

Catalyzing Innovations and Digitization for
Safe, Sustainable, Resilient, and Inclusive Water Management

LAUNCH OF E-MARKETPLACE AND PUBLICATIONS

IIoT, AI & Cloud Technology
Intelligent Water Leakage Management System

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March 16, 2021

Water Intelligent Platform



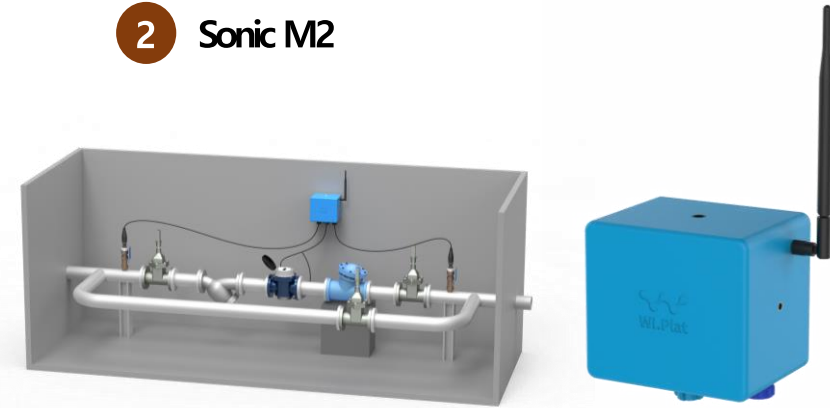


Intelligent water leak management system

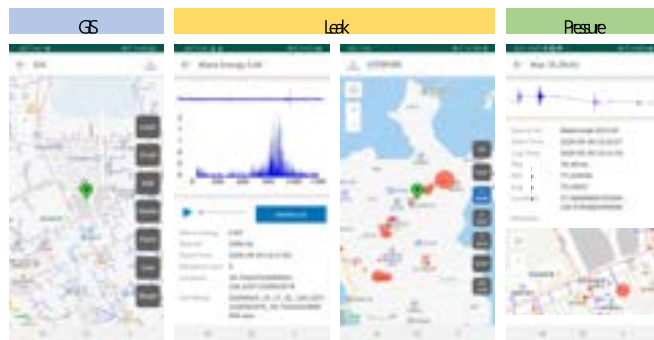
1 Sonic M1



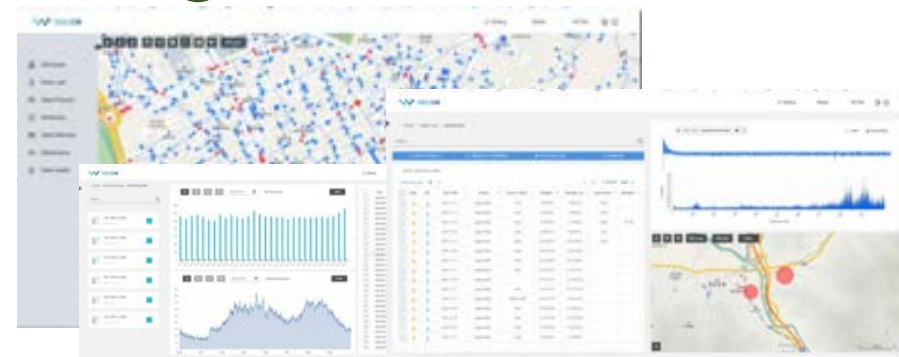
2 Sonic M2



3 NELOW_App



4 NELOW_Web



Major function & Capability of Sonic M1, M2

Sonic M1 (Handheld)

ARM MCU, Bluetooth 5.0, Lithium polymer battery

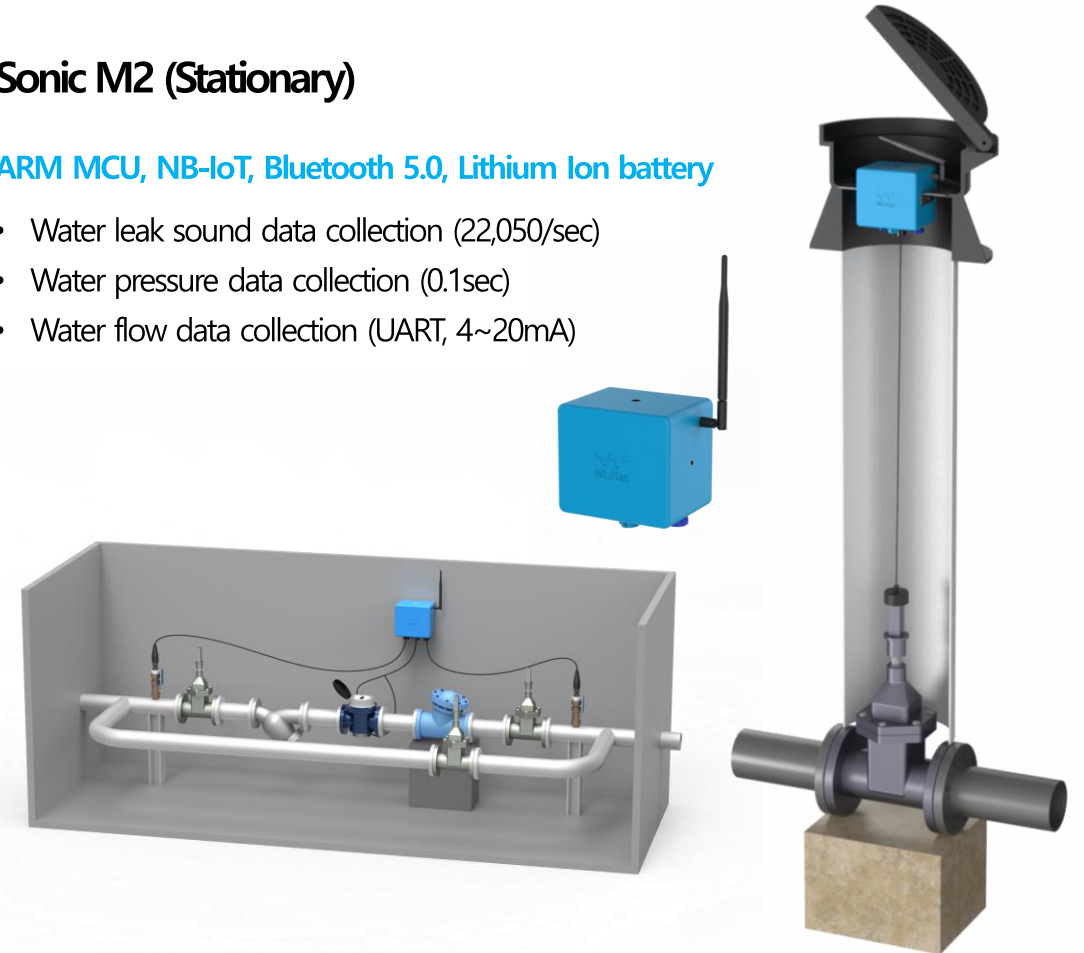
- Water leak sound data collection (22,050/sec)
- Water pressure data collection (0.1sec)
- Water flow data collection (UART, 4~20mA)



