Non-Household Wholesale Tariff Simplification

Final report

22 December 2022

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Market Improvement Fund

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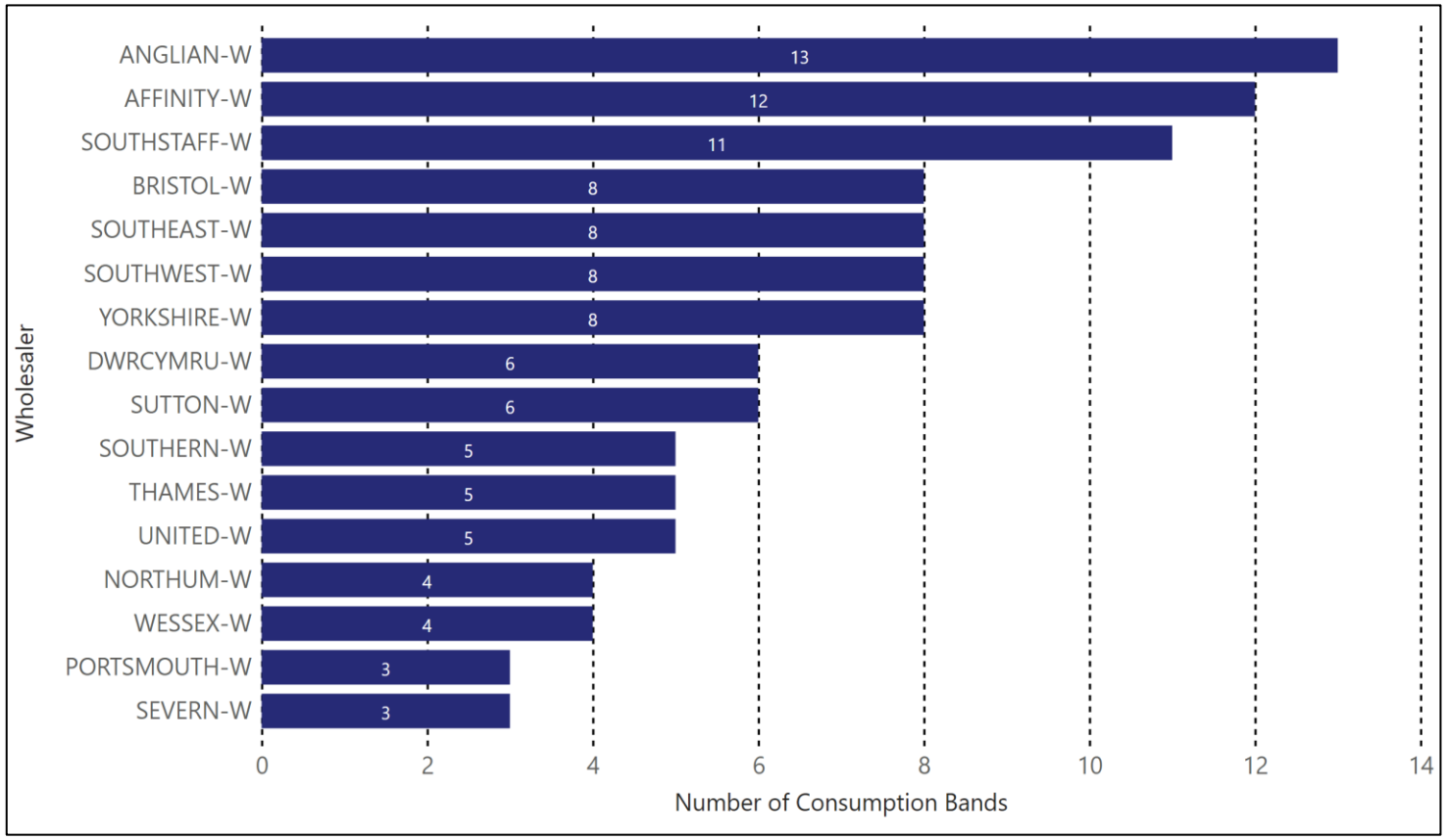
Each individual wholesaler has historically developed its own tariff structure in response to regulatory principles outlined by Ofwat and their own system dynamics, resulting in different approaches and variation between regional tariff structures. This has led to a high degree of tariff complexity within the NHH market, with c.9,000 tariff elements currently in the CMOS database:

- there are more than 100 different bands for NHH customers across the market;
- the number of water consumption bands per wholesaler ranges from 3 to 13;
- several wholesalers apply separate tariffs for regional or smaller areas in the geographical area that they provide water services;
- the range between a wholesaler's highest and lowest unit rates varies from ~6% to 67%;
- South West, Wessex and Yorkshire each set falling block tariffs for volumetric consumption;
- in one case (Southern) the unit rate increases as consumption increases[1];
- the most common number of tariff bands for water is 8 (noting any separate regional tariffs applied); however the bands themselves vary considerably across wholesalers.

Number of volumetric consumption bands per wholesaler (water only)



Source: Individual wholesaler charging schedules for 2022-23
Note: the chart above contains all regional volumetric consumption bands for those wholesalers that apply separate regional charges (Affinity Water, Anglian Water, SES Water, South East Water and Yorkshire Water). As there is a legal requirement by Ofwat for wholesalers to keep geographical insets/regional tariffs separate (and ensure that these customers are made no worse off under any tariff reform), we have captured these distinct separate regional tariffs in our tariff simplification modelling

1. See page 8 of 2022-23 wholesale charging schedule https://www.southernwater.co.uk/media/5827/wholesale-statement-of-principles-and-charges-2022-23.pdf

Existing non-household wholesale tariff structures vary widely (cont.)

Illustrative example (fixed meter charges, water only)

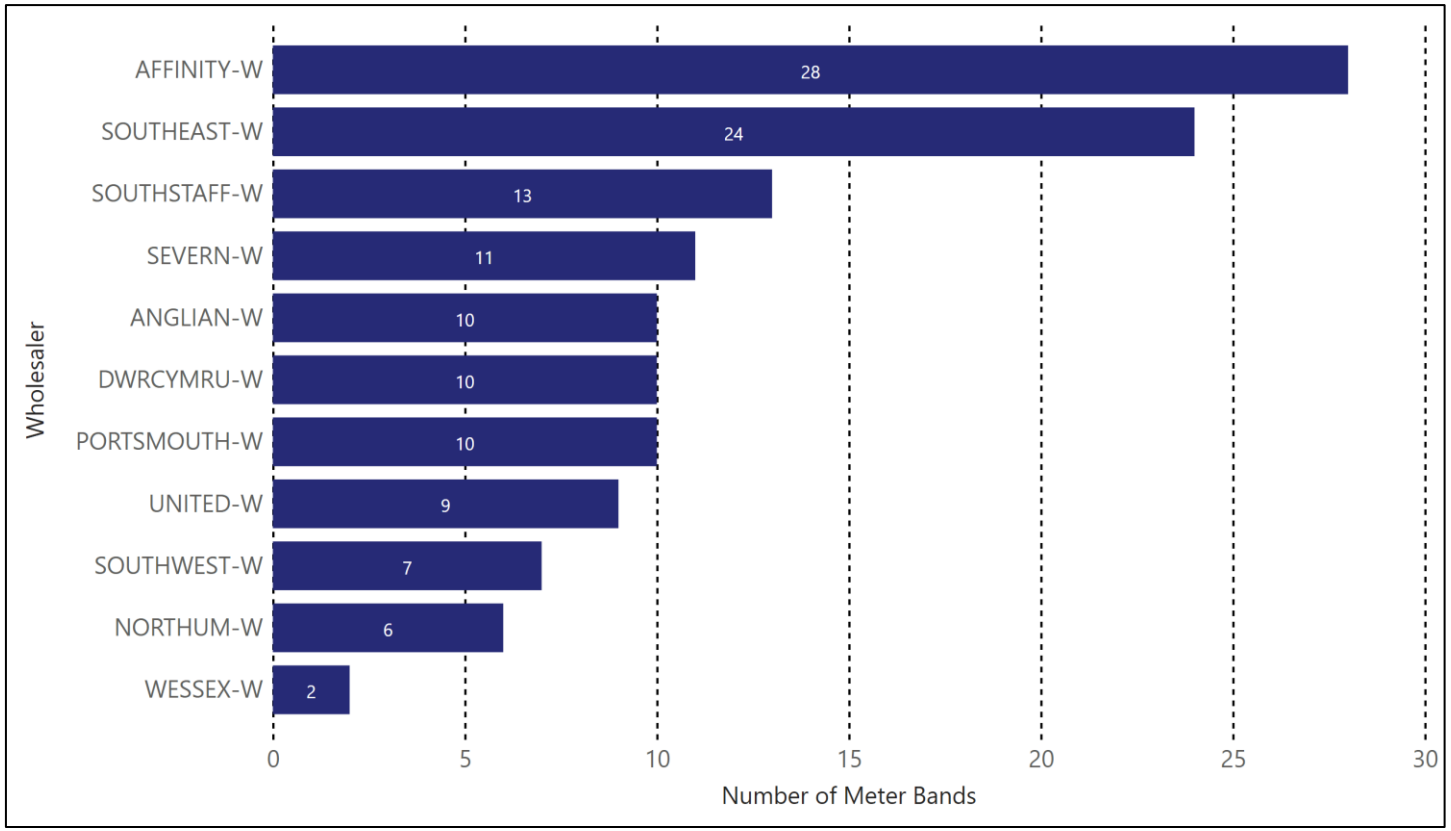
Eleven wholesalers currently have a fixed charge per meter (for water) as well as or instead of the site charge, based on a customer's meter size. Two wholesalers (South West and Welsh Water) apply a fixed meter charge for sewerage consumption relating to foul discharge.

