

PPP Framework for Sustainable Development & Investment in Wastewater Management

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KOLON WATER & ENERGY

T O T A L W A T E R S O L U T I O N P R O V I D E R



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A BOUT KOLON

- Established in 1954
- Over 14,000 Employees with 34 Subsidiaries
- 16 Branches, 25 Regional Offices worldwide
- Sales Revenue \$ 10 Billion USD (2011)



Core Business Domains

Growth Engines

Chemicals & Advanced Materials



43%

US\$4.3b

- Chemicals & Bio
- Electronics materials
- Automotive products

Construction & Services



40%

US\$4.0b

- Engineering
- Construction
- Leisure
- Water

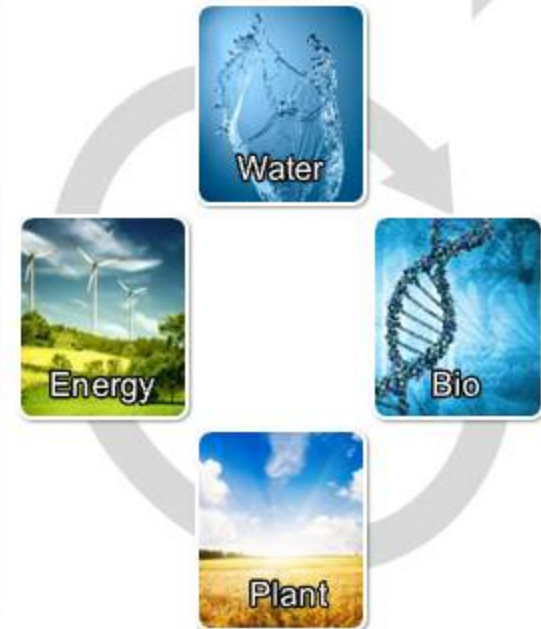
Fashion & Retails



17%

US\$1.7b

- Fashion
- Retail
- Premium goods



A large, white, sans-serif letter "A" is positioned inside a blue square that has a white diagonal line running from the top-left to the bottom-right.

ABOUT KOLON WATER

KOLON Water Business

Using synergies among KOLON subsidiaries, KOLON completed water business value chain to provide total water solutions for customers

A large, light gray circular graphic is centered on the page. It features a central 3D cityscape with the text "Total Water Solutions" overlaid. Three circular inset images are arranged around the cityscape: one at the top showing industrial water treatment facilities, one in the middle showing an aerial view of a city with green spaces, and one at the bottom showing a large-scale water treatment plant. Dashed lines extend from the right side of the circle to three text blocks: "Construction Business", "Operation Business", and "Materials & Equipments Business".

Construction Business

- KOLON Engineering & Construction

Operation Business

- KOLON Water & Energy

Materials & Equipments Business

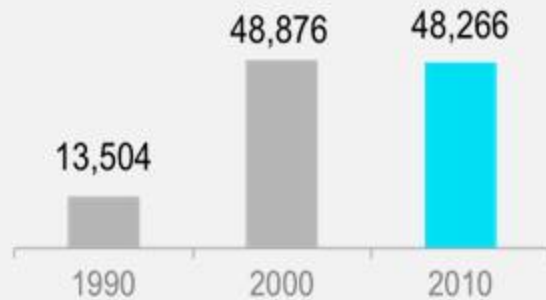
- KOLON Watertech
- KOLON INDUSTRIES
- KOLON LIFE SCIENCE
- KOLON EN-Solution

IN-WIN PPP FRAMEWORK

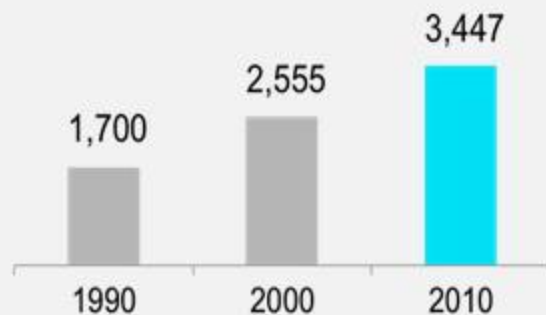
Government 'for Sustainable Development'

