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Overview of SL Corp.

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Future Plan



I. OVERVIEW of SL Corp.



Track Record

Aims

- ◆ To practice sound waste management as well as maximize resource recovery
- ◆ Transforming the world largest landfill into the world's best environmental and cultural attraction

Basic Landfill O&M

- Run by "SUDOKWON Landfill O&M Union"
- Started waste carry-in and Simple landfill operation

LTRC (GTRC)

- Set up R&D department
- Enhanced technology development & laboratory analysis
- Reinforced LTRC(Landfill technology research center) with new recruit

Global Contribution

- Conducting feasibility study and national waste management planning, waste Management facility operation, staff training, etc

HISTORY

1991 2000 2004 2006 2010

1991 Basic Landfill O & M

2000 Organization Reform.

2004 LTRC(GTRC)

2006 LFG Power Plant

2010 Global Contribution

Organizational Reformation

"SUDOKWON Landfill Site Management Corp." inaugurated its obligation as a public entity under the Ministry of Environment, Korea

LFG Power Plant

- Started the operation of 50 MW landfill gas power plant and CDM Project
- Made the Master plan for the future use of SUDOKWON Landfill

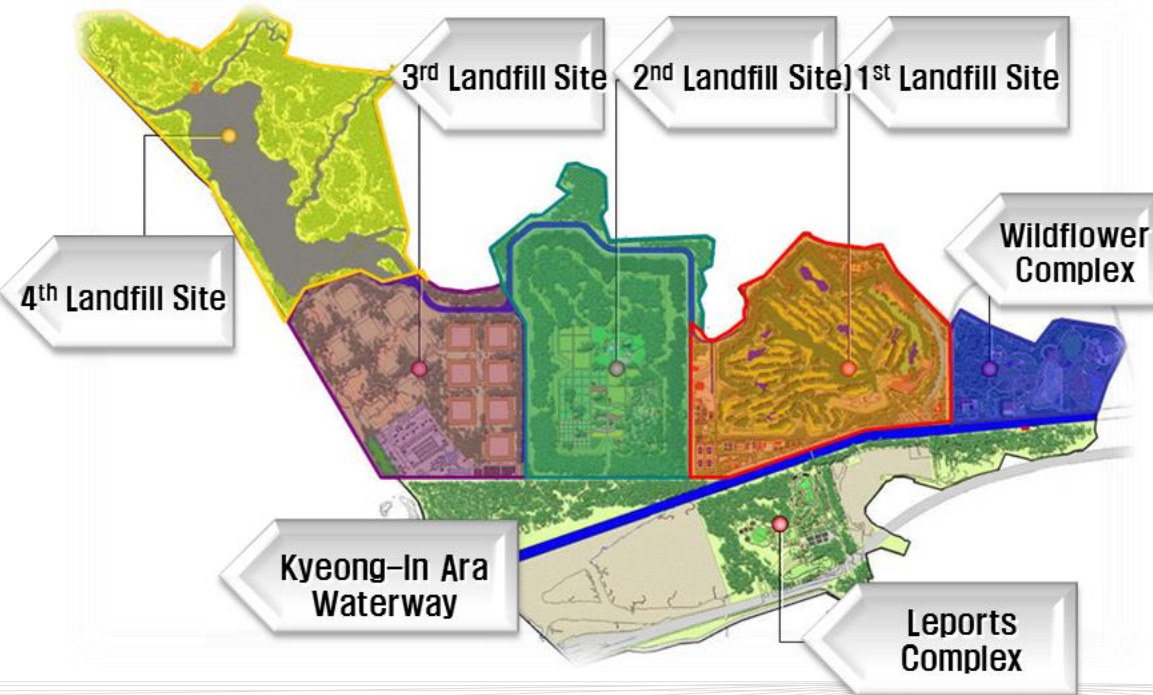
I. OVERVIEW of SL Corp.



SL Corp.

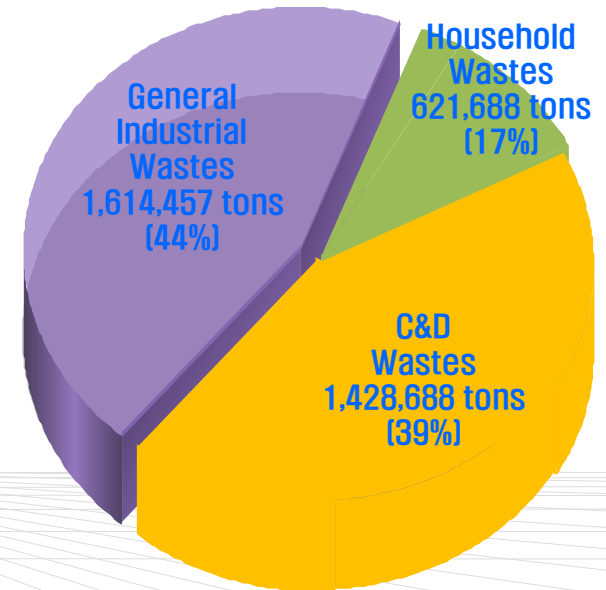
Current Status of SUDOKWON Landfill

(Annual statistic report on incoming wastes : 2015)



