Project Leakage

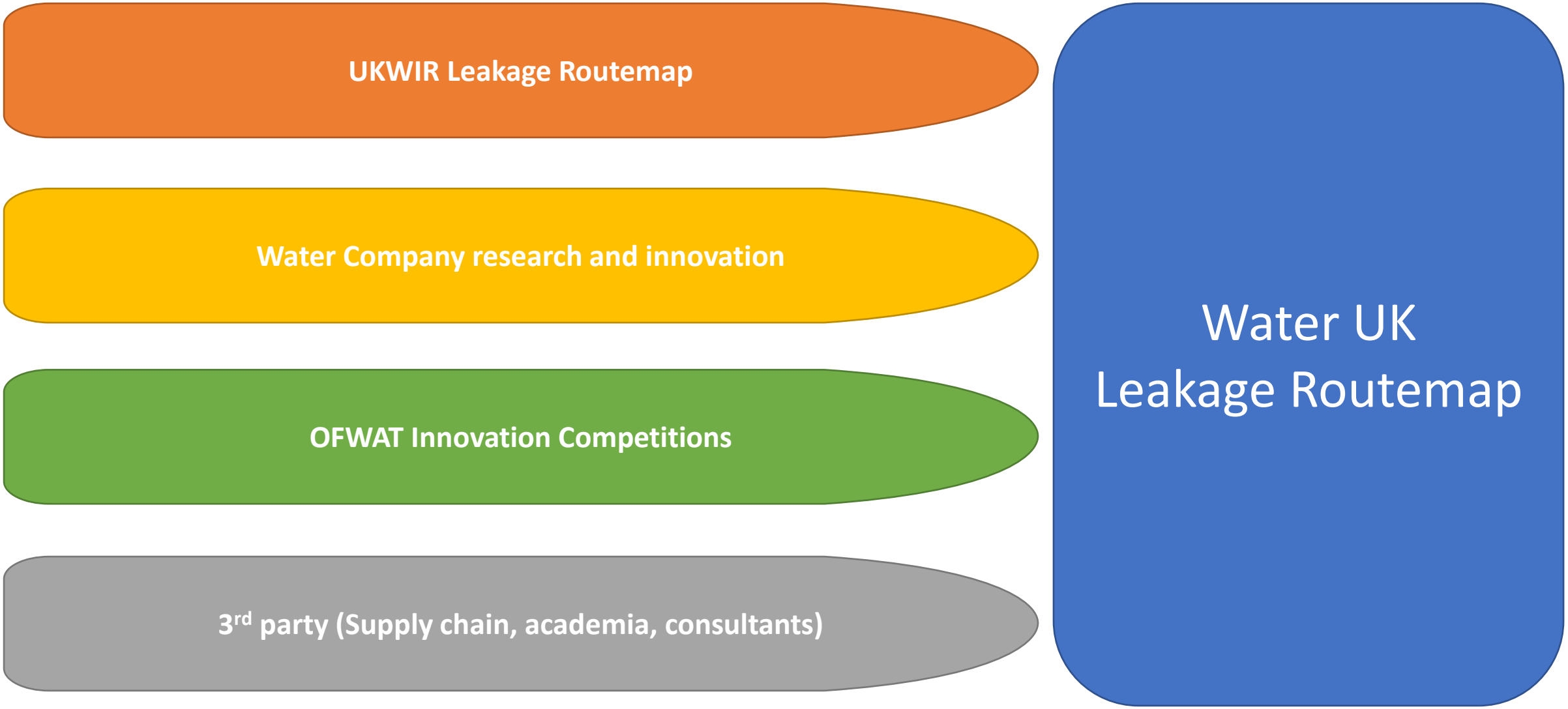
UKWIR Leakage Routemap

Water Company research and innovation

OFWAT Innovation Competitions

3rd party (Supply chain, academia, consultants)

Project Leakage



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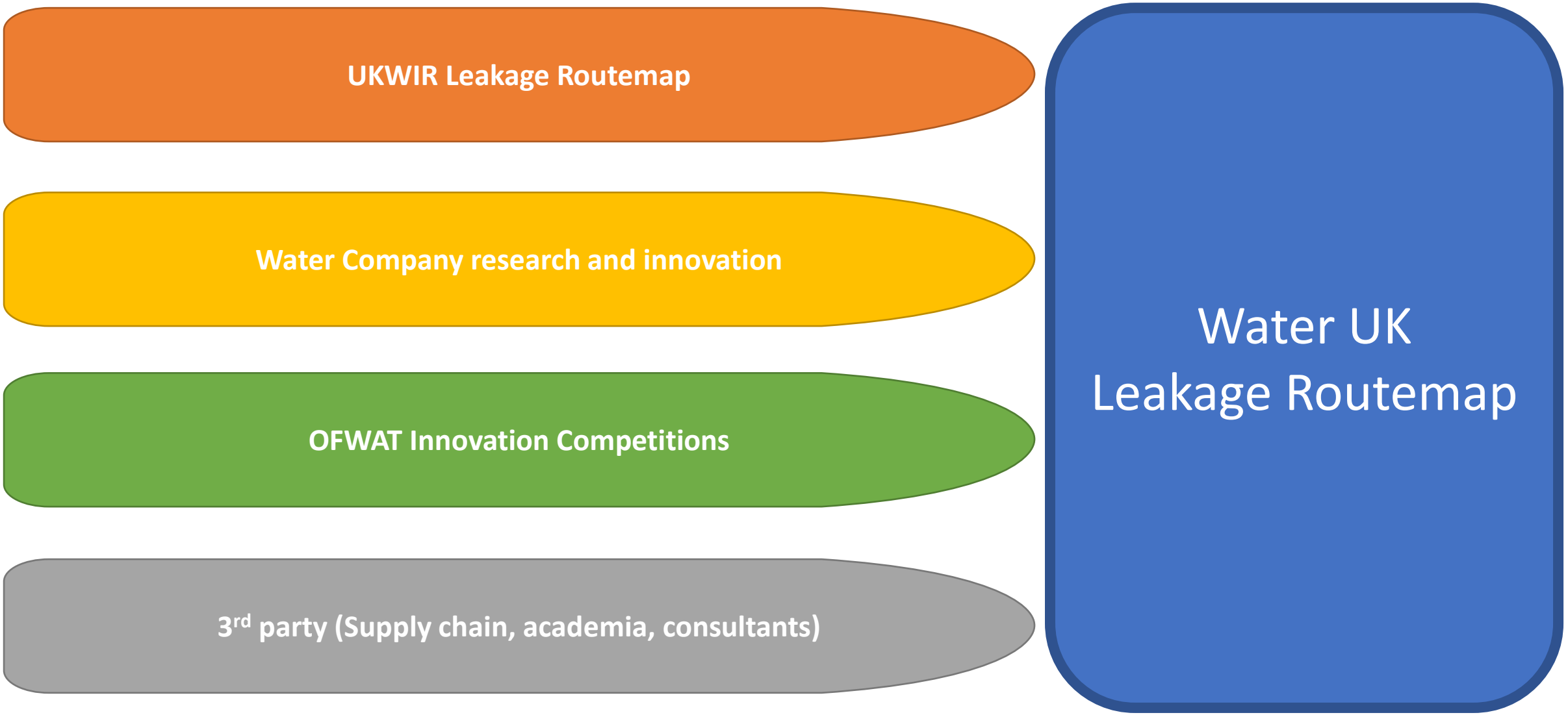


