The 18th
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Part 1: Country Report

Korean Economy and Construction Industry

Prepared By

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1. Executive summary

The Korean economy has successfully passed through the global financial and economic crisis, even if it is currently slowing down due to sluggish exports and imports. The Korean GDP growth rate in the first half of 2012 showed a slight decrease compared with the previous year, despite the drop in international oil prices and the improvement of terms-of-trade.

In the first half of 2012, the private consumption and construction investment increased 0.5% and 0.3% respectively, but the equipment investment decreased 6.4% compared with the previous year.

Both exports and import increased by 0.6% and 2.4% respectively compared with the same period last year, due to the growth of automobile car, petrochemicals, steel and general machinery.

In the construction sector, the value of contracts in the first half of 2012 has increased 9.7% owing to the recovery in civil (infrastructure) and residential construction. The number of contractors in May 2012 maintained the same level as last year, and that of employees increased a few more. For the exports in construction, the Architecture sector showed an exceptional growth, while the plant sector confronted with the shrinking trend. The construction investment in 2012 is expected to increase by 1.5%, improved from the negative results of the previous year.

All things considered, the Korean GDP growth rate in 2012 is expected to be 3.0% under the influence of the domestic and global economic slowdown. The economic outlook for next year is predicted to be more improved, even if it will be affected by the change of Korean government and the global economy.

2. Macro Economic Review and Outlook

The Korea as well as other countries had been confronted with a serious economy crisis after the Subprime mortgage in U.S.A, 2008. However, the GDP growth rate had greatly been up to 6.2 percent in 2010 from 0.3 percent in 2009, riding on brisk exports and recovering domestic demand. The GDP growth rate, unfortunately, has fallen again from 3.6 percent in 2011 to 2.6 percent in the first half of 2012, which means that the Korean economy has been at a standstill. In the first half of 2012, the population and labour force growth rate slightly increased and the unemployment rate declined, compared with the values in 2010. Although the interbank and short term loan interest rate increased during the same period, the long term loan interest rate reversely decreased 3.72 to 3.29.

In the first half of 2012, private consumption grew by 1.2% over a year ago, which was helped by the increases of nondurable goods like the clothing and shoes and of durable goods like automobile. The construction investment increased by a growth of engineering projects, while the investment in plant and equipment decreased by a drop of the machinery like the communication and broadcasting equipments.

On the production side, the manufacturing sector decreased of 2.7% over the same period in the previous year, which was mainly due to the decrease of metalware and electric and electronic equipments. The construction sector also decreased of 1.4% by a fall in the building construction. Whereas, the service sector increased of 2.6% on the strength of finance, insurance, food and lodging industries.

As the rate of Korean economic growth is predicted to be slower in the next half of 2012, it is difficult to say that economic has been completely recovered. However, the major credit rating agencies like Moody’s take an optimistic view of Korean economy despite downgrading the most developed countries’ rating. The Korean economy is expected to be positive growth, but its pace might slow down.

Table 2.1. Main Economic Indicators

	2004	2005	2006	2007	2008	2009	2010	2011	2012. 2Q
GDP and Components									
GDP at real price (bill. won, base year 2005)	832,305	865,241	910,049	956,515	978,499	981,625	1,043,666	1,081,594	540,134
GDP at current market price (bill. won)	826,893	865,241	908,744	975,013	1,025,452	1,065,037	1,173,275	1,237,128	551,231
GDP growth (%)	4.6	4.0	5.2	5.1	2.3	0.3	6.3	3.6	2.6
GDP growth (%) for agriculture, forestry and fishing sector	9.1	1.3	1.5	4.0	5.6	3.2	-4.4	-2.0	-0.6
GDP growth (%) for manufacturing sector	10.0	6.2	8.1	7.2	2.9	-1.5	14.7	7.2	3.4
GDP growth (%) for services sector	2.3	3.5	4.4	5.1	2.8	1.2	3.9	2.6	2.6
GDP growth (%) for mining sector	-0.4	-0.4	-0.1	-4.1	1.3	-1.6	-7.7	-6.7	0.6
GDP growth (%) for construction sector	2.0	-0.3	2.2	2.6	-2.5	1.8	-2.7	-4.6	0.1
Demographic Indicator									
Population (1000 people)	48,039	48,138	48,297	48,456	48,607	48,747	48,875	49,337	49,497
Population growth rate (%)	0.38	0.21	0.33	0.33	0.31	0.28	0.26	0.23	0.32
Labour force (1000 people)	22,557	22,856	23,151	23,433	23,577	23,506	23,829	24,244	25,117
Labour force growth rate (%)	1.89	1.33	1.29	1.22	0.61	-0.30	1.37	1.74	1.47
Unemployment rate	3.7	3.7	3.5	3.2	3.2	3.6	3.7	3.4	3.2
Inflation rate (CPI)	3.6 (83.8)	2.8 (86.1)	2.2 (88.1)	2.5 (90.3)	4.7 (94.5)	2.8 (97.1)	3.0 (100.0)	4.0 (104.0)	2.2 (106.1)
Financial Indicator									
Interbank interest rate	3.66	3.35	4.14	4.65	4.77	1.92	2.03	3.01	3.00
Short term loan interest rate (Yields on CD(91-day))	3.79	3.65	4.48	5.16	5.49	2.63	2.67	3.44	3.54
Long term loan interest rate (Yields of Treasury Bonds (3-year))	4.11	4.27	4.83	5.23	5.27	4.04	3.72	3.62	3.29
Average change against USD$	1,144	1,024	955	929	1,102	1,276	1,156	1,108	1,165

3. Trading Country

3.1. Value of Import and Export

The balance of trade was recorded a surplus of $41.1 billion in 2010, due to the sharp increase of export exceeding the increase of import. However, that value in 2011 declined to $30.8 billion, even if the trade volume of export and import increased. In the first half of 2012, it made a surplus of $10.7 billion with a similar level of the previous year.

The export in the first half of 2012 is estimated to have grown only 0.6%, which was caused by the 10% growth of automobile car, general machinery and petrochemicals and by the 20% decline of shipping and wireless mobile products. The import is also estimated to have grown about 2.4%, which was caused by the strength of steel and general machinery.

The balances of exports and imports in 2012 are being forecasted to increase about 3.5% and 5.0% respectively by the effects of the domestic and foreign economic uncertainty, which would be reduced below than anyone expected.