Sonic M2 (Stationary)

ARM MCU, NB-IoT, Bluetooth 5.0, Lithium Ion battery

- Water leak sound data collection (22,050/sec)
- Water pressure data collection (0.1sec)
- Water flow data collection (UART, 4~20mA)



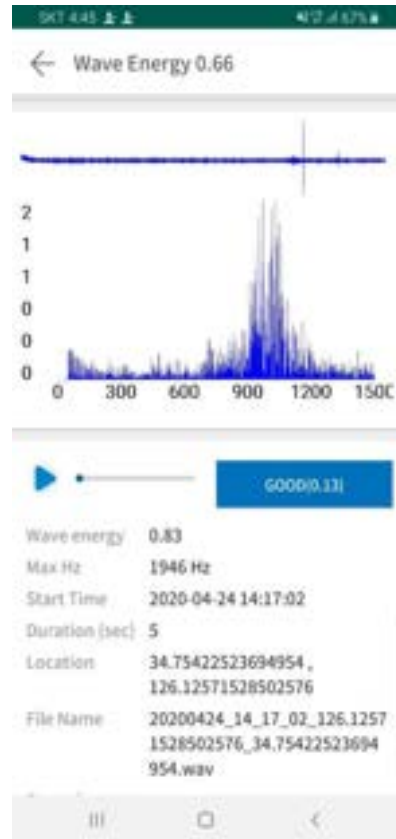
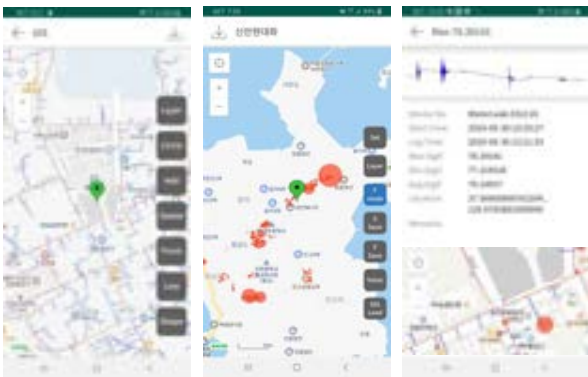
Major function & Capability of NELOW S/W (Good S/W Certified in Korea)

NELOW_App

Android 8.0

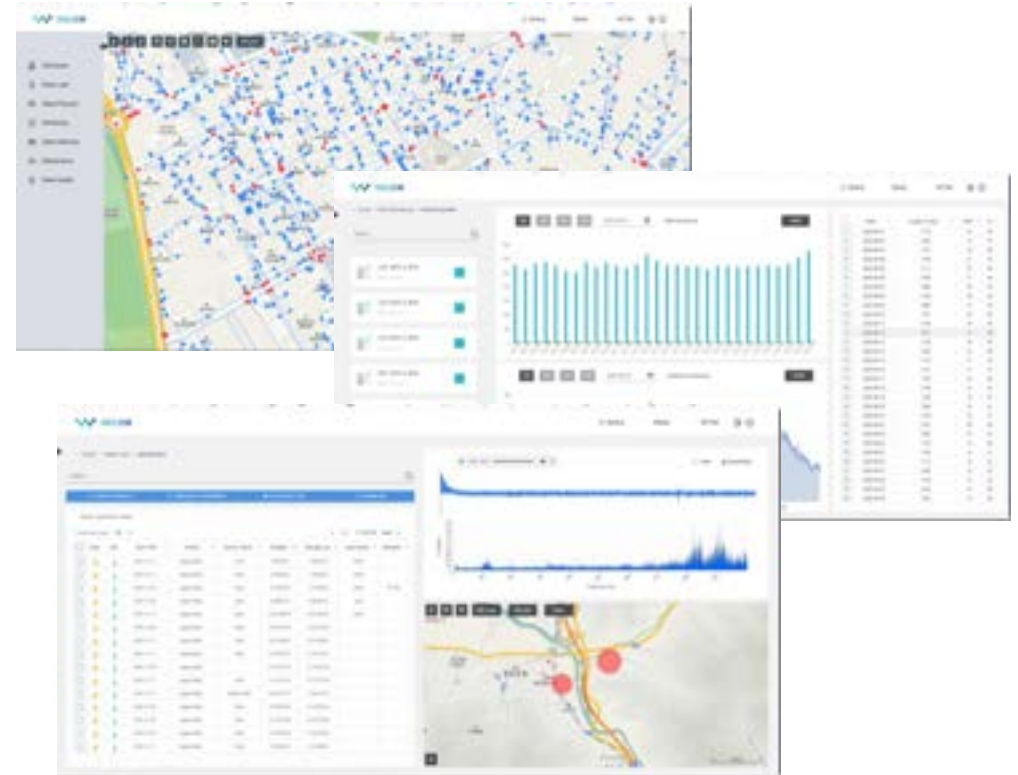
Major Function


- GIS management
- Water leak management
- Block monitoring
- Water pressure management
- Maintenance management