Developing a leakage route map – update for managing leakage webinar

Jeremy Heath – 22nd October 2021

Project Team

Joe Sanders, Technical Director, RPS

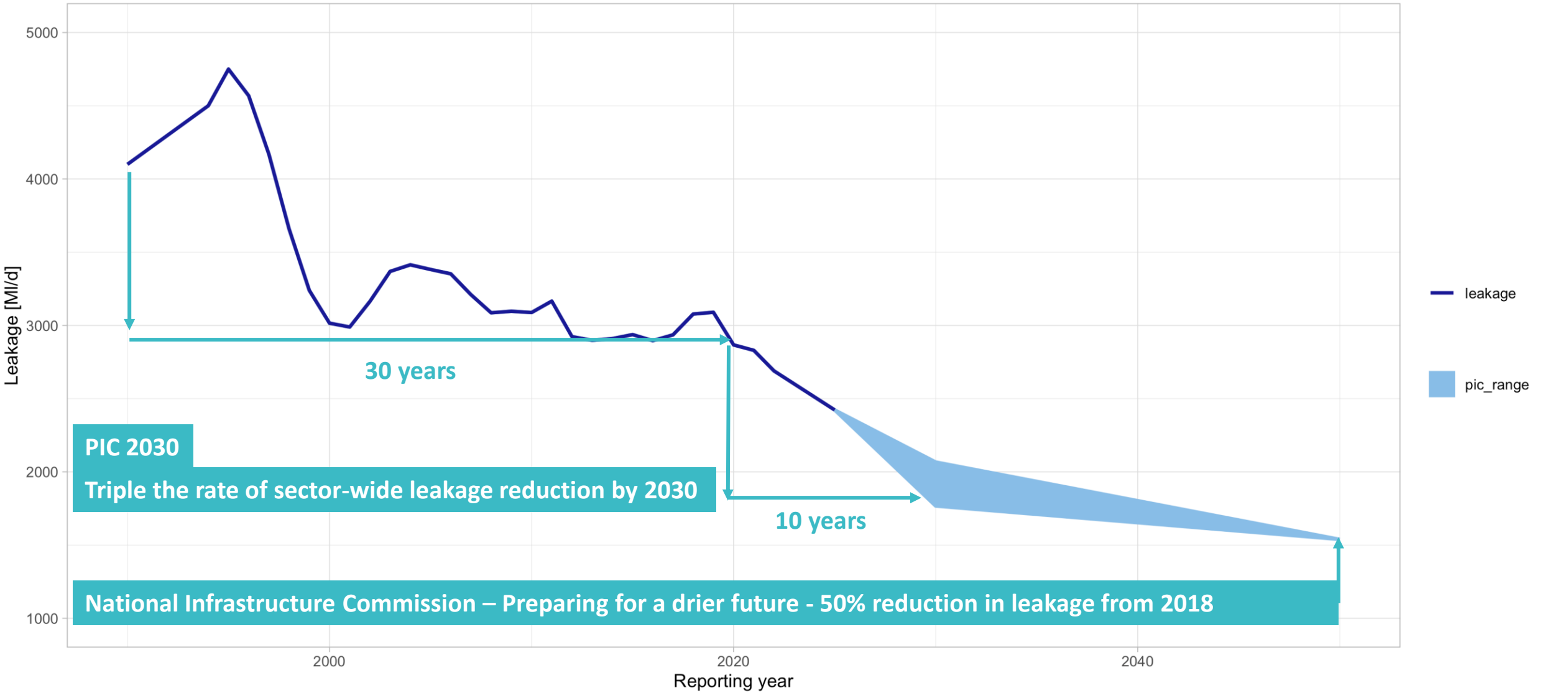
Dene Marshallsay, Director, Artesia

Glen Mountfort, Director of Technical Consulting, WRc

Project Manager

Jo Parker, Watershed Associates

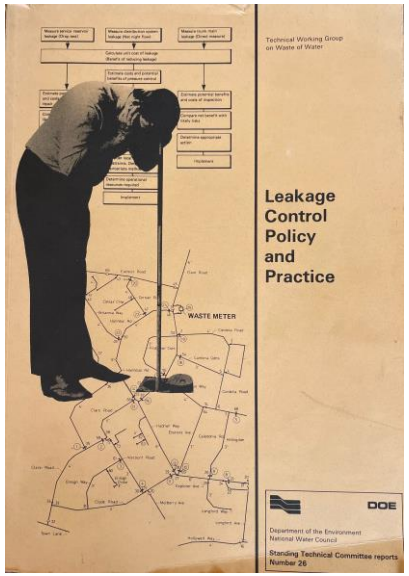
The PIC and NIC leakage challenge

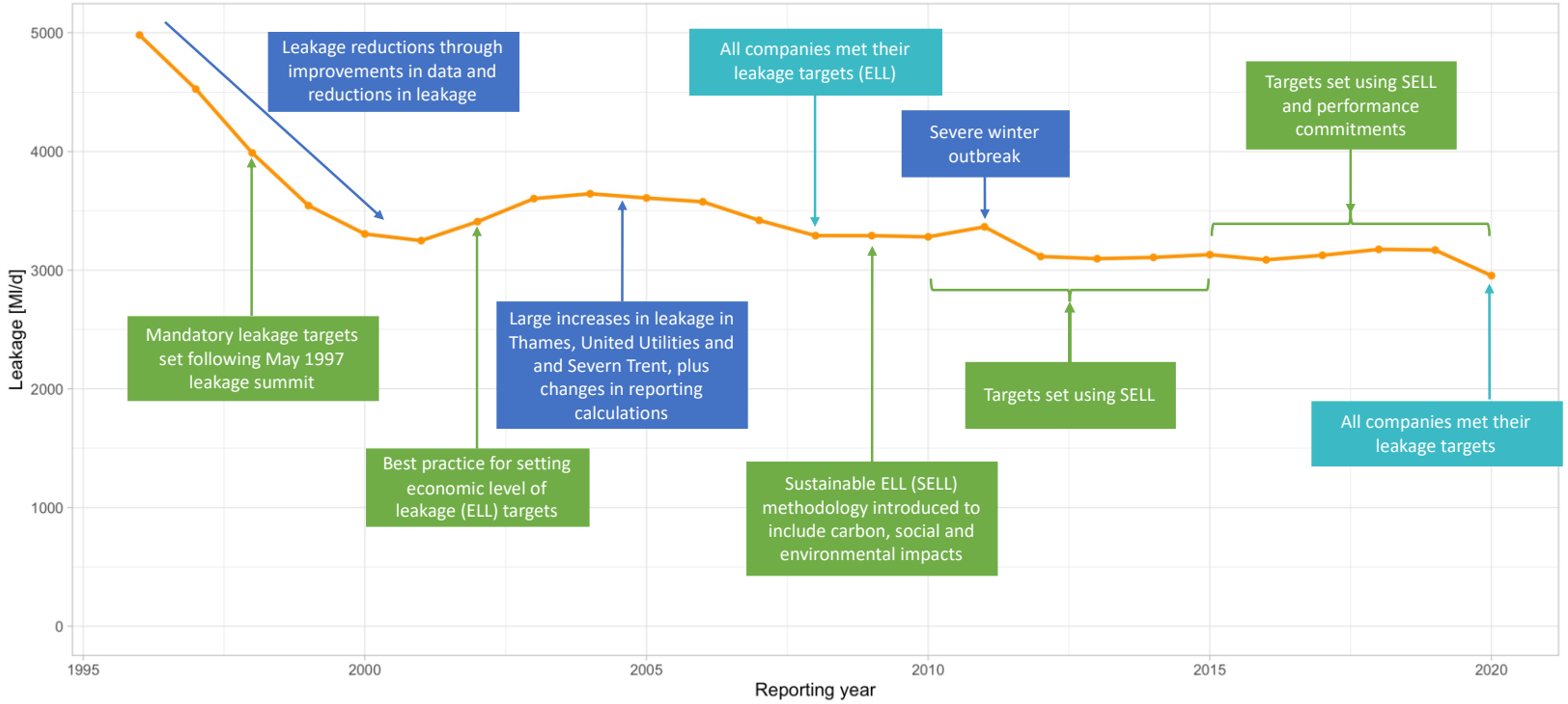


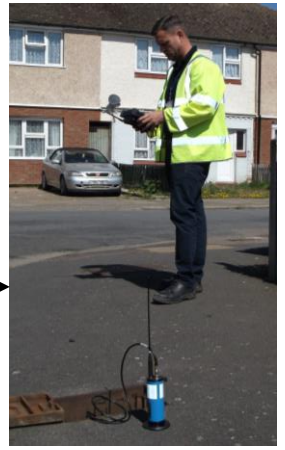
Water UK project objectives

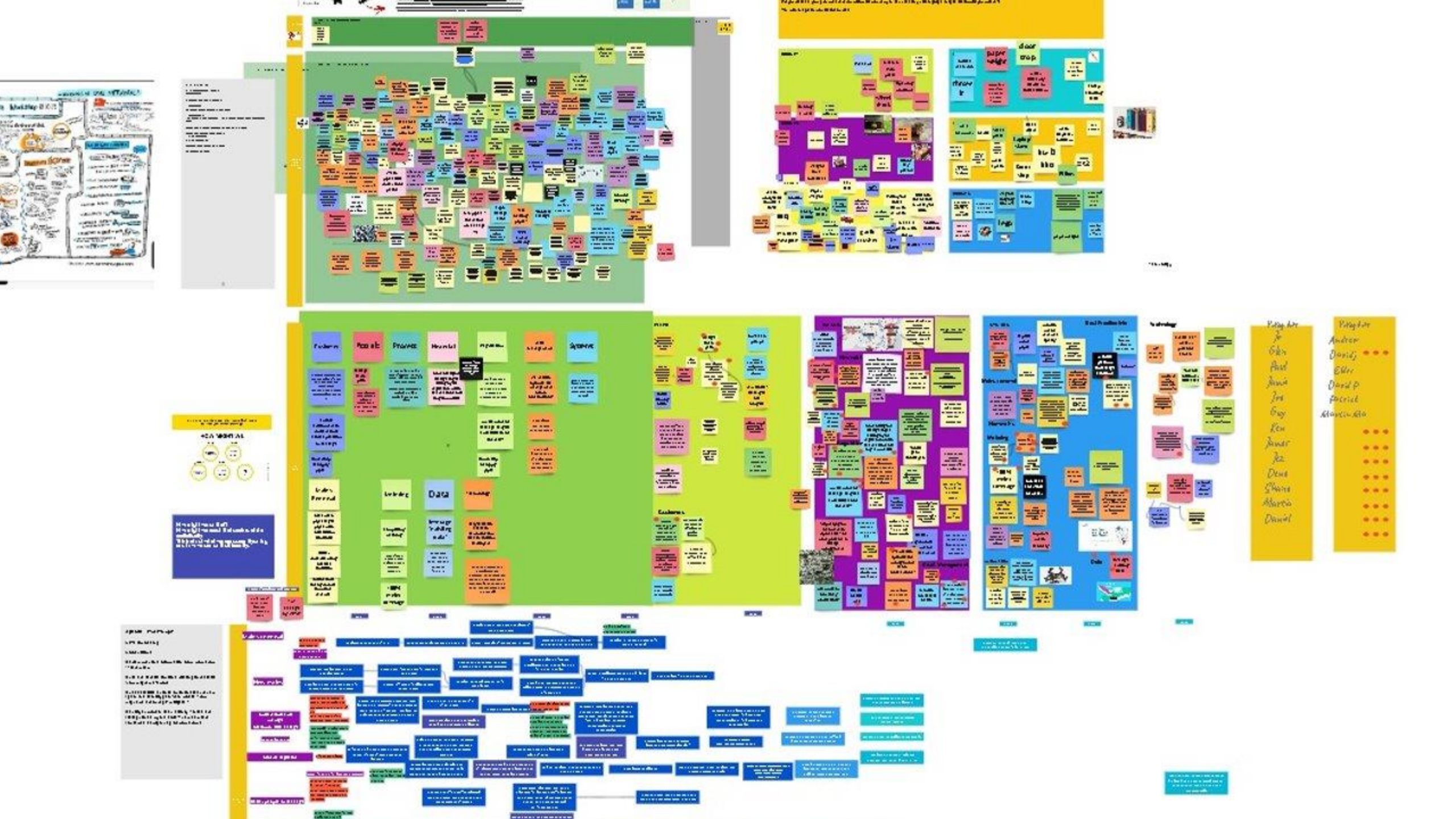
- Which interventions could have the biggest impact on the trajectory of companies in delivering leakage reductions by 2030 and 2050?
- What external factors pose the biggest risks?
- What are the small number of scenarios that show the different pathways for getting to 2030 and then halving by 2050?
- What are the costs and benefits of alternative approaches.
- What are the conclusions for where companies, regulators, Government and the supply chain should be focused?
- Which innovation priorities hold the biggest promise? Which elements of PALM (prevent, analyse, locate and mend) need more attention?
- What are the other changes that would maximise progress and minimise risk and where are the biggest gaps in evidence.

