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Welsh Water

PR24 Preparation

Andy Taylor – Director of Asset Planning

June 2024

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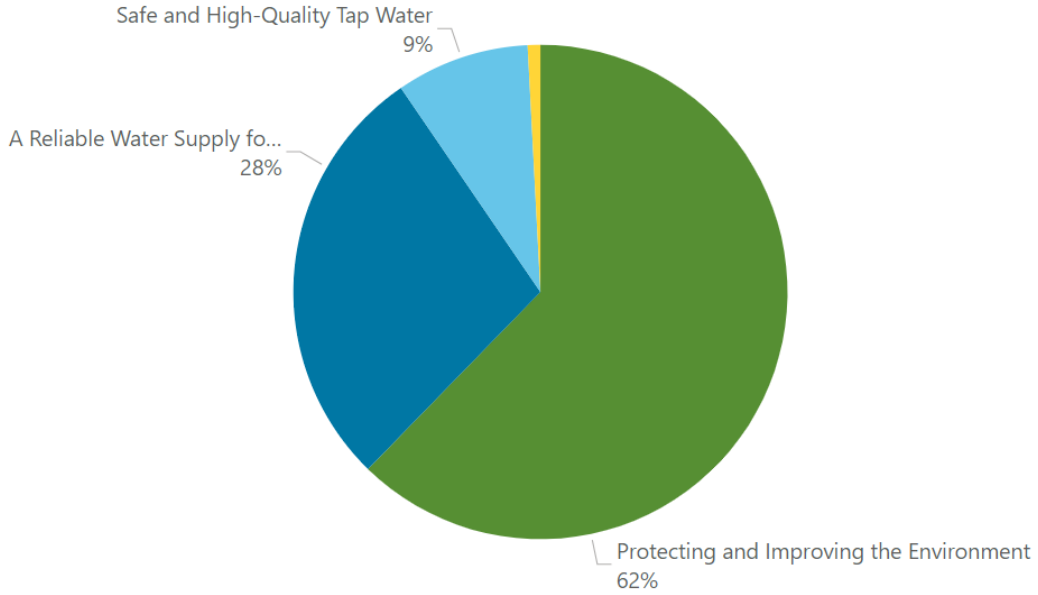
Strategic ambition

PR24 business plan developed with the guiding principles of being

- Affordable
- Deliverable
- Financeable

PR24 business plan has been developed against four strategic objectives;

- Safe and high-quality tap water
- A reliable water supply for the short and long term
- Protecting and improving the environment
- Excellent customer service



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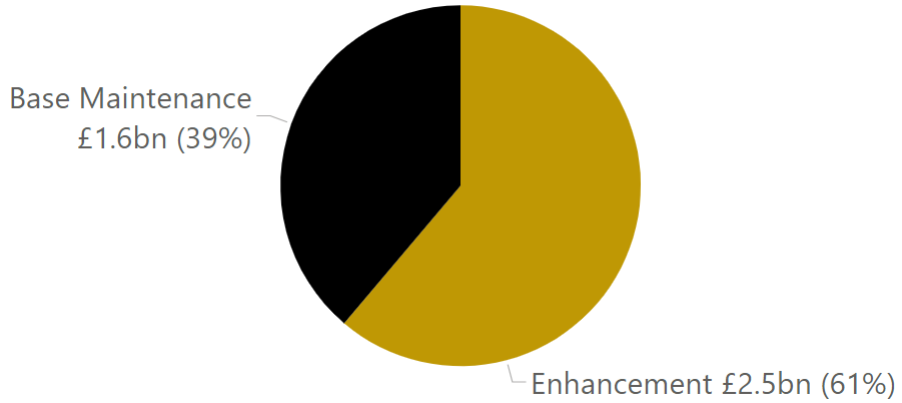
Highlights of our PR24 plan

- Largest ever investment programme at £4.0bn – 90% bigger than AMP7
- £1.5bn NEP programme 6 times larger than PR19
- Average bill increase of c.30%
- Highest customer acceptability across the sector at 84%
- Return to 4 Star Environmental Performance Assessment (EPA)
- Elimination of all ecological harm from operation of storm overflows by 2040
- Pollution incidents cut by 13% - 78 to 68 per annum
- 10% reduction in leakage levels
- Drinking water quality contacts reduced by 43%
- Underpinned by principles of being balanced, affordable and deliverable
- Delivers against the PR24 Forum ‘Strategic Steers’ and thereby meets expectations of Welsh Government and regulators
- Stretching Performance Commitment targets, particularly where lagging



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Context and challenges

- Current performance challenges against some regulatory measures
- Public concern around storm overflows and pollution
- Need for greater resilience to climate change and extreme weather
- Progress towards net zero carbon emissions
- Huge asset base in need of modernisation
- Largest environmental programme in the history of the sector
- Major supply / demand schemes
- Rising debt costs and challenging finance-ability position set by Ofwat
- Cost of living crisis and affordability concerns
- Late changes to WRMPs and WINEP

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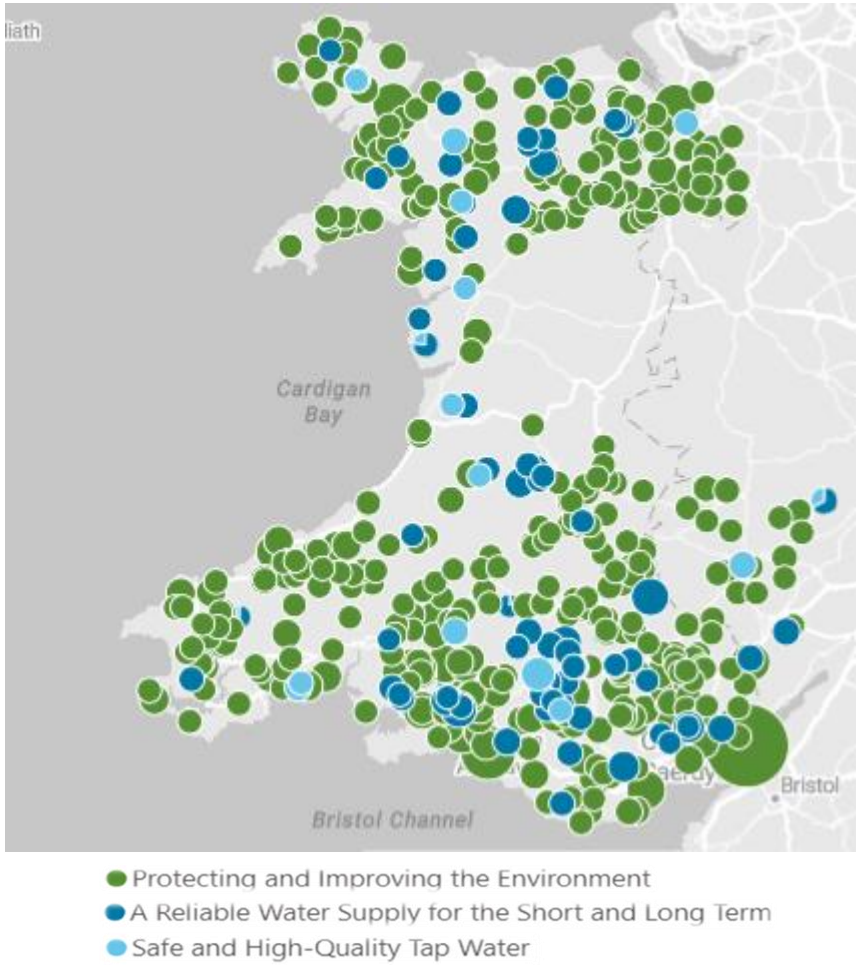
Current status

- PR24 business plan submitted in October 2023
- Query process started soon after – focus on cost assessment
- Updated tables in November - £50m uplift expenditure for latest NEP
- Updated tables in January – further £475m uplift for latest NEP and revised guidance
    - Storm overflow NRW GN066 guidance £375m
    - Uncertainty mechanism
    - Price control deliverables
- Welsh Government and PR24 Forum engagement
- Resubmitted updated board assured plan – additional £525m investment, increasing customer bills by £20 by 2029/30
- Query process and engagement with Ofwat on-going
- Draft Determination expected mid-June 2024
- Final Determination expected December 2024



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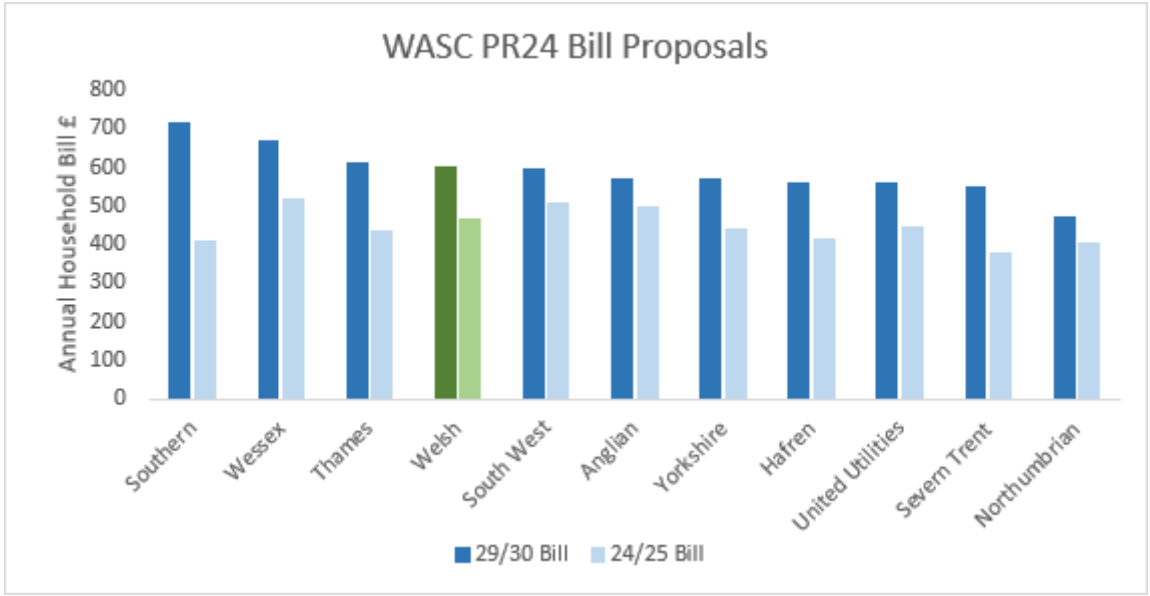
How our PR24 plan compares to others

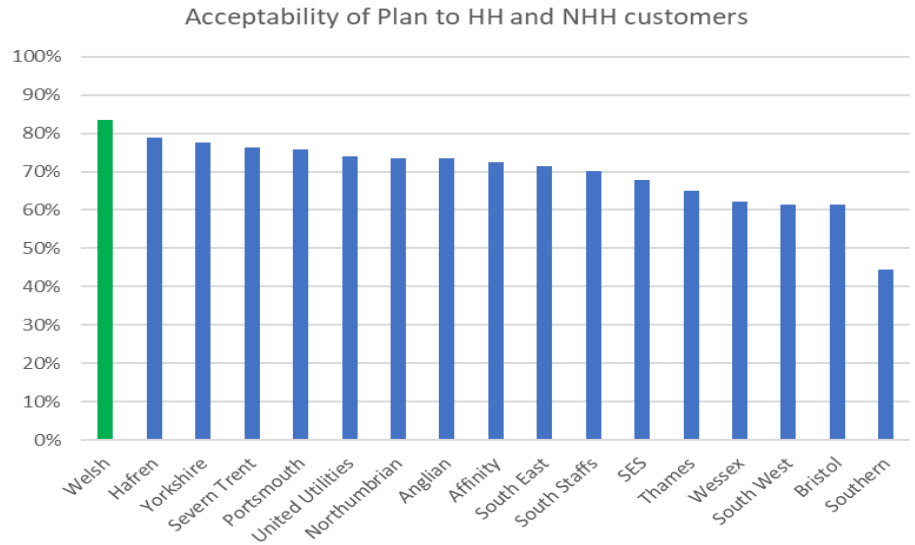
Overall, our plan compares well on the fundamental metrics

