Introduction
The paradigm shift

“If you always do what you always did, you will always get what you always got.”

Focus on customer service

Significant transformation programme
Systems Thinking

Invested in our people
Graduate and apprentice programmes and external recruitment
United Utilities is leading the way

United Utilities is ideally placed to meet these challenges and our innovation capabilities are at the heart of this.

Today will demonstrate how innovation and our Systems Thinking approach is central to our strategy and will deliver long term value for customers, the environment and shareholders.

United Utilities is now a leader among the WASCs

We have a clear vision and a long term strategy

The industry faces many challenges

Environmental  Affordability  Maintaining shareholder returns  Reputational

United Utilities is ideally placed to meet these challenges and our innovation capabilities are at the heart of this.

Today will demonstrate how innovation and our Systems Thinking approach is central to our strategy and will deliver long term value for customers, the environment and shareholders.
What we mean by leading

- Holistic Systems Thinking
- Innovation Centre
- Embedded culture

Innovation

- 4* industry leading status with the Environment Agency

Water quality

- DWI recognition
- Industry leading approach to resilience

Capital delivery

- More efficient delivery
- Using competition

Customer satisfaction

- Ofwat’s SIM measure
- UK CSI
- CCWater customer satisfaction research
- Recognition cross sector

Porter’s Efficient Frontier

- New Efficient Frontier Set
- Less Than Best Practice
- High

# Agenda

### Overview
11:10 – 11:30

**Steve Fraser**  
Chief Operating Officer

Steve joined United Utilities in 2005 from the power and utilities service provider Bethell Group, where he was Operations Director. Steve, a member of the United Utilities Group Board, is currently the Chief Operating Officer responsible for the regulated water and wastewater business, having previously worked as Managing Director of the wholesale business and, prior to that, as Managing Director of the energy & contracting services division of United Utilities.

### Systems Thinking & Innovation
11:30 – 12:00

**Simon Chadwick**  
Central Operations Director

Simon joined United Utilities in 1997 and since then has held a variety of roles in the wholesale and retail areas of the business. Simon now heads up Central Operations at United Utilities, focusing on transforming the business through technology led innovations.

### Engineering and Capital Delivery
13:00 – 13:25

**Richard Ratcliff**  
Engineering Delivery Director

Richard has worked as a process engineer throughout the world for 24 years. He joined United Utilities in 2015 as Head of Engineering and Technical disciplines. In 2017 Richard took on the role of Engineering Delivery Director at United Utilities, managing the engineering and delivery aspects across the regulated water and wastewater business.

### Customer Service
13:25 – 13:50

**Louise Beardmore**  
Customer Services & People Director

Working as Customer Services & People Director at United Utilities, Louise has held a number of senior positions at North West Water, Norweb Plc, Vertex and United Utilities, leading business in operations, customer services and HR in the UK and internationally. Louise is a huge advocate of the power of employee engagement to drive improved customer service and is a Non-Executive Director of Engage for Success as well as a Vice President of the Institute of Customer Service.
Strength in financial risk management

- Maintaining a stable A3 credit rating
- Appropriate gearing aligned with Ofwat’s notional structure
- One of the lowest financing costs in the sector
- Stable IFRS pension surplus
No longer in catch up; now a leader

AMP4
- Operational laggard
- Sale of non-regulated business

AMP5
- Refocus on operational performance
- Catching up with leading performers

AMP6
- No longer in ‘catch up’ mode
- Upper quartile against most operational and customer service metrics
- Five year lead on Systems Thinking
- Regulatory outperformance biased towards financing

AMP7
- Evolution of regulatory regime
- Reset of ODI and totex mechanisms with increased opportunity for reward
- Extending the lead on Systems Thinking
- Aiming for more balanced regulatory outperformance
PR14; a challenging settlement

£600m efficiencies vs. original business plan

ODI’s Rewards/Penalty ranges

- £470m
  - £100m
  - £70m
  - £50m

P10/P90 range
PR14
Soft guidance
May 2015
Target
May 2016
Target
May 2017

ODI package heavily skewed to the downside
Delivering our strategy for AMP6

Planned acceleration of capital programme

Net regulatory capex


Net cumulative ODI reward in years 1 and 2
## Sustained improvement

<table>
<thead>
<tr>
<th>Water performance measure</th>
<th>5 year improvement to 2016/17</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTW Coliform infringements</td>
<td>+67%</td>
</tr>
<tr>
<td>WTW Turbidity infringements</td>
<td>+67%</td>
</tr>
<tr>
<td>SR Coliform infringements</td>
<td>+47%</td>
</tr>
<tr>
<td>DWI Category 3 or above events</td>
<td>+29%</td>
</tr>
<tr>
<td>Total number of water quality infringements</td>
<td>+34%</td>
</tr>
<tr>
<td>Customer Contacts Discoloured Water</td>
<td>+22%</td>
</tr>
<tr>
<td>Customer Contacts Taste and Odour</td>
<td>+10%</td>
</tr>
<tr>
<td>Leakage (Ml/d)</td>
<td>+3%</td>
</tr>
<tr>
<td>SIM Qualitative</td>
<td>+6%</td>
</tr>
<tr>
<td>SIM Quantitative</td>
<td>+56%</td>
</tr>
<tr>
<td>Written complaints</td>
<td>+24%</td>
</tr>
<tr>
<td>Stage 2 complaints</td>
<td>+73%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wastewater performance measure</th>
<th>5 year improvement to 2016/17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 1-2 pollution</td>
<td>+75%</td>
</tr>
<tr>
<td>Cat 3 pollution</td>
<td>+53%</td>
</tr>
<tr>
<td>Failing Flow to Full Treatment</td>
<td>+18%</td>
</tr>
<tr>
<td>Bathing water failures</td>
<td>+100%</td>
</tr>
<tr>
<td>Maintenance - proactive / reactive</td>
<td>+29%</td>
</tr>
<tr>
<td>SIM Quantitative</td>
<td>+22%</td>
</tr>
<tr>
<td>SIM Qualitative</td>
<td>+10%</td>
</tr>
<tr>
<td>Written Complaints</td>
<td>+34%</td>
</tr>
<tr>
<td>Stage 2 complaints</td>
<td>+55%</td>
</tr>
<tr>
<td>Internal flooding - other causes</td>
<td>+25%</td>
</tr>
<tr>
<td>Sewer blockages</td>
<td>+43%</td>
</tr>
</tbody>
</table>