Fixed meter charges are primarily used to recover metering costs and standing/supplementary charges are utilised to establish parity of charges at the threshold between tariff bands.

There is little commonality observed between the number of meter size bands, or the band thresholds across wholesalers. For example:

- there are 130 different bands for NHH customers across the market;
- the number of meter bands per wholesaler ranges from 0 to 28;
- five wholesalers (Bristol, SES, Southern, Thames and Yorkshire Water) have no fixed charge per meter;
- three wholesalers (Affinity, Anglian and Severn Trent Water) apply separate tariffs for regional or smaller areas in the geographical area that they provide water services.

Number of fixed meter bands per wholesaler (water only)



Source: Individual wholesaler charging schedules for 2022-23
Note: the chart above contains all regional meter bands for those wholesalers that apply separate regional meter charges (Affinity Water, Anglian Water and Severn Trent Water). We have excluded those wholesalers who do not set any fixed charges per meter in the chart above

PA Consulting has been commissioned to analyse incidence effects arising from options for possible non-household wholesale tariff simplification

According to the RWG, the wide range and diversity of wholesale tariffs has been identified and observed by retailers and NHH customers as a significant source of complexity, confusion and friction in the market, with adverse impacts on competition, customer experience, efficiency and innovation. The RWG's November 2021 Request for Information (RFI) identified several options for tariff simplification and/or harmonisation across both water and sewerage charges.

In this context, the RWG has commissioned PA Consulting to carry out an independent assessment of the broad feasibility of several options for tariff simplification across the wider industry, with the intention to provide the RWG with an evidence base on whether and how to simplify NHH wholesale tariffs in the future.

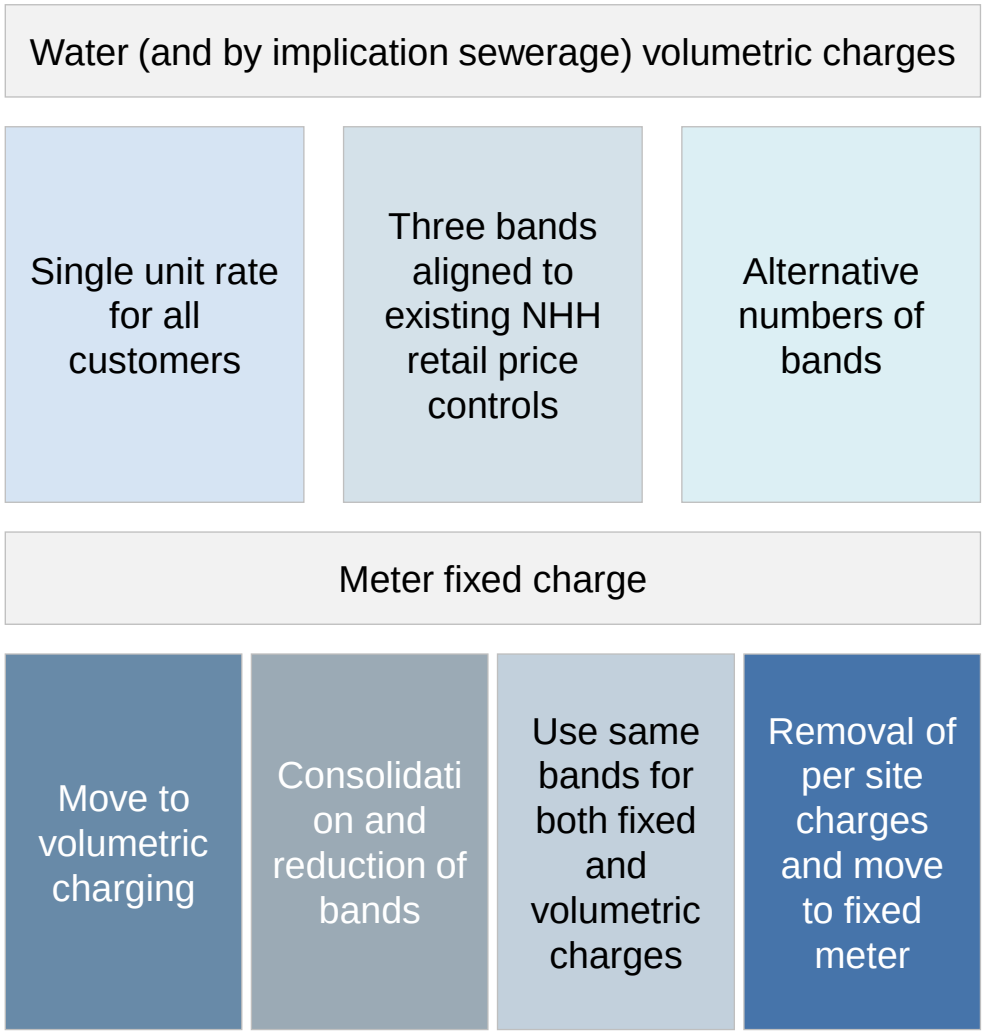
Specifically, PA Consulting has been commissioned to:

- Identify tariff simplification options for volumetric and fixed meter charges for NHH wholesale customers for both water and sewerage;
- Analyse the impact on customers from each option at an industry-wide and individual wholesaler level;
- Analyse the incidence effects of each option; and
- Discuss potential mitigation strategies ahead of reforming wholesale tariffs.

PA Consulting has not been commissioned to:

- Consider sewerage tariffs related to surface water drainage, highway drainage or trade effluent.
- Consider the "standing charge" component of volumetric tariffs or any other charge set by individual wholesalers.[1]
- Make any definitive recommendations to the RWG on tariff simplification.

Options for tariff reform proposed by the RWG in November 2021



1. We have nevertheless considered how standing charges could be used to mitigate the impact of simplifying and aligning volumetric bands through an illustrative example in Section 5 of this report

The starting point in our approach was to consider a range of stakeholder responses to the RWG's Request for Information (November 2021)

Summary of stakeholder feedback to the RWG's RFI

- Wholesalers, retailers and industry bodies supported proposing an alternative number of volumetric bands (ranging from alignment to the retail sector (i.e. 3), through to several (6+) bands) when modelling the incidence effects of tariff simplification.
- There was general agreement amongst industry that waste bands could be aligned to the proposed water simplification bands.
- There was also a preference to consider the impacts of consolidating fixed meter charges to a smaller, consistent number of bands across industry.
- Several stakeholders also raised the possibility of removing regional variations within wholesaler areas, and aligning meter sizes across water and waste to simplify for customers that have different service providers.

In addition to the above, there were overarching themes across the majority of responses highlighting the need for any tariff simplification and/or harmonisation to:

1. Reflect long-term cost impacts across individual companies – noting that common pricing levels across the industry was neither feasible nor desirable;
2. Improve information transparency and better signalling to consumers;
3. Balance the need for greater simplification with increased conservation benefits; and
4. Reiterate an ongoing focus towards improving water efficiency.

Building upon this feedback we also took into account the RWG's own views[1] as well as our assessment of CMOS data provided by MOSL and wholesalers' existing tariff structures

RWG's viewpoint *Internal assessment based on wider stakeholder feedback*	**Assessed CMOS data and wholesalers' tariff structures** *Most recent consumption data provided by MOSL (2021/22) and wholesaler's 2022/23 NHH charging statements (water and sewerage)*	**PA analysis and advice** *External assessment and input*
The RWG ruled out certain/ specific options for potential simplification based on the RFI feedback. For example, it was not considered viable to consolidate and apply one single unit rate for all water tariff charging bands due to the cost differentials between customer groups and need to ensure cost reflectivity.	We used the CMOS dataset to plot the distribution of supply points IDs (SPIDs) for both volumetric and metered bands across wholesalers to better understand existing consumption patterns. We then assessed existing tariff charges to determine whether current water and sewerage consumption bands inferred any natural 'breaks' in their structures to help inform a view on how best to simplify and/or harmonise wholesale tariffs across wholesalers (for example, understanding the proportion of wholesalers that currently have a new banding above 50,000m^3/a (volumetric) or 50mm (metered)).	Through weekly conversations and workshops held with the RWG, we were able to provide our own assessment and input towards these types of issues based on our knowledge and understanding of the NHH water market. This allowed us to present a range of potential solutions for simplification and/or harmonisation of wholesale tariffs.

