



Presentation: A view towards smart water networks



- Water Management and Smart Cities

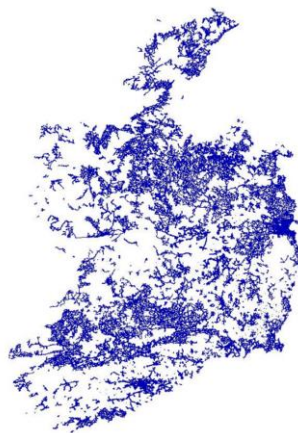
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Nordic – Irish Partnership for Smart Cities
14 May 2019

Part of **ervia** group

Irish Water

Water and Waste Water Asset Statistics Asset Intelligence

February 2019
UISCE EIREANN - IRISH WATER



Waste PE Treated

5.4 million
waste water PE total
combined domestic & non
domestic population served

Waste Population Served

3.1 million
waste water domestic
population served

Waste Treatment Plants

1,100
waste water treatment
plants

Waste Pump Stations

2,066
waste water pump stations in
the sewer network

Waste Water Sewer

26,000 km
waste water sewer length
which includes foul &
combined sewers

Water Population Served

3.9 million
drinking water population
served

Water Production Plants

788
operational Irish Water - water
treatment plants

Water Reservoirs

1,426
drinking water reservoirs in
the network

Water Pump Stations

2,376
water pumping stations in
the water distribution
network

Water Hydrants

153,057
water hydrants in the water
distribution network

Water Production

1,739 MLD
national water production

Water Production GDA

579 MLD
GDA water production

Water Network

63,000 km
water mains captured in the
IW GIS

Water DMA Count

4,269
total number of district
metered areas in the IW GIS.

Water Valves

500,450
water valves pumping in the
water distribution network

The Wheel of Asset Information:



Water Metering Programme



- Over 894,000 domestic meters installed between 2013 and 2017;
- 100% Drive-by AMR technology.
 - RF Clip-on Radios
 - Diehl Meters (1-way)
 - Itron Meters (2-way)
 - Temetra Reading System



Output Data:

- Construction:
 - Pipe depth & material
 - Connection location
- Usage Data:
 - Current Reading
 - Month-end Reads (3)
- Alarms:
 - Continuous Flow
 - Backflow
 - Low Battery
 - Tamper
- Skip Codes:
 - Manually collected



Spin-Off Programmes



- First Fix Free Programme
 - Up to Q2/2017
 - 41,431 leak investigations
 - 36,524 customer repairs
 - 8,097 repairs by IW
- Lead Replacement Programme
 - 36,000 lead services identified.
- Non-return Valve Replacement
 - Backflow alarms led to replacement of NRV's.



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Beast from the East & Storm Emma



- **Ice & Snow event:**
 - 28th Feb - 4th March 2018
 - Bursts & Water Outages
 - Supply restrictions in Dublin;
- **Meter Reading**
 - Vans deployed 5th March
 - Quick results (6th March)
 - First batch (5,500) showed leaks increased from 196 to 467 houses
 - Top 20 in Dublin used 943 m³/day in 6 days since 1st March (= 3,772 houses)
 - Reading continued for 2 weeks nationally
 - Results fed into leak repair activities



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Innovation: Apartment Metering Trials



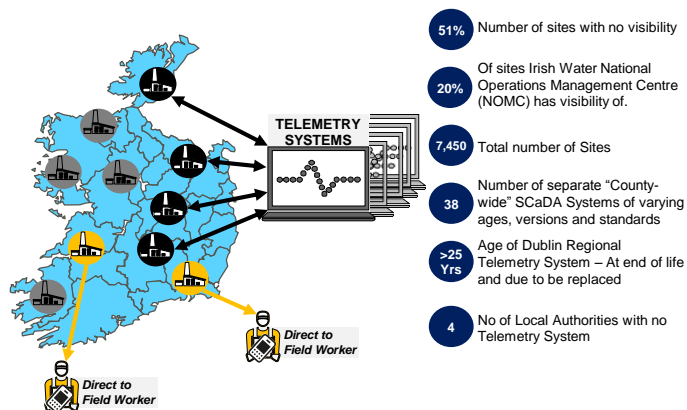
- CRU (Economic Regulator) Innovation Fund
- Consortia including technology providers
- Apartment Buildings nominated by the consortia
- Pre-installation surveys and design
- Investigate installation challenges
- Fixed-radio systems and data collection solutions (GPRS, Sigfox, LORA)
- Operational phase and data analysis
- Added value services
 - Access to data



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Our Telemetry Capability Today

Our current telemetry capability is fragmented, inconsistent and lacks the required functionality



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A Single National Telemetry System



Establish a single national telemetry capability that provides a consistent and cost effective method for monitoring and remote control of sites, assets and processes so that Irish Water can operate at an international industry standard.