1 DWI Measures are calendar year
Heading into AMP7 as a high performing company

We’ve come from being a laggard to catching up to now leading the industry.

We’re delivering on our AMP6 strategy; delivering more for less and sustainable year on year improvements.

Our Systems Thinking approach is a competitive advantage and is 5 years ahead of the rest of the industry.

This is delivering our current leading performance and we also have further applications that will help extend our lead.

This gives us confidence heading into AMP7 and beyond.
Systems Thinking & Innovation
Innovation in United Utilities

Systems Thinking
- Overview and our learning to date
- Case studies

Implementing Systems Thinking
- Using digital technology to accelerate delivery of Systems Thinking
- Case studies

Innovation
- Sharing our approach
Systems Thinking

Innovation in our operation strategy
An introduction to Systems Thinking

Traditional analysis focuses on the individual pieces of what is being studied

Systems Thinking focuses on how the things being studied interact with the other constituents of the system.

Instead of isolating smaller and smaller parts of the systems being studied, Systems Thinking works by expanding its view to consider larger and larger numbers of interactions as an issue is being studied.
Integrated catchments

A Systems Thinking approach to catchment management
Systems Thinking in an environmental catchment

The Petteril integrated catchment case study

**Innovation**
- Innovative permitting approach
- New low tech asset for Phosphorous removal
- Natural capital pilot
- Nutrient trading

**Partnership**
- Co-delivery of catchment interventions
- Match funding opportunities
- Petteril steering group
- Community engagement

**Multiple benefits**
- Targeted asset + catchment interventions
- Match funding opportunities
- More for less
- Flooding and water quality improvements
- Added natural capital value
- Long-term benefits to the catchment

**Holistic risk assessment**
- Enhanced modelling
- Intensive monitoring
- Benchmarking
- Stakeholder engagement

**Systems Thinking at catchment scale**
56% reduction in totex

Original (traditional) solution
- £17.878m Capex
- £0.266m/yr Opex
- £23.198m Totex

Systems Thinking solution
- £6.308m Capex
- £0.164m/yr Opex
- £0.508m One off Opex
- £10.096m Totex
- £1.7m additional NATURAL CAPITAL BENEFIT

Carlisle
- Flooding and quality interventions
- Green infrastructure
- Customer engagement

Southwaite M6 services
- Work with Highways & Moto
- Load impact on Wastewater Treatmentworks

Blackrack Beck
- Septic tanks investigations & EA partnership

Calthwaite Beck
- Catchment interventions as additional measures to tackle P (beyond asset solution)

Bowscar
- Catchment interventions to protect abstraction point and reduce diffuse phosphorous pollution

Petteril integrated catchment plan

Beyond asset solutions
Opportunities for integrating other activities
In AMP7 we will apply Systems Thinking to a further 13 catchments.

These 13 catchments have been identified across our region as part of our AMP7 programme.
Wastewater network management

A Systems Thinking approach to network management
Wastewater Network

A trailblazer for Systems Thinking

The project is looking at how the holistic drainage system can be **optimised to reduced totex and improve service.**

The underlying principle is to **understand the network** and how it delivers services to customers, as **part of a broader system.**
Implementing Systems Thinking

**STEP 1**
Facilities & Asset Assessment

**STEP 2**
Area information

**STEP 3**
Connecting the components and relationships

**STEP 4**
System monitoring and control

**STEP 5**
Next evolution is an A.I. running the system
Pilot results:

49% reduction in totex

70% improvement in service

80% actual blockage reduction
Forecasts customer service issue reduction of 70%

Totex efficiency
49% reduction in Totex

Risk management in Systems Thinking
Totex AMP6 saving £4.4m

Systems Thinking: Cause effect
Traditional flooding solution cost £m’s. Risk mitigation for £10k

The pilot results are promising, however this is a long term strategy over multiple AMPs to implement across our business.
Pilot Results: 89% saving in cost to repair

Through Systems Thinking we can identify areas where service performance is susceptible to external factors.

We are using satellite data processed through advanced image analytics to identify ground movements that indicate the risk of sewer collapses.

The potential benefits are significant in terms of cost and customer disruption.