- Proposed bill increases of 30% (lower than sector average of 33%) and 4th highest overall
- Industry leading customer support measures
- Highest customer acceptance
- Financially resilient plan
- Welsh Government support



Areas where our plan differs to the sector

- Focusing on harm – storm overflows and phosphorous.
- Plans to address where we are currently falling short on
- Enhancement expenditure WAS lower than sector
- No DPC in PR24 but on-going DPC scheme from PR19



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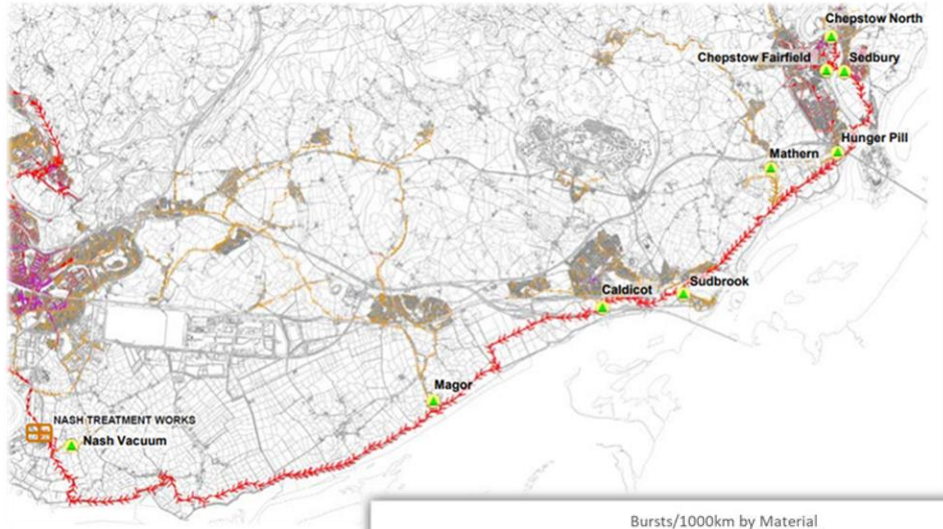
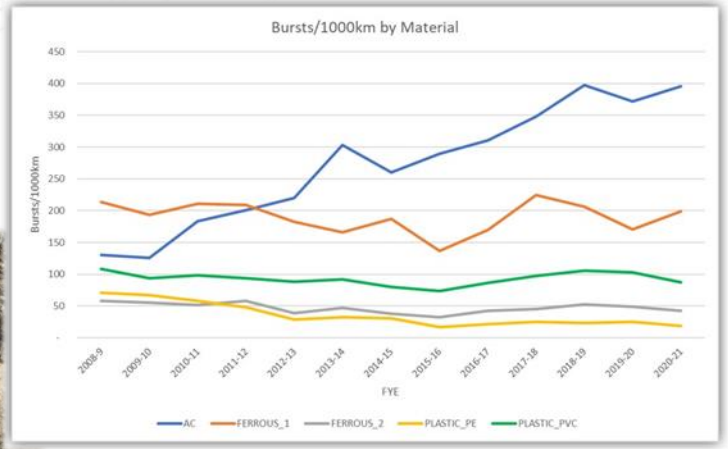
Overview of investment programme

- Largest ever investment programme at £4.0bn driven by environmental expectations
- Efficiency of £0.4bn included in our plan
- Stepping up replacement of AC mains which are no longer fit for purpose
- Tackling failing rising sewer mains in sensitive environmental areas
- Numerous investigations to inform future storm overflow investment to address harm
- Accelerated metering installation programme





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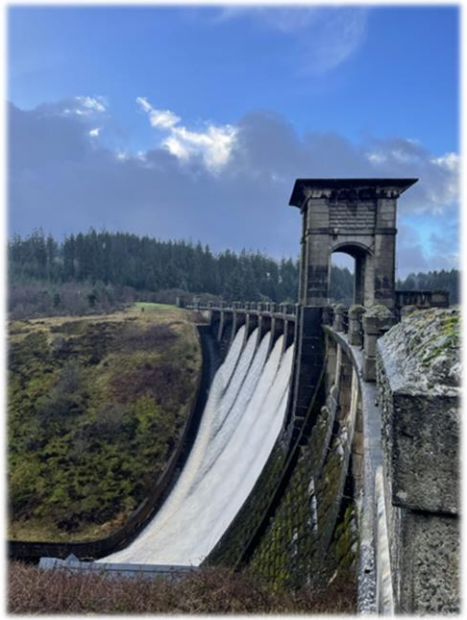
Investment programme - Water

- Customer priorities
  - Water supply resilience
  - Reduce leakage
- Regulator priorities
  - Drinking water discolouration
  - Dam resilience
  - 2022 drought lessons implemented
- Performance improvements
  - 10% reduction in leakage from 191ml/d to 173 ml/d
  - Reduction in supply interruptions from 8 mins to 4 mins – 44% reduction



		CapEx
Resilience	AC mains, customer side inspections	£150m
Customer Supply Metering	Enhanced programme	£125m
Infrastructure	Taste, odour and discolouration	£118m
Supply/Demand	Interconnectors	£83M
Reservoirs	Dam safety	£79m
Growth	BG capacity	£48m
Enhanced treatment	UV & manganese	£42m
Security	CNI and Cyber	£29m
Catchment management	Reverse deterioration	£27m
GHG reductions	Restoring peatland and creating new woodland; network control to reduce energy consumption	£27m
Cwm Taf	DPC	£25m
Lead pipes	Replacement programme	£15m

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Investment programme – Waste Water

- Customer priorities
  - River and bathing water quality
  - Storm overflows
  - Reduce sewer flooding
- Regulator priorities
  - Reducing phosphorous levels in rivers
  - Pollution incidents
- Performance improvements
  - Return to ‘4 Star’ EPA
  - 19% reduction in pollution incidents
  - 17% reduction in internal sewer flooding
  - 21% reduction in external sewer flooding
  - Maintain excellent bathing water quality

		CapEx
WI(NEP)	CSO spill reduction	£693m
	Nutrient (N&P) removal	£259m
	Biodiversity, habitats, WFD, pollution, groundwater	£118m
	Flow at WwTW	£85m
	Sludge treatment	£83m
	Monitoring (EDM and river quality)	£72m
	Storm tank capacity	£66m
	GHG reductions in Waste	£40m
Growth	AG and BG capacity	£133m
Customer service	Odour and flooding	£64m
Pollution	Serious incidents	£54m

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Welsh Water

Summary

- Largest ever investment plan to improve the environment, meet rising customer expectations and secure long term resilience
- Aligned to Long Term delivery Strategy and Welsh Water 2050
- Delivers against PR24 Forum ‘Strategic Steers’ and meets expectations of Welsh Government, regulators and customers
- Developed following on-going customer engagement
- We are committed to our plan and delivery programmes for AMP8 are being finalised – focusing on first two years
- Rigorous and robust challenge from Board, stakeholders and customers
- Plan is financeable, affordable and deliverable

Capital Delivery and Procurement

Capital Delivery Update

Martin Hennessey,
Director of Capital Delivery

David Druett,
Procurement Director

Agenda

- What's important to us
- Water
- Wastewater
- Nature Based Solutions
- Innovation and Sustainability
- AMP8 compared to AMP7
- How do we deliver schemes?
- Procurement Update
- Questions

Capital Delivery

What's important to us?

Health, Safety and Wellbeing

Value for Money

Quality

Meeting Regulatory Commitments

Customer Satisfaction (internal and external)

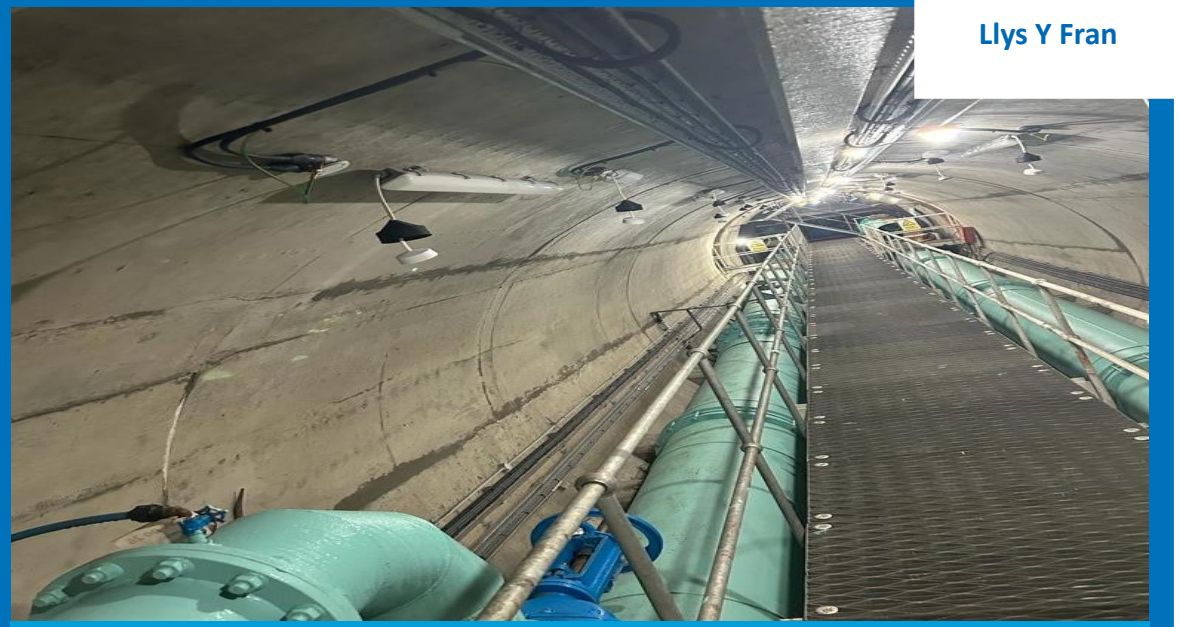
Continuity of service to customers

Continuity of service to the environment

ESG – Carbon, Recycling, Biodiversity

Capital Delivery - Water

Llys Y Fran

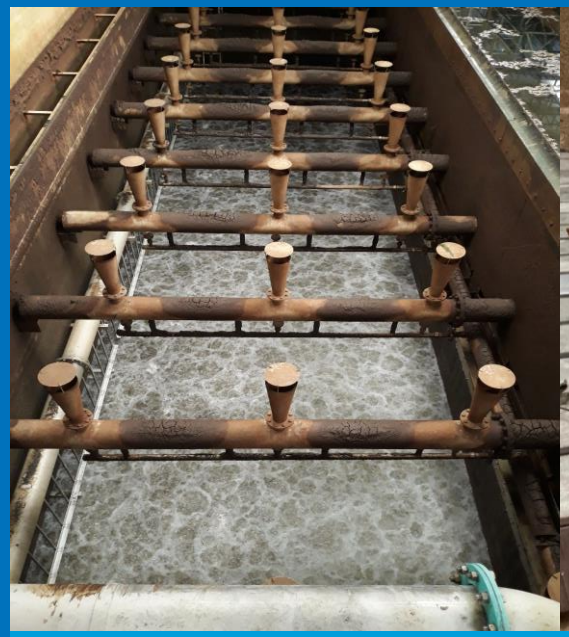


Newly Painted Valve and Pipework and new lighting

Llyn Celyn

900mm Pipework installed

Felindre CoCoDAFF



Filter E1 – Floor Replacement / Cap Installation and Pattern Test

Ysbytty SRV - Overbanding works

DWR Programme

Hendrefydd SRV - Internal liner installation

Capital Delivery - Water

Claerwen – Mock Mines Rescue

Claerwen Pressure Relief Drainage Llyn Y Fan Fach

Llyn Y Fan Fach - New spillway

Llyn Brianne Spillway

Concrete defect repairs on the invert and walls , (hydro demolition method used)