Review of the last 30 years of leakage management completed





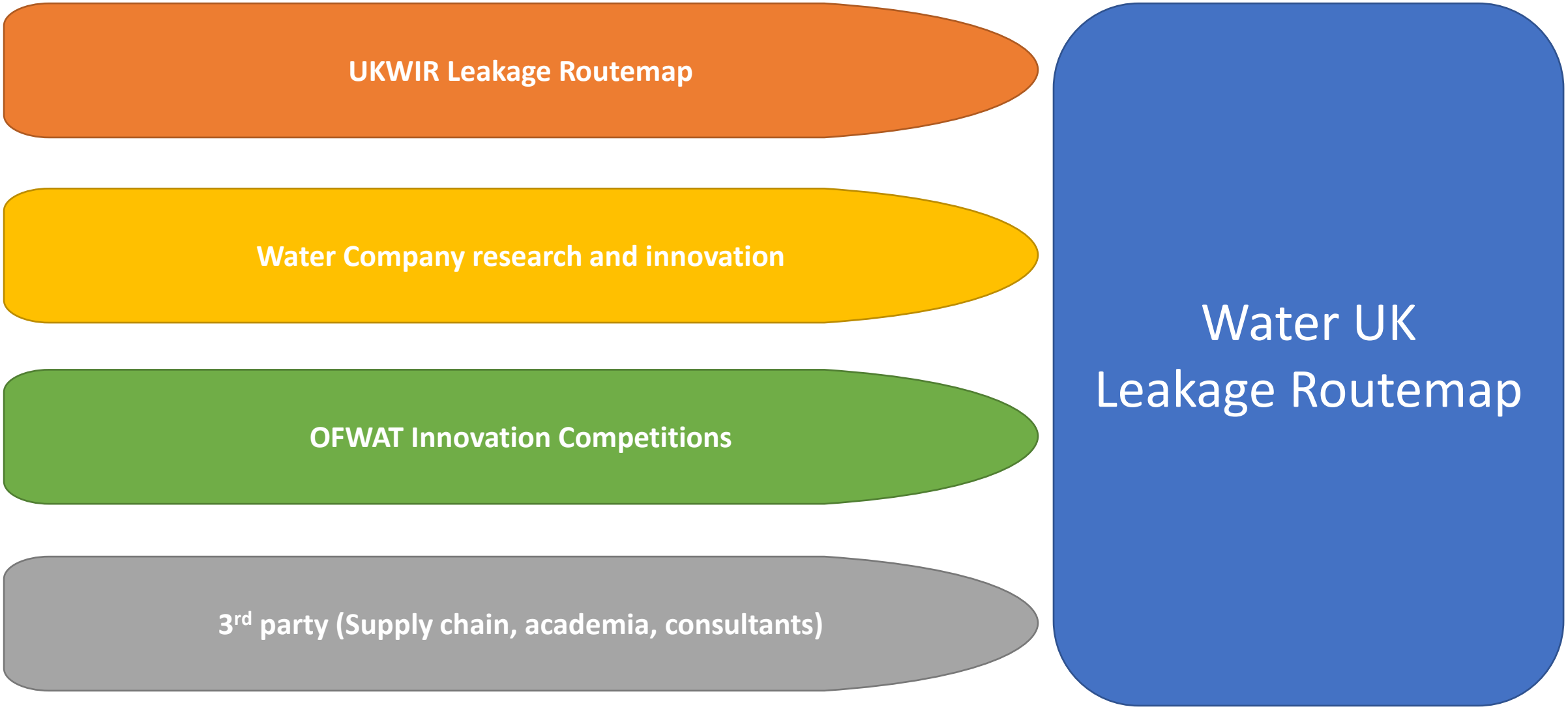




Route map is nearing completion

- There are some key ‘unknowns’ on the journey to 2030
  - For example: how low can active leakage control reduce leakage?
- Therefore, the route map will be in the form of an adaptive plan to address future uncertainties
- A core set of interventions and scenarios have been developed that could deliver the adaptive plan to 2050
- These link to UKWIR’s research on leakage
- Final stakeholder consultation is being carried out ahead of publication

Project Leakage



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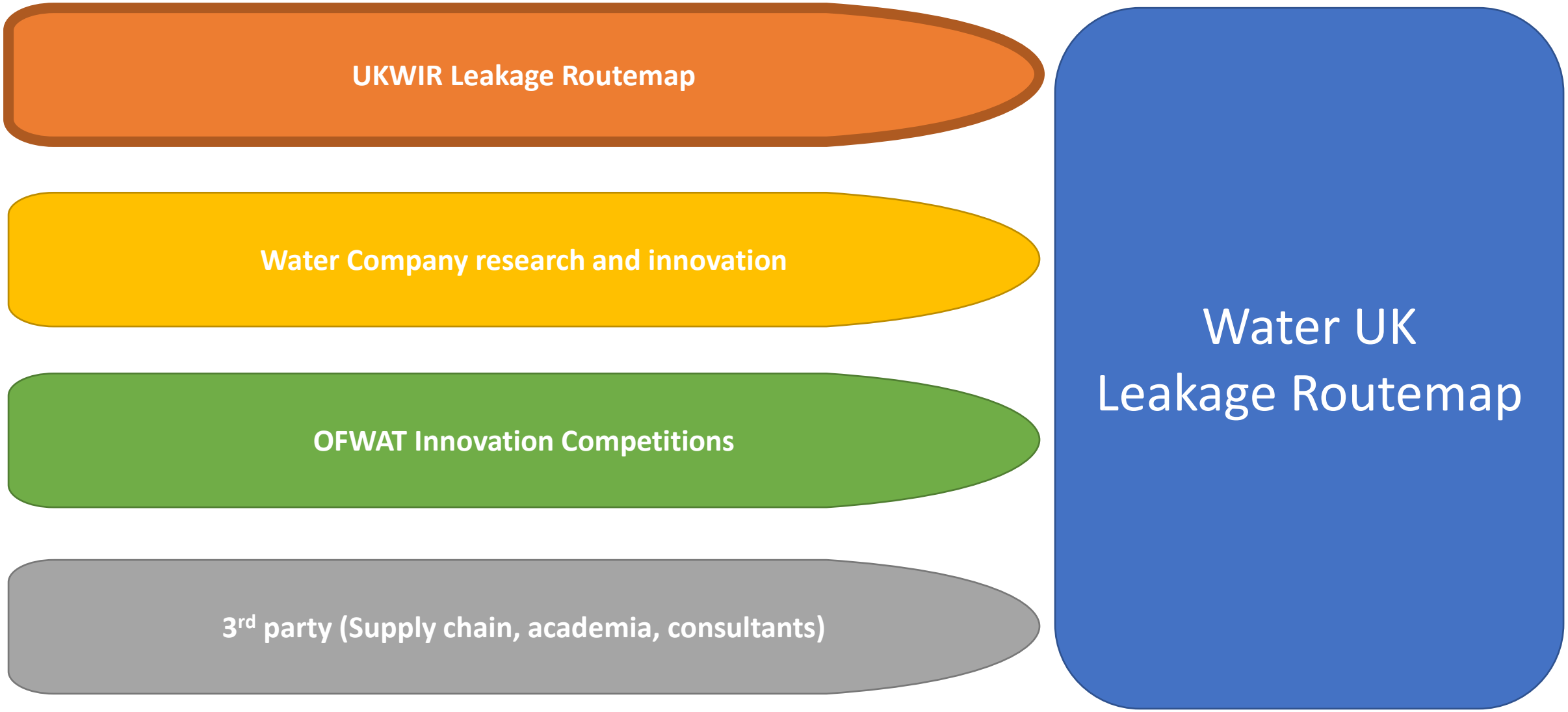


