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2008

APPLICATION FOR THE AWARD TO "CLIMATE CHANGE AND HEALTH IN CITIES"



2008. 8.

"Clean Green Cool City - Wonju Plan"

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Wonju, Korea

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"Clean Green Cool City - Wonju Plan"



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I . Background

The 4th report of IPCC (Intergovernmental Panel on Climate Change) says that the average global temperature is expected to rise continuously. The impact caused by such climate change appears in various ways in food, water, eco systems, and extreme wether events, and especially, the measure for impact on the health systems is required since the impact is expected to be very big.

International effort for reduction of carbon dioxide, which is the cause of climate change, is started from 'The United Nations Framework Convention on Climate Change (UNFCCC)' concluded in 1992 and continued to 'Kyoto Protocol' in 1997. This Kyoto Protocol was effectuated in 2005, and the substantial effort to reduce carbon dioxide emission is started by the initiatives of advanced countries.

Korea also will participate in such efforts soon in the level of government, and Wonju City also has big interest in it. Wonju City occupies the position of excellent healthy city by being awarded¹⁾ in the sector of "How to Finance Healthy City Project" by WHO after being designated as Healthy City in 2004, and is complying with Aalborg Charter and promoting Agenda 21 after joining in ICLEI in 2006.

Recently, Wonju City recognizes the problem of environment protection is an important policy sector and is groping for measures in order to reduce negative effect to the health caused by climate change and develop further as a healthy city. For example, city official of Wonju City visited Kyoto and Nagoya in Japan which are aggressively corresponding to climate change, in 2004 in order to grope for the method of cooperation.

It is possible to say that Wonju City is characterized by the rapidly growing population, fast urbanization under progress and one of the cities of fastest rising temperature in Korea (Korea Meteorological Administration²⁾, 2008). Intense heat and inundation relating to this are continued to cause damage of health, life and property, and the

1) See VI. Other pertinent information

2) <http://www.kma.go.kr/>

phenomenon is in the growing trend. Therefore, Wonju City recognizes the factor called climate change as the biggest problem threatening the health of citizens and the quality of life, and concluding that urgent preparation for the measures is keenly necessary before the climate change becomes more critical.



Source : <http://english.visitkorea.or.kr/enu/index.kto>

<Figure 1> Map of Wonju city

II . Objectives

Wonju City, a member of the Healthy City of the WHO, will establish concrete measures for climate protection to observe the Aalborg Charter and fulfill its obligation as member of ICLEI.

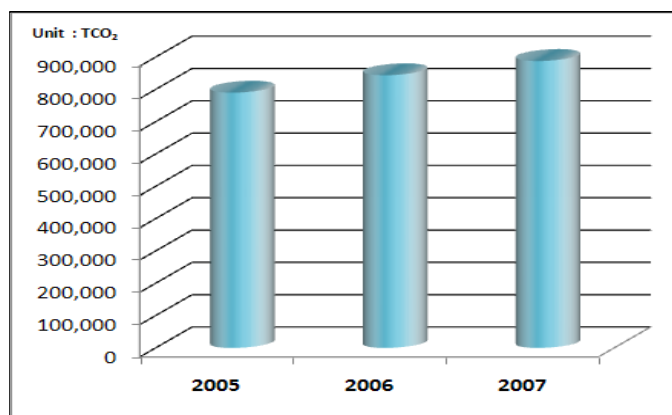
The present proposal for a climate protection program includes the status of climate change in Wonju City, reduction of carbon dioxide, and measures to adapt the climate change. The program should seek to establish connections between environment and energy, and develop into a real healthy city by transiting from a developed paradigm the unchecked urban development into one based on a 'Low Carbon Community (LCC)'³⁾.

3) 'Low Carbon Community(LCC)' is the terminology similar to 'Low Carbon Society (LCS)' in Japan. Refer to <http://2050.nies.go.jp/> for the details of LCS.

The primary objective of this proposal is to protect the citizens of Wonju City from tropical disease and enhance the health of citizens in Wonju City by reducing carbon dioxide. For this purpose, the program may have potential to realize and to exhibit the distinctive result of reducing carbon dioxide. The target of reducing carbon dioxide will be achieved through enhanced participation of citizens, change of organization and improvement of socio-economic circumstances.

The climate change proposal offers a series of short term measures, that Wonju City will give the opportunity to become convert climate-friendly society. A medium and long term plan will likely be developed after the Korean Government adopts a climate policy such as a carbon dioxide reduction plan and a detailed survey of carbon dioxide emission of Wonju City is completed. Ten projects in 8 fields will be developed for the midium and long term plan, and the reduction of carbon dioxide, which was previously impossible will be realized.

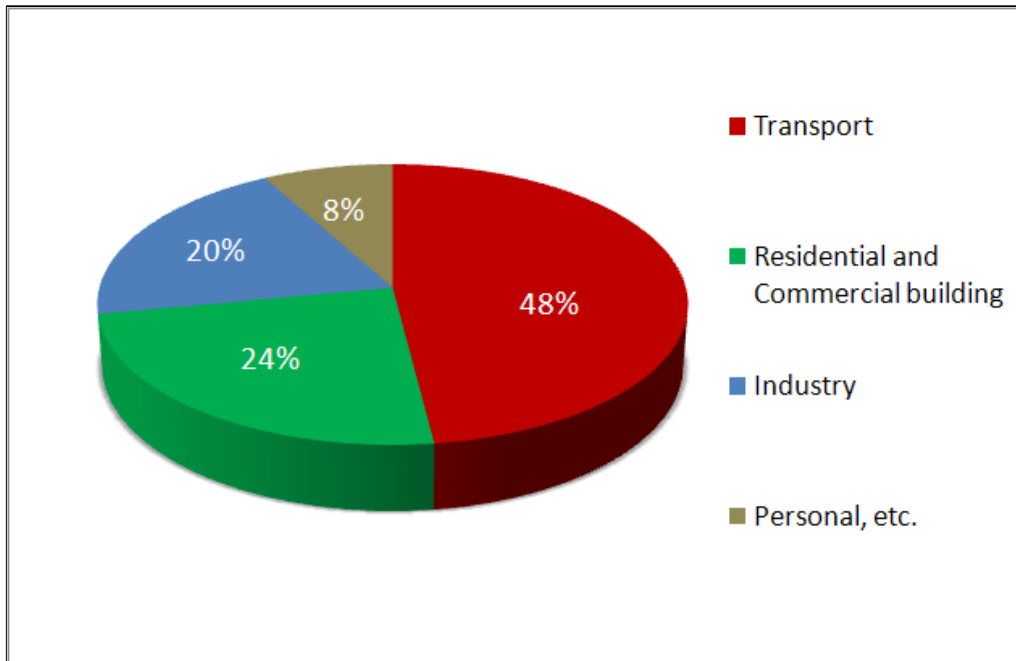
Carbon dioxide emissions occupies the highest rate among several greenhouse gas in Wonju City, and the carbon dioxide emissions have risen for the past three years as shown in <Figure 2>. The emission of carbon dioxide in 2007 was 858,000 TCO₂, and increased by 7% compared to 2005.



Source: Internal data of Wonju City 2008 (Carbon dioxide emission came out from energy consumption of Wonju City)

<Figure 2> Trend of carbon dioxide emission in Wonju City

The highest proportion of carbon dioxide emissions is from the transportation sector in Wonju City (48%) <Figure 3>. Carbon dioxide emitted from residential and commercial building account for the next largest source (24%), which industry and personal etc. account for the third and fourth emissions (Wonju City, 2008).



Source: Internal data of Wonju City 2008 (Carbon dioxide emission came out from energy consumption of Wonju City)

<Figure 3> Carbon dioxide emission by sources

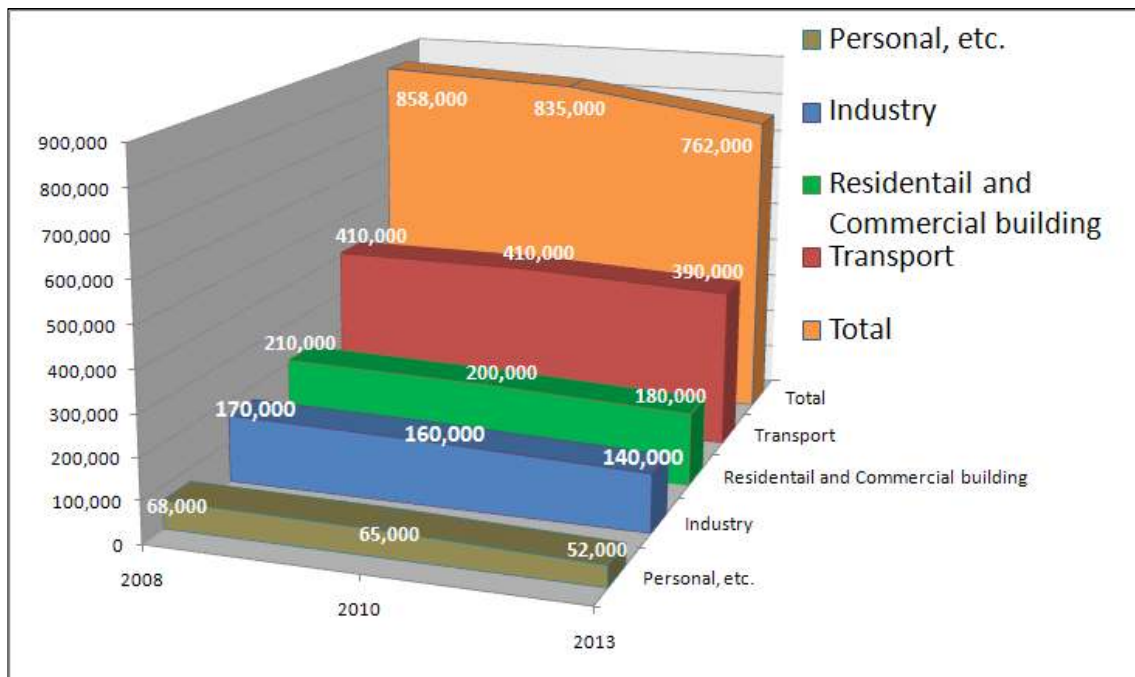
Wonju City must reduce carbon dioxide at a rate faster than the increase in population since carbon dioxide emission increases in proportion to the increase in population and urbanization in Wonju City. It is somewhat difficult for Wonju City in the initial stage of its climate production policy to achieve such a reduction target; however, Wonju City will achieve the reduction result by building a program of detailed projects and citizen's participation plan in parallel and securing organization, manpower and budget. The carbon dioxide emissions reduction target according to this plan of action will be have emissions stay at 97% (2010), 89% (2013), 80% (2020), and 50% (2050) of 2007 (citywide target levels) as shown on <Table 1>, and the target of each emission source is based on the following <Figure 4>.