Llandegfedd

Llandegfedd Reservoir - New Xylem Depth Profiling Pontoon being prepared for launching into

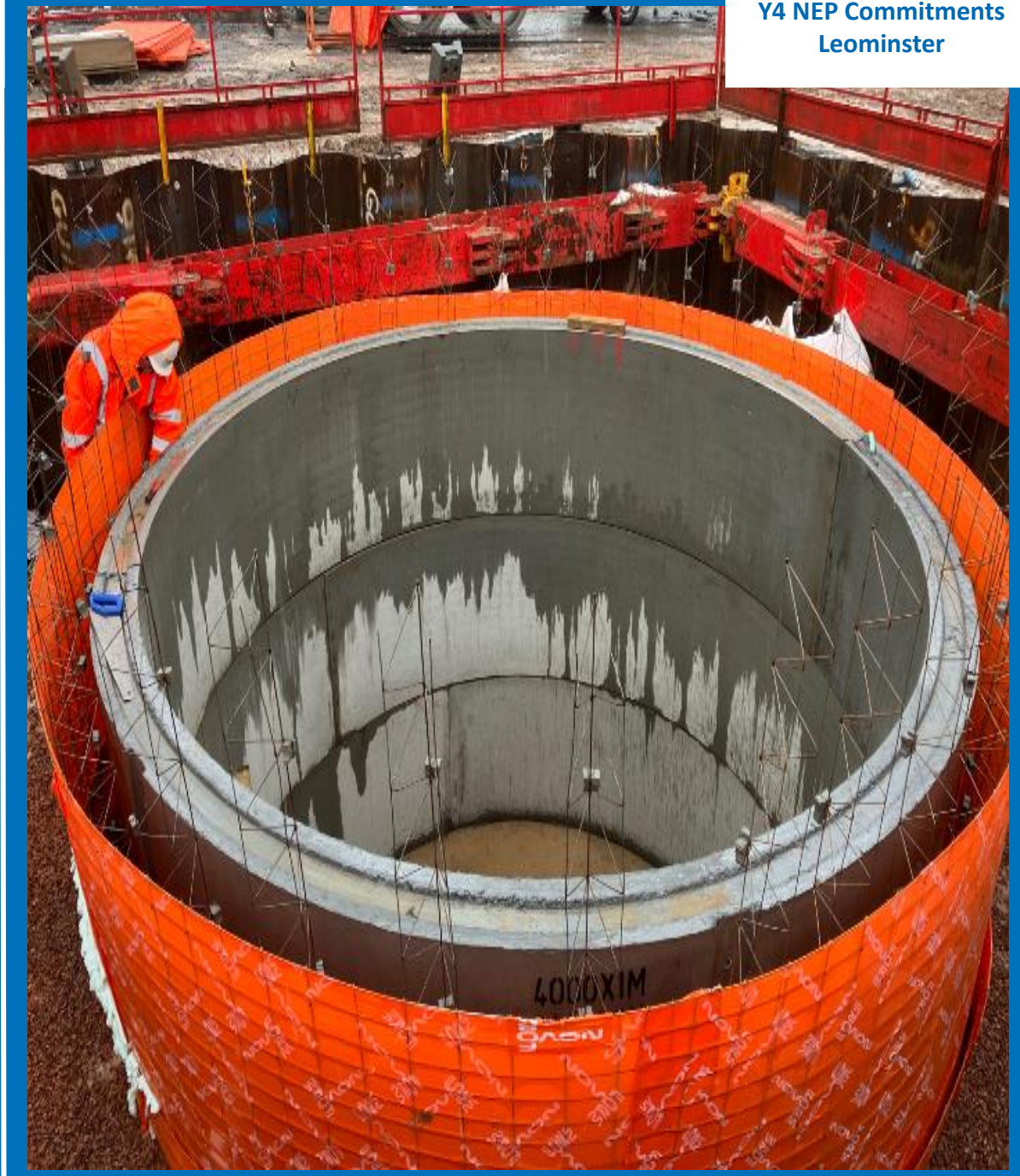
Upstream Losses

Talybont Trunk Main Repair

Capital Delivery - Wastewater

NEP Completion – Kingstone & Madeley Weobley

Y4 NEP Commitments Leominster



Capital Delivery - Wastewater

River Taff Phase 2

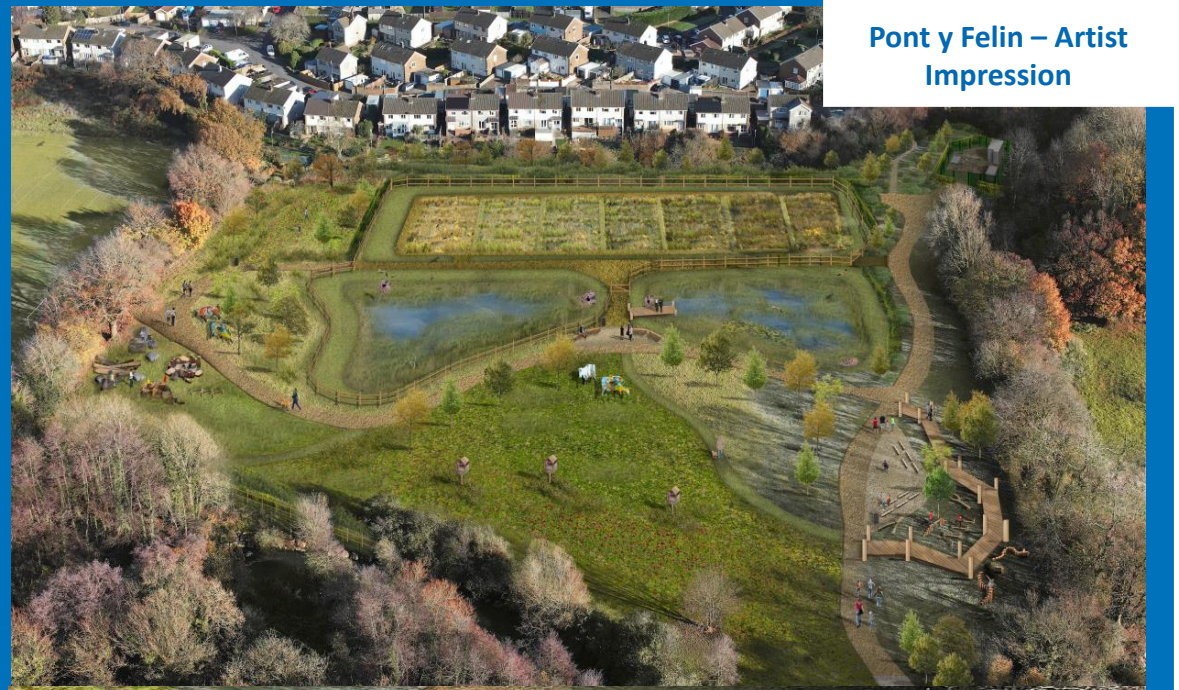
MiniIB

White Friars

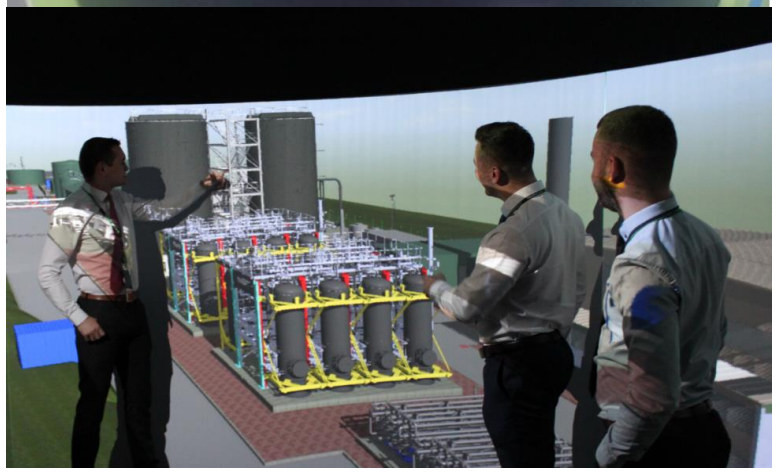
Ganol WwTW
Inlet Works

Nature based Solutions

Pont y Felin – Artist Impression

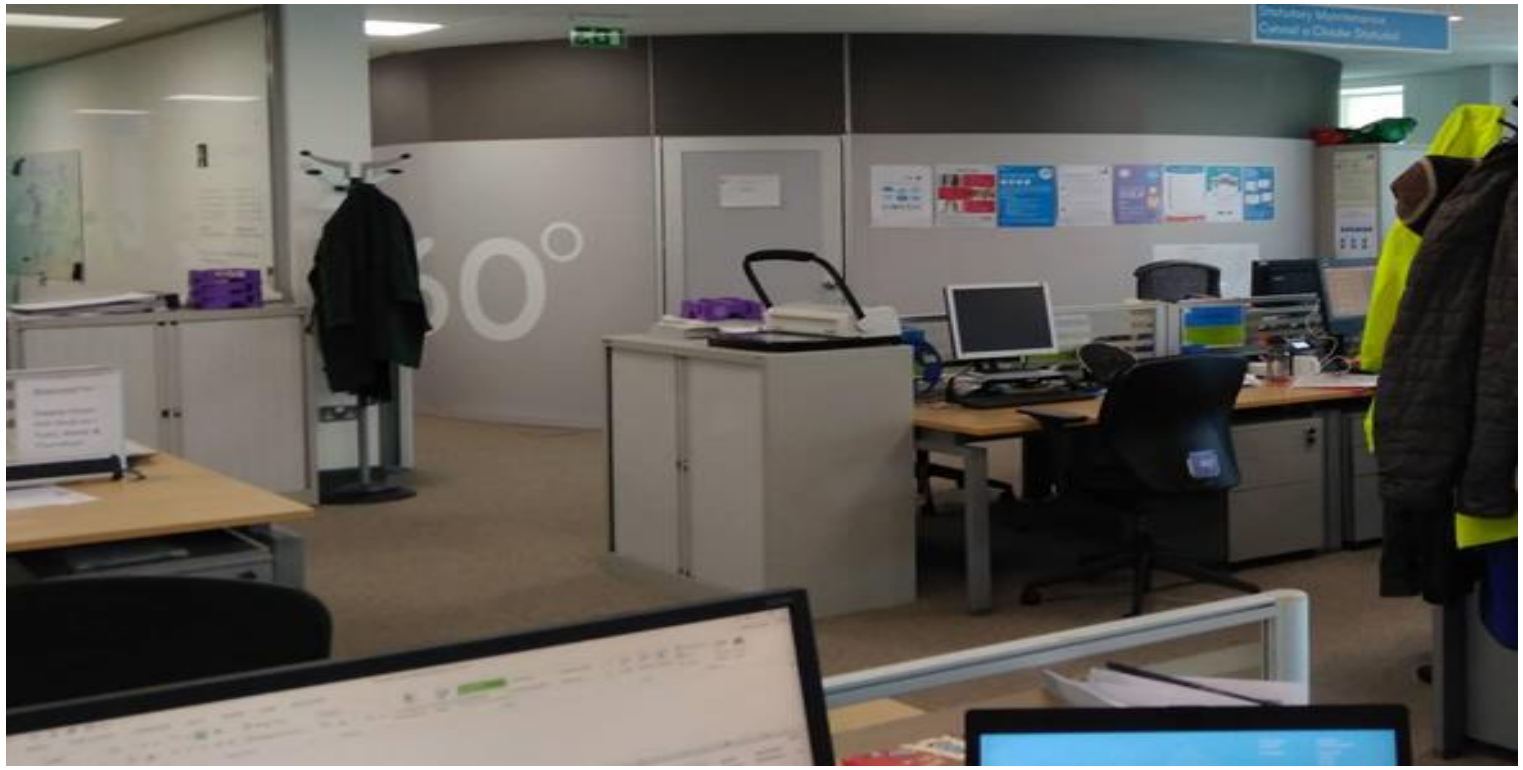


Llanelli Rainscape



Design in a Virtual World - The Igloo

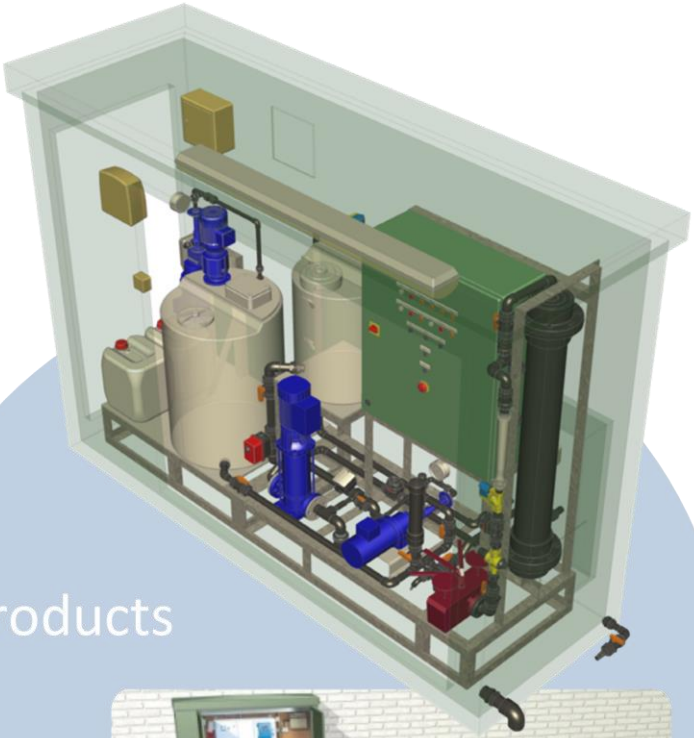
- 360° immersive environment
- Used primarily for 3D model visualisations and design collaboration
- Allows 3D CAD models to be projected at 1:1 scale
- Immersive ‘walkthroughs’ with project teams to highlight potential issues prior to confirming the design or starting on-site
- The Igloo has proven to reduce project costs and increase collaboration across the whole project lifecycle
- Enhanced engagement with the Digital Twins
- Google Earth capability



Products and Off site Manufacturing

Off Site Fabrication

Pre-cast Concrete Structures

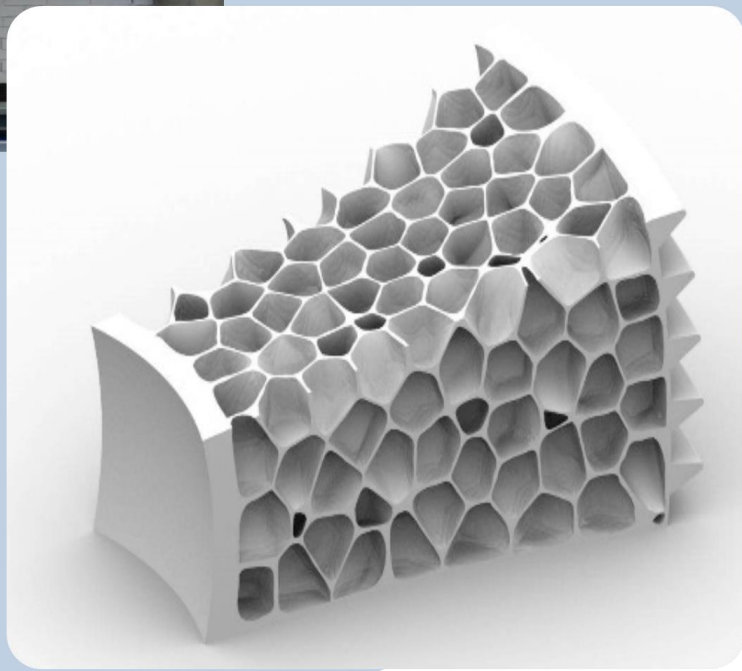


Products

Construction materials

New Materials

3D Concrete Printing



Sustainable construction

Carbon

Recycling

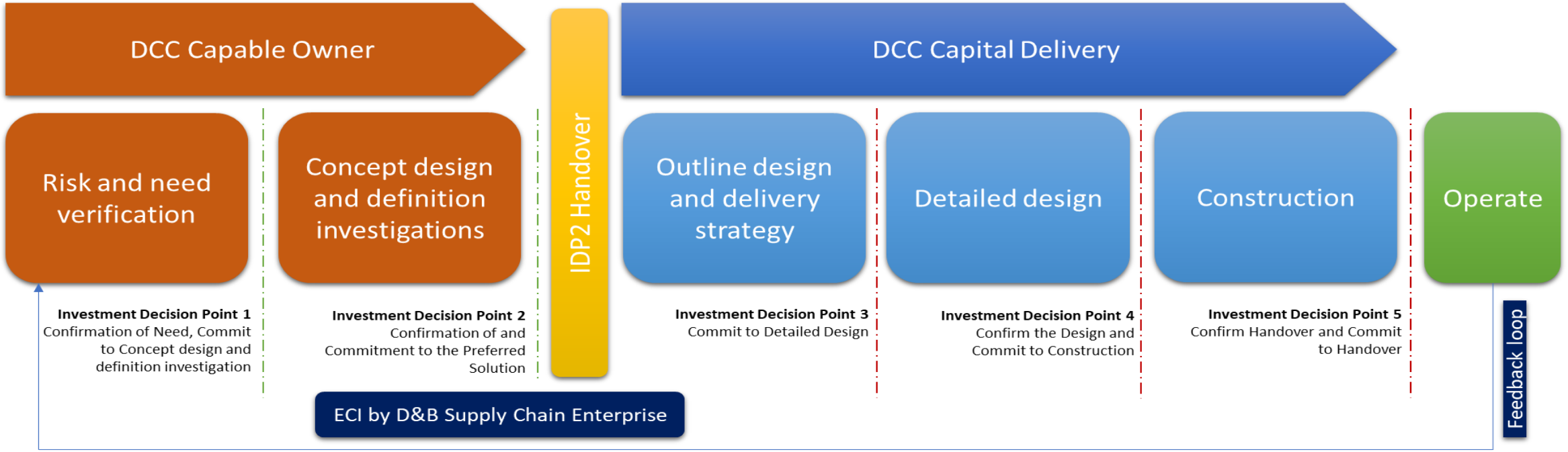
Biodiversity

What does AMP8 Look like for Capital Delivery?

- We will be delivering on average £300m of schemes / annum in AMP8 compared to £180m / annum in AMP7
- Big increase in the environment programme – spills, pass forward flow and nutrient removal – WNEP
- Water programme broadly similar to AMP7
- We are ramping up to circa £250m of schemes in AMP7 Year 5
- We will have circa 400 projects live on site at any time

How do we Deliver our Capital Schemes

Delivery



Engineering Consultancy Services

- Root cause analysis, data gathering and analysis, modelling and site assessments – liability to sit with ECS
- Optioneering – Process choice liability to sit with Capable owner.
- Engineering input based on core skills of civils, mechanical, electrical, water and wastewater process, network and catchment modelling.
- Develop optimised solutions through modelling, maximising asset headroom and innovation
- Risk identification and management.
- Working collaborative with DCC D&B Supply Chain Enterprise on ECI.

* List above is not exhaustive

DCC's Design and Build Supply Chain Enterprise

- Delivery and detailed engineering capability.
- Health and Safety