Table 3.1. Export and Import

(unit : bill. US$)

	2004	2005	2006	2007	2008	2009	2010	2011	2012-2Q
Export (increase rate)	253.8 (31.0)	284.4 (12.0)	325.5 (14.4)	371.5 (14.1)	422.0 (13.6)	363.5 (-13.9)	466.3 (28.3)	555.2 (19.0)	275.2 (0.6)
Import (increase rate)	224.5 (25.5)	261.2 (16.4)	309.4 (18.4)	356.8 (15.3)	435.3 (22.0)	323.1 (-25.8)	425.2 (31.6)	524.4 (23.3)	264.6 (2.4)
Balance of trade	29.4	23.2	16.1	14.6	-13.3	42.6	41.1	30.8	10.7

Source: Korea Customs, The Korea International Trade Association.

3.2. Five Major Trading Countries

The three major trading countries of Korea in the first half of 2012 are China, Japan and America. Hong Kong and Singapore are also included in the five major countries of export, and Middle East Asia countries including Saudi Arabia and Qatar are the major countries of import. About 80% of oil import of Korea is from these Middle East countries. While the share of EU Countries and China in the trading to Korea has decreased, the share of America, Japan and Middle East Asia countries has increased.

Table 3.2. Top 5 Major Trading Countries of Import and Export (2Q, 2012)

(unit : mill. US$)

Rank	Export		Import	
	Country	Value	Country	Value
1	China	63,389	China	40,449
2	America	30,684	Japan	32,725
3	Japan	19,392	America	23,359
4	Hong Kong	16,597	Saudi Arabia	20,655
5	Singapore	11,304	Qatar	12,841

4. Overview of construction industry

4.1. The Value of Construction Contracts

Until 2007, the construction business has risen helped by buoyant housing business, regardless of government's strong restriction on the real estate market. And thus residential building construction was increased in the nation wide, especially apartments in local cites. With the spreading global financial crisis by sub-prime mortgage in America, domestic housing business was also greatly shrunken in the end of 2007. It has resulted in a huge oversupply in housing market and unsold apartments all over the country.

Since early 2008, the economic stimulus policy had led the government expenditure to rise rapidly, letting the investment in construction, mainly for infrastructure projects, to rise fast. In 2009, the rate of civil construction contracts increase by 31.2%, but that of total construction contracts conversely decreased by 1.1% with offsetting by a large fall of private projects. In 2010, only non-residential construction contracts recorded positive growth of 18.6%. Fortunately, the residential construction contracts in 2011 increased rapidly into 22.4%, which brought about the positive growth in total construction.

The civil and residential construction contracts were recorded the positive growth of 21.2% and 15.5% respectively, meanwhile, the non-residential construction contract decreased by 7.1% compared with the same period the previous year. By the results, the total construction contracts showed the growth of 9.7%, reaching a value of KRW 54.82 trillion (US$ 48.18 billion).

The economic prospects for the second half of this year are different from the sectors. It is expected that it will be difficult to improve the residential construction contracts by the depressing of the housing market in Seoul metropolitan area. It is predicted to be the positive growth in the non-residential buildings and infrastructure, however, resulted by increasing the supply in public sector relocation into Multifunctional Administrative City (Sejong City) and the financial investments.

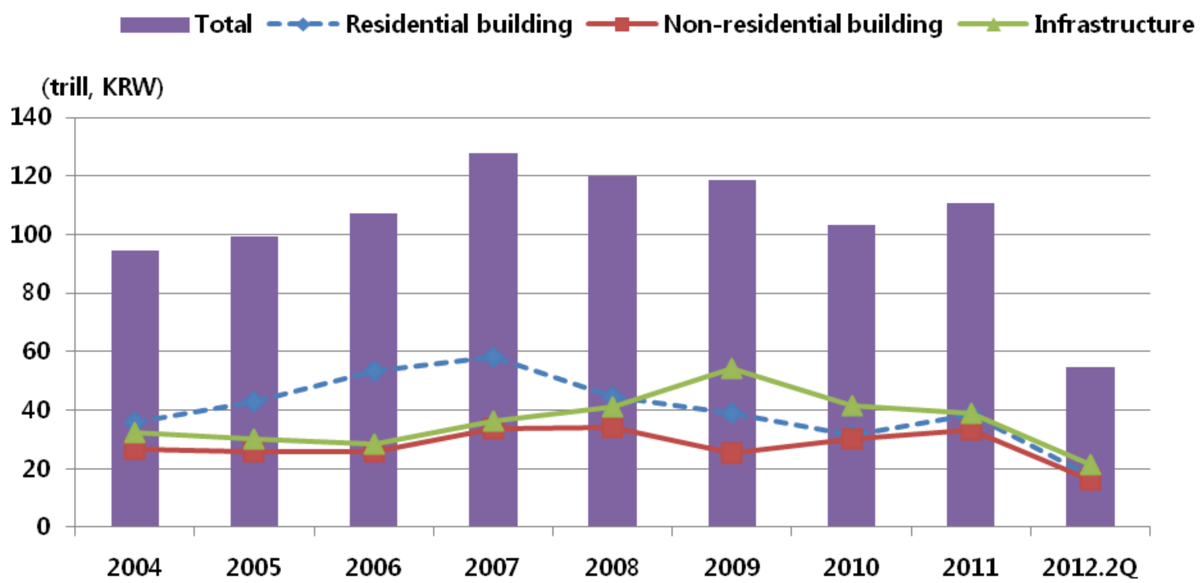


Figure 4.1: The Value of Construction Contracts (2004~2012.2Q)

Table 4.1. The growth rate of construction Contracts

(Unit: %, compared with the same period)

year	residential	non-residential	civil(Infra)	total
2003	44.6	10.1	10.5	23.2
2004	-21.0	5.2	0.9	-7.7
2005	20.6	-2.6	-5.7	5.1
2006	23.9	-1.2	-6.6	8.0
2007	9.1	30.8	27.5	19.2
2008	-23.2	1.8	14.0	-6.1
2009	-12.5	-25.4	31.2	-1.1
2010	-19.1	18.6	-23.5	-13.0
2011	22.4	9.8	-6.2	7.2
2012.6	15.5	-7.1	21.2	9.7

Table 4.2. Breakdown of Construction Contracts

(Unit: bill. won, current price).