Incoming Wastes

Total 3,664,833 tons
 <14,778 tons/day >



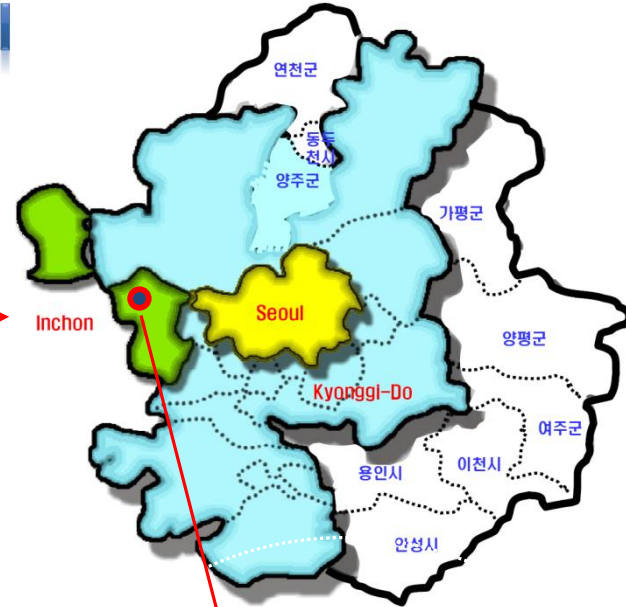
Total	Size (Million m ²)		Capacity (Million tons)
	Landfill	Others	
17	15	2	228

※ Incoming ratio according to the waste incoming regions : Seoul 46%, Incheon 19%, Kyeong-gi 35%

I. OVERVIEW of SL Corp.



Current Status of SUDOKWON Landfill

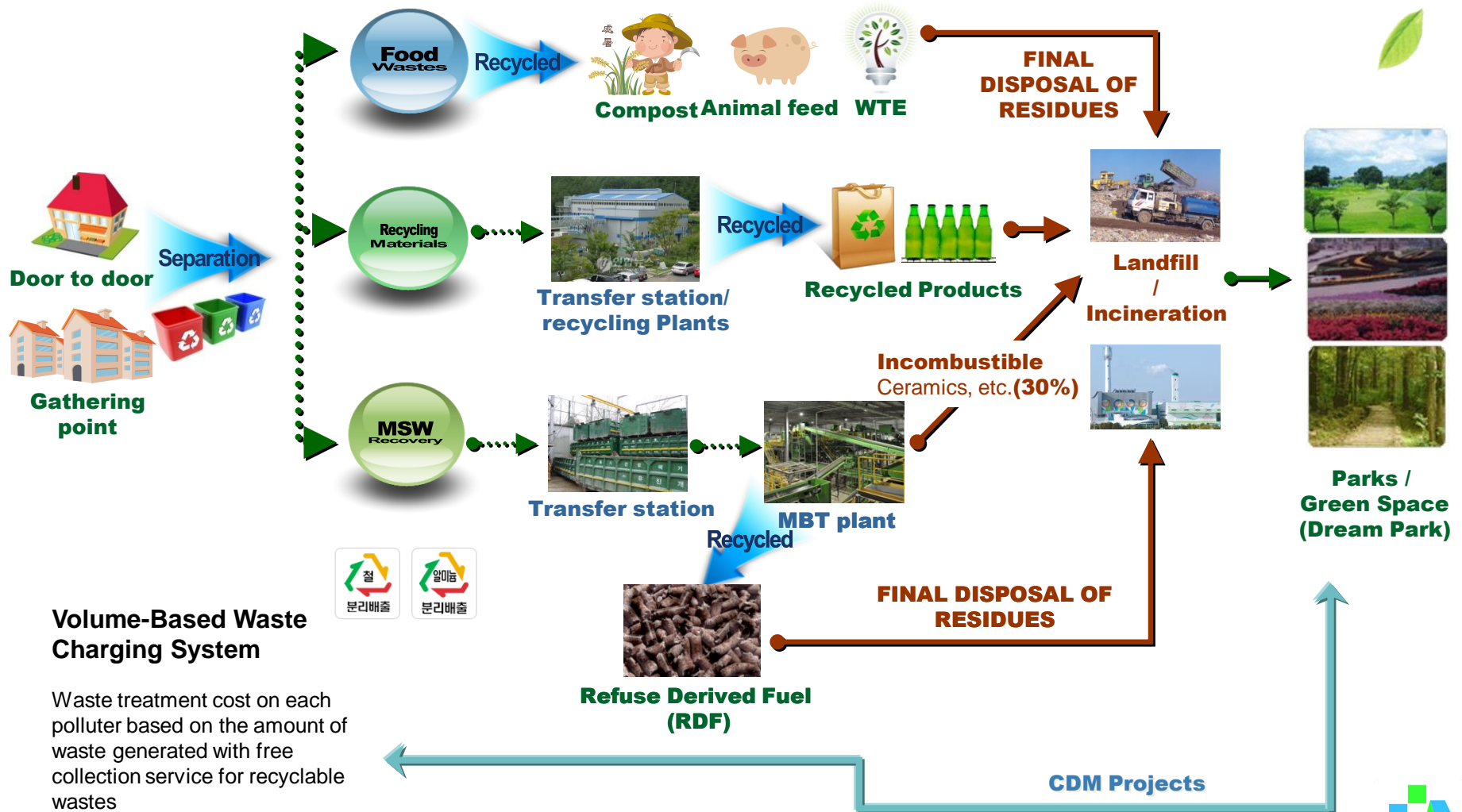


※ Incoming from : 58 districts of Seoul, Gyeonggi and Incheon regions (23Million People)