<Table 1> Target

(Unit: TCO₂)

Category	2007	2010	2013	2020	2050
Greenhouse gas emission reduction target	858,000 (100%)	835,000 (97%)	762,000 (89%)	686,400 (80%)	429,000 (50%)

Source : Internal data of Wonju City 2008 (Carbon dioxide emission from energy consumption in Wonju City)



Source : Internal data of Wonju City, 2008 (Carbon dioxide emission came out from energy consumption of Wonju City)

<Figure 4> Mitigation target of carbon dioxide emission for each sector in Wonju City

III. Proposed approach and activities

1. The present status analysis and finding problems

1.1 The present status analysis

1.1.1 The geographic and demographic status

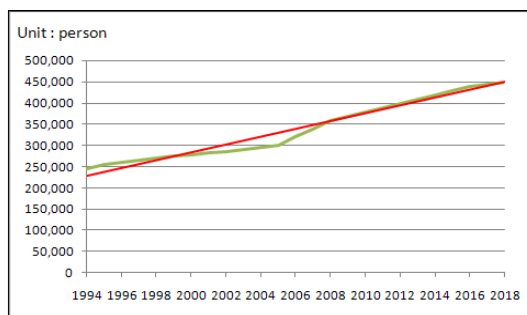
Wonju City, one of 246 local bodies in Korea located in the center of Korean peninsular, function as a self-governing key point city. Wonju City has the topographical characteristics of high east and low west that the altitude of the east and south is mostly high and it becomes lower and lower to the west. Wonju river flows through the center of Wonju City.

The total area of Wonju City is 867.3km². The ratio of urban to agricultural area is 1 : 9 with the area of urban center of 84.51km² and the agricultural area of 782.79km² (Wonju City, 2007).

The change of land utilization for 10 years from 1997 to 2006 shows that the area of forests and fields has decreased by approximately 2%, and the area of industrial region used for factories and housing has increased by more than 50%.

Approximately 301,101 people live in Wonju City (2007), and the population has increased, by 21% over the past 10 years.

The population density of Wonju City is 347.2 persons/km², considerably greater than 0.9 persons/km² of Gangwon-do. The population density of the urban center of Wonju City is 281.52 persons/km², and the population density of the agricultural area of 75.58 persons/km² demonstrate the big difference between the agricultural area and the urban center.



Source: Woju City, 2007, Urban Basic Plan 2020

<Figure 5> Trend and forecast of population of Wonju City

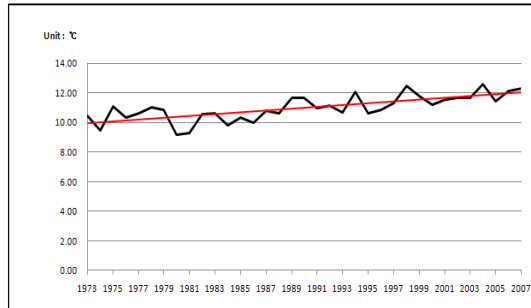
1.1.2 The climate change status

■ Temperature

The annual average temperature of Wonju City is 11.9°C. However, the average temperature in the summer season (July and August) is 24.5°C and the winter (January) is - 4.8°C showing the typical continental climate (Wonju City, 2008).

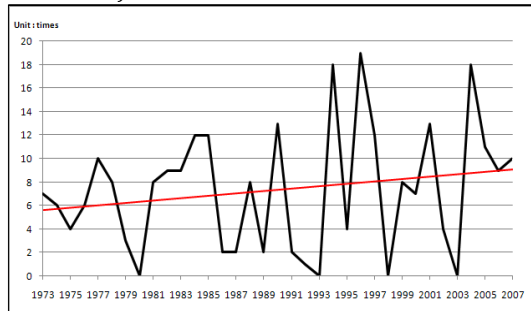
The temperature of Wonju City has been gradually rising for the past 30 years as shown in <Figure 6>. The data from the Korea Meteorological Administration shows that the average temperature in Wonju City is rising more rapidly (1.1°C) than the annual average temperature of the country over the past 30 years (Korea Meteorological Administration, 2008).

The graphs of intense heat warning ⁴⁾ and intense heat alarm ⁵⁾ also illustrate a rising trend <Figure 7>, <Figure 8>.



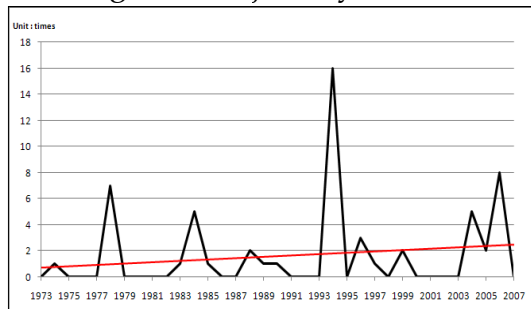
Source: Korea Meteorological Administration, 2008, <http://www.kma.go.kr/>

<Figure 6> Trend of temperature in Wonju



Source: Korea Meteorological Administration, 2008, <http://www.kma.go.kr/>

<Figure 7> Trend of intense heat warning in Wonju City



Source: Korea Meteorological Administration, 2008, <http://www.kma.go.kr/>

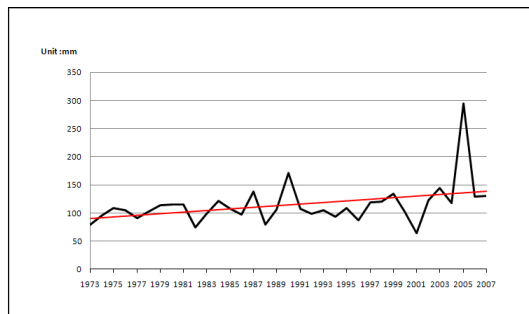
<Figure 8> Trend of intense heat alarm in Wonju City

4) Intense heat warning is announced when the state that the maximum temperature of the day is higher than 33°C and the maximum heat index is higher than 32 is sustained for more than 2 days.

5) Intense heat alarm is sounded when the state that the maximum temperature of the day is higher than 35°C and the maximum heat index is higher than 41 is sustained for more than 2 days.

■ **Precipitation**

The annual average precipitation of Wonju City is 1,290.9mm close to the annual national average precipitation of 1,250mm. Approximately 754mm, occupying 58% of the total precipitation, occurs in the summer (Wonju City,2008).

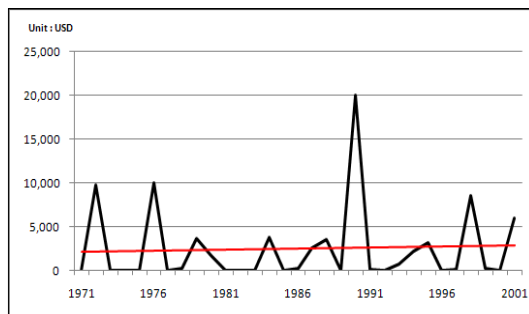


Source: Korea Meteorological Administration, 2008, <http://www.kma.go.kr/>

<Figure 9> Trend of precipitation in Wonju City

The trend of precipitation of Wonju City has been increasing for the past 30 years as shown on <Figure 9>.

Abnormal climate events such as torrential downpours, flooding and droughts occur and the trends in the damage to property in Wonju City in increasing slightly as shown in <Figure 10>. And the annual number of injured (2,844persons) has been relatively high for the past 9 years (1996~2006) due to heavy rain (Wonju City, 2008).



Source: Han River flood Control Office, Ministry of Land, Transportation and Maritime Affairs, 2008, <http://www.wamis.go.kr/>

<Figure 10> Trend of flood damage in Wonju City

1.1.3 The socio-economic status

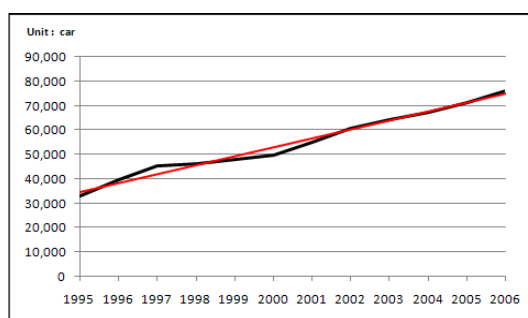
Wonju City, which functions as a key point city, has biggest population among the 18 primary self-governing bodies in Gangwon-do and it is only city with a growing population Gangwon-do (Wonju City, Basic urban plan 2020). The area is urbanizing rapidly due to the growing demand for urban development. In particular, 'Innovation City⁶⁾' and 'Enterprise City⁷⁾',

6) Innovation City, Innovation City is a new type of future city furnished with optimum innovation

which are anticipated as development projects to play construction an important roll in the development of the city, are currently under progress.

