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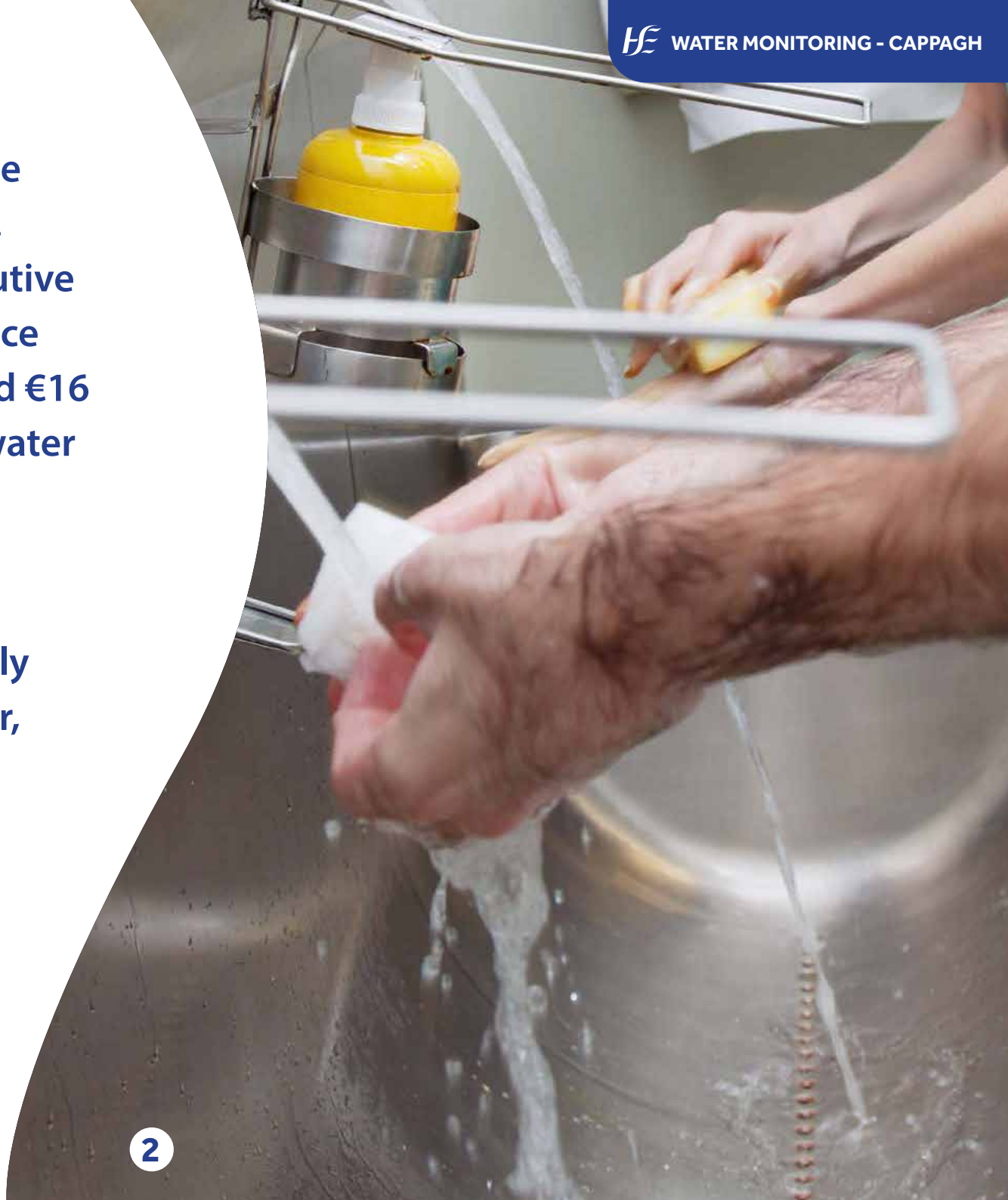
Continual monitoring of water use - a clear path to savings

Ongoing water conservation success at National Orthopaedic Hospital Cappagh

Water is an essential resource for the operation of all healthcare services. Nationally, the Health Service Executive (HSE) is the biggest customer of Uisce Éireann (UE), spending an estimated €16 million a year on water and waste water services.