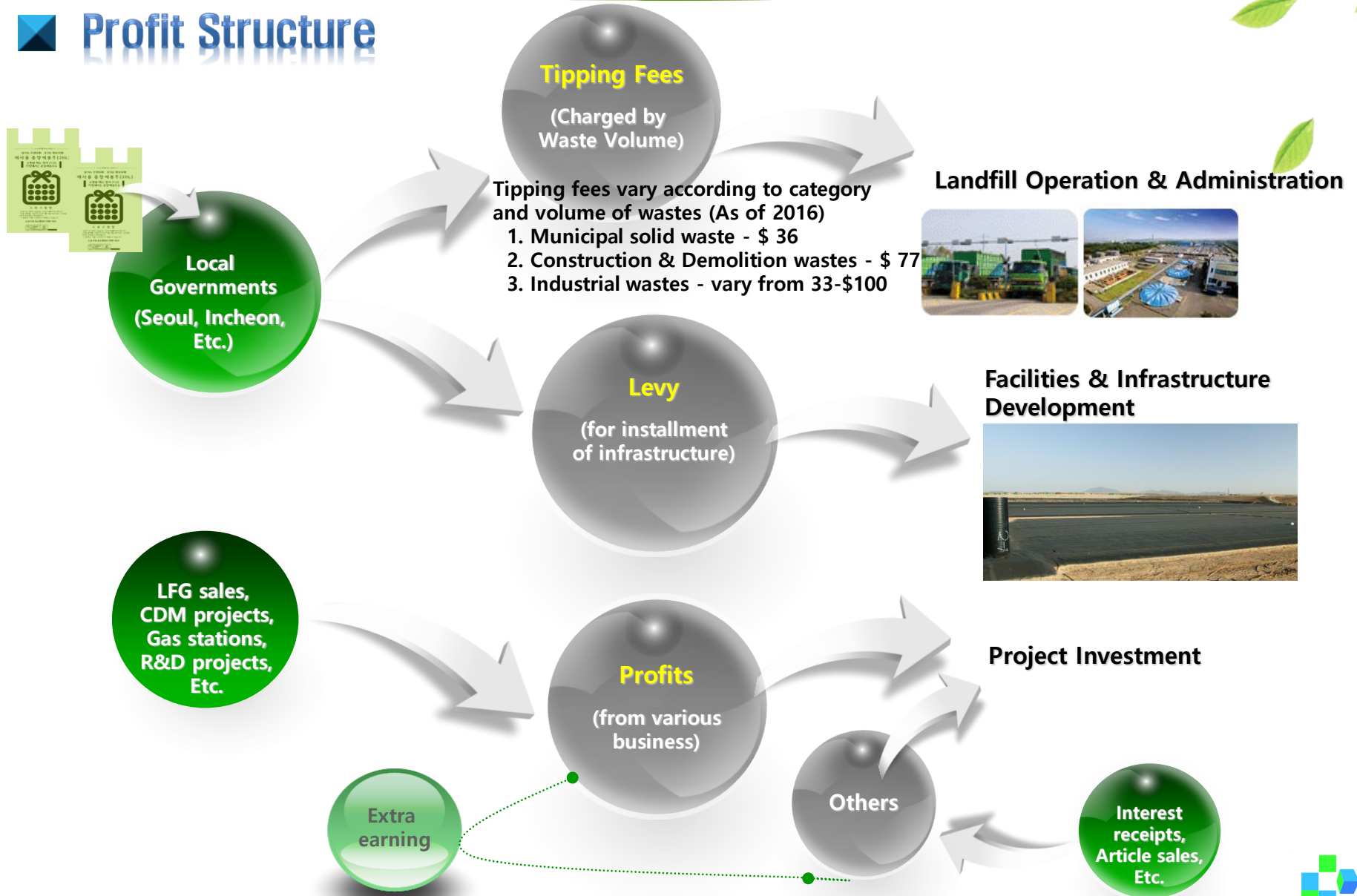
I. OVERVIEW of SL Corp.

Waste Management System in Korea



I. OVERVIEW of SL Corp.

Profit Structure



II. Relationship with Residents

the Present and the past

➔ **To solve environmental problems + economic & social benefits**

Korea waste management in the past (80s) & the present

Past
(1980s)