<table>
<thead>
<tr>
<th>Reactive repair</th>
<th>Pro-active repair</th>
</tr>
</thead>
<tbody>
<tr>
<td>£550k</td>
<td>£60k</td>
</tr>
<tr>
<td>6 week road closure</td>
<td>3 day lane closure</td>
</tr>
</tbody>
</table>
Systems Thinking

A framework for implementation
We have scanned different business sectors for advanced technology to accelerate our implementation of Systems Thinking

<table>
<thead>
<tr>
<th>Digital workers</th>
<th>Intelligent and integrated plant and network</th>
<th>Digital customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connected worker</td>
<td>Digital asset management</td>
<td>Market facing platforms</td>
</tr>
<tr>
<td>Mobile and wearable technologies combined with analytics, augmented reality and artificial intelligence</td>
<td>IT/OT integration allowing asset/network visualisation, predictive maintenance and automation</td>
<td>Digital trading platforms that enable energy optimisation and participation in energy and bioresource markets</td>
</tr>
<tr>
<td>Digital learning</td>
<td>Digital event management</td>
<td></td>
</tr>
<tr>
<td>Enables collaborative and personalised learning through online portals, gamification and virtual reality</td>
<td>Predictive analysis and digital communication channels to enable event prediction and customer pre-warning. Includes site imaging and virtual assistants</td>
<td></td>
</tr>
<tr>
<td>Liquid workforce</td>
<td>Digital foundation</td>
<td></td>
</tr>
<tr>
<td>Optimises supply and demand and skills mix across locations. Enables flexible workforce via online marketplaces</td>
<td>Provides the foundation for big data capture, storage, processing analysis and visualisation</td>
<td></td>
</tr>
<tr>
<td>Digital inventory</td>
<td>Digital inventory</td>
<td></td>
</tr>
<tr>
<td>Tracking of materials and parts, inventory visualisation and 3D printing</td>
<td>Rapid automation of manual, rules based, back office administrative processes using software ‘robots’</td>
<td></td>
</tr>
<tr>
<td>Process automation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Digital enterprise

- Digital foundation: Provides the foundation for big data capture, storage, processing analysis and visualisation
- Digital asset management: IT/OT integration allowing asset/network visualisation, predictive maintenance and automation
- Digital event management: Predictive analysis and digital communication channels to enable event prediction and customer pre-warning. Includes site imaging and virtual assistants
- Market facing platforms: Digital trading platforms that enable energy optimisation and participation in energy and bioresource markets

Capital Markets Event • Systems Thinking & Innovation
Robotics is an example technology to accelerate implementation of Systems Thinking

Our research identified areas of digital opportunity

Rapid automation of manual, rules based, back office administrative processes using software ‘robots’.

Business process automation
Based on software tools to automate specific manual processes (BPA)

Robotic process automation
Automation of manual (even complex ones) processes in corporate functions of field operations
Our capability model defines the set of capabilities required to deliver our Systems Thinking operating strategy – it has been informed through our digital research.

### Capability model design

<table>
<thead>
<tr>
<th>Asset planning and provision</th>
<th>System optimisation</th>
<th>Work execution and delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset lifecycle management</td>
<td>Production planning &amp; optimisation</td>
<td>Work scheduling</td>
</tr>
<tr>
<td>Water resources</td>
<td>Wastewater network+</td>
<td>Bioresources</td>
</tr>
<tr>
<td>Operational monitoring</td>
<td>Operational control</td>
<td></td>
</tr>
<tr>
<td>Data and information management</td>
<td>Process excellence</td>
<td></td>
</tr>
</tbody>
</table>
Bringing the capability model to life

The operational monitoring capability maturity model

1. Remote visibility of asset status
   - Local
   - Human-led
   - Inconsistent
   - Asset focused
   - Lagging

2. Remote visibility of asset status performance

3. Remote visibility of system performance

4. Predictive analytics on system performance

5. A.I monitoring of system performance
   - Centralised system
   - Machine-led
   - Integrated
   - Predicative

- AMP6 Alarm handling (in full operation)
- AMP6 Wastewater Treatment Works hub model (Implementation)
- Robotic Process Automation in Water (Implementation)
- Event Recognition in Water (Implementation)
- Wastewater Network Management (Proof of concept)
Systems Thinking

Maturing our capability

Example projects thus far

Event Recognition in Water Network (ERWAN)
The Power of Advanced Technology

Machine Learning

ERWAN (Event Recognition in Water Network)

We have **200 million** readings per year through our advanced sensor network.

Obtaining insight from this data is **key to predict and respond** to network changes that could impact customers.

ERWAN is the **first example of Machine Learning** and is a self-learning system that learns the ‘normal’ system signature within our water network and sends an **alert** as soon as it sees a deviation in.
Wednesday 31 May there was a failure of a 450mm diameter main on the Formby bypass. This affected 10,600 properties.

This reduced the duration of the supply interruption to customers by 42% from 261 minutes to 151 minutes and provided an ODI benefit of £602k
Systems Thinking

Maturing our capability

Example projects thus far

Robotic process automation (RPA)
Robotic process automation (RPA)

RPA is new technology to use machines to undertake task previously done by humans it can:

- Improve operational performance
- Reduce totex

This is an emerging technology area with the potential for significant benefits.

We already have the first robots working for us...
Our next phase will save 18,989 hours of manual work

And we’ll deliver 8 production processes through the next implementation phase of Robotic process automation (RPA)