Short-list of options:

Following the above we developed a short-list of options to help illustrate the impact of simplifying/harmonising wholesale volumetric and fixed meter charges for both water and sewerage tariffs.

Options were deliberately selected to cover plausible extremes – simplifying the tariff structure by implementing a small number of bands across all wholesalers, or simplification through harmonisation by adopting several common current bands across wholesalers. We considered these tariff bands/structures in an attempt to highlight the kinds of changes that would lead to significant incidence effects (and therefore which bands should be avoided).

1. For the avoidance of doubt, when referencing the RWG's views throughout our report, we are referring to the views of the sub-group overseeing the study only, rather than the RWG or RWG tariff group as a whole

We developed a short-list of options that are consistent and meet the objectives of the RWG as well as the high-level evaluation criteria for this study

Volumetric consumption

Option 1
0-0.5Ml, 0.5-50Ml, 50Ml+

Option 2
0-50Ml, 50-100Ml, 100-250Ml, 250Ml+

Option 3
0-5Ml, 5-10Ml, 10-20Ml, 20-50Ml, 50-100Ml, 100-250Ml, 250Ml+

Option 4
0-5Ml, 5-15Ml, 15-30Ml, 30-50Ml, 50-100Ml, 100-250Ml, 250Ml+

Fixed meter charges

Option 1
0 - 25mm, 25mm+

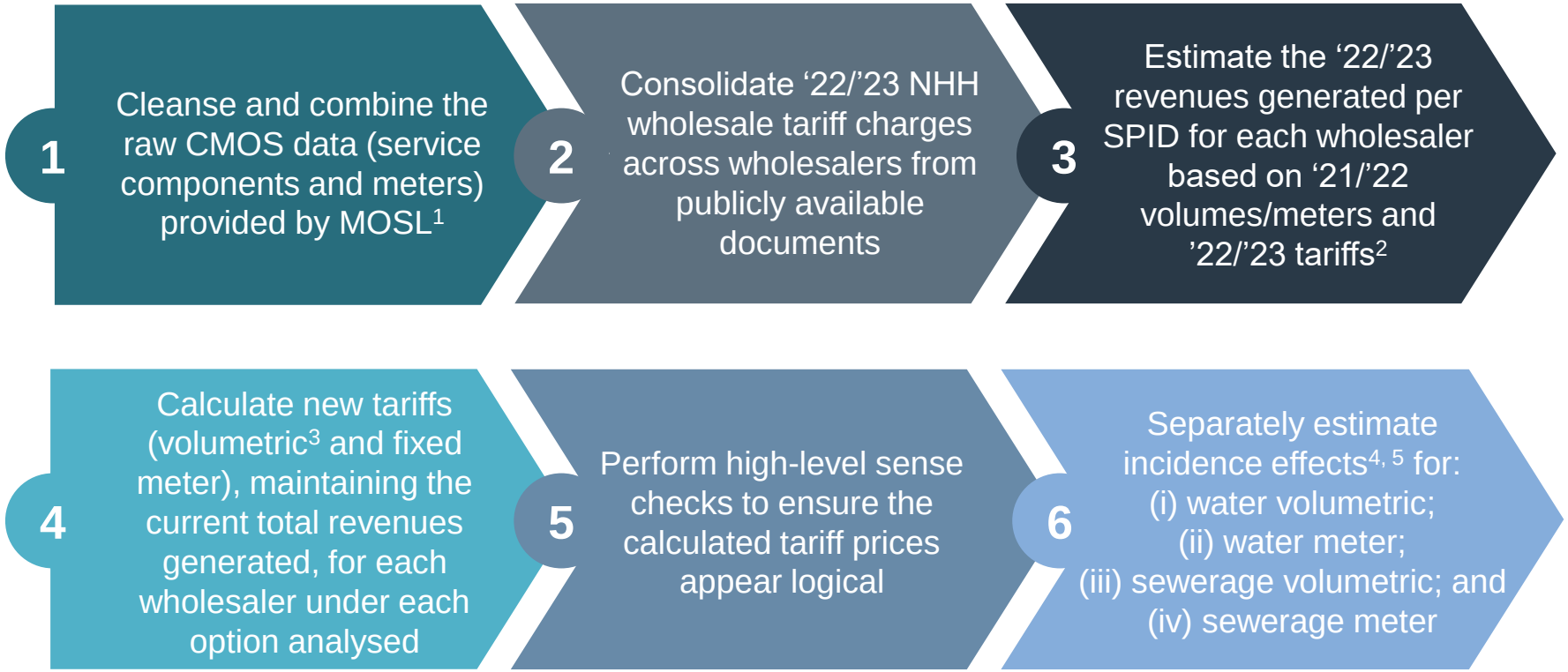
Option 2
0 - 25mm, 25 - 100mm, 100mm+

Option 3
0 - 25mm, 25 - 50mm, 50 - 100mm, 100mm+

Note: the short-listed options above represent hypothesized volumetric consumption bands and fixed meter bands based on our assessment for the purposes of simplifying and/or harmonising wholesalers' water and sewerage tariff structures

We then calculated incidence effects of implementing each short-listed option for all wholesalers, including analysis of the impact on customer bills

Below we summarise the methodology that we have applied to calculate incidence effects for all wholesalers.



1. Details of the data cleansing steps performed and the impact on the number of SPIDs included in the analysis are provided in the Appendix.
2. As agreed between PA Consulting and the RWG on 12th October 2022, a single unit rate for all usage within each band will be calculated for new wholesaler tariff, as opposed to any "falling block" tariffs.
3. Consideration of volumetric charges did not take into account supplementary charges imposed by wholesalers
4. Incidence effects for volumetric charges were calculated for all SPIDs separately - on the rare occasions when there were multiple SPIDs for a single premise (this happens only for sewerage and on 2,554 occasions), these SPIDs were considered separately within the analysis
5. Incidence effects for fixed meter charges were calculated separately for every meter, there was no consideration of the aggregate impact on a single customer with multiple meters.

Incidence effects: customer impact of each option for *volumetric* charges

Below we present industry aggregate incidence effects for volumetric consumption based on the short-listed options on page 10 compared to wholesalers existing tariff structures. The stylised modelling results show that for example, under Option 1 for water, 13% of SPIDs see a reduction in their current bill (i.e. are "positively impacted").

	Option 1 0-0.5Ml, 0.5-50Ml, 50Ml+	Option 2 0-50Ml, 50-100Ml, 100-250Ml, 250Ml+	Option 3 0-5Ml, 5-10Ml, 10-20Ml, 20-50Ml, 50-100Ml, 100-250Ml, 250Ml+	Option 4 0-5Ml, 5-15Ml, 15-30Ml, 30-50Ml, 50-100Ml, 100-250Ml, 250Ml+
Water				
# SPIDs			**1,080,303**	
Positively* impacted	136,938 (13%) *(39% total volume)*	683,333 (63%) *(40% total volume)*	169,932 (16%) *(9% total volume)*	173,900 (16%) *(13% total volume)*
Unchanged	933,618 (86%) *(38% total volume)*	350,083 (32%) *(39% total volume)*	847,859 (79%) *(76% total volume)*	842,694 (78%) *(70% total volume)*
Negatively impacted	9,747 (1%) *(23% total volume)*	46,887 (4%) *(21% total volume)*	62,512 (6%) *(15% total volume)*	63,709 (6%) *(17% total volume)*
Sewerage				
# SPIDs			**872,013**	
Positively impacted	39,164 (4%) *(16% total volume)*	257,654 (30%) *(18% total volume)*	95,669 (11%) *(3% total volume)*	96,993 (11%) *(5% total volume)*
Unchanged	830,858 (95%) *(75% total volume)*	612,470 (70%) *(77% total volume)*	761,665 (87%) *(92% total volume)*	760,007 (87%) *(90% total volume)*
Negatively impacted	1,991 (0%) *(9% total volume)*	1,889 (0%) *(5% total volume)*	14,679 (2%) *(5% total volume)*	15,013 (2%) *(5% total volume)*

**Positively* impacted in this context means that end bills are *lower; negatively* impacted means that end bills are *higher*
Note: Where the consumption volume is recorded as zero the SPIDs associated with these volumes have been removed from the volumetric analysis to ease the calculation of unit costs

Incidence effects: customer impact of each option for *fixed meter* charges

Below we present industry aggregate incidence effects for fixed meter charges based on the short-listed options on page 10 compared to wholesalers existing tariff structures. The stylised modelling results show that for example, under Option 1 for sewerage, 6% of SPIDs see a reduction in their current bill (i.e. are "positively impacted").

