R&D and Business area of Samsung C&T related to CITIES project

Institute of Technology

Senior Researcher Kyunghun Woo

SAMSUNG C&T
Engineering & Construction Group

CITIES

Contents

1. Introduction to Samsung C&T

2. Green Building Technologies in Samsung C&T

3. R&D and Business in City context

1. Introduction to Samsung C&T

1. Introduction to Samsung C&T

1938

Samsung Corporation was founded in 1938 and is the origin of Samsung Group which has been the driving force behind the astonishing growth of the Korean economy.

1. Introduction to Samsung C&T

2013

Samsung Corporation became a leader in global construction industry with remarkable achievement on landmark projects world wide.
Our vision is **Emerging as a top-tier global construction company by 2015**

- Foundation : March 1, 1938
- CEO : Chi-hun Choi
- Employees : 11,909 (as of Jan. 2014)
- Business Area : Trading & Investment
  Construction & Engineering
- Sales : 27.1 billion US$ (2013)
- Capital : 24.3 billion US$ (2014)

Website: http://www.samsungcnt.com

1. Introduction to Samsung C&T

Commercial Building

High-rise Office Building, High-techs (Clean Room), Airport, Hotel, Retail Facility, Cultural & Educational, Resort

Residential Building

Residential Complex, Apartment, District Renovation, Remodeling

Civil

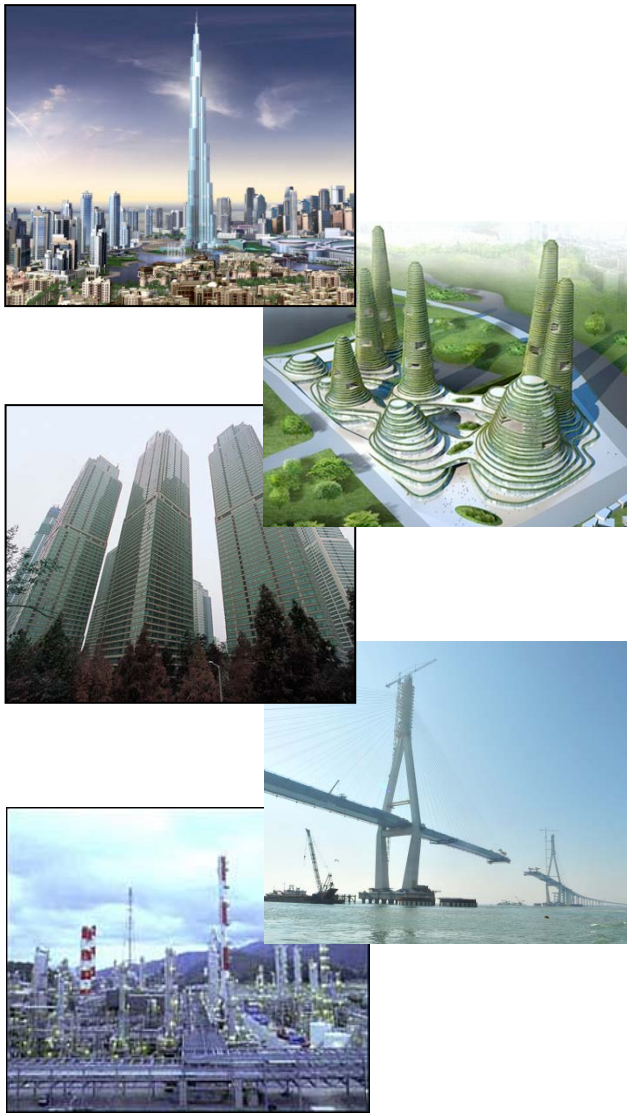
Road & Bridge, Tunnel, Subway, High-Speed Railway, Port/Harbor, Dredging & Reclamation, Dam

Plant

Petrochemical & Chemical, Power Plant, Oil & Gas Storage, Transmission, Substation, District Cooling Plant

Sustainable Building

Green Building, Renewable Energy, Energy Management, LEED Consulting, Pre-construction Services



1. Introduction to Samsung C&T

❖ High-rise Building

- Burj Khalifa(828m), Taipei 101(508m), Petronas Tower(452m)