- Responsible for outline and detailed design based upon solution development by DCC Capable Owner.
- Buildability challenge during the project lifecycle
- Construction delivery following approval at IDP4.
- Stakeholder management including Operations from IDP2 onwards
- Ecology, environmental and planning requirements post IDP2.
- Risk management and implementation of mitigation measures
- Early Contractor Involvement (if required) prior to IDP2 handover.

* List above is not exhaustive

Procurement & Supply Chain

What's important to us?

Health, Safety and Wellbeing

Value for Money

Quality

Meeting legislative requirements

Customer Satisfaction (internal and external)

Engaged and motivated supply chain

Forward programme/ Pipeline of activity

Sustainable Procurement

Procurement and Supply Chain

- To deliver what matters to us – extensive reliance on the supply chain.
- Circa £500m p.a. expenditure.
- 62% of spend is retained in Wales supporting over 6000 FTE supply chain jobs. (Cardiff University Local Economic Impact Report 2023).
- Centrally managed by Welsh Water Procurement Category teams.
- Achilles and Jaggaer eTendering system.
- NEC and bespoke Welsh Water Terms and Conditions
- Increasing focus on supply chain resilience

Capital Delivery Supply Chain

Dŵr Cymru Welsh Water

Who Delivers our Capital Schemes?

- Supply chain deliver all of our schemes, civil, mechanical and electrical
- 14 employers employing circa 3000 people in the supply chain
- Supported by key equipment suppliers

KNIGHTS BROWN

GRIFFITHS civil engineering and construction

Young Bros CIVIL ENGINEERING

MORGAN SINDALL GROUP

Northavon Group

enisca

MMB Mott MacDonald Bentley

GallifordTry

Bentley

envolve Infrastructure

IPS

Bridges

CELTIC PROCESS CONTROL LTD

ERIC WRIGHT WATER

PART OF THE ERIC WRIGHT GROUP

Procurement Programme
Key processes 2024-2026

- AMP 8 Design & Build Contractors*
- Water Meters*
- Valves & Hydrants*
- Water Repair and Maintenance/Meter Installation/Mains laying (Water Network Alliance).
- Waste Water Repair and Maintenance
- Waste Water Network Operator Services
- Pressurised Pipeline Contractors
- Asset Planning
- Chemicals & Gases
- Cost Management Services
- Pumps
- Polyethylene Pipe
- Ductile Iron Pipe
- IT Hardware

Sustainable Procurement

Sustainable Procurement

- Process development with the Supply Chain Sustainability School
- Inclusion of our key Environmental, Social and Economic aspirations in tender exercises.
- Ramp up engagement in 2024
- Market engagement and Meet the Buyer events

Questions?

Contact

- AskProcurement@dwrcymru.com
- https://corporate.dwrcymru.com/en/innovation

Questions?