<table>
<thead>
<tr>
<th>Business Area</th>
<th>Process</th>
<th>Overview</th>
<th>Complexity</th>
<th>Benefit Level</th>
<th>Hours back p.a.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Ops</td>
<td>Alarms (WW)</td>
<td>Manual check and reset of alarms in the strategic telemetry systems</td>
<td>High</td>
<td>High</td>
<td>7280</td>
</tr>
<tr>
<td>Central Ops</td>
<td>Water Site Control &amp; Data Acquisition Tours for 58 sites</td>
<td>Automate telemetry readings</td>
<td>High</td>
<td>High</td>
<td>3362</td>
</tr>
<tr>
<td>Central Ops</td>
<td>Clean Water Tracker</td>
<td>Collation of data in Click</td>
<td>Medium</td>
<td>Medium</td>
<td>2000</td>
</tr>
<tr>
<td>Commercial</td>
<td>Goods receipting Email reminders</td>
<td>Send chaser emails for goods receipts</td>
<td>Low</td>
<td>Medium</td>
<td>2000</td>
</tr>
<tr>
<td>Developer Services</td>
<td>Meter Releasing</td>
<td>Create work orders for meter installations through to delivery partner</td>
<td>Medium</td>
<td>Medium</td>
<td>2000</td>
</tr>
<tr>
<td>Domestic Retail</td>
<td>Automated Speech Recognition Transactions</td>
<td>Text customers who have had a failed transaction</td>
<td>Medium</td>
<td>Low</td>
<td>347</td>
</tr>
<tr>
<td>Wastewater Services</td>
<td>Water samples</td>
<td>Scheduling Engineers to take water samples</td>
<td>Medium</td>
<td>Medium</td>
<td>2000</td>
</tr>
</tbody>
</table>

TOTAL 18,989 hours back to the business p.a.
Innovation

Our approach
Innovation overview

Cheaper, faster, better, safer

Our Strategy

Accessing the innovation ecosystem
- Triage
- Idea scouts
- Innovation Lab

Prototyping breakthrough technology
- Dedicated team
- Trial zones
- Adapting

Working with academia
- Stimulating research
- Applying research
- Leveraging funding

Inspiring innovation
- New entrants
- Employees
- Value
- Innovation Centre

Harnessing and exploiting good ideas – big and small - to improve performance and reduce totex
Innovation lab

Encouraging new entrants
Accelerating technology development
Innovation lab

The first ever innovation lab in the water sector

New procurement

Our first 5 problem areas

Connected water and customer
Proactive customer actions
Predictive asset maintenance
Safe and healthy worker
Future of water
Innovation lab

1500 suppliers
80 applied
55 new to UU
22 presented
7 to join the lab

- UV LED treatment
- Pipes with built-in sensors
- Water efficient showerhead
- Motor condition monitoring
- AI for water management
- Sewer condition
- Drones for safety
One of our magnificent 7

Worlds first utilities scale UV LED Water treatment systems

- Effective against biological contaminants including chlorine resistant microorganisms
- Effective against organic pollutants, pesticides, pharmaceutical residuals, hydro carbons
- Applicable for both clean and waste water treatment

Up to 90% energy saving over existing systems
Punching through the efficiency frontier

Porter’s Efficient Frontier

Lunch Break
Integrated Control Centre (ICC) tours

**Group 1**
12:00 – 12:20
- Rikard Dahle
- James Brand
- Stephen Hunt
- Maurice Choy
- Gavin Kennedy
- Anna Mills

**Group 2**
12:00 – 12:20
- Richard Hughes
- Michael Stiasny
- Chris Laybutt
- Iain Turner
- Dominic Nash
- Steve Smith

**Group 3**
12:20 – 12:40
- Verity Mitchell
- Guy MacKenzie
- Rui Dias
- Jeremy Wiseman
- Fraser McLaren
Engineering & Capital Delivery

Richard Ratcliff
Engineering Delivery Director
What does TCQi stand for?

Time, Cost, Quality index

The three elements of TCQi contribute equally to the overall score.

**Time**
We will deliver a project to the regulatory standard within the required time frame.

**Cost**
We will deliver a project within the approved original budget.

**Quality**
The projects we deliver will add quality and be of benefit to customer.
AMP5 and AMP6 TCQi performance

Achieving and maintaining industry leading TCQi performance

AMP5/AMP6 TCQi Historic Performance

- TCQi Reported Position
- Equivalent to AMP5 Methodology

Change in Methodology
Closing the gap and accelerating the capital programme

£600m efficiencies vs. original business plan

Planned acceleration of capital programme

Net regulatory capex

UU proposed totex

Ofwat proposed totex

c£600m sustainable cost reductions delivered through more efficient capital delivery and Systems Thinking

£600m efficiencies vs. original business plan

Planned acceleration of capital programme

Driving £300m of efficiency into the major capital programme (£2.3bn)

- New Processes - £20m
- Continuous innovation - £20m
- DfMA - £20m

- Embedding risk and value - £34m
- Competitive tender and batching (20-35%) - £60m
- Delivering innovation - £60m
- Changing delivery model - £66m
- Changing to Design & Build and expert client - £55m
- BIM
- DfMA
- Collaborative Planning

Based on 40% of the programme

Driving £300m of efficiency into the major capital programme (£2.3bn)
Driving holistic solutions through Risk and Value

Embracing totex and shifting from a capital bias through the tools that we use and pervasive engineering

Risk & Value has been about establishing a mind-set, to ensure that we keep challenging and validating both the need for our projects and the way we deliver them. The principal of R&V is to maximise value, but we have also been successful in creating CAPEX efficiency with significant potential to drive further benefits.

What have we achieved so far, and how much is left to do?

<table>
<thead>
<tr>
<th>RV Studies held across the programme</th>
<th>£24m</th>
<th>£10m+</th>
<th>&gt;200</th>
<th>87</th>
</tr>
</thead>
<tbody>
<tr>
<td>LBE Reduction through R&amp;V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further Opportunity Forecast</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunities discovered and being developed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshops still to deliver in AMP6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What is next?

