

Hållbara städer

Sydkorea

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Summary

The sustainable city development in South Korea started with National strategy for Green Growth in 2009, but current President Park has kept the interest for smart and sustainable cities. Several projects are run, e.g. the Green City Project by Ministry of Environment and Smart City Project from Ministry of Trade, Industry and Energy.

This report explores the case of Green City project of Gangneung, a tourist spot at the Korean east coast. The project is running since 2009 and financed to 50 percent from private investments. In general, the projects have a focus on managing natural resources such as water and wildlife, and engaging and educate citizens and visitors. The business perspective is not so prominent.

From the results so far, the Ministry of Environment has documented selection criteria and process for green city projects, which will be used in design of new governmental programs. So far, the important questions for the future are how to finance such initiatives long term, and how to spread the knowledge from the pilot projects to other cities across the country.

Sammanfattning

Utvecklingen av hållbara städer tog fart med den nationella strategin för Green Growth år 2009, och nuvarande president Park har fortsatt stöd för utveckling av smarta och hållbara städer. Olika projektprogram pågår från olika departement, till exempel Green City Project från Miljödepartementet och Smart City Project från Industridepartementet.

Denna rapport beskriver ett Green City Project som pågår i Gangneung, en turiststad på den koreanska östkusten. Projektet startade år 2009 och finansieras till hälften av privat sektor. Det har framförallt fokus på vatten- och naturvård, samt på att engagera och undervisa invånare och besökare. Affärsperspektivet är ännu inte dominerande.

Resultat och erfarenheter har samlats av Miljödepartementet i ett dokument för urval och process för kommande program för hållbara städer. Hittills har två viktiga frågor identifierats; hur man långsiktigt kan finansiera verksamhet kring hållbar stadsutveckling och hur man sprider kunskap och erfarenheter mellan olika pilotprojekt till andra städer i landet.

1 Sustainable city projects and policies in South Korea

1.1 National strategy for Green Growth

The initiative and development of sustainable cities in South Korea can be viewed in the context of its National strategy for Green Growth¹. In August 2008, the former president Lee Myung-bak announced the vision “Low Carbon, Green Growth” for mid-to long-term development (2009–2050), as a means to tackle the global financial crisis occurring at that time. To implement this vision, South Korea signed the OECD Green Growth declaration², and created their National strategy for Green Growth.

In its National strategy for Green Growth South Korea provided a comprehensive policy framework to encourage growth based on opportunities associated with sustainable development. It was composed as a mix of financial, fiscal and taxation policies, mainly covering renewable energy, energy-efficient buildings, low-carbon vehicles, railways and water, and waste management. The strategy aimed to promote green growth engines, enhance the quality of life and contribute to international efforts to fight climate change. A five-year plan was announced in 2009, as a way to implement the first part of the strategy, and a framework act on Low Carbon Green Growth enacted in 2010.

With the launching of the National Strategy a number of ministries organized projects to involve and encourage local governments, as a way to localize national policy initiatives. Local authorities are considered to be the best positioned to develop solutions suitable for their specific geographic, climatic, cultural and economic conditions. Examples are Green City Project by Ministry of Environment (MoE) and Smart City Project from Ministry of Trade, Industry and Energy (MOTIE). Other examples are the EcoRich City Competition, the Eco-city project and the Low-carbon Green village projects³.

With the change of president in February 2013, when President Geun-hye Park assumed office, the overall national strategy for green growth has turned into focus on the IT-based “creative economy”, but the interest for smart and sustainable cities has continued, as well as the projects. The two larger projects will be described briefly below, and a case study from a Green City, Gangneung, is found in section 2.

1.2 Green cities

The Ministry of Environment started in 2009 to ask for proposals from cities on how to develop to Green Cities. The purpose from the ministry’s point of view was to address climate change as well as how to promote green cities in terms of infrastructure, education and tourism. Four cities have been selected, all with different conditions and challenges. The city and tourist attraction Gangneung was appointed in 2009, and described in detail in the next section. Another example is Busan, an industrial city in need for revitalisation, with aging population and old buildings.