Present

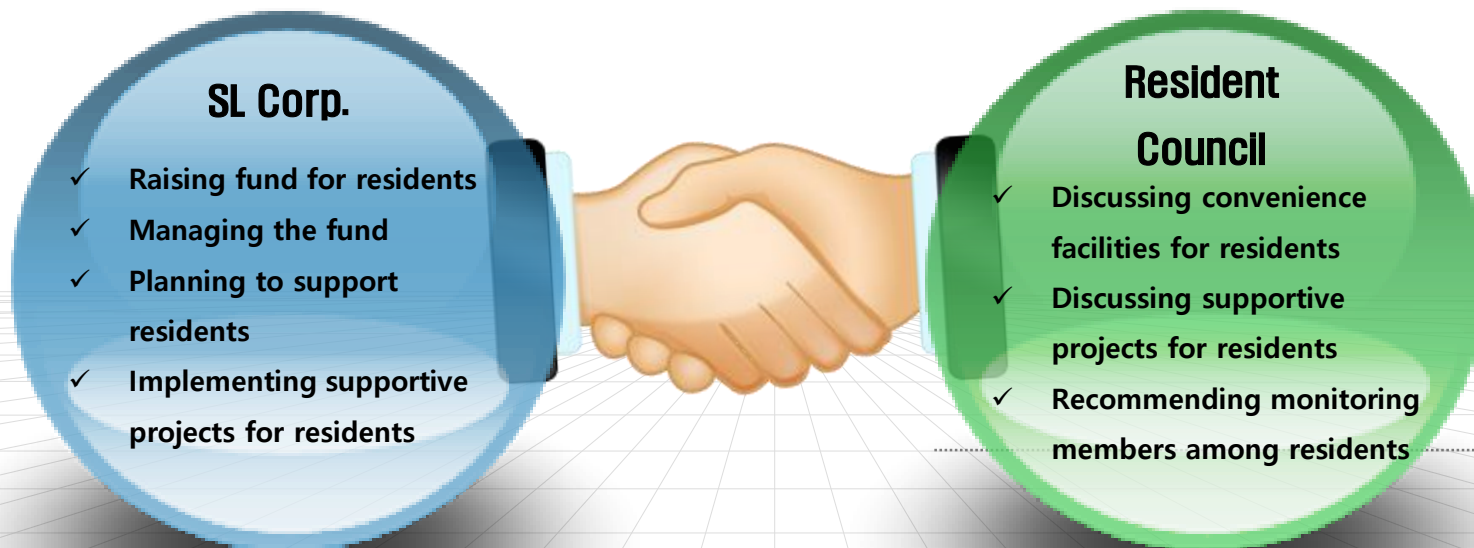


II. Relationship with Residents

■ The relationship with residents

- SL Corp. laid the groundwork for participation of residents by enacting the law on 「Promotion of installation of waste disposal facilities and assistance, ETC. to adjacent area act」

The ways to support affected areas based on law



II. Relationship with Residents

■ RESIDENTS SUPPORT

- **Target : Residents within 2km radius (38,000 people)**
- **Fund : 10% of waste tipping fees (about \$ 10 million/ year)
for 38 thousand residents**
- **Examples : Regular medical check up**
 - Scholarships for students**
 - Sports Park (football, baseball, basket/volleyball, tennis, running track)**
 - Community Centers**
 - Multipurpose Senior Centers**
 - Discount of admission fees (golf & horse-riding course, swimming pool)**
 - Overseas Field Trip**
- **Others : Employment for various works**
 - (waste inspection, smell monitoring, gardening)**
 - Operating Snack bars during Festivals**

II. Relationship with Residents

Supporting public facilities



III. Main Business

Main Facilities



Sanitary Landfill/Waste Management System

Eco-Friendly Sanitary Landfill Operation

- Quick, Safe & Sanitary landfill operating system
- Eco-friendly Waste management technology



Leachate Treatment System

Leachate Treatment Technology

- Design Capacity : 6,700 ton/d
(Daily processing amount: 4,300 ton/d)
- Aim to 'Zero discharge Leachate Treatment System'



Solid Recovered Fuel (SRF) Plant

SRF Plant

- Design Capacity: 200 ton/d
- Converting wastes into fuel and energy



Clean Development Mechanism (CDM) for Recycling Landfill Gas

The primary purpose of CDM is to assist energy independence by converting waste into new and renewable energy and to actively respond to global warming and climate change by reducing greenhouse gas emissions while improving environmental conditions such as local air in areas surrounding landfill.

CDM Project for Recycling Landfill Gas

- UNFCCC Issue more than 900,000 CO₂ tons of CERs annually to SL Corp.



Sludge Recovery Plant

Sludge Recovery Plant

- Capacity : 200 ton/d
- Turning sewage sludge into fuel



Food Waste Effluent Biogas Plant

- Capacity : 500 tons/d
- Anaerobic digestion-based biogas production(25,000m³/day)

III. Main Business

Integrated carry-in Management System

Household Waste,
Construction Waste,
General industrial Waste

Enter Weighbridge

Auto vehicle recognition, gross weighing & waste character inspection

Incoming

Random selection of incoming vehicles for careful inspection (penalty and shutout for illegal waste)

Landfill Site

Location tracking systems on every vehicle to be controlled from entry to exit via the landfill site wide Wi-Fi network