Set up for AMP7 success – R&V has already been used as a key function of PR19, and we aim to fully establish within our AMP7 delivery framework.
AMP6 Design & Build delivery model

Driving towards industry best performance

- Changing from Alliance based model to Design & Build model has reduced indirect construction costs (AMP5 £0.41 to AMP6 £0.35) to align with industry best performance.
- Change to Design & Build model has enabled UU to better industry average overall performance and drive to industry best performance.

<table>
<thead>
<tr>
<th></th>
<th>AMP6 (Year 1)</th>
<th>AMP6 (Year 2)</th>
<th>AMP7</th>
<th>Industry Average Performance</th>
<th>Industry Best Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>UU labour/non labour and capital overhead costs</td>
<td>£0.41</td>
<td>£0.36</td>
<td>£0.25</td>
<td>£0.32</td>
<td>£0.25</td>
</tr>
<tr>
<td>Indirect construction costs</td>
<td>£0.35</td>
<td>£0.35</td>
<td>£0.35</td>
<td>£0.41</td>
<td>£0.35</td>
</tr>
<tr>
<td>Direct construction costs</td>
<td>£1.00</td>
<td>£1.00</td>
<td>£1.00</td>
<td>£1.00</td>
<td>£1.00</td>
</tr>
<tr>
<td>£ in the ground</td>
<td>£1.76</td>
<td>£1.71</td>
<td>£1.60</td>
<td>£1.73</td>
<td>£1.60</td>
</tr>
</tbody>
</table>
Innovating the way we deliver our capital programme
Nereda

To date Nereda has saved £15m of CAPEX, will save £1.9m of OPEX per year and set up four sites for Systems Thinking

Kendal WwTW
- Estimated £1m CAPEX saving compared to conventional solution
- Future OPEX saving of £308k per year
- Lower risk solution due to reduced existing assets offline in construction
- Largest UK reference when built

Morcambe WwTW
- Estimated £6.3m CAPEX saving through use of Nereda
- Future OPEX saving of £54k per year
- Reduced need to acquire new land / build tidal storage
- Programme improvement as no EIA required compared to conventional

Failsworth WwTW
- Lowest Whole Life Cost
- Future OPEX saving of £240k per year
- Future proofed for phosphorus removal and product recovery

Blackburn WwTW
- Estimated £7m CAPEX saving compared to conventional solution
- Future OPEX saving of £1.3m per year
- Future proofed for phosphorus removal and product recovery
- Largest reference in Europe when built
DfMA and standard products move from innovation to BAU

To date £20m of CAPEX savings have been achieved, time related costs are additional.

Advance
1. Valve in a bin installed on Windermere Project.
2. WPL prefabricated treatment system critical enabler on the Halton East project.

C2V+
1. Chorley Settlement tanks design.
2. Hesketh Bank Shay Murth / Dutchland post tensioned tank one of the first of it's in the UK.

MMB
1. Jackson Edge service reservoir
2. Preston storm tanks.

LiMA
1. DfMA MCC Kiosk, duct pit and pre-fabricated transformer walls.
2. Pipex DfMA distribution chamber and DfMA MCC kiosk.
3. Pre-assembled pipe bridges.
Embracing the digital world

Building Information Modelling (BIM) driving asset centric data into an operational world and delivering CAPEX time related savings

- 2000: 3D modelling first 3D ALM reviews
- 2005: Liverpool BIM flagship project
- 2010: BIM strategy paper published
- 2011: Employer’s information requirement specification issued (S13)
- 2012: BIM Level 2 written into AMP6 contract
- 2013: 3D ALM’s as BAU
- 2014: First VR ALM on a project
- 2015: BIM excellence programme
- 2016: Common data environment launched (BS1192) for all project delivery
- 2017:
- 2018:
- 2019:
- 2020:
- 2025:

Liverpool WWTW – Flagship AMP5 BIM Project

Immersive ALM Review

3D ALM Reviews

Co-written BIM4Water Industry guidance document

Standard Digital products - BIM Adoption throughout the supply chain

UU’s Common Data Environment moving to the cloud

Sharing Information with Field Service Engineers
Embracing the digital world

We are the only water company to have
• Written BIM into the AMP6 contracts
• Provisioned a client owned Common Data Environment
• Documented our Information requirements (S13 specification)
• Our own BIM professionals in house
• Made 3D modelling and intelligent schematics the default way of working
• Achieved BIM Level 2

Why are we doing this?
• Improve resilience of our infrastructure
• Optimise the lifecycle performance of our assets.
• Reduce risk and improve health and safety performance.
• Reduce cost and time to deliver projects e.g.
  • Liverpool – Savings £1m
  • Davyhulme – saved 11,000 working days on site.
• Ensure that UU remains at the forefront of digital working and are ready to exploit future opportunities.
West Cumbria strategy

Driving programme innovation through planning, procurement and stakeholder management

Project Driver

- European Habitats directive
- Infraction proceedings
- Ennerdale Environmental drivers, (compensatory measures)
- Examination in Public
- Long term resilience for West Cumbria
- EA want us to stop using Ennerdale water by 31st March 2022

ODI ‘s

- Only project in the UU programme with its own set of distinct ODI’s
- 16 ODI’s in total, 5 achieved, remaining on target to outperform
- Incentive of £22.5 million

Project Particulars and status

- £300 million scope, current LBE significantly beating budget
- Project currently in implementation, year 2 construction
- Regulatory PIU 31st March 2022, target 31st March 2021
- 9 year duration, (5 years construction on site)
- 95km pipeline, (33km of twin 900mm, 62km single 800mm / 600mm)
- 80 Ml/d water treatment works
- 3 service reservoirs, 2 pumping stations
- Renewable energy, (hydro and solar)
- Planning achieved, unanimous decision from all planning authorities

Delivery through innovation

- Project task team approach and early engagement
- Extensive stakeholder management
- Early contractor involvement
- Contract strategy
- Collaborative planning
- DFMA, 3 / 4 d modelling and virtual visualisation
- What’s in it for Cumbria
Sharing Outperformance

Delivering industry leading long term water resilience.