Type of Contract	2004	2005	2006	2007	2008	2009	2010	2011	2012.-2Q
Public Project									
Residential building	3,172	3,853	5,122	7,570	9,346	7,378	4.738	6,963	2,199
Non-residential building	7,332	7,001	5,755	7,587	9,149	8,327	7,749	7,779	3,092
Infrastructure	23,261	20,972	18,643	21,932	23,354	42,782	25,749	21,882	9,945
Sub-Total	33,765	31,826	29,519	37,089	41,849	58,487	38,236	36,624	15,237
Private Project									
Residential building	32,496	39,155	48,155	50,578	35,311	31,699	26,875	31,742	15,134
Non-residential building	19,349	18,978	19,905	25,984	25,021	17,161	22,486	25,406	12,961
Infrastructure	8,963	9,425	9,740	14,261	17,904	11,366	15,631	16,927	11,482
Sub-Total	60,808	67,559	77,799	90,823	78,236	60,227	64,993	74,076	39,577
Total									
Residential building	35,668	43,009	53,276	58,148	44,657	39,078	31,613	38,705	17,333
Non-residential building	26,680	25,979	25,660	33,571	34,170	25,488	30,235	33,185	16,054
Infrastructure	32,224	30,396	28,383	36,193	41,258	54,149	41,380	38,809	21,427
Total	94,572	99,384	107,318	127,912	120,085	118,714	103,229	110,701	54,815

Source: Construction Association of Korea.

4.2. Construction Companies

4.2.1. The number of Contractors by Type

The number of construction companies had steadily increased since 2006, and dropped back to 55,972 in 2011, where it stayed until May, 2012. Although the number of general contractors is gradually decreasing year after year, those of specialized and equipment contractors are reversely increasing a little.

Most of the contractors are composed with the general and specialized companies, and the shares of them consist of 20.8% and 68.1% respectively in total.

Table 4.2.1. The number of Construction Companies

(Unit: each).

Type \ Year	2004	2005	2006	2007	2008	2009	2010	2011	2012.5
General contractors	12,988	13,202	12,914	12,842	12,590	12,321	11,956	11,545	11,455
Specialized contractors	32,990	35,547	35,040	36,422	37,106	37,914	38,426	38,100	38,116
Equipment contractors	5,338	5,505	5,387	5,478	5,768	5,994	6,151	6,330	6,401
Total	51,316	54,254	53,341	54,742	55,464	56,229	56,533	55,972	55,972

Source: Construction Association of Korea.

4.3. Construction Employees and Labors

4.3.1. The number of construction workers by job type

The number of workers shows an up-and-down pattern in the construction industry. For the year of 2007, more than 1.8 million employees worked in the construction field, 7.9% of total employment. However, the number of workers in 2008 slightly declined with construction business depression. And it sharply fell by 1.7 million workers in 2009, when Korean economy was in the deepest recession affected by global financial crisis. In 2010, the number of employees in construction increased a few owing to the growth in the economically active population. Reflecting this trend, the number of employees in April 2012 already exceeded that of previous year.

Table 4.3.1a. The total number of workers in Construction

(Unit : thousand persons)

Number \ Year	2004	2005	2006	2007	2008	2009	2010	2011	2012.4
Number of employee in construction	1,820	1,813	1,833	1,849	1,812	1,720	1,753	1,751	1,787

Source: Korea National Statistical Office.

It is hard to analyze the latest trend by job type, because the relevant data was only available until 2010, as showing in the Table 4.3.1b. The number of building construction workers increased amid the buoyant housing and building business from 2004 to 2006.

Table 4.3.1b. The number of Construction Workers by Job Type

(Unit: thousand workers)

Type \ Year	2004	2005	2006	2007	2008	2009	2010
General construction	562	571	579	576	529	491	468
Heavy construction	174	176	161	162	157	196	166
Building construction	389	395	417	414	372	294	302
Special trade construction	1,175	1,147	1,138	1,151	1,127	1,170	1,157
Engineering and building	504	475	482	477	469	465	466
Building installation	185	183	170	165	165	169	177
Electrical & communication works	256	252	246	265	258	290	280
Building completion	230	236	239	243	233	246	234
Equipment construction	83	95	116	121	155	59	128
Total	1,820	1,813	1,833	1,849	1,812	1,720	1,753

Source: Construction Association of Korea.

4.3.2. The number of foreign construction workers by job type

There are few statistics about the number of foreign workers in Korean construction market, because it is difficult to assemble acute figures for the number of foreigners.

4.4. Productivity

4.4.1. The Value added per employee

The index of value added per employee was changed into 100 in 2008, therefore we just suggest the figures since 2008. Unfortunately, the latest values are not supplied, we can just see the limited data. The table 4.4.1 shows the value added per employee construction dropped from 108.1 in 2009 to 95.0 in 2010.

Showing the trends in the past data, the value added per employee in each industry had gradually increased since 2004, even though the percentages charged in manufacturing had dropped from 2004 to 2008.

Table 4.4.1. The Value Added per Employee

(unit : %)

	2008	2009	2010
Construction	(100.0)	(108.1)	(95.0)
Manufacturing	(100.0)	(101.5)	(112.1)
Service	(100.0)	(98.8)	(105.3)
Primary sector	(100.0)	(99.7)	(107.1)

Source: Korea National Statistical Office.

4.4.2. Physical measurement of construction productivity

We do not have the adequate data explaining physical measurements of construction productivity, since there is no labor input data classified by construction types.

4.5. Construction Cost

4.5.1. Major construction material average price

The official prices of major construction materials are influenced by government guideline but the actual transaction value changes according to the market conditions. The demand and supply of most construction materials can be more or less matched domestically. Shown as table 4.5.1, the price of construction materials has not been much changed since 2004, except Steel bars. In Jun 2008, the price of Steel bar sharply rose to 888,500 won per ton from the previous year 526,500 won. Because the raw material of Steel bar mainly depended on import, the price was influenced by international market situation. The price of steel bar came down to 811,000 won in 2010, but it is still rising up to 995,000 won in July 2012.

Table 4.5.1. Average Construction Material Price

RMC * kg/cm^3 (won per^3)	Cement in bulk (won per 40kg)	RMC * kg/cm^3 (won per m^3)	Steel bars (won per ton)	25mm aggregates (won per m^3)	Concreting sand (won per m^3)	Common Bricks (won per thousand pieces)
2004	3,404	53,827	515,917	12,250	13,000	46,000
2005	3,387	51,708	498,583	14,167	13,083	46,000
2006	3,370	49,080	455,667	11,333	13,250	45,000
2007	3,370	49,080	526,500	11,500	13,083	45,000
2008	3,370	51,248	888,500	12,417	12,000	45,000
2009	4,000	51,970	741,000	12,000	13,000	45,000
2010	3,800	54,670	811,000	12,000	13,000	50,000
2011	3,800	51,430	975,000	12,000	13,000	50,000
2012.7	4,400	57,600	995,000	13,500	13,000	55,000

* RMC: Ready Mix Concrete.