The GRDP of Wonju City is currently 4,100,000,000 USD, the highest level among 18 cities and counties in Gangwon-do, Wonju City`s GRDP has increased for past decades. Meanwhile the GRDP per capita is 14,393 USD (Provincial Office of Gangwon-do, 2008).

A major cause of greenhouse gas emission can be found in transportation sector. The number of vehicles in Wonju City has increased from 48,290 to 107,017 from 1995 to 2005.



Source: Statistics annual report 2008, Wonju City

<Figure 11> Trend of automobile increase in Wonju City

The rate of vehicles for personal movement and transportation business 91% with the rate of passenger vehicle of 69% and that of cargo truck of 22%.

1.1.4 The environmental status

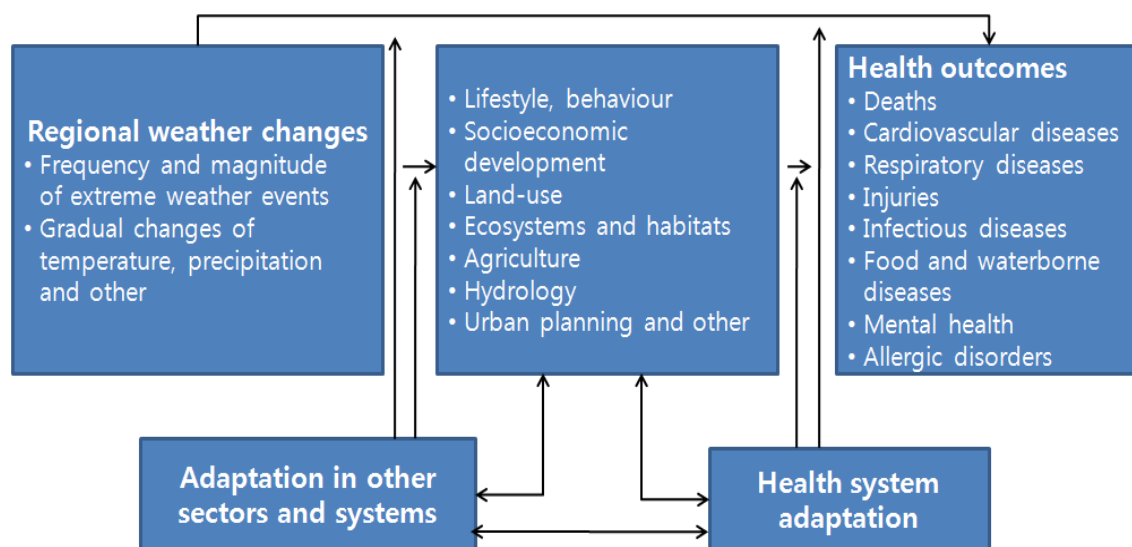
Urban air pollution levels and the degradation of urban green area are increasing in Wonju City due to rapid urbanization the increase in vehicles. Pollution levels in Wonju City (2008) especially nitrite have recently reached their peak in Gangwon-do, twice as higher as day standard. The ozone alarm system is under operation in order to protect the health of citizens since PM10 of $65.0\mu\text{g}/\text{m}^3$ exceeds the atmospheric environment standard ($50\mu\text{g}/\text{m}^3$) (Real time opening of atmospheric pollution level⁸), 2008).

circumstances and high level life environment by relocation of public institutions to local area and by cooperation of industry, academy, R&D and authority.

7) Enterprise City, Enterprise City is a city furnished with the function of 'self-sufficient compound function' including not only major functions for economic activities such as industry, R&D, tourism, leisure and business but also for improving the quality of life of local residents such as residence, education, medical care, and culture.

1.1.5 The disease status

Regional weather change in Wonju Region affects individual livelihood, social and economic systems and the ecosystem and is continued to create health problems. Therefore, the proper adaptation is required in the health sector and others <Figure 12>.



Source: WHO Europe, Health and climate change, 2005 -the :now and how", A policy action guide-

<Figure 12> The relationship between regional weather changes, exposures and health outcomes

The climate change`s impacts on health have already appeared in Korea (by Eunjin Choi, 2008), According the research, the rate of occurrence of malaria will increase by more than 2% and the rate of infectious disease such as rickettsia tsutsugamushi disease, malaria, bacterial dysentery, leptospirosis and etc. increased by a maximum of 10% if the annual average temperature of the summer season rises by 0.5 % (by Yoon-Hyeong Park, 2008).

As a disease related to climate change in Wonju City, Malaria has appeared since 2001 and at least one person was infected with a dengue fever in 2007 for the first time. Moreover, food poisoning occurred for the

8) <http://www.airkorea.or.kr/>

first time in 2006 and continued to occur in 2007 in a place where group meals were served.

1.1.6 Infrastructure

It is very important that institutions such as universities and other local institutions (NGOs) are organized on a manner conducive to cooperation so they can successfully adopt revival the climate change policies and programs. Fortunately, Wonju City has established a organized set at institutions and cooperation system is well operated. Some important institutions are briefly introduced below.

- **Wonju ECO Environmental Technology Center of Yonsei University**

Wonju ECO Environmental Technology Center⁹⁾ of Yonsei University, opened in 2007, has a Climate Change Corresponding Project Organization (CCCPO) and is supporting the research in the field of renewable energy and clean technology such as hydrogen production technology, high-quality human resources education, and environmental enterprises. The ECO Environmental Technology Center has held climate related seminars¹⁰⁾ and provided environment conservation education, targeting Wonju City community leaders by utilizing the Wonju ECO Environmental Technology Center of Yonsei University since 2008, and is planning to install and operate a Climate School at the center beginning in 2009.

- **International Sustainable Organic Agriculture Center (ISOAC) of Sangji University**

Established in 2005, the International Sustainable Organic Agriculture Center (ISOAC)¹¹⁾ of Sangji University is an organization to support the development and propagation of Korean style environment-friendly agriculture related technology, and is playing an important role in the

9) <http://weetec.yonsei.ac.kr/>

10) See VI. Other pertinent information

11) <http://www.isoac.or.kr/>

development of ecological agriculture in Wonju City.

- **Multiple Clean Energy Research Center of Halla University**

The Multiple Clean Energy Research Center of Halla University is scheduled to be completed in 2009. It will focus on R&D for the production of renewable energy such as wind power, solar photovoltaic power, fuel cells etc.

- **Wonju Local Agenda 21**

The Wonju Local Agenda 21¹²⁾, created by Wonju's council for sustainable development in 2001, is currently being implemented with the support 121 organizations and citizens. Participating carrying out an active and diverse programs in order to realize the districts agenda 21 objectives. Particular, it is devising positive activities to make Wonju City to respond to climate change by suggesting programs to Wonju City Hall and holding seminars and conferences¹³⁾ relating to climate change. In addition, north-south cooperation is in progress through the environmental exchange with local organization in the Philippines.

- **Wonju Korea Federation for Environmental Movement**

The Wonju Korea Federation for Environmental Movement¹⁴⁾, established in 1993 as regional organization of the Korea Federation for Environmental Movement, is expanding activities including direct site activities relating to the problems of waste, air pollution, energy saving and climate change as well as activities environmental conservation activities such as advertisement and education targeting citizens.

12) <http://www.wonju21.or.kr/>

13) See VI. Other pertinent information

14) <http://wonju.kfem.or.kr/>

1.2 Climate political status

1.2.1 The political commitment of the Mayor

The mayor of Wonju City announced "The Wonju Declaration to Responding to Climate Change" on August 9, 2008 stating "we will aggressively respond to climate change to keep our city healthy by taking healthy initiative for the healthy city than earlier other cities" (Wonju City, 2008)¹⁵). The announcement carries a special meaning from become it was made before other healthy cities in Korea. "We will aggressively respond to climate change to keep our city healthy" includes five key elements.

The Wonju Declaration to Responding to Climate Change

First, we will aggressively respond to climate change to keep our city healthy.

Second, we will protect health of citizens by doing the best to prevent disease caused by climate change.

Third, we will take initiatives not only to save energy but also to produce and propagate environment-friendly renewable energy.

Fourth, to keep our city and its people healthy we will acting persue a policy of to respond to climate change.

Fifth, we will make the best efforts not only to reduce but also to absorb greenhouse gas by forming forests in the city.