	Option 1 0 - 25mm, 25mm+	Option 2 0 - 25mm, 25 - 100mm, 100mm+	Option 3 0 - 25mm, 25 - 50mm, 50 - 100mm, 100mm+
Water			
# meters	**741,902** (wholesalers with fixed meter charges only)		
Positively impacted	68,761 (9%) *(13% meter charges)*	68,799 (9%) *(12% meter charges)*	67,411 (9%) *(12% meter charges)*
Unchanged	37,120 (5%) *(6% meter charges)*	37,411 (5%) *(7% meter charges)*	40,778 (6%) *(9% meter charges)*
Negatively impacted	636,021 (86%) *(81% meter charges)*	635,692 (86%) *(81% meter charges)*	633,713 (85%) *(79% meter charges)*
Sewerage			
# meters	**40,613**[1] (South West only)		
Positively impacted	2,258 (6%) *(7% meter charges)*	2,244 (6%) *(7% meter charges)*	1,829 (5%) *(5% meter charges)*
Unchanged	0 (0%) *(0% meter charges)*	14 (0%) *(0% meter charges)*	14 (0%) *(0% meter charges)*
Negatively impacted	38,355 (94%) *(93% meter charges)*	38,355 (94%) *(93% meter charges)*	38,770 (95%) *(95% meter charges)*

1. South West are the only wholesaler who currently sets fixed charges for sewerage meters. The meters included in this analysis are those sewerage meters contained within the meters dataset provided by MOSL and any proxy sewerage meters introduced to enable the service components and meters datasets to be combined (as advised by MOSL). Further details of the approach used to join these datasets are provided in Annex 1.

In general, the incidence effects analysis shows that a small number of larger users would be worse off while a larger number of smaller users would benefit

Volumetric charges

- Under each modelled option the vast majority of customers are unaffected
- Options 1, 3 and 4 have the lowest impact on water and sewerage SPIDs existing charges
- Under these options there are more “winners” than “losers”. This suggests that the “losers” lose by more than the “winners” win
- A small number of large or very larger users pay higher prices whereas a higher number of smaller or medium consumers pay lower prices

- Options 1 (86%), 3 (79%) and 4 (78%) impacted the fewest water SPIDs based on existing volumetric charges. A similar trend was observed for sewerage SPIDs.
- Options with more disaggregated consumption bands (i.e. Options 3 and 4) generated the smallest incidence effects on customer water bills (76% and 70% respectively).
- Under each of these options there are more winners than losers i.e. those with bills that would decrease rather than increase. This suggests that the losers lose by more than the winners win.
- The losers are generally a small number of very large users, whereas the winners are very small or medium users. This is because the prevalence of economies of scale/cost abatement regarding the small-bore network for larger customers is diluted when combined with smaller network users.
- Users towards the upper limit within a consumption band will be paying more than before compared to those users aligned to the lower end or average unit rate within the same band.
- In general, wholesalers with fewer existing bands (e.g. Welsh, Portsmouth, SES Water) have fewer incidence effects than wholesalers with more bands (e.g. South Staffs, Anglian, Affinity). In future this will be dependent on how thresholds are applied under any simplification of bands (e.g. whether the 0-50Ml band is retained or not as the majority of SPIDs currently sit within this band).

Fixed meter charges

- Given the relative magnitude of size based meter charges in the overall bill, the impact on customers is small
- Each option has more “losers” than “winners”
- Larger users benefit through simplification under each option (i.e. paying less); whereas a higher proportion of smaller users would be paying more

- The smaller users lose more (moved onto higher rates) whereas the larger users pay less as a result of the proposed simplification.
- Those wholesalers with a large number of bands for fixed meter charges and large price differences between these bands (e.g. Affinity, South East and Wessex) see particularly large incidence effects under the options considered.
- Several wholesalers (Bristol, SES, Southern, Thames and Yorkshire) do not currently have fixed meter charges for water or sewerage and therefore see no impact from the proposed changes.

Overall conclusions

The objective of this analysis was to consider the merit for tariff simplification, which in turn could enable further harmonisation of wholesalers existing tariff structures. We have focused on the incidence effects of the proposed simplification options, rather than making any definitive recommendations. The choice of reform option is a matter for the RWG, in consultation with a wider set of stakeholders, and will depend on further analysis by individual companies of their own data. Below we summarise the key conclusions from our study.

Under each modelled option the vast majority of customers are unaffected

In addition only a very small percentage of customers for specific wholesalers are worse off under these simplification options (even where this is the case and customers are worse off, these customers are not significantly worse off).

Options 1, 3 and 4 have the lowest impact on SPIDs' charges relative to the status quo.

Each proposed *fixed meter charge* option generated similar incidence effects

Fixed meter charges are a small proportion of overall customer bills, so changes to these tariffs have less incidence effects.

There is also less diversity of fixed meter charges across the sector, meaning that any changes to these tariff components have similar incidence effects across all options.

Changes to volumetric and fixed meter charges should not be considered in isolation

Changes to volumetric and meter charges need to be combined with supplementary/standing charges and drainage charges in order to measure the overall incidence effects on customer bills.

This is an area for further consideration by the individual companies.

Incidence effects vary across wholesalers

Wholesalers with fewer existing tariff bands tends to have fewer incidence effects than those with more existing tariff bands. Simplification through tariff harmonisation could mean some wholesalers end up with more bands than currently, but this may still reduce overall administrative burden for the industry and create a more easily understood tariff landscape for customers.

The incidence effects of tariff simplification could potentially be mitigated through a number of measures

While there are only a small percentage of customers that are worse off under the simplification options we have proposed (and those which are worse off are typically only very marginally worse off, and hence only a very small percentage of customers exhibit a bill increase in excess of 5%)[1], there are several possible methods that could be introduced to mitigate the negative incidence impacts on these particular customers. These include:

- **Transitional arrangements:** where incidence effects are significant, particularly if certain customer groups would be made materially worse off as a result of tariff simplification, it may be appropriate (particularly for those customers most negatively affected) to adopt transitional arrangements to either avoid those incidence effects altogether, or to at least only introduce them gradually. For example, grandfathering of transitional arrangements could be introduced over time. Further, water companies could support customers in becoming more efficient in their water usage and/or help reduce on-site leakages in order to offset the impact of increasing unit rates through reducing the amount of water used.
- **Increase tariffs for specific user groups:** increasing tariffs for specific user groups could offset large increases for a handful of users.
- **Consider standing/supplementary charges:** harmonising each companies approach in setting supplementary charges could mitigate to some degree the extent of incidence effects generated through simplification. There is, however, no commonality at present in how these charges are set.
- **Wider regulatory and economic factors:**
  - **PR24** – Ofwat has not yet provided detail on each wholesaler's draft totex allowance or allowed revenue, but has provided an initial view on the allowed WACC during PR24. The changes in allowed revenue, and by extension in wholesale tariffs, may exacerbate or mitigate any changes in wholesale tariffs stemming from proposed simplification and/or harmonisation by individual companies during the price control process.
  - **Affordability** – water tariffs are indexed to inflation, so changes in wholesale tariff structures may be exacerbated or mitigated by inflation indexation, depending on the rate of inflation prevailing at the time. Given the sustained high rates of inflation at present, this means that customer bills are likely to rise regardless of any proposed simplification and/or harmonisation of charges. This provides an opportunity for wholesalers to make changes to existing tariff structures (in real terms) that, while leading to potentially higher (or lower) charges for certain customer groups, ~~would~~ may be no higher (in nominal terms) than the increase in charges resulting from higher outturn inflation.

In order to effectively introduce wholesale tariff reform, some combination of the above arrangements could be introduced. These mitigation measures would however be dependent on the estimated incidence effects generated through proposed simplification and/or harmonisation of tariff charges, and would ultimately be for the individual wholesalers to determine.

