

25th Annual Leakage conference

UKWIR update and UKWIR innovation heat map

Jez Heath – SES Water Innovation Manager

UKWIR Programme Lead on Leakage

The current and future UKWIR Leakage Programme.

Outcomes

Key Benefits

Prevent

We can prevent new leaks from forming and minimise the effect of existing ones

We understand how leaks form and develop and can minimise their growth
We can effectively justify and target mains replacement programmes to reduce leakage

39
Leakage impact of high-pressure variance within DMAs

28
Optimising the selection of pipes for renewal to reduce leakage

23/WM/08/77
Assessing the levels of leakage on new polyethylene networks.

WM/04/C/204
The Impact of Pressure Transients on Leakage

22/WM/04/14
The Occurrence and causes of pressure transients in distribution networks

17/WM/08/60
Basic Mechanisms Of Bursts And Leakage

29
Calculating whole life costings and total value of mains renewal methodologies

27
A review of the success of previous mains renewal methods and an overview of new techniques

WM/08/A/215
Understanding how the deterioration of cast iron evolves into leakage

22/WM/03/25
Improving the testing approach to novel lining materials for potable water networks - Phase I

17/WM/08/64
Laying Leak Free New Networks

WM/08/S/218
Tracking pipeline fault progression using acoustic signature detection

19/WM/08/71
Incidence And Causes Of Repeat Bursts At Old Repairs

Aware

We can correctly measure and quantify the various components and areas that leakage occurs in and prioritise interventions

We understand the various components that make up leakage and can accurately quantify them
We can monitor the changes in leakage in components and geographical areas in order to effectively target resources

31
Understanding what factors contribute to and affect overall DMA leakage

WM/08/A/220
Update on non-acoustic leak detection and location

20/WM/08/72
Understand The Balance Between Use, Supply Pipe Leakage, Plumbing Losses And Meter Under-Registration

19/WM/08/68
The impact of reductions in leakage levels on reported and detected leak repair frequencies

17/WM/08/65
Water Accounting And Quantification Methods

32
Defining a consistent approach to calculating MAL and MABL

26
A deep dive into leakage using smart meter data

20/WM/08/74
Best Practice For Trunk Main Flow Monitoring Areas

22/WM/03/25
Use Of Smart Meters And Smart Networks For Leakage Management

17/WM/08/62
Leakage Detection and Location - Non Acoustic Methods

30
Quantifying leakage levels on difficult to meter properties

Locate

We can accurately locate leakage on all materials and under all surface conditions

We understand the use and limitations of current leakage location methods
We can assist with the development and trials of new leak location methods

40
Update on trunk main leakage location technologies

33
Use of models to determine the size and most likely location of CSL

WM/08/A/217
Optical fibre sensing for acoustic leak detection

WM/08/S/211
Combination of transient and steady state leak detection methods

17/WM/08/61
Leakage Detection By Acoustic Methods

34
Contract management to incentivise efficient leak location and repair

WM/08/A/218
Pipe wave modelling for acoustic leak detection

WM/08/A/216
The use of acoustic sensing rods for leak detection on trunk mains

WM/08/S/210
Hydrant dynamics for acoustic leakage detection

Mend

We can repair leaks quickly and economically with minimum disruption

We can reduce the run time of leaks due to more effective repairs
We can assist in the development of new repair technologies

35
Temporary flow reduction and repair technologies

36
Assisting the development and adoption of in pipe repair methods

22/WM/12/01
Transferring minimal excavation methods into the water industry

17/WM/08/63
Leak Repair Techniques

37
Development of testing methodologies for mains repair techniques

38
Factors affecting leak repair times

20/WM/08/73
Impact of customer-side leakage approaches

Notes

Project Status

Idea

Planned

Live

Completed

Project Priority

High

Medium

Low

Not prioritised

For Information

Report reference (on Completed projects)

21/DW/13/10 1
Project title

Version 15
Last Updated 19/09/2024

The Leakage Innovation Heatmap.

