

6 Using markets and innovation



6.1 Key Messages

- **Bold innovation strategy reaching beyond the water sector:** Breakthrough technologies at the frontier of innovation combined with Systems Thinking and other initiatives delivering £445m of savings
- **Comprehensive Market Engagement Methodology:** Innovation in procurement best practice, testing 100% of cost base, with £359m of savings identified
- **Transparent bid assessment framework:** Supports the bidding market for water resources, demand management and leakage
- **Committed to encouraging sludge trading:** Actively support the development of markets for bioresources in AMP7 and beyond
- **Optimising delivery routes for major capital projects:** Proposing to implement a significant resilience project through direct procurement for customers
- **Strategy to deliver long-term, best-value and sustainable plan for water supplies:** Water resources to meet demand for next 25 years
- **Appropriate RCV allocations:** Supports Water Resources and Bioresources price control separation

6.2 Overview

6.2.1 Innovating for customers

Innovation has been a core value at UU for many years. We have a strong innovation culture, as demonstrated by:

- **actively working with global innovators, from small start-ups to large established corporations:** Our Innovation Lab process has provided unprecedented access to the company to very small businesses with very big ideas – companies which would normally struggle to interact with a large utility;
- **our willingness to develop innovations at both large and small scale:** from Systems Thinking (e.g. our Future Concept of Operations project is estimated to generate c£200m of savings in AMP7) to trialling small changes in technology, such as in-house app development; and
- **embedding innovation in our delivery strategy:** taking calculated risks, being flexible and nimble to reduce costs of trials and implementation, and learning quickly from failure when trying to push the boundaries of innovation.

We estimate that our range of innovations will save £445m in AMP7, compared to AMP5. This chapter summarises some of our innovations but much more evidence is provided in supplementary document S5001 – “Innovation in Action”.

We are committed to our long term strategy to embrace Systems Thinking in how we run our service, as we believe this provides the right platform to deliver the best quality service at the lowest cost. We are leading this innovative approach in the industry, and are already benefiting from historical investment in capability and infrastructure, through our Future Concept of Operations (FCO) initiative which has laid the foundation for further developments within our Systems Thinking programme. Our overall approach to innovation, and how we are harnessing systems, processes and people to deliver benefits for customers and the environment, is outlined in section 6.3 of this chapter.

6.2.2 Harnessing the power of markets

We are making significant use of markets to benefit customers through better value and better quality of service:

- **we have market tested our whole cost base** against our Market Engagement Methodology (MEM) developed with PwC and the University of Salford. We believe that implementing these recommendations will deliver a total £359m of savings, which will benefit customers in full during AMP7. More details are covered in section 6.4 and supplementary document S5002 – “Market Engagement Methodology”;
- **we have made many beneficial uses of markets**, such as nutrient trading, debt collection agencies competition, our construction delivery partners approach and use of other partnerships. These are also described in section 6.4; and
- **we are proposing to implement one of the industry’s earliest direct procurements for customers**. This is a major project supporting the resilience of water services to over two million people in the Manchester and Pennines areas of our region who are supplied by the Haweswater Aqueduct. We have set out in detail how we expect this direct procurement (DPC) to operate, and how customers will be protected (see section 6.5 of this chapter and supplementary document S5007 – “Direct Procurement Overview”).

6.2.3 Developing and using new markets

We were at the vanguard of the sector in delivering early separation of Business Retail, demonstrating our support for market development, and we have been keen proponents of water trading:

- **we have clear long term water resources and bioresources strategies**, including beneficially trading with other companies and service providers. This follows our early lead in trying to establish a workable approach to access pricing, having published two access pricing papers, and the significant effort we have made to establish trades to date. We outline our approach to these areas in sections 6.6 and 6.7;
- **we have set out our proposed Bid Assessment Framework in support of the bilateral trading market**, with the aim that it is successful in generating market activity and better outcomes for customers. This is described in section 6.8 and supplementary document S5006 – “Water Resources Bid Assessment Framework”; and
- **we also summarise our proposed RCV allocations for Water Resources and Bioresources to support price control separation**, taking account of the feedback received about how these can best support market development. This is described in section 6.9 and in more detail in supplementary document S5004 – “Water Resources Regulatory Capital Value – revised proposals” and S5005 – “Bioresources RCV allocation”.

6.3 Driving innovation (Test 5.1)

This section sets out to demonstrate our strong innovation capability and how this has helped deliver service improvement over the 2015-20 period, and at lower cost. Our systems and business processes are now more aligned to adopt new technologies and our supply chain is incentivised to offer better solutions. We have a bold innovation strategy to reach beyond the water sector and seek breakthrough technologies at the frontier of innovation in other industries/geographies.

6.3.1 A focussed approach to deliver more for less

Innovation is a core corporate value at UU. We have fostered a strong innovation culture, which underpins our drive to deliver more for less, backed by a solid innovation delivery model. In order to meet rising customer expectations, support those who need help and sustainably manage our impact on the environment we need to see, think and act differently and evolve this at pace.

Innovation

Is about harnessing and exploiting good ideas, big or small to make us better at what we do

Over the last few years innovation has contributed significant positive change and a shift in business performance with United Utilities now in the upper quartile against many of our operational and customer service metrics. This is against a backdrop of delivering expected efficiencies through innovations of £87m in AMP6.

Innovation is key to unlocking the potential for delivering new and better services and is a critical enabler to improving affordability through the identification of further efficiencies. Innovation can also provide resilience and significant mitigation against future risks such as population growth and climate change.

Innovation is often focussed on technology change, but for UU it means a lot more. Innovation is one of our company's three core values, alongside customer focus and integrity.

Figure 6.1: United Utilities' core values



Our innovation strategy goes beyond the traditional water industry approach of technology and regulatory change, by thinking globally, seeing beyond water industry boundaries and connecting with frontier innovators. We have drawn insight from global leaders in systems thinking including; aerospace, mining and oil and gas. Our technology roadmap has been based on global disruptors including Nike and Google, our Innovation lab (see "Accessing the innovation Ecosystem" in section 6.3.2 of this chapter and in section 3 of supplementary document S5001 for more detail) alone had a global reach over 13 countries with 49 out of the 80 applicants from the start-up community yet to break into the sector. Our strategy also ensures that we consider the cultural and corporate enhancements to allow innovation to thrive.

A cutting edge element of our innovation strategy is our approach to Systems Thinking and in particular breaking new ground in AMP7 by exploiting the full capabilities of our Integrated Control Centre and System Operator Strategy to fully operate the source to tap system, this will enable truly holistic optimised decisions to be made.

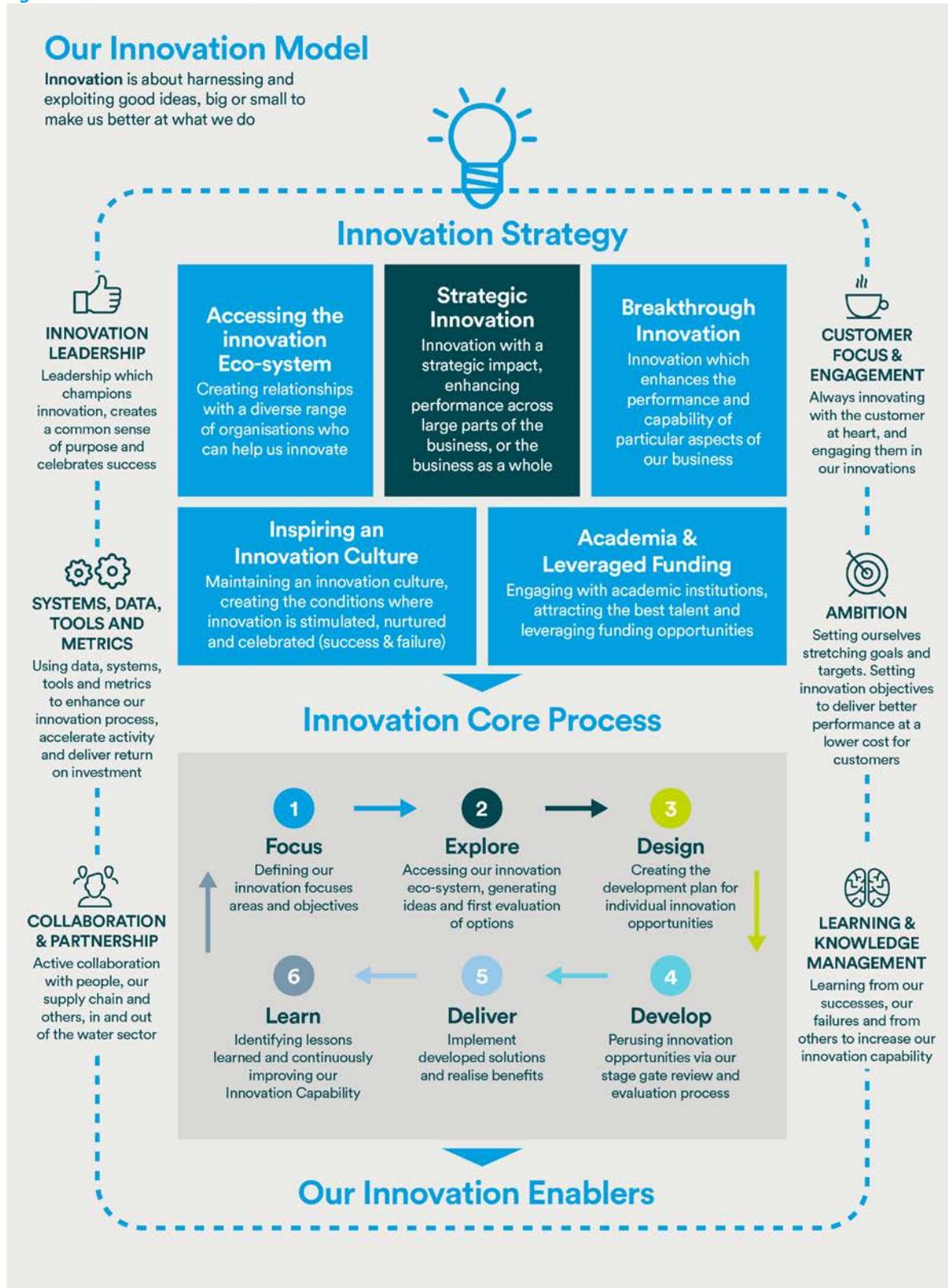
An industry leading approach to Systems Thinking

In a recent review of our Systems Thinking approach Accenture stated that they consider "UUW to be leading the water sector in executing a system thinking approach. [UU's] strategy necessitates a level of strategic maturity, long term focus and investment in innovation that is amongst the most sophisticated in the sector"

The five key elements of our innovation strategy are backed by a robust six step process for delivery. This combines with our key innovation enablers to create our Innovation Model (see Figure 6.2).

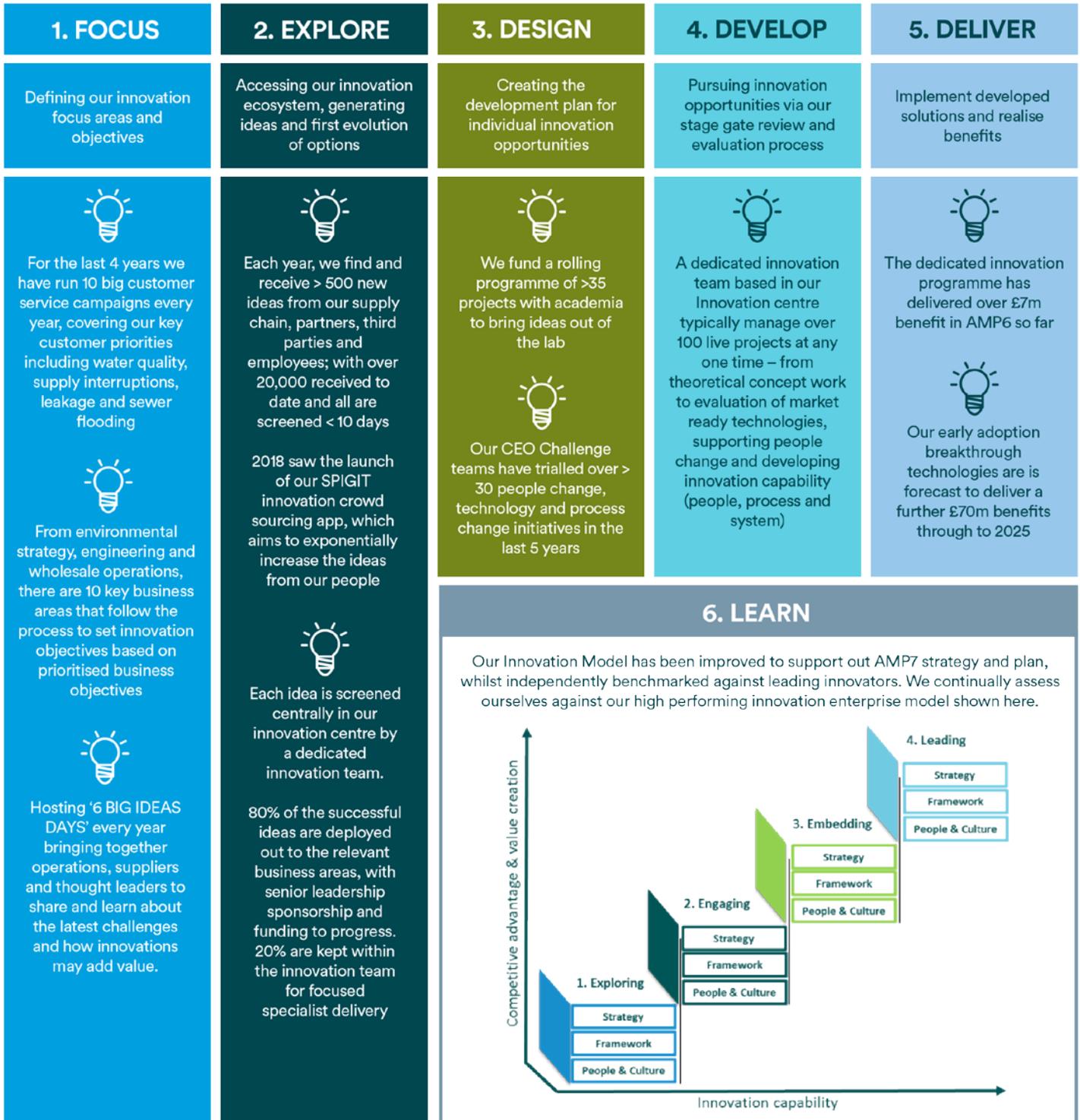
This model allows us to exploit innovation as a welcome and inevitable disruptor in the delivery of our plan. The people, process, systems that sit behind it are part of ongoing continuous improvement to ensure that our innovation capability is constantly enhanced.

Figure 6.2: United Utilities' Innovation model



We outline the key elements to our enhanced strategy in further detail in this section to demonstrate the depth and breadth of how innovations continue to improve the service for customers, the environment and at a lower cost. Supporting our Innovation strategy is a solid six stage delivery process which has been creating value from innovations since 2014.

Figure 6.3: Value creation from United Utilities six stage innovation process



6.3.2 The key elements of our innovation strategy

Strategic innovation – Systems Thinking

Systems Thinking is a novel and innovative discipline which recognises that our business is not a collection of independent components delivering discrete services to customers. Systems Thinking recognises that making a small change in one element of the system can have a big impact elsewhere, and makes use of patterns of change rather than static snapshots. Our long-term strategy has been set to manage and operate the business as a single end-to-end system which is broader than the organisation, or any of its components.

We are committed to our long-term strategy to introduce Systems Thinking into how we run our business, as we believe this provides the right platform to deliver the best quality service at the lowest cost. We are leading this innovative approach in the industry and are already benefiting from historical investment in capability and infrastructure, through our Future Concept of Operations (FCO) initiative which started in 2011. We believe that this will deliver a c£10 saving on customers' bills in cash terms by 2023. It has also contributed towards significant customer service benefits (from FCO inception to 2016/17) such as a 3% reduction in leakage, a >19% reduction in customer contacts (discolouration, taste and odour), a 63% reduction in serious pollution incidents (Cat 1-2) and a 29% reduction in serious DWI events (Cat3 and above).

The success and lessons we have learned through implementing our Future Concept of Operations transformation programme led us to consider how our Systems Thinking capability would need to evolve given the particular challenges on service, efficiency and resilience in the short and long term.

Recognising that digitisation is a critical enabler to delivering the benefits from Systems Thinking, we have challenged ourselves on the role technology can play in our future operations. In 2016 we employed Accenture, the leading global digital technology and operations company, to complete a global scan of digital innovation, looking outside the water sector for innovative solutions that would challenge and disrupt our thinking. The detailed report identified key digitally enabled solutions in use elsewhere, and then scored and assessed those solutions on a risk/reward framework that considered mature, improving and newly emerging technologies in the context of the water industry. More details on this research and how it inspired our 9 digital focus areas as part of our AMP7 strategy can be found in supplementary document S5001.

This digital research alongside cross sector benchmarking in Systems Thinking and our learning to date has pushed our Systems Thinking ambition even further, allowing us to create a detailed operating model and delivery framework.

Digital technology solutions will not only help us to understand how the system operates, but the emerging digital technology around artificial intelligence will enable superior operation of this complex system by machines. This will help drive efficiency and reliability across our core systems. We believe this radical new operating model has the potential to establish new efficiency and performance benchmarks for the sector.

However, delivering this change is not just about amassing digital technology; it requires a structured approach to transformational change. We have developed a framework that focuses on the maturity of our Systems Thinking capability that brings together the processes, people and system/technology improvements required. It has been proven across industries that a structured and governed capability model can be invaluable as it sets out a common language and consistent architecture that can be used to drive transformation.

Our Systems Thinking capability model and framework describes five levels of maturity. We have used these to develop a view of our current and target positions and to start to develop the associated programme of work that would be required in AMP7. Our framework has been endorsed by a third party (Accenture) as showing "significant alignment with observed cross-industry good practice".

Our Systems Thinking capability and approach to measuring maturity has been third party assured to ensure alignment with best practice and benchmarked against leading maturity models in other sectors including electricity, energy, mining, banking and telecoms. Levels of capability are assessed against a maturity scale of 1 to 5. Level 1 demonstrates a basic

Disruption opportunities; global digital innovations



The 9 focus areas for AMP7 digital transformational change

standard of Systems Thinking maturity, it demonstrates well established systems, processes and technologies with traditional organisation structures for delivery in discrete parts and only some connectivity between business operations. Level 5 demands significant innovations, such as new operating models, machine robotics, artificial intelligence and yet to be established business processes at a system scale.

We will incentivise innovation and improvement in our capability through our Systems Thinking Capability ODI, detailed in section 5.3 of chapter 5, which recognises the extended duration for delivery and the investment requirements outside of our plan.

An industry leading approach to Systems Thinking

“United Utilities have amongst the most mature Systems Thinking led strategies in the UK water sector; the vision is clear, execution has commenced and importantly, a systematic approach to baseline and measure capability uplift has been put in place which is so often missing” Accenture, 2018.

