# Our Leakage Reduction Challenge

## It's part of our Blueprint for Yorkshire

YorkshireWat

# Our Leakage Reduction Challenge

| Company name | % leakage reduction proposed 2020-25 from the WRMP | Business Plan Commitment (Ofwat) |
|---|---|---|
| Affinity Water | 10% | 15% |
| Anglian | 20% | 17% |
| Bristol Water | 10% | 15% |
| Dee Valley Water | 7% | 15% |
| Northumbrian | 14% | 16% |
| Portsmouth | 15% | 15% |
| Severn Trent Water | 16% | 15% |
| South East | 4% | 14% |
| South Staffs | 17% | 23% |
| Southern | 10% | 15% |
| Sutton and East Surrey | 20% | 15% |
| Thames Water | 8% | 15% |
| United Utilities | 4% | 15% |
| Welsh Water | 3% | 15% |
| Wessex Water | 2% | 15% |
| Yorkshire Water | 39% | 25% |

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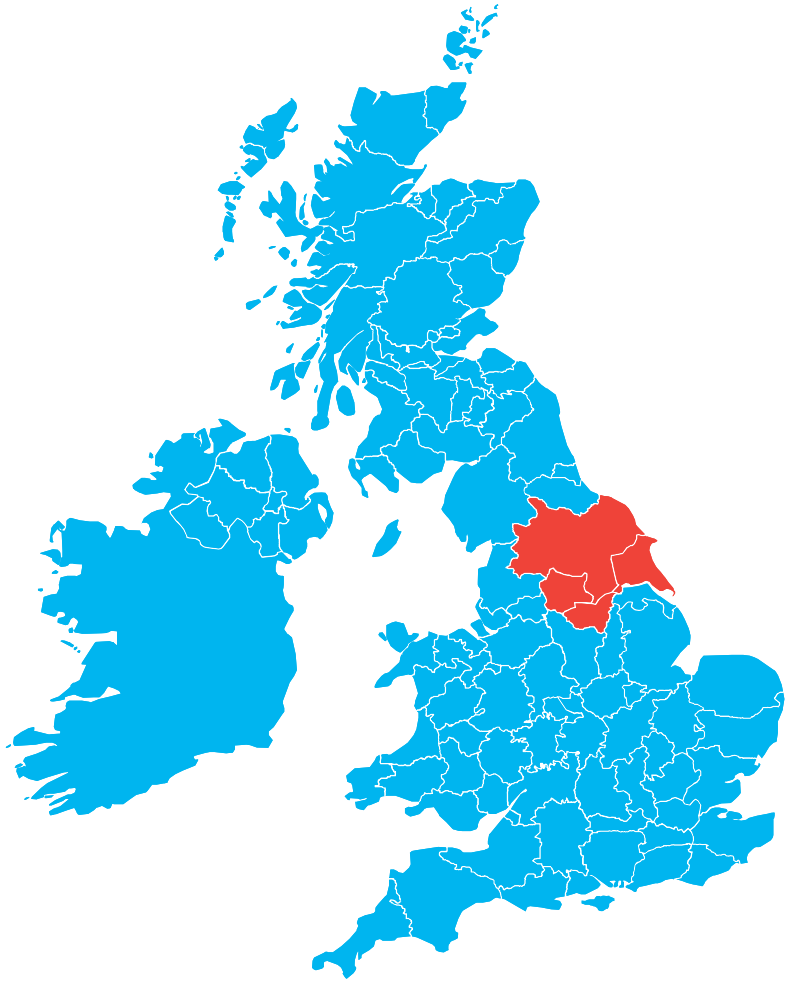
# Yorkshire Water's Leakage Reduction Challenge