Joint inspection by local resident guard and SLC staff

Unloading waste



prevention of Environmental pollution

Integrated Carry-in Management System

Perfect carry-in and Investigation

Advance prevention of illegal waste

Unfolding, tramping and compacting, soil covering



Car wash



Enter Weighbridge

Auto estimation of waste incoming amount



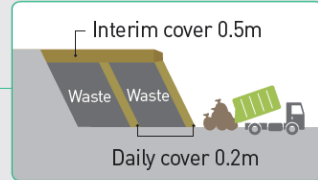
Exit



III. Main Business

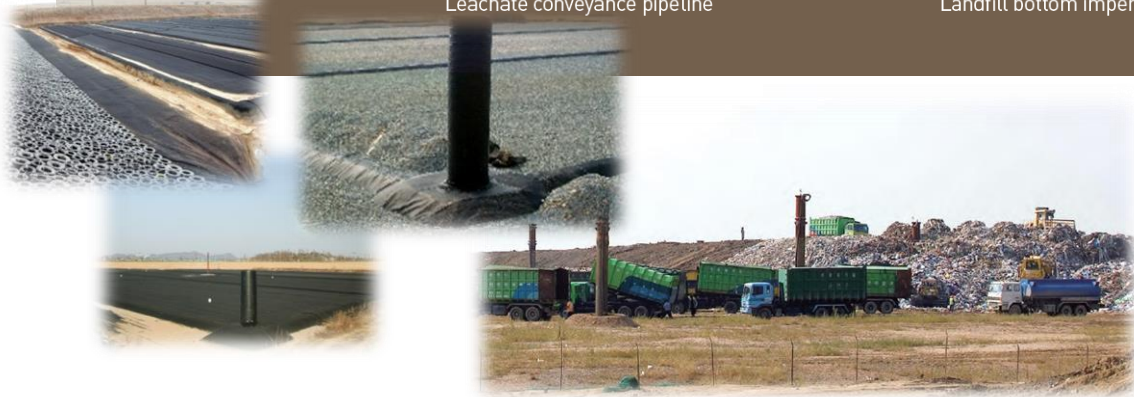
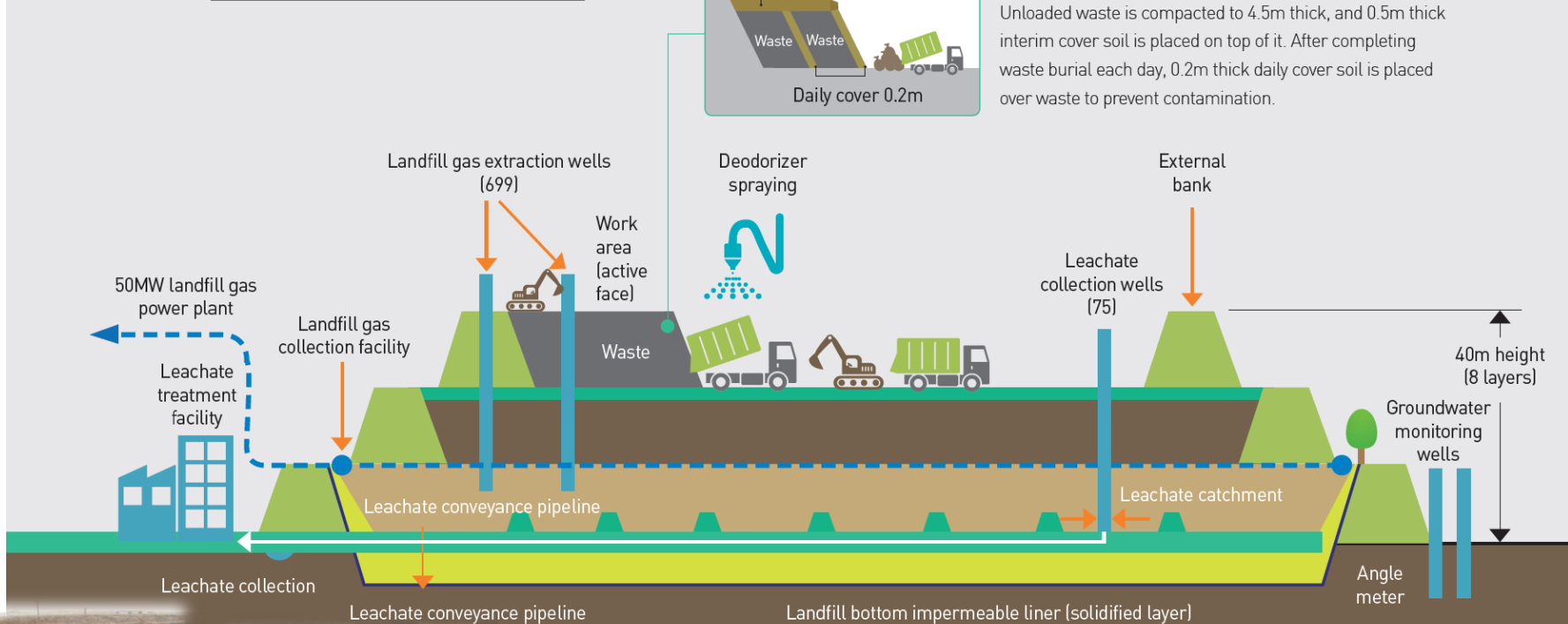
Eco-friendly Landfill

Landfill Site Cross Section

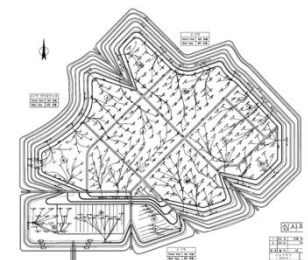


What is soil covering?

Unloaded waste is compacted to 4.5m thick, and 0.5m thick interim cover soil is placed on top of it. After completing waste burial each day, 0.2m thick daily cover soil is placed over waste to prevent contamination.