Systems Thinking maturity

Our focus in AMP7 is to advance our Systems Thinking capability to drive improvements in:

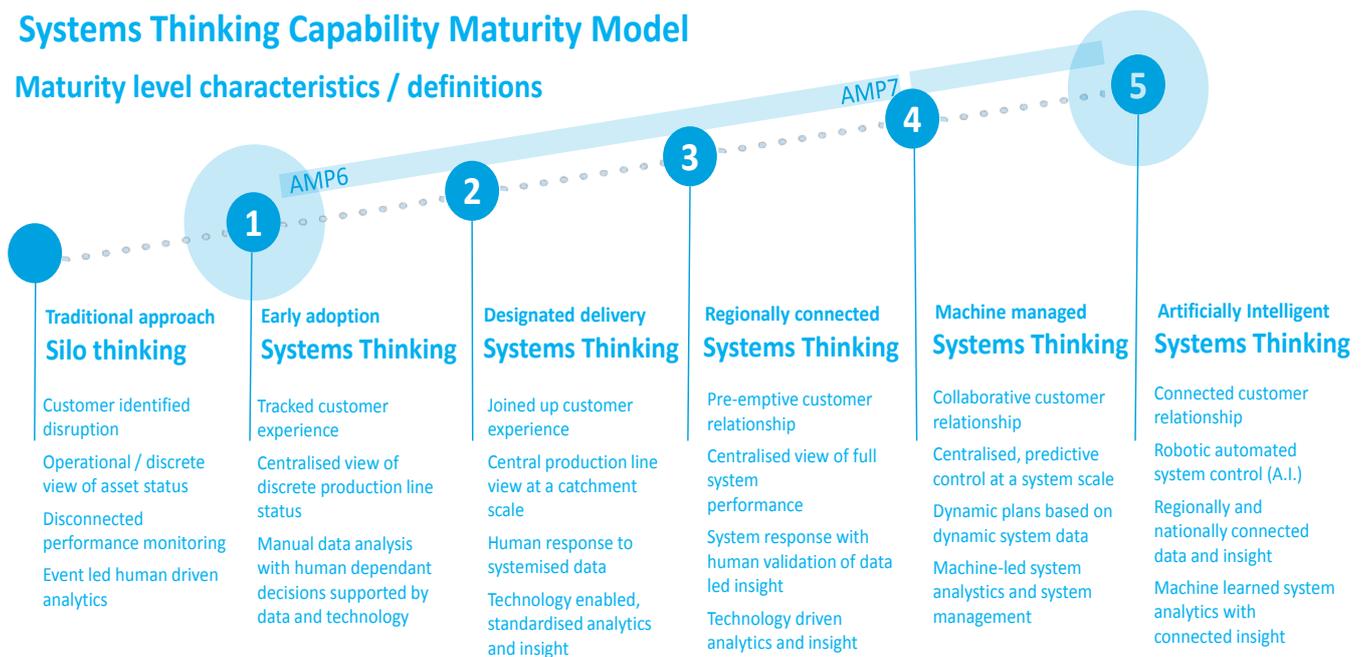
1. Customer experience
2. Asset Lifecycle Management
3. Production Planning
4. Work scheduling
5. Operational monitoring
6. Operational control
7. Data and information management
8. Process excellence

Figure 6.4 is an extract from our Systems Thinking Capability Model and illustrates the five maturity levels:

Figure 6.4 Systems Thinking Capability Maturity Model

Systems Thinking Capability Maturity Model

Maturity level characteristics / definitions

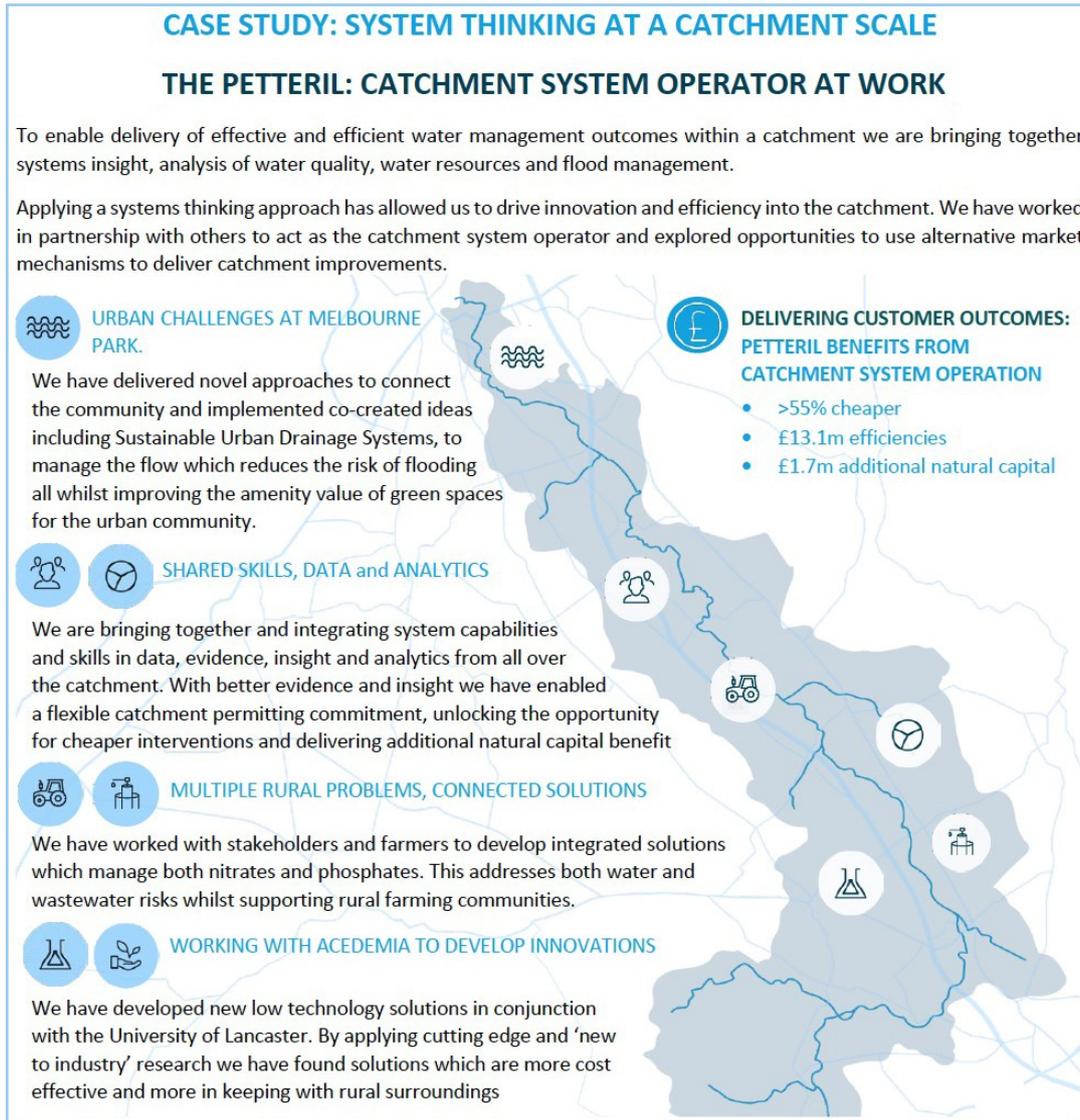


We have already accelerated improvements in Systems Thinking capability maturity by piloting the approach at a catchment scale and in our integrated control centre, by adopting some of the emerging technologies such as BIM, Robotics, AI and machine learning.

For example, we currently use Robotic automation (RPA) across 3 of our business processes to undertake high volume/low value tasks that were previously undertaken by humans resulting in reduced totex and improvements to operational performance. Our maintenance scheduling process required 8 people to produce reports four times a day with c.720 minutes of effort per day. The robot takes 32 minutes with complete accuracy and a robust audit trail of the information sources. The next phase will see RPA rolled out in another eight of our business processes across wholesale operations, developer services and domestic retail, collectively forecasting to save over 18,000 hours per year.

The case study below demonstrates at a larger scale the application of Systems Thinking delivering benefits and efficiencies across a whole geographical area.

Figure 6.5 Petteril Case Study



DELIVERING MORE FOR LESS NOW AND IN THE FUTURE

Having scaled catchment system operation trials across five catchments in the North West in AMP6 we are reducing costs further and delivering more benefits in a stretching roll out across a further 13 catchments in AMP7.

Further information about our catchment operator strategy and use of alternative markets can be found in section 6.4.2 of this chapter and in our supplementary document S4004 "Ecosystem resilience: Ecosystem resilience through catchment management, partnership and markets".

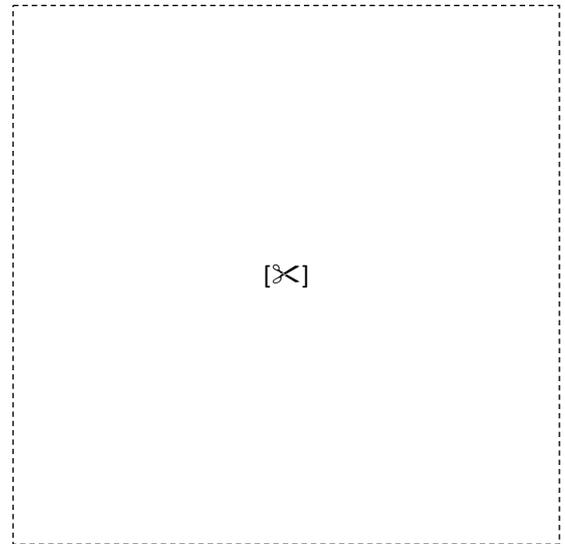
Breakthrough technology



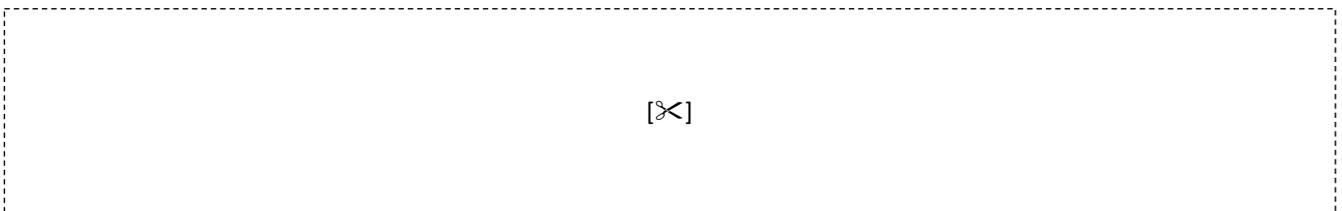
Another key element to our strategy is to focus on breakthrough technology. Traditionally the water sector has made incremental improvements in technology to deliver service and efficiency benefits for customers. Our horizon scanning of the wider business world is showing an acceleration of disruptive technologies across multiple sectors. This is driven not by incremental innovation but through breakthrough technologies that radically changed how services are delivered and specifically in disruption of the cost of those services that result in a shift in business models. We recognise that achieving this in the water sector offers valuable benefits for customers but one we must achieve in step with stringent quality requirements from our drinking water and environmental regulators.

Using our 6 stage process, we believe we can achieve this by focussing on new technologies that we can rapidly prototype in safe environments, testing, assessing, evolving and retesting technologies to quickly bring them up to a state suitable for full operational use on a regional scale.

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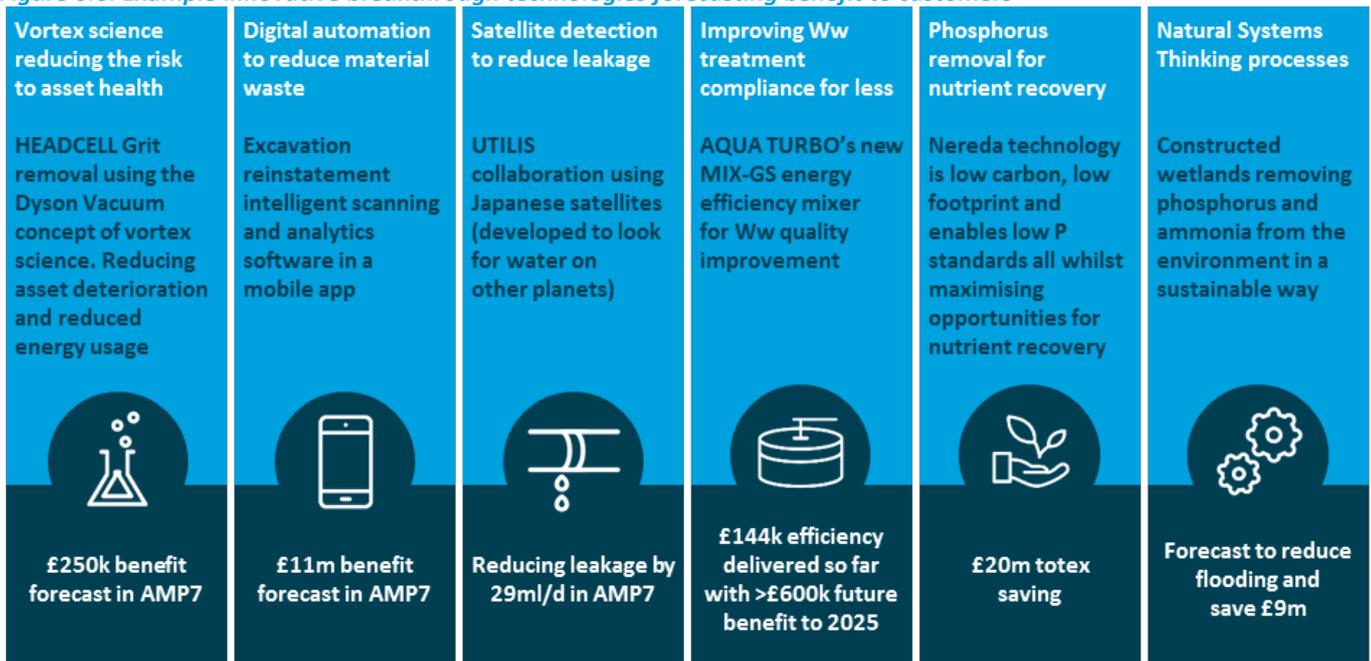
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Affordable bills are one of customers' highest priorities which makes driving efficiencies through innovation a key component of our strategy. We are also harnessing innovation to improve services to customers and to deliver better environmental outcomes. Through our breakthrough technologies we are pushing the boundaries of service and quality improvements.

Figure 6.6 shows a sample of the innovative breakthrough technologies that will deliver future service improvements, reduce the costs in providing that service and improve our resilience in AMP7.

Figure 6.6: Example innovative breakthrough technologies forecasting benefit to customers

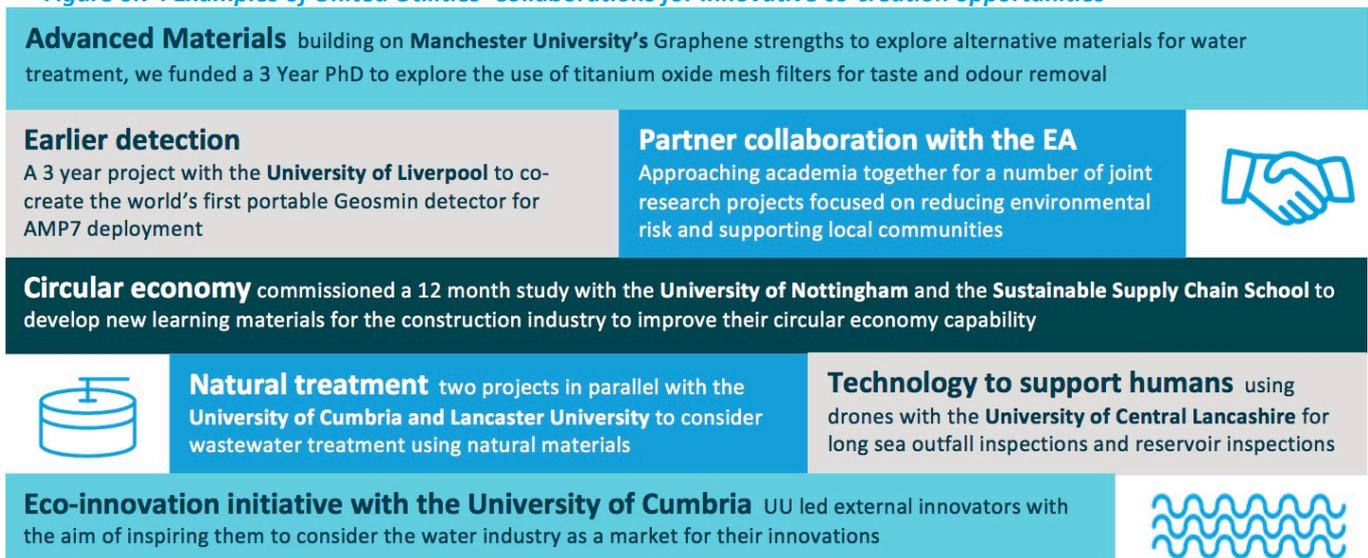


Working with academia and leveraged funding

Working with academia has been a long standing and value adding approach in United Utilities and is key to enabling the innovation opportunities from collaboration. Our AMP7 strategy will continue to stimulate research, adapt quickly to take advantage of new innovations promptly and keep bills affordable by accessing leveraged funding wherever possible.

To support our strategy of connecting with the best innovators, we regularly work with academia to stimulate new research, adapt and implement the research they have completed (for us and for others) and to ensure that we leverage every opportunity for co-funding. We share our problems and opportunities with universities (the FOCUS part of our 6 step process); last year alone we met 5 universities to establish new working relationships and this resulted in 6 new research projects being commissioned. We have a portfolio of 35 academia-driven projects at any one time ranging from 6 month graduate dissertations to longer term 3-4 year PhD or EngD qualifications – all linked to real industry challenges.

Figure 6.7 : Examples of United Utilities' Collaborations for Innovative co-creation opportunities

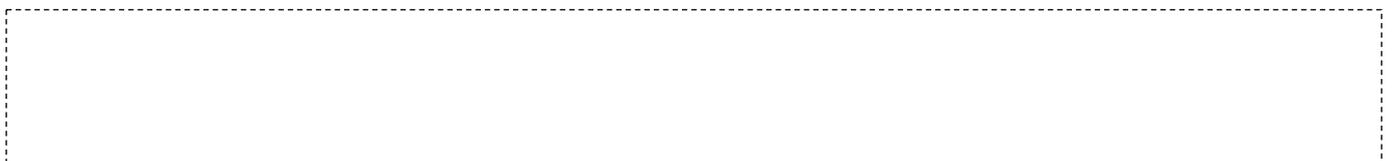


Having access to the best research is stimulating intellectually but has no impact unless we adopt the innovation. We are continually adapting our business processes and systems to accommodate new ideas; often this involves new training for our people so they work with and accept the change.

We strive to attract the best talent; working closely with universities allows us to shape their teaching curriculum so that graduates have the best skills for us and they understand the benefits of a career in the water sector and United Utilities for employment. [X]

[X]

Figure 6.8 [X]



Inspiring an innovation culture

We recognise that creating the right culture at United Utilities to drive an innovation-inspired workplace is a critical part of an effective innovation strategy.

This has required a change in culture within the organisation, to take more risks, be more flexible and nimble to reduce the cost of trial and implementation, and to learn quickly from inevitable failure when trying to push the boundaries of innovation in the sector.

Innovation is a core value which is embedded in our performance management processes for all employees and across the workforce we are working hard to embed a culture, backed up by tested processes, that allows innovation to manifest itself in our day to day work.

Our people have a big part to play in delivering a better and more affordable service in the future which is why we have taken a more encouraging and motivational strategy to inspire an innovation culture through some novel approaches including; our annual CEO's Innovation Challenge, our Employee gamification platform SPIGIT and our customer 'Tell me' initiative. Further details can be found in section 7 of supplementary document S5001.



Figure 6.9 CEO Innovation Challenge case study

CASE STUDY: LEADING FROM THE TOP WITH THE ANNUAL CEO'S INNOVATION CHALLENGE

Our CEO challenge is an annual programme where graduates from all disciplines are engaged in solving real business challenges to improve service and reduce cost. They follow our structured innovation process and are coached by the innovation team. As the title suggests the programme is sponsored by our CEO and the challenges are agreed with and sponsored by directors across the organisation.