1. Page 6 of Ofwat's Charges Scheme rules stipulates that undertakers should carry out a proportionate impact assessment whenever the nominal value of bills for a given customer type (assuming a constant level of consumption) is expected to increase by more than 5% from the previous year (defined as a "significant" price rise)

02

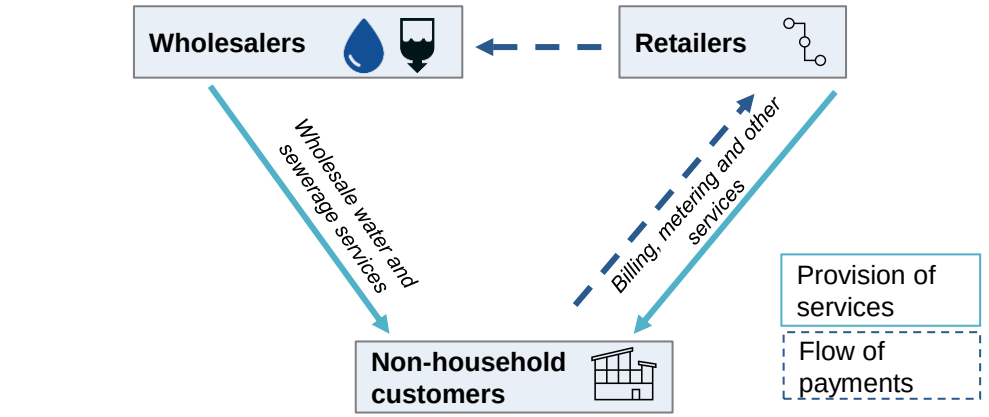
Introduction

Non-household market overview and key stakeholders

The non-household (NHH) segment of the water industry across England and Wales focuses on the supply of water and sewerage services to businesses, charities and public sector organisations. An overview of the NHH market structure is summarised in Figure 1. Below we provide detail on how each key stakeholder participant interacts with one another:

- **Wholesalers**: The individual wholesalers own and operate the network of water and sewerage pipes, mains and treatment works in their geographic region. Their primary role in the market is to provide the services and functions necessary for the retailers to serve customers. Customers may interact with wholesalers in the event of an issue relating to the underlying infrastructure (e.g. relating to routine maintenance and unplanned events).
- **Retailers**: The role of licensed retailers (i.e. suppliers of water and/or sewerage) is to buy wholesale services (the physical supply of water and wastewater services) from regional wholesalers and provide the required retail services which includes meter reading, billing and customer service. Retailers operate in a competitive market and some provide a bundle of services (e.g. with other utilities) to compete for customers.
- **Non-household (NHH) customers**: NHH customers are premises that are mainly used and operated by businesses, charities or public sector organisations. These customers can switch suppliers and can choose the retailer that is best able to meet their needs.
- **Market Operator of England's Non Household Water Market (MOSL)**: MOSL administer the Market Performance Framework (MPF), which ensures that the market is operating effectively and that trading parties are complying with their statutory obligations.
- **Ofwat:** As the economic regulator, Ofwat issues licenses to wholesalers and retailers in England and Wales which enable them to operate, and regulates the prices that can be charged by these companies to customers under separate price control frameworks.
- **The Department for Environment, Food and Rural Affairs (Defra):** Defra is the government department that sponsors Ofwat and is responsible for setting wider policy and regulatory framework for the water and sewerage sectors in England to ensure that they deliver the government's objectives.

Figure 1: Non-household water and sewerage market structure in England and Wales



Function	Entity
Market operator	MOSL
Regulators	Ofwat, defra (Department for Environment Food and Rural Affairs)

Retailer Wholesaler Group (RWG)

The Retailer Wholesaler Group (RWG) is a voluntary group of retailer and wholesaler representatives who aim to identify opportunities and deliver solutions that will improve outcomes and address issues that are hindering the effective operation of the regulated water and sewerage sectors across England and Wales.

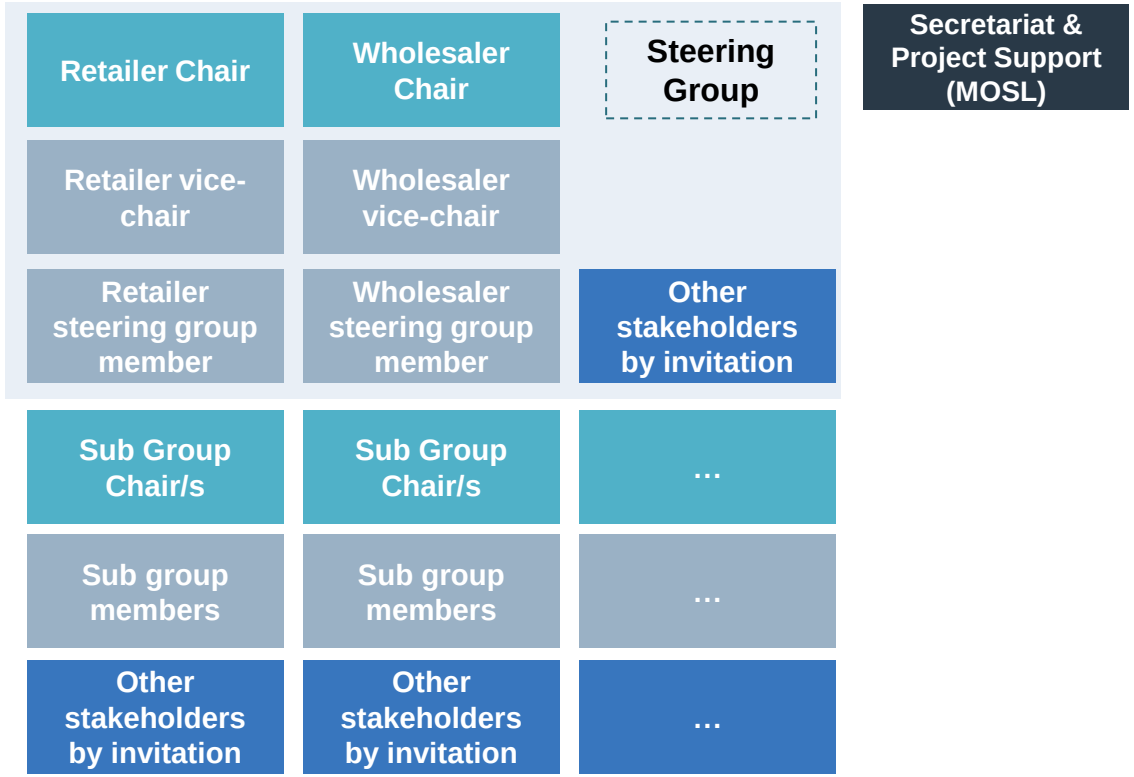
The RWG's key objectives and principles are to[1]:

- Provide a forum for retailers and wholesalers to work together constructively;
- Deliver change for the benefit of customers;
- Identify, discuss and prioritise opportunities, issues and market frictions;
- Drive consistency and standardisation where required through the development of good practice guidance;
- Promote effective adoption and implementation of good practice;
- Promote benefits and successes with customers and stakeholders; and
- Embrace and promote innovation across the market.

The RWG regularly engages in open communication with industry stakeholders including retailers and wholesalers, the Consumer Council for Water (CCW), Ofwat and MOSL, specifically in relation to reducing market frictions, fostering trading party collaboration, and improving the level of customer experience received in the NHH water market.

By creating specialist sub-groups with subject matter experts from various retailers and wholesalers, the RWG is able to investigate several challenges impacting the wider industry and develop best practice guides and principles to improve the end outcome for customers.

Figure 2: RWG organisational chart



Source: RWG Governance Framework

1. https://mosl.co.uk/groups-and-forums/industry-groups-forums/retailer-wholesaler-group#:~:text=The%20RWG's%20key%20objectives%20and,opportunities%2C%20issues%20and%20market%20frictions

Current state of non-household wholesale tariff structures

Wholesalers have a range of licence obligations and statutory duties to comply with when setting wholesale tariffs. Generally, if a customer has a meter, they will pay for water and/or sewerage through a standing charge (per site/SPID), a fixed meter charge (which depends on the size of meter) and a volumetric rate.[1] However, different standing charges can be levied for different size meters and volumetric charges for the amount of water consumed. Over time, each individual wholesaler has historically developed its own tariff structure in response to regulatory principles outlined by Ofwat and their own system dynamics, resulting in different approaches (i.e. no formal standardisation) and a distinct variation between regional tariff structures. This has led to a wide variety of wholesale tariffs within the NHH market, with c.9,000 tariff elements currently in the CMOS database.

Whilst acknowledging that there may be justification to support some variation in water tariffs over time, feedback from retailers and NHH customers to the RWG 'Tariff Structure Simplification Sub-Group' in 2021 observed navigating a saturated, confusing environment, with the potential for adverse outcomes such as increasing costs for some retailers and customers creates a barrier for future competition. There could be benefits from simplifying tariff structures (e.g. reducing the number of meter size bands or volumetric bands) or through harmonising tariff structures (e.g. all companies using the same meter size or volumetric bands, even if the actual tariff levels vary between companies).

