

Future Proof City : Busan Eco-Delta Smart City



Korea Water Resources Corporation

Dr. Jeonghyeok Park

Contents

- 1 K-water
- 2 Busan Eco Delta City
- 3 Busan Eco Delta Smart City

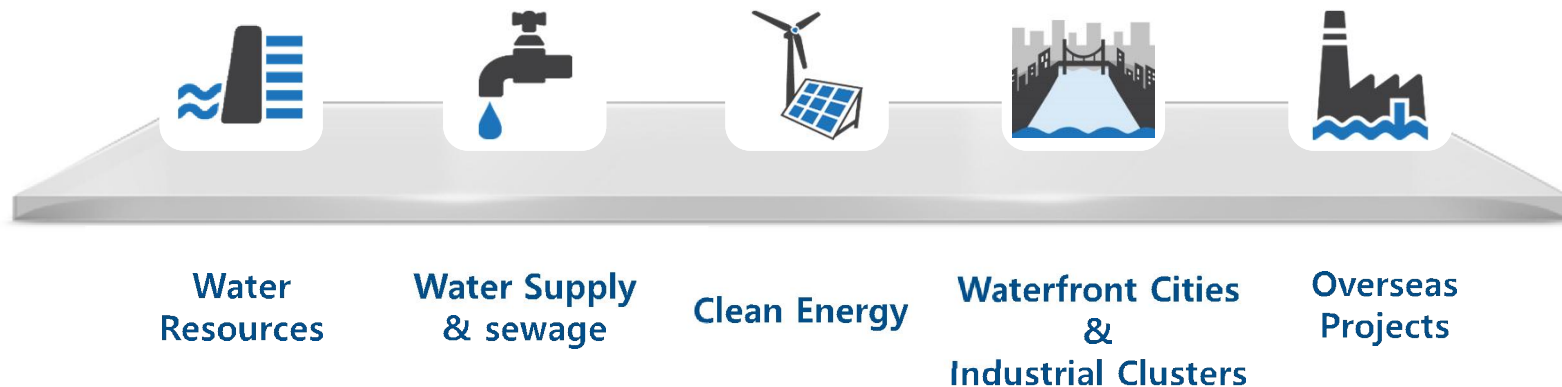
K-water

About K-water

**A major water-managing public corporation in Korea
with a history of fifty years of water management**

Established in 1967

Total Water Service Provider



K-water's Vision

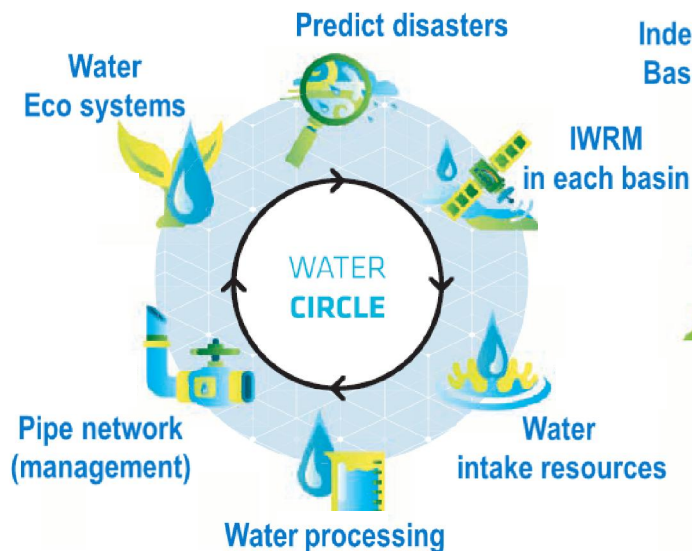
Water-specialized company capable of providing total water management service throughout **the water cycle**

with a history of over 50 years of water management (established in 1967)

Building an optimized hydrological system for the world

Adding value through the creative use of water

Providing water service worldwide for the betterment of humanity



K-water's Waterfronts Development

- 1960s** K-water's waterfront developments started
- 1970s–1990s** Industrial district developments & played key role in the industrialization process in Korea
- 2000s** specialized in developing waterfront cities as a new business model
- At present** K-water's various waterfront assets becomes economic and socio-cultural engine for (re)vitalizing cities in Korea
- City** Sihwa Waterfront City, Ara Waterway, Busan Eco Delta



Dam



Lake



River & Weir



Canal & Harbour

Busan Eco Delta City

Busan Eco Delta City



Location	Gangseo-gu, Busan Metropolitan City
Area	11.77 million m ²
Period	2012~2023
Population	75,100 (30,000 households)
Developers	Busan Metropolitan City, K-water, Busan Metropolitan Corporation