❖ Inchon International Airport

- 1996.05~2001.03, 498,538㎡

❖ Samsung Semiconductor / LCD Fab

❖ Incheon Bridge

- 12,343 km, World 5th cable-stayed girder bridge

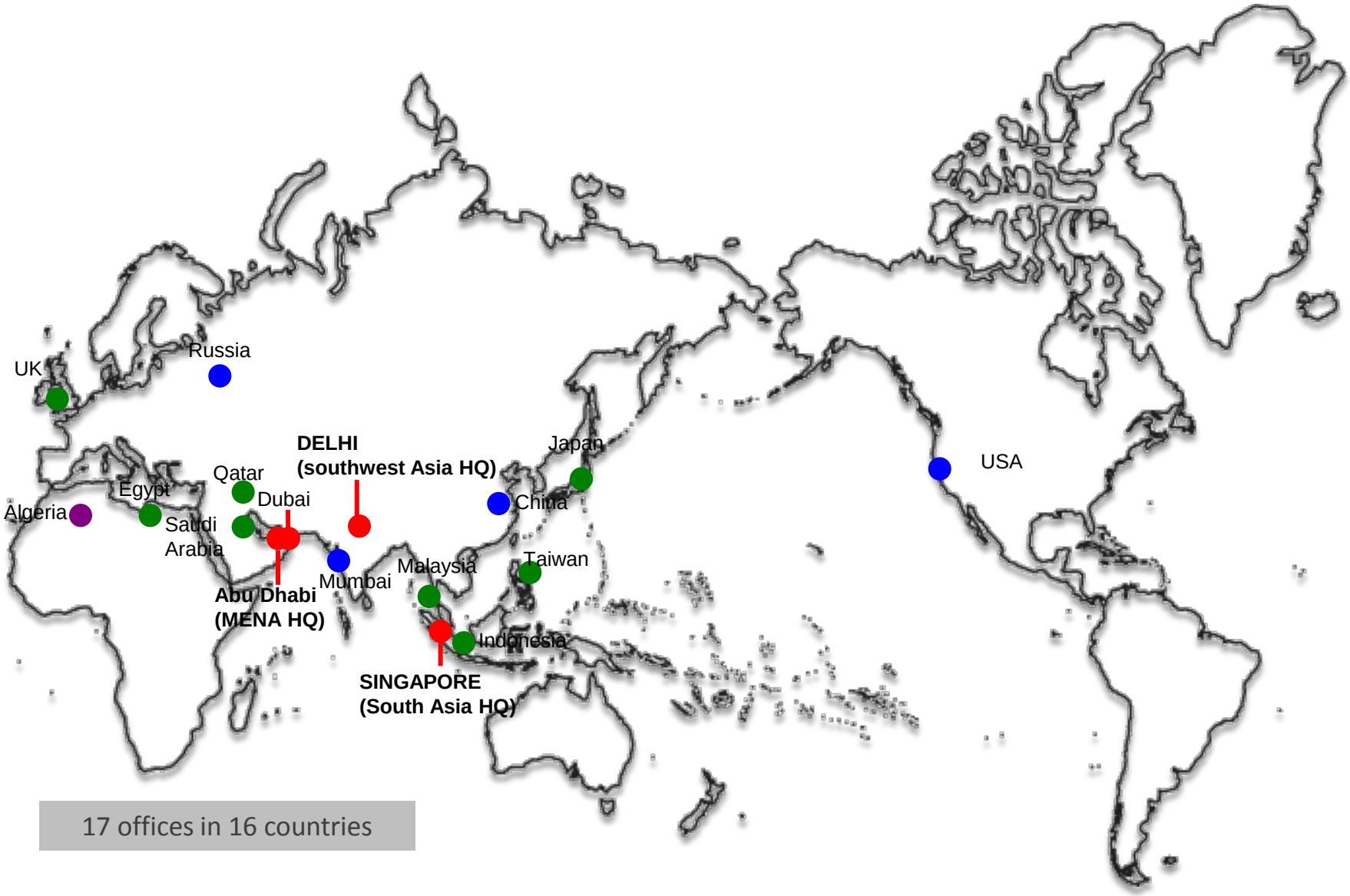
❖ UAE Shuweihat S2 IWPP

- 1,510 MW Power generation + 100 MIGD Seawater desalination

❖ Raemian Apartment

- NCSI(National Customer Satisfaction Index) 1st prize from 1998

1. Introduction to Samsung C&T – Global Network



17 offices in 16 countries

2. Green Building Technologies in Samsung C&T

2. Green Building Technologies

(Active) (Passive) (Renewable)