DWR CYMRU

INNOVATION

Our Approach

Welsh Water Innovation Strategy

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INNOVATION

Figure 1: Enablers of innovation

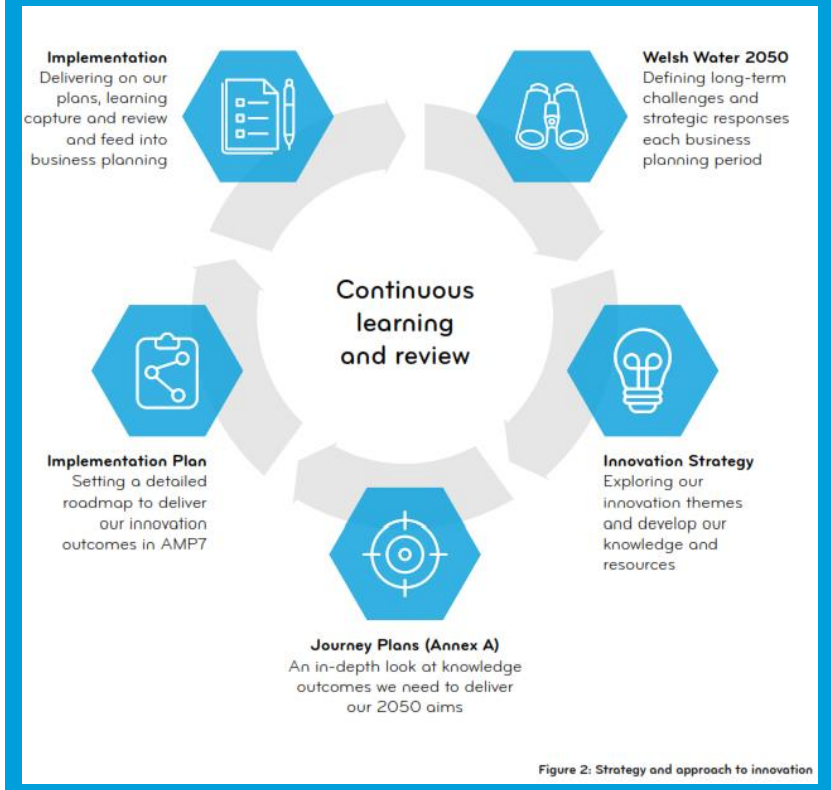
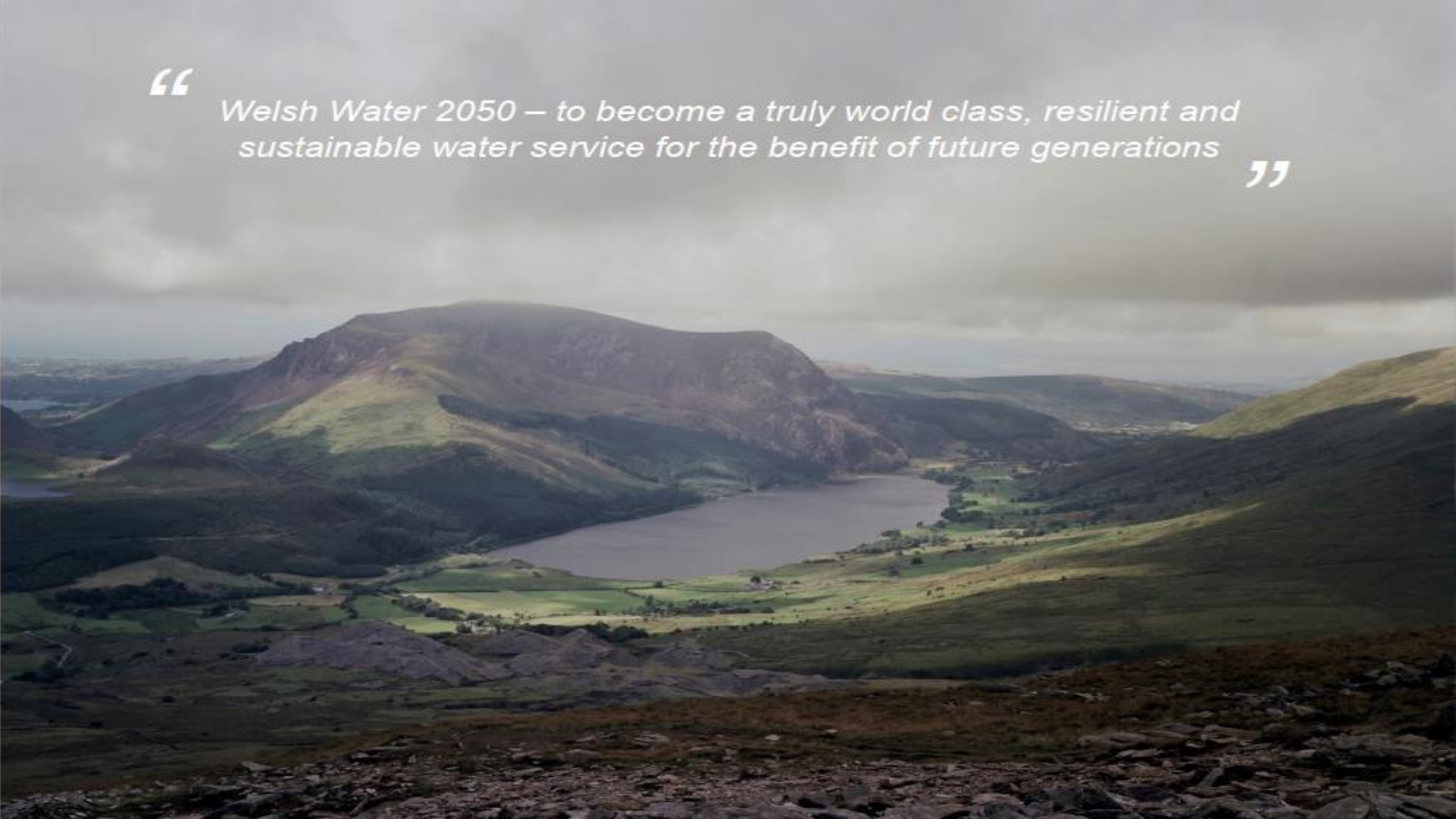


Figure 2: Strategy and approach to innovation


“Welsh Water 2050 – to become a truly world class, resilient and sustainable water service for the benefit of future generations”

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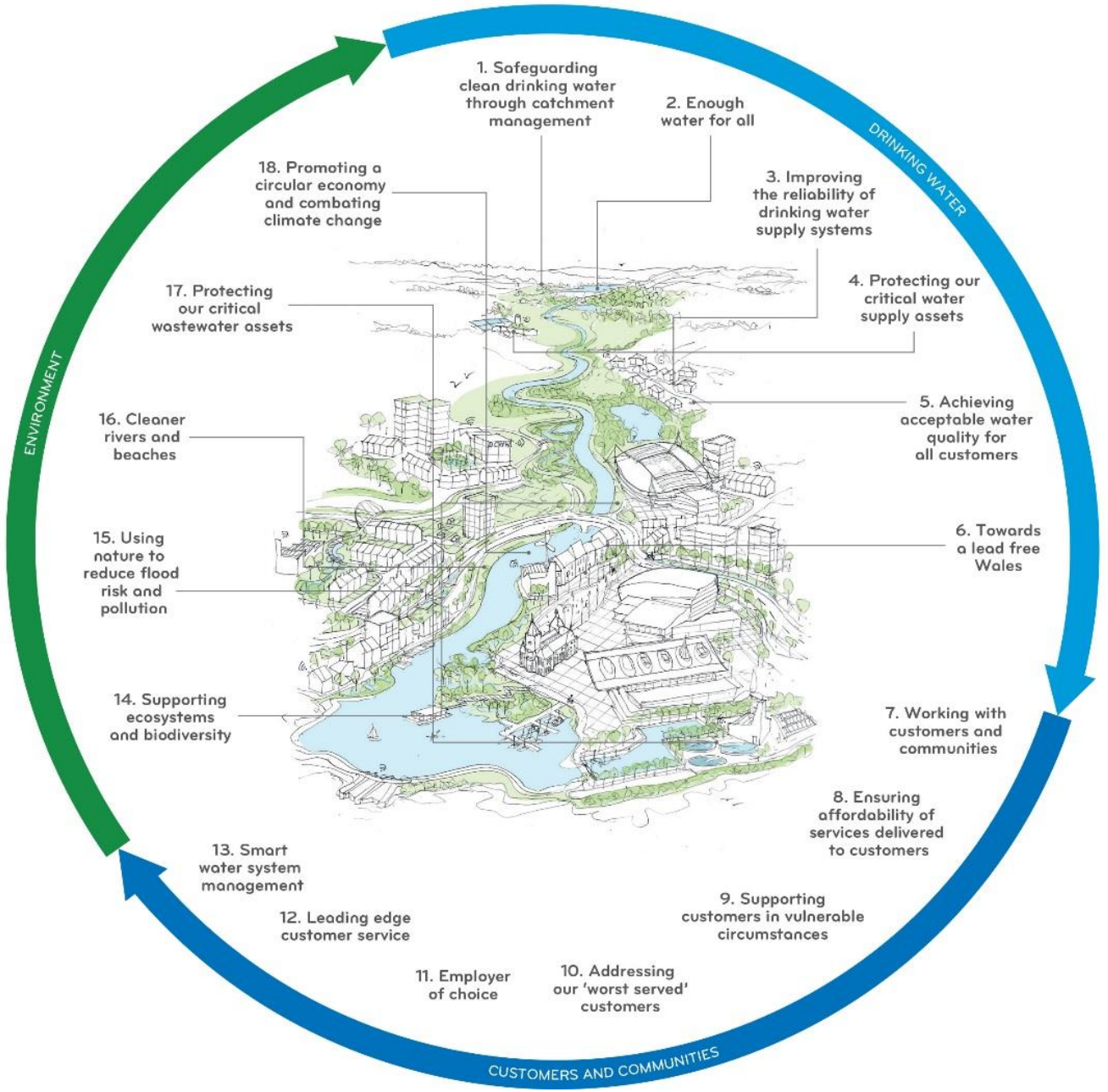
Welsh Water

Our 18 Strategic Responses



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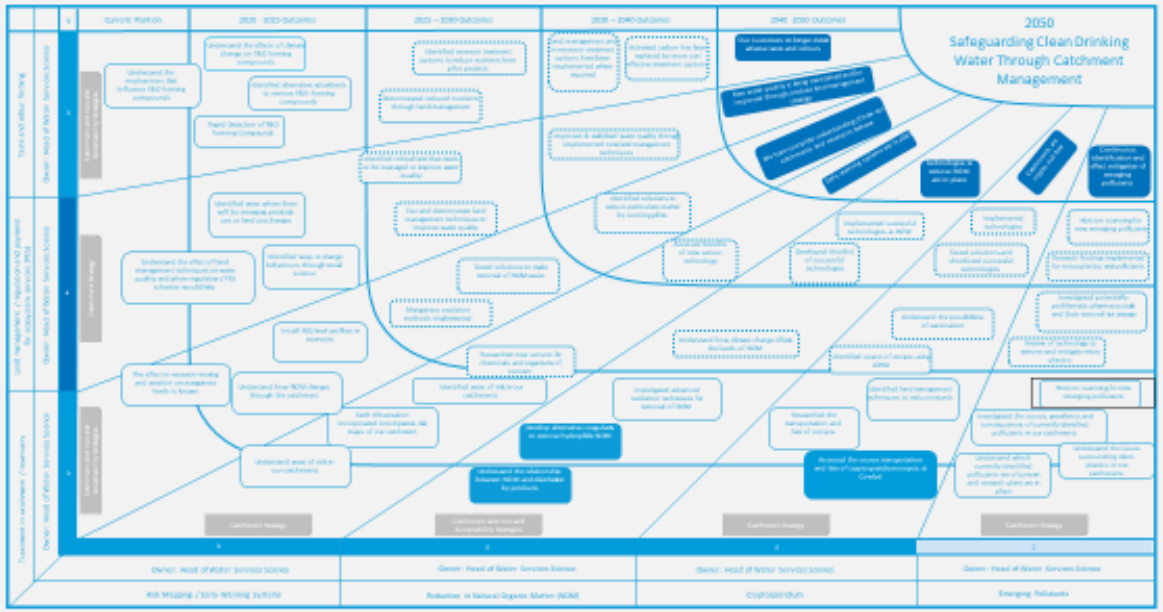
Journey Plan Update