NELOW_Web

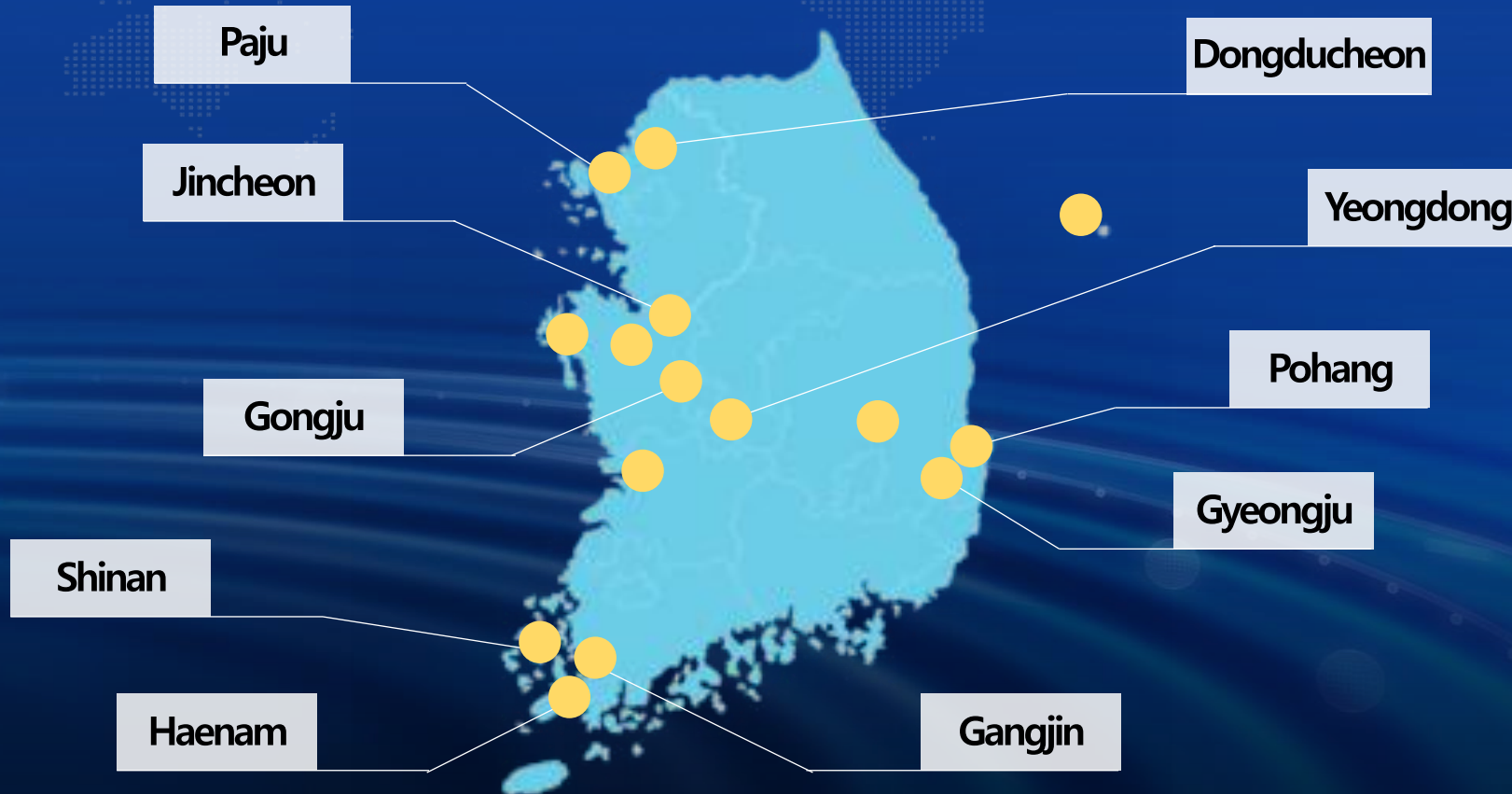
JAVA Script, Nodejs, Open Layers





Client collects water leak sound with Sonic M1

15 pilot projects have been completed successfully with K-water in 2020



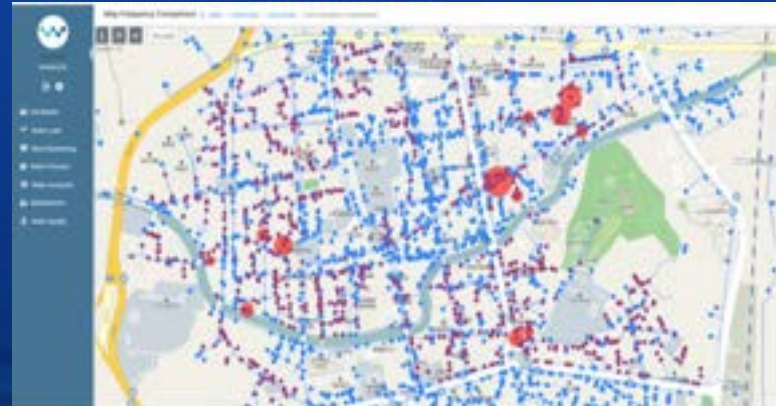
Naju City : Not-expert staffs found out 6 water leaks for 2 days (50,000 USD/year)

Chung Song City : Not-experts staffs found out 9 water leaks for 2 days (180,000 USD/year)

누수복구 결과 보고서

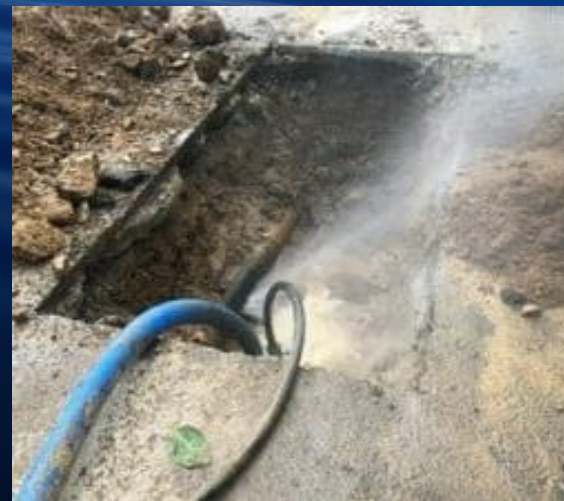
탐사번호	나주-1	관용도 [㉠]	급수관로	공사위치(소분류)	군남
복구일자	2010.10.14	누수관종 [㉡]	HVP	관경(mm)	15
누수부위 [㉢]	직관부	누수원인 [㉣]	관로노후	복구내용 [㉤]	직관교체
복구비(원)	450,000	수압(kgf/m)	4.0	누수부 직경	0.6
누수추정량 [㉥] (m ³ /일)	79.9	누수방지량 [㉦] (m ³ /년)	29,163	크기(cm) [㉧] 가로*세로	-
				누수방지역 [㉨] (천원/년)	12,686