HVAC Efficiency

Water Efficiency

Lighting Efficiency

Building Automation System

Building Envelope

Passive Design

Daylighting

SAMSUNG C&T's

Core Green Building Technologies

Renewable Energy

Waste Reduction

Energy Storage

Energy Simulation

Commissioning

BEMS / FMS

Green Building Certification

Energy Efficiency / Savings

Green Energy Products

Energy Evaluation

Zero Energy Building / Energy & Smart Grid

Energy Management Solutions

SAMSUNG C&T
Engineering & Construction Group

2. Green Building Technologies

❖ Energy Efficiency

HVAC Efficiency

- Concrete Core Activation System
- UFDA(Under Floor Air Distribution) System
- Air Barrier System
- Chilled Beam System

Water Efficiency

- Air-lifted Membrane Bio Reactor(MBR) System
- Advanced Ecological Wastewater Treatment System

Lighting Efficiency

- Intelligent Lighting Control System
- LED Lighting System

Building Automation System

- Integrated Monitoring System
- USN (Ubiquitous Sensor Network)

Ewha Campus Complex

Nurikum Square

TESCO Asia Academy

Samsung Group HQ

Green Tomorrow

2. Green Building Technologies

❖ Energy Savings

Building Envelope

Passive Design

Daylighting

- Green(Cool) Roof System
- High performance glass curtain wall
- Double Skin Façade
- Exterior insulation and finishing system(EIFS)
- High Performance Eco-Insulation
- PCM(Phase Change Material)
- Cool Tube System
- Hybrid Ventilation
- Intelligent Shade System
- Light-pipe System

Ewha Campus Complex

Seoul City Hall

TESCO Asia Academy

East Palace Raemian

Green Tomorrow

2. Green Building Technologies

❖ Renewable Energies and Storages

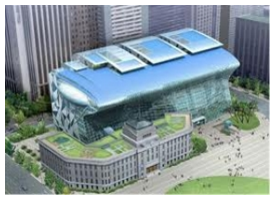
Renewable Energy

Waste Reduction

Energy Storage

- Geothermal Heating & Cooling
- Geothermal Snow-melting
- Solar Photovoltaic
- Solar Heating (Hot Water)
- Wind Power
- Waste Management
- Waste Recycling and Treatment
- Rain & Grey-water System
- Thermal Storage System
- Ice Storage System
- Fuel Cell System

National Ecological Inst.



Seoul City Hall

Bampo Raemian First Class

East Palace Raemian

Green Tomorrow

2. Green Building Technologies

❖ Performance Evaluation

Simulation

Commissioning

BEMS / FMS

Green Building Certification

- Dynamic energy simulation
- Lighting Simulation
- Indoor thermal comport
- $LCCO_2$ Analysis
- Energy Auditing
- Test & Commissioning
- BEMS (Building Energy Management System)
- HEMS (Home Energy Management System)
- LEED
- Korea Green Building Certification

Samsung LCD Campus

Parc 1

TESCO Asia Academy

Samsung C&T HQ

Green Tomorrow

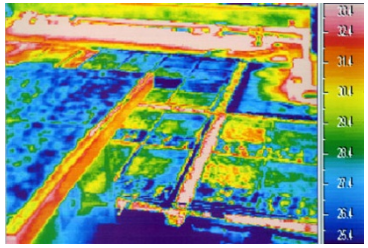
2. Green Building Technologies

❖ Project cases : Green Tomorrow

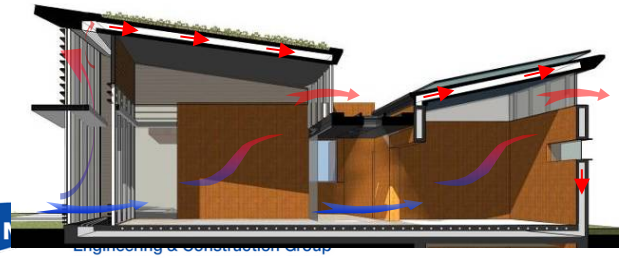
- Location : Young-in, Gyung-gi, South Korea
- Built : August, 2009
- Floor area : 400.54 ㎡
- Description : First LEED Platinum building in South East Asia. Designed for Zero Carbon Building. Four year's full measurement and annual remodeling based on measurement and analysis