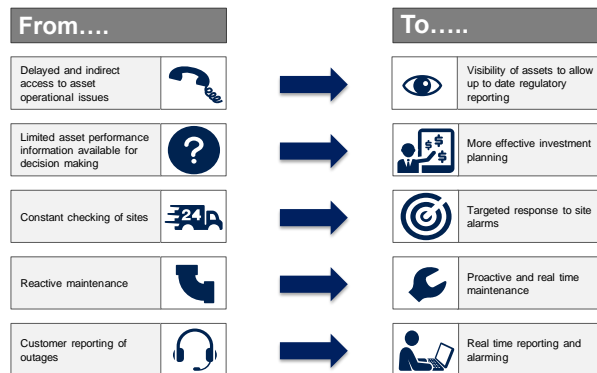
1.	National Operations Management Centre (NOMC) – establish industry standard asset management and control capability <ul style="list-style-type: none"> Establish NOMC and adopt the Dublin Regional Telemetry System as the interim National Telemetry System (iNTS) Develop and implement national policies and standards for consistent operations management Expand the coverage of the interim system to 40 critical sites nationwide and three additional counties
2.	National Telemetry System (NTS) – eliminate unsecure, obsolete, non-standard and functionally weak localised systems <ul style="list-style-type: none"> Procure and implement a modern, secure, future-proof telemetry system Migrate the iNTS and the existing county-wide SCADA systems to the new NTS
3.	Analytics and Asset Performance – provide visibility and insight into operational data <ul style="list-style-type: none"> Establish an enterprise data historian and asset performance & compliance reporting capability Implement advanced analytical tools for Situational Awareness, Investment Decision Making and Network Optimisation
4.	Leakage Reduction - enable optimal return on leakage reduction investments <ul style="list-style-type: none"> Procure and implement a single national Leakage Management System (LMS) Develop and implement Policies and Standards, Processes and Procedures for leakage management nationwide

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Why we need Telemetry



By Implementing Telemetry Irish Water will move....



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Challenge & Opportunity



- **Sensors:**
 - *Small and cheap sensors*
 - *RF radio units are cheaper and more powerful*
- **Communications:**
 - *Sigfox, LoRa, NB-IoT, etc*
- **Big Data:**
 - *More data sets with powerful analytics*
- **Smart Utility Metering:**
 - *EU Smart Metering Rollout*
- **Risks:**
 - *Data Security & Protection (GDPR)*
 - *Hacking and external control*



Connection metering is no longer “dumb” or an isolated activity.

Smart connection metering is increasingly about leakage control and water network management.

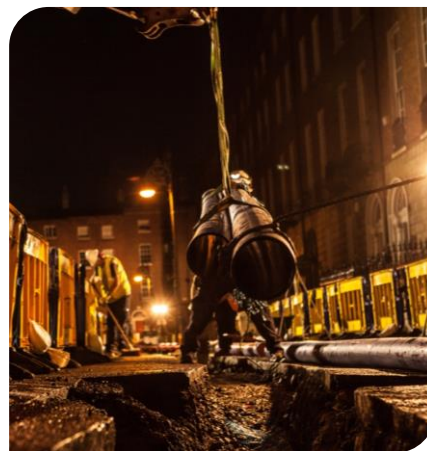
Water Authorities need to plan for smart metering within a wider smart architecture.

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Smart Water Systems



- **Leakage Management System**
 - *Went live at the end of 2018*
- **Telemetry *Plus***
 - *Smart Connections with 2-way communications;*
 - *Compatibility of data collection from large and small meters;*
 - *Revenue & Non-Revenue meters are secondary to water conservation;*
 - *Sensors to identify early leaks from joints;*
 - *Water quality real-time sensors*

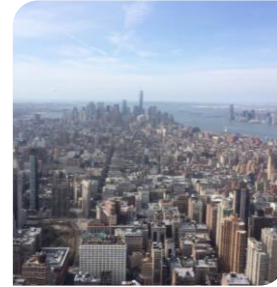


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Smart Homes & Cities



- **Smart Cities Movement**
 - *IoT Architecture*
 - *Shared Communications Infrastructure*
 - *Integrate at the cloud*
- **Data Dashboards**
 - *Open source data (anonymised)*
 - *Promote responsible behaviours*



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- **Customer Benefits**
 - *Leak Alarms;*
 - *Remote controls;*
 - *Data triggers;*
 - *Water Quality*
- **Energy**
 - *Hot water costs*

Achievable Benefits



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- **Better Information => Better Service**
 - *More efficient service to customers*
 - *Quicker response & reaction times*
 - *Better targeting of work*
 - *Less impact from outages*
- **Single Public Utility**
 - *Single strategy & budget*
 - *Standardised approach*
 - *Implement new technology*

Closing Comments



- A vision for smart networks starts with asset knowledge and information.
 - *Maintain Asset Register;*
 - *Live Asset Information;*
 - *Insights & Analysis;*
 - *Predictive, Proactive & Prompt;*
 - *Evidence-based decision making.*
- Smart Metering is on a journey that is giving an insight into the possible.
 - *Automatic meter reading with alarms;*
 - *Network benefits leveraged from data;*
 - *Future opportunities to adopt smart technologies.*
- Observations:
 - *The connected network is emerging in practice;*
 - *The intermediate communication options are a challenge;*
 - *Smart water networks will integrate with wider smart infrastructure.*



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Thank you

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