1. Ecological waterfront city



2. Global cultural waterfront city



3. Self-sufficient & waterfront city



Waterfront City

Waterside environment

Three Waterways with reliable water flow provide a perfect ground for developing an eco-city based on European references



K-Venice (Semulmuri)



Semulmuri artificial waterway



Main waterway street



Ecological wetland park



Bird feeding ground



Marina Village



Eco Village

Busan Eco Delta Smart City

Introduction to Eco Delta Smart City and locational advantages

A city where the ecological environment around the three rivers and the key technologies of the 4th industrial revolution are in harmony

Busan Eco Delta City(EDC)

- Location : Gangseo-gu, Busan
- Area : 11.77 km²
- Schedule : 2012-2023
- Target population : 76,000 (30,000 households)
- Focus : Housing, commerce, R&D, logistics, etc.
- Developer : Busan Metropolitan City, K-Water, Busan Metropolitan Corporation

National Smart City Pilot Project

- Area : 2.2 km²
 - * 2.8 km² including the health care cluster
- Target population : 8,500 (3,380 households)
- Advantages : Multi-functioning area including major city features such as housing, commercial and R&D ideal for application of cutting-edge technologies



Vision

Bring forward futuristic living where the nature, people and technology come together

Key Value

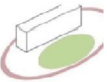


Foster 4IR technology & improve quality of life

Busan Eco Delta Smart City aims to adopt the Fourth Industrial Revolution technologies to lead future industry and allow citizens to benefit from fair opportunity and inclusive growth with increased quality of life in the areas of education, culture, safety and environment



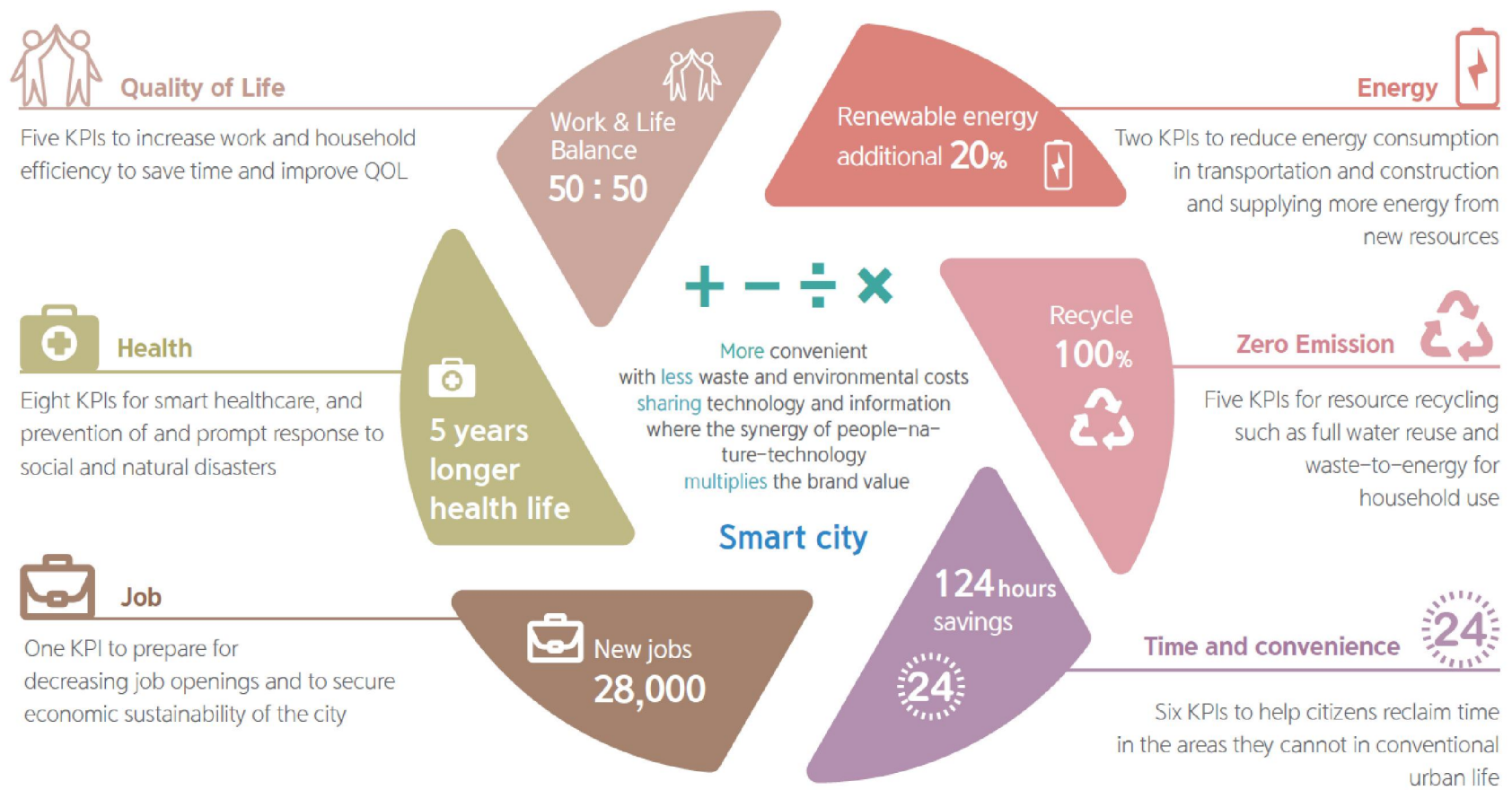
Vision & Key Values of Busan Eco Delta Smart City