• 3pain Glazing

• Green Roof



• Natural ventilation & Otimized Solar Gain



• Geothermal HVAC and Snow melting

• PV&Solar Thermal

• LED

• Building Perspective

2. Green Building Technologies

❖ Project cases : Zero-carbon Emission Building

- TESCO Asis Academy

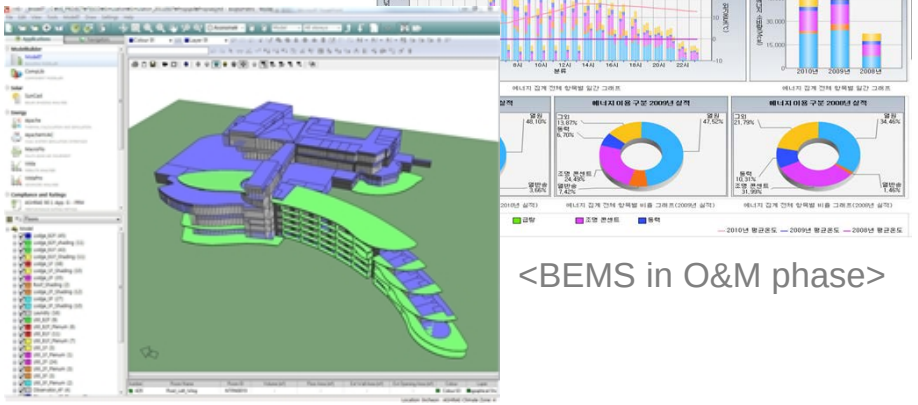
Owner's Requirement
- Definition of zero carbon
- Master plan and strategy

Feasibility Study Tech. Survey
- 68 initiatives for the project
- Simulation of the proposed system

Design
- Passive design
- Active technology
- Renewable energy
- Integration of the systems and tech.'s
- Energy monitoring