Increased demand for wastewater treatment facilities due to rapid economic growth

① Number of Companies



② Wastewater Capacity (1,000m³/day)



Value-added Approach

Rapid economic growth



Established six government owned industrial complexes

Individual management for WWT facility

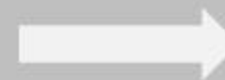


Demand for the integrated WWT facility

Establishment of the Environment Pollution Prevention Organization in 1987

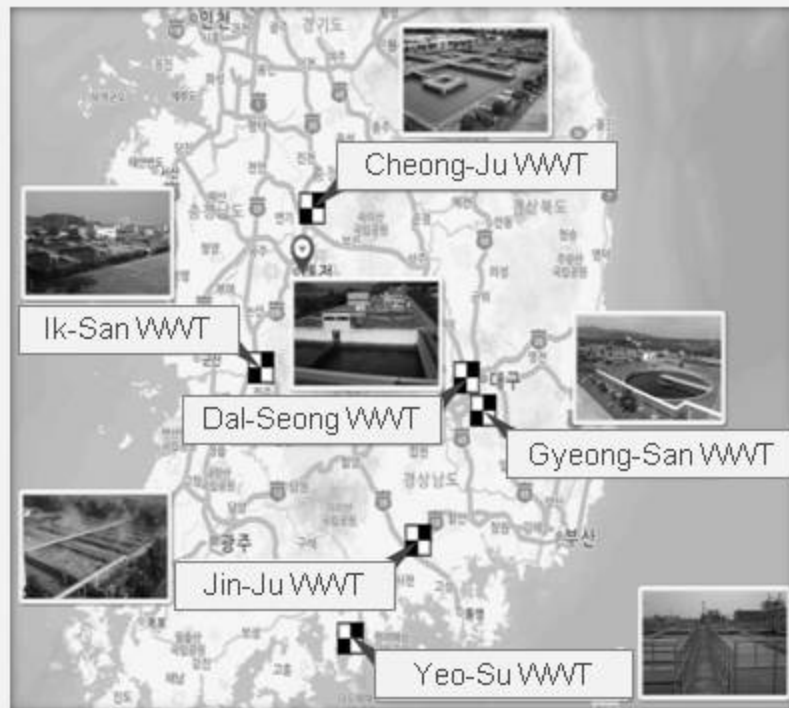


Individual Treatment



Integrated Solution

Government 'Suffering from Inefficiencies and Difficulties'
Six government owned industrial complexes' WWT facilities across Korea



- 1987: Installation of six WWT facilities
- 1998: Privatized facilities (acquired by current Kolon W&E)

What makes it difficult?