- Published and available for download of the UKWIR website.
- Brings together over 400 Water Company projects, UKWIR reports, Ofwat funded projects and Spring Knowledge shares
- Well received by water companies, suppliers and regulators.
- Recognise that it quickly goes out of date, so (potentially) to be updated every 4 years.



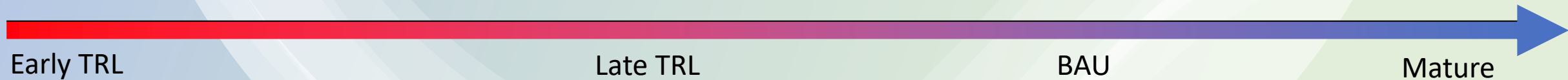
The research & innovation programmes.

Mend

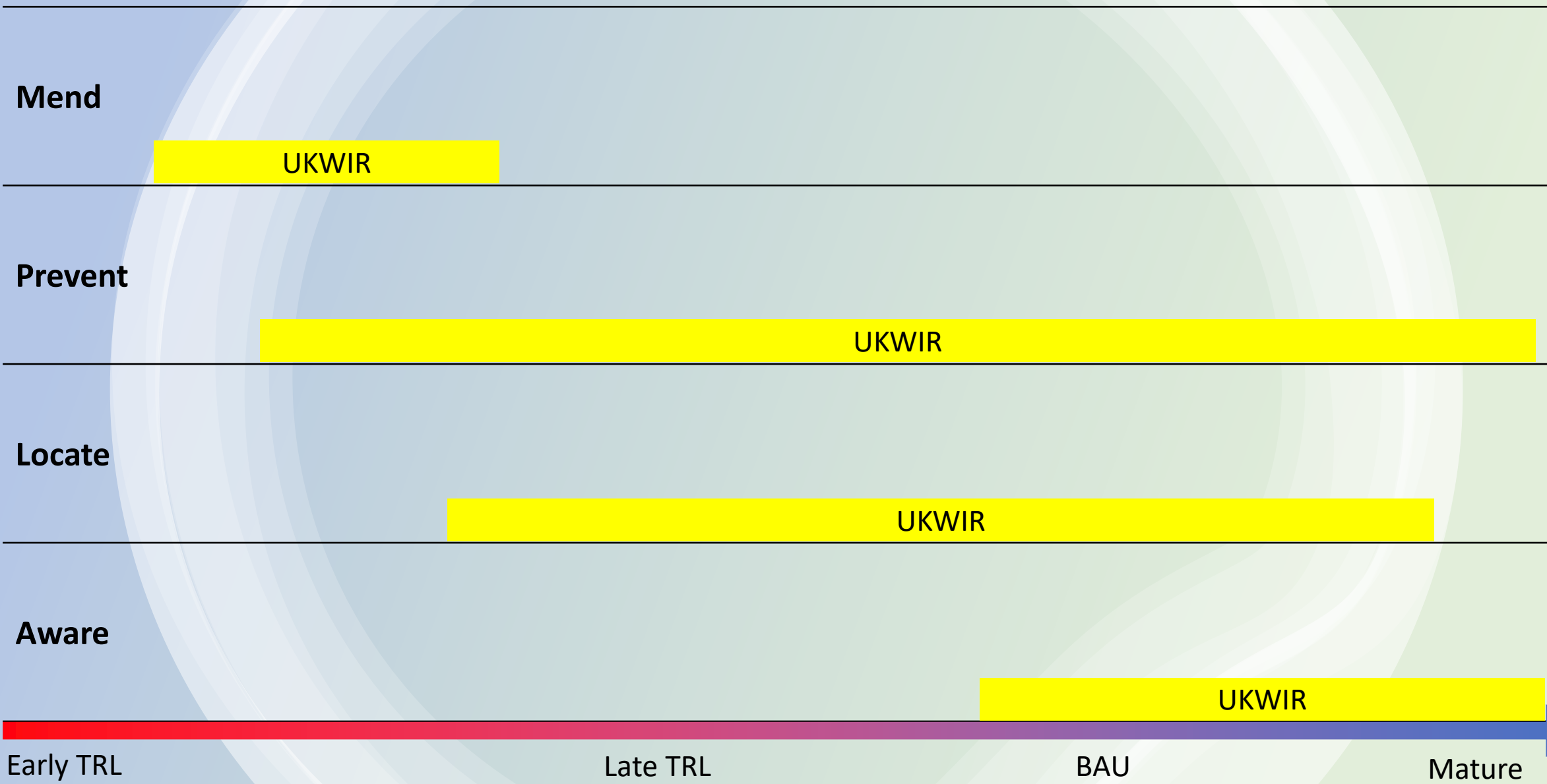
Prevent

Locate

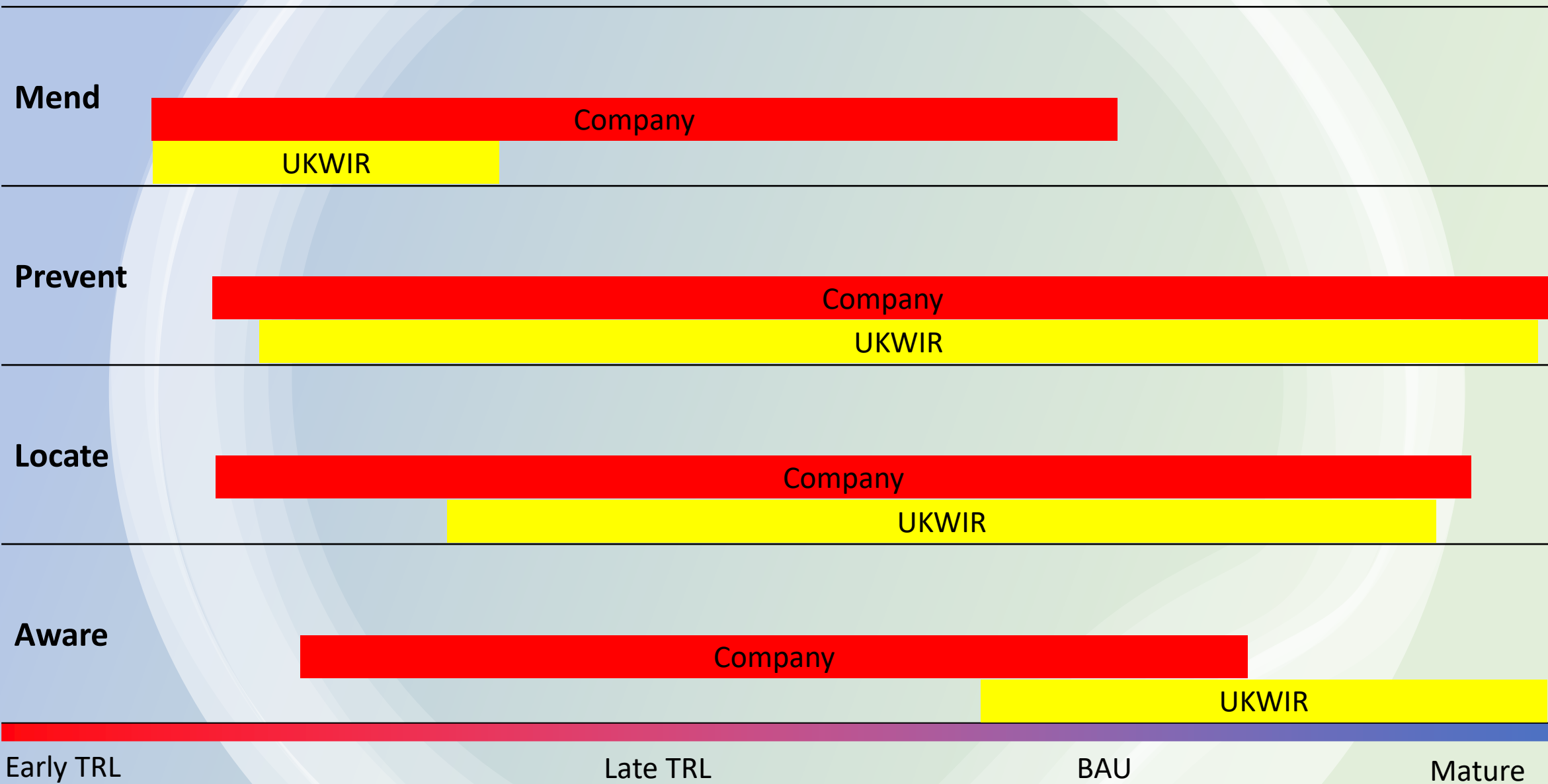
Aware



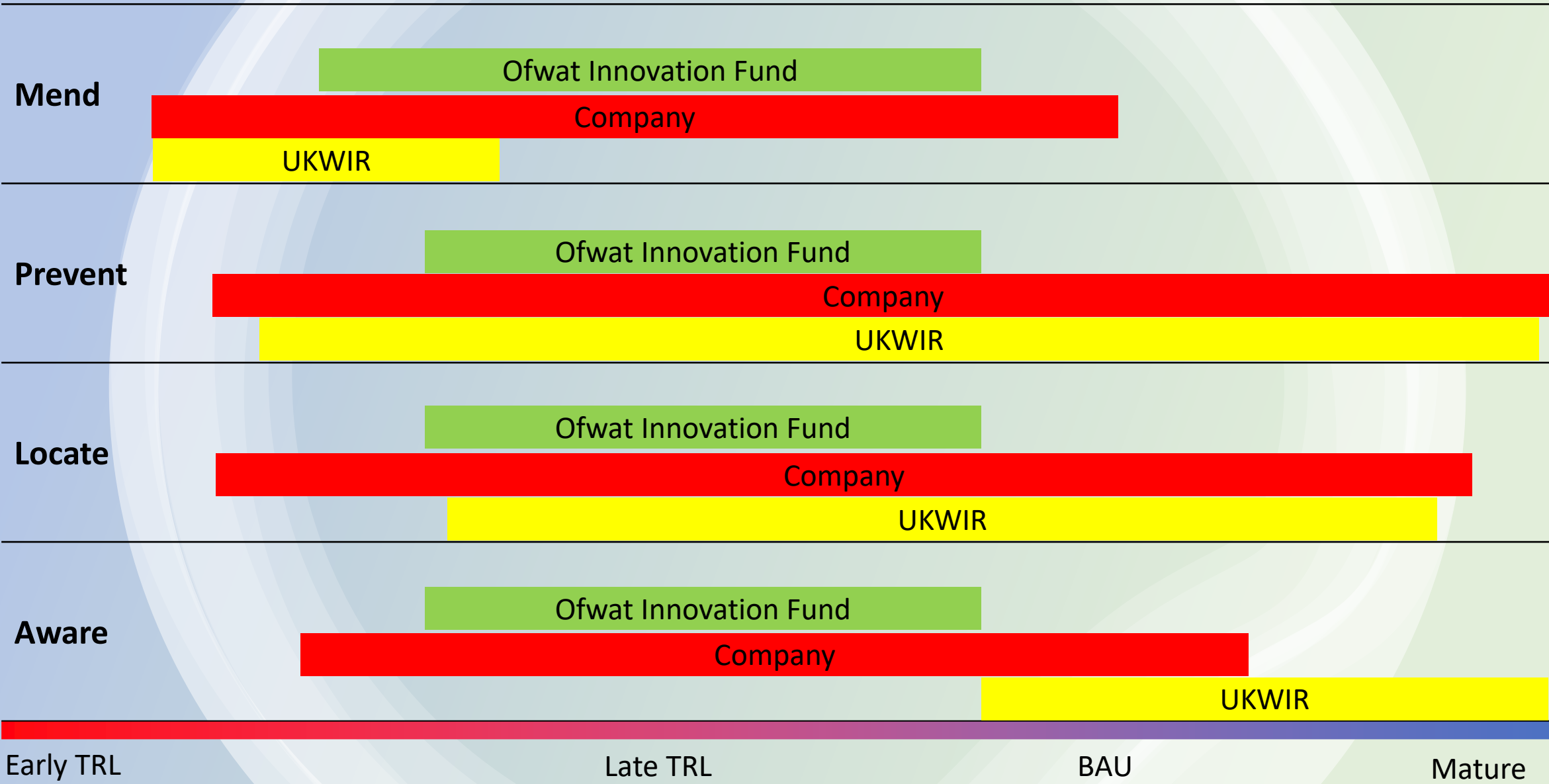
The research & innovation programmes.



