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

Institute of Technology
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1. Introduction to Samsung C&T
1. Introduction to Samsung C&T

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

Samsung Corporation became a leader in global construction industry with remarkable achievement on landmark projects worldwide. 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 m²

- **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
2. Green Building Technologies in Samsung C&T
2. Green Building Technologies

- Energy Efficiency / Savings
- Green Energy Products
- Energy Evaluation

- Zero Energy Building / Energy & Smart Grid
- Energy Management Solutions

- (Active) HVAC Efficiency, Water Efficiency, Lighting Efficiency, Building Automation System
- (Passive) Building Envelope, Passive Design, Daylighting

SAMSUNG C&T's Core Green Building Technologies
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
    - 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)
  
  - Passive Design
  
  - Daylighting
    - 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
  - 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

- Renewable Energy
- Waste Reduction
- Energy Storage

- National Ecological Inst.
- Seoul City Hall
- Bampo Raemian First Class
- East Palace Raemian
- Green Tomorrow
2. Green Building Technologies

- **Performance Evaluation**
  - Dynamic energy simulation
  - Lighting Simulation
  - Indoor thermal comport
  - LCCO₂ 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 m²
  - **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
  - Geothermal HVAC and Snow melting
  - LED
  - PV & Solar Thermal
  - Natural ventilation & Optimized Solar Gain
  - 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

*Image: Energy simulation in design phase*
*Image: BEMS in O&M 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 Affiliate 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)
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 m²
    - Total Floor Area: 106,368 m²
    - 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. 9km²
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

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