August 9, 2008

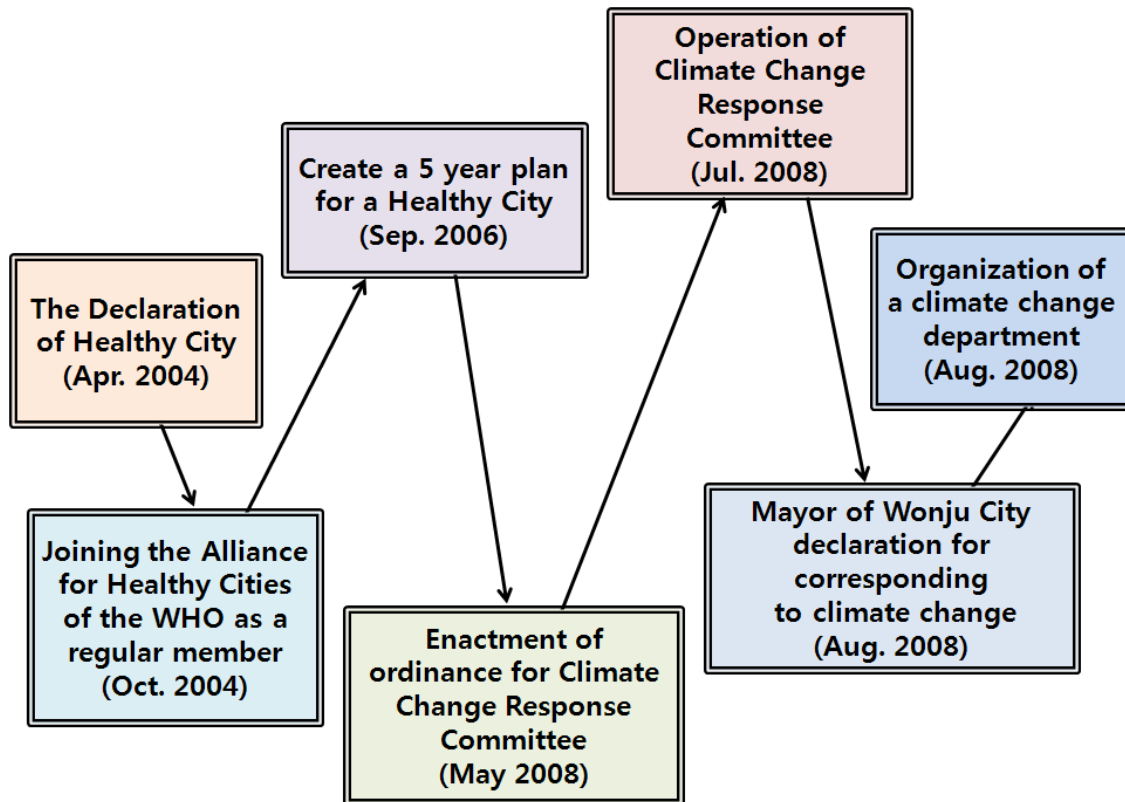
Kim, Gi Yeol

Mayor of Wonju City

15) See VI. Other pertinent information

1.2.2 Organization change

Wonju City recognizes that it is important to set up measures against climate change in order to retain its status of a healthy city, and is making several kinds of efforts in support to meeting objective. The administrative organization of Wonju City should be reformed in order to make the city more resilient to the impact of climate change. In the mean time, Wonju City has organized and operated¹⁶⁾ a committee by enacting an ordinance to establish a Climate Change Responding Committee and is showing its intentions to responding to climate change for th health of citizens by organizing a department sorely responsible for climate issues.



<Figure 13> Process of setting up climate protection measures in Wonju City

16) See VI. Other pertinent information

1.3 SWOT analysis

SWOT (strength, weakness, opportunity, threat) analysis was used to strengthen Wonju, climate policy and set up an efficient climate change response strategy.

The analysis indicates that political will the Mayor of Wonju City as illustrated by 'The Declaration of Wonju City to Respond to Climate Change' is the establishment of the committee for responding to climate change is a strength in the city.

The fact that the DB (Data Base) relating to greenhouse gas emission and infrastructure for the use of renewable energy is not yet constructed and there is still no consensus on the necessity of preventing of climate change appeared to be a weakness.

The factors functioning as opportunity a Wonju City for instance distinguish Wonju from other cities for responded earlier than other cities under the same circumstances Wonju City also recognized the possibility to improve the local economy and create employment opportunities through fostering the climate related environmentally friendly industries.

Factors of threat are the increase of greenhouse gas caused by continuous urbanization and an automobile oriented transportation system, and the increasing concern about the growing probability of subtropical infectious disease due to national temperature increasing.

Strength	Weakness
<p>Healthy City of WHO</p> <p>Committee for corresponding to climate change</p> <p>Department only in charge of corresponding to climate change</p> <p>Policy will (Declaration of Wonju City for corresponding to climate change)</p> <p>Enough R&D infrastructure (ECO Environmental Technology Center, Multiple Clean Energy Research Center)</p> <p>Construction of renewable energy production (Bio-gas conversion to automobile fuel)</p> <p>Exchange with local communities in Philippines</p>	<p>Insufficiency of survey for carbon dioxide emission source and quantity of emission</p> <p>Quantity of carbon dioxide reduction not calculated</p> <p>Insufficiency of survey for production potential of renewable energy</p> <p>Climate change adaptation plan not prepared</p> <p>Lack of funding for budget relating to climate change</p> <p>Insufficiency forming of consensus for measures of climate protection</p> <p>Lack of understanding of residents for climate change</p>
Opportunity	Threat
<p>Spread of conventional ECO environmental agriculture</p> <p>Expansion of life-centered philosophy of Wonju</p> <p>Prior occupation of dominant position in the process of discussing climate change of the country</p> <p>Improvement of local economy and employment creation through fostering climate related industry connected with environment.</p> <p>Meeting the desire for quality of life of local residents</p> <p>Promotion of cooperation between South and North</p>	<p>Frequent occurrence of abnormal atmospheric temperature phenomenon</p> <p>Increase of the weak social stratum for climate change</p> <p>Increasing probability subtropical infectious disease</p> <p>Increase of greenhouse gas emission</p> <p>Indiscreet urban development</p> <p>Automobile-centered transportation system</p> <p>Reduction in green area</p>

<Figure 14> SWOT analysis of Wonju City

Development of the following strategy is required through SWOT analysis.

First, the SWOT framework suggests that the S/O (Strength/Opportunity) strategy, which should be extended and broadened will entail revitalizing the regional economy by reducing carbon dioxide emission and fostering climate industry through investments in climate related research human resources and infrastructure. It would also be beneficial if the strategy enables to support native residents of the tropical forest region for the global climate protection measure through the existing exchanges with local communities in the Philippines.

The SWOT framework also suggests that the S/T (Strength/Threat) strategy, which should be avoided or reduced by increasing from, will entail setting up measures to protect the poor climate change and preventing on increase carbon dioxide emission caused by unchecked development through the will and administrative power of the Wonju City Mayor.

The W/O (Weakness/Opportunity) strategy, which should be expanded to compensable weaknesses, entails protecting residents from climate change and acting as a good model for other local self-governing bodies. This can be accomplished by raising the awareness of residents who lack in climate change through education and advertisement. The strategy would also involve reducing greenhouse gas by constructing a climate-related DB of various kinds of information making it easier to adapt to climate change.

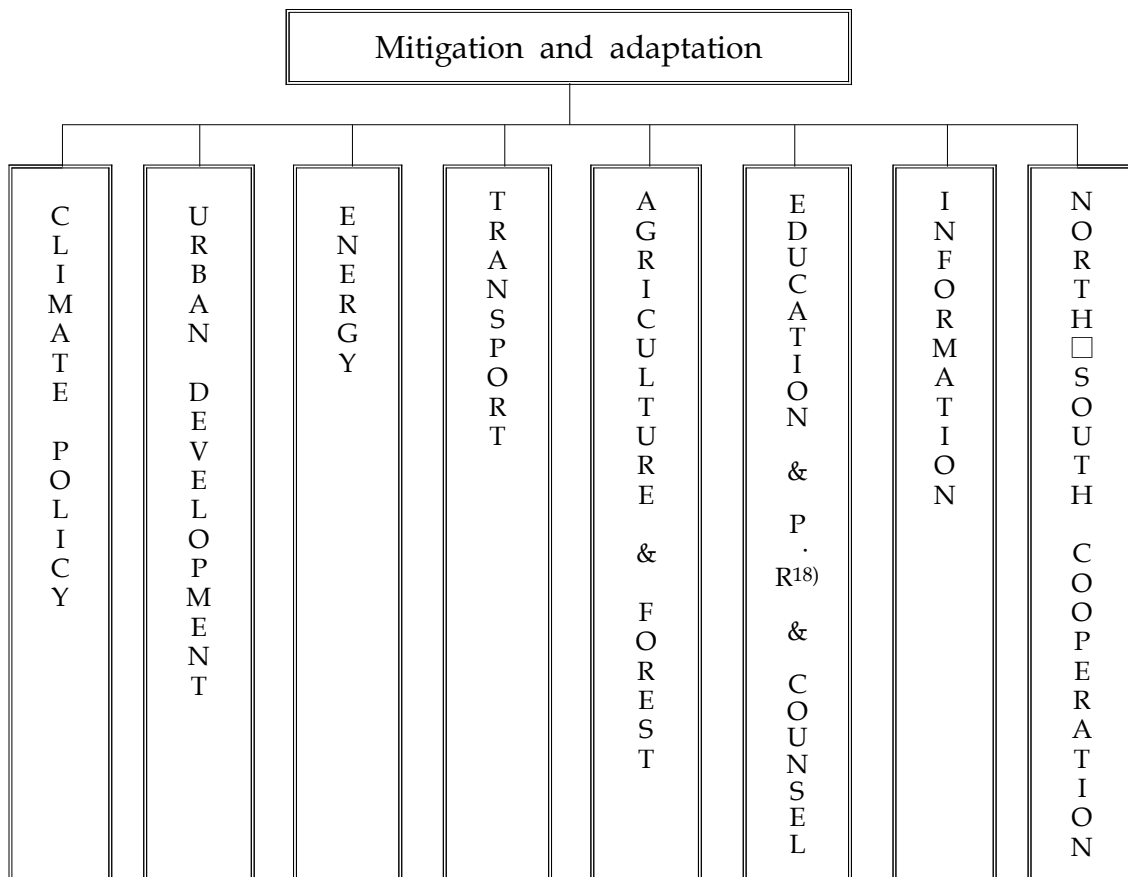
The W/T (Weakness/Threat) strategy, which should be avoided to compensable for the weaknesses, entails setting up a carbon dioxide reduction plan and preparing climate change countermeasure by constructing early warning systems for infectious disease, designing climate and environment-friendly urban plan, expanding green area in urban centers, in place a public transportation policy.

IV. Proposed activities

1. Activity fields, mitigation tool and adaptation tool

It is desirable to decide the level of current climate policy prior to setting up climate protection activities and set up the future plan upon which it will be based. The level of current policy of Wonju City is in the 3rd of 10 steps (Climate Alliance/ifeu, 2008)¹⁷⁾.