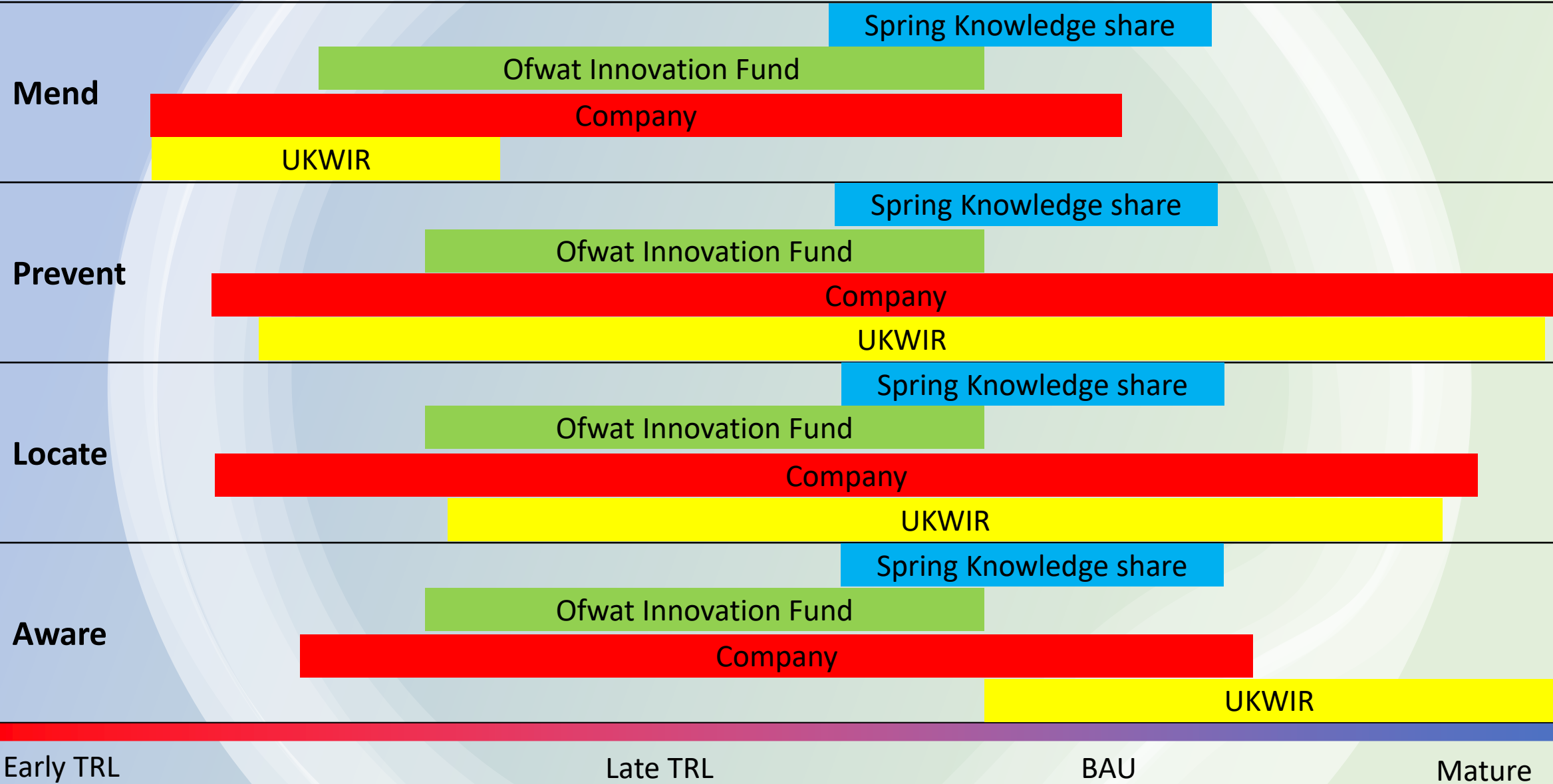
The research & innovation programmes.