Three Innovations for "Korean Smart City"

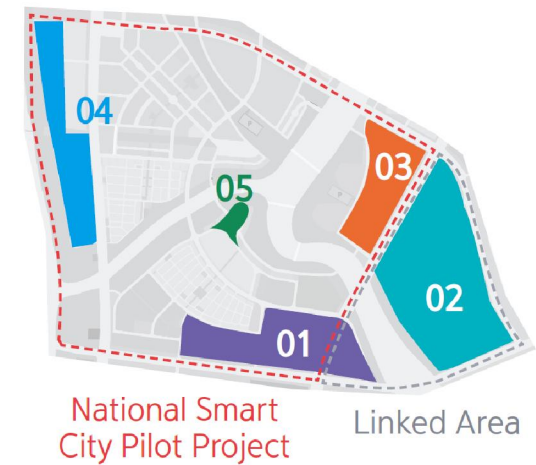
Three innovations	Process Innovation		Technological Innovation		Governance Innovation	
Six objectives	Follow-up & management for sustainable growth	Citizen engagement	Improved urban design	Smart 4IR technology	BIZ model for management & operation	Innovation support system
As-Is	Special purposed, short-term projects (no index)	Government-led, top-down (Selective decision making)	 (Structure-focused)	Uses mature technologies that are currently available (Technology-oriented)	Government-led projects (development & operation) (Limited private sector involvement)	Universal support to minimize conflict of interest (Conventional frame)
To-be	Mid-to-long-term projects (with performance index)	Society-led, bottom-up (open to various opinions)	 (Environment/people-focused)	Uses 4IR technologies (Platform-oriented)		Focused support for future-ready industry (technology) (Legal system for innovations)

Six Objectives

Quantitative overview of six objectives and twenty-seven KPIs for Busan Eco Delta Smart City



Smart City Planning



Five-innovations cluster to create decent jobs



01
Open municipal innovations cluster
(199,000 m²)

Public office cluster for relevant agencies under Busan City



02
Healthcare & robot cluster
(450,000 m²)

A cutting-edge medical center with medical, health, research, and residential features



03
Water-thermal energy cluster
(122,000 m²)

Water-thermal energy infrastructure that uses wastewater



04
Water energy science village
(53,000 m²)

House blocks with water-nature-energy technologies



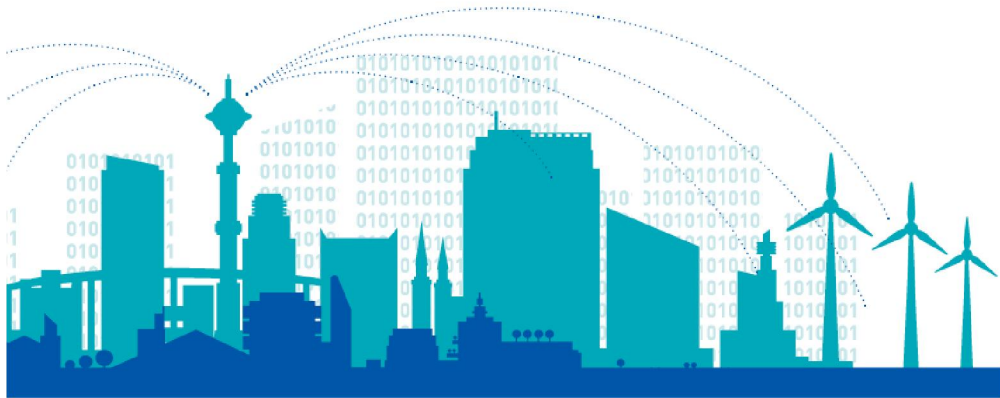
05
New Korean Wave AR/VR cluster
(21,000 m²)

