# Application of Smart Grids to Drinking Water Monitoring





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# Why did we start Smart Water Grid in ROK?

### Drinking rate of tap water is very low (even though tap water is safe)

- ✓ Domestic tap water drinking rate is 5% (extremely low compared to US (56%) or EU (#50%)
- ✓ Social expenses for bottled water and water purifiers > KRW 2 trillion/year in ROK

<b>Types of Drinking Water</b>								
Directly di	rinking Tap-water		5.4%					
	Bottle water		_	15.19	%			
	Etc.(boiled water)	4	_			33.0%		
Us	sage of water purifier	ļ					9 46.5%	
		0%	10%	20%	30%	40%	50%	

2013 Tap water satisfaction survey result (tap water promotion council)



\* Chosun Ilbo and TV Chosun - 'What Water Is Safe?' (2013)

#### Social cost > US(\$) 2 billion/year





### What did we find?



# **Considerations for Solutions**

- People want Healthy Life → Priority to Welfare (more government budget allocated as welfare budget)
- People want Healthy Food (price 2-3 times > ordinary product)
- People/Politician think Welfare is providing \$
- Fresh Air / Clean Water = Basic Welfare (# \$)
- Reconsideration to supply drinking water (welfare = public water supply system inexpensive and reliable)





## Water Welfare Approaches Needed

#### Welfare

- Policy to increase life quality Achieve Happiness for All
- Welfare and Related Water Requirement

Division	Types of Life Quality	Related Water Requirement	Targets	
Medical & Food	Healthy Life	Contribution to Health Enhancement	Mineral	
Security, Justice & Public Peace	Safe Life	Water Security & Pollutant Removal	Clean & Safe	
Housing, Environment & Resources	Refreshing Life	Reliable and Comfortable Drinking	Temperature & Confidence	
Public Service, Traffic, Communication & Education	Convenient Life	Enough Water Supply & Sewerage Services	Comprehensive Service from Source to Tap	
Culture	Pleasant Life	-	-	





### Water Welfare Approaches: a Paradigm Shift



# **Concept of Smart Water City**



# SWG Pilot Project in Paju City



# First Year Pilot Project in Paju City: Contents



#### All procedures for water quality management

- Installation of measuring instruments for water quantity and quality management
- Monitoring and controlling the entire process with water-NET
- Establishment of re-chlorine facility to improve taste of water
- Pipe cleaning and installation of automatic drain in vulnerable area





# Third Year Pilot Project in Paju City: Outcome

Direct drinking rate of tap water

Average direct drinking rate of tap water reached 36.3% in all regions of Paju

Increase of direct drinking rate of tap-water  $(1.0\% \rightarrow 19.3\% \rightarrow 24.5\% \rightarrow 41.5\%)$ 

- Direct drinking rate: (before)  $1.0\% \rightarrow (after) 41.5\%$
- Direct or indirect (boiled) drinking rate: (before)  $36.3\% \rightarrow (after) 67.5\%$





# Regulations, Systems, Technologies and Services for SWC



# **Recommendation for Effective Application**

### For successful SWG project:

- Before starting the project: undertake customer survey to identify issues, expectations, and possible solutions
- Select a test-bed area; identify improvement needed in the system (from Source to Tap)
- Prepare step-by-step improvement plan (within 2-3years) based on economy, infrastructure, and ICT facilities
- Schedule from beginning: planning, design (basic and derailed), application (or construction), and operations