We believe that giving our graduates the opportunity to work on real business challenges, with the freedom to make decisions, learn from mistakes and change the way we do things is very important for their development as future leaders. The graduates are given training and exposure to innovation techniques and the innovation process which is critical to embedding an innovation culture for the long term. They have access to senior leaders in the company, financing to support experiments and trials, and are encouraged to learn as they try to win the programme by demonstrating key innovation behaviours.

How to win behaviour

Speed and agility, engaging, influencing, maximum business benefit and compelling communications

Over the five years the programme has been running we have trained and developed over 150 graduates in 30 teams who have successfully led the implementation of many new innovations, they have transformed four key business processes, created five people change initiatives and have implemented 11 new systems or technologies, including drones, e-learning and energy usage dashboards. For example; using submersible drones to assess the condition and risk of our reservoirs.

This process has placed our future leaders in a safe learning environment where they can take risks, understand the implications of those risks and as a necessary consequence of innovation sometimes experience failure. During this process it has also allowed the senior leadership team to identify talent using the process as an opportunity to accelerate this talent through the business and into managerial positions.

6.3.3 Innovation enhancing customer service

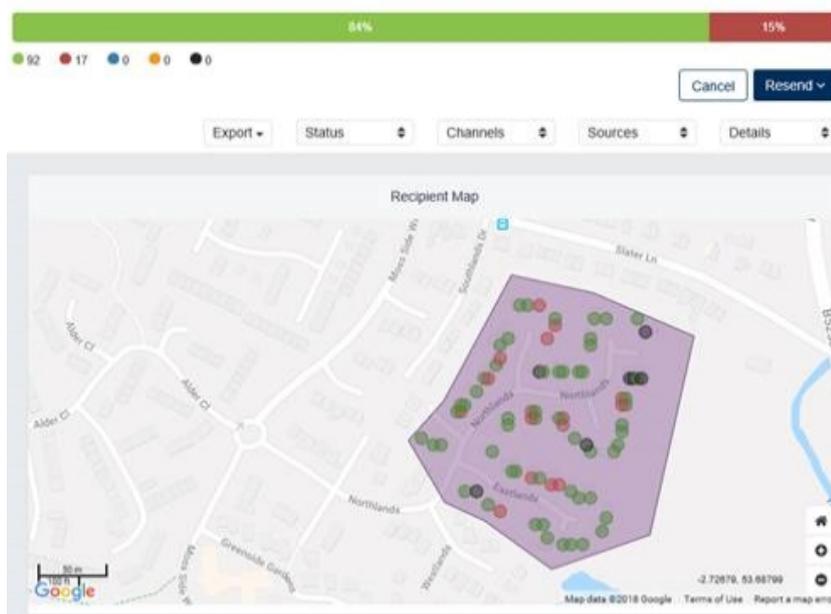
Changes in technology, innovation and business processes also offer significant scope to reduce costs and enhance service for retailers across a range of sectors, including water and other utilities. The opportunities offered through the effective utilisation of the latest digital capabilities have the potential to change both the ways in which retailers engage customers and the ways customers engage with us. Changes in the application of advanced analytics, increasing volumes of customer data and the opportunities from connected smart meters are key examples of technologies that can change the way water residential retailers operate in future, and that is why our innovation proposals target these areas heavily. It will become increasingly important that we are able to innovate at speed, measure success or failure through improved analytics and deliver the digital engagement that customers want from us. In the digitally enabled world effective collaboration and engagement can be as important as effective solution design and delivery.

Recent innovations

In recent years we have delivered a range of new innovations by identifying new technologies and bringing them into retailing in the water sector. We have also sought to apply existing technologies to solve new problems. Examples of recent innovations include:

- Proactive engagement - UMS tool for incidents:** We have implemented a new capability to proactively inform customers swiftly of service events and incidents. Use of a new cloud based Unified Messaging System (UMS), has enabled us to identify all customers affected by an event within minutes and contact them via a wide range of communication channels. This is usually achievable within the first hour of a service event or incident, ensuring as many customers as possible are contacted as soon as possible. In total since June 2017 we have sent over five million messages to customers updating them on what's happening in their area;

Figure 6.10 Unified Messaging System



Data matching and visualisation

The combination of Geographic data on network and property locations matched to customer contact records allows for swift identification and communication to impacted customers during a service event.

- Co-designing improvements with customers - New bill design:** We have engaged our 7,000 strong customer panel in co-designing new household bills. We have also engaged an employee panel and integrated complaints data and "lessons learned" comments from agents to gain a rich picture of where new bills were working well, and where changes should be focussed. As a result of this co-designed output the new and improved bill is contributing to reductions in bill related complaints;
- Customer Data collaboration – Sharing Priority Services registrations:** Since January 2018 we have been actively sharing new registrations onto our Priority Services register with Electricity North West (see chapter 3, section 3.5). By sharing registrations (following informed customer consent) we are able to increase our insight into those customers that need enhanced support whilst simultaneously saving customers the inconvenience of going through multiple registration processes;
- Iterative innovation – Reminder letter redesign:** We noted that we received many complaints from our standard reminder letter, and so took an iterative approach to redesigning parts of the debt reminder process, and testing

the effectiveness of the redesigned elements as we went along. As a result we have seen a 50% reduction in complaints on the back of reminders; and

- **Developing Our Digital Maturity:** We have created an excellent digital foundation across our customer engagement channels. Our digital customer engagement footprint is constantly evolving. Since 2016 we have implemented the following developments:
 - We have launched the first fully native Mobile App for both iOS and Android platforms in the water sector. The App is fully native to mobile devices, meaning unlike some other apps it does not link through pre-existing web pages, helping to improve the user experience;
 - UU is already a leader in the sector for automated and online transactions. Our website and “My Account” space have been upgraded, supporting an increase in automated transactions; and
 - We have provided webchat as a new contact channel.

Future innovation

In AMP6 we have achieved a lot through a more open approach to innovation and we are committed to continuing this going forward. In AMP7 we will increasingly look to digital to provide opportunities to reduce our cost to serve and improve customer service. We currently plan a range of new innovations and improvements:

- **roll-out of online consumption portals for metered customers:** see the case study in section 6.3.4;
- **new tariffs and payment plans:** Trials of innovations such as our ‘Lowest Bill Guarantee’ and ‘Payment Breaks’ (see chapter 3, section 3.6) are proving effective and popular with customers, we will seek to roll these out more widely and deliver further innovation in this space in AMP7;
- **advancing digital maturity:** Future developments of the UU website, mobile app, and social media channels will focus on creating a continuously improving customer service experience. This will be underpinned by an ongoing content strategy to understand and deliver the information, campaigns and digital engagement that customers tell us they want;
- **customer data and analytics capabilities:** A cornerstone of our future strategy, customer led data will increasingly inform future investment choices, engagement strategies, and intervention design. In chapter 7, section 7.8, we discuss a range of new initiatives that will utilise customer data in this way, such as our proposals to develop enhanced abilities to identify and engage customers at risk of falling into debt before they actually start missing payments. New tools and capabilities, particularly in the analytics space will be needed to enable this; and
- **AI supported chatbots and robots:** As AI driven chatbots become more capable, and social media becomes an increasing customer channel of choice we will investigate developing a UU chatbot as a means to reducing cost whilst maintaining customer service experience. We are already investigating the opportunity that the latest developments in software robots affords, as outlined in section 6.3.2.
- **smart metering, the connected home and the internet of things:** We recognise the significant growth in this area, both in terms of technological development and customer demand. We will continue to work to develop coherent industry standards in this area to maximise the value of the resulting customer dataset.

Learning from the business retail market

We moved early to separate activities between Wholesale, Residential Retail and Non-Residential Retail. The separation provided clarity as to the responsibility of each function and the creation of a Wholesale team. We exited from the non-residential market in April 2017 but continually monitor this market, as well as the services provided in other sectors, for new developments and innovations so that we can adapt these for the benefit of residential customers.

6.3.4 Case study: New Water Usage Report, utilising data to empower customers

United Utilities collects meter reading data from approximately 1.2m household meters in the North West with 50% of these meters having Automated Meter Reading (AMR) capability. The majority of AMR meters are read “passively”; a process which involves data being collected fortnightly. This represents a substantial dataset which can be used by customers for their benefit. We are engaged in trialling a new Water Usage Report portal for customers.

The Water Usage Report trial (which initially consists of 100k randomly selected customers) looks to go beyond simple reporting of data. Instead the trial will utilise meter read data in combination with machine learning and behavioural science capabilities to better engage customers with their water usage and to encourage water consumption reduction. Behavioural science can help in designing new forms of customer messaging, helping us understand what drives customers’ behaviours and what form of communications are most likely to ‘nudge’ customers to change the way they use water. For example messages on social normative behaviour can prompt change in the behaviours of high water

users, but we suspect the messaging will prove most effective if customers believe the comparisons to other homes are genuinely similar. The use of machine learning capabilities will give us a substantially enhanced ability to identify which forms of messaging actually work to reduce consumption with individual customer groups, and ensure these more effective engagement techniques are rolled out to customers. The customer experience will be fully digitally supported through our online customer account manager and mobile app.

Figure 6.11 Water usage report trial



Water efficiency is particularly pertinent in the North West as it addresses both affordability and demand management objectives whilst also supporting the increasing customer demand to receive services through digital channels. We hope that the trial will be able to demonstrate:

1. water efficiency benefits of at least 2% across the trial group;
2. improvements in water affordability for customers who are struggling to keep on top of their bills;
3. increased digital channel sign up by up to 15% and current user utilisation by 10% through providing an engaging customer proposition; and
4. increased water meter adoption rates, 8% target from trial group.

The trial is now due to start in late 2018, running for an 18 month period during which we will be steadily seeking to increase sign-ups from the initial target of 100,000 customers to a broader roll-out of up to 500,000 customers in AMP7.

6.3.5 Case study: Using innovation to reduce leakage

We are using innovative ways to improve leakage, as outlined briefly in the two case studies below.

Figure 6.12: Snipe in training



Use of sniffer dogs – we have collaborated with Cape Specialist Pest Control to see whether their sniffer dogs can find leaks in the same way as targets such as explosives, drugs and bedbugs. This will prove especially valuable for rural mains where leakage detection has, traditionally, been difficult because there are few fittings from which to listen for the sound of leaks.

The early results are promising, suggesting that they will, alongside our other leakage innovations (satellites and Systems Thinking), allow us to cover large areas swiftly and deploy our existing resources more efficiently, detecting underlying leaks that are difficult or impossible to find with existing methods. This gives us high confidence that they will complement our existing leakage detection methods and help to achieve our stretching targets to 2025 and beyond. Our use of sniffer dogs is expected to reduce leakage by 1.3MI/d in AMP7.

[X]

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Figure 6.13: [X]

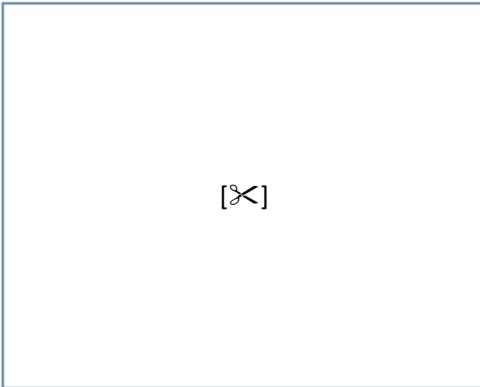


Figure 6.14: [X]



[X]

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6.3.6 Case study: Utilising sustainable drainage systems (SuDS)

Growth and new development variably impacts our network depending on the size, location and remaining sewer capacity. Discharging surface water directly into the sewer system adds significant volume to the network during rainfall events, in particular impacting combined sewer systems which makes up the majority of our sewer network in the North West. Utilising Sustainable Drainage Systems (SuDS) is a way of managing the volume and speed in which surface water enters our network to mitigate against the negative impact additional flows can have. To meet our obligations, we have to ensure that new developments have available wastewater network capacity and the resultant flow and load is treated to the required standard.

As a business we have limited influence on where and when development occurs. However, we can minimise the impact surface water can have by encouraging sustainable drainage practices, raising awareness of surface water management approaches and encouraging others in the development and planning process to ensure that surface water is discharged in line with the surface water hierarchy.

We do this by:

Working with local authorities and lead local flooding authorities – we actively engage in the development of local plans and long term strategies. This allows us to drive sustainable drainage plans and apply insight into our infrastructure plans. We can also identify opportunities to work in partnership to resolve multiple needs and increase the natural capital.

Working with developers – we continue to work closely with developers to influence their approach to drainage strategy at individual sites. Our Developer Services and Planning team review planning applications using the surface water discharge hierarchy:

1. remove (through infiltration, SuDS or surface water discharge);
2. reduce (partial surface water discharge);
3. discharge to highway drain or surface water network; and
4. discharge to the combined sewer (never to the foul sewer).

We have found that many developers are willing to engage on finding a solution which works for everybody. It is worthy of note however that where a sustainable route for surface water cannot be achieved a developer has absolute right to connect to a combined sewer, irrespective of any lack of available capacity.

Adoption of SuDS – we are actively piloting and progressing the adoption of a range of SuDS through retrospective adoption and via section 104 of the Water Industry Act (see case study below).

Education of customers – we will continue to provide information to customers on innovative ways to slow the flow of surface water from their properties to the sewer network, increasing available capacity during storms. Household customers are becoming more aware of the impact surface water run-off has on our network. Research from our community surface water partnership initiatives have indicated that they are amenable to doing their bit to reduce this impact and are supportive of green infrastructure solutions.

Figure 6.15 New development case study

Location: Carlisle **Developer:** [redacted]

, Number of properties: 41

A new development to be constructed in an area where our combined network was already hydraulically challenged and causing external flooding to nearby properties. The combined network was the closest sewer to the development and the developers had a right of connection. Connecting to this sewer would increase the hydraulic risk of flooding and have an impact on customers.

To mitigate this, UU liaised with [redacted]

[redacted] to facilitate the adoption of the infiltration basin being constructed. This enabled us to technically assess the SuDS feature prior to adoption to ensure it was an appropriate solution and that the risk of operation and maintenance were minimised. This

secured the discharge of all surface water to ground as opposed to our combined network. In line with industry standards for surface SuDS features, the basin was designed to store a 100 year event with an additional allowance for climate change. This provides a resilient alternative for surface water at this location.



The aim of these activities is to encourage the use of sustainable solutions to minimise the impact additional surface water has on our network. As a result this will minimise the additional cost burden from increasing surface water discharging to combined sewer. Where we are successful in this, we will share best practice internally and with partner organisations to be included in projects elsewhere. We are also actively pursuing opportunities within our existing network. We have carried out sustainable drainage systems mapping using “sustainable drainage systems studio” to identify where the biggest opportunities are for this. This tool assesses a number of factors, such as ground conditions and watercourse proximity, to understand which type of sustainable drainage systems are appropriate for an area. We are in the final stages of publishing this tool on our website, which will provide useful support for developers making decisions on their drainage plans.

All these measures, both proactive and retrospective, encourage the use of separate sewers and sustainable drainage methods. As well as reducing flood risk and the operational costs associated with pumping and treating surface water, these green and blue interventions have been proven to provide wider community benefits such as additional ecosystems, health and wellbeing improvements and increase natural capital.

6.3.7 Wholesale innovation savings summary

Table 6.1 [X]

[X]
[X]

[X]

[X]

6.3.8 Managing voids and gap sites

We recognise the important role that effective management of property data has in supporting the fair billing of all customers. It is in all customers' interests that do all we can to identify occupiers or confirm that properties are truly unoccupied. Equally we need to actively ensure that all household and non-household properties connected for water and wastewater services are registered on billing systems and appropriately charged.

In recent years we have substantially improved the processes, systems and data used to manage property and occupier records. The introduction of non-household retail competition has changed the way that the industry collectively manages property records, and has helped focus our efforts to identify and correctly classify household and non-household properties and customers.

Household Voids

Our household void management process is focussed on independent verification of property void/occupied status, utilising third party Credit Reference Agency data and property visits to validate our records. As set out in document S6010 "Residential Retail Business Plan", section 4.2.2, our systems and datasets enable a deep understanding of the occupied/void status of the total household property base.

We believe this process is robust, likely to be sector leading and is proving a very effective process for managing voids. An independent assessment by Deloitte endorses this view, as set out in third party document T6008 "Bad Debt Management Maturity Assessment (Deloitte)". We have achieved good results, with almost half of void properties positively verified by third parties as being empty, and over 60% of properties yet to be validated have been empty for less than 6 months.

In addition to these processes, we also test levels of void properties against independent external data on household occupancy rates. We have compared levels of water company reported voids against an econometric model of

predicted voids, which uses government data on levels of long-term vacant homes¹. This demonstrates that UU reported levels of void properties are in line with industry norms once normalisation for regional differences in the numbers of empty homes is applied.

Household gap sites

We have been developing alternative methods for identifying missing properties for some time and, as set out in supplementary document, S6010, section 4.2.2, we now have a robust and effective process for making best use of third party data to identify missing properties. In 2016 we started to develop new techniques utilising third party data to identify these properties, and improved follow up activity to verify occupancy details. This work resulted in a number of gap sites, or missing properties, being identified and has helped us to put in place an improved enduring process to address this issue. We believe that on an on-going basis the volume of gap sites is not high but it is in customers' interests that we maintain an on-going regular activity to validate our billing records.

Non-household voids

We have adopted a collaborative data-cleanse approach to managing non-household vacant data, seeking to support retailers in meeting their market code obligations to manage data on vacant premises. We have had success in searching for premises marked as "vacant" but which have registered consumption. Resolution of such cases is facilitated through ongoing data analysis and data sharing and regular dialogue with retailers.

We recognise that on occasion retailers and wholesalers may disagree on the correct occupancy status of premises. We have introduced a non-primary charge for vacant site administration to facilitate resolution of such disagreements, whereby we can recover the costs of any investigation if occupancy status is found to be incorrect. We believe that we are the only English wholesaler to have such a charge, but in Scotland their Vacant Charge Administration Scheme is a nationally recognised part of the retail market. We have not yet had need to levy this charge.

In addition we propose to introduce a new incentive scheme in AMP7 for non-household retailers to identify occupied premises that are showing as vacant within the Central Market Operator System. The cost of the incentive will be linked to a bespoke performance commitment.

Non-household gap sites

Prior to the opening of the non-household market, in April 2017, we invested a significant amount of time and effort into ensuring the completeness and validity of data items required for market operation. We established a dedicated data programme to ensure that data was in the correct structure and of sufficient quality for United Utilities to participate in the market when it opened.

Since then we have sought to continuously validate the completeness of our non-household data set. For example in a recent validation exercise over 99% of sites sampled were found to be correctly registered, with data on the remainder of sites now successfully added to the market. We use third party data such as VOA, Companies House, One Map and sites such as Trip Advisor and company websites to identify and establish the existence of new or missing non-household premises. We also actively match against internal data sets such as historic site visit records and "splits and mergers" records.

We have also been working with an external company to perform a gap site identification trial linked to postcodes with high levels of unexplained demand. This demand can be an indicator of either illegal use and/or network leakage. The trial results are being assessed and we are considering whether to roll out the trial further to supplement the work we are doing internally to identify gap sites.

In addition we propose to introduce a new incentive scheme in AMP7 to encourage identification of non-household properties where water and/or wastewater services are being used, but the property is not being billed ("gap sites"). The cost of the incentive will be linked to a bespoke performance commitment.

Bespoke performance commitments to equalise void and gap site incentives

Following Ofwat's review of financial incentives on companies to manage property records we have put forward four bespoke performance commitments to help rebalance total financial incentives. Details of the performance commitments and ODIs can be found in chapter 5, section 5.7.5.