With that in mind, the aim of the RWG is to explore options for reducing complexity and improving the efficiency of operation across the market; ranging from simple terminology harmonisation and best practice examples of information and data presentation, to more complex tariff structural proposal changes. It is also recognised that some changes could be relatively straightforward to introduce, whilst others will be far more complex, involving consultation, incidence effect modelling, and potentially lengthy glide paths to lessen or manage the severity of the impact over a number of charging years for implementation if adopted.

Therefore, in order to provide additional information and knowledge of this matter to the wider industry, this report aims to consider the incidence effects of simplifying (and harmonising) wholesale tariff structures and the potential impacts of these simplified tariff structures across the water and sewerage sectors in England and Wales. That said, as illustrated below, wholesalers have a wide range of factors to consider when setting individual tariffs, and so it will ultimately be the responsibility of the entire sector to ensure that a consistent approach to setting appropriate tariff structures – and any simplifications that it wishes to adopt – is undertaken.

Figure 3: Key considerations ahead of setting tariffs

1. Drainage charges in some regional areas are also a major element of the customer bill, albeit they are not being considered as part of this study.

Review of existing water tariffs: volumetric consumption bands

Summary of existing volumetric tariff bands

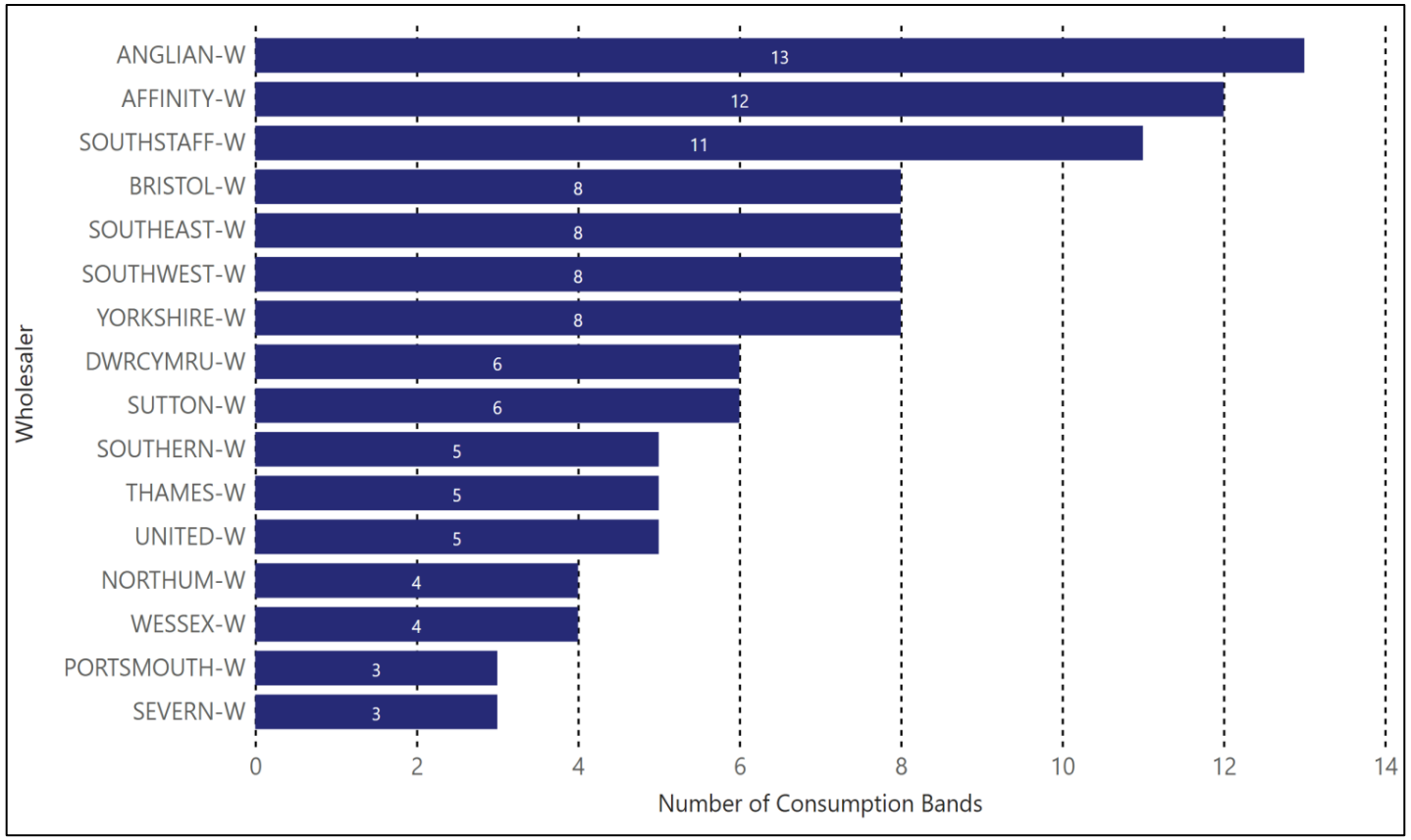
Water

As of charging year 2022/23, all wholesalers have volumetric charging bands for water. The unit rate applicable depends on a customer's annual consumption, and in most cases, the rate reduces as consumption increases.

At present, there is a lack of commonality between the number and size of volumetric bands across wholesalers:

- there are more than 100 different bands for NHH customers across the market (see Figure 4);
- the number of water consumption bands per wholesaler ranges from 3 to 13. There are considerably fewer bands (with a narrower range) for sewerage;
- several wholesalers including Affinity, Anglian, SES, South East and Yorkshire Water apply separate tariffs for regional or smaller areas in the geographical area that they provide water services;
- the range between a wholesaler's highest and lowest unit rates varies from ~6% to 67%;
- South West, Wessex and Yorkshire each set falling block tariffs for volumetric consumption;
- in one case (Southern) the unit rate increases as consumption increases[1];
- the most common number of tariff bands for water is 8 (noting any separate regional tariffs applied); however the bands themselves vary considerably across wholesalers.

Figure 4: Number of consumption bands per wholesaler (water only)



Source: Individual wholesaler charging schedules for 2022-23
Note: the chart above contains all regional volumetric consumption bands for those wholesalers that apply separate regional charges (Affinity Water, Anglian Water, SES Water, South East Water and Yorkshire Water). As there is a legal requirement by Ofwat for wholesalers to keep geographical insets/regional tariffs separate (and ensure that these customers are made no worse off under any tariff reform), we have captured these distinct separate regional tariffs in our tariff simplification modelling. The chart however does exclude several 'non-standard' or 'atypical' tariff charges that are not in scope for this study. Further explanation of all modelling assumptions can be found in Annex 1 of this report.

1. See page 8 of 2022-23 wholesale charging schedule https://www.southernwater.co.uk/media/5827/wholesale-statement-of-principles-and-charges-2022-23.pdf