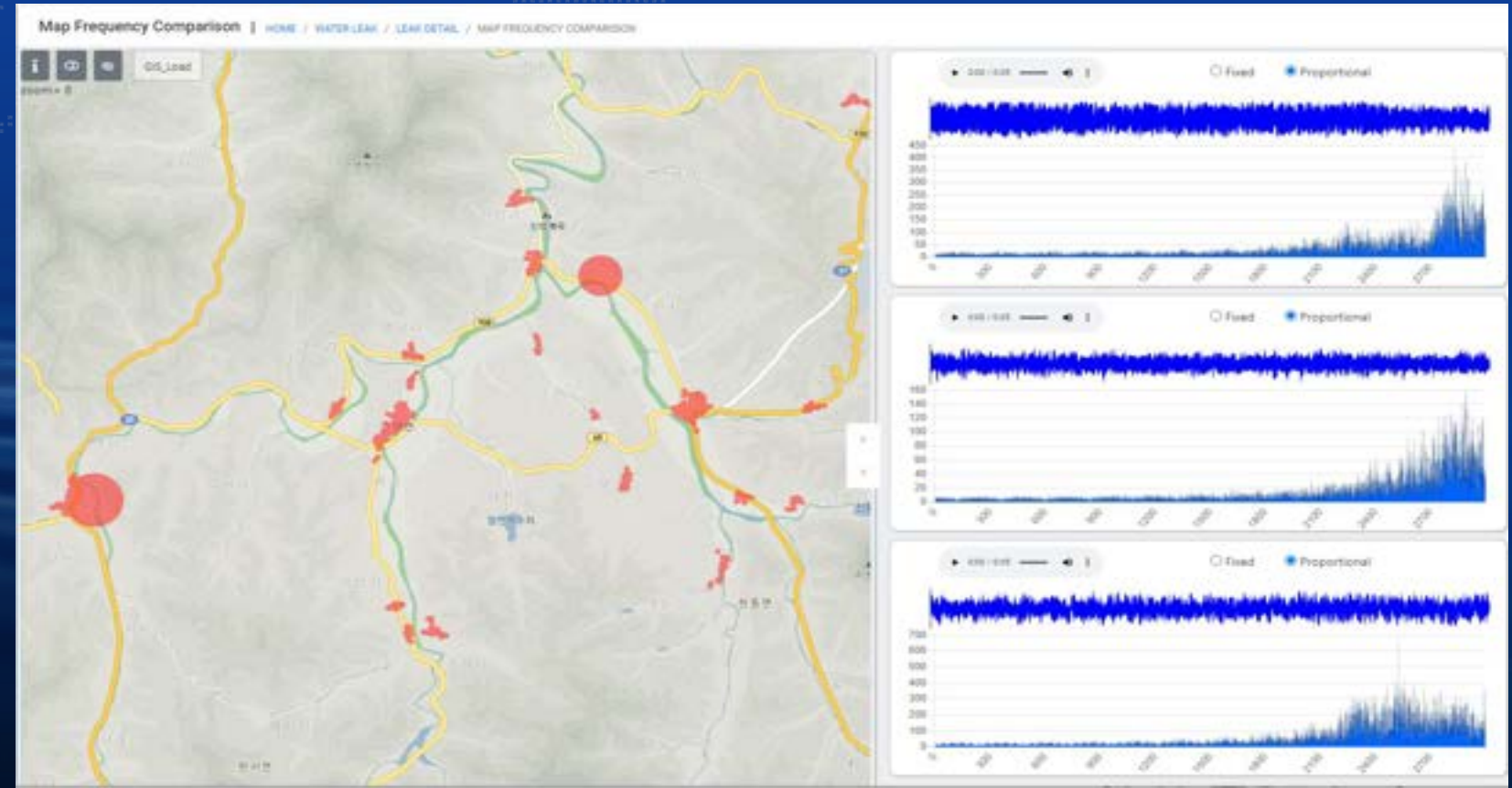



□ 청송 세부 적출현황

탐사번	위치	급수구역	적출No.	완료여부 (일자, 분량 l/h)
예천	고현교 하선형단 구간	진보	진보-01	완료(9.23, 6.0l/h)
	나실(가) 인근	부남	부남-01	완료(9.15, 3.0l/h)
	청운안길 15(배가)	청송	청송-01	완료(9.18, 0.8l/h)
	주방산로 30-2	청송	청송-02	완료(9.14, 3.3l/h)
거제	월악7길 8	청송	청송-03	완료(9.14, 3.7l/h)
	시장길 3-1	청송	청송-04	완료(9.15, 1.6l/h)
고령	진안서길 17	진보	진보-04	미성(분관, 민원 등)
	안현로 501	안덕	안덕-02	완료(9.17, 1.5l/h)
청송	덕리 485-1	청송	청송-05	완료(9.14, 4.0l/h)



Not-expert lady hired for water leak monitoring with the WI.Plat's solution in Chung Song, Korea