¹ We have used 2016 DHCLG information on long term vacant homes based on council tax discounts and exemption applications. Table 615 All long-term vacant dwellings by local authority district, England, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/609298/LT_615.xls

- E02-HH: Household occupancy verification
- E05-HH: Gap sites (retail)
- E03-CF: Non-household vacancy incentive scheme
- E04-CF: Gap sites (wholesale)

6.4 Engaging with markets (Test 5.2)

This section provides an overview of how we have made use of markets to advance improvements in services to customers and the environment, at a lower cost. In particular, we are achieving significant benefits by applying our Market Engagement Methodology (MEM), an industry leading innovation in procurement best practice. The MEM identifies which of 16 routes to market establishes the best value solution. The MEM was applied to our entire cost base, resulting in 64 different tests and identifying £359m of cost savings for AMP7, compared to AMP5. Our MEM process is to be refreshed every two years to help inform about the scope and scale of future efficiencies.

We also provide an insight into our broader use of markets, for example, through our Natural Course partnership project, including nutrient trading in integrated catchments and our innovative internalised competitive performance framework for debt collection providers, which drives debt collection cost and performance improvements. We provide a number of case studies in this section which exemplify our approach to engaging with markets.

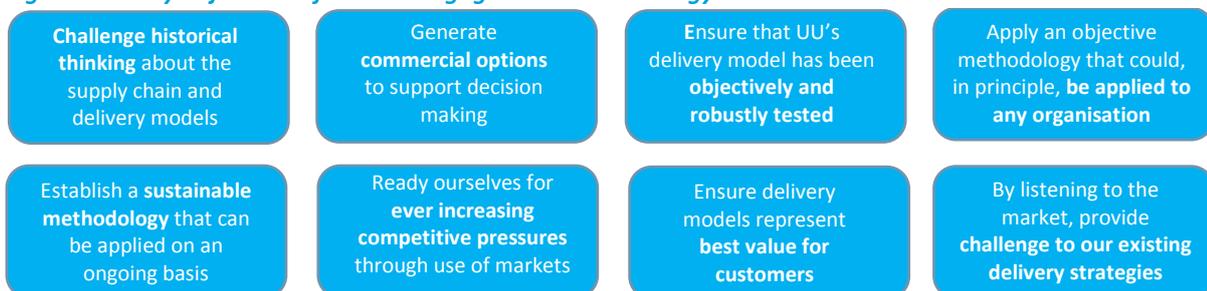
6.4.1 Case study: Market Engagement Methodology

An effective and efficient company will seek an optimal mix of suppliers and contractors to help it deliver the best value service to customers. In examining effectiveness, a straightforward approach to market testing would be to benchmark suppliers based on the current landscape and existing buying behaviours. However, a rich market testing exercise goes beyond this and asks more fundamental questions that can lead to completely new routes of procurement and/or redefine the product or service being procured. Where companies are challenging their existing buying behaviours appropriately, they should have an excellent understanding of the relative benefits of different procurement approaches and should understand the benefits of the procurement solution being used.

Our MEM approach is a procurement innovation based on the assumption that demonstrating a best value deal for ‘the way we’ve always done things’ is not enough because it risks ignoring best commercial practice, restraining innovation and leaving potential cost efficiencies unrealised.

Our MEM initiative builds on some established good practice within UU but challenges accepted delivery routes and procurement methods to drive procurement innovation. We have developed the approach by working with experts at the University of Salford and PwC. The MEM tool has potential for wider application outside of UU and can be used to interrogate how markets can best be used to deliver their needs. In June 2018 it was shortlisted for an award by the Chartered Institute of Procurement and Supply.

Figure 6.16 Key objectives of Market Engagement Methodology



The core MEM architecture consists of six phases, each serving a distinct purpose in reviewing all needs and challenging existing and future use of markets. The MEM is a systematic approach that operates a set of review and challenge gates, built around leading procurement practice, rules, systems and tools. It challenges not just how any need should be best aligned to the market but also who is best placed to undertake evidence based market testing. This process is repeatable and, whilst presented here specifically to challenge value in relation to AMP7, the MEM process is programmed to be fully administered on a two-year rolling cycle.

The MEM considers which of 16 routes to market would be expected to deliver the best value solution for any need. These routes include outsource, direct procurement, joint venture, frameworks, spot buy and insource and the MEM is not influenced by existing procurement methods. Additionally, the MEM identifies who is best placed in the market to undertake the market test, allowing us to access the full extent of best practice in the market. In some cases, tests are best provided by expert suppliers in that field, in others client organisations that are recognised as leaders in their field are best suited and occasionally using consultants to undertake detailed work on complex and multifaceted tests is important. A clear rationale for every test type and tester is set out for all tests. Market tests have been completed by a wide range of suppliers, contractors, clients and consultants with the support of over 40 external organisations inclusive of [X]

[X], with over £3.8bn worth of the cost base having been tested by third parties.

What was market tested?

The MEM process has been applied to 100% of the company’s cost base and represents an objective route through which we can identify both whether we (or the market) are best placed to supply a service to customers and what the most appropriate cost for that service should be. The result being an understanding of the most appropriate use of markets for customers, in terms of third party support options and where we can make better “make or buy” decisions.

Figure 6.17: The deployment of the MEM for PR19

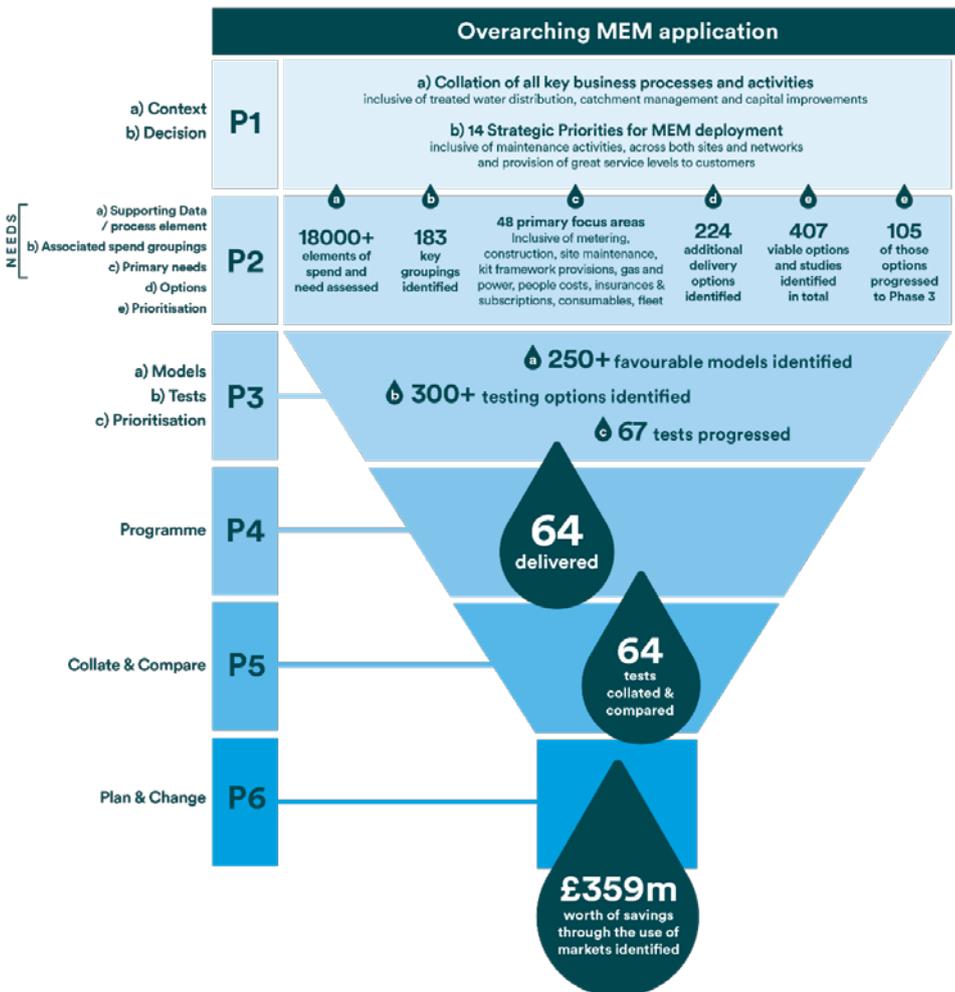


Table 6.2 shows the savings identified in different activity areas and reflected in our AMP7 plan.

Table 6.2 [X]

[X]
[X]

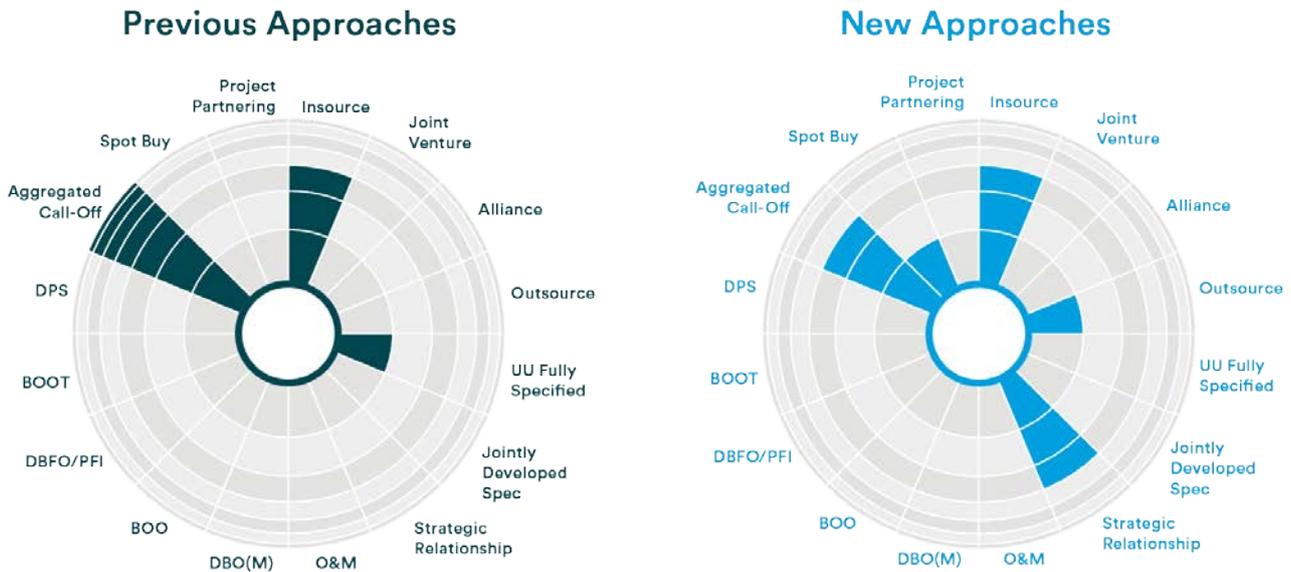
Further details of the MEM approach and case studies is provided in supplementary document S5002.

Not only has the MEM been developed with external partners from the University of Salford and PwC, but the programme of testing activity has drawn heavily on third party supplier support while instigating significant cultural change within UU.

Impact of the MEM on our purchasing decisions

As well as identification of significant cost savings, the MEM has led to us changing procurement and delivery routes for more than £2.3bn worth of activity across a range of services inclusive of large construction works, energy procurement and network maintenance. This is a significant departure from the previously overwhelming reliance on the delivery of market services through traditional Aggregated Call-Off (“Framework”) approaches. Deployment of more expansive approaches to market, such as Strategic Relationships with suppliers, Build – Own – Operate (BOO) type arrangements and direct market driven pricing approaches such as Spot-Buy are now expected to be used in AMP7.

Figure 6.18: Impact of the MEM has significantly changed our use of markets for AMP7 (based on spend assessed)



6.4.2 Broader use of markets

Across our business we are constantly seeking ways to deliver value in terms of better service, improved resilience or lower costs. These initiatives are wide-ranging and in this section we highlight five short case study examples to demonstrate how we make use of markets and market mechanisms to deliver performance and customer benefits.

In its broadest sense a market is a way of bringing different parties together to engage in an exchange for mutual benefit. As such, our five examples cover a range of different methods of using different parties to bring greater efficiency, innovation and resilience for the benefit of customers. The five examples are:

1. Debt collection agencies internal market regime	Incentivises service and cash collection for Residential Retail
2. Energy market demand side response	Brings resilient power supplies at an acceptable price
3. Natural capital trading strategy	Innovative ways of improving water and wastewater catchments
4. Partnership working through Natural Course	New and innovative sources of funding to improve water quality
5. Construction delivery partners	Using markets to deliver efficiencies and improved customer outcomes

Markets case study 1: debt collection agencies internal market regime

As part of our operational debt management strategy, we use a panel of external Debt Collection Agencies (DCA’s). This is a strategy that has been continually refined and refreshed to ensure that we are able to benefit from the customer service, efficiencies and innovation of a market driven approach. We have created an internal market incentive whereby the DCA panel members operate under a regime in which past performance impacts the future levels of work that an agency receives from us. We employ specialist agencies to recover certain types of debt. The panel of 7 agencies, currently collect on a total of 9 different debt types.

This approach has driven an increase in collection performance rates and also generated a reduction in the cost of collecting outstanding debt.

Our internal market regime means that we implement a rigorous performance management approach to the DCA panel. To ensure there are safeguards to protect customers we use a holistic approach to incentivisation. Quarterly performance reviews are undertaken with each DCA and we allocate proportions of the work, based on a weighted performance scorecard weighted 70% on cash collection (net return) and 30% on compliance.

The compliance element of the scorecard ensures that agencies maintain customer service and adhere to all operational service level agreements and SIM reporting requirements. As part of our compliance assessment, we expect that any customer whose account is sent to an external DCA must be treated in the same way as all other United Utilities' customers who are in arrears. In line with our "helping life flow smoothly" approach, any customer who is experiencing financial difficulty and facing affordability issues must have our payments assistance schemes promoted to them and this is incentivised through this approach. Our incentivisation of DCAs has helped an increased number of customers benefit from one of our payment assistance schemes (see chapter 3, section 3.6).

Figure 6.19 shows how the performance management regime incentivises agencies to improve their performance in order to receive more work from us. The agency in first place (based on average performance over the previous 3 quarters) receives a 50% allocation of all the work available for that particular debt type. We can see that Agency 3 was in third and then fourth ranking in the first two quarters of 2017/18 for their performance. Thereafter, they improved their performance to equal first place by the end of the financial year.

Figure 6.19: 2017/18 performance ranking of four agencies collecting debt for UU



We have seen improved internal collections performance in recent years and this has resulted in a lower volume of accounts being placed with DCAs. Improving our own internal collections performance also means that our DCA panel has received lower quality/harder to collect debt from us.

Our panel of DCAs collects circa £6m a year income from customers who are in debt to us, and our market mechanism incentivises them to improve performance despite debt becoming harder to collect. The evidence shows that our agencies have indeed increased the level of aggregate collections from accounts placed with them.

As well improving debt collection, the market mechanism has also improved service. Between 2013/14 and 2017/18 the DCAs have improved their overall compliance score from 93% to 99% meaning that the customer experience has been improved for customers whose account has been placed with a DCA. The compliance scorecard includes the assessment of DCAs for SIM performance, reporting, data protection adherence and call quality. In the corresponding period, the number of complaints relating to the conduct of a DCA has decreased from 2.4 to 0.8 per 1,000 customer accounts placed.

It is clear that the internal market we have created is working. Agencies move positions within the league table that we have created as a result of the incentivisation regime in place – i.e. to obtain more work from us. In our latest external assessment of our debt management approach, Deloitte assess our approach to DCA performance management as being in line with leading practice.

Markets case study 2: energy market demand side response

Our Systems Thinking approach has led us to think of our energy assets as a “virtual power plant”. This allows us to provide our wholesale business with resilient power supplies at an acceptable price, whilst providing valuable flexibility services to energy networks operators, such as The National Grid.

We have found that our resilience is increased through exploiting commercial markets, such as gaining contracts for back up diesel generators in The National Grid’s STOR (short term operating reserve) market. This market provides National Grid with a source of reserve power, from which we generate revenue. One of the ways we can help to ensure that The National Grid remains resilient in the longer term is by becoming more active in energy markets. We are playing our part by being involved in the provision of Demand Side response services (DSR), helping to balance the grid, which increases resilience both for our activities and the UK as a whole. As steering group members of The National Grid’s Power Responsive² campaign, we act as advocates for the water industry and the potential it has to provide large scale demand side response across the UK, lowering the overall cost of energy during the ongoing transition to a low carbon economy.

The Government recognised our work in this area and highlighted it in their recent document outlining the transition to a smart energy system³.

Markets case study 3: Natural Capital trading strategy

Our natural capital⁴ trading strategy provides an example of our innovation in alternative use of markets. As part of our integrated catchment approach, we are using Systems Thinking to drive sustainable catchment management, and are delivering alternative holistic solutions which result in benefits to customers and the environment. The approach means that we:

- develop innovative, sustainable approaches to tackle water quality and quantity issues at catchment scale;
- develop key partnerships to tackle issues jointly, for multiple benefits through more affordable solutions; and
- explore opportunities to leverage different sources of investment to drive affordable environmental improvements across the North West and to contribute to more resilient communities and catchments.

We believe the best way to achieve these things is by using markets. Therefore we are rapidly adopting the use of alternative market mechanisms and innovative business models to incentivise different ways to deliver catchment improvements by:

- piloting the EnTRADE reverse auction nutrient platform developed by Wessex Water, in our Cheshire catchments for two years – being an early adopter of this innovation and looking to take the concept further;
- exploring opportunities to create “environmental credits” in urban catchments, such as in the Irwell, by trading unaffordable end-of-pipe solutions for integrated, more cost-beneficial greener solutions; and
- co-developing a natural capital market platform with other partners.

² <http://powerresponsive.com/>

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/633442/upgrading-our-energy-system-july-2017.pdf

⁴ Natural Capital is defined as the stock of renewable and non-renewable natural resources (e.g. plants, animals, air, water, soils, and minerals) that combine to yield a flow of benefits to people. Markets can be used to improve the stock of natural assets and hence increase the benefits provided (the “ecosystem services”). Additional supporting evidence is in supplementary report S4004, which demonstrates how we are ensuring the resilience of the natural environment and ecosystems on which our operations depend.

Figure 6.20: Extract from HM Government report *Upgrading Our Energy System: Smart Systems and Flexibility Plan, July 2017*

Case study - Smart demand-side response services

The water company United Utilities has contracted with an energy aggregator—Open Energi—to provide demand-side response (DSR) services to the System Operator (SO). A smart box installed at United Utilities’ sites allows its process equipment to “talk” to the grid and acts like a ‘virtual’ power station, allowing the SO to even out temporary peaks and troughs in demand instead of turning power stations up and down. Motors and pumps can automatically adjust their energy consumption in seconds. By 2020 United Utilities aims to provide 50MW of demand response from multiple sites, which saves turning on a power plant.



Although in its early stage of development, we are engaging with different potential partners and private and public organisations, looking at developing a natural capital trading platform. This consists of a brokerage-like financial vehicle, whereby we are creating:

- an investment portfolio, looking to match potential investors with projects and opportunities to improve the environment and to deliver multiple benefits; and
- future market competition, where catchment service providers, such as NGOs, can engage in a competitive process to offer environmental improvement services, which can deliver sustainable, innovative and cost-effective solutions.