SR1: Safeguarding Clean Drinking Water Through Catchment Management

Sponsor: Managing Director of Wholesale Water Service



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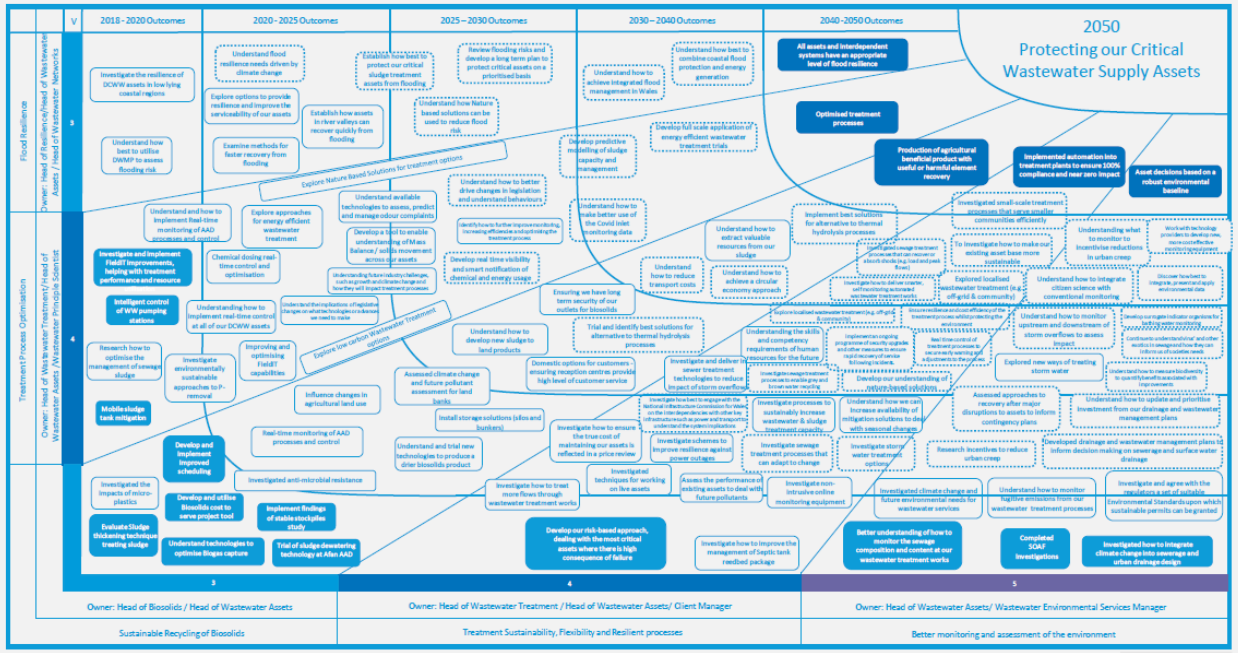
13/03/2019

SR17: Protecting our Critical Wastewater Supply Assets

Sponsor: Managing Director Wastewater Services



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19/08/2022

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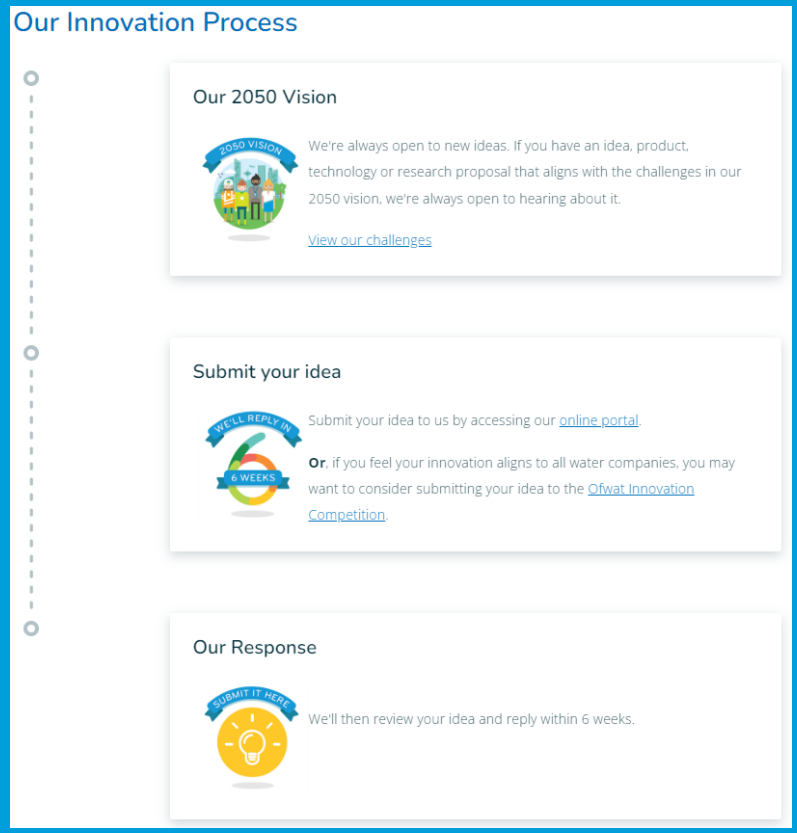
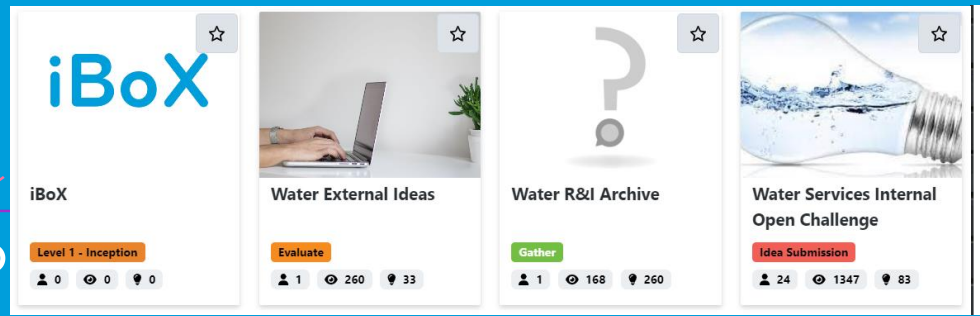
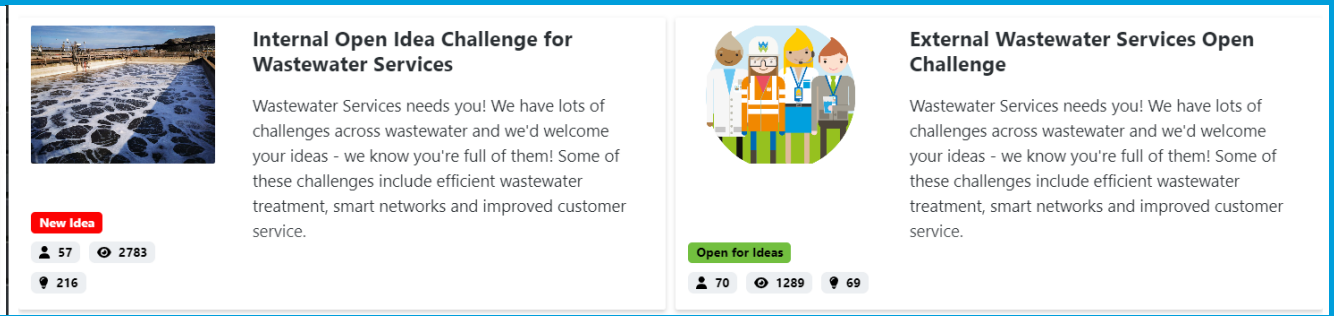
INNOVATION

Managing Innovation

- Small teams (Water and Waste) embedded in Operational Functions
- New Idea - DwrEka
- Assess idea through R&I Teams using top priorities
- Share with stakeholders for review
- Progress with developing business case and delivery if required
- A number of “champions” throughout the business support innovation
- Set out our challenges on our Website (www.dwrcymru.com/innovation) and internal Source pages
- Projects are sponsored by Heads of Service
- Rely heavily on operational teams
- Disseminated through the iLab process







DWR CYMRU INNOVATIO

Summary so far this AMP

69
projects completed

£7.1m
Committed to our research programme

>500
Ideas arrived at our portal

8.22:1
Research Leverage Ratio

>100
Organisations

£31.7m
Leverage achieved through research

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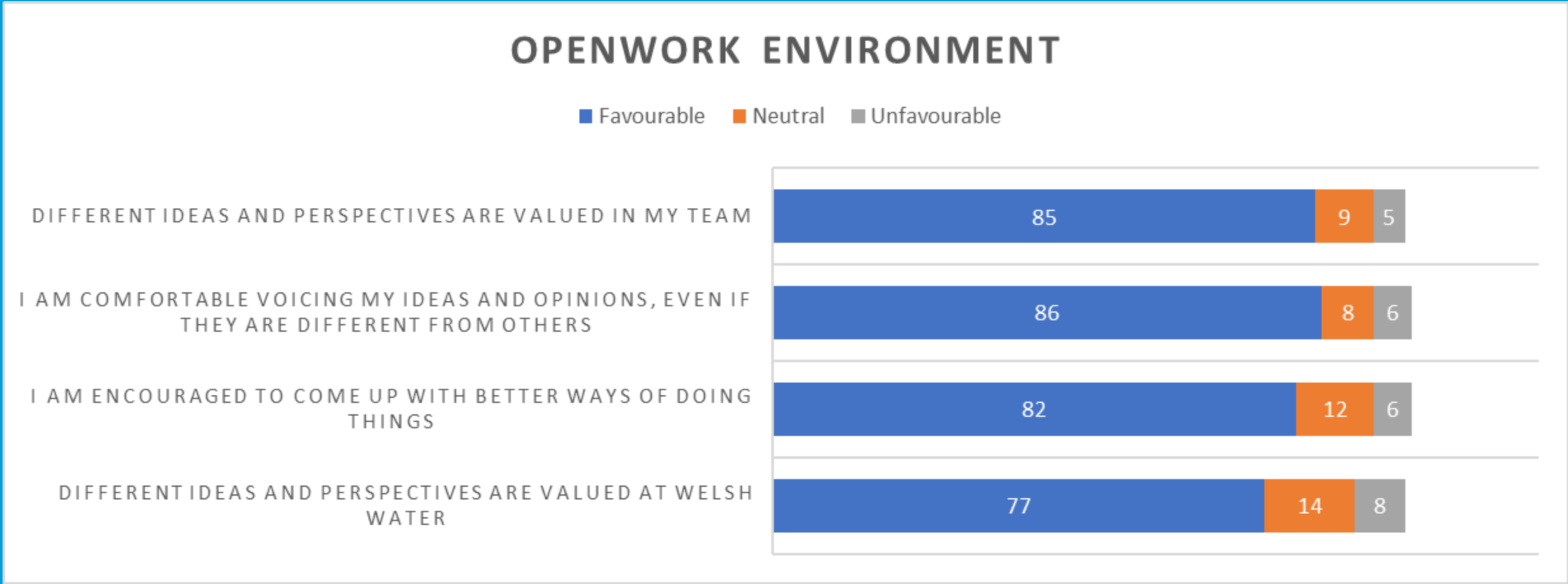
INNOVATION