Construction
- Commissioning
- Optimization of the systems

O&M Consulting
- Energy Tuning
- BEMS



<BEMS in O&M phase>

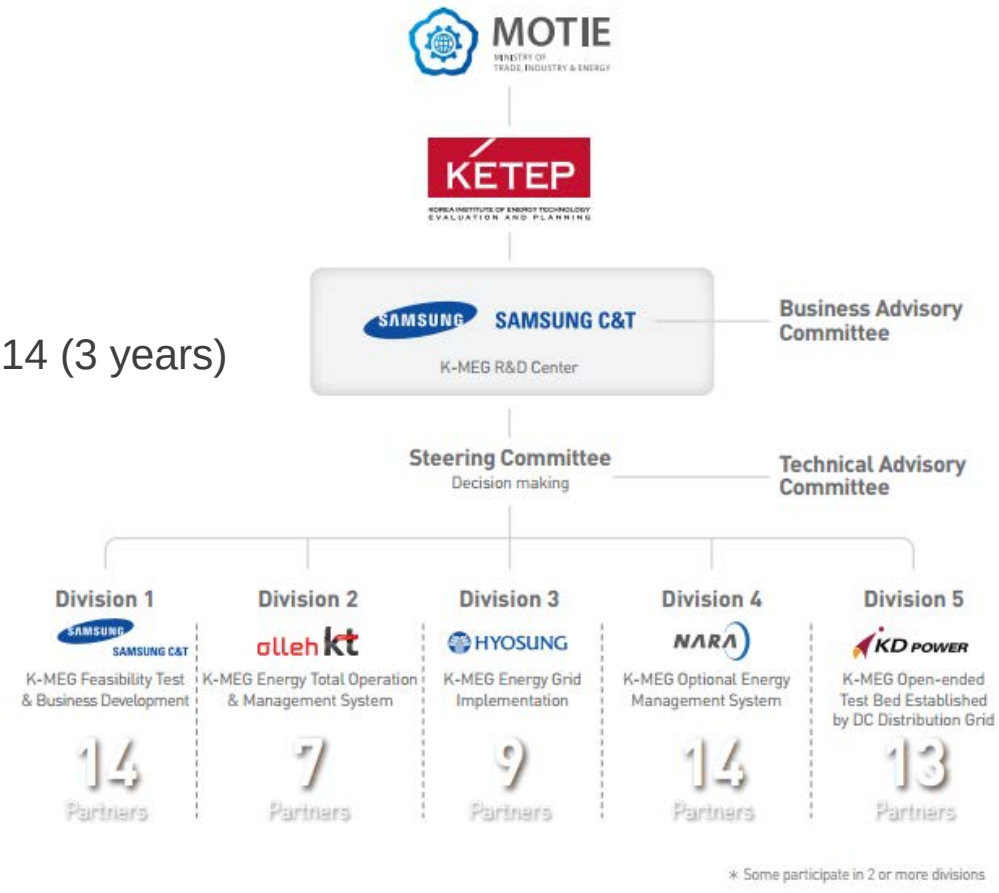
<Energy simulation in design phase>

3. R&D and Business in City context

3. R&D and Business on City context

❖ R&D Project : K-MEG (Korea Micro Energy Grid)

- **Project Administrator**
  - Korea Institute Energy Technology Evaluation and Planning
- **K-MEG R&D Center**
  - Principal Leader : Samsung C&T
  - Number of Partners : 44
  - Number of Affilate Partners : 25
- **Project Period** : July 2011 ~ June 2014 (3 years)
- **Budget** : 80M USD
- **Website** : http://www.k-meg.org/

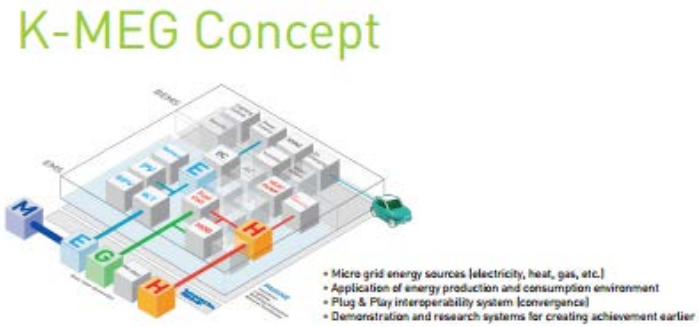


3. R&D and Business on City context

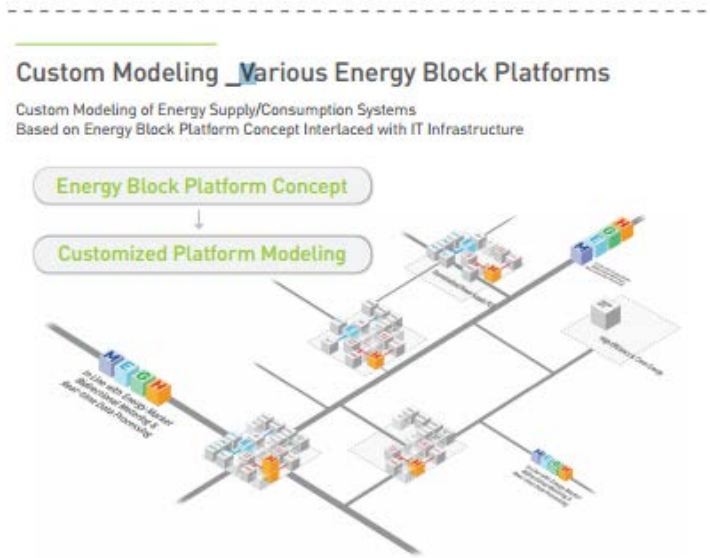
❖ R&D Project : K-MEG

– Project Goal

- Development of optimized Energy grid model in district level combining various energy sources such as Electric, Gas, Heat, and Off grid
- Development of integrated IT solutions
- Validation through Application and measurement in real project (7 domestic, 6 overseas)



[Overseas Pilot Projects]