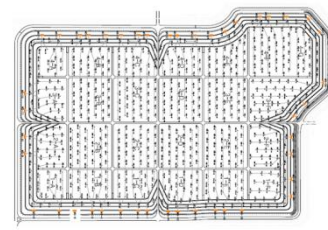


1st Landfill Site



Area : 4.0 million m²
 LFG Collection pipe : 329 EA
 Manifold Station : 31 EA

2nd Landfill Site



Area : 3.6 million m²
 LFG Collection pipe : 699 EA
 Manifold Station : 44 EA

III. Main Business

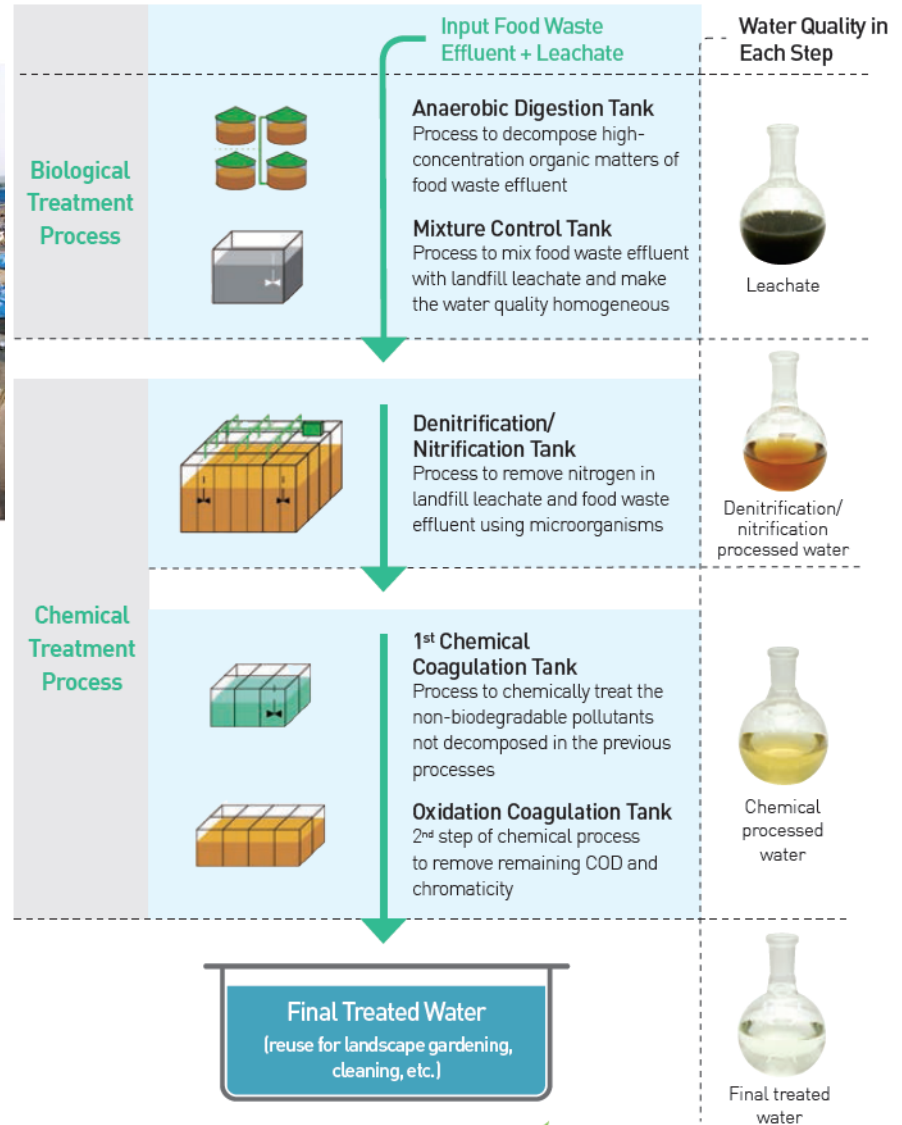
Leachate Treatment Plant



Biogas Power Generation

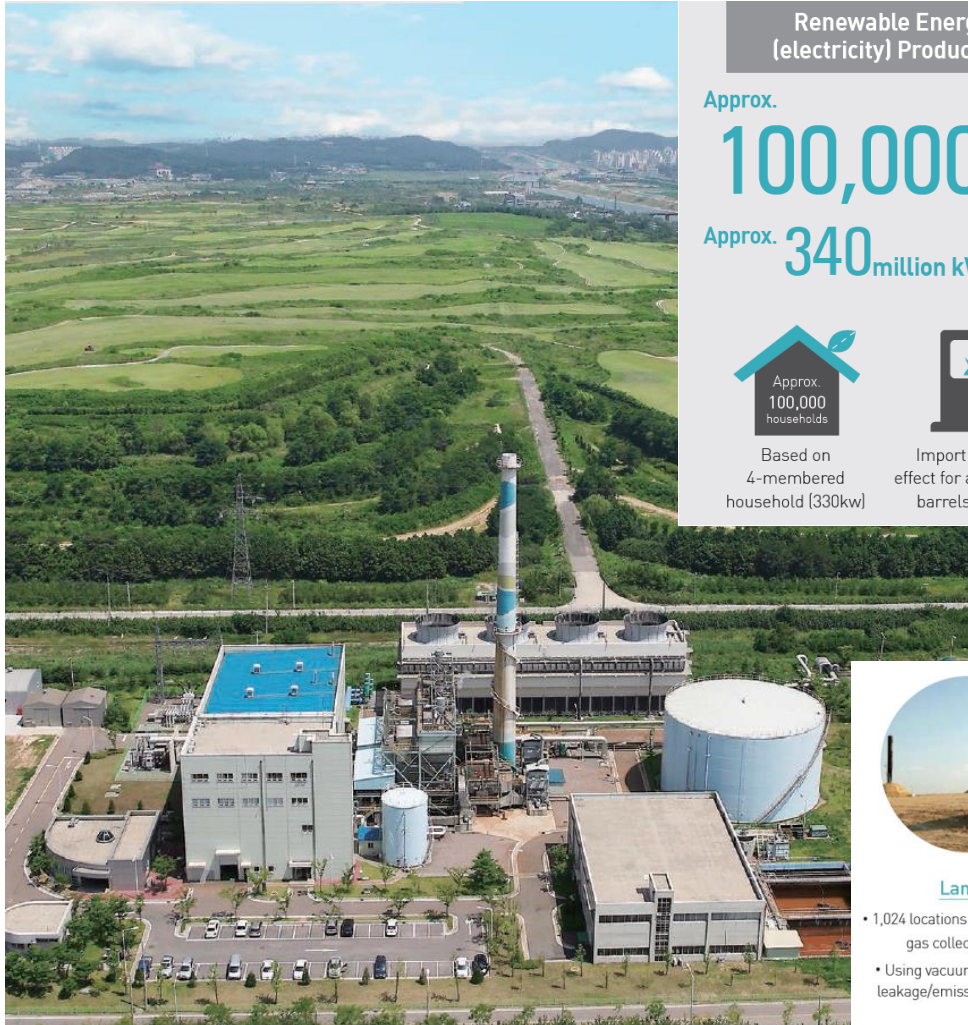
Methane generated in the anaerobic digestion process is refined and supplied to fuel the 2.4MW power plant and automobiles for establishing a resource recycling system.