Operating in a unique water using environment where water is typically used 24 hours a day, 365 days a year, the healthcare sector must play a major role in national water conservation measures.



SUSTAINABLE DEVELOPMENT GOALS

Water conservation is now a key element to the HSE's Climate Action Strategy 2023-2050 and also addresses a number of the Sustainable Development Goals (SDGs) that Ireland has signed up to.

Early Detection

At the National Orthopaedic Hospital Cappagh in Dublin, Ireland, **water conservation** is a practical priority that supports both patient care and environmental responsibility.

When starting this journey, the hospital's first focus was to **gain a clear understanding of water usage** across the campus through **online metering of the mains** and through an **internal sub-metering system.**

Since installation, this system has been used to identify and detect new leaks quickly, enabling early repairs to prevent wasted resources.

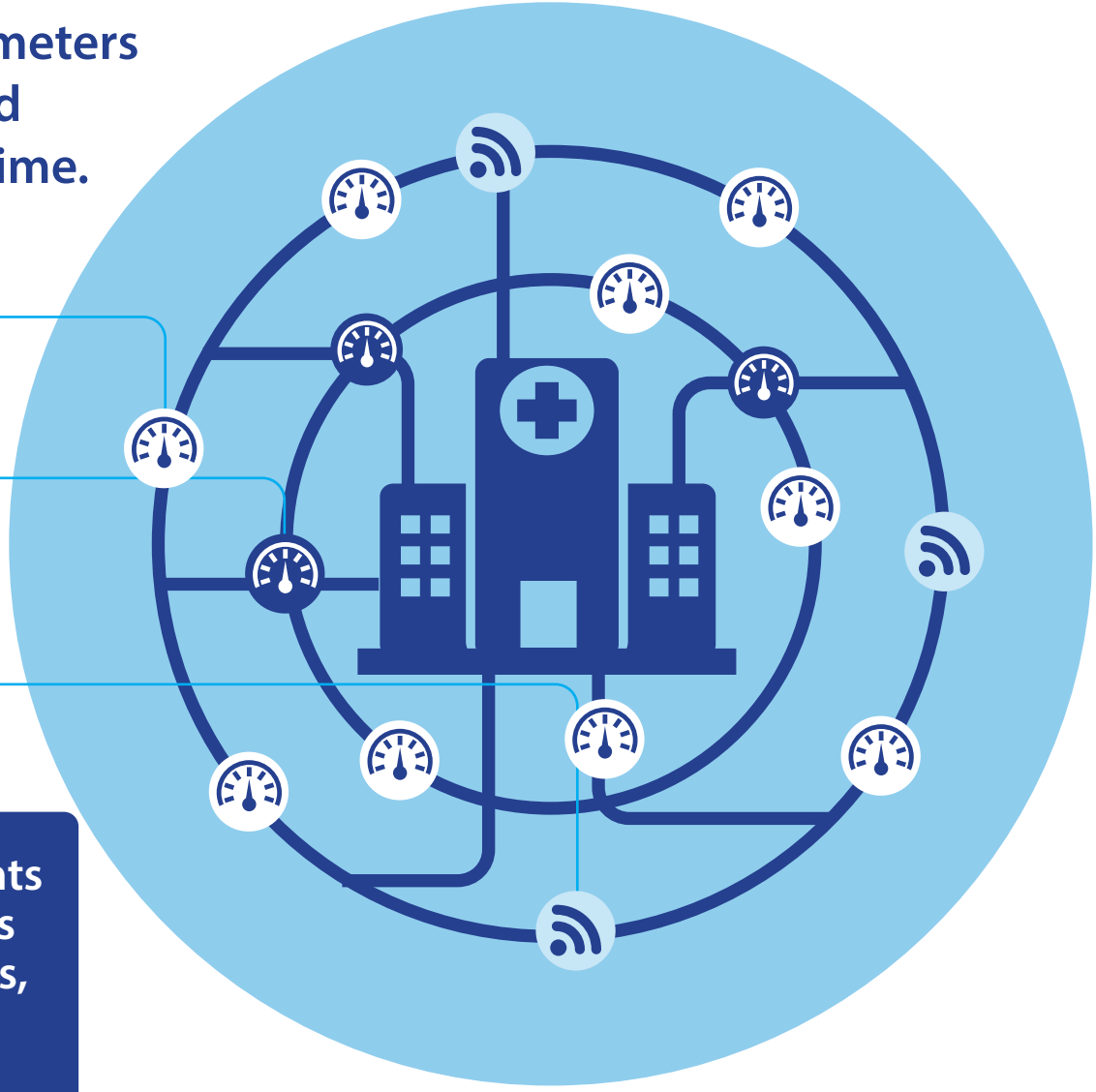
Implementing the Solution: The Water Submetering Project