Source: KPC (Korea Price Information Corp).

4.5.2. Construction industry salaries and wages

In construction like other industries, the salaries and wages have mildly increased since 2003. But special daily workers experienced the negative wage growth due to the decreased construction demand during 2003~2004. In January 2012, the average wages per day were 102,573 won (about 90.33 dollars) for chief workers, 97,283 won (about 85.67 dollars) for special daily wage, and 75,608 won (about 66.59 dollars) for normal daily wage.

Table 4.5.2. Salaries and Wages in the Construction Industry

(unit : Korean won)

	2004	2005	2006	2007	2008	2009	2010	2011	2012.1
Chief worker	70,184	73,402	78,124	81,700	85,203	90,889	95,671	100,879	102,573
Special daily wage	66,504	68,917	73,572	79,027	81,596	84,862	89,835	95,366	97,283
Normal daily wage	52,575	54,171	57,321	59,715	63,530	68,437	70,497	74,008	75,608

Source: CAK (Construction Association of Korea).

4.6. Import and Export of Construction Work

4.6.1. Annual exports of construction work

Such a tremendous increase in export of construction work was experienced in 2010, because the United Arab Emirates (UAE) nuclear power plant contract signed at the end of 2009 was brought into 2010 calculation. The 18.6 billion dollar UAE project accounted for most of the increase in the amount. Meanwhile, the exports in 2011 showed a little decreasing by the global depression sparked in Europe. The total value in export in construction was recorded 32,650 million dollars by July 2012, and this was similar amount compared with the same period the previous year.

Among construction sectors, the export of plant occupied the largest portion recording 18,067 million dollars, but it showed the largest drop in 2012. On the other hand, the export of architecture in construction sectors increased by 10,157 million dollars, which was more than the value over the past year.

Table 4.6.1. Annual Exports of Construction Work

year	Total	Contract Amount by work type(million US$)					
		Civil	Architecture	Plant	Electric	Telecomm	Engineering
2004	7,498	806	874	5,182	545	3	89
2005	10,859	836	1,226	8,263	374	13	147
2006	16,468	1,532	3,433	10,920	474	3	106
2007	39,788	5,232	8,177	25,268	690	41	381
2008	47,640	9,364	9,192	26,764	1,336	19	965
2009	49,147	5,746	6,273	35,692	756	20	660
2010	71,578	4,124	7,724	57,285	770	458	1,217
2011	59,144	5,765	7,937	43,319	953	61	1,107
2012.7	32,650	3,337	10,157	18,067	470	73	544

Source: ICAK (the international Construction Association of Korea).

4.6.2. Five major foreign markets by value

Middle-east Asian countries are usually included in top five countries for construction export of Korea. The U.A.E and Saudi Arabia were the highest countries in construction exports, in addition, Kuwait, Vietnam and Australia newly entered into the five major export countries in 2010. The construction service of exported to middle-east Asian countries is mainly plant construction sector and the service to south-east Asian countries is infrastructure or architecture construction sector.

In 2011, Saudi Arabia was the most important country in construction exports, where 16,588 million dollars of construction service was exported. It was noteworthy that Brazil in South America held the second rank in the construction export.

Table 4.6.2. Top Five Countries for Construction Export

(unit : million US$)

Rank	2007		2008		2009		2010		2011	
	Country	Value	Country	Value	Country	Value	Country	Value	Country	Value
1	U.A.E	5,585	Kuwait	7,540	U.A.E	15,860	U.A.E	25,602	Saudi Arabia	16,588
2	Libya	5,450	U.A.E	4,841	Saudi Arabia	7,203	Saudi Arabia	10,531	Brazil	4,606
3	Saudi Arabia	5,055	Qatar	4,400	Algeria	3,727	Kuwait	4,893	Iraq	3,666
4	Singapore	3,178	Saudi Arabia	4,122	Libya	3,134	Vietnam	3,298	Vietnam	3,459
5	Egypt	2,081	Singapore	2,917	Iran	2,492	Australia	3,246	Singapore	3,289

Source: ICAK (the international Construction Association of Korea).

5. Construction Outlook 2012 / 2013

The Korea's GDP growth had sharply dropped off after the global financial crisis, and the growth rate was only 0.3 percent in 2009. In 2010, however, the growth rate rose to 6.8 percent with economic activity increasingly led by the private sector. The recovery was led by the rebound in fixed investment and the turning of the inventory cycle. Nevertheless, the growth rate in 2011 dropped again into 3.6 percent with the stagnant domestic economy and the financial crisis triggered by Europe. The growth rate in 2012 is predicted to be 3.0 percent lower than last year. The economists in Korea, meanwhile, would forecast that the world economic growth rate in 2012 will be 3.2% with reflecting the main countries' economic situation.

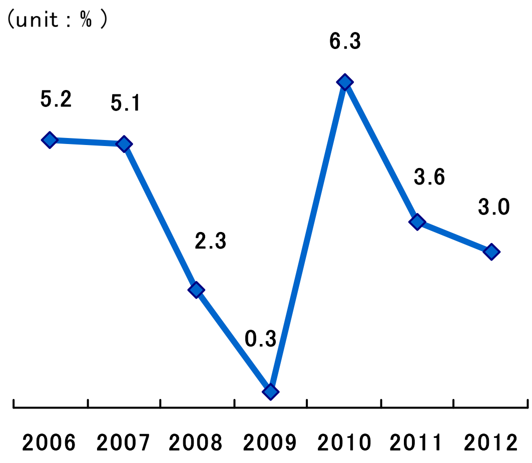


Figure 5.1: Korea's GDP growth

The growth rate in construction investment was converted from negative in 2011 into positive in 2012, which reached 0.2% in the first half of 2012. It is expected that the annually rate will be about 1.5%.

Table 5.1. Prospect of Construction Investment in 2012

(Unit: %, compared with the same period)

Segment	2011 annually	1st half of 2012	2nd half of 2012	2012 annually
Construction Investment	-5.0	0.2	2.5	1.5

Source: Construction Economy Research Institute of Korea.