Review of existing sewerage tariffs: volumetric consumption bands

Summary of existing volumetric tariff bands

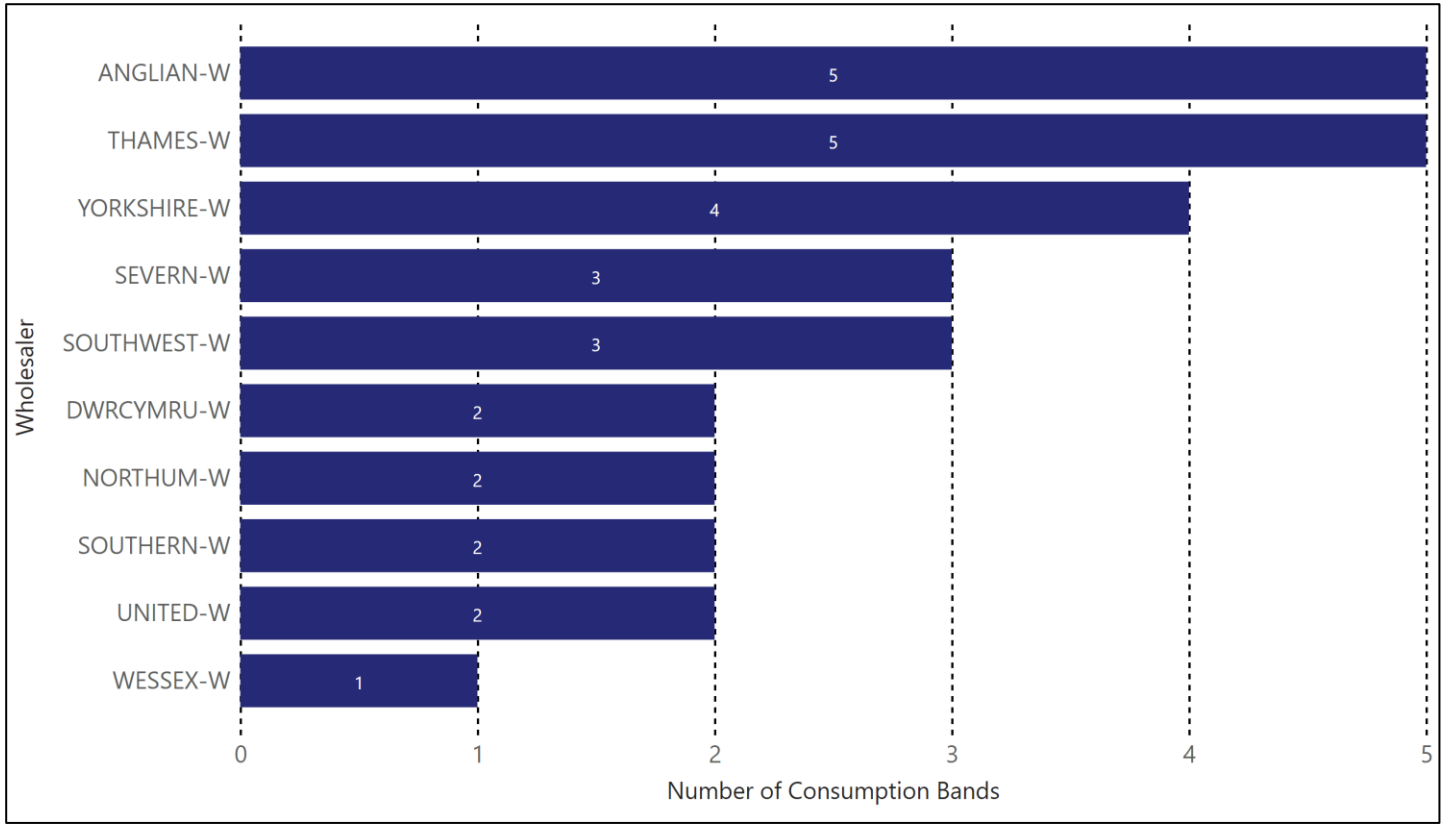
Sewerage

Sewerage services have four main activities in relation to collection and treatment: foul sewage, surface water drainage, highway drainage, and trade effluent. Only those charges in relation to foul sewage are assessed in this study.

Similar to that of water, there is a wide range of sewerage tariff bands across the wholesale market at present. The range in use is less than that in use for water, however, arguably reflecting a lower number of sewerage providers across the market:

- the number of sewerage consumption bands per wholesaler related to foul drainage ranges from 1 to 5;
- Yorkshire Water apply the same volumetric consumption banding across both water (for their primary region) and sewerage (4 bands);
- Wessex Water apply the same unit rate regardless of volumetric consumption.

Figure 5: Number of consumption bands per wholesaler (sewerage only)



Source: Individual wholesaler charging schedules for 2022-23
Note: the chart above contains regional sewerage tariffs for Anglian Water.

The chart however does exclude sewerage tariffs related to surface water drainage, highway drainage or trade effluent, as these are not in scope for this study.

Review of existing tariffs: fixed meter charges

Summary of fixed meter charge bands

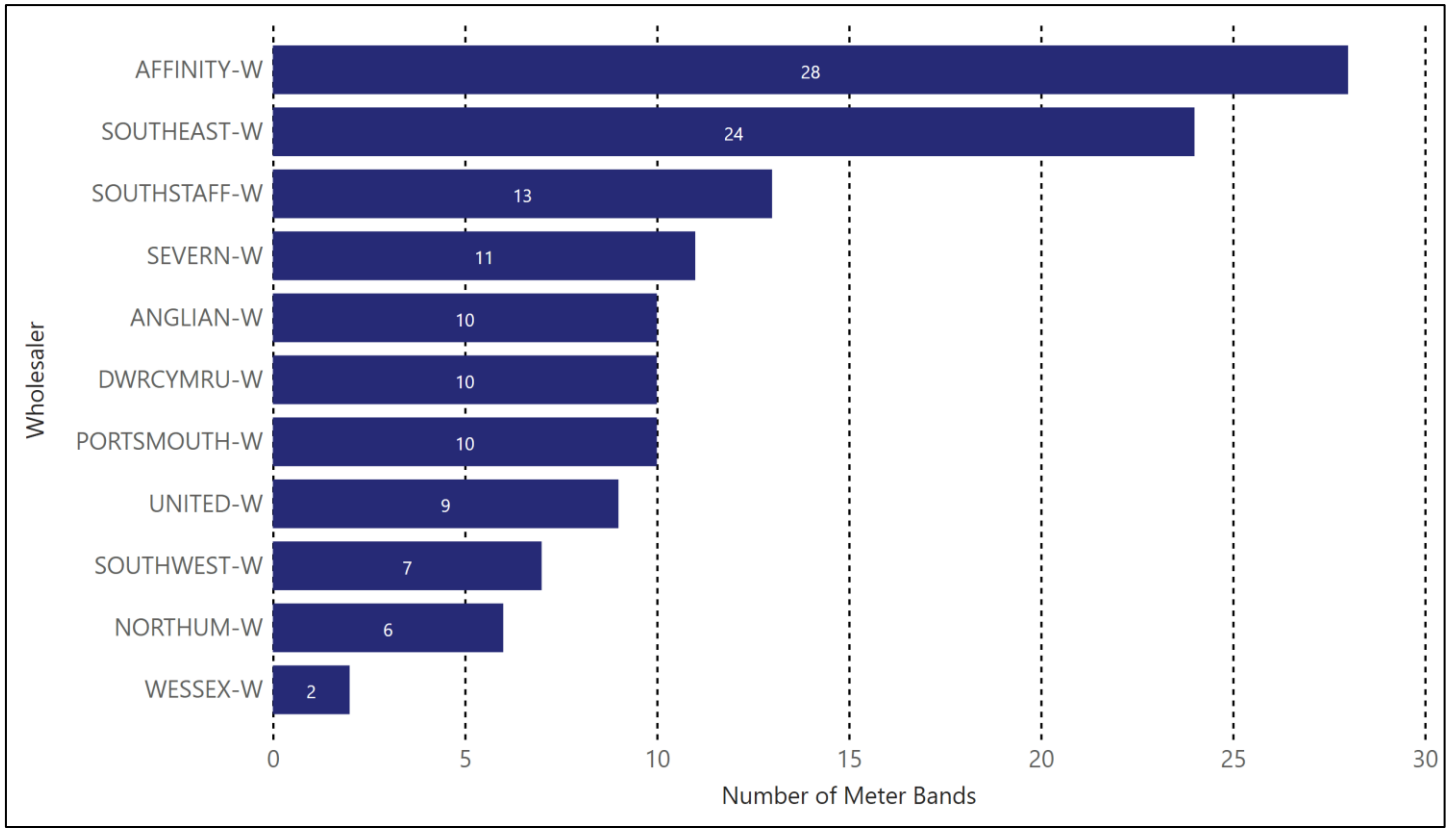
Eleven wholesalers currently have a fixed charge per meter (for water) as well as or instead of the site charge, based on a customer's meter size. Two wholesalers (South West and Welsh Water) apply a fixed meter charge for sewerage consumption relating to foul discharge.

Fixed meter charges are primarily used to recover metering costs and standing/supplementary charges are utilised to establish parity of charges at the threshold between tariff bands.

In a similar vein as for volumetric consumption bands, there is little commonality observed between the number of meter size bands, or the band thresholds across wholesalers, as shown in Figure 6. For example:

- there are 130 different bands for NHH customers across the market;
- the number of meter bands per wholesaler ranges from 0 to 28;
- five wholesalers (Bristol, SES, Southern, Thames and Yorkshire Water) have no fixed charge per meter;
- three wholesalers (Affinity, Anglian and Severn Trent Water) apply separate tariffs for regional or smaller areas in the geographical area that they provide water services.