The measure to reduce the health-impact of climate change can be divided into mitigation and adaptation measures. The eight sectors in which these measures will be implemented can be found in <Figure 15>.



<Figure 15> Activities by sector

17) See VI. Other pertinent information

18) P·R: Public Relations

In terms of mitigation, it is possible to use the 'Amica Mitigation Scan Model¹⁹⁾' to analyze what measures are in place in Wonju City and then build the necessary program of the results of model. When the 'Amica Mitigation Scan Model' is applied to Wonju City, it appears to have few climate measures²⁰⁾.

It is possible to decide whether proper measure can be adopted examine the correlation between overheating in urban area, with measures for adaptation to climate change in the matrix <Table 2>.

<Table 2> Matrix of adaptation measures

Categories of measure	Impact: Overheating in urban areas
Vulnerability Assessments	Climate Diagnostics and Modelling
Information and Aid Services	Heat Wave Warning System; Heat Wave Action Plan; Information Program for Employees; Information Folder
Planning	Legal Limitations; Regional Catastrophe Management; Integrated Climate Policy; Climate-conscious Planning
Construction	Limitations; Green Roofs; Blue Roofs; Air-Conditioning
Energy Systems	Lake Energy; Security for Energy Supply System
Transport	Adapting Transportation Systems; Traffic Limitation
Human Health	Heat Wave Warning System; Heat Wave Action Plan

Source : http://www.amica-climate.net/online_tool.html

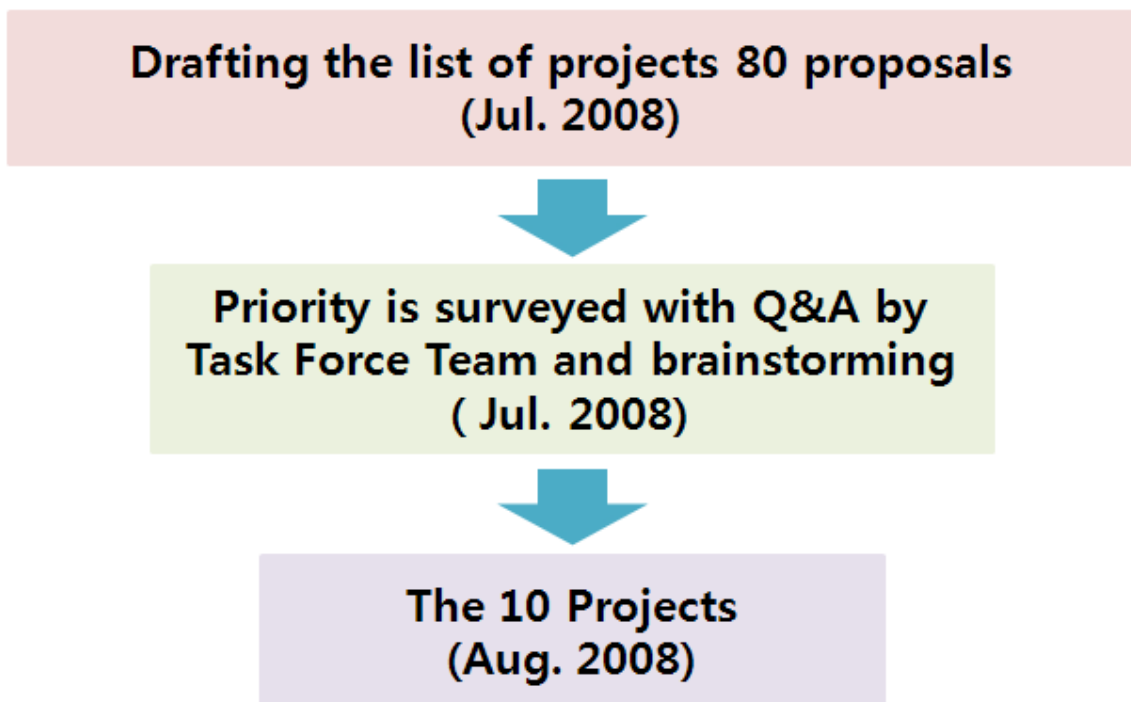
19) http://www.amica-climate.net/fileadmin/amica/amica_mitigationscan_matrix_en.pdf.

20) See VI. Other pertinent information

2. Measures

2.1 Selection of projects

The climate protection project passes 3 steps, and first of a total of 80 projects were selected by researchers., The priority order is selected through questionnaires of Task Force Team for climate change measure of Wonju City and brainstorming²¹⁾ since these are limits on what can be accomplished in a short period of time. The key factors considered in prioritizing projects are their relative level of importance and the feasibility of reality stated goals.



<Figure 16> Process of selecting major projects

21) See VI. Other pertinent information

2.2 The 10 Projects

2.2.1 Setting up Action Plan for Corresponding to Climate Change

■ Status and necessity

- Accurate data should be compiled to successfully respond to climate change; however, the quality of data is quite poor.
- Therefore, as strategic and systematic approach such as the development of a greenhouse gas emission inventory, greenhouse gas emission mitigation plan is necessary.

■ Content and method

- Set up a plan for monitoring climate change.
- Investigate greenhouse gas emission for each emission intensive sector (construction, traffic, agriculture etc.).
- Set up a greenhouse gas mitigation target after analyzing the mitigation potential of greenhouse gas and set up a detailed plan.
- Perform an analysis of imported and exported (balance) emissions.
- Produce a report summarizing climate change measures for every two year cycle and determine the content and style of the report so that it can be published.
- Implement the carbon point system by applying to the Ministry of Environment in the latter half of 2008.
- Hold a seminar in Korea with local self-governing bodies, that have established climate change countermeasures, construct a city-to-city network, and carry out exchanges, with European climate protection organization²²⁾, a German city²³⁾, and a Japanese climate related organization²⁴⁾.

22) Ms. Ulrike Janssen in Europe Climate Alliance(<http://www.climatealliance.org>)

23) Mr. Joachim Lorenz in Muenchen, Germany (<http://www.rgu-muenchen.de/rgu>)

24) The Coalition of Local Government for Environmental Initiative(<http://www.colgei.org/>) and Prof. Tsuneo Takeuchi in Nagoya University(<http://www.env.nagoya-u.ac.jp/>) in Japan

- **Progress schedule for each project**

<Table 3> Setting up action plan corresponding to climate change

Project	2008	2009	2010	2011	2012	2013	Budget (USD)
Set up five year action plan for climate change	Preparation	Setting up	Setting up	Execution	Execution	Execution	200,000
Carbon point system	Preparation	Application	Execution	Execution	Execution	Execution	50,000
Monitoring of climate change	Preparation	Execution	Execution	Execution	Execution	Execution	100,000
Exchange with domestic local self-governing bodies and international organization	Preparation	Preparation	Execution	Execution	Execution	Execution	20,000

- **Setting approach**

- Wonju City Hall: Set up a five year action plan, implement the carbon point system and exchange with local self-governing bodies and international organization.
- Wonju Meteorological Administration: Carry out climate change monitoring.
- Home: Participate in the carbon point system.

- **Anticipated effect**

- The foundation for climate policy is prepared.
- Active citizen participation is expected.
- It is possible to contribute in forming consensus over climate measure.
- It is possible to be a good example for other local self-governing bodies to correspond to climate change.

2.2.2 Disease Control System Relating to Climate Change

■ Status and necessity

- Cholera and diarrhea caused by high temperature stress, increasing waterborne disease and food-related ailment.
- Statistics about climate related disease in Wonju City is unsatisfactory and the status is not fully understood.

■ Content and method

- A warning system for intense heat, storms, floods, torrential rains and drought caused by extreme climate change should be established.
- A high heat stress warning system should be developed and introduced to all area cities, and introduced to the public after constructing cholera and diarrhea warning system caused by waterborne disease at the time of floods and heavy rain.
- The disease control system should be connected to the healthy city home page²⁵⁾ of Wonju City and the home page of the public health center.

25) <http://www.wonju.healthycity.go.kr>

■ **Progress schedule for each project**

<Table 4> Disease control system related to climate change

Project	2008	2009	2010	2011	2012	2013	Budget (USD)
Operation of high heat stress warning system	No	Basic survey	Introduction	Execution	Execution	Execution	25,000
Construction of cholera and diarrhea warning system	No	Basic survey	Construction	Execution	Execution	Execution	25,000
Construction of disease control system due to drought and others (connected to the home page of healthy city of Wonju City)	No	Construction	Execution	Execution	Execution	Execution	25,000
Construction of infectious disease reporting system such as malaria and dengue fever	No	Basic survey	Construction	Execution	Execution	Execution	25,000

■ **Setting approach**

- Wonju City Hall: Construct warning system that can monitor the temperature in real time and alert citizens about the outbreak of disease from waterborne food publicly to all areas in Wonju City.
- Wonju Public Health Center: Update in real time the appearance of disease (both infectious and non-infectious disease).

■ **Anticipated effect**

- Protect the health of citizens especially vulnerable to climate change by preventing climate-related disease.
- It is possible to construct rapid response system for patients.

2.2.3 Green City Project

■ Status and necessity

- Climate-friendly urban development is required in Wonju City since carbon dioxide emissions are steadily increasing due to population growth and rapid urbanization.
- Green City Project is necessary in order to relieve heat island effect and enhance city, aesthetics and recreation space by increasing green space in the urban center.