418%
Customers logging into my account since 2020

Over 25% of household customers using online billing

Culture and People



5% above global benchmark

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INNOVATION

Co- Creation and Communication

- Spring
  - Actively supporting Spring
  - 2 Knowledge Sharing Events
  - Supporting Spring Accelerator programme
  - Bid declaration and current portfolio document
- Research
  - Working with over 10 academic institutions – mostly highly leveraged with UKRI and co funding from other Water Companies
  - Active members of UKWIR supporting the big questions and research projects

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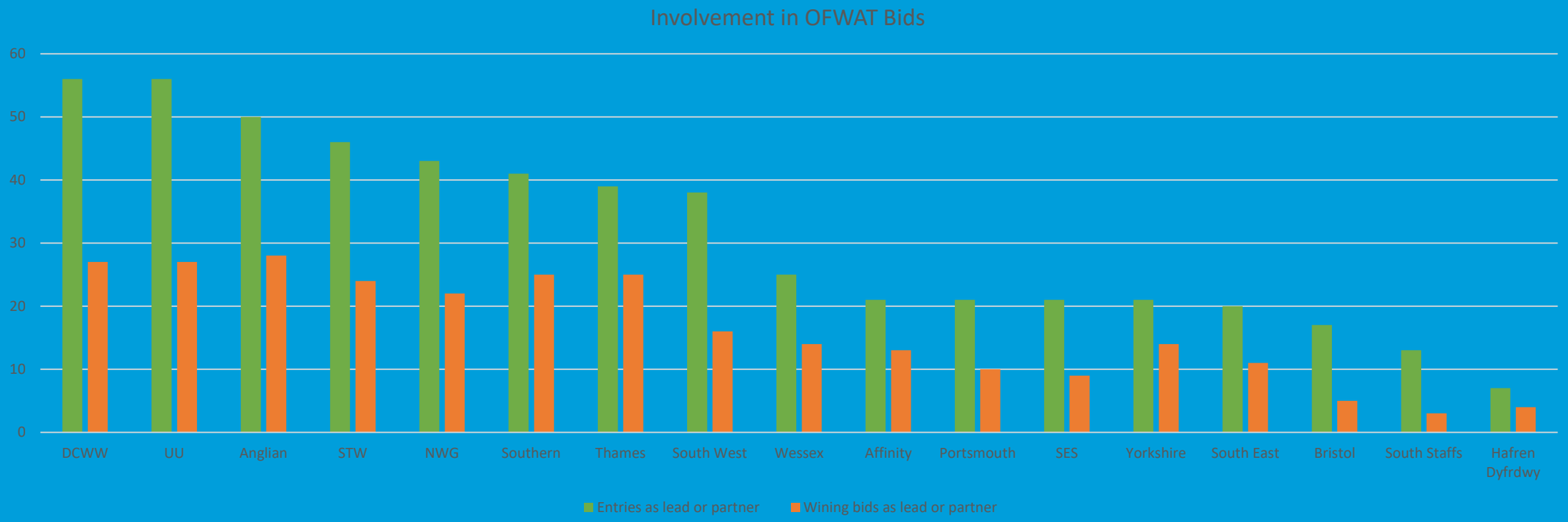
OFWAT Innovation Fund



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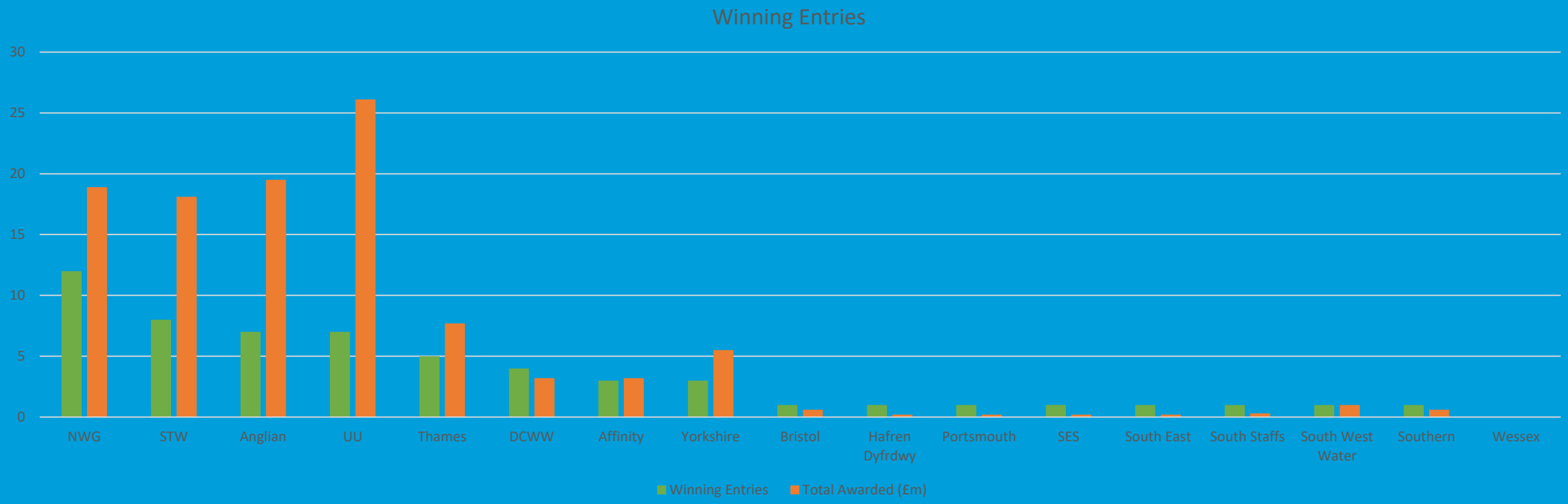
INNOVATION

OFWAT Innovation Fund



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INNOVATION

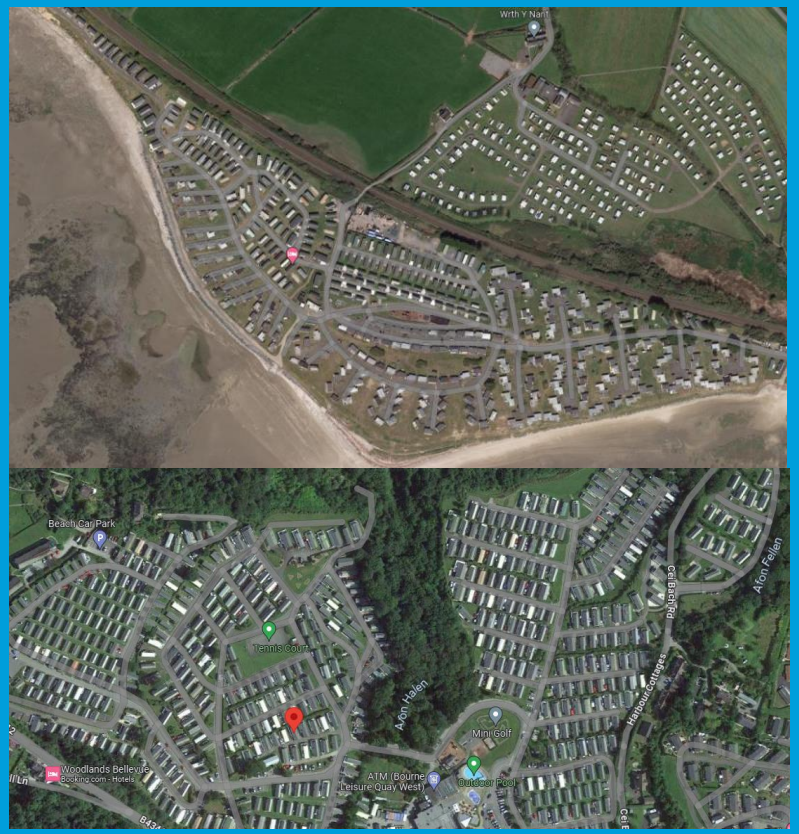
Challenges to Innovation

- Everyone is busy, getting engagement in some teams can be an issue
- Adopting innovation as BaU and embedding changes
- Bringing value from collaborative external projects into Welsh Water
- Improving the way the supply chain understand our issues:
  - www.dwrcymru.com/innovation
  - Sector challenges quite well set out in the Water Sector Innovation Strategy and UKWIR Big Questions
  - Spring maturity will help in driving the sector needs and signposting suppliers to the relevant Water Companies

DWR CYMRU INNOVATION

Project Galw

- Idea from Affinity Water
- Proof of concept at 2 holiday parks in West Wales to reduce consumption and increase network resilience at peak times
- Install flow regulators on each static caravan and chalet
- Water efficient measures in communal areas
- Current Position: Regulators fitted at one park, pressure surveys conducted at the other park to add reassurance
- Next Steps: Install regulators at the other park, measure reduction in use over the next two summers and contacts for low pressure and loss of water



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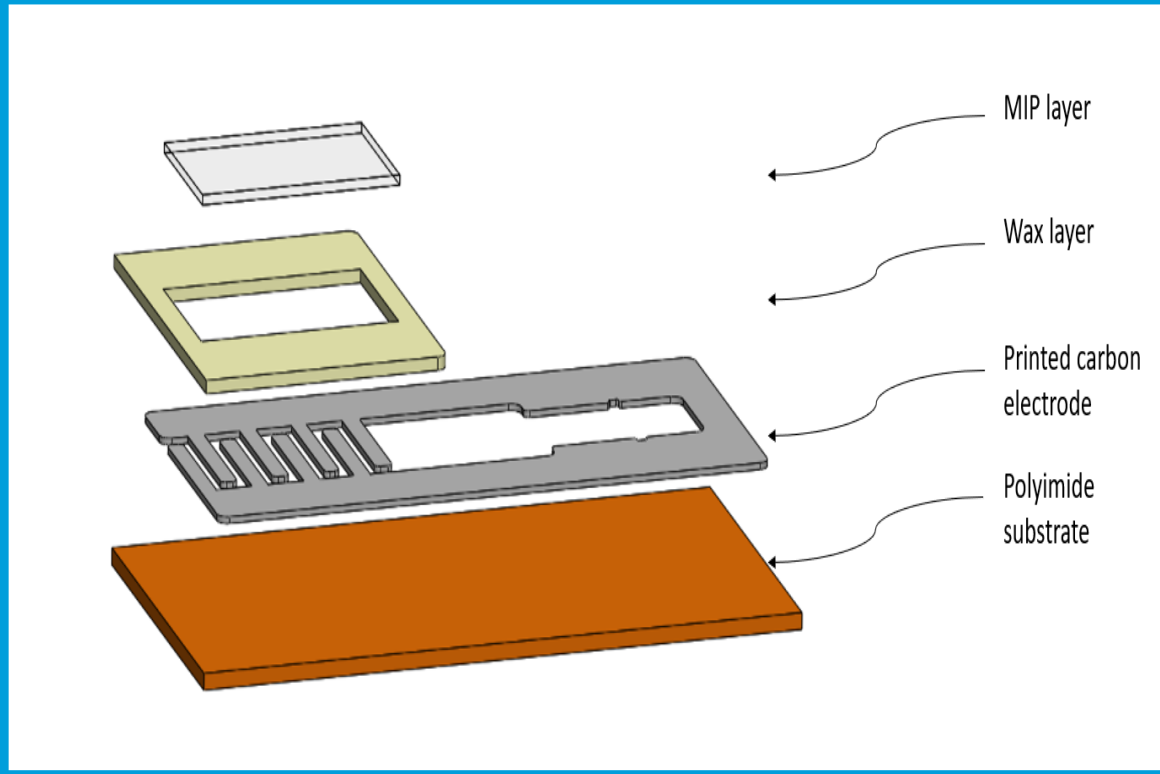
INNOVATION