From the selection process of the Green City project and the results so far, the experiences are now captured in a selection criteria and process document that will be used in the conti-

¹ <http://eng.me.go.kr/eng/web/index.do?menuId=168&findDepth=1>

² <http://www.oecd.org/env/44077822.pdf>

³ <http://www.oecd.org/korea/49330153.pdf>

nued work (see Appendix, Table 1 and 2). Currently, the results and lessons learned are collected and evaluated from the project as input in the design of new programs from the ministry. So far, the important questions for the future are how to finance such initiatives long term, and how to spread the knowledge from the pilot projects to other cities across the country. These factors are crucial to achieve true sustainability from social and economic point of view. In terms of financing, the ministry is discussing collaboration with the private sector, although the industry seems resistant in current economic situation due to large costs involved in e.g. renovation projects.

1.3 Smart cities

In response to the Green Growth strategy, the Ministry of Trade, Industry and Energy (MOTIE) started the Smart Grid Projects in South Korea in 2009⁴, which focus entirely on technology and business models for smart energy systems with the use of IT. The overall objective was to develop the world's first nationwide Smart Grid System. The government established the National Smart Grid Road Map of Korea in January 2010, running to 2030, and an updated action plan for 2012 to 2016 in July 2012. In total, 180 billion SEK (25 trillion KWN) has been put aside for the Smart Grid projects until 2030.

The nationwide Smart Grid project started out with the smart grid test-bed project at Jeju Island. Although the project ended last year, the work at Jeju has continued. It has recently been proposed that the Jeju Island can be a cradle for use of EV vehicles in South Korea⁵. Furthermore, the project on business models for microgrids, K-MEG, is currently wrapping up⁶. As a next step, decision is expected in Nov 2014 about green light for six billion SEK (800 billion KWN) to expand and scale up smart grid systems in eight Smart Grid Hub cities. The cities will be the platform for following steps in the national roadmap; for "Wide Area Smart Grid" in 2020 and finally "Nationwide Smart Grid" in 2030.

⁴ "Smartare elnät för förnybar energi och ökad konsumentmakt", Tillväxtanalys Svar Direkt 2013:10.

⁵ Interview Prof. Moon, Seoul National University, Nov 2014.

⁶ "Hänt i Världen hösten 2014", Tillväxtanalys Svar Direkt 2014:13.

2 Case Study: Gangneung

2.1 Background and aim for the city

Gangneung city is located on the east coast of South Korea, with a population of roughly 200,000 people. However, more than 13 million people visit the city every year, making tourism the major industry. With its advantageous location by the coast with many beaches, and mountainous area with walking trails, the city is a tourist destination all year around. Because of the city's high amount of tourists in relation to its modest size, preserving the city's ecological habitat, and generating sustainable growth, can be seen as an incentive for its sustainability efforts. It is confirmed by the city government that the most prominent driving force for the city to engage in Green city is the promotion value it brings for the tourist sector.

The Green City project is further aiming to create a globalized city leading in low-carbon green growth. The city is the economic center of the Yeongdong region of the Gangwon Province, with a 3 hour express bus ride from Seoul. The city will co-host the 2018 Winter Olympics, and a new railway will be established between Gangneung and Seoul; two factors important for the future development of Gangneung. The Olympics is also a driving force for further sustainability efforts, to make the Games as sustainable as possible. This includes both the arenas used during the Olympics, and the housing that is being built for the athletes.

2.2 Content and outcome

As mentioned in previous section, Gangneung city was the first low-carbon green demonstration city designated by the central government in South Korea in 2009. By 2016 the city is aiming to reduce its greenhouse emission by 80 percent⁷. The Gangneung low-carbon green city plan has four major characteristics⁸

1. It emphasizes the need for close cooperation among central and local government, public and private enterprises, and local citizens
2. It provides new methods for green growth in the establishment of a low-carbon green city. This includes for example green traffic systems, new and renewable energy, urban watershed planning.
3. It suggests how stock of environmental assets should be enhanced during the development process, through ecological restoration of water, wetland, forest and coast.
4. It is based on long term thinking. The plan emphasizes that efforts against climate change can only succeed if the goals are concretized in the initiation period of development.