3. R&D and Business on City context

❖ City development Project : As an Investor

− Tianjin Eco-City Plot 1a

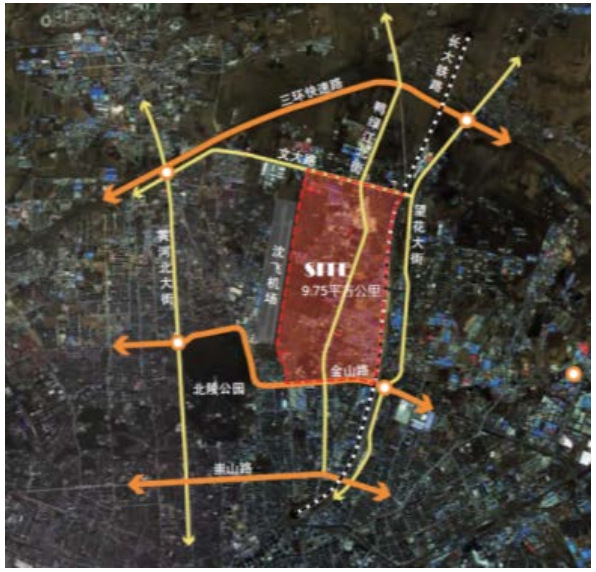
- Developer : Tianjin Eco-city Shengxing Development Co. Ltd.
  (SSTEC 60% + Samsung C&T 40%)
- Site Area : 54,900 ㎡
- Total Floor Area : 106.368 ㎡
- Marketing & Sales of Project, CM of Construction

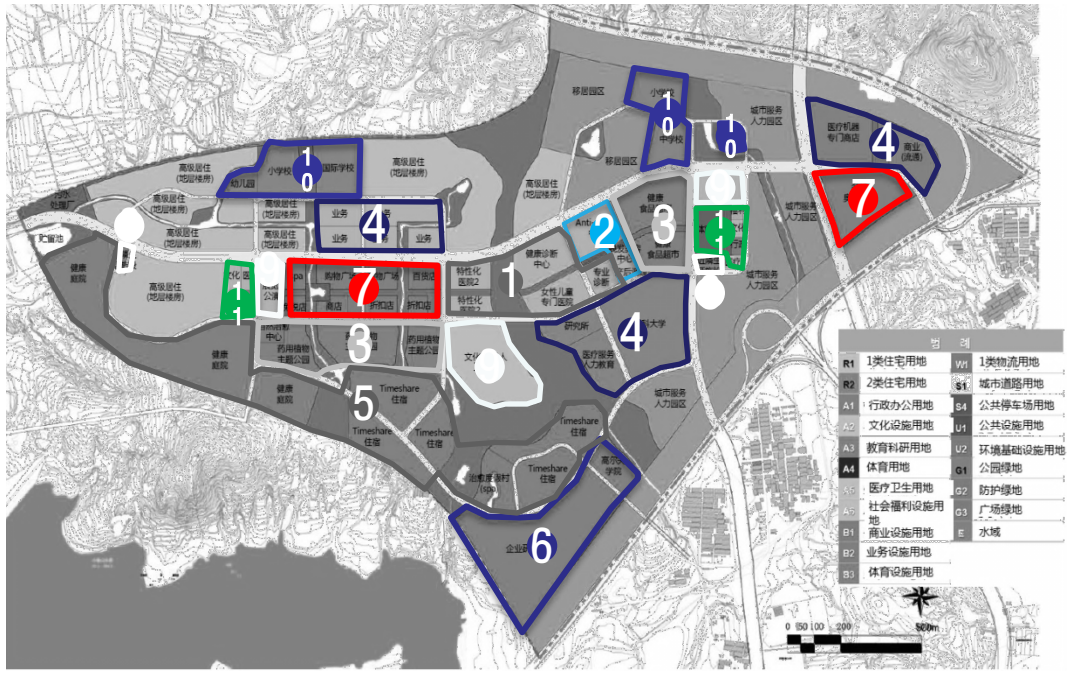
3. R&D and Business on City context

❖ City development Project : Consulting and Planning

− Development Planning and Research Service of Qingdao HANSUNG City

- Concept : Eco-smart City
- Main Consulting : Samsung C&T Unban Development Team with AECOM & ARUP
- Project Period : January 2014 ~ June 2014
- Area : Approx. 9㎢





3. R&D and Business on City context

❖ Possible collaboration in CITIES Project

- **Know-How from lots of experiences in building energy efficient technology application**
- **Knowledge and technologies from Micro Energy Grid R&D and its project application**
- **Application of developed technologies in CITIES project in a new city development project and validation**

Thank You

For more questions :
archope@samsung.com