This initiative started with the installation of strategically placed water submeters to monitor water use from around different parts of the site in real time.

Installed 9 new meters

Integrated 3 existing ones (including the mains meter)

Created 3 virtual meters (software-based trackers)



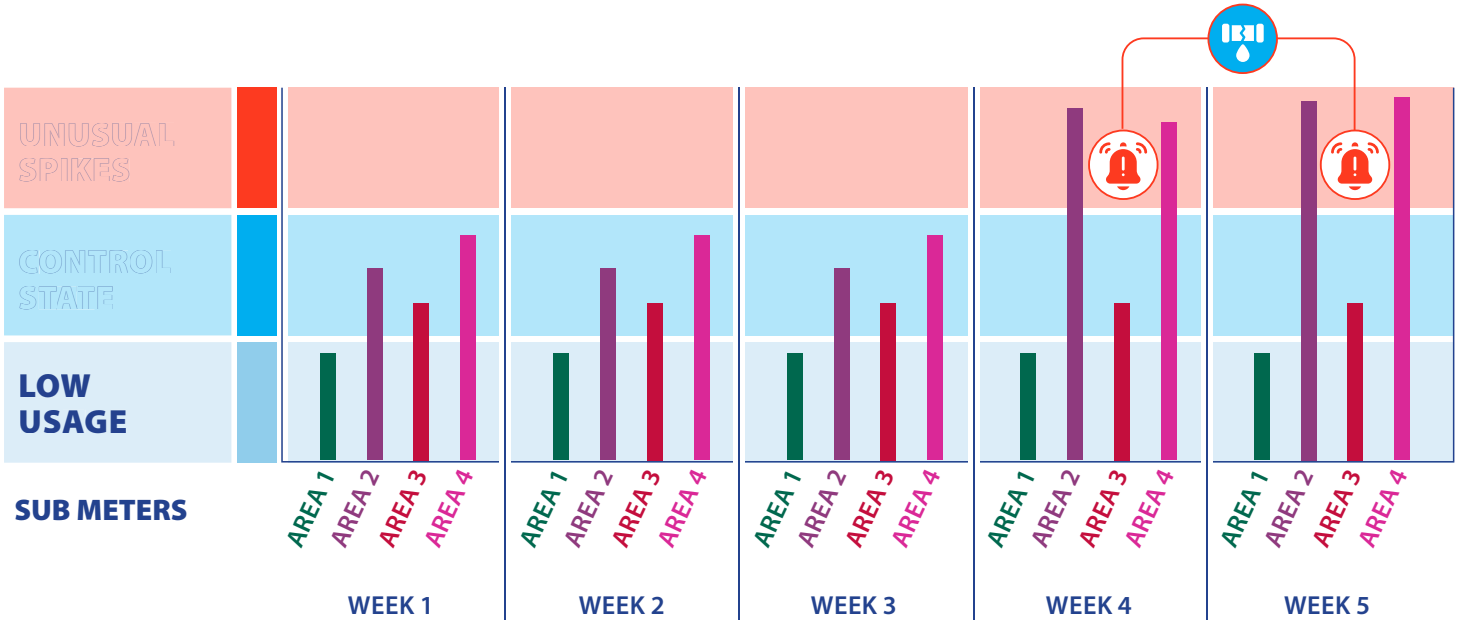
That's a total of 15 water meter points across the site covering critical areas like hot water and gas meters, wards, and a number of other strategic locations.