■ Content and method

- Suggest garden roof and blue roof models in buildings under the control of Wonju City and extend those models to private building owners. Build rooftop gardens on private buildings designated by ordinance when a building permit is provided.
- Continue and expand the ivy planting project which has been successfully carried out in Wonju City.
- Stop the construction of buildings blocking the wind by drafting a map with wind flows so that the wind originating from surrounding forests can flow smoothly into the urban center.
- Wonju City is making as a self-governing progress biotope mapping project from 2007 to 2010 as one of the few local bodies in Korea. The objective of the biotope mapping project is to manage the Wonju City's land space and construct a biological network that reflect the urban planning. It is possible to execute a basic survey of the LULUCF project to absorb carbon dioxide. Therefore, a LULUCF project should be established.

■ **Progress schedule for each project**

<Table 5> Green city project

Project	2008	2009	2010	2011	2012	2013	Budget (USD)
Green roof and blue roof project	No	Preparation	Trial execution	Execution to be extended	Execution to be extended	Execution to be extended	100,000
Wall afforestation using ivy(EA/year)	1,000	1,200	1,400	1,600	1,800	2,000	35,000
Drafting the wind map	No	Drafting	Post management	Post management	Post management	Post management	100,000
Biotope mapping	Progress	Partial completion	Total are completion	Post management	Post management	Post management	1,500,000
LULUCF	No	Excavation of carbon dioxide absorption source	Forestation reforestation	Forestation reforestation	Forestation reforestation	Forestation reforestation	20,000,000

■ **Setting approach**

- Wonju City Hall: Make progress on the forestation project by selecting an area appropriate for carbon dioxide based on biotope mapping.
- Home: Plant ivy after receiving approval from Wonju City Hall.
- Building owner: Owners of the target building should include rooftop afforestation in their design based upon the ordinances.

■ **Anticipated effect**

- Heat island effect can be reduced with an increase in green space in the city.
- A green and healthy city can be created greenhouse gas absorption source.
- Biotope mapping becomes the basis for ECO environmental urban development when development and conservation are in harmony.
- Wind flows can remove particulate matter and reduce temperatures can in the urban center.

2.2.4 Low Energy Use City

■ Status and necessity

- Energy consumption is very high in old housing complexes office and buildings. It is necessary to publicize and inform citizens about energy saving possibilities in low energy housing complexes and passive and active houses.
- Energy losses from low income housing tends to be high because housing is typically old. Therefore, it is necessary to provide healthy residential environment by improving low income housing.
- The demand for renewable energy is high, but the renewable energy industry is not mature. Therefore, measures are needed to protect the climate and revitalize the energy industry.

■ Content and method

- Construct a self-sufficient residential complex where it is possible to produce, utilize and sell environment-friendly energy.
- Foster a renewable energy hub city by introducing R&D centers and large scale firms specialized in renewable energy.
- Prepare a plan for the certification of and incentives for carbon reduction in the building sector.
- Make progress on WAP, an energy efficiency housing project.

■ **Progress schedule for each project**

<Table 6> Low energy use city

Project	2008	2009	2010	2011	2012	2013	Budget (USD)
Formation of environment-friendly energy independent village	No	Preliminary survey	Execution	Execution	Execution	Execution	4,000,000
Setting up the plan for constructing renewable energy combined industry complex	No	Organization of cooperation group	Request for support of central government	Inducement of enterprise	Operation	Operation	200,000
Carbon reduction certification and incentives	No	Preparation	Execution	Execution	Execution	Execution	20,000
WAP project (Household)	No	10	15	21	25	30	480,000

■ **Setting approach**

- Wonju City Hall: Provide support for renewable energy industrial complex, and prepare policy a carbon reduction certification in buildings as well as accompany and incentives.
- Low residents income building: Improve old housing.
- Office: Cooperate in building renewable energy industrial complex.
- Building owner: Participate in a carbon reduction certification in the building sector.

■ **Anticipated effect**

- The quantity of carbon reduction is secured in advance in preparation of a carbon emission trading system.
- Apromotely air quality from reduction is improved energy consumption.
- Renewable energy helps create new jobs and sustain development.

2.2.5 Healthy Transport System

■ Status and necessity

- The current bicycle road is neither a climate-friendly nor sustainable since these are inadequate provisions for safety. Therefore, the bicycle path and walking path should be further extended.
- The bicycle and walking path can help reduce the use of carbon dioxide emission from automobility and increase the health of the citizens.

■ Content and method

- Enhance the security of the currently constructed bicycle path first and then extend its length. Once the bicycle path is improved, expand the secure walking paths²⁶⁾.
- Construct or expand roads that prohibitive automobile traffic in commercial district of urban center.
- Promote walking through periodic walking events.

■ Progress schedule for each project

<Table 7> Healthy transport system

Project	2008	2009	2010	2011	2012	2013	Budget (USD)
Extension of bicycle road (km)	142	150	160	175	190	200	4,000,000
Extension of walking road(km)	142	150	160	175	190	200	200,000
Construction of road with automobiles	Under preparation	Execution	Extension	Extension	Extension	Extension	20,000
Execution of periodic walking event	Execution	Execution	Execution	Execution	Execution	Execution	480,000

26) See VI. Other pertinent information

■ **Setting approach**

- Municipal office: Expand bicycle and walking paths, and hold regularly scheduled walking events.
- Individual: Reduce the operation of vehicles by using bicycle and walking paths, and promote walking by participating periodic walking events.

■ **Anticipated effect**

- It is possible to reduce operation of vehicles and contribute to a climate-friendly modal split.
- The health of citizens is enhanced from using bicycles and walking.

2.2.6 Low Carbon Transport

■ Status and necessity

- The number of personal passenger vehicle in Wonju City is rapidly increasing due to rapid urbanization in Wonju City.
- Measures to reduce emissions from automobiles, which is the principal cause of air pollution and carbon dioxide, are required.
- It is necessary to inform citizens that automobile traffic is the main cause of carbon dioxide emission and positive participation can reduce pollution levels.

■ Content and method

- Introduce of light weight cars and reduce operation of vehicles to mitigation carbon dioxide from Wonju City.
- Execute strict management of parking lot and charge high parking fees to prevent cars from entering the city.
- Expand the scope of the CNG bus project to reduce carbon dioxide.
- Implement the CNG taxi project to reduce carbon dioxide.
- Implement two shift manual drive in vehicles, and start the WBB-Car ride²⁷⁾ campaign.
- Reduce carbon dioxide emission and air pollution emission by promoting environment-friendly driving habits through environment-friendly driving events such as a competition to select "the king of all drive r²⁸⁾", and prepare selection criteria to the awarding of this distinction.

27) WBB-Car ride campaign: Campaign for using Walking, Bicycle, Bus, and Car pool

28) <http://www.eco-driving.de/>

■ **Progress schedule for each project**

<Table 8> Low carbon transport

Project	2008	2009	2010	2011	2012	2013	Budget (USD)
Introduction of light weighted official vehicles (%)	17.2	21.6	27.6	34.8	43.7	45.0	168,000
Raising parking charge(%)	0	20	30	40	50	60	No
CNG bus propagation project(%)	61	84	100	100	100	100	350,000
CNG taxi propagation project	planning	300	650	1,200	1,600	2,000	320,000
2 shift system for vehicle	Execution (Public institution)	Extended execution	Extended execution	Extended execution	Extended execution	Extended execution	No
WBB-Car ride campaign	Execution (Public institution)	Extended execution	Extended execution	Extended execution	Extended execution	Extended execution	No
The "king of all driver" contest	No	Preparation	Execution	Execution	Execution	Execution	50,000

■ **Setting approach**

- Wonju City Hall: Encourage the purchase of light weight official vehicles, raise parking fees, promote CNG buses and taxies, operate vehicle two shift manual drive and prohibit the operation of official cars for private purposes during holidays or lunch time.
- Home: Reduce the use of personal passenger cars and public traffic.
- Wonju City office, Automobile association, Environmental group: Select environment-friendly "king of all drivers".

■ **Anticipated effect**

- Wonju City Hall and officials should act as a role model for citizens. Build the image of pioneering city corresponding to increasing oil prices and environment change.
- The effect of reducing greenhouse gas emissions appears from reductions in carbon dioxide.
- The image of environment-friendly healthy city is raised by creating clean and pleasant environment.

2.2.7 Forest Management for Climate Protection

■ Status and necessity

- Decrease of the forest area due to rapid urban development has a negative impact on the city's climate and biological diversity.
- The forest plays an important role in absorbing carbon dioxide; however, the recognition of its importance for is still very low. Forest management certification of FCS (Forest Stewardship Council) is required to manage environmental, social and economic aspect properly.

■ Content and method

- Carry out FSC certification for municipal forests (Small & Low Impact management Forest) owned by Wonju City.
- Carry out FSC certification for private forests in Wonju City.

■ Progress schedule for each project

<Table 9> Forest management for climate protection

Project	2008	2009	2010	2011	2012	2013	Budget (USD)
Municipal forest FSC certification	No	Preparation	Certification	Certification extension or re-certification	Certification extension or re-certification	Certification extension or re-certification	20,000
Private forest FSC certification	No	Preparation	Certification	Certification extension or re-certification	Certification extension or re-certification	Certification extension or re-certification	20,000

- **Setting approach**

- Wonju City Hall: Receive FSC certification for municipal forests, and continue to manage these forests.

- **Anticipated effect**

- It is possible to promote sustainable forest management and expand FSC certification by setting a model for owners of private forests.
- Improving the image of "Clean Green Cool Wonju City" in Wonju City.

2.2.8 North-South Cooperation

■ Status and necessity

- Wonju City should increase carbon dioxide absorption source by forestation of the forest which is decreased by the rapid urbanization.
- It is necessary for Wonju City lacking the space to forest large areas to carry out forestation project of overseas tropical rain forest in the wider viewpoint.
- Tropical forest is the ground for life primitive residents and at the same time plays the role as green lung to revive the earth, however, climate change also damages the life of residents in this region. The consciousness of primitive residents for tropical forest is very low.
- Therefore, it is necessary to construct the cooperation system to protect tropical forest and the life of primitive residents.