- 15% reduction in 2 years
- 25% reduction in next 5 years



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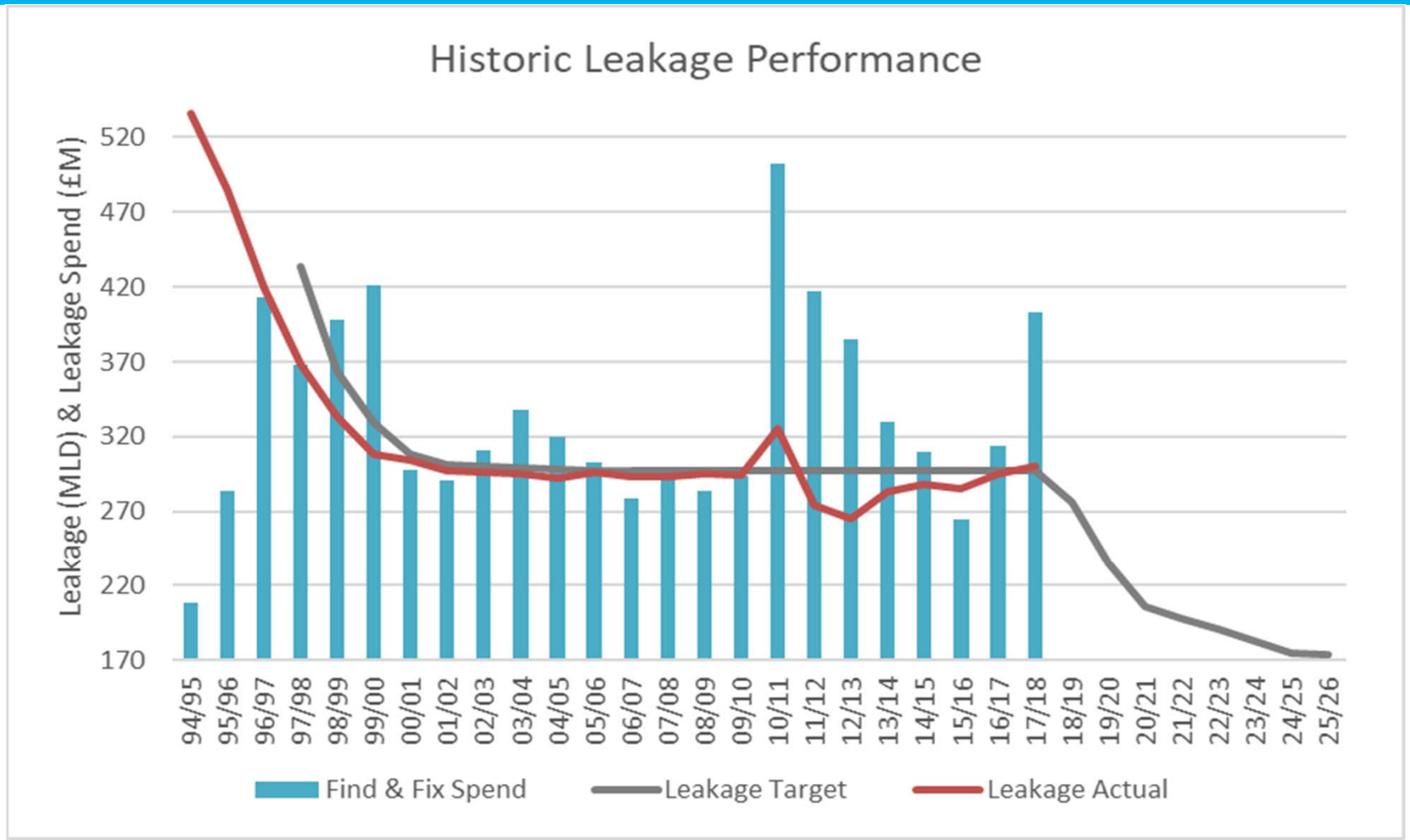
# Can we achieve future levels using historic approaches?

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## Build on 4 pillars of find and fix

- 250% increase in find and fix resources
- Extensive training and competency programme
- End to end business process improvement

Accurate accounting

Effective targeting

Rapid detection

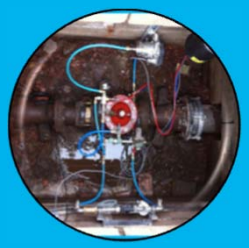
Economic repair

# Increasing prevention activities

- Mains renewal is limited by cost
- Renewal of whole service pipe delivering reductions
- Adopting available techniques eg Kobus pipe puller
- Optimising asset life by pressure management, transient logging and calm networks and leak free new networks

Maintaining Mains Renewal

Starting Service Pipe Renewal



Increasing Pressure Management

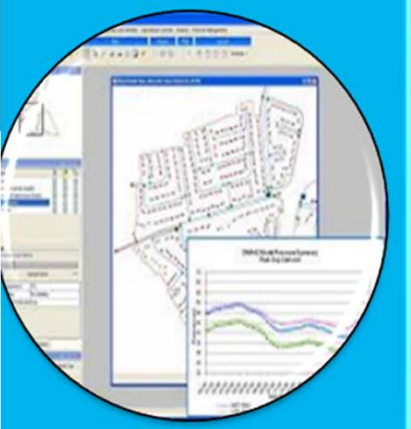
Implementing Calm Networks

Laying Leak Free New Networks


Accurate accounting

# Data Improvement Plan

- Comply with Convergence requirements
- Account for Water Balance
- Separate leakage from demand
- Understand consumption variation between DMAs
- Account for seasonal variation
- Quantify trunk main leakage
- Manage meter under registration
- Make better use of AMR consumption data
- Quantify cost and benefits of all leakage activities