Implementing the Solution: The Water Submetering Project

After installation, the online dashboard was used to calculate the proportion of water used by each of the metered areas. This provided the onsite team with an understanding of where, and when, the most water was being used.

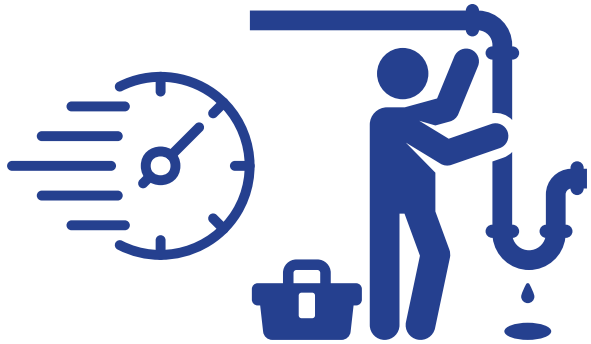
The next step was to establish water use profiles for each sub-meter and determine whether there were any long-standing leaks (these would be signified by high background water use during the night).

Once these baseline use profiles had been established, alerts were set up to flag when out of the ordinary flows occurred.



This graphic shown is for illustration purposes and not a representation of dashboard

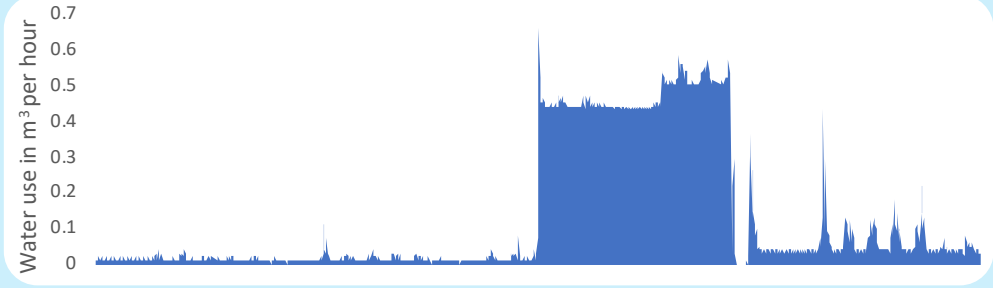
These alerts provided maintenance staff with the information to pinpoint issues **quickly** using details like the leak's start time, affected area, and hourly loss rate for faster resolutions and more efficient operations.



Implementing the Solution: The Water Submetering Project

The internal sub-metering system identified a number of issues since being installed including: burst underground hot and cold water pipes, valves left open after maintenance and faulty Legionella flushing valves.

This profile shows a recent leak that was flagged by the system and, with the submetering information, the location of the issue was narrowed down quickly.



This allowed the onsite team to organise a quick repair for an underground leak that could have gone unnoticed for weeks.

THIS QUICK RESPONSE SAVED THE HOSPITAL 12m³ A DAY WHICH WOULD HAVE COST ~€350 A WEEK, EVERY WEEK, UNTIL IT HAD BEEN NOTICED AND REPAIRED.

Important!

As most leaks are hidden (i.e. underground), without the extensive sub-metering in place, such leaks can go unnoticed for long periods without the information provided by the real time water meters.

Savings and Results

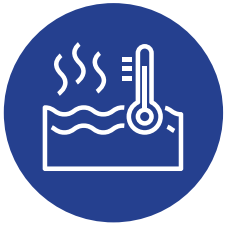
The system became operational in mid-Jan 2024, providing reliable data from Feb 2024.
The results are as follows...

12% overall decrease in the hospital's water use compared to the same months in 2024

That's an equivalent to **2,700 m³ of water saved** (enough to fill over 18,000 standard bathtubs)

Which is worth **€11,250** (note that this does not include the energy savings related to hot water)

These water savings equate to **1.9 tonnes of CO_2eq.**



And a further **8.8 tonnes of CO_2eq.** from the hot water savings.