The ladies hired for Kim Je city water leak management

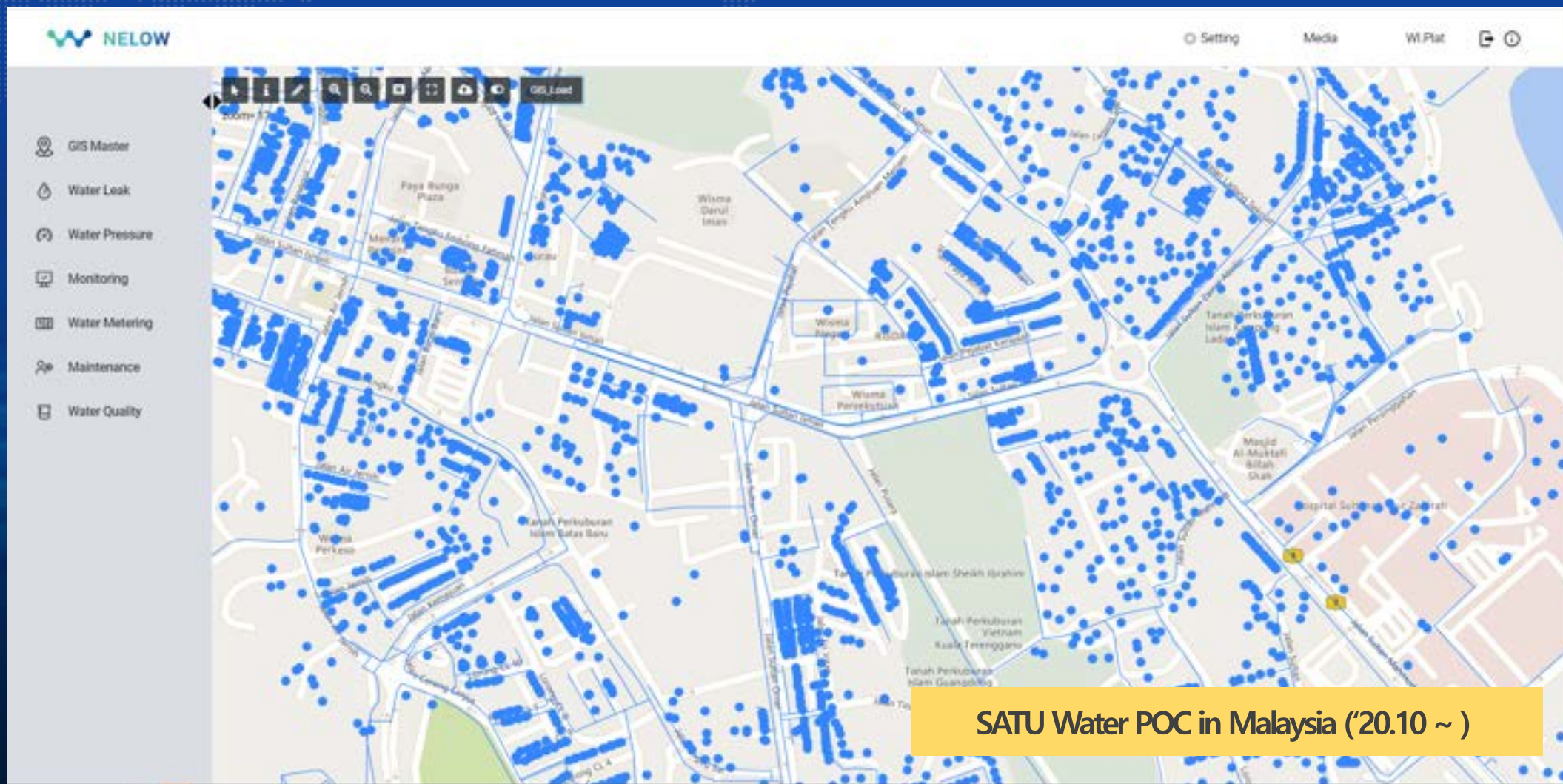


The ladies hired for Young Duck city water leak management

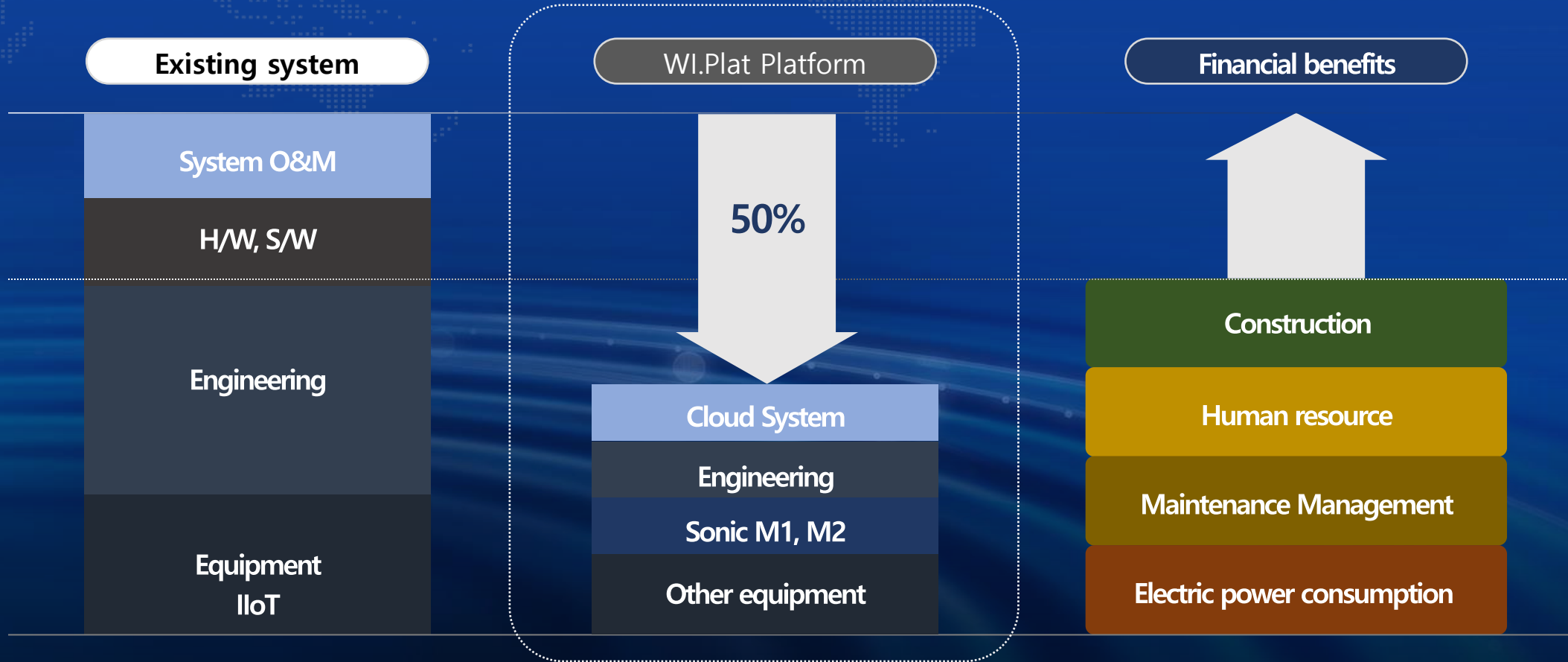


3 POC projects in Malaysia, Vietnam, and Indonesia

Proof-of-Concept



Financially sustainable solution by WI.Plat



Free 5-month POC project before the business contract

(Target site with under 2,000 households)

1. MOU (Target site selection)



2. Supply devices and S/W



3. Training (On-line)



4. MNF measure



5. Field activities (Detection, Recovery)



6. Performance Verification



7. PBP contract



Founded in March 2020 as a K-water start-up, Finalist of P4G Partnership, POC(Vietnam, Indonesia & Malaysia), Winner of various competitions