Comprehensive culture space for Korean Wave featuring entertainment, F&B, and shopping

Sustainable Urban Innovations

Eco Delta Smart City Platform

Digital city platform	Open data collection– management–utilization
Augmented city platform	Real-time data convergence in both the digital twin and the real world
Robot city platform	Optimized for robotics development and applications



Conventional smart cities

Infrastructure–data–utilization process for each service

- Need separate investment & development to connect services
- High development cost
- Difficult to apply and validate new ideas
- Top–down development



Busan Eco Delta Smart City

Shared infrastructure elements between services

- Unrestricted convergence between services
- Reduction in the development cost
- The entire city can be used as a testing lab
- Bottom–up development

Ten Innovations

That Add Values to Urban Living



The people-led, bottom-up approach for field-specific innovations & the top-down approach for the 10 most important and influential innovations as strategic objectives

CITY-BOT

Robotics

for the basic livelihood security

- ① Rehabilitation and mobility assist bots
- ② AI assistant bots
- ③ Care bots

1



New lifestyle with robots

Various bot services experienced in daily life

- ① Valet parking bots
- ② Warehouse & transfer bots
- ③ Tutor bots
- ④ Checkout free stores
- ⑤ Robot trainers
- ⑥ Lower-limb rehabilitation robots

2



Supports for the development and utilization of robotics

Expansive shared infrastructure to make robotics accessible and affordable

- ① Shared bot infrastructure
- ② Testbed
- ③ Future robot concept house

3





LEARN, WORK and PLAY



LWP Infrastructure

Infrastructure for people to enjoy the combination of LWP activities

- ① LWP integration community centers
- ② Creator spaces
- ③ LWP infrastructure

1



Smart work and jobs

A new economic model for rapidly changing workplace of the smart era

- ① Future-ready smart work systems
- ② Supports for one-person producers & microbusinesses
- ③ Social economy and jobs

2



Community education

with cutting-edge technologies creating new learning opportunities within the community

- ① Community schools
- ② VR & AR education

3



City of happiness

New culture and infrastructure accessible throughout the city

- ① Urban sports
- ② Playable city

4



Smart-Intelligence

Intelligent smart city administration

AR-based AI operation and management

- ① AR-based operation and management
- ② AI powered civil services
- ③ Digital forum for public debate

1



Robotics for city maintenance

Effective city maintenance with robots

- ① Bot patrol, guide, and translation
- ② Maintenance bots e.g. for cleaning
- ③ Real-time survey bots

2



Autonomy with blockchain technology

Blockchain-based citizen engagement in decision making on important issues

3





Smart-Water



Precipitation monitoring & urban/water-related disaster response

Small-sized precipitation forecast radars and prepare for flooding and integrated water-related disaster response system

1



Low impact development (LID)

Customized green infrastructure at public facilities, lands, and buildings

2



Stream quality improvement

Eco-filtering system to improve the natural water source quality

3



Water recycling system

Highly advanced treatment for 100 water reuse

6



Smart water management (SWM)

ICT application in all water supply processes for live monitoring and remote control of water quality and quantity

5



Smart water treatment plant

Multi-story water treatment facilities for supplying freshly treat water from locations that are closer to users

4



Smart-Energy



Thermal differences into energy for heating and cooling

Utilizing rich water resource to produce heat energy for heating and cooling

1

Self-sufficient renewable energy

Complete energy self-sufficiency through reusable sources

- ① Fuel cell generation
- ② Eco-friendly heat supply system
- ③ Energy storage systems (ESS)

2

Zero-energy housing pilot

Zero-energy pilot village with 100 % energy self-sufficiency

3

Cross-city energy operation

Operating both heating and power supplies to reduce energy costs

4



Smart-Edu & Living



Smart education

New school systems to foster smart era capabilities

- ① AR education
- ② Smart school
- ③ Innovative education

1



365-day smart shopping & culture

City of 365-day smart shopping and rich culture

- ① Smart shopping district (131,000 m²)
- ② Free Wi-Fi, checkout free, bio-payment
- ③ Festival street