Important Factors

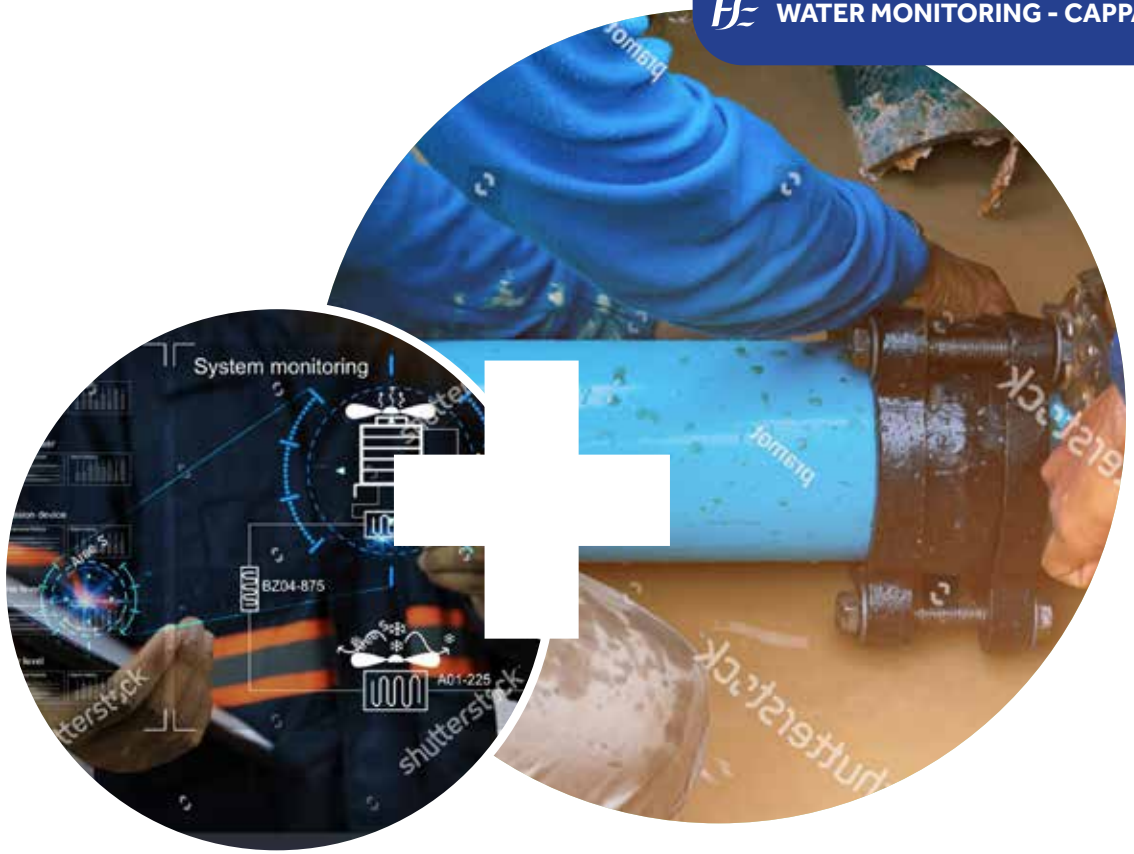
It is important to note that there were no significant existing leaks identified at the outset. Therefore the savings were achieved through the **quick response times** to new water issues arising as a consequence of the live data monitoring sub-metering system.

The system was installed, with a 4 year operations and maintenance contract for ~€20,000, so the Return On Investment (ROI) has been less than 2 years.

Ongoing Benefits

This initiative demonstrates how targeted technology can help with identifying and repairing water issues as they occur.

A key element in this successful example is the importance of **proactive monitoring.**



Without the ongoing monitoring of this technological solution, and the **responsive work of the onsite teams** to resolve the issues identified, the results would not be as effective.

By establishing such a responsive system, that merges technology with an empowered onsite team, the National Orthopaedic Hospital Cappagh is setting a strong example for efficient resource management in healthcare.

A technological solution with human intervention!

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