■ Content and method

- Construct the cooperation system with NGO supporting primitive residents.
- Wonju Local Agenda 21 expands the exchange project including support for restoration of primeval forest of Philippines through Asia bridge.
- Support the prevention project of desertification of Mongol.

■ Progress schedule for each project

<Table 10> North-South cooperation

Project	2008	2009	2010	2011	2012	2013	Budget (USD)
Signing of MOU with local self-governing entity of tropical region	No	Preparation	Signing	Maintenance	Maintenance	Maintenance	10,000
Supporting restoration project of primeval forest restoration (USD/person)	No	Preparation	0.1	0.2	0.4	0.6	390,000

■ **Setting approach**

- Wonju City Hall and Agenda 21 for Wonju: Support overseas afforestation project by concluding MOU with local self-governing bodies overseas.

■ **Anticipated effect**

- Make the citizens of Wonju City to recognize the importance of international cooperation since international cooperation in climate change is required.
- Climate change is corresponded in the global point of view by increasing carbon dioxide absorption source.
- Contribute to protecting global climate protection by expanding carbon dioxide absorption sources.

2.2.9 Citizen Spirit Improvement for Climate Protection

■ Status and necessity

- Induce positive participation of citizens for climate change.
- The necessity of education and advertisement is growing since the program of education and the advertisement relating to climate change is coming into the limelight.

■ Content and method

- Fabricate pamphlet for advertisement of corresponding to climate change.
- Invite slogan for climate change publicly targeting citizens.
- Carry out education to nurture the leadership in corresponding to climate change through inviting specialist lecturer or entrusting to specialized institution.
- Hold international forum for corresponding climate change in order to collect policy and examples of each country.
- Hold the competitive exhibition to raise interest of citizens in climate change.
- Open and manage climate school by utilizing summer and winter vacations.

■ **Progress schedule for each project**

<Table 11> Citizen spirit improvement for climate protection

Project	2008	2009	2010	2011	2012	2013	Budget (USD)
Fabrication of advertisement pamphlet for corresponding climate change	No	Fabrication /distribution	Distribution	Distribution	Distribution	Distribution	50,000
Public invitation for climate change slogan	No	Execution	Execution	Execution	Execution	Execution	2,000
Leadership fostering education for corresponding to climate change	No	Twice a year	Twice a year	4times a year	6times a year	6times a year	50,000
Hording international forums relating to climate change	No	Holdi ng	No	Holdi ng	No	Holdi ng	100,000
Competitive exhibition for climate change	No	To be plann ed	Execut ion	Execut ion	Execut ion	Execut ion	10,000
Operation of climate school	No	Execut ion	Execut ion	Execut ion	Execut ion	Execut ion	50,000

■ **Setting approach**

- Wonju City Hall: Fabricate and distribute advertisement pamphlet for corresponding to the climate change, and invite slogan or motto, and poster targeting citizens publicly. Hold international forums for corresponding to climate change periodically, and open the climate school by utilizing vacations and holidays.
- Individual: Raise the consciousness for climate change by participating positively in the education relating to climate change provided by the Wonju City Hall.

■ **Anticipated effect**

- The consciousness of citizens for climate change is stirred up and the degree of participation is increased.
- The image of leading healthy city for climate change is formed.
- The possibility to induce climate change related businesses and execution of pioneering project is increased.

2.2.10 Climate Protection Information System

■ Status and necessity

- Wonju City does not have any climate related DB.
- The necessity of constructing the correct DB relating to climate change is increasing in connection with participation of citizens and release of information for climate change.
- Carbon dioxide emission mitigation measure is based on the correct information for carbon dioxide emission of each emission source. Climate related DB can be used in the field where citizens are invited to participate for climate change.

■ Content and method

- Construct DB of Wonju City relating to overheating and disease relating to climate change.
- Construct DB relating to the production status of the renewable energy
- Construct the climate change related home page.
- Draft the climate map of Wonju City to make easy to watch the status of climate change at a glance.

■ **Progress schedule for each project**

<Table 12> Climate protection information system

Content of project	2008	2009	2010	2011	2012	2013	Budget (USD)
Climate change related DB (temperature, precipitation, greenhouse gas emission of each business type)	No	No	Construction	Completion	Completion	Completion	50,000
Renewable energy related DB (Power generation for each kind)	No	No	Construction	Completion	Completion	Completion	50,000
Construction of homepage for climate change	No	Construction	Completion	Completion	Completion	Completion	20,000
Drafting of climate map	No	Construction	Completion	Completion	Completion	Completion	20,000

■ **Setting approach**

- Wonju City Hall: Construct the DB relating to climate characteristics such as overheating, and the DB relating to renewable energy, the home page of the climate of Wonju City, and draft the map of the climate based on the constructed DB.

■ **Anticipated effect**

- Possible to forecast the climate change with objective and correct data and stir up the participation and consciousness of residents.
- Construct the image of pioneering image of the city in climate change.
- Possible to set a climate protection plan and make post evaluation easy.

V . Evaluation methodology

The purpose of evaluation is to make improvements after carrying out the action plan (The 10 projects) by examining the result of mitigation of carbon dioxide and adaptation to climate change and finding out problems. The evaluation is progressed in the method of PDCA process²⁹⁾, which is divided into quantitative and qualitative methods.

The quantitative result evaluation will be carried out with 11 indexes properly developed by Wonju City based on the indexes recommended by Climate Alliance. The qualitative result evaluation will be progressed in the method of survey with questionnaires and Focus Group Meeting.

The result evaluation will be performed through the report being worked out in the cycle of two years according to the recommendations of Climate Alliance. According to this, the first climate report will be published early in 2011. The evaluation can be done by the Climate Change Corresponding Committee or Task Force Team. However, the evaluation team should be composed of objective researchers with a specialty in the field.

29) Plan - Do - Check - Act

<Table 16> Evaluation indicators

Project	2008	2009	2010	2011	2012	2013
1. Carbon dioxide(TCO ₂ /Person)	2.82	2.81	2.79	2.67	2.59	2.51
2. Power consumption(kWh/Person)	5825	5766	5650	5533	5359	5184
3. Reduction of energy consumption (heat, power) compared to 2007(%)	100	99	97	95	92	89
4. Modal split(%)	90	87	82	75	70	65
5. Number of patients of disease relating to climate change(malaria) (persons)	4	4	3	2	1	0
6. Forest FSC certification area(%)	0	0	5	10	15	20
7. Passenger vehicles(EA)	76,267	76,000	75,000	74,000	73,000	72,000
8. Light weight cars among official vehicles(%)	0.13	17.00	28.00	35.00	44.00	54.00
9. Budget support for energy saving and renewable energy(USD)	10,000	30,000	100,000	150,000	200,000	250,000
10. Eco-agriculture certification area(%)	2.0	5.0	10.0	18.0	25.0	25.0
11. Support of tropical forest protecting primitive residents(USD)	0	0.01	0.05	0.1	0.15	0.2

VI. Other pertinent information

Wonju City Hall

- Participation in seminars: 4 times (May 2008. ~ Jul. 2008)
- International Exchange: Visit Japan 19 times (Nov. 2004 ~ Aug. 2008)

Wonju agenda 21

- Participation in seminars: 3 times (Oct. 2007 ~ Jun. 2008)
- Informal gathering for discussion: 11 times (Feb. 2008 ~ Aug. 2008)
- Data collection: Once (May 30, 2008)
- International exchange: Visited Philippines (Mar. 2007 ~ Apr. 2008)

Climate Change Corresponding Committee

- International exchange: Visited Germany Once (July 3, 2008 ~ July 18, 2008)

Wonju ECO Environmental Technology Center

- Environmental education: 10 times
- Seminars: 5 times (May 2007 ~ July 2008)

WHO gives Healthy Cities awards to eight outstanding cities in Asia-Pacific

Suzhou, China, 28 October 2006—The World Health Organization today commended eight cities in the Western Pacific Region for outstanding achievements and good practices in Healthy Cities projects at the Second General Assembly and Conference of the Alliance for Healthy Cities.

Dr Richard Nesbit, WHO acting Regional Director for the Western Pacific, led the awards ceremony. Over 400 delegates representing 21 countries in Asia and the Pacific participated in the event from 28 to 30 October.

The Healthy Cities approach was introduced almost two decades ago in the Western Pacific Region as a means of improving the health of urban populations. Since then more than 100 cities have adopted the approach and have engaged communities, stakeholders and partners in multisectoral activities to address health problems.

The Healthy Cities Awards 2006 aim to give recognition to cities that have excelled in their endeavours and allow them to share experiences.

The awards were given in three categories:

- * Good practice awards – for innovative approaches taken to address selected health issues.
- * Best proposal awards – with seed money for new initiatives to solve selected health problems.
- * Regional Director's awards for Outstanding Healthy City – an honorary recognition presented to a city that has a long-track record in sustained improvement of the overall quality of life of its citizens using the Healthy Cities approach.

The Good Practice Awards went to the following:

- * Wonju City, Republic of Korea — Financing of health promotion activities.
- * Kunshan, Jiangsu, China — Gender-based violence.
- * Jeju City, Republic of Korea — Recognition of best practices in breastfeeding promotion and protection at the work site.
- * Marikina City, Philippines — Making our cities safer through health emergency preparedness and response planning.
- * Kunshan, Jiangsu, China — Improving the quality of care through mother-friendly hospital initiative.