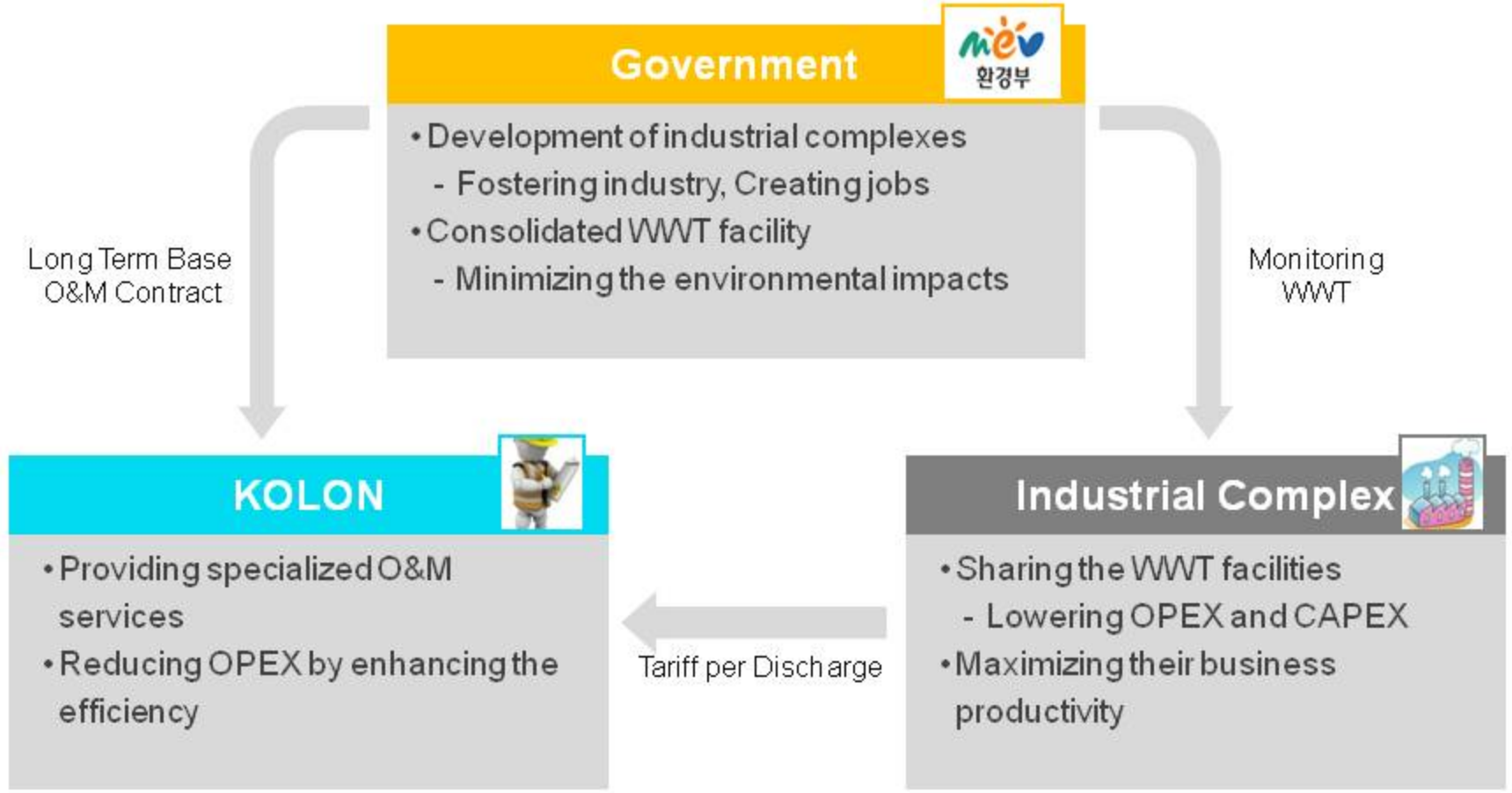
1. High variation in quality of water intake
 - Toxic, Heavy Metal such as mercury, cadmium, chromium, lead, and copper
 - Varied by time, season, and weather
2. Stricter government regulation than ever
 - Quality of water, TMS installation, Eco toxicity test
 - Strengthened monitoring of NGOs & Press
3. Limited management skill & know-how
 - Total capacity: 341,000 m³/day
 - Total number of the factory: 1,337

⇒ More Specialized O&M Expertise Required

W

IN-WIN PPP FRAMEWORK

Win-win PPP Framework of Wastewater Management in Korea
Government, individual companies, and KOLON, all have to be satisfied





UR SERVICES & SOLUTIONS

Our Services 'Optimization'

KOLON provides multidisciplinary services approach

COST OPTIMIZATION

- 40% reduction of cost per tonnage
- Man-hour: 290 → 187
- Cost: 449 Kwon/T vs. 270 Kwon/T

OPERATION OPTIMIZATION

- Integrated monitoring system
- 5C, TBM, OJT Training
- Risk management manual and on-site training

GREEN OPTIMIZATION

- Sludge reuse
- Wastewater reuse
- Energy self-supply

SERVICE OPTIMIZATION

- Technical consulting for factories
- Discharge stabilization
- WW source risk management



OUR SERVICES & SOLUTIONS

Our Solutions 'Out-think'

KOLON promotes sustainable investment business model by fully capturing sludge & wastewater reuse and energy generation opportunities