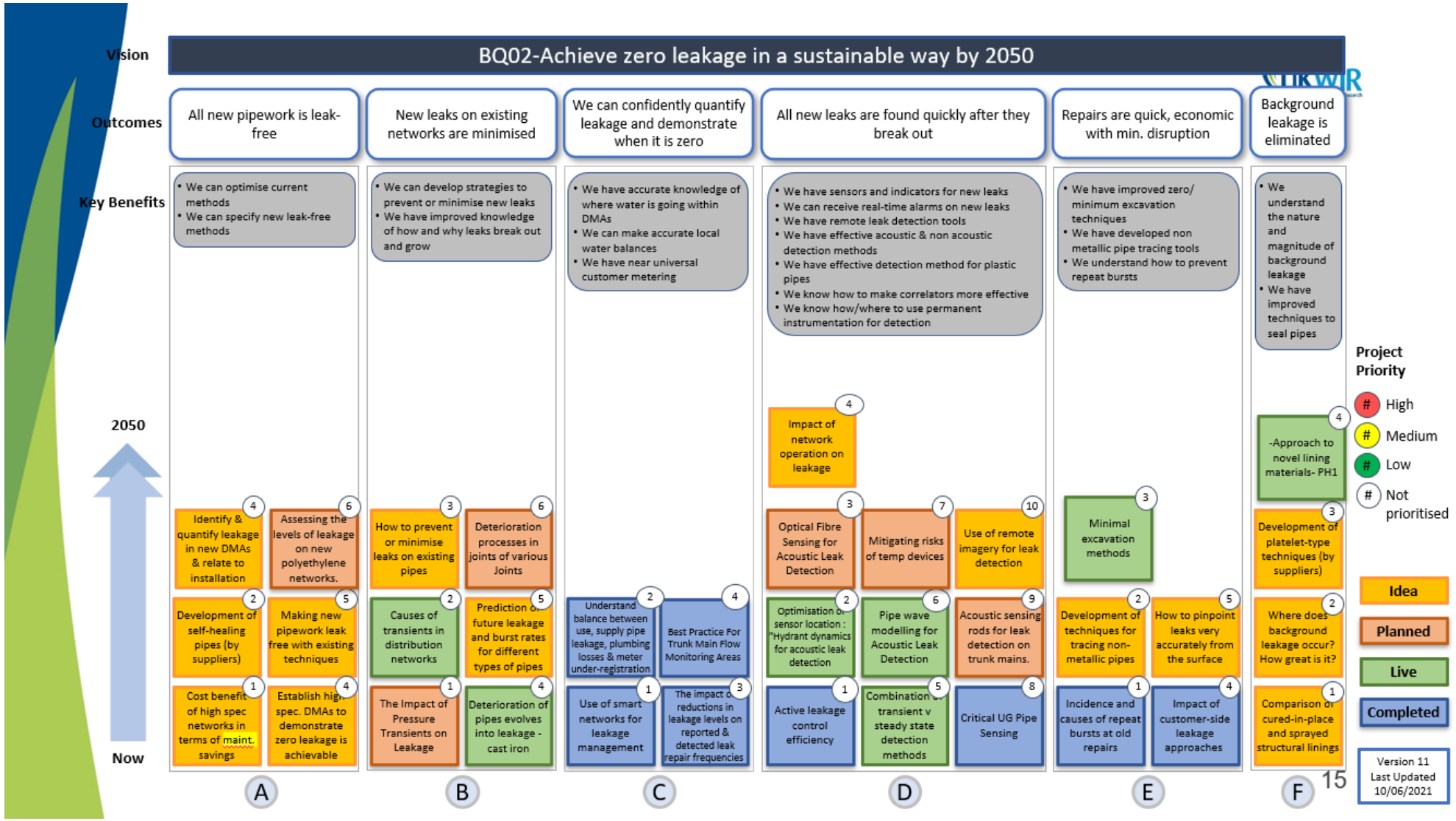
UKWIR Leakage Routemap

Project Title	Contractor	Start date	Finish date
BQ02 - Analysis of leak noise to determine characteristics of the leak before extraction (PhD)	University of Southampton	Sept-2018	Sep-2022
BQ02 - Achieving Zero Leakage by 2050: Phase 2 - Hydrant dynamics for acoustic leakage detection PhD	University of Southampton	Sept-2019	Sept-2022
BQ02 - Achieving Zero Leakage by 2050: Phase 2 - Combining transient and steady state methods for acoustic leak detection	University of Southampton	Sept-2018	Mar-2022
Understanding of how deterioration of pipes evolves into leakage - cast iron	University of Sheffield	Sept-2020	Sept-2024
The Impact of Pressure Transients on Leakage	University of Sheffield	Sept-2020	Sept-2024
Pipe wave modelling for Acoustic Leak Detection	University of Southampton	Sept-2020	Sept-2023
BQ02 Improving the testing approach to novel lining materials for potable water networks - Phase I	RPS	Apr-2021	Oct-2021
BQ02 Transferring minimal excavation methods into the water industry	WRc plc	Jul-2021	Jan-2022
BQ02 - Optical fibre sensing for acoustic leak detection (PhD)	University of Southampton	Sept-2020	Sept-2024
Causes of transients in distribution networks	RPS	Jan-2021	Dec-2021

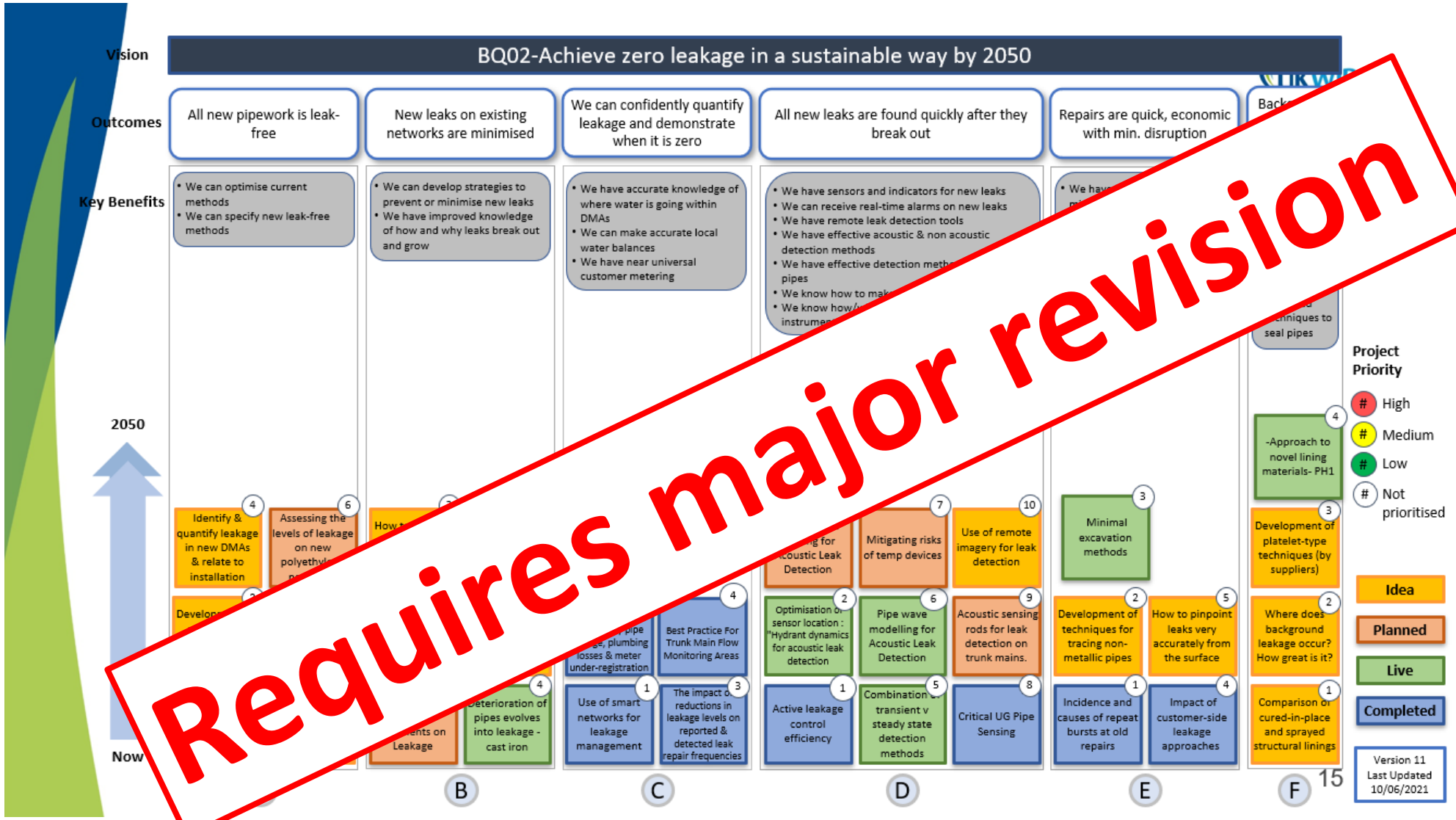
Project title: Long Term Performance of Electromagnetic Meters

Aims/Objectives: Taking into account the importance of accurate data and replacement costs, the project will provide firm guidance, in the form of a report, on when an electromagnetic meter should be replaced. Recommendations maybe broken down into different cohorts, taking into account factors such as likely cost of replacement, meter size and electronics. If any meter tested, fails to meet specification, the report will as best it can will establish the reason for this. This part of the report could be shared with manufactures to help them improve future performance.