The prospects for the Korean economy next year is not very hopeful. There are so many uncertainties ahead in the Korean economy as well as the global economy. Although the change of government at the beginning of next year will have great effects on the Korean policies, the GDP growth rate in 2013 would be predicted to be about 3.8% higher than this year.

Green Trends

in Korean Construction Industry

CHOI, Seok In
Research Fellow/Ph.D.

KIM, Heung Soo
President

2012.10.10

CERIK
(Construction & Economy Research Institute of Korea)

Contents

Introduction

〈 Comparison with OECD Countries(2005) 〉

	Korea	Rank	Remarks
Emission	590 million CO_2eq ton	7th	1st: U.S. (7260), 2nd: Japan (1360)
Increase ('00~'05)	12.1%	4th	1st: Luxemburg (33.3), 2nd: Austria (15.0), 3rd: Spain (14.6)
Emission per GDP	0.62 CO_2eq ton/1000$	8th	1st: Australia (0.86), 4th: U.S. (0.66)
Emission per capita	12.24 CO_2eq ton per capita	13th	1st: Luxemburg (27.9)

* International Energy Association (IEA) Standards: Korea's GHG Emission Ranks 16th out of 137 nations

Source: Kim, Ki-Ho, Green Korea 2009, pp.5

- **The global push to "Go-Green"**
  - In an interconnected world, green lies at the **"Heart"** of the drivers in shifting global market
  - Construction Activities ➔ Majorly Impacts on the environment
    - Buildings and Transportations are the heaviest consumers of natural resources.
  - Green Construction ➔ "Next Growth Engine"
- **Mechanism of "Green Growth"**
  - **I. Public Policies, Laws & Regulations**
    - **Standards & Codes, Incentives & Penalties System, etc.**
    - **Long-term Goals ➔ Leading to investments in pubic & private sector**
  - **II. Budget ➔ Green Projects**
    - **Visualization of Green Projects**
  - **III. Green Technologies ➔ Innovation of Construction Engineering & Technologies**
    - **Existing Tech. + Emerging Tech.(IT, NT, etc.)**
    - **Who plays a vital role of collaborations in Green Construction? ➔ Green Contractor?**

Green Policy in Korea: National Strategy

VISION

To become the World 7th Green Power by 2020, and the 5th by 2050

Three Objectives, Ten Policy Directions

Mitigation of climate change & energy independence

1. Effective mitigation of greenhouse gas emissions
2. Reduction of the use of fossil fuels and the enhancement of energy independence
3. Strengthening the capacity to adapt to climate change

Creating new engines for economic growth

4. Development of green technologies
5. The "greening" of existing industries and promotion of green industries
6. Advancement of industrial structure
7. Engineering a structural basis for the green economy

Improvement in quality of life and enhanced international standing

8. Greening the land, water and building the green transportation infrastructure
9. Bringing green revolution into our daily lives
10. Becoming a role-model for the international community as a green growth leader

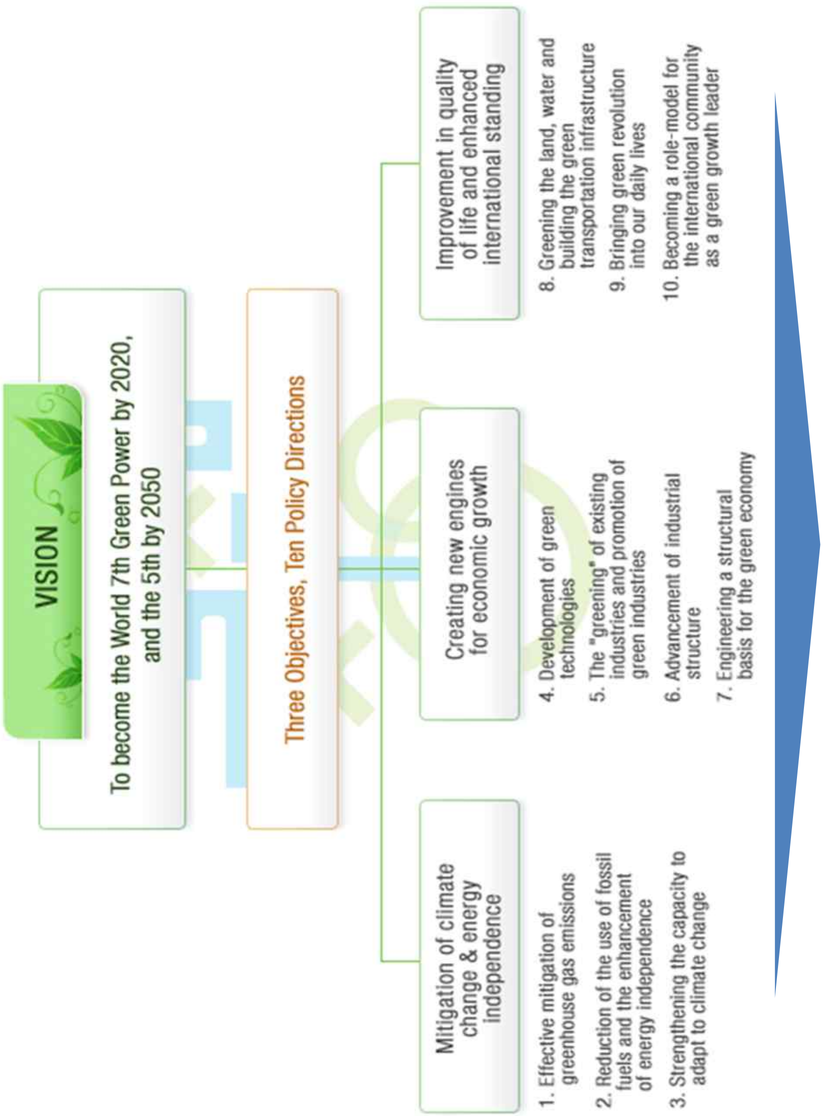
The Presidential Committee on Green Growth
(January 2009)

FRAMEWORK ACT ON LOW CARBON, GREEN GROWTH
(Enforcement April 14, 2010)

- **Basic principle**
- **Responsibilities of national & local government, business entity, and citizen**
- **National strategy**
- **Recycling resources**
- **Green tech. and enterprises**
- **Finance, Incentives, etc.**

http://www.greengrowth.go.kr/english

Roles of Construction Industry



- **Development of Green Facility Design Criteria, Codes, Standards, etc.**
- **Supply Green Facilities by Sector (City, Building, Road, Plant, Railway, etc.)**
- **R&D of Green Construction Tech.**
- **Fusion between Existing & Emerging Construction Tech.**
- **Green Construction Company**
- **Green Construction Job**
- **Green Education**
- **Entry into Overseas Green Construction Market**

