy saving is regarded as the 5th energy and citizens’ voluntary participation is crucial in cities such as Seoul where consumption account for a major part. Thus citizen movements to endure “rational inconvenience” should be expanded by aggressively promoting activities such as Eco-Mileage, Eco-Drive and Eco-Tour.
 - To create low-carbon civil society, Seoul will promote various policies, establish educational facilities such as Climate Energy Experience Site and reinforce energy saving educations from primary and elementary school, to transform current Citizens and Netizens (Internet + Citizen) into future Ecotizens.

Green Growth City

⇒ 10 Major Green Technologies for Seoul

⇒ 1 million new green jobs, green market worth of 170 billion USD

Seoul is not gifted with natural resources and its industrial structure concentrates on service businesses. Hence Seoul saw the economy shrank as the consumption fell due to global economic downturn. Seoul will make the best use of its infrastructure which is suitable for development of green technologies including world best class technical grounds for IT (Information Technology), NT (Nano Technology) and BT (Bio Technology), talented human resources and integrated venture companies, to designate green technologies suitable for Seoul and to mainly focus on these technologies. Seoul expects this to improve environment and promote economy at the same time.

- ① Choose 10 Seoul-style Green Technologies and Lay a Foundation for R&D
 - Designation of 10 green technologies suitable for Seoul:
Next Generation Hydrogen Fuel Cell; Photovoltaic cell; IT Electricity(i.e. Smart Grid); Green Building; LED Lighting; Green IT; Green Car; Urban Environment Restoration; Recovering Waste into Resource; and Climate Change Adaptation Technology
- ② By 2030, invest \$2 billion in Green technology R&D and support commercialization
 - Seoul will invest around total of 2 billion USD (100 million USD for annual average, \$200 million for each technology) in research and development for green technologies. Among invested projects, Seoul will continuously support exemplary projects to commercialize them, and will support participating industries, academics and R&D sectors in matching manners to expand the scope of financial resource.
- ③ Develop world best GT research network by establishing Magok district as a hub and training talented human resources
 - We will establish cooperation system for business, academic and R&Ds for each green technology, and develop the system into world leading research network. We

will also strengthen partnership between major large cities and private professional institutions around the world. At the same time Seoul will actively foster talented human resources in green technology field.

- ④ Prepare stable environment for development by providing test beds for ideal planning and creating domestic market, based on road map for purchasing.
 - We will promote development of green technologies and create domestic market by preparing test beds for ideal planning to conduct verification test on products developed and by pursuing continuous group purchase. We will also use policy road maps including advance purchase announcement to minimize potential risks from aggressive investment, and create stable environment for investment and development of green technology.

- ⑤ Subsidize and protect Green Technology related mid-to-small scale businesses and venture startups
 - For mid-to-small scale businesses and venture startups that have best green technologies, Seoul will support overseas marketing and the process of acquiring and maintaining patents and other intellectual rights. Also Seoul will protect and actively support stabilization of the business through capital loans and trust guarantees.

- ⑥ Promote greening major industries
 - We will link industrial New Town with 6 major industries of new growth engine in Seoul, and emphasize on the development of the industries such as new/renewable energy, LED application, Green City, Resource Recovery, Climate Change Adaptation, and IT integrated system.

Examples of connecting with new growth engines

▷ Fashion & Design + (climate adapting clothes, green design, etc.)

Convention + (host GT related international conferences, exhibitions, trade fairs in carbon neutral manner)

Finance + (attract carbon exchange), tourism + (eco tourism), R&D, + (GT)

Digital contents + (develop contents related to low-carbon green growth)

- We will lead Green Mart movements that some large chain retail stores are promoting voluntarily. We will establish systematical sales environment, product sales and green selling methods and then expand such activities to all large chain retail stores across Seoul

Advanced Adaptation City

- ⇒ Establish integrated counter system for climate change impacts and vulnerability evaluation
- ⇒ Promote high efficient management policy on 5 major vulnerabilities including

contagious diseases

Temperature rise in Seoul is around two times higher than the average of Korea, and about three times higher than the average of the Earth. And the international community's interest on adaptation to tackle impacts of climate change is growing. Hence Seoul will pioneer the following efforts in order to protect citizens' health from extreme temperature change and climate-related impacts such as heat wave, extremely hot summer nights (a.k.a. Tropical Night Phenomenon in Korea) and torrential rainfall and minimize economical and physical damages.

- ① Establish foundation for pre-emptive & preventive adaptation
 - We will develop a system to anticipate climate change impacts in Seoul and evaluate vulnerabilities. In addition we will develop climate change adaptation scenario, and establish adaptation infrastructures including establishment of institutional, judicial and social cooperation network and collaboration network for domestic and international communities. We will also develop guidelines for citizens to improve their climate adaptation ability, establish an information system, and initiate detailed educational training system.
- ② Establish climate-friendly basis for urban management
 - We will establish urban planning and development standards considering climate impacts, minimize impenetrable level, add 11km² of more green space in the city, pursue gradual roof greening at large buildings in the city, and restore 13 streams into eco streams by 2020 to increase urban climate control ability
- ③ Support adaptation by developing and distributing advanced adaptation technology
 - We will provide customized medical information according to the climate impacts such as heat wave, and will develop and distribute portable devices to protect individuals. In addition, we will develop and distribute protective medical devices to contribute to neutralization and mitigation of damages caused by each case. For instance a special mask will be developed and provided for the public to wear when particulate matter warning including yellow dust warning is issued.
- ④ Intensive management of 5 major climate vulnerable areas
 - 5 major climate vulnerable areas: Contagious Disease, High Temperature including Heat Wave, Climate-related Damages, Water Shortage, Disruption at Ecosystem
 - We will develop effective management system including establishment of database for the vulnerable class, installation of research and protection facilities, securing water resources by diversifying water sources, and development of disaster responsive system.