Effective targeting

# Targeting Analytics

- Use of improved night use allowances to accurately target DMAs
- Use of new techniques to analyse leak growth rates
- Developing a holistic approach to intervene on growing leak
- Rationalising DMAs to optimum size
- Resolving DMA specific data issues through DMA optimisation
- Using analytics to intervene earlier than can be observed by nightline analysis
- Quantifying leakage using MNF & TDF

Rapid detection

# Alternate Detection Options

- Determining optimum detection technique/team by DMA including intensive detection & DMA hotspotting techniques
- Improvements in correlators, steptest recording, etc supplemented with emerging technologies
- Largescale permanent acoustic logger deployment
- Use of L-Ray Satellite detection
- Use of stopwatch loggers to identify customerside leakage
- Trial of street sensors in rural DMAs
- Make better use of AMR consumption meter data
- Deploying additional pressure sensors with analytics to enab within DMA targeting

Economic repair

# Reducing repair costs

- Intervening earlier to reduce consequential damage
- Repairing live to reduce interruption impact
- Performance management of dry hole numbers
- Reducing excavation size where possible
- Reviewing excavation, backfill and reinstatement options
- Use of Aquapea, etc for internal repairs
- Renewing service pipes where asset life expired to prever repeat repairs

# So Have We Got It Covered?

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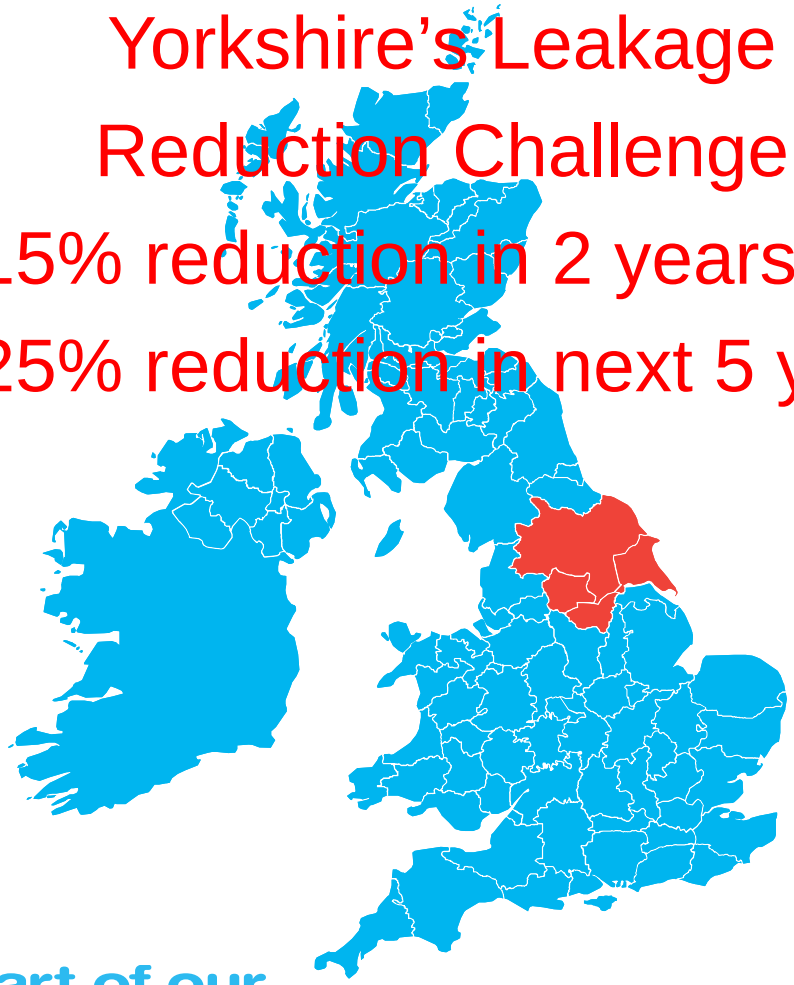

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I'll tell you what I want....

what I really really want....

# A network resistant to ground movement…..

- Last AMP 50% of our mains bursts were due to ground movement
- This year far, far more
- Our old rigid cast iron network - cracks when its cold + cracks when its dry
- Zero interruptions targets mean installing more rigid clamps

- Is it possible to install a flexible coupling as a repair clamp on cast iron?
- Slice through the main?
- Without the leak propagating?
- Repairing the main?
- Maintaining supplies?
- Increasing network flexibility?
- Preventing future bursts all at the same time?