Low Cost Electrochemical Biosensor for Pollutants

- MSc by Research (Swansea Uni) for proof of concept using MIB as a target compound
- Now expanded to a PhD to develop a multi platform PhD to investigate pollutants such as MIB, Geosmin, PFAS, phosphate etc
- Polymer matrix has specific binding sites for target compound
- Once detected a change of the electrical properties is detected providing a signal

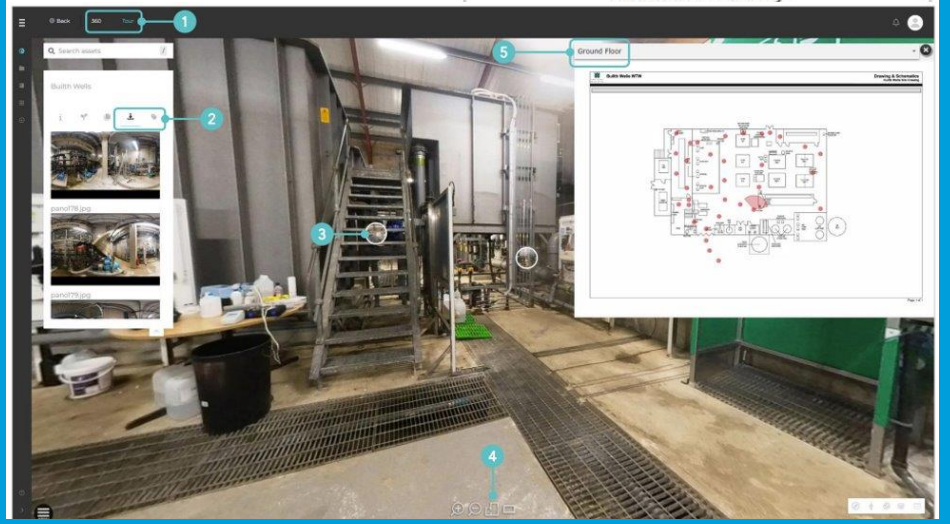


DWR CYMRU INNOVATION

Spinview

- Worked with the WOMs team to undertake create digital 3D blueprint of a Water Treatment Works
- No need for experts to survey just us 3D camera
- Aide memoir for people not on site to be able to access site and see the layout of the works
- Now looking at taking internal images from Service Reservoirs to detect anomalies and capture layouts

360 Camera	Air Detector
	
360 Images 360 Videos	CO2 sensor HCHO sensor TVOC sensor Particle Quality



DWR CYMRU INNOVATION

Discolouration Research and Innovation

- Working with Swansea University, Materials Research Centre looking at corrosion rates with differing water chemistries. Highlights so far are phosphate seems to increase corrosion rates, confirmed dosing rates for sodium silicate.
- Longstanding relationship with Sheffield University looking at biofilm formation, stability and control in trunk mains. Highlights so far are a model to enable us to adjust flow rates in mains to produce a stable biofilm layer, increasing chlorine and or phosphate creates a weaker biofilm.
- NMR Pipetector, converts ferrous and ferric hydroxide to magnetite in the main – results at trial site promising with an increase in internal diameter. Next steps are to install on a larger system and involve Swansea University in analysing results and understanding of the mechanisms at play.

DWR CYMRU
INNOVATION

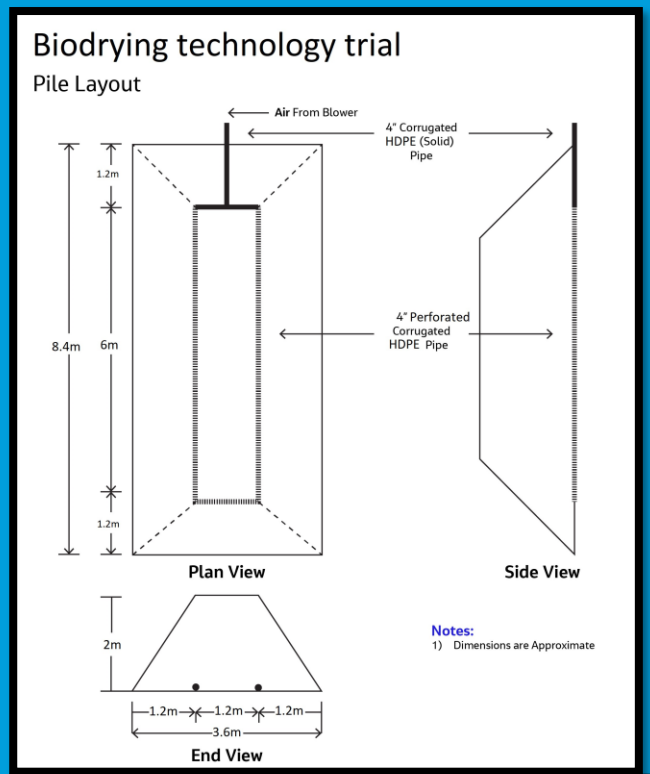
Cleaner Rivers and Beaches: NoRag

- **WHAT**: A static screen enhancement for storm overflows
- **WHY**: Blockages of rag and debris can result in flows bypassing screens and therefore ending up in the environment
- **HOW**: Venturi effect by harnessing the main sewer flow to remove the solids impacting the screen and passes it forward to the main sewer flow
- **NEXT STEPS**: continue to share results and benefits, add to technical specifications

DWR CYMRU
INNOVATION

Sludge Optimisation: Biodrying Project

- **WHAT**: Low temperature pilot scale trial
- **CHALLENGES**: Regulatory changes including, landbank availability, temporal/strategic storage, logistical costs, emerging contaminants, public perception
- **HOW**: To produce a seed biosolids pile by air drying, and add to fresh biosolids, place on blowers and monitor drying rate, GHG emissions, temperature and quality.
- **CONCLUSIONS**: Average %DS of biosolids were >50% (usually 25-30%). Metals and pathogen concentrations achieved current compliance requirements.
- **NEXT STEPS**: Larger scale trial to further confirm GHG emissions and support design



DWR CYMRU INNOVATION

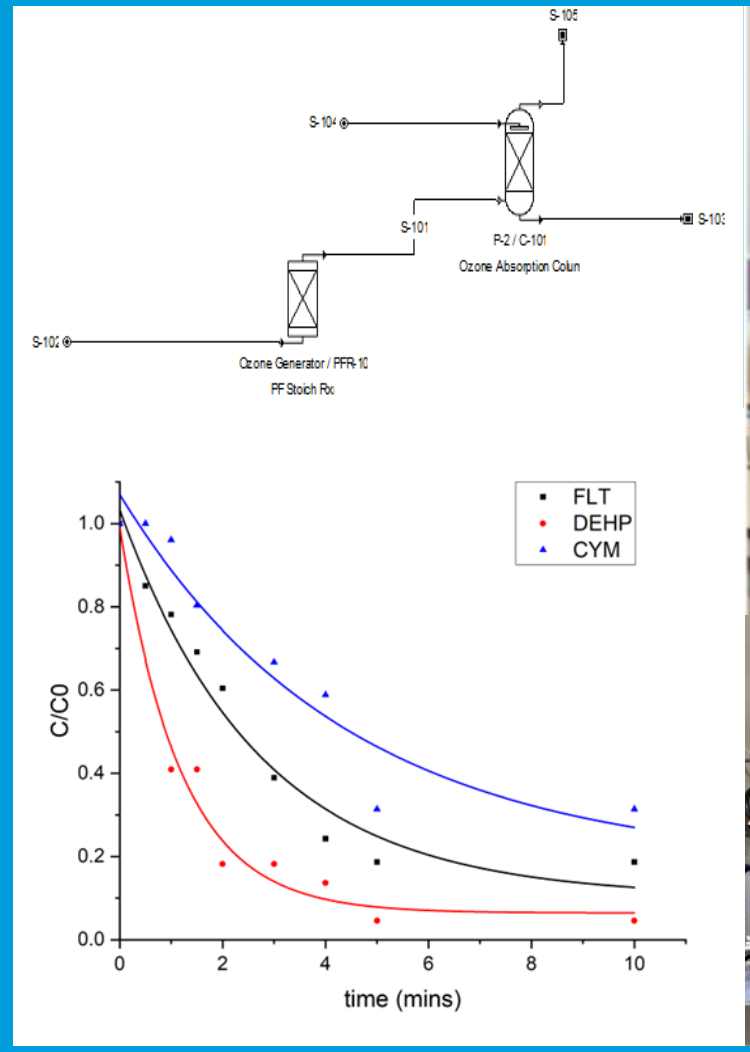
Net Zero & Circular Economy: Carbonisation Research

- **WHAT**: Pyrolysis pilot scale plant
- **WHY**: Sustainable and future proof outlets for biosolids, 2040 journey to net zero
- **HOW**: Process biosolids through unit and assess variables such as feedstock characterisation, energy production, quality of biochar etc.
- **Conclusions**: Potential to reduce an overall volume reduction of raw biosolids by 90%. Raw AAD Biosolids need commingling and blending with an additional material of higher calorific value to meet operational conditions. Potential to abate 5,400 tonnes of CO2e/yr
- **NEXT STEPS**: Conduct LCA, understand bioavailability of nutrients. Market development for biochar use

DWR CYMRU
INNOVATION

Emerging Contaminants: Advanced Oxidation Process Research Swansea University

- **WHAT**: Preliminary research as an MRes
- **WHY**: Through CIP several chemicals have been shown to be an environmental risk including; fluranthene, di(2- ethylhexyl) phthalate, and cypermethrin. Currently no technologies for removal
- **HOW**: benchtop tests for removal of emerging contaminants through ozone and GAC. Comparing standard and spiked Final Effluent
- **CONCLUSIONS**: both ozone and GAC were effective at degrading/ adsorbing the chemicals. Cost analysis of ozonation appears favourable
- **NEXT STEPS**: further studies at pilot scale to ascertain performance and provide better cost figures



DWR CYMRU INNOVATION

Compliance: Solar Powered Pumps

- **WHAT**: Solar Powered Universal Dosing Pump (SPUD) & Solar Powered Recirculation Pump (GATOM)
- **WHY**: Rural sites, lack of electricity, low summer flows & blockages on existing dosing units. Upcoming P Backstop limits.
- **HOW**: SPUD – all in one unit built on and around an IBC GATOM – onsite panel install, smart enough to run on instrumentation, e.g. arm rotation
- **COST**: £2-4K per unit
- **NEXT STEPS**: Build more

DWR CYMRU
INNOVATION

Strategic Technology Opportunities

Digital Trends presented to Digital Strategy Steering Group

Digital Platforms	Artificial Intelligence (including Generative AI)	Data Driven Strategy
• Contact Centre as a Service • Digital Payment Platforms	• Microsoft Copilot PoC	• Welsh Environmental Data Hub

ITS
Innovation & Strategy

Retail Innovation

- Using our customers to shape our digital services
- Improve the contact options for our customers
- Looking to Develop a Welsh Water App
- Flexible billing options
- Building our AMP8 plan

DWR CYMRU INNOVATION

Future Innovation

SMART Networks

Reduce chemical consumption

Understanding Customer Behaviour

Resource Recovery and Reuse

Discolouration Research and Control

Nature Based Solutions

Source control of Emerging Contaminants

Leakage and CML Advances

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