Green Policy in Korea: Green Certification System(2010.4.14)

Relevant Regulations

- Framework Act on Low Carbon, Green Growth Article 32
  Enforcement Decree of the Framework Act Article 19
- Operational Guideline for Green Certification
  (Joint notification by relevant ministries, Apr. 14, '10)

Objects of Certification

- Green Technology ➡ 61 key technologies in 10 areas
- Green Project ➡ 95 projects in 9* areas
  - Among 10 areas of green technologies, 'new material' area is excluded.
- Green Tech Enterprise ➡ Certified green technology companies with 30% or more sales from the previous year

"Including green construction projects"

◆ **Areas need to be improved :**

- **Not a system for certificating green projects of domestic public sector**
- **Current green certification system is limited to environment-friendly buildings and energy-efficiency grades**

Tax benefits for Green Financing (Feb. 18, '10)

Category	Green Fund	Green Saving	Green Bond
Tax Benefits	Tax exemption on dividend income	Tax exemption on interest income	Tax exemption on interest income
Limit	KRW 30mil. /person	KRW 20mil. /person	KRW 30mil. /person
Maturity	Over 3 yrs.	Over 3 yrs.	Over 3 yrs.

Support for 'Companies with Green Technologies'

Financing
- No limit on policy loan
- Exemption of guarantee fee for technology evaluation (0.2%), preferred treatment for evaluation
- Included in the candidates for investment by New Growth Engine Fund of Korea

Export-Marketing
- Added points for the application of export incubator, overseas exhibition, support for exporting companies
- Exemption of export insurance fee, guarantee fee(10%~20%), double limit for loan guarantee

R&D, etc.
- Added points for application of R&D projects by relevant ministries
- Preferential review on patent application, provision of support for employment of foreign engineers, etc.

Incentives and supports will be determined by the end of May, 2010 by relevant ministries

http://www.greengrowth.go.kr/english

Expansions of Green Construction Projects Certification

As Is

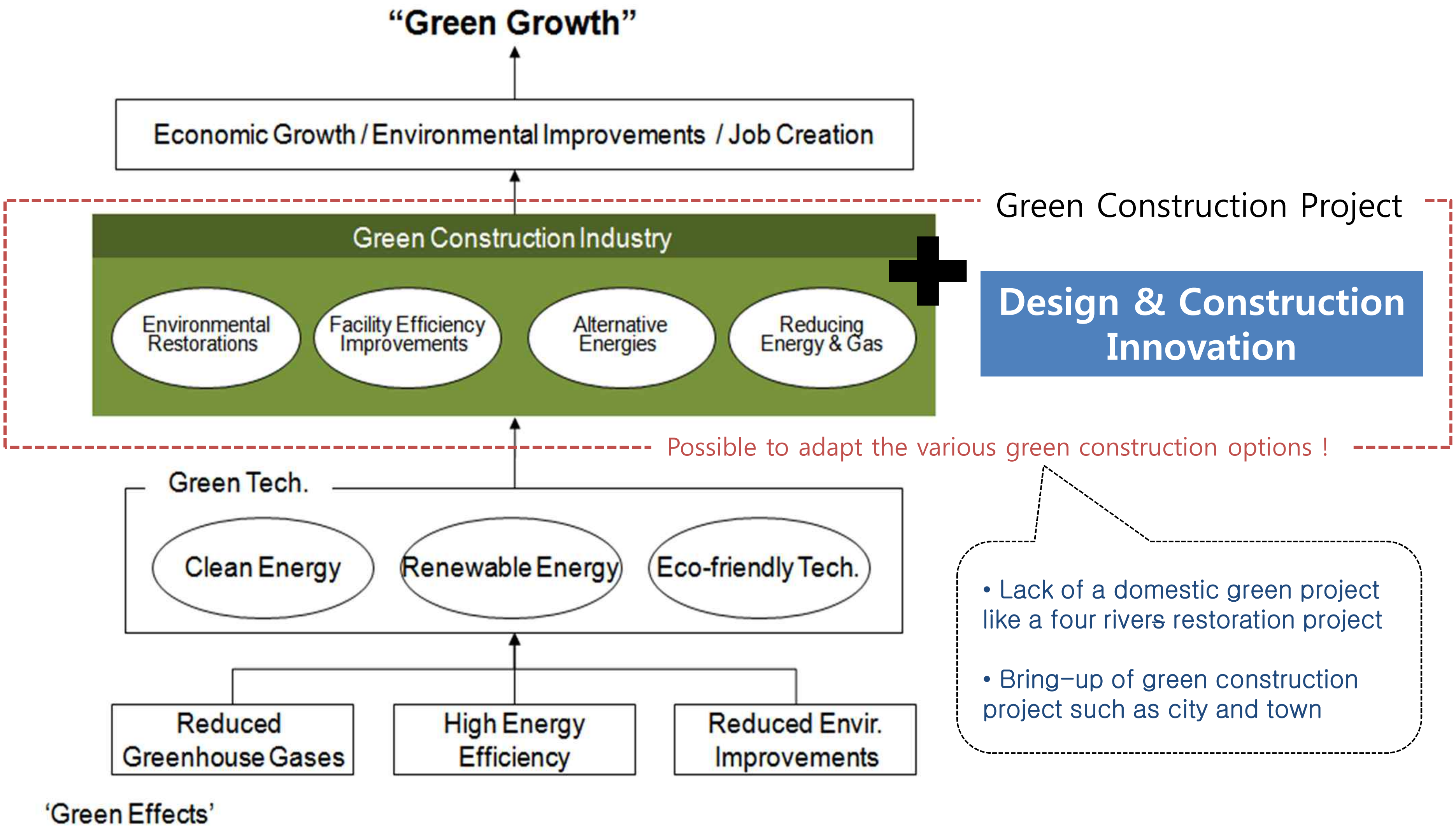
- Green Building Certification System
- Energy Efficiency Rating System

Identification-System of Green Construction Projects

To Be

- Green Building Certification System
- Energy Efficiency Rating System
- **Green Transportation Certification System**
  - ✓ **Road, Railway, Port, Airport**
- **Green Plant Certification System, etc**

What is Green Construction ?