UKWIR Leakage Routemap



UKWIR Leakage Routemap



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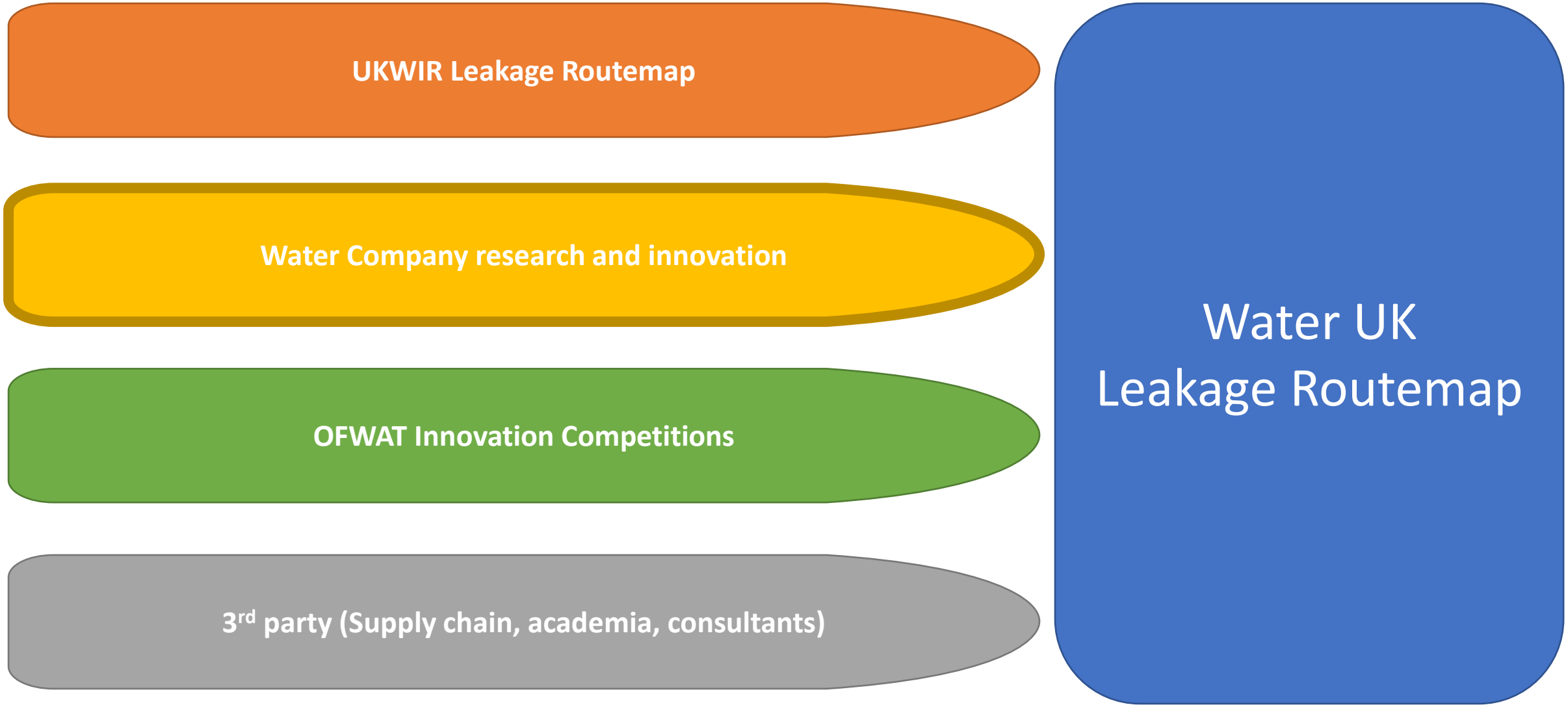

Water Company research and innovation

ID	Project Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Pipe & fittings installation practices		27				17				8							
2	Pipe and fittings installation standards/qualif										8							
3	Improved pipe fittings								21									
4	Network pressure optimisation		21			15			60	35		52	45				19	63
5	Mains condition surveying		27	24					22	18	10	29			63	62	19	
6	Network calming		42			10				26	17	49	47		47	63		16
7	Dynamic/Optimised networks				34					26						5		
8	Mains laying programme optimisation		35								8	26		9		23	19	
10	Supply pipe repair/replacement	18	17	21	21							37	36					4
11	Quantify trunk main leakage									12		18				30		
12	Quantify supply pipe leakage	13														16		
13	Quantify property leakage / allowances		40	74	86	10	47	21	57	26	22	21	61	82	123	141	37	24
14	Quantify network leakage / allowances	10			17			20			22	18						
15	Leak calculation convergence														21			
16	Quantify storage losses															19		
17	Top down/bottom up calculation alignment	10									32	52						25
18	Trunk main leakage awareness				17	16				23		31				10		
19	Trunk Main leakage location					21	53				26	38	44		47	65		
20	Network leakage awareness	21	58	61	34	29		95	46	75	36	23	26	21	65	88	37	53
21	Network leakage location (acoustic)		74	32	17	31	24	12		21	27	21	18		78	79	17	22
22	Network leakage location (non acoustic)		90	38	42	34	21	24	21	47	170	39	65	86	128	99	38	17
24	Supply pipe leakage location	9	29			28						17			47	27		
25	Micro excavation		18				17		18							10		
26	Internal repair methods				18		21				42	56	26	9		29		
27	Temporary repair methods			9		18									26		17	
28	Repair process optimisation							9			52	19				212		

Water Company research and innovation

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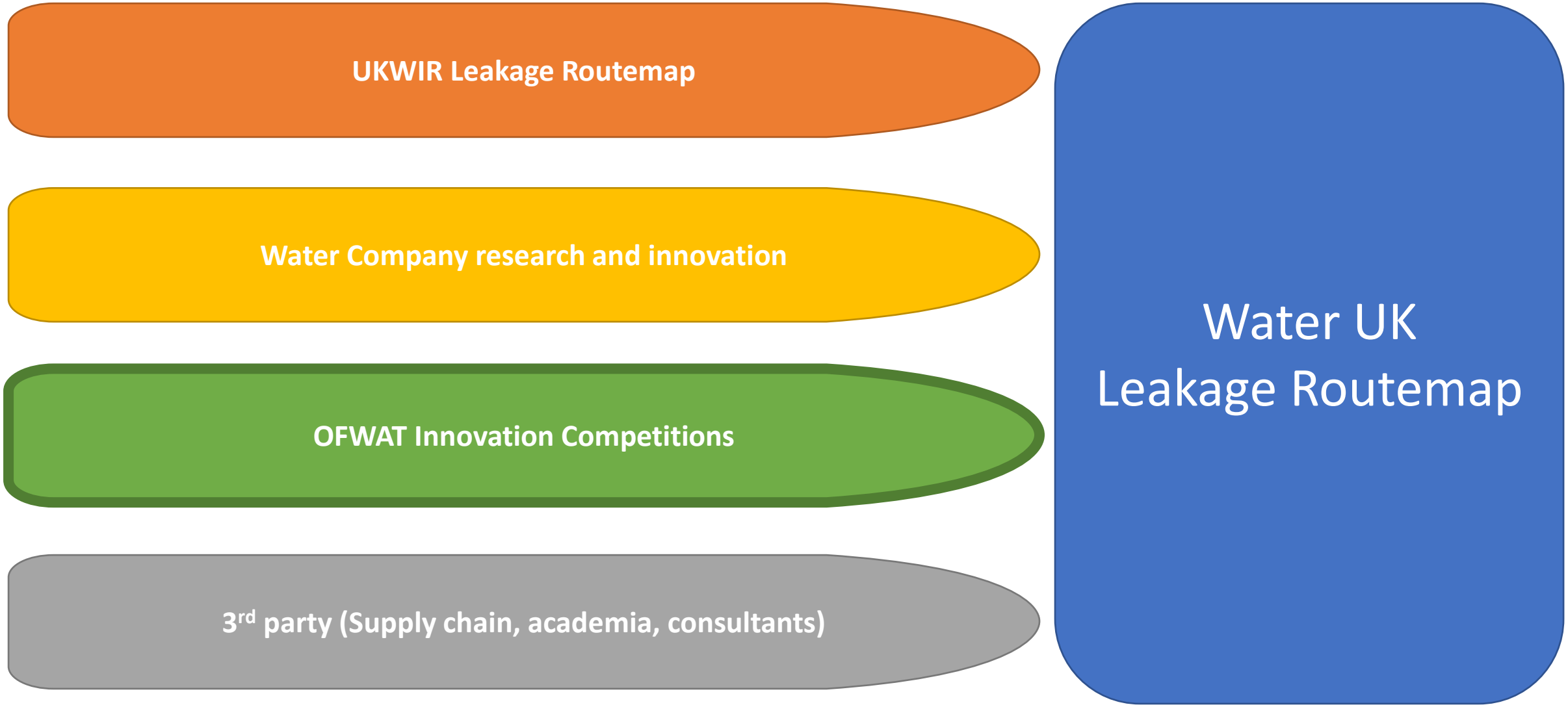
Requires update