Experts in water and ICT industry



CEO

- K-water 23 years
- Global Marketing, AI
- Ph. D. of Mechanical Eng (ABT)



Vice & CTO

- Seoul waterworks 15 years
- WB, ADB Consultant
- Ph. D. of Civil Eng (US)



Marketing

- Water sector 10 years
- Overseas marketing
- Business strategy



Leak detector

- K-water 7 years
- Leak detecting expert
- Field assessment



S/W Developer

- C#, C++, JAVA, PHP
- 7 years in K-water
- system architecturer



S/W Developer

- JAVA, Vue.js
- Front end developer
- System designer



IIoT Developer

- IIoT engineer
- Firmware programmer
- Linux, C++



R&D Manager

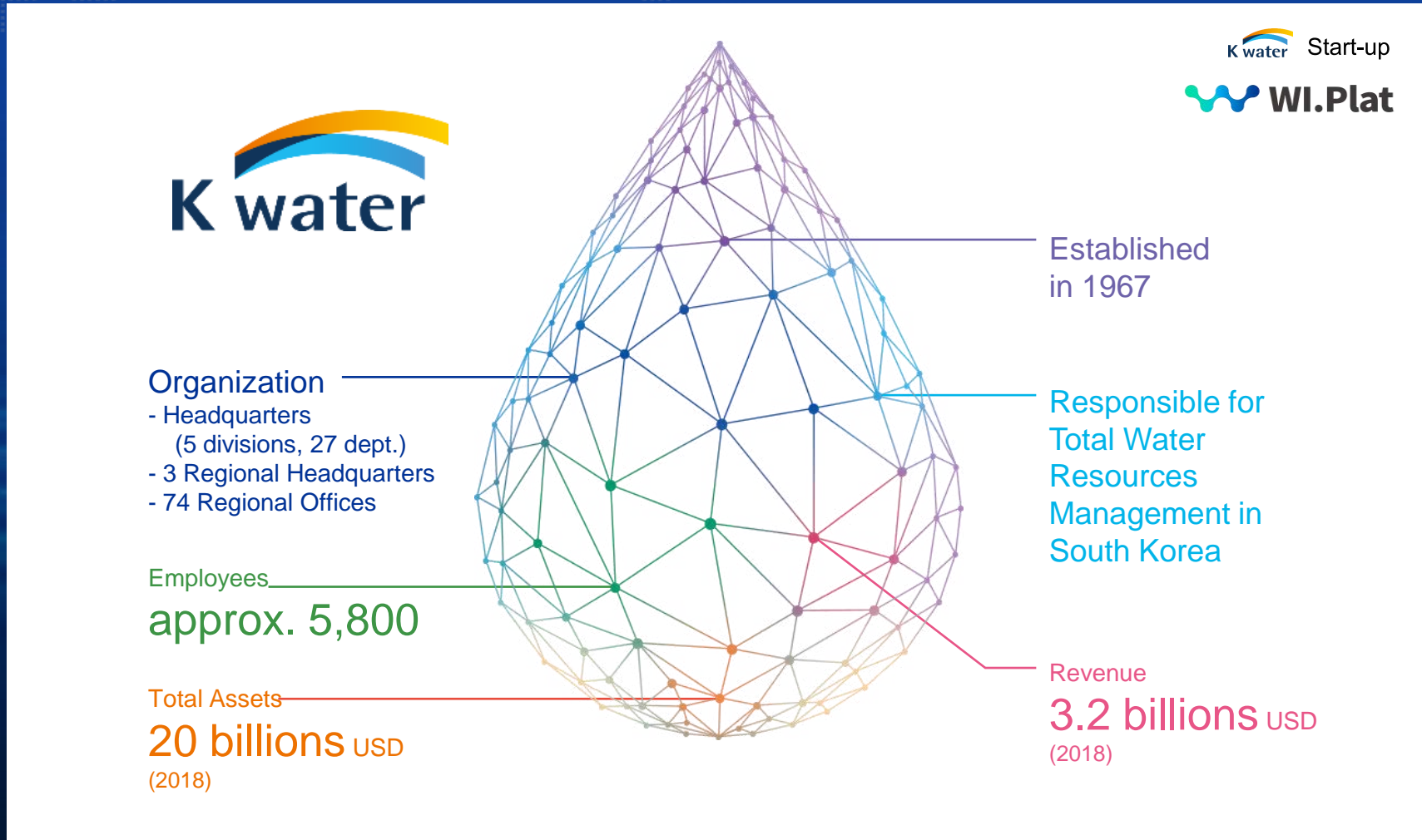
- Device engineer
- R&D manager
- Big data analysis



WI.Plat

Water Intelligent Platform (WI.Plat)

WI.Plat is a start-up founded with support from Korean government & K-water



K water

WI.Plat Start-up

Established in 1967

Responsible for Total Water Resources Management in South Korea

Revenue **3.2 billions USD** (2018)

Total Assets **20 billions USD** (2018)

Employees **approx. 5,800**

Organization

- Headquarters (5 divisions, 27 dept.)
- 3 Regional Headquarters
- 74 Regional Offices

Price policy of NELOW System (1 Set is suitable for a small town under 20,000 houses)

NELOW (1 Set)

(Sonic M1 5, NELOW S/W License : 5)



Sonic M1

+



NELOW_App

+



NELOW_Web

Price (1 Set)

- Subscription type

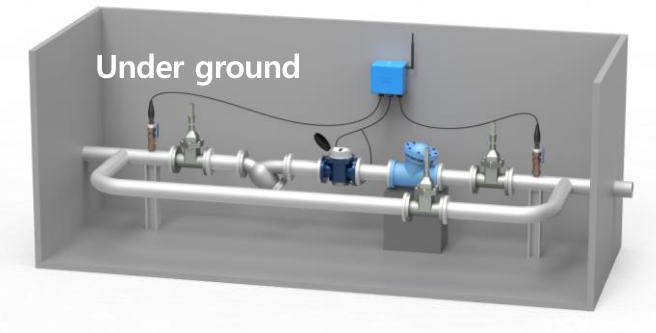
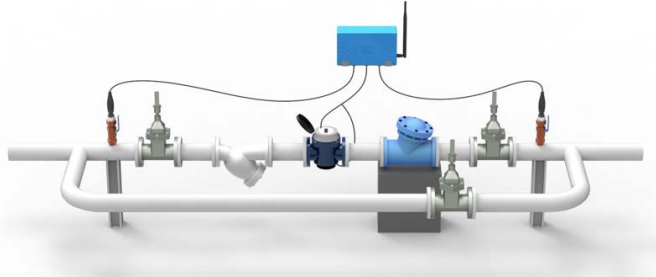
 **28,000 USD/Year**