- The green construction
  = environmental protection + economic growth ← green technology

Green Construction Areas

- **Green construction market consist of 4 major areas.**
  - **Green Building: government office, commercial office, education, airport etc.**
  - **Green Energy: wind, hydro, solar, biofuels, etc.**
  - **Green Infrastructure: road, railways, etc.**
  - **Green city : Smart city, Zero-carbon emission, Zero-energy consumption city, etc.**

- **Green Construction Market are limited to energy and Building areas in Korea.**
  - ❖ **Infrastructure is not a major market in green construction industry.**
  - ❖ **4 rivers restoration project was completed in 2012.**
  - ❖ **High Speed Railway projects have been underway for 15 years.**

- **It is needed to identify the "green projects" in the construction market !!**

- **CERIK identified the green construction ratings by construction type.**
  - ❖ Six expert groups of practitioners with more than 10 – 15 years of experience in the construction industry were invited to participate in the Delphi survey.

Rating of Green Construction Products

[Green Construction Ratings by Construction Type]

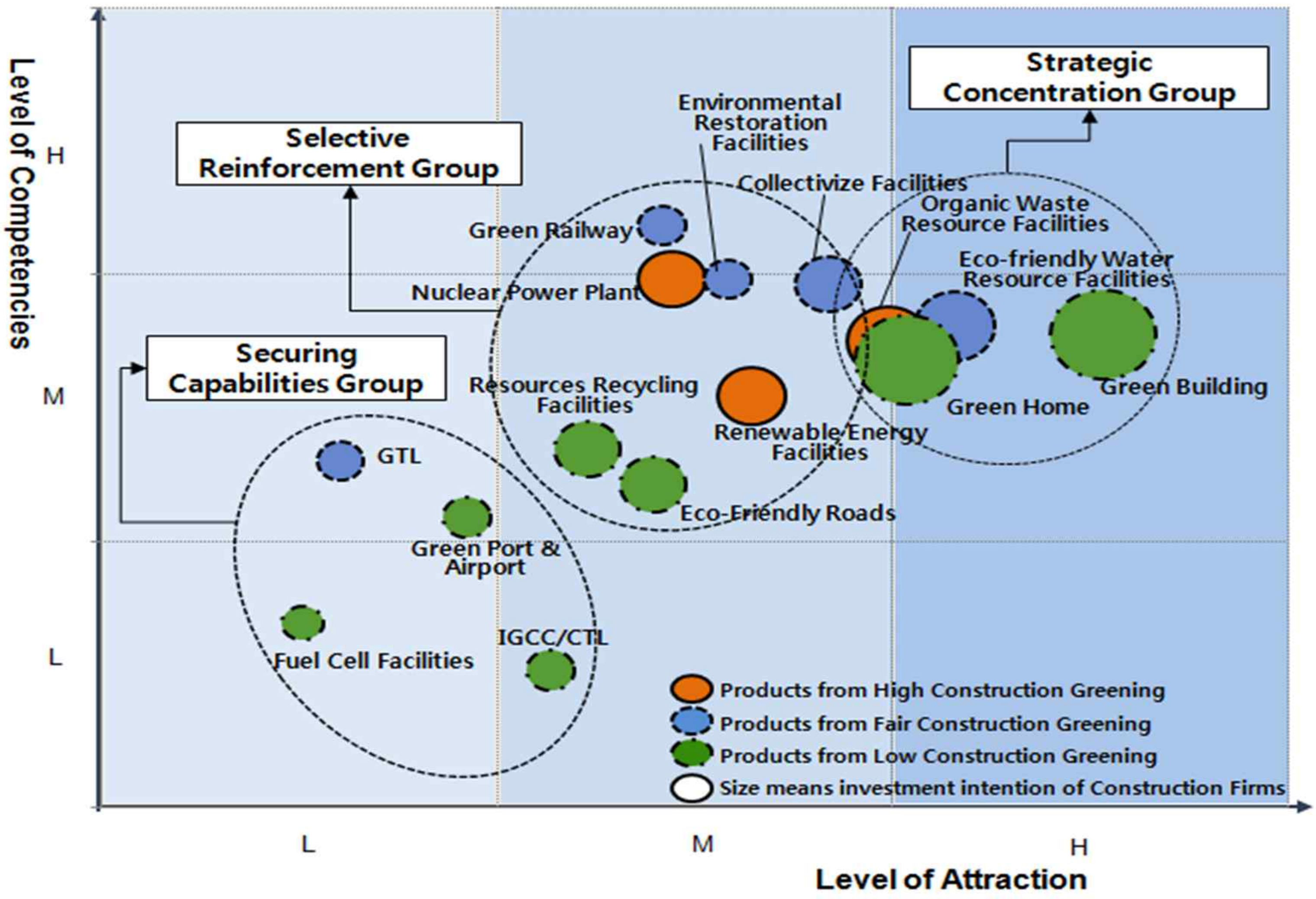
Construction Products			'Construction Greening' (As-Is): Reducing Energy & Gas			Alter-native Energies			Facility Efficiency Improve.			Envir. Re-storations			Construction Greening Rate
			L	M	H	L	M	H	L	M	H	L	M	H	
Residential		Residential Housing, Housing Complex	■			■				■		■			Low
Non-residential	Building	Office Building	■			■				■		■			Low
		Commercial Building	■			■				■		■			Low
		Institutional & Public Building	■			■			■			■			Low
		Hospital & Hotel	■			■				■			■		Low
		Gymnastics	■			■			■			■			Low
	Industrial Structure	Industrial Factory	■			■				■		■			Low
		Steel Industrial Facilities	■				■		■				■		Low
		Cement, Paper-mill, Mining Facilities	■			■			■			■			Low
		Chemical, Petroleum Plants		■		■			■			■			Low
		Oil & Gas Plants		■			■			■		■			Fair
Infra-structure	Trans-portation	Railway, Rapid Transit			■	■			■					■	Fair
		Road, Bridge	■			■			■			■			Low
		Airport	■			■				■		■			Low
		Port, shipbuilding		■		■			■			■			Low
	Public Health	Water supply and Drainage		■		■				■				■	Fair
		Sewer and Waste Water Treatment	■				■		■					■	Fair
		River Improvement Facilities	■				■			■				■	Fair
		Garbage, Sewage Sludge Treatment			■		■		■				■		High
		Soil-purification		■		■				■			■		Fair
	Energy	Thermal Power Plant	■			■				■		■			Low
		Combined Cycle Power Plant		■		■				■		■			Low
		Combined eat and Power Plant		■			■			■			■		Fair
		District Heating & Cooling Facilities			■		■		■				■		Fair
		Wind Power Plant			■			■		■			■		High
		Transmission & Distribution Facilities		■		■			■			■			Low
		Sunlight & Solar Heat Power Plant			■			■			■		■		High
		Tidal Power Plant			■			■			■		■		High
		Nuclear Power Plant		■				■		■			■		High
		Hydropower Plant		■			■			■			■		Fair
		Wave Power Plant			■			■		■				■	High
		Biomass Power Facilities			■			■		■				■	High
		Mechanical Biological Treatment			■			■		■				■	High