Project Leakage



Water Company research and innovation

Innovation in Water Challenge final projects

Project	Company
AI & Sewer Defect Analysis	United Utilities
CatchmentLIFE	South East Water
Enabling Whole Life Carbon Design	Anglian Water
Industrial Symbiosis	United Utilities
Leak Detection using Dark Fibre	Hafren Dyfrdwy
Organics Ammonia Recovery	Northumbrian Water
Reservoir water community monitoring for algal associated risk assessment	Dŵr Cymru (Welsh Water)
Seagrass Seeds of Recovery	Affinity Water
Smarter Tanks to build a resilient network	Affinity Water
Supporting customers in vulnerable circumstances	Severn Trent Water
UK Water Sector Innovation Centre of Excellence	All Companies

Water Company research and innovation

Water Breakthrough Challenge final projects

Project	Company
Alternative approaches to phosphorus removal on rural wastewater treatment works	United Utilities
Artificial Intelligence of Things Enabling Autonomous Waste Catchments	Seven Trent Water
Catchment Systems Thinking Cooperative (CaSTCo)	United Utilities
Flexible local water supply schemes pilot	Bristol Water
Safe Smart Systems – Embedding resilience for the future through automation and artificial intelligence	Anglian Water
Transforming Customers' Lives: Integrated Pathways to Fair and Sustainable Water (FAIR WATER)	Northumbrian Water
Transforming the energy balance of wastewater treatment	Thames Water
Triple Carbon Reduction	Anglian Water
Water neutrality at NAV sites	Affinity Water

NATIONAL LEAKAGE RESEARCH AND TEST CENTRE

WHAT IS PROPOSED?

A 5km long test network
All diameters up to 12”
Multiple pipe materials
New and old pipe

Unique features
Zoneable – configure loops
Moveable leaks
Simulate consumption
Recycle leaked water

Value added features
Free to use
Dedicated staff at centre

Stream's vision to stimulate innovation and collaboration through **open and shared data**

Stream's vision is to "unlock the potential of water data to benefit customers, society, and the environment."

That's why we're hard at work designing a scalable open data framework enabling innovators to use data to address key water sector challenges, such as:

- Preventing environmental incidents;
- Reducing absolute carbon emissions associated with water extraction, use, and treatment;
- Bringing down the cost of water, particularly for the most vulnerable customers;
- Catalysing innovation and new ways of working across the sector; and
- Enabling our people to do more exciting, meaningful work

STREAM MEMBER COMPANIES

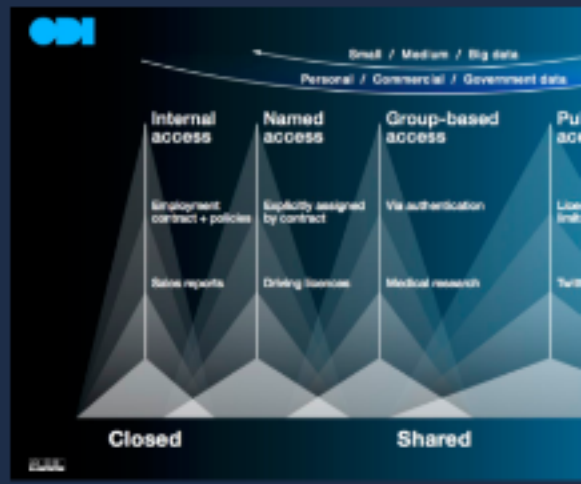
Stream

love every drop anglianwater · Dŵr Cymru Welsh Water · NORTHUMBRIAN WATER living water · ses WATER · SEVERN TRENT · Scottish Water · Southern Water · South West Water · Thames Water · United Utilities · YorkshireWater

How does Stream d… Open Data?

Stream defines Open Data as: "da… available to everyone to access, u…

While our aim is to open any wate… doesn't pose commercial, ethical … risks to our stakeholders, we ackn… doing so will entail a journey from … to 'Shared' data to 'Open Data.' T… curve is demonstrated by the Ope… Institute's Data Spectrum below.



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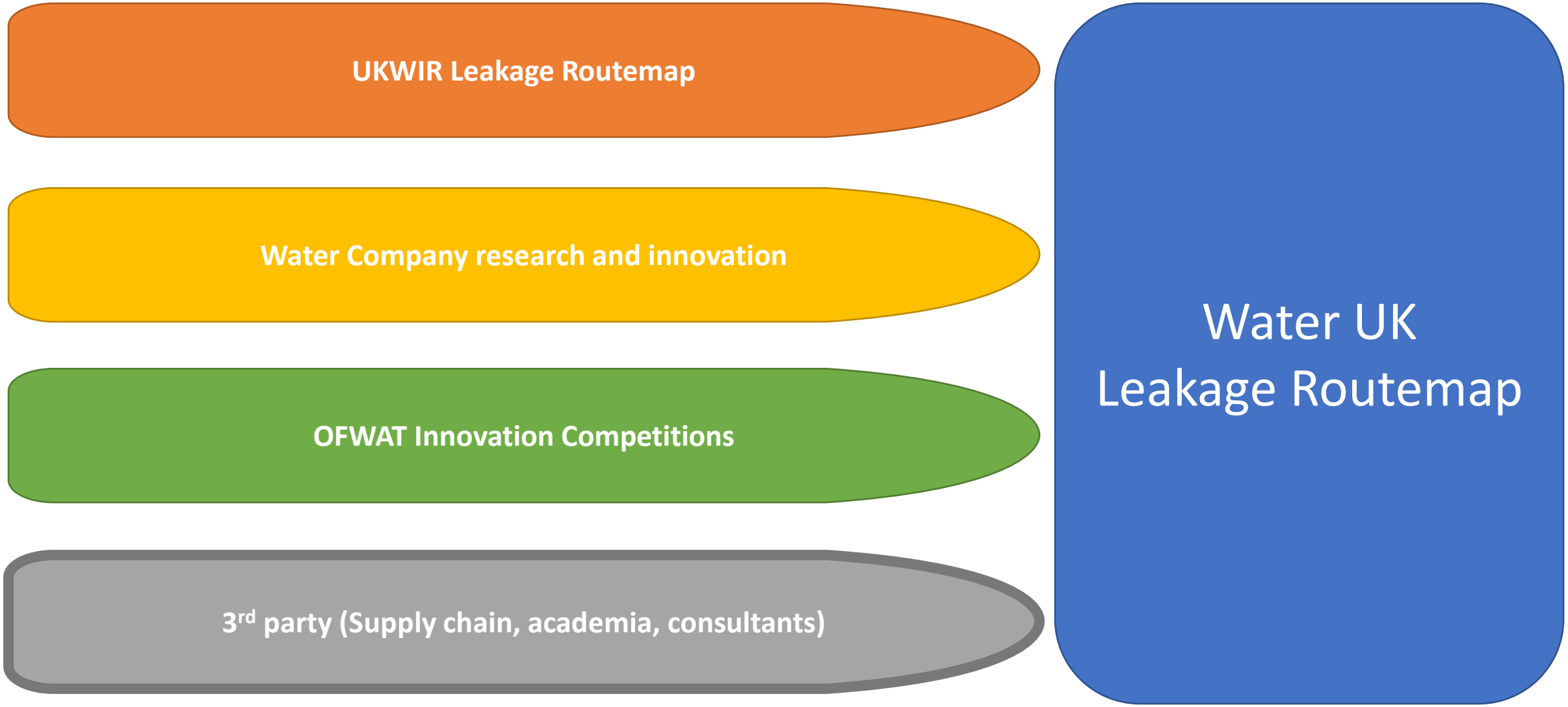