The overall budget for the Green City project is 7 billion SEK (1 trillion won). The expenses are shared between the national (35 percent) and local governments (14) and private sector (51). The budget is allocated for in all 29 different projects, with short- mid- and long term perspectives. The sub-projects are about e.g. preserving of the city's natural habitat, creating green spaces so people can live in harmony with nature, and encourage

⁷ http://www.weitz-center.org/uploads/1/7/0/8/1708801/urban_development_model_kwi_gon_kim.pdf

⁸ Ibid.

people to take care of the environment by using bicycles and sustainable energy options. Smart meters have been distributed by the city and installed in 2500 households. 14 projects have been completed so far and another eight are started and ongoing. For a complete list, see Appendix, Table 3.

The Green City Experience Centre opened up in 2014 in Gangneung city, as a part of the sustainable city project. The centre itself is an environmentally adapted building, running on solar and geothermal energy and with better isolation such as triple glazed windows. The centre aims to encourage sustainability among citizens and visitors. This is done by welcoming people to the centre and run different projects for the citizens to teach them about ecology and “green” products. One popular project is to teach kids about traffic safety, and how to ride bikes. In this project both kids and mothers are involved, to encourage a more environmentally friendly way of transportation. Many bicycle roads have also been created around the city, for the purpose of encouraging people to use their cars less. Another project is cooking courses, where it is taught how to utilise locally produced and seasonal ingredients.

2.3 Governance and communication

The comprehensive Green City project is sponsored by the Ministry of Environment, but the many different sub-projects are initiated and managed by different ministries (e.g. Ministries of Education, Transport or Environment, see Appendix Table 3).

It is not known in detail how the comprehensive governance of the project is done, how it is coordinated and how lessons learnt are spread between the sub-projects. The collaboration between public national and local levels and the private sector is identified as crucial for the project. However, it has also been source of some misunderstanding, mainly concerning financing, mutual expectations and scope of projects⁹. The municipalities tend to depend on the central government to finance the projects, while the central government wanted municipalities to attract private investment and secure the finances locally. Furthermore, although involvement by the private sector has been encouraged, private actors have been quite reluctant to get involved and to invest, because the fear of the projects not being profitable.

Besides funding the projects, the city appoints communication with citizens, and raising awareness, as one of the major challenges. Changing behavior is viewed as essential for the long-term success “otherwise this project will just end up as a ‘one time project’”¹⁰. Citizen engagement and communication have also been encouraged by the Ministry of Environment throughout the implementation. One of the key success factors is said to be the Green City Experience Centre, described above, where sustainability is taught in a fun and creative way, involving both children and their parents. According to the project management, the citizens of Gangneung have in general been very positive to the initiative. Being a tourist attraction, the people living in the city are in general open and positive to changes. There is actually said to have been complaints about the fact that the project only focus on specific areas and not include the entire city. On the other hand, there are records stating that the deep focus on discussions and dialogue with public has made the overall

⁹ http://www.weitz-center.org/uploads/1/7/0/8/1708801/urban_development_model_kwi_gon_kim.pdf

¹⁰ Quote from Head of Green City Experience Centre

project develop slowly, raising questions from the government whether or not there is actually progress¹¹.

2.4 Commercialization and expansion

Gangneung city is responsible for evaluating the progress of the activities. An evaluation of the project is currently undertaken, and a preliminary report will be done by the end of this year. However, there is no information about evaluation criteria for the Gangneung project. As mentioned above, some lessons learned from the Green City project is utilized in the Ministry's selection criteria (Appendix, Table 1).

The results so far are mainly manifested in a restored lake in the central part of the city, with improved access to recreation facilities and improving wildlife. The amount of waste generated in the city has decreased from 1.14 kg/person per day in 2007, to 0.66 kg in 2013. These results may be important for keeping and enhancing the tourist attractiveness.