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# A network resistant to corrosion…..

- Last AMP 15% of our mains bursts were due to corrosion
- Our old cast iron network suffers from internal + external corrosion

- Is there a chemical optimum for drinking water to minimise internal corrosion?
- Can we eliminate the catalyst for internal corrosion?
- Or the growth of internal corrosion mechanisms by controlling pH?

# A solution to weeps and seeps…..

- Over 50% of leakage is ‘Background Leakage’ not currently detectable
- This could be
  - Unaccounted for plumbing losses
  - Early stages of growing leaks
  - Weeps and seeps
- ….but we don’t know the proportion of each theory
- Phosphate dosing to prevent lead issues is well established

- Is there something chemically similar (eg Calcium based)?
- Can it be dosed at WTWs?
- Will it seal small weeps and seeps upto 1mm?
- But not block ferrules, stoptaps, taps, etc?

# An economic method of identifying plumbing losses…..

- Recent studies indicate plumbing losses are higher than current assumptions
- Particularly on un-metered properties
- We've used Stopwatch surveys to identify plumbing losses on un-metered properties
- These aren't detected by routine sounding
- Clearing out stoptap chambers is costly
- Follow up appointments with customers are difficult to make

- Are there other techniques to identify plumbing losses on un-metered properties?

# A way to integrate sensor communication technologies…..

We have 1000s of GPRS loggers and are installing 1000s more recording flow, pressure, level, acoustics, turbidity, chlorine, etc

We are looking at implementing AMI consumption meters (LoRa, IoT..) in AMP8

Domestic appliances contain many of these sensors at minimal cost

Analytic tools will create Smart Networks by integration of this sensor data

Is there a way of collaborating between logger providers, AMI meter providers, and even appliance manufacturers so that these minimal cost sensors can be incorporated into AMI consumption meters?

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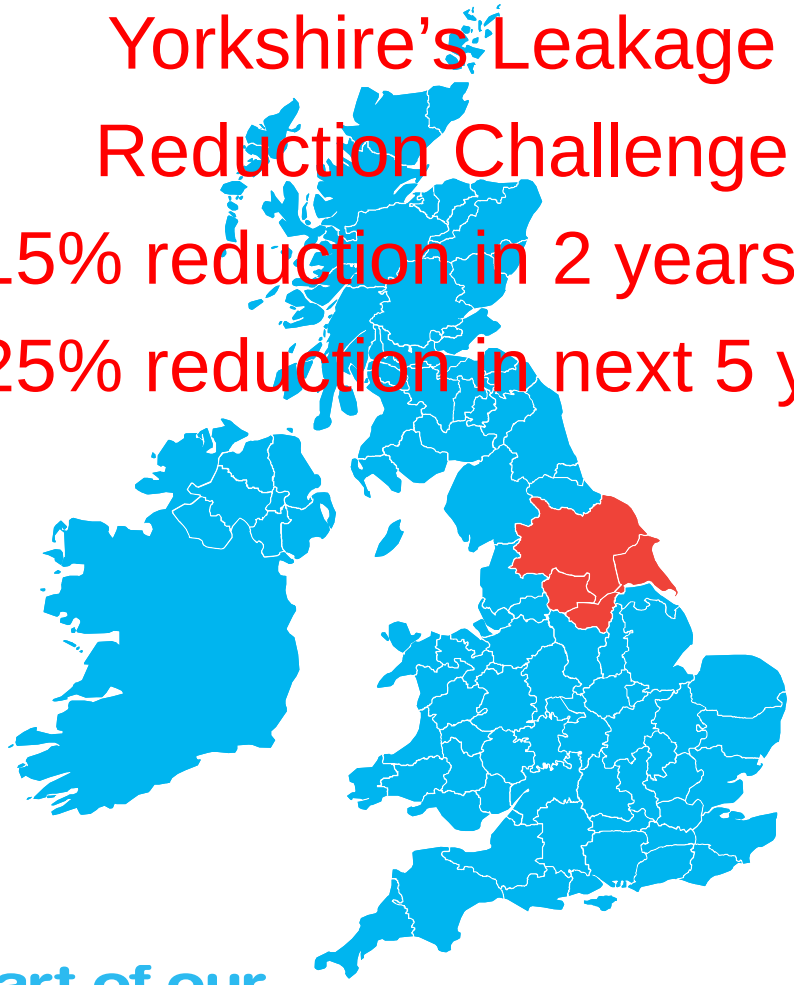

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*I get by with a little help from my friends.....*