Leachate Treatment Process



III. Main Business

WTE Facilities



Renewable Energy (electricity) Production

Approx. **100,000** households
 Approx. **340** million kWh each year



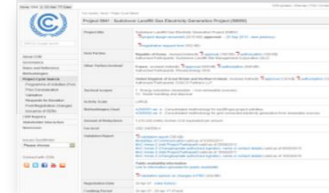
Approx. 100,000 households
 Based on 4-membered household (330kw)



Import substituting effect for approx. 400,000 barrels of crude oil

Carbon Emission Right

800,000
 tons of CO₂ each year



Power Sales Revenue

Approx. **33** million USD each year



Landfill gas recycling for the CDM project
 Registered as a CDM project with the UNFCCC in the landfill gas application area for the first time in Korea



Landfill

- 1,024 locations including vertical gas collection pipes
- Using vacuum pressure, gas leakage/emission prevention



Landfill Gas Collection/Transfer

- Use of high-pressure blower.
- Approx. 308km-long gas conveyance pipelines



50MW Landfill Gas Power Generation

- One 50MW unit, 1.2 million kWh/day power generation
- 6 units in total, 680m³/min. gas combustion

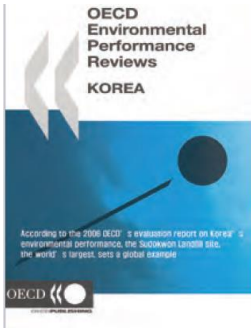
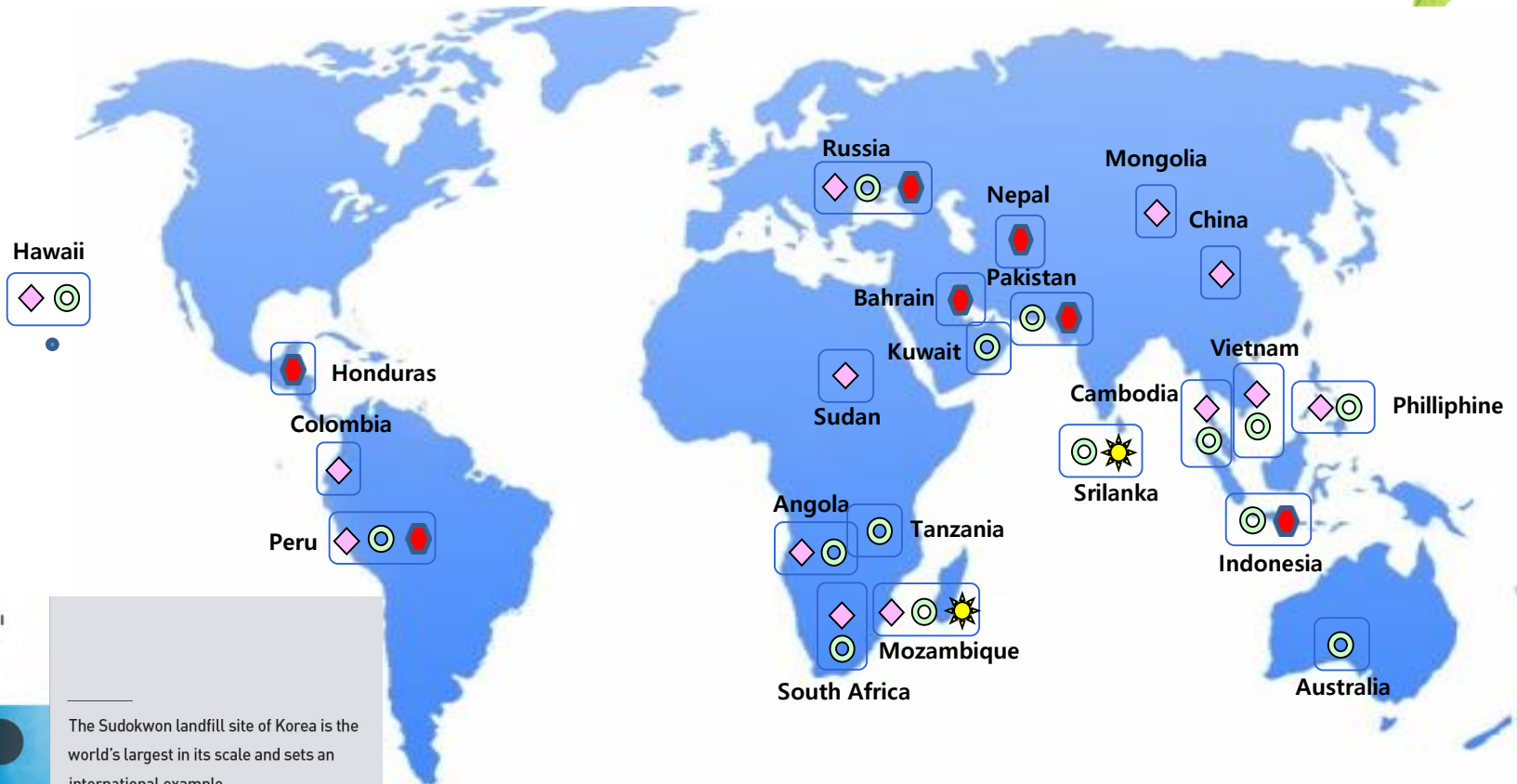