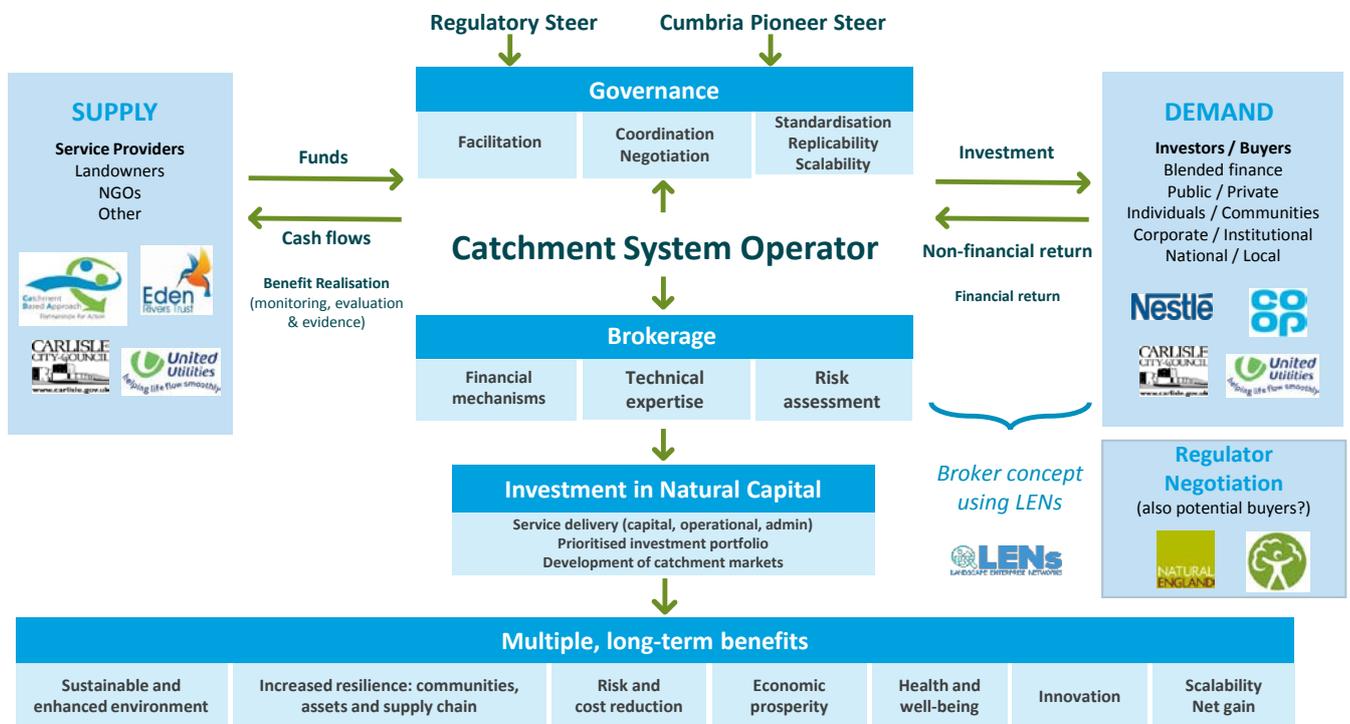
We’re following a progressive approach, stepping away from the traditional model of investment, consisting mainly of delivering environmental improvements as required by the regulatory framework, to a more combined natural capital investment approach. Through this combined approach, we will explore the concept of “blended finance”, offering both financial and non-financial returns, in which environmental schemes can deliver beyond statutory requirements, looking at added natural capital value.

We are looking to adopt this as business-as-usual within AMP7. In the long-term, our ambition is to fully embed use of the market platform so that environmental and societal benefits are delivered mainly through natural capital investment. In this approach non-financial returns will be given due prominence, primarily focusing on net gain and enhancement of ecosystem services.

Overseeing the market platform, will be a “system operation” function, with governance, planning, technical and monitoring duties, coordination of activities, and setting the long-term strategy for the catchment (figure 6.21). We are piloting this model through the Petteril Steering Group with representation from a wider group of stakeholders, such as the Catchment Host (Eden Rivers Trust), Natural England, Environment Agency, Lancaster University and Local Authorities. This pilot is helping to inform Defra’s Cumbria Pioneer development of the catchment system operator concept.

Figure 6.21: Overview of the main components within the natural capital market platform

Creating a catchment market place



Markets case study 4: partnership working through Natural Course

Working in partnership helps to deliver business objectives whilst realising multiple benefits. It's a broader form of market, bringing different parties together to engage in an exchange for mutual benefit. We can utilise the skills and resources of all parties in the partnership to address issues that we either might not be able to tackle on our own or can tackle more efficiently by working together. We have several partnerships addressing a variety of issues with a range of partners from local authorities and universities to national organisations and charities.

Partnerships can help us tap into a wide marketplace of ideas, bring in external funding for joint priorities, share good practice and tackle cross-sector issues. We can therefore achieve outcomes greater than the sum of the individual contributors. What follows is a case study of one of our existing partnerships that address a variety of issues with a wide variety of partners.

The **Natural Course** project is an EU Life Integrated Project comprising five beneficiaries, United Utilities, Greater Manchester Combined Authority, The Environment Agency, Natural England and The Rivers Trust. The purpose of the project is to work collaboratively to remove the technical and economic barriers to delivering improved water quality in the North West River Basin District in line with the Water Framework Directive requirements.

Natural Course is geared to generating new and innovative sources of funding to invest in environmental projects, which would typically fall into three types of project:

- delivering outputs which are used as demonstrations to encourage similar investment in other areas;
- completing data gathering and analysis which provides information which is used to identify and deliver other environmental interventions; and
- providing resources to increase the capacity of the organisations to identify and deliver better outcomes in the future.

The aim is that €20m of 'seed' money from the EU (funding not at risk due to Brexit) will yield €200m in additional investment in the river basin district. The seed money pays for a collaborative team across all five beneficiary organisations and a suite of demonstration projects. The team works collaboratively to identify opportunities for joint investments and co-create innovative solutions. The demonstration projects showcase what can be achieved, ranging from weir removal projects, to investment in sustainable drainage, to development of Natural Capital accounts and investment plans. With evidence from the demonstration projects the collaborative team can then attract further investment from a range of companies and grant making bodies.

Our Integrated Catchment Team, which is supported by Natural Course, identifies opportunities to invest differently to achieve our objectives. The team identifies opportunities for partnership working and where investment in the catchments may yield better results for less money. Specific projects they have examined include the River Petteril, Rhodes Farm and sustainable drainage solutions for schools. We provide more details on these projects below.

Natural Course has facilitated a project on the **River Petteril** in Cumbria which, through collaboration, has enabled a more pragmatic approach to permitting to be delivered, capturing benefits to the catchment at reduced cost to water customers. Through working with partners to understand the requirements of the catchment we were able to challenge permits on sites and suggest more efficient use of investment. By developing solutions in conjunction with the Environment Agency we were able to incorporate these into a new catchment permit, allowing us the flexibility to invest in more natural and affordable solutions on our assets whilst still delivering better performance on the catchment as a whole. These initiatives will also increase the natural capital of the catchment by £1.7m.

As a large wastewater treatment works in an urban environment, there was not a cost beneficial solution available to deliver the required Water Framework Directive improvements at Bolton wastewater treatment works. Our nearby **Rhodes Farm** site comprises old sludge lagoons with a significant maintenance requirement. Using the Natural Course partnership we were able to think about these two problems in different ways and identify opportunities to deliver an innovative solution using natural treatment to improve phosphorus and ammonia performance, deliver significant natural capital uplift in the area and a recreational resource for customers. This proposal involves converting the Rhodes Farm assets to a natural treatment solution and nature reserve. Working with Natural Course to understand the natural capital opportunities we have been able to attract partners to help develop and deliver this solution.



By pooling our investment and working collaboratively we can achieve more environmental benefit in a more sustainable and efficient way

Through working in partnership with Business in the Community we were able to identify an opportunity to develop a programme to install **Sustainable Drainage Solutions (SuDS) for schools** across Greater Manchester using reduced water bills to repay the initial investment. Working with Natural Course, its affiliates and other organisations we have installed SuDS solutions at a school in Greater Manchester and identified and designed a solution to install SuDS on an NHS Heath Centre in Stockport which will be installed later in the year. These demonstration sites have been funded by the Business in the Community programme, of which we are major contributor, to act as a demonstration of how SuDS work and what savings they can leverage for an organisation's water bills. Based on the results achieved at the demonstrating sites, a clear business case has been identified to invest in these technologies and the next phase of the project is to develop a funding mechanism and a programme of works to allow for a wider scale roll out across Greater Manchester and the region.

As part of this, we have been working with Business in the Community and other partners to assess schools across Greater Manchester and identify where there would be potential for payback on investment within 10 years and Business in the Community have hosted an event chaired by Lloyds which brought together leading financial figures to identify potential investment routes to finance a wider scale programme. This is based on the principle of pooling suitable schools to develop a large scale investment which can be repaid using the savings made on the school water bills. This development of a pipeline of green infrastructure projects across the region will open up these projects to investment in a sustainable way, on a far greater scale than previously, utilising previously untapped investment streams.

The Natural Course partnership is driving the development of multiple benefit solutions and is leveraging investment from additional sources, which have never been used before. Customers are provided with additional services and more projects can be delivered overall, as costs of projects are reduced and benefits increased and the investment available can go further.

The collaborative working approach used through these projects also leads to a more joined up and efficient approach from other stakeholders which are also serving customers. This joint thinking allows for greater innovation and new ideas to be developed and delivered, which has made previously infeasible schemes possible, meaning additional investment for customer benefit.

Markets case study 5: construction delivery partners

Our approach to delivering capital projects in AMP6 is based on us using markets to bring efficiencies and improved outcomes for customers. It involves us specifying requirements (i.e. the desired outcome) rather than a specific solution. We open ourselves to challenges from construction delivery partners (CPDs) to ensure we deliver the most efficient outcome for our customers.

As a result of a lengthy, robust and rigorous selection process we appointed five CDPs in 2014. In part the CDPs were selected for their cross-sector and international experience, which brings more opportunity to identify efficiencies and innovations. The new way of working with CDPs brings the involvement of the supply chain much earlier in the definition of the project than would traditionally be the case.

Figure 5.22: The innovative Oswestry WTW under construction, made more efficient with design for manufacture and assembly by our delivery partners.



Our Oswestry WTW project was one of the first to be delivered under this new way of working. We identified that reducing manganese at the 210 Ml/d WTW would be a cost-beneficial way of reducing discoloration risk for customers, and sought a CDP to take the project forwards. The aim of bringing efficiency and innovation was met with the winning bid from C2V+ (CH2M Hill and VolkerStevin). The solution they proposed uses pre-oxidation with chlorine dioxide to optimise treatment for manganese removal instead of constructing a traditional, significantly more expensive, second stage of treatment. While this technology has been used previously in the US and Italy, Oswestry will be the first time it is used in the UK.

The CDP also made use of Design for Manufacture and Assembly (DfMA), which also contributed to achieving efficiencies. This project was one of the early examples of its application. From concept stage the works were developed to minimise effort on-site and seek production of all products that can be pre-made off-site. This means that less people are working on-site, enabling safer and more efficient construction. Over 11,000t of concrete has been

precast off site and more than 700t of steel products fabricated and assembled before delivery. As a result of DfMA the amount of man hours not done on-site totals at 7,000 hours and c£500k of costs, providing further evidence of the benefits early engagement with the supply chain and allowing partners with extensive experience to innovate. A video presentation of our Oswestry street project is available⁵.

6.5 Direct procurement (Test 5.7)

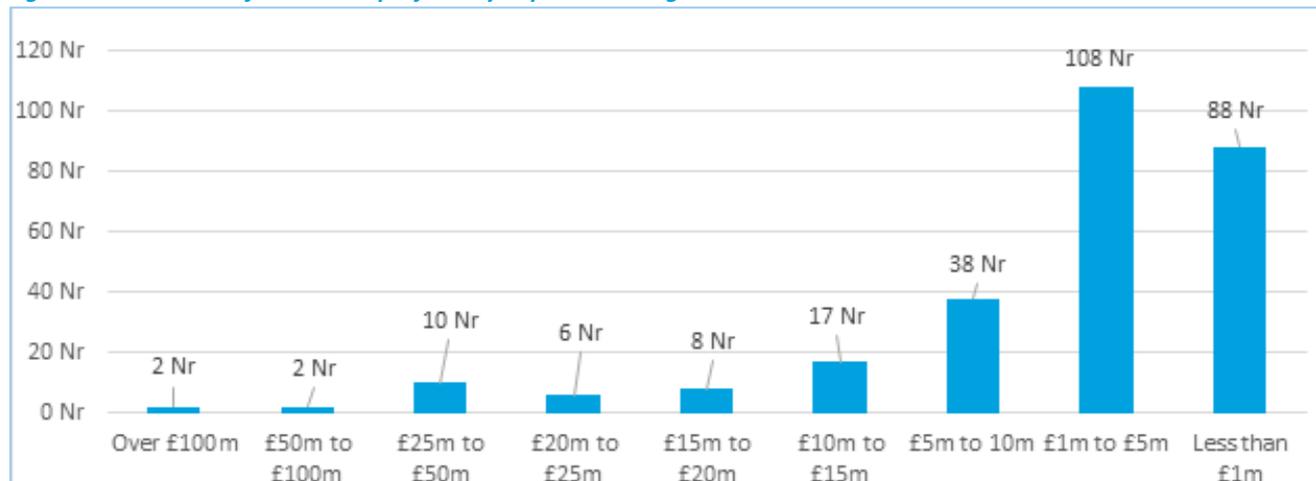
We are committed to utilising markets differently and more effectively and have assessed a comprehensive range of routes to market to improve both value and the customer experience. We have used KPMG’s guidelines to consider the use of direct procurement for customers as a means of adding value in AMP7. We have separately utilised the Market Engagement Methodology (MEM) to provide an alternative means of identifying projects which could be suitable for direct procurement for customers (DPC).

Utilisation of this process led to the identification of a significant project which could be suitable for DPC. In this section, we set out information about the approach to identifying this project and outline our current view on how we can continue to investigate DPC as a potential procurement route. Much more evidence on the assessment of DPC candidates and our proposed DPC activity is provided in supplementary documents S5007 and S5007a.

6.5.1 Comprehensive review of capital projects

UU identified 279 capital projects that may potentially be required during the 2020-25 period. Over 80 of these projects were estimated as requiring less than £1m investment. For the most significant projects, however, each project was reviewed in significant depth individually to ensure the markets’ ability to respond to each need could be fully understood. Around 90% of all projects identified were valued at less than £15m with only four projects likely to be of significant scale and value to be considered suitable for assessment via the DPC approach. All projects carried into the delivery plan are subject to assurance through a whole life cost assessment during UU’s optioneering process. For completeness, irrespective of probability (for progression through to the AMP7 programme), all candidate projects were reviewed in this analysis.

Figure 6.23 Number of candidate projects by capex cost range



Supplementary document S5007 sets out in detail the results of this analysis including the results of examination of the four final candidate projects. Both the MEM assessment and the KPMG framework indicated that Direct Procurement for Customers had potential to add value for one project - “Manchester and Pennines Resilience” (“M&PR”).

⁵ <https://www.youtube.com/watch?v=L6UnMwCslXg>

6.5.2 Manchester and Pennines Resilience – project overview

The Haweswater Aqueduct (HA) is the largest potable water aqueduct in the UK by capacity and length and is the major source of supply for the Greater Manchester and Pennine areas. It is 2.6m in internal diameter, 109km long and transports 35% of UU's daily supply to customers, at depths of up to 300m below ground level. A population of 2.5 million is supplied from the HA during normal operation. Built in the 1930s to 1950s the HA consists of a single line tunnels and conduits. Following extensive planned investigations into the Haweswater Aqueduct (HA), we have identified a risk of failure in need of a long term solution.

In addition to the customer research and stakeholder engagement that has informed our PR19 business plan as a whole, we undertook bespoke engagement on Manchester and Pennines resilience. We engaged with over 2,300 household and non-household customers specifically on the risk of impact on service to the two million people that receive their water from the HA and the options to mitigate the risk. Our Customer Challenge Group, YourVoice, and independent experts they appointed from the Centre for Regional Economic and Social Research at Sheffield Hallam University have informed and verified our process and outcomes.

Under the Water Industry Act 1991 we have a general duty to maintain a system of water supply, making supplies available to premises in our area (Section 37) and to ensure that water is wholesome at the time of supply (Section 68). Following regulatory guidance, we have integrated our work in Manchester and Pennines Resilience into our Water Resources Management Plan. We also provided evidence to the Drinking Water Inspectorate which has written a letter of commendation for the proposals. Under any procurement route our assumption is that United Utilities will remain responsible for compliance with its statutory duties as a water undertaker.

Preferred solution

United Utilities undertook an extensive process to identify and assess a full range of options to provide risk reduction. Through a robust process, assured by Vivid Economics (see supporting document "UUW WN1 7 Technical Report 7 Assurance and governance"), these options were tested with customers, who showed a preference for rebuilding all single line sections of the aqueduct. This option gave a relatively low residual risk with a presented bill increase of £11. The options are outlined in figure 6.24, with option D being taken forward as the preferred option.

Figure 6.24 Manchester and Pennines resilience option summary

Options summary				
Option A: Target repairs of the two tunnel sections that are in the worst condition	Option B: Rebuild the tunnel section that is in the worst condition and provide targeted treatment for water quality	Option C: Build 5 new water treatment works	Option D: Rebuild all tunnel sections	Option E: Rebuild all tunnel sections and provide additional water sources
<ul style="list-style-type: none"> This option focuses on addressing the highest risk to water supply. ✓ The work required to supply customers during the rebuild would give some of them alternative water supply for the future. 	<ul style="list-style-type: none"> This option robustly addresses the highest risk to water supply. ✓ It also addresses the highest water quality risks. 	<ul style="list-style-type: none"> This option will treat impurities that could enter the water supply when it is flowing through the aqueduct. ✓ This gives flexibility in how we would maintain the aqueduct, because we would be treating the water after it goes through it. 	<ul style="list-style-type: none"> This option addresses all water supply risks associated with the tunnels. ✓ It also addresses the water quality risks associated with the tunnels. 	<ul style="list-style-type: none"> This option addresses all water supply and water quality risks associated with the tunnels. ✓ This option would enable future tunnel maintenance by providing alternative water supply whilst work is being done.
<ul style="list-style-type: none"> Tunnel sections will continue to deteriorate and are likely to require future intervention. Furthermore, stopping the flow of water in the aqueduct for repairs causes it to deteriorate faster. ✗ There remains a risk of service failure arising from unrepaired tunnel sections. 	<ul style="list-style-type: none"> Other tunnel sections will continue to deteriorate and may require future intervention. ✗ There remains a risk of service failure arising from unrepaired tunnel sections. 	<ul style="list-style-type: none"> This option does not address the deterioration of any of the tunnel sections. ✗ There remains a risk of service failure arising from flow being obstructed by deteriorating tunnels. This may lead to the need for future intervention. 	<ul style="list-style-type: none"> The whole length of the tunnel sections would be rebuilt, including the areas that pose less risk of service disruption. ✗ There would be a small residual risk of service failure from the non-tunnelled sections of the aqueduct. 	<ul style="list-style-type: none"> The whole length of the tunnel sections would be rebuilt, including the areas that pose less risk of service disruption. ✗ There would be a residual risk of service failure from the non-tunnelled sections of the aqueduct, but the additional sources would reduce this risk.

Following receipt of the feedback from the customer research, United Utilities completed a detailed cost benefit analysis (CBA), using specific and standard economic metrics and wider multi-criteria decision analysis (risk reduction, bill impact, economic impact, environmental impact). The application of this process corroborated customers' stated preference: solution D. Full details of the work undertaken in examining options can be seen in supporting document

UUW_WN1_4, – “Technical Report 4 – Customer and Stakeholder Engagement” and UUW_WN1_5, “Technical Report 5 – Best option for customers”. We consider the identified option (D) to represent potential value for customers through the direct procurement for customers’ model, primarily by the allocation of risks and incentives and the use of market mechanisms. Table 6.3 shows the summary analysis of the project against KPMG’s criteria.