- Covering of **all filters & chambers downstream** of first stage filters
- Installation of Shut down and Start up facilities at **ALL WTWs**
- **UV installed** at WTWs and ability to deploy it **everywhere** underway
- Engineer lead HAZREV completed at highest risk sites, with **ALL WTWs** on track for completion
- Robust service reservoir assessments & repair
Haweswater Aqueduct

The need for more resilience

Recent inspections of the HA discovered issues with tunnel lining in places, some targeted remedial works have been completed but there are still a number of areas requiring additional work.

Due to the age of the HA, there is an increasing risk of service failure to customers served: water quality problems and/or supply disruption.

Medium term fixes are underway, but there will remain a substantial risk unless long term investment is made.

We have identified five options which we are consulting customers and stakeholders on.

We are preparing a special factor claim and potential direct procurement submission as part of PR19.
Customer service
Customer Service Strategy

We have a clear strategy in place delivering new services and capabilities to position us now and in the future...

...and at the same time we are responding to the unique demographics of our region.

Great Service Costs Less

Reducing costs

Improving Service
Customer Service

We have improved service, building trust and demonstrating our ability to respond to the needs of our region.

- **Speed**: Customers don’t have opening hours
- **Friendliness**: Building trust with our customers
- **Complaints**: Service recovery in place for when we get it wrong

Results evident in our UK Research
Industry leading digital capability

Informed by customers

Our digital channels have grown in scale and sophistication.

We have engaged our 7,500 strong customer panel as early adopters of new capability.

Launched the sector’s first truly integrated mobile app.

Ethnographic research identified potential for the App.

Piloted with customer panel and launched in May – first fully integrated app in sector.

More than 750,000 customers now registered for our online customer portal, My Account.

Further customer feedback has prompted the trial with Advizzo which will deliver home usage reports for metered customers. The only digital trial at scale of water consumers in the UK.
Driving Priority Service offering for our customers and the Utility Sector

Learning from all our insight and customer experiences, we identified the need to review and enhance the services offered to customers in vulnerable situations and to engage multi-agencies and the third sector in the identification of these customers.

Registrations remain strong and embedded within core customer touchpoints

There are now more than 50,000 Priority Services customers registered

Launched industry pilot with Electricity North West to share priority services data

Engagement with agencies and third sector organisations such as Public Health England, Local Authorities (county, district, unitary), MPs, Citizens Advice Bureau, Red Cross, AgeUK, Salvation Army who gave us some insightful feedback. They told us:

• The old Extra Care brand was confusing for customers with vulnerable needs
• The sign up process was complicated and intrusive
• Organisations didn’t believe that the benefits of schemes were clear to the customer.
• The scheme was one dimensional and focussed on physical vulnerability

The new Priority services proposition has been shaped by insight...

Physical Mental health Life events

Language Financial

A complete and dedicated service when our customers need it most

Working with partners, stakeholders and charities to drive registration. Training for employees to spot and support those customers who are ‘suffering silently’
SIM Qualitative Performance

Year to date against the WASC’s we are seeing strong performance and encouragingly are significantly ahead of the other two listed companies.
SIM Qualitative All Companies - Upper Quartile
SIM Quantitative Performance

How are we performing?

We have set ourselves challenging targets on service recovery and continue to see a declining number of complaints across all areas.

Complaints – Stage 1
We have made significant improvements – reducing complaints by over 32% in 2 years

Complaints – Stage 2
Stage 2 complaints have reduced by 62% over 2 years
We are running at 2% repeat rate which is in line with industry best performance
CCW reported up to end September they have seen a 44% reduction in complaints directly to CCW which is the largest decrease of any of the WASCs
We have made significant progress in the latest UK Customer Satisfaction Index, 2nd of the 10 WASCs.