2



Smart home

Accessible from anywhere at any time providing convenient living experiences

3



AR-based City App

Access to every facility in the city with reservation options at fingertips

4



Smart-Healthcare

Personalized smart healthcare platform

Next-generation medical services focused on preventive care rather than hospital-based treatment

- ① Smart healthcare solutions
- ② Healthcare & big data center construction
- ③ Communication services for people to care
- ④ Introduction of health token concept with blockchain

1



Smart healthcare cluster

Advanced smart healthcare cluster that can contain 70 football fields (450,000 m²)



2



Future-ready medical service and real-world validation

Utilizing medical big data for accurate diagnostics and treatment

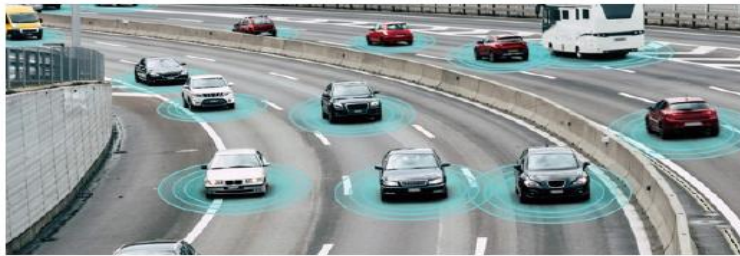
- ① Cloud-based hospital information system for precision medicine (P-HIS)
- ② AI-based precision medicine solutions (Dr. Answer)

3





Smart-Mobility



Smart roads

To prepare an intelligent traffic system for self-driving infrastructure and traffic flow optimization

- ① C-ITS infrastructure
- ② Smart traffic light system

1



Smart mobility

Mobility provided by autonomous shuttles and eco-friendly cars between the main places around the city

- ① Autonomous shuttle system
- ② Car sharing service
- ③ On-demand public transportation
- ④ Multi-service charging stations

2



Smart parking lot

Bot parking, smart parking, and shared parking lot system to minimize time spent on finding parking spot

3



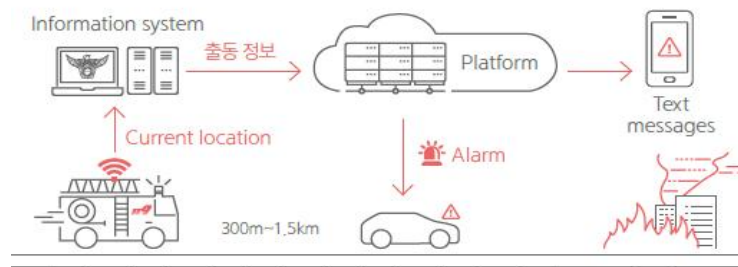
Last mile service

Personal mobility (PM) system for an easy short-distance transport without personal cars

4



Smart-Safety



Optimized emergency response system

Optimizing the process of detection, public notification, resources deployment, and control

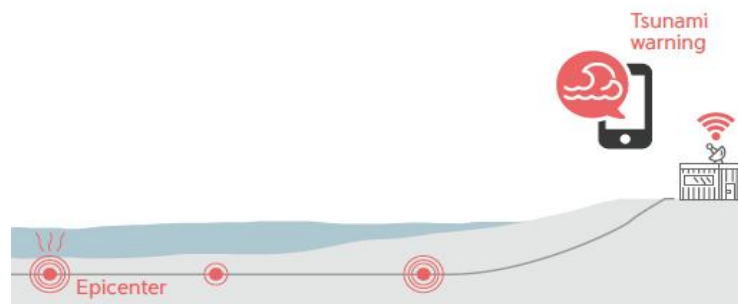
1



Smart evacuation agent

Optimized eventuation guidance system for indoor emergency events such as fire

2



Intelligent city monitoring system

Early detection warning system for earthquake and tsunami Instant psychoanalysis system (pilot)

3



Smart city safety management

Using the IoT infrastructure to provide smart safety services (climate, crime, road/traffic, fire, and security)

4



10 Smart park

Smart-Park



Smart Daily Park

Smart services in the parks provided for daily use



Wi-Fi zone



Smart media board



Smart resting area



Smart landmark park

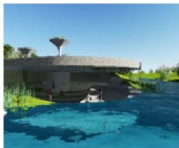
Smart technologies and innovative design implemented in a park



Air-purification tower



Water-spot



Habitat experience



Global Governance

Construction and operation of Eco Delta Smart City for **global governance** to share results and **grow together**