Sludge Reuse

Consolidated sludge recycle facility(under construction)

- Preventing overlapping investment through total sludge treatment solution



Water Reuse

WW reuse with advanced treatment

- Providing competitive cost to industrial complex
- Maximizing the usage of limited resources



Energy Self-Supply

Initiating energy self-supply business

- Solar & Hydraulic power generation
- Heat recovery system
- High efficiency of digester chamber

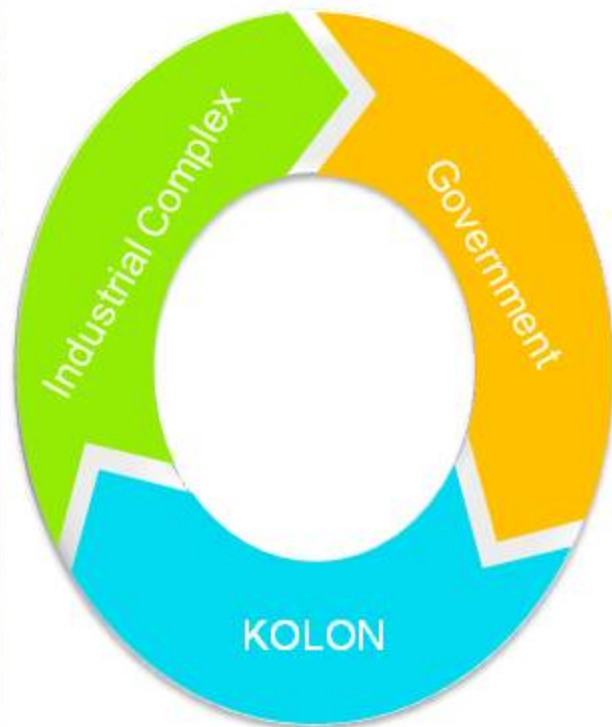


REDUCING COST → MAKING PROFIT

Achievements

40% Cost Reduction & Stabilized Water Quality

Government & individual companies have accelerated the sustainable development while KOLON has expanded its business through the sustainable investment



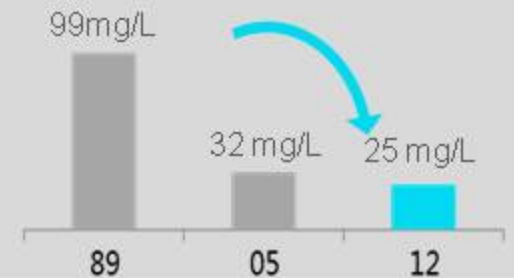
Industrial Complex

- Reducing WWT costs
- Focusing on productivity

Government

- Minimizing investment through integrated treatment facility
- Stabilizing water quality

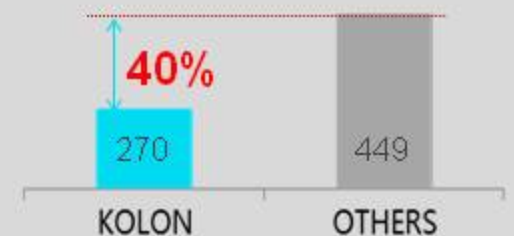
Result of outflow COD (Nakdong River)



KOLON

- Operating and managing about 804 treatment facilities('12)
- Contributing the reduction of treatment cost

KWON per Tonnage(Kwon)



R

ECOMMENDATIONS

How to Motivate Private Sector For large scale projects, we shall plan & invest together and assign construction & operation to private sectors

	Sustainable Development	Sustainable Investment
Public Sector	<ul style="list-style-type: none"> • Strengthening policy for its environment • Consulting with private sector 	<ul style="list-style-type: none"> • Implementing business friendly policy • Developing sizable projects which private sector can maximize the effects of innovation • Sharing credits for private sector to do project financing
Private Sector	<ul style="list-style-type: none"> • Stabilizing water quality • Providing not only technologies but also state-of-art solutions 	<ul style="list-style-type: none"> • Innovating cost-efficient technologies • Developing sustainable PPP framework

Thank you!