The research & innovation programmes.



The research & innovation programmes.



The UKWIR programme.

- We have now completed 18 projects under the big question, with another project just in the process of finishing.
- Four dissemination events have been held recently. We have adopted the tactic of combining the dissemination events with the leakage managers quarterly meetings, which has assured both good attendance and interest.
- Either myself or Doug Spencer (co-programme lead) attend every meeting of the leakage managers to ensure that their concerns are addressed and the programme aligns with their needs.
- We have adopted a policy of asking the leakage managers to prioritise the next projects from a list of the projects submitted, either through the website or from Doug and myself.

The UKWIR programme.

- There is still a dearth of live projects for Mend (Prevent=17%, Aware=38%, Locate=32% & Mend=13%) despite the fact that about 52% of leakage management costs are on Mend.
- Despite all of the research & innovation being carried out, leakage reduction in the UK remains in a critical state with a number of companies reporting failure to reach their leakage reduction targets..
- This is primarily due to the rise of summer breakouts due to excessive soil movement as a result of dryout (typically when soil moisture deficit exceeds 100) which leads to a sustained period of bursts.
- Doug and I are aware of this concern and are adapting our research plan accordingly...

The UKWIR programme – recently shared projects.

Project title or activity	Benefits/ Outcomes
A deep dive into leakage using smart meter data	An attempt to tarry up DMA inputs with smart meter outputs which demonstrated that the method is useful for refining leak awareness but not for leakage calculations.
Assessing the levels of leakage on new polyethylene networks.	Leakage unfortunately still occurs on polyethylene at alarming levels. Good workmanship and the pressure test results are key to minimising leakage on new PE.
The Impact of Pressure Transients on Leakage	A Sheffield PhD that demonstrated clearly how leakage can develop from cast iron corrosion pits under flexure.

The UKWIR programme – Future projects.

- Four projects prioritised by Leakage Managers and going through the UKWIR voting process
- **Factors affecting leak repair times.**
Identifying the root causes of long running leak repairs.
- **Calculating whole life costings and value of mains renewal methodologies**
This project will evaluate the whole life cost of the various methodologies available. In addition, the project will consider the total value of these methods based on financial cost, environmental impact, carbon cost and social value.
- **Understanding factors contributing to and affecting overall DMA leakage.**
The output will be a model where DMA characteristics and leakage level and pattern will generate a battleplan for companies to apply the most effective response: ALC, pressure management, rehab
- **Defining a consistent approach to MAL and MAbL**
The project aims to review the adoption of MAL and MAbL across UK water companies in terms of how it is used and the benefits realised with the aim to provide new guidance on how best to exploit the available knowledge to drive leakage optimisation.