### Organisation Ranking

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Jan-18</th>
<th>Jan-17</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK all-sector average</td>
<td>78.1</td>
<td>77.8</td>
<td>0.3</td>
</tr>
<tr>
<td>Utilities</td>
<td>74.4</td>
<td>74.4</td>
<td>0.0</td>
</tr>
<tr>
<td>OVO Energy</td>
<td>81.5</td>
<td>82.5</td>
<td>-1.0</td>
</tr>
<tr>
<td>Utility Warehouse</td>
<td>78.9</td>
<td>78.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Bristol Water</td>
<td>77.4</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>M &amp; S Energy</td>
<td>77.4</td>
<td>77.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Yorkshire Water</td>
<td>77.4</td>
<td>80.1</td>
<td>-2.7</td>
</tr>
<tr>
<td>United Utilities (water)</td>
<td>77.3</td>
<td>69.9</td>
<td>7.4</td>
</tr>
<tr>
<td>Scottish Water</td>
<td>76.9</td>
<td>74.1</td>
<td>2.8</td>
</tr>
<tr>
<td>First Utility</td>
<td>76.8</td>
<td>77.4</td>
<td>-0.6</td>
</tr>
<tr>
<td>Wesssex Water</td>
<td>76.7</td>
<td>79.5</td>
<td>-2.8</td>
</tr>
<tr>
<td>Anglian Water</td>
<td>76.4</td>
<td>77.0</td>
<td>-0.6</td>
</tr>
<tr>
<td>Dwr Cymru (Welsh Water)</td>
<td>76.4</td>
<td>75.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Affinity Water</td>
<td>76.3</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Severn Trent Water</td>
<td>76.0</td>
<td>78.0</td>
<td>-2.0</td>
</tr>
<tr>
<td>Power NI</td>
<td>75.9</td>
<td>76.9</td>
<td>-1.0</td>
</tr>
<tr>
<td>Northumbrian Water</td>
<td>75.6</td>
<td>76.1</td>
<td>-0.5</td>
</tr>
<tr>
<td>British Gas</td>
<td>75.1</td>
<td>75.4</td>
<td>-0.3</td>
</tr>
<tr>
<td>The Co-operative Energy</td>
<td>74.8</td>
<td>70.0</td>
<td>4.8</td>
</tr>
<tr>
<td>EDF Energy</td>
<td>74.3</td>
<td>74.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Scottish and Southern Energy (SSE)</td>
<td>73.8</td>
<td>75.3</td>
<td>-1.5</td>
</tr>
<tr>
<td>Scottish Gas</td>
<td>73.8</td>
<td>74.0</td>
<td>-0.2</td>
</tr>
<tr>
<td>Essex and Suffolk Water</td>
<td>73.1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>South West Water</td>
<td>73.0</td>
<td>75.8</td>
<td>-2.8</td>
</tr>
<tr>
<td>E.ON (energy)</td>
<td>72.5</td>
<td>75.0</td>
<td>-2.5</td>
</tr>
<tr>
<td>Thames Water</td>
<td>71.5</td>
<td>71.8</td>
<td>-0.3</td>
</tr>
<tr>
<td>Scottish Power</td>
<td>70.5</td>
<td>68.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Southern Water</td>
<td>69.7</td>
<td>72.5</td>
<td>-2.8</td>
</tr>
<tr>
<td>npower</td>
<td>69.5</td>
<td>67.5</td>
<td>2.0</td>
</tr>
</tbody>
</table>

We are the most improved Utility company against a backdrop of declining performance for many One of the most improved of all brands.
Leading the sector on Service

**Ofwat SIM Survey 2016/17 Annual Report**

Qualitative + Quantitative performance **trending significantly above** industry average

**United Utilities is now a leader amongst all companies**

**Best listed performer**

**The Institute of Customer Service**

Step change in ranking and performance
+ 7.4 point increase in 12 months

**The most improved Utility company**

**Most improved**

**Leading listed water company for CCWater customer satisfaction research**

**Best listed performer**
Affordability is a challenge

We have increased the reach of our financial assistance schemes more than double the number of customers we had originally forecast in our FD.

Households in the North West sit in the top decile of arrears risk according to external data from Equifax.

Regional Levels of Deprivation

<table>
<thead>
<tr>
<th>Region</th>
<th>1% most deprived</th>
<th>5% most deprived</th>
<th>10% most deprived</th>
<th>20% most deprived</th>
</tr>
</thead>
<tbody>
<tr>
<td>North West</td>
<td>52%</td>
<td>35%</td>
<td>28%</td>
<td>22%</td>
</tr>
<tr>
<td>North East</td>
<td>12%</td>
<td>10%</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Yorkshire</td>
<td>17%</td>
<td>18%</td>
<td>17%</td>
<td>14%</td>
</tr>
<tr>
<td>East Midlands</td>
<td>5%</td>
<td>17%</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>West Midlands</td>
<td>9%</td>
<td>2%</td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td>East of England</td>
<td>2%</td>
<td>7%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>London</td>
<td>0%</td>
<td>4%</td>
<td>12%</td>
<td>19%</td>
</tr>
<tr>
<td>South East</td>
<td>3%</td>
<td>4%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>South West</td>
<td>2%</td>
<td>3%</td>
<td>4%</td>
<td>4%</td>
</tr>
</tbody>
</table>
Our Industry leading approach to Can’t Pay customers

We have fundamentally changed our approach to help those that can’t pay, redesigning and introducing new schemes and taking them out to customers who need them most.

Town action planning

- 45k visits – 100k visits
- 50% contact
- Able to agree payment plans there and then
- 75% still on track

Specialist advice on the doorstep

Sustainable payment plans

Town action focused

“Weight off our shoulders”
“Guy was brilliant, really helpful”
“Lovely, absolutely brilliant, so nice, helpful”

Winner of
Responsible Approach to Consumers Award
CICM British Credit Awards 2018

Winner of
Excellence in Treating Customer Vulnerability
The Credit Awards 2017

Shortlisted for
Best vulnerable customer support team
U&T Awards 2017

We’re popping by
We’re already helping 8,100 customers in your neighbourhood. Let’s see if we can help you too.

We’re popping by
We’re already helping over 3,000 customers in your neighbourhood. Let’s see if we can help you too.
Engage the wider debt community

Our first ever North West affordability summit – launched on ‘blue Monday’

We came together on Blue Monday 2018 as a willing community to focus on poverty in our region here in the North West and what we could do to make a difference. We have five themes of activity that will be sponsored by members of our community and over the next 12 months we will turn your ideas into solutions that will make a difference. We will keep you updated every eight weeks on progress and with details of how to get involved along the way. Next year on Monday 21st January 2019, we will come together again and celebrate the progress we have made and make the next Blue Monday a Bright Monday.