Power Transmission

III. Main Business

Overseas Business

- ◆ MOU
- ◎ MP/FS conduction
- ☀ Construction/operation
- ◈ New project development



The Sudokwon landfill site of Korea is the world's largest in its scale and sets an international example.

- OECD Environmental Impact Assessment on South Korea

III. Main Business

Case study



Joint Study on SWM in Punjab, Pakistan

- **Project Outline**
 - ✓ Period : Jun 2006 ~ Jul 2007 (13 months)
 - ✓ Financed by KOICA-WB
 - ✓ Target Area : Punjab in Pakistan
 - ✓ Conducted by SL Corp., KEI & Sunjin Eng.
- **Aims**
 - ✓ To develop technical, institutional, financial, private and public involvement frameworks to improve WM
 - ✓ To review existing WM system
- **Work Scope**
 - ✓ Pre-FS for SWM system for Lahore and Sialkot
 - ✓ Promotion of public awareness of SWM
 - ✓ Workshops and training programs



Training Workshop in Korea



III. Main Business

Case study



Integrated Waste Management System, Sri Lanka

- **Project Outline**
 - ✓ Project Period : Sept 2008 ~ Jul 2015
 - ✓ Capacity : Landfill 20,000m², Leachate treatment facility 40 ton/d
 - ✓ Financed by KOICA(Korea International Cooperation Agency)
 - ✓ Cost : \$6million - \$1.5million(Sri Lanka), \$4.5 million(Korea)
- **The Role of SLC in the Project**
 - ✓ Expert dispatch for landfill construction and O&M
 - ✓ Construction supervision as PM
 - ✓ Policy and O&M training in Korea
- **Project expected Effect**
 - ✓ The first Sanitary landfill in Sri Lanka
 - ✓ Expected to minimize the environmental damage caused by leachate, methane gas etc.
 - ✓ Methane avoidance effect by collecting and incinerating landfill gas



Construction Supervision



Training in Korea



Dompe Landfill Site

Case study



LFG Power Project & New Sanitary Landfill, Peru

- **Project Outline**
 - ✓ Daily waste generation in Lima : 7,918 ton (collection 87%)
 - ✓ Landfill size 107ha, waste in-take 1,500ton/d
 - ✓ LFG Utilization & Improvement of landfill O&M
 - ✓ **Bioreactor to increase LFG generation**
 - ✗ Oceanic climate (annual rainfall 0.5~4.4mm)
 - ✓ **Financed by KEITI(Korea Environmental Industry Technology Institute)**
- **History**
 - ✓ Environmental facility field trip (Sep 2011)
 - ✓ LOI between Lima City & SL Corp. (Sep 2011)
 - ✓ FS for LFG project & sanitary landfill (Mar 2012)
 - ✓ MOU between MOE & MINAM (Apr 2012)
 - ✓ Peruvian Delegation visit to Korea (Jun 2012)



III. Main Business

2014 Incheon Asian Games



III. Main Business

Wild Flower Complex : Flower Festival



Flower Festival (Chrysanthemum)

Flower Festival (Cosmos)

IV. Future plan

ECO Energy Town

Realization of Green Growth : Installation of 4 theme towns



Division	Waste Energy Town	Bio Energy Town	Natural Energy Town	Eco-Cultural Town
Size	• 10,400 t/d	• about 305 millionm ²	• about 30MW	• 35,000m ²
Project period	• 2009 ~ 2017	• 2009 ~ 2016	• 2009 ~ 2012	• 2010 ~ 2016
Cost (\$)	• 1,430.5 billion	• 24.5 billion	• 259.2 billion	• 33.3 billion
Key facilities	• RDF, sludge recovery plant Bio gas recovery plant, C&D waste recovery plant	• Bio diesel production, Service station, etc.	• Solar power plant, Wind power plant, etc.	• Research center, Exhibition hall, education center, etc.

IV. Future plan

Theme Park Project



Bio reactor test project (Zero discharge system)

Simple landfill



Multi-purpose hybrid type landfill



- **Period : 2013 ~**
- **Cost : \$2.89million**
- **Method : Pumping leachate up to the top of the landfill**
- **Injection amount : 220 ton/ day**

- ✓ Prevent environmental impacts from polluting stream nearby
- ✓ Save leachate treatment cost and shorten stabilization period
- ✓ Take more LFG to produce electricity
- ✓ Help us use the land earlier

THANK YOU

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