- Construction type



150,000 USD/Year
(Server is not included)

It is option to install DMA Monitoring system or Realtime monitoring with Sonic M2



DMA Monitoring System
(Option)



Water pressure or meter
monitoring



Water leak monitoring
(Option)

Proposal

for performance-based water leakage reduction project

PBP(Performance Based Project) will be divided to Level 1, Level 2

Level 1 (3Year)

Goal : 30 % Reduction of MNF
(MNF : Minimum Night Flow)



Product & Service

Sonic M1	Sonic M2 (Pressure)	NELOW
DMA Construction	Water leak Detection	Water leak Recovery
GIS Management	Pressure Management	Technology Consulting

Level 2 (10 Year)

Goal : 50 % Reduction of MNF
(MNF : Minimum Night Flow)

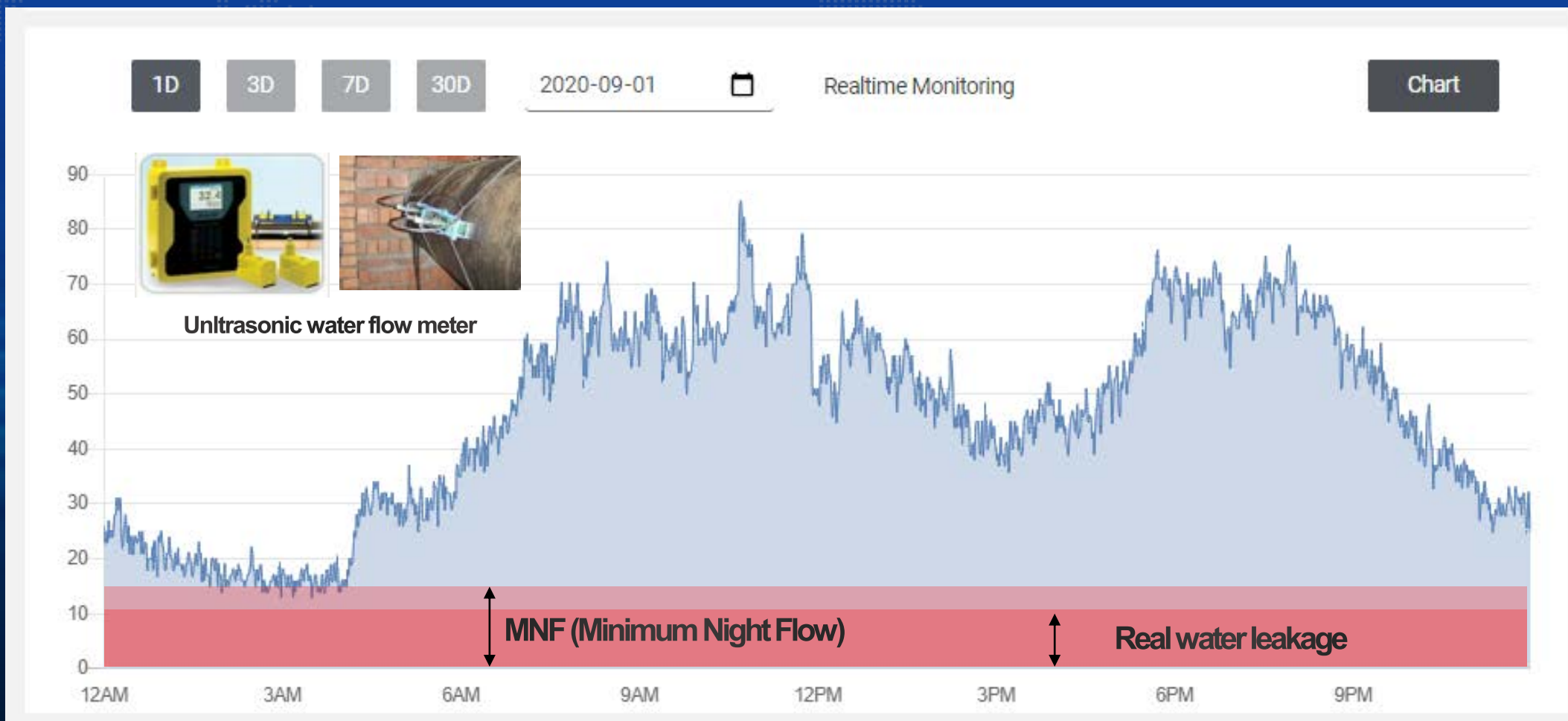


Product & Service

Sonic M1	Sonic M2 (Pressure)	NELOW
DMA Construction	Water leak Detection	Water leak Recovery
GIS Management	Pressure Management	Technology Consulting

60~70% of MNF (Minimum Night Flow) is a real water leakage

(MNF will be measured with ultrasonic water flow meter or others for an assumption of water leak in target site)



Components of NELOW System for Level 1



Sonic M1
(Water leak detection)

+



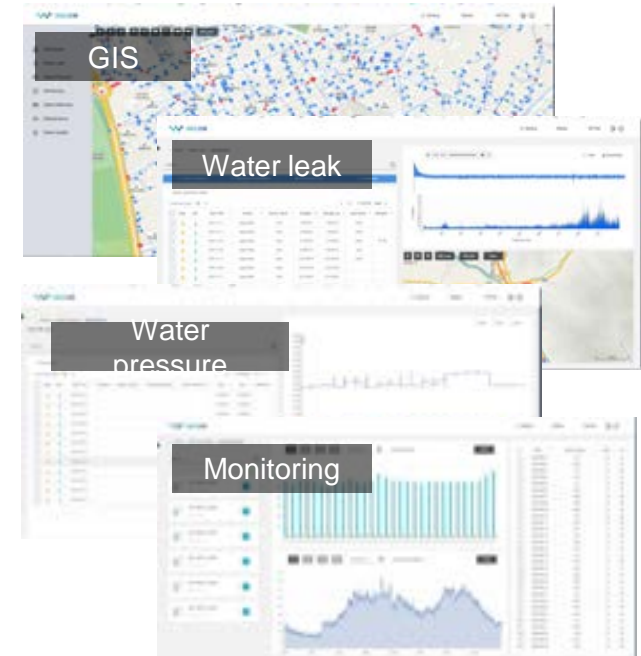
Sonic M2
(Water pressure monitoring)