Table 6.3 Manchester and Pennines resilience project and KPMG DPC criteria

	Project somewhat suitable for DPC	Project Somewhat less suitable for DPC	M&PR
Project size	Very large schemes with capex values in excess of £100m	Small Schemes with Totex Values close to or below £100m	Exceeds project size parameters
Stakeholder Interactions and statutory obligations	Limited or marginal impact on the appointees ability to meet item statutory obligations (e.g. non potable or raw water sources)	Asset materially contributes towards appointee meeting statutory obligations	Significant source of delivery on statutory obligations servicing Manchester and Pennines communities
Interaction with network	Assets where there are limited economies of scale and scope with the rest of the appointees network system OR where those economies of scale or scope could be maintained through contracts	Assets where there are material economies of scale and scope with the rest of the appointees network system or where economies of scale or scope cannot be maintained through contracts	Scope could be undertaken through contracts
	Simple or limited, well understood and manageable interactions with the appointee's network	Significant, complex and frequent interactions with the appointees' network	Large elements of the asset are discreet although connect into network through numerous complex interfaces
	Separate non-contiguous networks or assets within the appointees area	Assets that are actively managed as part of the overall system operation of the network	Current and proposed asset integral to Water network and would only service the West of England under current market conditions
	Assets where capacity is shared by multiple appointees		
Contributions to supply capacity and ability to specify outputs	More passive assets (e.g. network enhancement pipes) that are not actively managed as part of the overall system		
	Assets where capacity is regularly needed and contracting requirements can be more easily defined and priced	Assets where capacity is rarely needed (e.g. resilience schemes) and contracting requirements difficulty to specify	The asset has significant and discreet boundaries
	Schemes where outputs can be clearly defined and are not subject to substantial change from other factors or difficult to predict in the future (e.g. Around asset condition at handback)	Assets where capacity requirements are not well understood uncertain	
	Schemes where outputs cannot be clearly defined		
Asset and operational failures	Assets where operational failure risk is well understood and mitigations well established for similar assets	Assets where operational failure risk is not well understood with limited track record of effective mitigations	The existing asset is well understood and established
	Well-developed market or technical supply chains with strong experience of similar project delivery	Weak market or technical supply chains with limited experience of similar project delivery	Whilst the market is relatively well developed to undertake construction of the asset the asset is also predominantly a sole source provision
		Assets where there are no alternative back up supplies	

As set out in supplementary document S5007 we consider that the most appropriate tender model to maximise value is a procurement approach broadly aligned to Ofwat’s “late” model. This is based on a step by step assessment of each element described in that document.

Figure 6.25: [X]



6.5.3 [X]

[X]

[X]

6.5.4 DPC delivery and governance

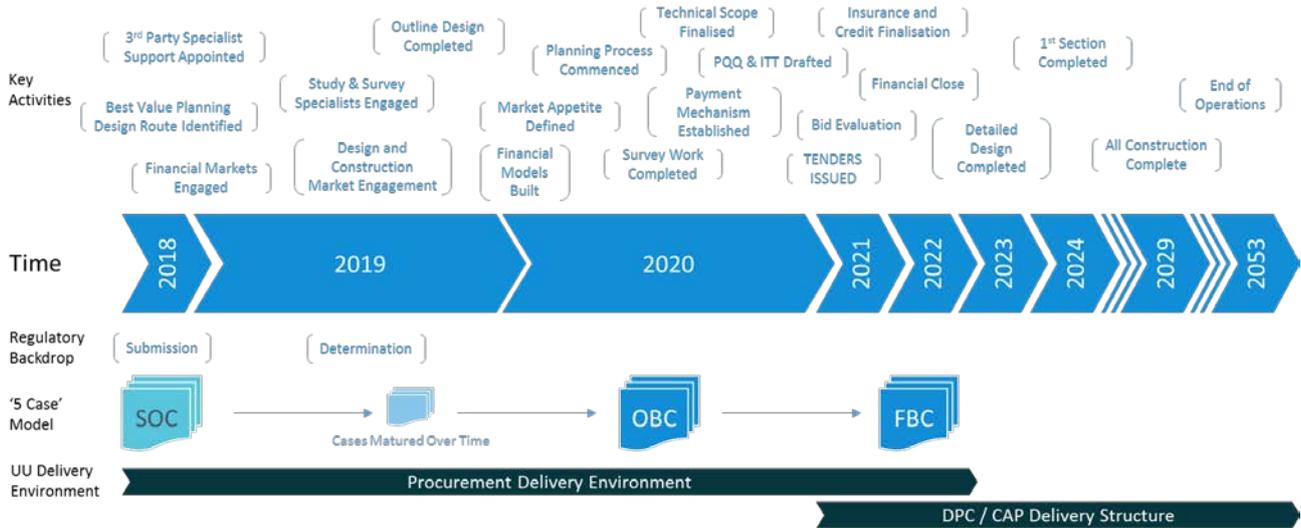
The key activities in the delivery of a successful DPC, aligned to regulatory milestones, are set out in figure 6.26 and are explored in more detail in supplementary document S5007 and S5007a.

United Utilities recognises that given the size, scale and scope of the DPC, its existing corporate governance structure should be supplemented to ensure the successful delivery of the project objectives. In supporting the delivery elements outlined above and the resultant DPC, United Utilities will create a strong procurement delivery environment, ensuring appropriate collaboration with stakeholders and the market whilst ensuring compliance with the applicable procurement regulations in delivering a high quality procurement outcome in appointing a CAP. The associated project team will include specialist areas of legal, finance, procurement, technical and planning whilst ensuring engagement with expert third parties in creating value for customers. UU commits to working with all stakeholders and engaging with the market during the DPC procurement phase to ensure such an environment is fit for purpose.

6.5.5 Customer delivery requirement

Given the nature of the asset, procurement and value drivers currently suggest that the operation of flows through the new structure would be best managed and integrated into the balanced system by United Utilities. Early engagement suggests that the ‘operational’ element of the asset could attract a risk premium if undertaken by the CAP.

Figure 6.26 Outline DPC milestones



However we will test this further through market engagement. It is anticipated that the CAP will take responsibility for maintenance and repair of the system following their design and construction of the asset. This allows the CAP to consider lowest whole life cost solutions in relation to maintenance through the design process, including appropriate access and egress to the system and use of technology and innovations in relation to ensuring the new asset is maintained to the required standard. A profile of anticipated maintenance and repair interventions has been built into the value for money (VfM) analysis and these will be tested further during the market engagement and procurement process.

6.6 Water resources strategy (Test 5.3)

Our 2040 ambition

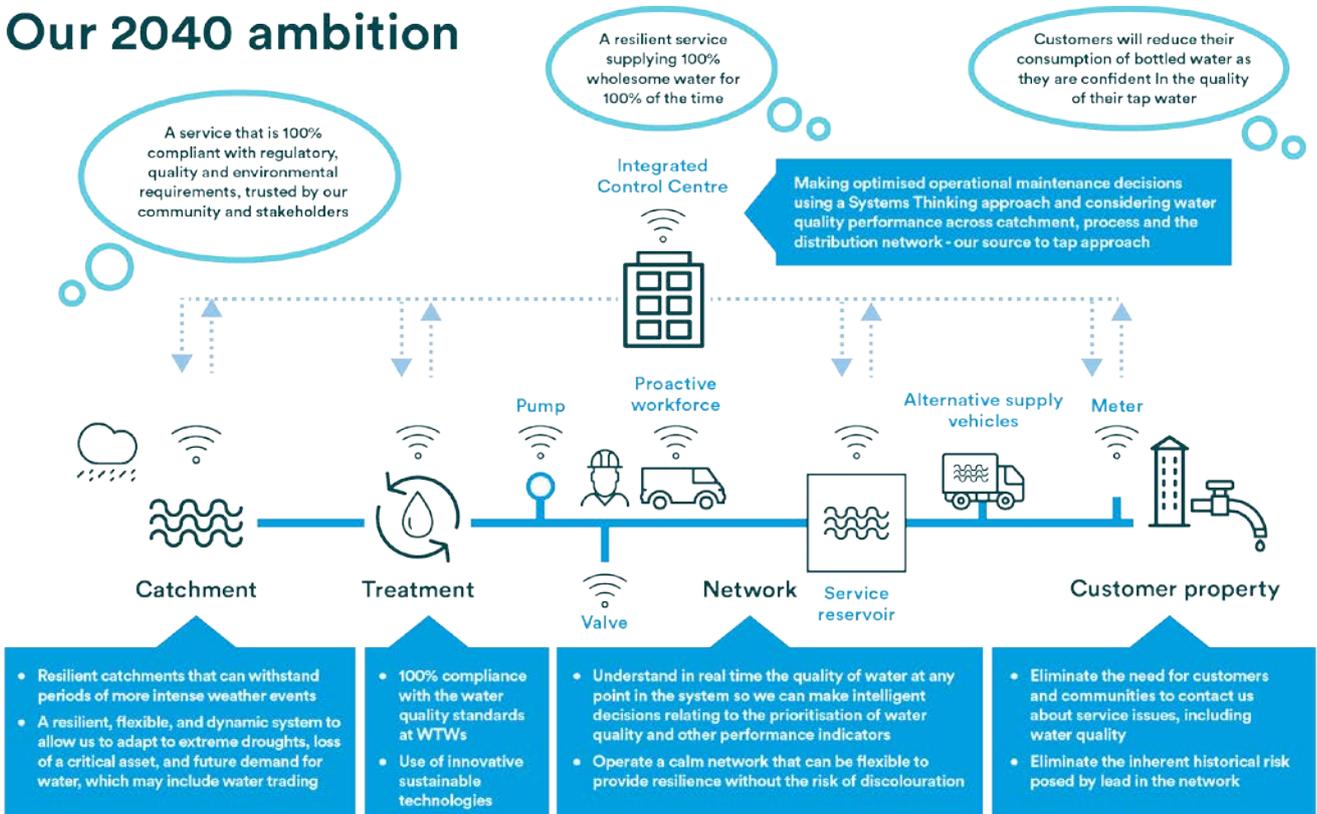


Figure 6.27 Our 2040 ambition

We have a strategy in place to deliver a long-term, best-value and sustainable plan for water supplies. We have water resources to meet demand for the next 25 years, with sufficient capacity to ensure long term resilience. Our new bid assessment framework is aimed to stimulate water trading markets and our robust water resources position underpins our proactive approach to promote water trading. Our innovative demand management and supply-side approach will help drive a 15% reduction in leakage over the 2020-25 period and we will continue to operate with a strong focus on protecting and enhancing the environment. This section summarises our water resources strategy – more detail is available in supplementary S6007 - “Water Resources: Business Plan”.

6.6.1 Our ambition

Our ambition is to ensure focus at all stages in the production of a reliable and resilient water supply to customers in the North West of England and, in the longer term, to customers beyond our current boundaries. Our overarching principle focusses on continuing to improve water quality and sets our expectations that water quality is paramount no matter whether that comes from current suppliers in the North West of England or from other sources. Similarly, we expect to provide best quality water to other customers outside our boundaries.

We believe that it is clear, through the activities described in section 6.6, that we have integrated the water resources management plan (WRMP) process into the business planning process and the WRMP outputs are reflected in the plan.

6.6.2 Long-term strategy for securing resilient and sustainable water resources

UU is committed to delivering reliable, safe, clean and resilient water supplies to three million household customers and around 200,000 non-household customers in the North West at a fair price. Our company strategy is:

To provide best value and sustainable water supplies to customers in the North West in the long term, supported by water trading opportunities where they are the most efficient option

The priorities for the Water Resources business in the long-term are:

- to maintain a reliable supply of high quality raw water, sufficient to meet the forecast needs of our Water Network Plus business, along with an agreed headroom volume held in case of equipment outage or emergency (such as a freeze thaw event) and to make this raw water available at an efficient cost for customers;
- to maximise the added value that our operations can provide for customers, through recreational access, agricultural activity and environmental management for the benefit of customers now and in the future; and
- to minimise costs for customers by rationalising our asset base, or exploring alternative markets for any surplus water resource beyond the forecast needs of Water Network Plus, along with an agreed headroom volume.

Approach to water trading – we aim to identify and use the most efficient water sources where possible. Taking water from third parties and supplying water to others, where it represents best value, is an activity that we currently undertake and we are seeking opportunities to do more in the future. We benefit from a robust water resources position, with appropriate additional spare capacity compared with the predicted demand requirements over the next 25 years to ensure long-term resilience. This enables us to continue to promote water trading with other companies, including potential significant volumetric trades with Severn Trent Water and Thames Water as outlined in our WRMP. These are real, practical examples of our strategy in action where we are seeking to ensure that national water trading is at the forefront of our thinking. Through continued bilateral engagement and our new bid assessment framework, we will continue to actively explore such opportunities for water trading into and out of our supply region.

Our robust water resources position underpins our approach to promoting water trading

In the summer of 2018, North West England experienced an unusual period of prolonged hot weather and low rainfall. Unusual events can increase the pressure on water supplies by both reducing the volume of water resource available, and in some cases increasing customer demand. We maintain headroom, (resources greater than predicted demand) in order to manage unexpected events such as unusual weather, and to reduce the impact of these events on customers. The exact mechanisms that would be used during a future water trade are still evolving, however a key principle that we would employ would be that any volume of water made available for trade would be offset by the introduction of additional sources. There would be no impact on the water resources available to customers in the North West as a result of a trading relationship with parties in other regions.

We have taken significant strides to lead the industry. Our bilateral engagement through the focus of the WRMP has shown that there is the opportunity for potential new markets to receive any surplus supplies from within our region. We have tried to develop a significant water trade with Thames Water which could require water from 2039. In addition, Thames Water's long term preferred plan includes a Severn Thames transfer supported by water from Vyrnwy reservoir from 2083. We remain frustrated, however, that there is not a wider demand for trading of water resources from other market participants, but we will continue to maintain and develop our relationships in order to define more opportunities. We are taking an active and leading role in striving to secure water trading opportunities across the country and seek to realise available incentives. Any water trading will comply with both our Trading and Procurement Code and our Access Code. We have produced a bid assessment framework which defines our approach to assessing third party bids.

Stimulating markets - we anticipate that our new bid assessment framework (outlined in more detail in section 6.8 of this chapter) and procurement code will help stimulate the markets further. We see a way that we can challenge the status quo and encourage active participation during AMP7 of better sharing of resources and approaches to demand management. Of the 315 options considered as part of the options appraisal process, 42 were third party options. This activity was conducted alongside water trading transfer proposals with a number of water companies.

Even further stimulation could come from greater incentives which we would welcome. In addition, proposals to establish the setting up of a Water Resources West group, along similar lines to groups in other parts of England - notably Water Resources East and Water Resources South East - could help provide further stimulus. The purpose of the group would be to ensure strategic oversight and co-ordination of water resources matters across the River Dee and River Severn catchments. Introducing a group for this part of the UK fills a gap in the coverage of existing regional groups, and also has several distinct advantages. The area represents a natural corridor for water transfers and it also represents a substantial area of shared catchment. This means there are opportunities to improve resilience and efficiency through better coordination. The group would be multi-sector and catchment based. To make it successful, it is proposed that Water Resources West should have the highest level of leadership, clear governance and transparency.

We also recognise there may be commercial opportunities and benefits for customers where a potential bilateral market entrant may be more expensive than a current supply within UU, but that could be offset by using the released UU water to supply an area which receives water which is even more expensive. We will take all opportunities to do this that we identify, as the integrated nature of our Strategic Resource Zone will assist with this.

Demand management – our approach to demand management is similarly far reaching. Recognising the importance of leakage reduction to customers, stakeholders and regulators, we are proposing a stretching leakage reduction target of 15% across the 2020-25 period and a further 10% reduction in AMP8. To deliver this, we will embrace new ways of working to assist with achieving this goal. Using demand management innovation from outside our existing detection and repair systems is a way that we can achieve this and we are working with industry to understand the most cost effective approach to meeting this target. Our desire to implement this change is evident through our WRMP market engagement with third parties, which has sought out demand management techniques that offer us the chance to deliver these savings at the minimum cost to customers. The twin-track approach of existing and new leakage techniques will become part of our business strategy as we transition into AMP7.

In summary, supply surplus indicated by our WRMP underpins and fulfils our water strategy; the framework we have created clearly shows our willingness to seek out innovative ideas and explore the opportunities for water trading and better value options on a national scale. Our commercial approach to market engagement is actively seeking to allow equitable and fair consideration of third party options alongside our own options into our business plans, thereby driving efficiency and delivering best value long-term solutions from which customers in the North West and those further afield will benefit.

6.6.3 Minimising cost and meeting short and long-term public water supply needs

We have considered every option, as part of the WRMP process, to meet future public water supply needs at the minimum cost to customers. We have collaborated closely with customers, regulators, stakeholders and other third parties, to co-create a plan, considering multiple options to meet future public water supply needs. This has included engagement with commercial markets to investigate different and innovative third party solutions, as detailed in the 'Identifying future options' section of our plan.

In collaboration with other water companies, we have considered water trading as a pathway in our preferred plan. We have completed discussions with all neighbouring water companies to understand cross-boundary or joint options for imports and exports. Very recently, a Water Resources North group has been inaugurated to further promote

collaborative working on water resources between organisations in the North of England in future and we plan to lead a Water Resources West group with our contiguous water companies.

Competitive markets and innovation underpin this plan, from contractor and supplier selection through to delivery of WRMP options. Our preferred plan includes a sizeable contribution from third-party options. In our last WRMP, unlike several other water companies, we engaged widely with third parties for water import and export opportunities. Through WRMP19, we have built on this approach, specifically targeting both opportunities for water imports and exports, as well as seeking out innovative ways in which we can manage the demand for water.

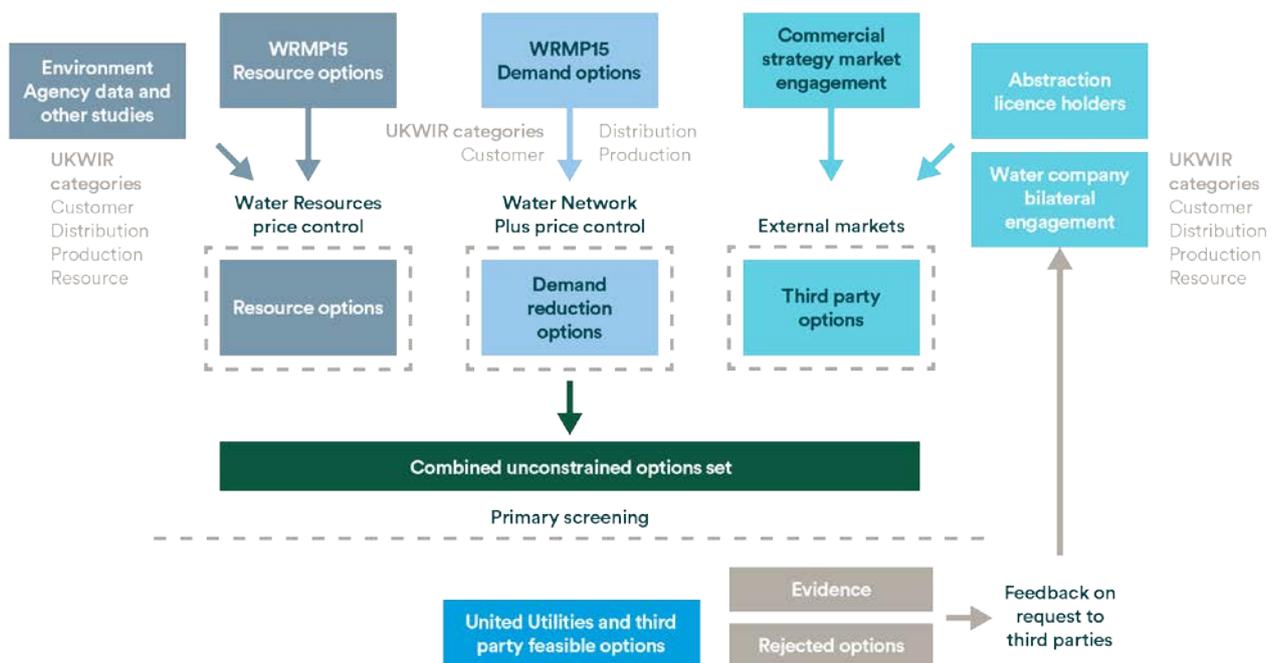
Alongside options submitted from the WR price control, we developed our bid assessment framework in order to allow other water companies and new market entrants (termed third parties) an unbiased opportunity to put forward ideas (e.g. for managing demand or supply of new resources) that could be considered beneficial for customers. An important resource management option that has been considered in this plan relates to the bulk transfer of water into, out of and within our own supply area. Options to improve the connectivity between water companies and to better share existing abstraction licences will also lead to better value for customers.