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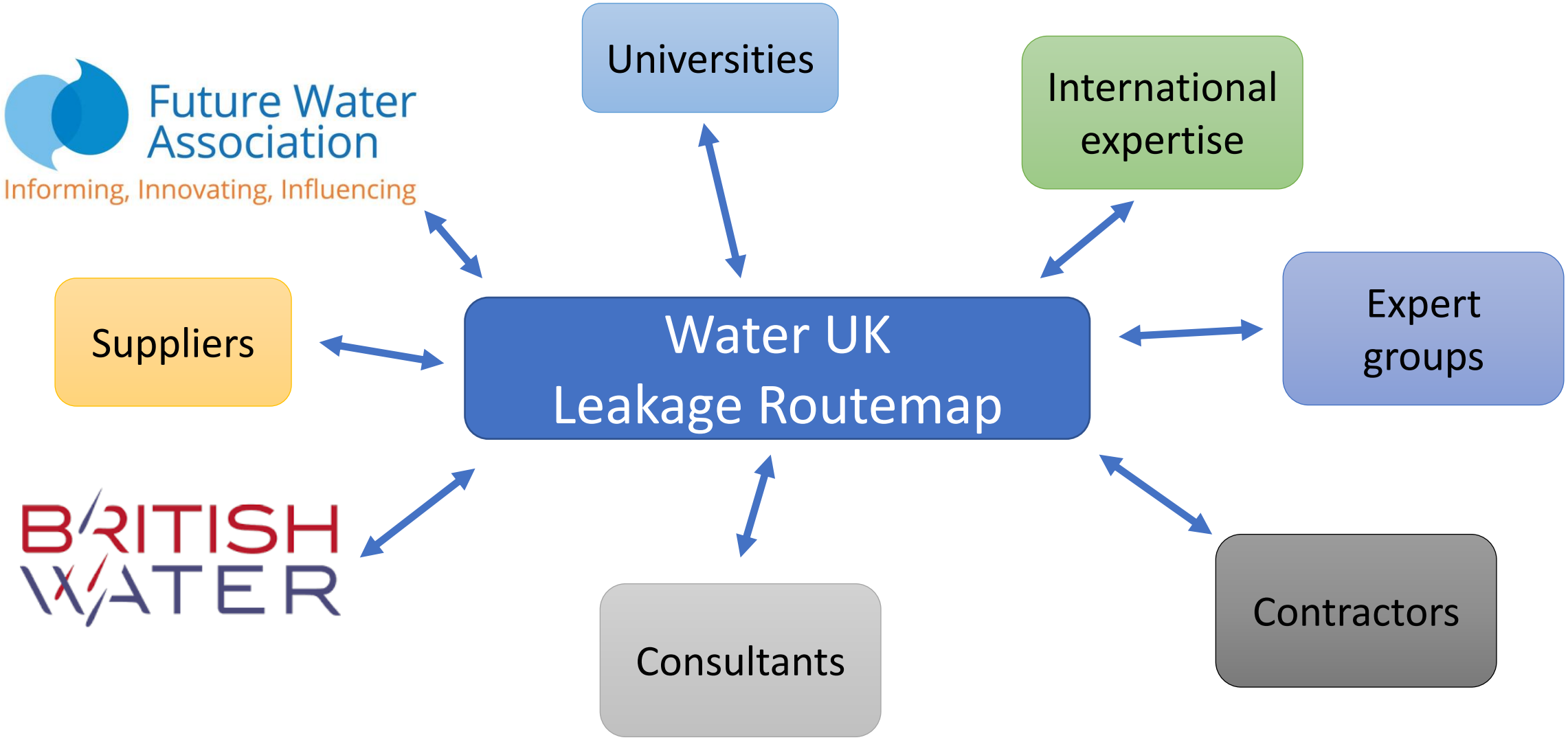

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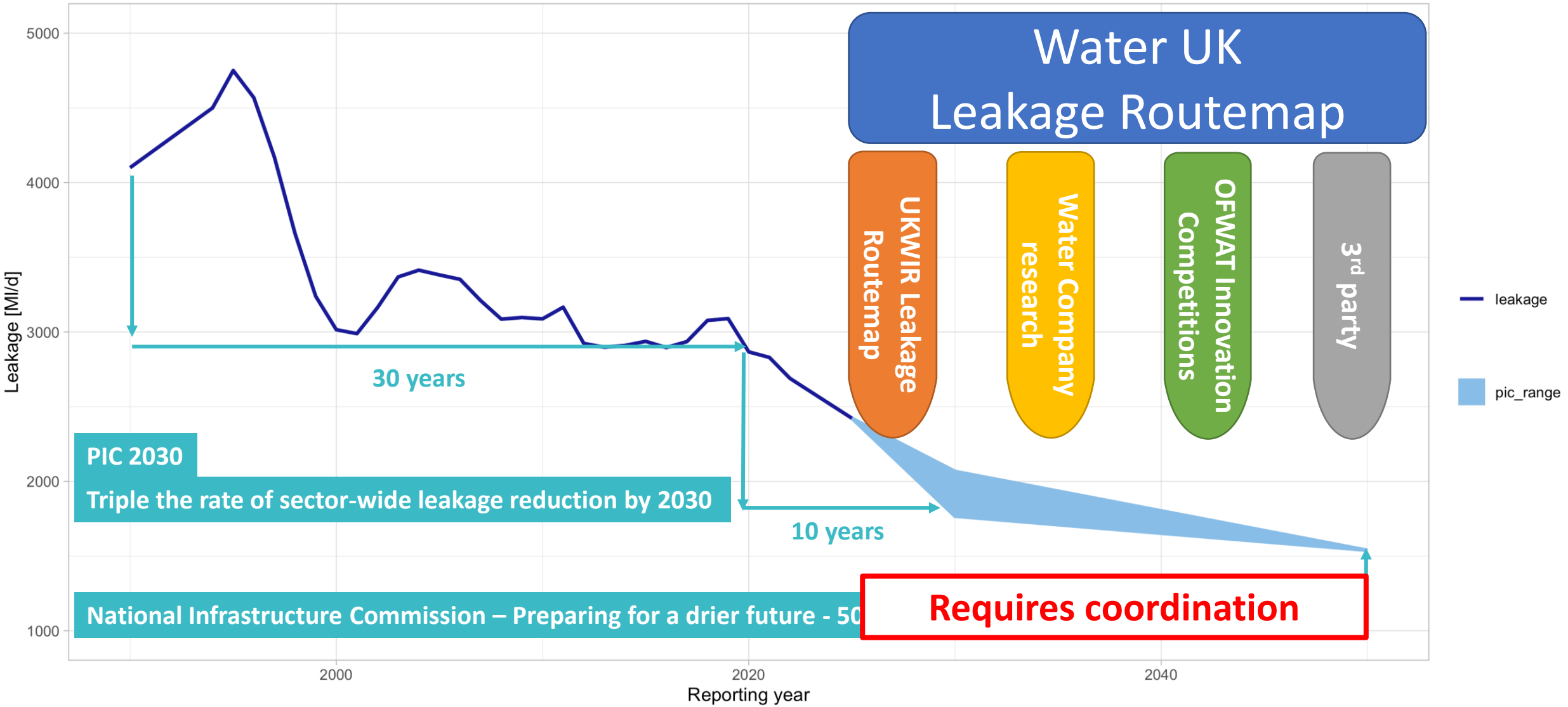

Lots of questions?