<Figure 17> Wonju City honored with WHO Award



<Figure 18> Seminar provided by the Deputy Minister Lee Byeong Wook of Ministry of Environment



<Figure 19> Selection of the priority of project and brainstorming



Above : Seminar for local self-governing bodies on climate change and energy problem(Jun. 30, 2008)

Below: Conference for suggestion of policy for corresponding to climate change of Wonju City(Jul. 07, 2008)

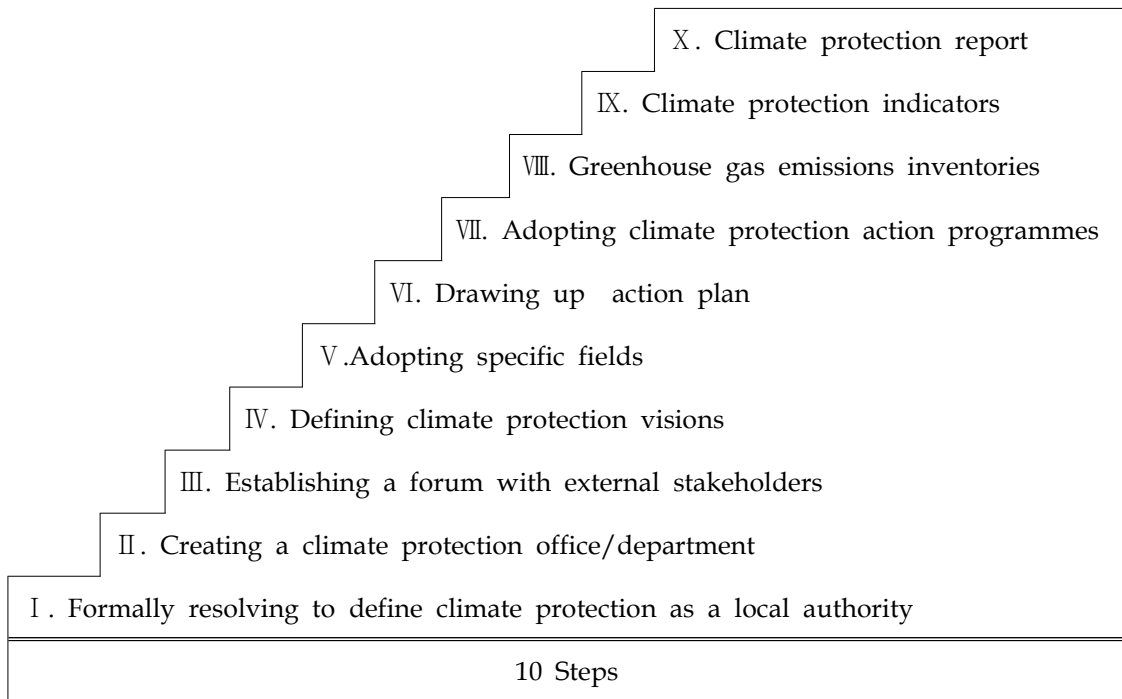
<Figure 20> Conferences held by Wonju Agenda 21



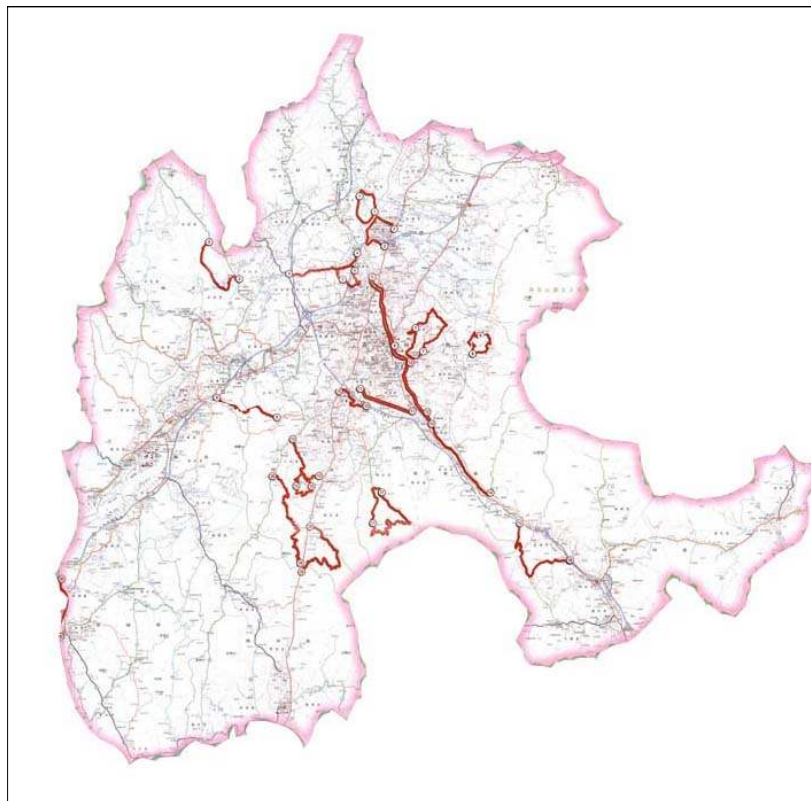
<Figure 21> Wonju City Declaration for Corresponding to Climate Change



<Figure 22> Meeting of Climate Change Corresponding Committee



<Figure 23> The 10 Steps for Climate Protection



<Figure 24> Bicycle road and walking road in Wonju City

<Table 14> Amica Mitigation Scan Model

CLIMATE POLICY					
Measure	1:getting started		2.moving forward	3:forging ahead	4:taking the lead
1. Adopt targets and develop a concept	Develop a general commitment to climate policy	✓	Establish carbon dioxide reduction target	Adopt detailed reduction targets for all relevant sectors	Set targets to become a 50% carbon dioxide reduction
2. Institutionalize a climate policy	Determine a responsible officer/department for climate policy	✓	Inform and involve all relevant departments in climate policy	Regularly report to the political decision makers about the progress of climate policy	Establish a climate protection agency(including both involved departments and external parties, stakeholders etc.)
3. Set up and implement the action programme	Set up the action programme		Select priority measures and decide on first measures for immediate implementation	Detail the action programme for selected sectors in accordance with the targets	Detail the action programme for all relevant
4. Inform about climate change and your climate policy	Organize a public event on climate change and the local commitment	✓	Set up an annual campaign on climate change	Regularly inform and raise awareness for specific target groups in at least one sector	Elaborate a comprehensive information and communication strategy for target groups in all relevant sectors
5. Involve the local actors	Set up an approach for participation and involvement of stakeholders	✓	Establish a permanent working group/round table on climate policy with external actors	Set up structures for active co-operation with citizens, individual target groups and stakeholders	Co-operate with private sector partners, stakeholders and individual target groups
6. Monitoring	Check data availability for carbon dioxide balance		Build carbon dioxide balance the Wonju city and selected sectors	Publish a report about the implementation of the action programme with a carbon dioxide balance every 2 years	Monitor carbon dioxide emissions in detail and debit a full set of indicators for all relevant sectors
7. Co-operate with other local governments and join international networks	Construct to an international network		Establish Regional Collaboration	Develop a comprehensive climate strategy with main public actors in the region	Set up a comprehensive co-operation with international partners for the implementation of projects

Note. Blanks that has ✓ mark apply to Wonju city, and do not apply for the rest.

URBAN DEVELOPMENT				
Measure	1:getting started	2:moving forward	3:forging ahead	4:taking the lead
Define energy efficiency as a basic principle in urban planning	Introduce basic energy criteria for all planning processes	Include energy evaluation/ balance as obligatory theme/ section in all planning documents	Set up energy efficiency standards for refurbished and new buildings	Include energy efficient systems, like CHP or district heating, in every new or renovated urban area

ENERGY				
Measure	1:getting started	2:moving forward	3:forging ahead	4:taking the lead
Bring your own facilities up to scratch	Check selected own facilities in terms of energy use and saving potentials	Establish energy performance standards for municipal buildings	Install an energy management system for all municipal buildings, including energy audits	Improve energy performance standards for public buildings
Refurbish existing housing stock	Inform house-owners about the potentials to increase the energy efficiency of their building	Collect data and set up a land register for energy use in the housing stock	Label the housing stock according to their energy efficiency and offer targeted advice and recommendations	Set up a loan programme for retrofitting the housing stock in terms of energy efficiency
Inform about climate change and your climate policy	Organize a public event on climate change and the local commitment	Set up an annual campaign on climate change	Regularly inform and raise awareness for specific target groups in at least one sector	Elaborate a comprehensive information and communication strategy for target groups in all relevant sectors

TRANSPORT					
Measure	1:getting started		2.moving forward	3:forging ahead	4:taking the lead
Increase the share of zero carbon transport modes	Set targets to increase the rate of cycling and walking modes		Work on the progressive enlargement and improvement of your cycling and pedestrian network	✓ Consider cyclists and pedestrians as main actors when reorganizing the distribution of roadways	Become a cycling city!
Campaign for sustainable mobility	Inform about challenges in transport and increase insights in the possibilities of sustainable modes and alternative fuels		Organize public awareness actions about sustainable mobility	Participate regularly in European or national campaigns for sustainable mobility	Continuously campaign for sustainable solutions

FOREST					
Measure	1:getting started		2.moving forward	3:forging ahead	4:taking the lead
Involve wonju city forest	Organize an information campaign on sustainable forest management		Promote FSC-Certification towards wonju city own forest	Promote FSC-Certification towards private forest owners	Set up co-operations with private forest owners on sustainable forest management
Use the forest as a place for education	Present exhibitions, offer guided tours in your forest		Organize tree-planting actions with citizens	Develop a pedagogic programme on forests and forestry for schools	Assign municipal staff for forest pedagogics and environmental education activities

NORTH-SOUTH COOPERATION					
Measure	1:getting started		2.moving forward	3:forging ahead	4:taking the lead
Promote north-south and indigenous issues	Organize presentations and events		Join municipal north-south activities	Link local north-south activities on a regional and national level	Link local north-south activities on a European and international level

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