The three main types of option category that have been generated are:

- **water trading options** – transfers of water between water companies and licensed undertakers that have been formulated through distinct bilateral engagement. These could be options to import or export water from our supply system. A potential future pathway within our preferred WRMP specifically identifies a significant water trading opportunity with Thames Water. However, after initiating the other bilateral discussions through the WRMP bilateral engagement process, we would have liked a stronger level of engagement from the market. Our ambition is to continue these discussions to seek out future opportunities and to realise the benefits of any supply system surplus, rather than be locked into the five yearly annual review cycle associated with statutory water resources planning;
- **abstraction licence trading options** – this provides other individuals, companies or organisations (non-water companies) with opportunities to trade water with us, for example to sell their abstraction licence rights; and
- **third party resource or demand options** – allowing others to provide demand reduction (e.g. leakage, water efficiency) and/or resource options, which could lead to lower costs when compared to our own options

Our approach to this market engagement activity is summarised in figure 6.28.

Figure 6.28 Our approach to water resources market engagement activity



We are always open to all options any organisations may put forward. Our approach to market engagement as part of the information gathering phase was completed via a number of separate activities:

- communicating with known and potential new third parties from a contact list via direct correspondence. This list includes: water companies, water/wastewater retailers and licensees, abstraction licence holders (received following discussions with our local Environment Agency contacts), local authorities, reservoir owners and landowners, businesses known to offer demand reduction services and options from third parties who had previously expressed an interest in providing options in during our previous WRMP. Between August and September 2016, we sent out over 350 individual communications to these organisations notifying them of the WRMP process and how they could input;
- looking for expressions of interest by publishing a Prior Information Notice (PIN) within the Official Journal of the European Union (OJEU). This provided a summary of the WRMP process and a response template of required information/data of how third parties could contact us with any ideas they wished to submit. We also communicated to the contact database providing notification of the PIN publication and response deadline. This PIN was active for a period of six weeks between August and September 2016;
- publishing a market engagement request ‘Can you help us ...’ on our external website with response forms. We had 20 expressions of interest submitted via this route; and
- holding a market engagement event to discuss the process with interested third parties that responded to the communications. Fourteen individuals and organisations attended this event in September 2016.

We considered lots of third party options and, as part of the assessment of options, we defined two separate phases of screening which were applied consistently across all options. This ensured that the final list of feasible (constrained) options generated from the original list of unconstrained options either from the Water Resources price control or from third party submission were considered equitably and fairly. Our final list of options for consideration in the WRMP appraisal process comprised about 20% of options from third parties (see table 6.4). In addition, we have identified 12 feasible export options which we have offered to other water companies.

Table 6.4 Number of third party and United Utilities’ options considered in our WRMP

Stage of WRMP options process	Option provider	Resource/production options	Customer demand options	Leakage options	Total
Option identification (unconstrained list)	United Utilities	170	68	22	260
	Third Party	50	4	12	66
Feasible options (constrained list)	United Utilities	57	26	18	101
	Third Party	10	1	14	25

The Halcrow/CH2M assurance audit of our option identification processes stated that we had ensured “regulatory compliance and a cost effective/sustainable long term solution”...within which we had...“engaged fully and collaborated with 3rd parties (including other water companies) during options identification”.

Working collaboratively with other organisations to achieve our long-term water supply ambitions is embedded in our business processes and not limited to periodic engagement through the formal WRMP process. For example, we have numerous existing cross-border supply connections to share water resources with neighbouring companies, either to satisfy short-term needs or as part of longer-term solutions.

6.6.4 [X]

[X]

[X]

[✂]

[✂]

6.6.5 Protecting and enhancing the environment

Our plans seek to protect and enhance our environment, acting collaboratively – we seek to ensure that we avoid deterioration of the condition of catchments and waterbodies under the terms of the Water Framework Directive, in particular. Assessment of the impacts and benefits of the plan to the environment is fundamental to its development; we strive to enhance the environment through the delivery of our plan. Where risks are identified as part of our long-term plans, we will complete further investigation in the future to explore these and mitigate any impacts.

Managing environmental risk – we have worked with the environmental regulators to identify and account for sustainability changes via the Water Industry National Environment Programme (WINEP), which sets out measures needed to protect and improve the environment. We've identified the need for further investigations from 2020 onwards, and will continue to work with regulators and stakeholders (such as River Trusts) to protect against deterioration and, where possible, reverse it.

Catchment management approach – we have delivered real catchment improvements through an integrated approach. The implementation of the Sustainable Catchment Management Programme (SCaMP) is an example of how this type of catchment management improves raw water quality and where partnership working delivers improvements.

6.6.6 Access pricing methodology

This section sets out how our approach to access pricing will support the English bilateral market expected to be introduced during 2020-25, by facilitating the further development of markets for new water resources and ensuring efficient third party providers who are able to provide additional water resources at lower cost are able to compete against incumbents in the bilateral market.

During 2020-25, we will publish notional cost-based charges for water resources and water network plus to be charged to retailers, providing transparent charging information and alignment with future market developments. We agree that any costs of losses should be incurred by Water Network Plus, recognising that the majority of losses (e.g. leakage) occurs on the treated distribution network. Our existing wholesale charging approach already takes this into account, ensuring that the cost of losses are only borne by customers receiving a potable supply of water, and not by those customers who use non-potable water.

The access charges will partly depend on the allocation of regulatory capital value (RCV) between Water Resources and Water Network Plus. We support the general approach of using equalisation payments to ensure that access prices reflect incremental water resource costs when there are water resource schemes which could be displaced by competition. This will encourage efficient competition, where an entrant can beat an incumbent's incremental costs.

However, we will not be implementing water resource schemes in AMP7. As per business plan table Wr7 "New water resources capacity – forecast cost of options beginning in 2020-25", there are no deficits forecast across the planning horizon (2020/21 to 2044/45) in any of our water resource zones that require new water resource options which will begin during 2020-25 to increase water resources capacity. Therefore, access prices will be based on Water Network Plus costs.

In line with our submission on the water resources RCV allocation, we consider that the RCV allocation based on economic value creates access prices which provide the right economic incentives for entry, where this is efficient. A higher allocation, based on MEAV for example, may risk inefficient entry, as this would lead to a lower Water Network Plus charge, and encourage entry at a higher cost than the additional water resources which we could provide. This is

because we have more reservoirs and aqueducts with higher asset values in the north and west; hence using modern equivalent asset value (MEAV) does not reflect that water is available at lower cost than in water-scarce areas. More detail is provided within section 6.9 of this chapter.

6.7 Bioresources strategy (Test 5.4)

We actively support the development of markets for bioresources, underpinned by direct external engagement with the water and other organic waste sectors, and are prepared for market opening, having established a separate bioresources business unit and implemented commercial arrangements with Wastewater Network Plus. Our plan will see us moving away from incineration with the aim of recycling 100% of biosolids to agriculture, as the lowest cost and most sustainable disposal route.

Our Totex plan for 2020-25, of £372m, provides significant customer value, being c£170m lower than AMP5, as well as delivering more sludge transport, treatment and disposal services for a greater quantity of sludge. Our short-term focus is to improve throughput, reliability, availability and maintainability of our facilities, whilst leveraging innovation with third parties to enable the closure of high cost facilities. Customers will benefit from our performance commitments and our value sharing mechanism from our non-appointed activity. Much more detail is provided in supplementary document S6009 – “Bioresources: Business Plan”.

6.7.1 Bioresources strategy overview

Over the next five years our Bioresources focus is to deliver optimised and efficient service to our Wastewater Network Plus business and be their supplier of choice. We will increase the performance and efficiency of our existing sludge treatment capacity and close higher cost facilities by optimising asset throughput in the end-to-end production line, exploring innovative approaches and using markets where they are more efficient.

Agile business structure – we have established an agile business structure and work processes in a separate bioresources business unit and implemented a commercial relationship with Wastewater Network Plus. We measure sludge at the boundary and provide transparent costs which are reflective of the service provision and provide a level playing field with third parties. More information is provided in section 6.7.8. Innovating and improving the way we work commercially will drive greater efficiency and resilience. This will be supplemented by our use of markets where it can deliver service that offers greater value to customers.

We are well prepared for market opening, having established a separate bioresources business unit and implemented commercial arrangements with Wastewater Network Plus

Supporting the development of markets – beyond 2025, we expect the understanding of the bioresources market to have developed significantly. The bioresources business could operate independently from the wastewater business and be in full competition with the wider waste market. We will continue to support the development of markets through data and information sharing, participation in trading platforms and encouraging third parties to deliver services. We expect the market to mature and sludge treatment services to increase over time, beginning with small volume short term trades and co-ordination of planned outages of sludge treatment centres across company boundaries. As sludge production increases and assets reach the end of their useful life, there will be greater opportunities for the market to provide sludge treatment or joint capacity through commercial arrangements. There are still challenges facing the development of the bioresources market with environmental regulation and government energy incentive policy being the most significant. These positions drive significant economic barriers into establishing a harmonised bioresources market. We are proactively working with the market, other water companies at national forums and regulators to promote a level playing field that can realise its potential for the benefit of customers, stakeholders, investors and the environment.

Actively exploring innovations – to address these challenges we are actively exploring innovations in bioresources treatment, including opportunities for resource recovery and recycling. These cover all aspects of our innovation model including data management and collaboration, we are working with both academic and start-up communities to deliver novel, cost beneficial solutions. These will be tested through our innovation process and our bioresources strategic planning tool.

Maximising value from existing assets – the maintenance focus in 2020-25 will target investment on sustaining and then improving existing asset performance in order to improve productivity and mitigate key risks with regard to process safety, compliance and service resilience, all at an efficient price. Our focus is delivering our service at the most efficient cost. We will continue to use a mix of digestion technologies, reducing liming in Cumbria and generating energy from more sludge. We will maximise the value from our existing assets, most notably, Manchester Bioresource Centre. This is our largest site with opportunities to maximise energy revenue from electricity and gas markets and the possibility of re-purposing some assets to use for co-located waste digestion. Where sites are less efficient, sludge will be diverted to alternative facilities whilst we explore alternative market opportunities to generate value from the assets. This could be through undertaking co-digestion, asset sales or rental to third parties.

Recycling to agriculture – in response to customer and stakeholder feedback, we will make a significant move towards 100% recycling of biosolids to agriculture, conforming to the Biosolids Assurance Scheme, as the lowest cost and most sustainable disposal route. This will allow us to suspend day-to-day incineration operations. We will retain incineration capability as this enables us to manage the risk of significant periods of insufficient agricultural land availability.

Performance commitments shaped by customer priorities – our performance commitments have been developed to incentivise us to focus on areas that matter most to customers, including:

- ‘Recycling biosolids’ – delivering great end-to-end service in the transport, treatment and disposal of biosolids;
- ‘Better Air Quality’ – improving public health by delivering better air quality through a reduction in nitrous oxides released per unit of renewable energy produced; and
- ‘Enhancing Natural Capital’ for Customers – enhancing natural capital value through integrated and innovative solutions across water and wastewater.

6.7.2 Development of the bioresources market in the North West

Significant changes since privatisation – since privatisation, the market for biosolids has seen several significant changes due to environmental regulation, changes in sludge quantities and market changes including the demand for biosolids products. The current disposal options include recycling to agriculture, use in land restoration projects, incineration and landfill. The lowest cost and most sustainable option is to recycle biosolids to agriculture, where there is sufficient agricultural land available in close proximity to the site of production. If there is not sufficient available landbank, as is the case for UU, alternative outlets at a higher cost can be used. The availability of landbank in the North West has historically driven both our treatment and disposal strategies. The history of our treatment and disposal processes are shown in figure 6.29.

Disposal routes constrained – in 1998 there was a need to find disposal routes for material that had previously been disposed at sea, which was banned by the Urban Wastewater Directive. The Directive also introduced improvements to sewage treatment standards, leading to an increase in sludge production. The available agricultural landbank in the North West was dominated by grassland and the market for biosolids was not able to efficiently receive all of this material.

Centralised incineration – the most efficient investment at that time was to use an existing sludge pipeline running from Manchester to Liverpool and centralise a digested sludge incineration process. This enabled us to deliver a balanced outlet approach between recycling to agriculture and disposal through incineration. We were also early adopters of advanced anaerobic digestion to reduce the regional quantity of biosolids recycled to agriculture, enabling recycling to grassland and increased renewable energy generation.

Moving away from incineration towards agriculture – we have continued to secure the agricultural outlet by increasing advanced anaerobic digestion and enhancing our agricultural service provision to provide more to the farming community. In parallel we minimised the cost of incineration with a new, more efficient, autothermic incineration technology in 2011.

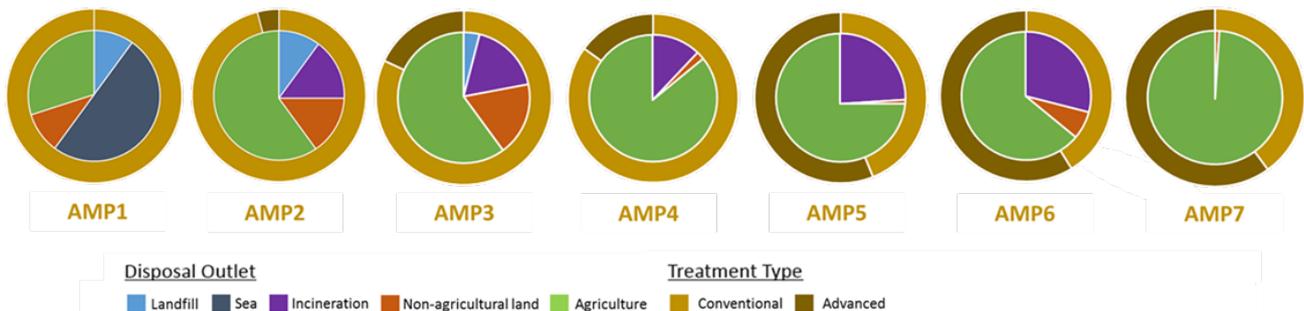


Figure 6.29: How our sludge treatment and outlets have developed over time

The current market for biosolids is underpinned by the implementation of the Biosolids Assurance Scheme (BAS). This is a voluntary quality assurance scheme developed by the Water Industry for the management of sewage sludge, to reassure stakeholders over the use of biosolids in agriculture. Our analysis suggests that recycling all of the biosolids produced in the North West is possible and would be the lowest cost. However, it will be a significant challenge to secure sufficient additional sustainable agricultural land and to support the recycling of 40% more biosolids than we have ever recycled before. The nature of the landbank means we have to drive further to recycle to agricultural land than the average company. This and compliance with Industrial Emissions Directive environmental permits associated with disposal outlets is the basis of a botex cost adjustment claim (as outlined in Chapter 7, section 7.7).

6.7.3 Effective relationship with Wastewater Network Plus

In preparation for 2020 we have worked closely with Wastewater Network Plus to define ways of working to ensure we maintain an efficient and effective end-to-end production line with a clear commercial interface, through a new Client Services function. This will focus on ensuring Wastewater Network Plus has the appropriate capability in order to fully define its requirements and drive Bioresources to be a client focussed service provider delivering an efficient service.

End-to-end production line thinking – this allows both business units to work efficiently, account for regulatory changes, benchmark against best practice and exploit opportunities in an integrated way. This will include areas such as resource recovery, catchment solutions and delivery against the ‘Enhancing Natural Capital Value for Customers’ performance commitment.

Internal commercial interface – we have set the boundary between the two business units based on RAG4 and have trialled ways of operating commercially between the two business units. This included a strategic pilot with a non-regulated bioresources business and the development of service level agreements between Bioresources and Wastewater Network Plus. Both have been successful and have allowed us to develop effective levels of service to drive the right outcome for customers. Service level agreements were deployed in 2018 and will be fully embedded by 2020. They include liquor treatment charging to Bioresources using trade effluent consenting (see section 6.7.8), energy charging to Wastewater Network Plus using power purchase agreements, sludge quality and quantity and sludge removal transactions at the boundary and Bioresources tenancy of Wastewater’s land and facilities.

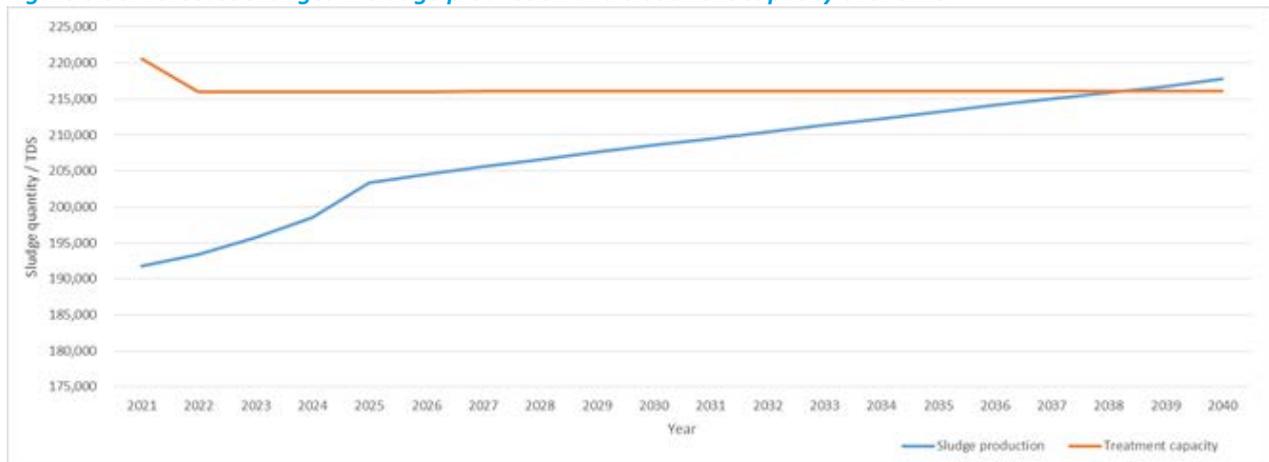
Site specific charges – costs for bioresources to treat sludge will vary by sludge treatment centre and by the quality and quantity of sludge produced. The development of site specific charges will be explored during the next business planning period in preparation for full market opening.

6.7.4 Sludge forecasting informs our plans

By 2040, the annual total quantity of sewage sludge produced in the North West is forecast to increase by around 16% from the 2018 level. The production forecast in 2020-25 is aligned to the current Water Industry National Environment Programme and the catchment and technology solutions proposed to meet cleaner effluent standards.