Three levels of global governance for Eco Delta Smart City:
State level, city level, and business/agency level

[State Level] Netherlands
[City Level] Eindhoven / Rotterdam

[State Level] Denmark
[City Level] Copenhagen

[State Level] Norway
[City Level] Oslo

[State Level] Estonia

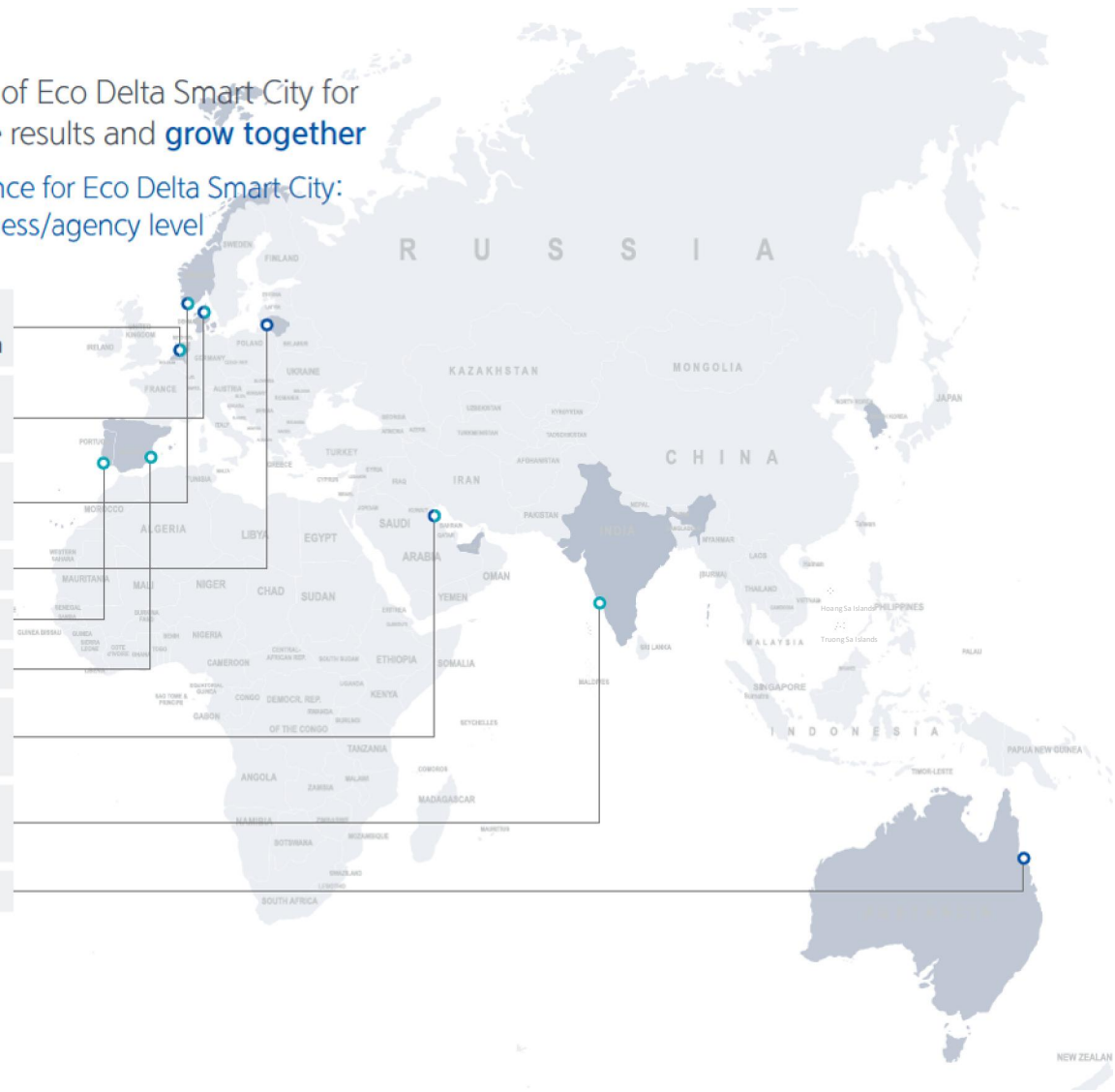
[City Level] Braga

[City Level] Santander

[State Level] UAE
[City Level] Dubai

[Urban expansion] India
100 Smart Cities Mission

[State Level] Australia



Thank you.