Stakeholders
- Charities
- Foodbanks
- Citizens Advice
- StepChange
- DWP
- Credit unions
- Debt agencies
- Housing associations
- Councils
- MP/ House of Lords
- Other utility companies
- UU Board members
Tackling customer bad debt

We have delivered substantial reductions in regulatory bad debt charges and bad debt as a % of revenue. Since 2014/15 we have reduced household regulatory bad debt by £24m/yr.
Addressing the AMP6 Cost to Serve challenge

Reducing Cost to Serve continues to be a main area of focus. In the last three years we have effectively reduced Cost to Serve per a customer from over £50/Hh to £39/Hh.

Driving down Cost to Serve

We have put in place a series of initiatives to reduce costs without negative impact on customer service:

- Delivering operational efficiencies
- Growing digital penetration
- Improved revenue management
- Improved affordability propositions
- Stronger won’t pay debt management
- Customers choosing to use self service channels continues to grow.
Responding to the future challenges

Econometric models for Household Retail

At the last price review Ofwat based retail cost allowances on simple Cost to Serve models. These models can not easily account for many important factors that drive retail costs.

We have presented Ofwat with robust econometric models demonstrating that extreme deprivation and household bill size are important factors in modelling retail costs.

Ofwat have indicated that these factors are being considered as part of design options for final PR19 cost models. They will consult on draft cost models on 29th March.

Improved cost drivers

<table>
<thead>
<tr>
<th>Old Cost to Serve model*</th>
<th>Econometric proposed factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of unique customers</td>
<td>Number of unique customers</td>
</tr>
<tr>
<td>Meter penetration</td>
<td>Meter penetration</td>
</tr>
<tr>
<td></td>
<td>Percentage dual service customers</td>
</tr>
<tr>
<td></td>
<td>Average deprivation levels</td>
</tr>
<tr>
<td></td>
<td>Extreme deprivation levels</td>
</tr>
<tr>
<td></td>
<td>Average bill size</td>
</tr>
</tbody>
</table>

A small number of additional cost drivers substantially improves the quality of retail cost models.

*Ofwat also made a top down adjustment for dual service customer numbers

Ofwat methodology

Previous retail Cost to Serve models proved too basic at the last price review. Many companies, including UU successfully argued for special adjustments. Ofwat have been working closely with companies in the run up to PR19 to develop more effective cost assessment methodologies.

Ofwat has signalled in their Final Methodology and Cost Assessment consultation that they will move away from a simple Cost to Serve unit cost, and instead use econometric models for retail functions at PR19.
Well placed for the next AMP

Improving service and reducing costs for customers today and our future customers

Service

- Ofwat SIIM Survey 2016/17 Annual Report
  - Industry Leading

- UU and ENW first utility data share for Priority Services customers
- over 50,000 customers registered

Institute of Customer Service: UKCSI results – January 2018
- 4th most improved company

Cost

- Since 2014/15 we have reduced regulatory bad debt by £24m/yr
- The highest DD penetration across the industry at 69.8% despite our affordability challenges
- Using segmentation and external data to drive efficient service and cash collection
- Reduced Stage 1 complaints by 32%
- Stage 2 by 62% over two years
- 750,000 customer registered for My Account portal
- Reduced Cost to Serve per a customer from over £50 to £39

Innovation

- Highest digital presence with 44% of customer contacts automated
- First ever North West Affordability Summit
- Co-creation with our 7,300 Water Talk panel helping design our services and propositions
- First fully integrated app in sector
- More than 100,000 customers being helped through one of our support schemes
External recognition for our great performance

We are receiving external recognition for best practice in Customer Services, Collections and Debt Management and Complaint Handling.

**WOW!**

Best rising star - Victoria Chester from our contact centre in Whitehaven.

100 Club - 30 of our Field staff won the 100 award as they have received over a 100 personal nominations each direct from customers.

Customer experience delivery of the year - best large business

**Cash Collection**

Excellence in Treating Customer Vulnerability – Collections & Debt Management

**Credit Awards WINNER May 2017**

Water Team of the Year

**U&T Awards WINNER October 2017**

Best Vulnerable Customer Support Team

**U&T Awards Finalist October 2017**

Innovative approaches to customer engagement and satisfaction

**Market Research Society Awards Shortlisted September 2017**

Responsible approach to Consumers Project of the Year

**2018 CICM British Credit Awards Finalist February 2018**

**Social**

#1 in the January 2018 water brand influence report

**Utility Week**

Team of the Year – customer facing Customer Care Award

**Utility Week Awards Finalist December 2017**

**Complaint Handling**

Best Utilities

Pro-active Complaint Handling – Utilities Team – Utilities, Trains & Housing

**UK Complaint Handling Awards Finalist February 2018**
Summary
United Utilities is leading the way

United Utilities is now a leader among the WASCs

We have a clear vision and a long term strategy

The industry faces many challenges

Environmental
Affordability
Maintaining shareholder returns
Reputational

United Utilities is ideally placed to meet these challenges and our innovation capabilities are at the heart of this.

Innovation and our Systems Thinking approach is central to our strategy and will deliver long term value for customers, the environment and shareholders.
Any questions?
Cautionary statement

This presentation contains certain forward-looking statements with respect to the operations, performance and financial condition of the group. By their nature, these statements involve uncertainty since future events and circumstances can cause results and developments to differ materially from those anticipated. The forward-looking statements reflect knowledge and information available at the date of preparation of this presentation and the company undertakes no obligation to update these forward-looking statements. Nothing in this presentation should be construed as a profit forecast.

Certain regulatory performance data contained in this presentation is subject to regulatory audit.

This announcement contains inside information, disclosed in accordance with the Market Abuse Regulation which came into effect on 3 July 2016 and for UK Regulatory purposes the person responsible for making the announcement is Simon Gardiner, Company Secretary.