We have tested a number of scenarios to conclude the most likely sludge production forecast. However, there is a lack of scientific evidence in the quantity of sludge produced from new technologies required to achieve low phosphorus standards. As data becomes available we will improve our forecasting methodologies. Our plan is aligned to manage this growth in the most efficient way, using a mix of our own facilities more innovatively, supplemented with markets to manage the risk of volume variation and minimise the risk of asset stranding in future. We will regularly review the capacity that will be required and engage the market to deliver the most cost beneficial solutions.

Figure 6.30: Forecast changes in sludge production and treatment capacity over time



Note: The capacity line represents the treatment design capacity minus planned shutdown time.

Figure 6.30 shows our forecast for sludge production and treatment capacity to 2040. This shows that in the short term we will have more capacity than the volume of sludge forecast to be produced. We intend to seek opportunities to use our additional capacity to provide resilience to our service or use of markets for the benefit of customers. Over time, as markets grow, we expect that we will need to have less reliance on our own treatment capacity and can make use of third parties and other water companies to treat sludge.

6.7.5 Innovation and efficiencies to prepare for market opening

Since 2012 we have invested in our systems, processes, people and technologies to drive efficiencies and prepare for market opening. This has allowed us to become an intelligent and efficient business with clear relationships across the wastewater production line and with third party service providers. We have developed our capability in Systems Thinking, enabled by our transformation activities around future concept of operations across the production line. We are now able to use data from our treatment facilities and the environment to better understand the end to end system and use this insight to effectively plan both operationally and strategically.

Our business transformation in the current business planning period has been driven by a desire to operate more commercially and efficiently with Wastewater Network Plus in readiness for full market opening. This was facilitated by the early development of a target operating model between price controls and strategic and operational planning tools to change how we manage our assets day-to-day to drive efficiency.

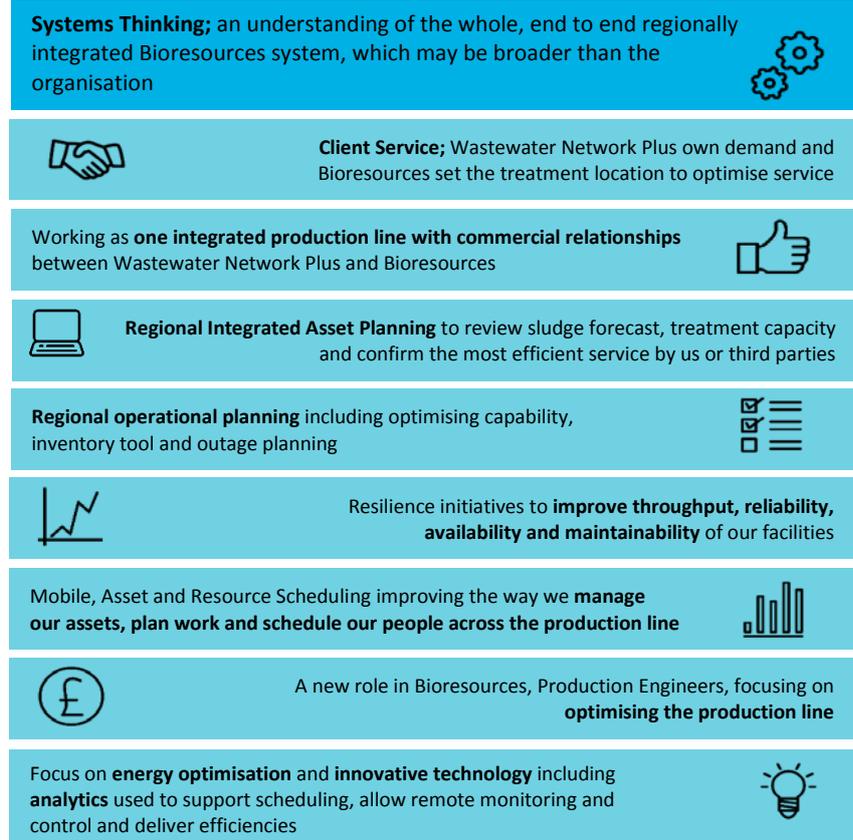
Improving control capability – our Regional Sludge Operational Management (RSOM) tool includes a central control hub with improved remote monitoring and control capability. This allows us to measure sludge at the boundary, at the point of arrival from another company and manage sewage sludge as a regionally integrated system moving sludge between wastewater treatment works and sludge treatment centres to treat and dispose of it in the most efficient way.

Harnessing mobile technology – operational capability has also been enhanced across water and wastewater through a Mobile, Asset and Resource Scheduling programme to improve the way we manage our assets, plan work and schedule our people. We have also developed new roles, with increased technical capability, to specifically focus on Bioresources assets to safely drive efficiency and maximise the value from energy.

Enhanced modelling tools – at a strategic level, the Regional Integrated Asset Plan (RIAP) modelling tool builds upon RSOM and our wholesale risk and asset planning approach. It is central to our asset investment strategy over the next 25 years as it has increased our understanding of assets, costs and market opportunities so that we can evaluate the service the Bioresources business is delivering for customers at the most efficient cost and a tolerable level of risk.

Best value plan at lowest efficient cost – these transformations have enabled us to develop an efficient totex programme of £372m for 2020-25 that delivers more sludge transport, treatment and disposal capability to a greater volume of raw sludge from Wastewater Network Plus (see chapter 7, section 7.5.4, which demonstrates how this efficient cost base was derived). We have no significant regulatory quality drivers to improve our facilities in the next business planning period. Historical enhancement expenditure has led to an increased maintenance programme focussed on delivering best value at the lowest efficient cost, extending current resilience initiatives to improve treatment capacity and reliability. Facilities with poor asset health where the costs of refurbishment or replacement are too high are being closed and the sludge diverted to more efficient facilities. We are also exploring opportunities to work with others in the water and waste sectors where they are able to deliver more efficient service or repurpose our assets which are no longer required for sewage sludge.

Figure 6.31 Bioresources strategy



6.7.6 Robust engagement with markets

We have used the current business plan period to learn about the size and nature of markets for sludge and other organic waste across and outside the North West. To support the development of markets we were the first company to publish a comprehensive information platform in October 2017 on our external website⁶. The information that companies have published about sludge production and sludge treatment centres has enabled detailed analysis and engagement with neighbouring companies and potential new entrants.

Facilitating market engagement – we have identified opportunities for third parties to deliver our service and explored areas of non-appointed activity where we can work with others to generate benefit for customers. Our plan therefore is to only treat North West sludge. We continue to hold discussions with various third parties to deliver bioresources services from 2020-25, but to date have not secured any contracts. We are actively discussing a 5-10tTDS per year trade to a neighbouring water company which will unlock capacity at Manchester Bioresource Centre enabling in bound sludge trading opportunities. We are continuing to engage with other companies for trades in and out of region, for both transport, treatment and recycling. To facilitate this engagement we have developed an industry leading comprehensive model, in line with RAG 5, to allow us to accurately price both long and short term trading opportunities. Alongside this, we are working with neighbouring companies to explore opportunities to realise sludge transport efficiencies, investment in common assets where appropriate, aligning maintenance shutdown programmes and sharing spare capacity data.

⁶ <https://www.unitedutilities.com/corporate/about-us/what-we-do/bioresources/>

Market testing indicates further efficiency potential - we are committed to improving our engagement with markets in procuring services. This includes comprehensive market testing of our costs via our Market Engagement Methodology (MEM) described in 6.4.1. In addition to our whole service test of bioresources, we conducted specific market testing by actively seeking opportunities to work with others in the water and waste sectors. We have mapped the location of sludge treatment and waste facilities adjacent to our borders to identify potential opportunities. We are exploring the following key opportunities to extend our regional system (these are shown geographically in supplementary document S6009 :

- **in discussion with neighbouring water companies for trading sludge out** to make more capacity available for trading sludge in from other companies;
- **reuse of facilities by third parties which are no longer being operated for regulated sludge treatment** - at one test site we are negotiating terms for a design, build, finance, operate contract for raw sludge dewatering and cake export. We are also in discussions for reuse of digesters by the waste industry;
- **exploring environmental, regulatory and economic barriers** to co-digestion at our sludge treatment centres;
- **we continue to review the acquisition of other organic waste anaerobic digestion facilities** which has not been pursued to date as it is not cost effective;
- **Veolia has introduced a waste trading platform and we are working with them** to test the process and the market interest for waste operators to accept sludge as a feedstock;
- **we have a long term operation and maintenance contract for an other organic waste anaerobic digestion plant in Scotland**. This is enabling us to gain crucial commercial knowledge around bidding, contract management, client relationships and exploration of other feedstock markets. We will apply this to our longer term strategy as the market develops;
- **initial discussions with Brampton & Beyond Energy**, who are investigating the development of a farm anaerobic digester plant in Cumbria that could use sludge within its feedstock, increase our digestion capability in Cumbria and supply electricity to our facilities; and
- **exploring potential use of biogas as a fuel for our tanker fleet**, to reduce totex, and improve air quality emissions. This links into our wider green fleet strategy.

6.7.7 Stretching performance commitments

We have a range of stretching performance commitments, aligned with our bioresources strategy, which have been developed as a result of customer feedback. These are detailed in chapter 5 of this price review submission.

6.7.8 Costs and impacts on pricing and revenue

Fixed and variable Bioresources revenue (for average revenue control)

Costs vary as volume of sludge changes. Assessment of which costs are fixed or variable costs depends on (a) the quantum of variation in sludge, and (b) the duration of time considered (i.e. whether it is a short or a long term change). For example, for small variations in volumes, capital costs will likely be fixed, but most operating costs would be variable, except for direct manpower, Environment Agency fees and business rates. For our business plan we have taken a more expansive approach, by taking the account of a larger increment of variation in sludge volume over the long term – in that case, only our key strategic assets (our central Manchester Bioresources Centre, sludge pipeline and Shell Green dewatering and distribution centre) would be considered fixed, which represents around one third of our capital costs in AMP7. As a result of the above considerations, we propose that 52% (as detailed on lines 28 and 29 of data table Bio4) of our Bioresources revenues recover variable costs. We will make adjustments to the allowed average revenue, £/TDS, to allow for under or over recovery of average revenue in an earlier year arising from volumes differing from forecast. This will be two years after the volume difference arises, since final volumes are not known until after the end of the financial year, and charges will be adjusted the following year.

Internal transfer pricing charges for liquor treatment

When sludge liquors are returned to a wastewater treatment works, the activity of treating the liquors is a Wastewater Network Plus activity but the cost of treating liquors should be paid for by Bioresources. It is very clear from RAG 5.07 that marginal costs should not be used to charge for this activity, as they would not be appropriately cost reflective. We have proposed charges based on the relevant “Mogden” components of our Trade Effluent charges (usually excluding the conveyancing component), to ensure that the recharges are cost-reflective, transparent and provide a level playing field with third parties. As a result our liquor costs in the next business planning period are £47m or 13% of our proposed Bioresources totex of £372m.

Transfer pricing for non-appointed activities, including sludge trading

As set out in Ofwat regulatory accounting guidance (RAG 4), treating or disposing of tankered waste or sludge from other water companies is a non-appointed activity. However, any such trades will use appointee bioresources assets. This section sets out our approach to transfer pricing where appointee assets would be used for non-appointed business activities, e.g. to process inter-company sludge trading, or non-sewage sludge organic waste, and how this supports the development of markets.

We believe that our approach to transfer pricing supports the development of bioresources markets and is in line with the appropriate regulatory accounting guidelines (RAG 5), and ensures that customers get a fair share of the benefits from such market developments. Costs and revenues crossing the price control boundary will be reported in our annual regulatory accounting data. Transfer prices are set to include, as a minimum, incremental costs and an appropriate share of the margin. In setting our prices, the extent to which incremental costs need to take account of the potential cost of increasing capacity will depend on the scale of the trade and length of the commitment to provide capacity.

We have observed that, in the case of short term trades, the market price is generally less than average total cost, as potential buyers are not willing to pay the price of proving long term capacity for a short term trade. Therefore, setting transfer prices to recover at least the incremental costs plus a share of the margin should encourage trading.

A key principle that we follow is that customers must see benefit, with no additional exposure to net costs as a result of any trade. Customers will be protected as our incremental cost will always be covered, and in addition they will see a benefit through any profit margin arising from a trade, which we will share with customers.

6.8 Bid assessment framework (Test 5.6)

UU is committed to encouraging open trading with third parties and ensuring this is done in a transparent, non-discriminatory and proportionate manner. Our bid assessment framework ('the Framework') supports the bidding market for water resources, demand management and leakage services and provides greater transparency as to how third party bids/options are appraised. We plan to hold an annual supplier conference to encourage the engagement of third parties and provide current and legacy proposals to act a guide for third parties in tailoring submissions.

This section outlines a summary of the Framework which supports our wider approach to water trading, which is provided in section 6.6 of this chapter. Our full bid assessment framework document for water resources, demand management and leakage services is provided as supplementary document S5006.

6.8.1 Summary

The Framework provides a template for inviting and considering third party bids and comparing them on an equal basis against potential in-house solutions which United Utilities may be able to provide. It builds on existing processes and obligations such as water resources planning requirements, procurement principles, and competition obligations, with a focus on ensuring consistency and transparency throughout the tendering process. Our framework has been externally reviewed by Deloitte.

Set out within the Framework are details as to how a competitive tendering process will work and the principles, stages and requirements that both United Utilities and third parties will be required to follow and comply with to allow us to trade together.

The Framework aims to complement the process we currently follow in creating and testing our Water Resources Management Plan (WRMP) by providing greater transparency on how third party bids/options are appraised and by inviting third parties to submit ideas, proposals and engage in dialogue with us about potential solutions. In addition to the WRMP process, we have sought to align our Framework to best practice procurement principles including the use of our dedicated Regulatory Procurement team to ensure all processes are run with the same diligence, transparency and efficiency as procurements run under the Utilities Contracts Regulations.

We are keen to open up dialogue and hear from suppliers focused on the areas of water resources, demand management and leakage services and have created a dedicated website (www.unitedutilities.com/BAF) where interested third parties can read more about our Framework and the processes that underpin it, as well as:

- review existing potential opportunities;
- review previous awarded opportunities;
- ask questions and seek further information from United Utilities on water resources, demand management and leakage within our company and our approach;
- find useful information for other potential bidding opportunities with United Utilities;
- find standard documentation and guides on completing tender returns; and
- propose ideas and potential innovations within a safe and confidential environment.

The procurement process set out within the Framework is detailed below, but on completion of all processes, or upon evaluation of any submission, written feedback is given to each bidder so as to detail the reasons for the scores they achieved, as well as useful guidance for any bids they may wish to propose in the future.

6.8.2 Process

The procurement process underpinning the Framework is aligned to that in Ofwat's final methodology document, appendix 8, and closely follows procurements ran under the Utilities Contracts Regulations and procurement best practice generally.

The Regulatory Procurement Team

Each procurement process will be undertaken by United Utilities' Regulatory Procurement team, which is a separate procurement function, independent from the wider business and the teams responsible for supplier management within the Commercial Department.

This team undertakes all procurement for the United Utilities' Group, including all procurement for United Utilities Water Limited, which is governed by the Utilities Contracts Regulations, and will oversee all submissions, assessments, scoring and feedback given for all third party bids, as well as any in-house solution proposed.

This consistency of assessment and alignment to good procurement practice will ensure all submissions are assessed equally and transparently and should give confidence to third parties when bidding.

In-House Solutions

All submissions, including any proposed in house solution will be assessed against the same evaluation criteria, which will be published in advance to all interested parties. This assessment is undertaken by the Regulatory Procurement team and will involve subject matter experts from across UU. So as to ensure transparency and confidentiality only those individuals needing to see any bid or document will be provided with it and appropriate security measures including information barriers and confidentiality agreements will be put in place.

Feedback

Upon completion of any procurement process under the Framework, or when any submission is declined, written feedback will be provided. This feedback will detail the scores achieved in relation to the published criteria as well as justification and guidance for future bidding activities. Our dedicated website will also contain information regarding submissions received and contracts awarded, provided nothing in the same is confidential or commercially sensitive.

Innovation

Wherever possible United Utilities looks to innovate both within our own company and our supply chain. Under our Framework, we hope to be provided innovative ideas within the areas of water resources, demand management and leakage detection, whether during any procurement process or otherwise.

Ideas will only be provided to those involved in any assessment or process and this will be limited to the subject matter experts for the specific areas, together with the Commercial team involved and our Innovation Team.

6.9 Regulatory Capital Value (RCV) allocations (Test 5.5)

This section sets out our approach to RCV allocations. We have proposed credible RCV allocations to support the price control separations and our allocations are aligned with Ofwat's competition and charges objectives and fully reflect Ofwat's feedback. For our water resources RCV, the economic value approach is deemed the most appropriate. For Bioresources, our approach is based upon potential new entrants' modern equivalent asset value (MEAV).

6.9.1 Water Resources RCV

In January 2018 we submitted our initial proposals, with a proposed RCV allocation to water resources of £453m, 12% of the forecast 1 April 2020 total water RCV⁷. We indicated that the proposed split would create the right water resource price for setting access prices and for alignment with potential prices for water trading and would minimise the impact on charges. Ofwat feedback in April 2018 stated that we needed to be transparent about the sensitivity of our assumptions in the methods used to allocate the RCV and take this into account when proposing an RCV allocation. Ofwat required us to provide further assurance that our allocation will protect the interests of customers in the context of the development of markets, and to explore methods for managing bill impacts.

We have taken into account the feedback and reviewed the sensitivity of our proposals. We continue to believe that an allocation based on MEAV would not be in customers' interests, nor in the interests of economic efficiency and promotion of effective competition. A split of RCV based on MEAV would create significant incidence effects for some customers, without any underlying justification. We would expect to face challenge from affected customers if we were to impose the increases which an RCV split based on MEAV would require.

We have, however, reviewed our approach and considered the sensitivity of the approach to assumptions used. Although there is no clear-cut right economic price, because it depends on the timing and size of any future trades, we believe that an allocation of 14% would have a very low probability of being too low. We have also triangulated results against approaches based on water resources expenditure as a proportion of total water expenditure. We therefore propose a 14% allocation of RCV to water resources, which is £546.8m out of a total Water RCV of £3,905.4m at 31 March 2020. Full details of this allocation approach are set out in supplementary document S5004.

6.9.2 Bioresources RCV

In September 2017 we submitted our proposed Bioresources RCV to Ofwat. Our proposed Bioresources RCV is based on that submission. Our general approach is unchanged but we have improved our proposals to reflect Ofwat feedback to companies in February 2018 and updates since the submission such as the assets allocated to bioresources.

Table 6.5 summarises these changes and we have included further details in the data table WWS12 commentary. We have also reviewed the charges impact in the light of the revisions to the proposed RCV. We have not resubmitted the full set of RCV tables. We considered that the nature and scale of changes means that our proposals can be sufficiently explained by setting out the impact of each of the adjustments. Our supplementary document S5005, sets out in detail the basis for these adjustments. The commentary to data table WWS12 explains how we have incorporated these adjustments in the table.

Table 6.5 Bioresources change to proposed RCV allocation

Original submission	383.1
Changes in response to Ofwat feedback	
1. Increase in hypothetical capacity	+9.8
2. Change to principal use basis for M&G assets	-31.1
3. Use of revised WACC of 3.3%	+7.5
4. Adjustments for ROCs and RHI income	+41.2
Updates to reflect latest information	
5. Change to 2017/18 price base	+12.8
6. Changes to assets included within bioresources	-19.1
7. Capacity increase at Ellesmere Port not being implemented	-3.1
8. Adjustment relating to operating costs for sludge disposal	+33.9
Revised Bioresources RCV	435

⁷ https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/looking-to-the-future/united-utilities-water-limited--water-resources-rcv-2018.pdf