For increasing 『Construction Greening』

Frontier Green Construction Products

- Renewable Energy Facilities
- Nuclear Power Plant
- Organic Waste Resource Facilities
- GTL
- Green Railway
- Collectivize Facilities
- Environmental Restoration Facilities
- Eco-friendly Water Resource Facilities
- Green Home
- Green Building
- Resources Recycling Facilities
- Eco-friendly Roads
- Green Port & Airport
- IGCC/CTL
- Fuel Cell Facilities

[Matrix of Attraction-Competence for Green Construction Products]



Green Construction Activities and Projects in Korea

Green City

- 10 Innocity Projects(provincial city in Korea)
  - ❖ 2007~2030
  - ❖ preserve natural environment and secure diversity & circulation of ecosystem
  - ❖ establish sustainable urban spatial structure and transportation system that conserves energy and resources
- Gangneung green city
  - ❖ 18.3km², 23,400 residents
  - ❖ Sustainable land use, Green transportation, Green Energy, Recycling, etc.

Green Transportation

- Maximize low carbon transportation
  - ❖ Road → Railway
  - ❖ new projects → renewal projects
- Establish hi-speed railways network within 90 minutes in the whole country
- Enlargement of cycle lanes
- CNG bus, electrical automobile, light rail, etc.

Green Buildings

- Korean Green Building Certification System(KGBC)
  - ❖ 2,132 projects were certified by KGBC (2011. 2)
- Green Home plan by public sector
  - ❖ Green projects for 2Million households to 2018
  - ❖ $30.8 Billion will be invested by public sector
- Adapt ICT systems to control green building efficiently
- Open Green Architectural Center
  - ❖ Dissemination of green building information
  - ❖ Certification of KGBC and Energy Efficiency Rating System
  - ❖ Perform related research, etc.

Export of Green Experiences & Track Records

Expectation of Green Building Market in Global Regions

[Market Trend and Outlook for Green Building by Region in the World]

Divisions	Overview (Business Weights)	Facilities	Others
Europe	- 2008: 0 ~ 5% weight - 2013: at least 16% or more / 60% or more (65% of respondents)	- Residential>office>governmental office >factories, etc. - Expected growth of 20% or more for the next five years - Growth momentum during recession	- Increased sales and profits - Reason for green business: market demand - Barrier: excessive cost
North America	- 2008: 6 ~ 10% weight - 2013: at least 16% or more / 60% or more (52% of respondents)	- Residential>governmental office>education>office>>hospital, etc. - Growth momentum during recession	- Increased sales and profits - Reason for green business: right direction - Barrier: excessive cost
South America	- 2008: 0 ~ 5% weight - 2013: at least 16% or more	- Residential>office>hospital, etc. - Expected 101 billion dollar market in the future	- Increased sales and profits - Reason for green business: market change - Barrier: lacking political supports and excessive cost
Australia /New Zealand	- 2008: 0 ~ 5% weight - 2013: at least 16% or more / 60% or more (48% of respondents)	- Governmental office>office>residential - Future market is expected to be the focal field	- Increased sales and profits - Reason for green business: market demand - Barrier: excessive cost
Asia	- 2008: 0 ~ 5% weight - 2013: 60% or more (73% of respondents)	- Office>governmental office>factory>residential - Expected growth in a very rapid speed	- Increased sales and profits - Reason for green business: internal corporate decisions - Barrier: excessive cost
Middle East /North Africa	- 2008: 0 ~ 5% weight - 2013: at least 16% or more / 60% or more (59% of respondents)	- Residential>office>governmental office - Possibly highlighted as a rapid growth and attractive market	- Increased sales and profits - Reason for green business: right direction - Barrier: short of related professionals

Questionnaire: More than 700 construction leaders in 45 countries

Source: Global Green Building Trends, 2008, pp.8~14

Green Construction Market Outlook in Korea

[Green Construction Market Outlook]

$ Mil.	2007	2012	2020	2030
Overall Construction Output	**86,864**	**102,669**	**134,154**	**187,417**
Housing	47,975	56,704	74,094	103,511
Ground Shaping	3,997	4,724	6,173	8,624
Road & Bridge	7,245	8,563	11,189	15,631
Water & Sewer	1,190	1,407	1,838	2,568
Green Construction	**2,710**	**38,431**	**50,216**	**70,154**
Housing	**2,399**	**34,022**	**44,456**	**62,107**
Ground Shaping	100	1,417	1,852	2,587
Road & Bridge	181	2,569	3,357	4,689
Water & Sewer	30	422	551	770

Source: Green Technology Roadmap, MLTM, 2009
The above green market is not include whole construction product such as energy plant, city, and commercial buildings, etc.

- **Public Sector → Private Sector**
- **New Projects → Renewal Projects**

- **Aggressive R&D Investment**
- **More Green Polices and Regulations**
- **Strategies for Green Market**

Conclusion

Focusing on laws, policies, and regulations of advanced countries

- Needs mainly considerable investments on construction sector as well as renewable energy ➔ Initiatives for green construction vitalization
- Beforehand, actions with law/regulation
- Focusing on concrete and quantitative objectives ➔ Accelerating to establish a mechanism for Green-standards and effectiveness-measurements

Possible impacts on construction industry and market

- Construction industry➔ Highly possible to be changed into "Green Construction"
- Green construction industry leadingly functions to acquire "Gas Emission Trading Scheme"
- Potential for "Market" to be globalized by advanced countries ➔ Requiring concerns and efforts of domestic construction industry

Improvement of "Korean Green Construction Growth" regulations

- Accorded with a functional role for a reduction of energy consumption and carbon-emission
- Green construction projects ➔ Green design standards + Budget
- Needs the advent of the strong "Incentive" policy for accelerating the green-rising of facilities, buildings, and cities
- Developing the standards and certifications for green-infrastructure(i.e. transportation) facilities