+



NELOW_App

+

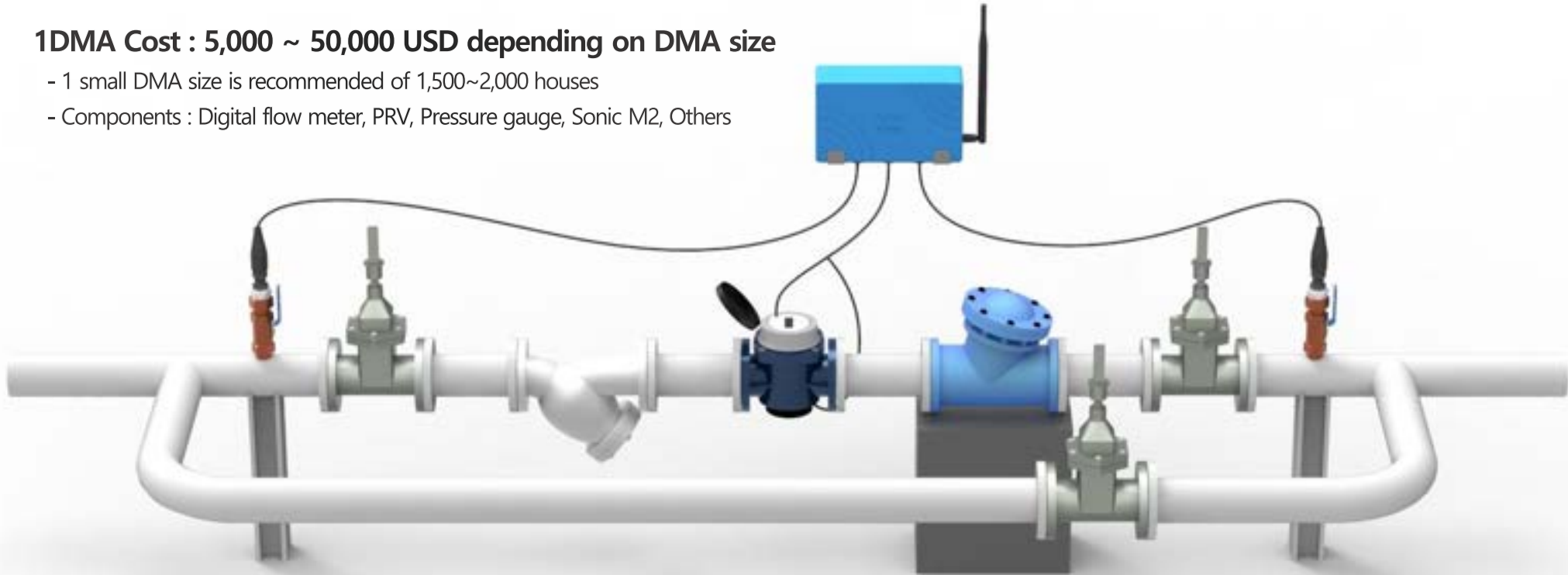


NELOW_Web

It is essential for Level 2 to construct DMA monitoring system (It is necessary to conduct F/S for a design of DMA monitoring system)

1DMA Cost : 5,000 ~ 50,000 USD depending on DMA size

- 1 small DMA size is recommended of 1,500~2,000 houses
- Components : Digital flow meter, PRV, Pressure gauge, Sonic M2, Others



(Level 1, 3 Years) Water leak reduction benefit will be 342,000 USD/Year Assuming 30% MNF reduction in small town of 15,000 houses

Condition



Small Town
15,000 houses



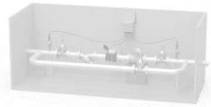
Water supply
15,000 m³/day



Water leak rate
25%



MNF
6,250 m³/day



DMA
10,000~60,000 USD



Unit production cost
0.5 USD/m³



NELOW System
28,000 USD/Year



Discount rate
11%

Engineering : 116,875 USD



GIS
Management



Water leak
Detection



Water leak
Recovery



Pressure
Management



Technology
Consulting

Target goal & B/C



30% Reduction of MNF
1,875 m³/day (final year)

1 Year	2 Year	3 Year
30%	60%	100%



Water leak reduction
benefit (final year)
342,188 USD/Year

(1,875 m³/day × 365 day × 0.5 USD/day)



BC : 1.23 (3 Years)

Total Cost : 405,609 USD
Total Benefit : 498,894 USD

(Level 2, 10 Years) Water leak reduction benefit will be 570,313 USD/Year Assuming 50% MNF reduction in small town of 15,000 houses

Condition



Small Town
15,000 houses



Water supply
15,000 m³/day



Water leak rate
25%



MNF
6,250 m³/day



DMA
10,000~60,000 USD



Unit production cost
0.5 USD/m³



NELOW System
28,000 USD/Year



Discount rate
11%

Engineering : 163,993 USD/Year



GIS
Management



Water leak
Detection



Water leak
Recovery



Pressure
Management



Technology
Consulting

Target goal & B/C



50% Reduction of MNF
3,125 m³/day (final year)

1 Year	2 Year	3~10 Year
30%	60%	100%



Water leak reduction
benefit (final year)
570,313 USD/Year

(3,125 m³/day × 365 day × 0.5 USD/day)



BC : 1.52 (10 Years)

Total Cost : 1,771,628 USD
Total Benefit : 2,684,088 USD

Level 1 can be served directly with Client Local agent or Joint Venture is necessary for Level 2



Work scope of each party

Partner	Work scope	Remark
WI.Plat	<ul style="list-style-type: none"> • Supply of Sonic M1, M2, NELOW S/W • Technical training for detecting water leak with NELOW • Technical consulting for total water leakage management (Option) 	
Local Agent	<ul style="list-style-type: none"> • Water leak detection by collecting water leak sounds with Sonic M1 (Level 1) • DMA monitoring system construction with Sonic M2 (Level 2) • Recovery of water leakage spot • PRV Installation and Water pressure management (Option) 	
Client (Water Com)	<ul style="list-style-type: none"> • Supervision of performance-based water leak reduction contract • Verification of performance of contract with other parties 	

* PRV : Pressure Relief Valve