The city has tried out some different actions, such as supporting purchase of electric vehicles for rental car firms and running busses on gas, but this has failed due to lacking (investments in) infrastructure for charging and fueling. The ambitions for the future contain establishing a business-science complex for cleantech companies and construction of zero-energy buildings, although there is no relevant existing industry to start from. Much hope is given the coming Olympic Games and the opportunity to establish a special economic zone to attract investments. The planned railway from Seoul will also be an important element for growing new industries in the region.

2.5 Reflection

The projects for sustainable cities in South Korea can be said to include mainly smart (with focus on technology and business development and results) or "green" aspects, with focus on a more holistic sustainability approach. For the "green" projects, there seems to be slightly less demand from the government for commercial output.

For the studied case of Gangneung city, the largest challenge for long-lasting results might actually be to show sustainable economic benefits from the project. Little attention is given the commercialization and expansion of results from the project, according to our impression. The project has clearly managed to attract substantial amount of industrial investments that will expect some return to continue to engage. The full project plan stretches several years ahead, so maybe the long term benefits are yet to be seen. However, at the end of the day, the purpose of the project is important to remember. The lasting impression is that the city government is looking to increase citizens' quality of life and to nurture the city as tourist attraction. This requires governmental support. The current Green City initiative might not spur entrepreneurs enough to achieve the declared city ambitions of growing high tech industries which are necessary to sustain the welfare. Instead, the hope for growth seems to be directed towards the coming Olympic Games and extended infrastructure, and not so much on results generated from the Green City project.

¹¹ http://www.weitz-center.org/uploads/1/7/0/8/1708801/urban_development_model_kwi_gon_kim.pdf

3 Appendix

Table 1 Selection criteria for future projects on sustainable cities.

Criteria		Contents
Types	Indicator	
Low-carbon	New Renewable Energy Application	▪ 5 stage classification graded by a new renewable energy application ratio
	Eco-friendly Transportation	▪ 5 grade classification of carbon emission reduction level graded by downscaling fossil fuel vehicle roads and introducing eco-friendly transportation system
	Eco-friendly Industrial Process	▪ 5 grade classification of amount of carbon emission reduction by improving industrial process
	Low-carbon Resource Recycling	▪ 5 grade classification of amount of carbon emission reduction followed by recycling waste, reducing incineration amount, etc.
	Eco-friendly Building Construction	▪ 5 grade classification for level of carbon emission reduction by constructing eco-friendly building
	Carbon Sink Improvement	▪ 5 grade classification of quantitative amount of carbon sink area that can absorb or save carbon emission
	Carbon-neutral	▪ 5 grade classification for evaluating level of reduction amount against total carbon emission
Environment	Environmental Conservation	▪ 5 grade classification graded by ratio of area needed environmental preservation and the actual preservation area in urban ecosystem
	Environmental Capacity	▪ Using an ecological footprint index, 5 grade classification graded by level of environmental capacity of city
	Green Network	▪ 5 grade classification graded by ratio of maximum green network area against required area size to evaluate level of green network in city
	Green Air Purification	▪ 5 grade classification graded by ratio of amount absorbed by green area against air pollutants emission to evaluate purification ability of green area
	Water Recycling	▪ 5 grade classification graded by ratio of proportion of water permeable area against total targeted area of evaluation
Society	Conservation Value of Local Resources	▪ Evaluating level of how local resources are used wisely
	Local Community	▪ Evaluating leadership of eco-environmental sustainable city by calculating local communities' activity
Economy	Sustainable employment	▪ Evaluating employment effect level and potential local employment graded by sustainable cities' activity
Other		▪ 5 grade classification graded by other achievement level of sustainable city that fits for its own characteristics

Table 2 Process of Sustainable City Project, including roles for national and local governments.

Process of Eco-friendly Sustainable City Project	Methods of using criteria
Providing a guideline (Ministry of Environment)	Providing methods of using criteria as a guideline
Making A draft proposal of eco-friendly sustainable city project (Local Government)	<ol style="list-style-type: none"> 1. Self-evaluating of local government 2. Setting goals of eco-friendly sustainable city project 3. Setting project direction 4. Setting goals of each plan
Evaluating the draft proposal (Ministry of Environment)	<ol style="list-style-type: none"> 1. Evaluating the proposal presented by local government 2. Utilizing criteria to select a site
Making final proposal of eco-friendly sustainable city project (Local Government)	Making plans for eco-friendly sustainable city complied to criteria
Evaluating the final proposal (Ministry of Environment)	Evaluating the final proposal
Implementing the project (Local Government)	Start the project
Performance assesment (Ministry of Environment)	Having assesment whether the performance meets a need of criteria

Table 3 Short- mid- and long-term projects in Gangneung

Types	Project Title	Initiating and/or Managing Department	Amount of Investment (one million won)				Years	Note
			Total	Government	Local	Private		
	Total		1,000,038	354,460	138,962	506,616		
Short-term	Creating Green Path	Ministry of Environment	5,300	2,650	2,650		'10~'11	Completed
	Fostering 10 Bicycle Hub Cities	Ministry of Public Administration and Security	8,700	3,500	5,200		'10~'12	Completed
	Restoring Gyeongpoho Lake Wetland	Ministry of Environment	16,351	11,446	4,905		'10~'12	Completed
	Forming Gyeng-po Ecological Detention Area	Ministry of Transportation	20,000	12,000	8,000		'09~'12	Completed
	Environmental Infrastructure and Carbon Neutral Program	Ministry of Environment	5,240	2,620	2,620		'10~'12	Completed
	Water Reuse Demonstration Project (R&D)	Ministry of Environment	2,920	1,460	-	1,460	'10~'11	Completed
	Green City Experience Center (Government Lead Project)	Ministry of Environment	35,000	24,500	10,500		'11~'14	Completed
	Carbon Zero Demonstration Schools	Ministry of Environment/Education	2,600	2,300	300		'10~'11	Completed
	M2M Spreading Project	Communications Commission	700	300	100		'10	Completed
Mid-term	Eco-friendly Car Infrastructure	Ministry of Environment	6,600	3,300	3,300	300	'11~'16	In progress
	Reforming of Green Transportation System	Gang-won Province	48,300	-	48,300		'13~'16	
	Creating Green Forest Trails	Korea Forest Service	7,264	3,632	3,632		'11~'13	Completed
	Restoring Sonpogaeho Lake Wetland	Ministry of Environment	15,000	10,500	4,500		'11~'16	In progress
	Gyeng-po Ecological Tourism Resources	Ministry of Environment	20,000	10,000	10,000		'09~'13	In progress
	Gyeongpocheon Local Stream Maintenance	Ministry of Transportation	16,723	10,034	6,689		'09~'14	In progress
	Constructing Gyeongpocheon Called 'River of Hometown'	Ministry of Transportation	30,000	18,000	12,000		'10~'16	In progress
	Using Seawater Temperature Difference energy	Ministry of Transportation	25,000	25,000	-		'10~'16	Completed
	LED Security Light Distribution Project	Ministry of Knowledge Economy	5,432	3,802	1,630		'11~'13	Completed
Renewable Energy Distribution	Ministry of Knowledge Economy	47,210	23,591	3,719	19,900	'11~'16	Completed	

	Developing Zed Village		23,860	-	-	23,860	'13~'16	
	Maintenance of Sewage Pipes of Green City	Ministry of Environment	22,710	13,493	9,217	-	'11~'16	In progress
	Creating U-City	Ministry of Transportation	9,400	1,700	1,700	6,000	'10~'16	Completed
	Forming Healing Forest	Korea Forest Service	9,632	9,632	-	-	'11~'16	In progress
	Green Tourism Agriculture		1,000	-	-	1,000	'13~'14	
Long-term	Creating Theme Park Using Green Tech	Ministry of Transportation	281,779	76,000		205,779	'12~'20	
	Implementing Smart Green City	Ministry of Knowledge Economy	120,000	60,000		60,000	'13~'20	
	Energy Recovery Project from Waste	Ministry of Environment	50,000	25,000		25,000	'13~'20	
	Forming Green Business Village		158,591	-		158,591	'13~'20	In Progress
	Traditional Korean-style House Experience Center		4,726	-		4,726	'13~'20	