Figure 6: Number of fixed meter charge bands per wholesaler (water only)



Source: Individual wholesaler charging schedules for 2022-23
Note: the chart above contains regional fixed meter charges for Affinity Water, Anglian Water and Severn Trent Water. We have excluded those wholesalers who do not set any fixed charges per meter in the chart above

RWG Tariff sub-group proposed wholesale tariff reform

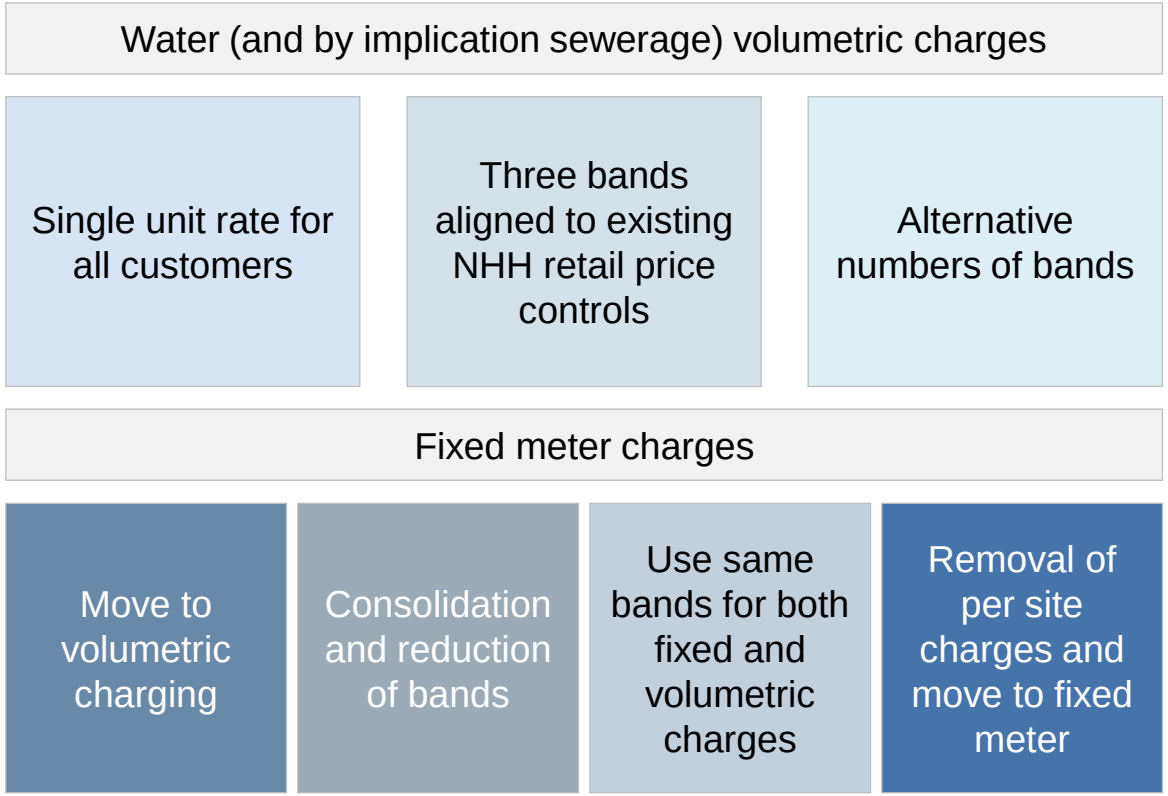
In the context of the wide range of tariff structures observed in the market, the RWG Tariff Sub-Group was established with the purpose of exploring options to investigate how to simplify the existing wholesale tariff structure in the NHH water market. According to the RWG, the wide range and diversity of wholesale tariffs has been identified and observed by retailers and NHH customers as a significant source of complexity, confusion and friction in the market, with adverse impacts on competition, customer experience, efficiency and innovation.

Through ongoing work and market engagement, the RWG's November 2021 Request for Information (RFI)[1] identified several options for tariff reform, with the potential to simplify and align approaches across the market based on an initial analysis of publicly available information on wholesale tariff structures. The market consultation aimed to inform wider thinking on the market appetite for change, and to gain a broader understanding of the complexity and challenges associated with change. The options proposed in the RFI for tariff reform across both the water and sewerage sectors are shown in Figure 7.

According to the RWG, the benefits of simplifying and harmonising the existing wholesale tariff structures may include:

- Creating a more consistent tariff landscape across the wider market – which should help establish a single, national market, rather than regional hubs;
- Reducing the complexity and confusion felt by customers in the face of different tariff structures in different wholesale regions;
- Greater equity across the market for similar customers in different regions;
- Reducing administrative burden and costs for retailers, and in turn reducing the potential for erroneous tariff reads (and hence bills) for customers;
- More consistent messages to customers around water efficiency;
- Greater opportunities for retail tariff innovation; and
- Simplification of Central Market Operating System (CMOS) tariff arrangements.

Figure 7: Options for tariff reform as consulted on by RWG in November 2021



Source: RWG Wholesale Tariff Structure Simplification Sub- Group Request for Information, November 2021

1. https://mosl.co.uk/groups-and-forums/industry-groups-forums/retailer-wholesaler-group/rwg-related-documents/4629-rwg-tariff-simplification-sub-group-request-for-information-2021-11-01/file

Scope of work

In this context, the RWG has commissioned PA Consulting to carry out an independent assessment of the broad feasibility of several options for tariff simplification across the wider industry, with the intention to provide an evidence base on which to form several recommendations on the most appropriate way forward for the wholesale NHH market.

Specifically, PA Consulting has been commissioned to:

- Identify tariff simplification options for volumetric and fixed meter charges for non-household wholesale customers for both water and wastewater (i.e. produce four sets of results);
- Analyse the impact on customers from each option at an industry-wide and individual wholesaler level;
- Analyse the incidence effects of each option; and
- Discuss potential mitigation strategies for wholesalers to consider ahead of reforming wholesaler tariffs.

PA Consulting has not been commissioned to:

- Consider sewerage tariffs related to surface water drainage, highway drainage or trade effluent.
- Consider the “standing charge” component of volumetric tariffs, or any other charge set by individual wholesalers. As the approach to setting these charges varies across the industry, these have been excluded from our analysis.[1]
- Make any definitive recommendations on tariff simplification; choices for tariff simplification are a matter for the wholesalers in consultation with the RWG and a wider set of stakeholders, and will depend on further analysis by individual companies of their own data.

To address the requirements set out in the scope to work, the remainder of this report is structured as follows:

- Section 3 describes our approach to developing a proposed short list of options for tariff simplification reform;
- Section 4 presents the results of our incidence effects modelling on the impact of proposed tariff simplification and discusses the impact on individual wholesalers and customer bills; and
- Section 5 discusses potential mitigating strategies to support the implementation of tariff simplification across the industry.

We also provide annexes to supplement the main body of our report:

- Annex 1 contains all modelling related assumptions and caveats; and
- Annex 2 presents additional incidence effect outputs generated from our modelling of the proposed tariff simplification options.

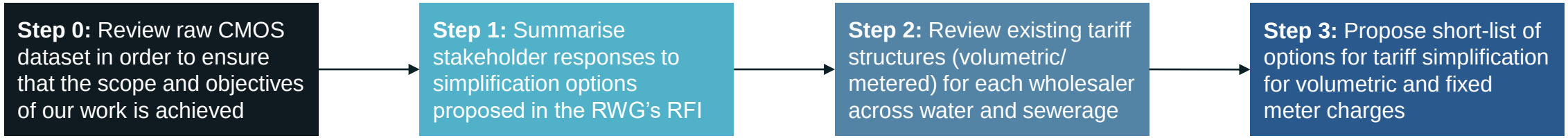
1. We have nevertheless considered how standing charges could be used to mitigate the impact of simplifying and aligning volumetric bands through an illustrative example in Section 5 of this report

03

Options for tariff reform

Our proposed approach to developing a short-list of tariff reform options

Figure 8: Our approach to develop a short-list of options for potential tariff simplification and/or harmonisation



Data review and preparation

Before undertaking any tariff simplification modelling, we firstly reviewed the CMOS data provided to us by MOSL and observed that several 'non-standard' or 'atypical' tariff charges had been included. As the objective of this study is to focus on exploring options for simplifying 'standard' or 'typical' wholesale charges and related tariffs, we agreed with the RWG to exclude the following tariffs from our analysis:

- Special agreements;
- Single customer tariffs e.g. for certain councils;
- Unusual tariffs e.g. for swimming pools;
- Non-potable water tariff codes; and
- Interruptible supply tariff codes.

Excluding these tariffs for the purposes of our incidence modelling (and hence excluding all SPIDs on those particular tariffs from the analysis) leads us to remove 19 out of 291 tariffs as provided by MOSL, but less than 0.1% of total SPIDs in the CMOS national dataset (relating to measured potable water and measured sewerage).

Further explanation of modelling assumptions made can be found in Annex 1.

Our approach

Following an initial assessment of the CMOS data, we analysed and summarised the feedback received by wholesalers, retailers and industry bodies to the options proposed by the RWG in its November 2021 RFI. At this stage we also ruled out several inappropriate simplification options based on ongoing conversations with the RWG.

We then considered our own detailed review of existing water and sewerage tariffs for each wholesaler, as well as the CMOS data provided by MOSL. For example, we analysed the distribution of SPIDs across both consumption volume bands and meter bands and whether these trends were similar across both water and sewerage.

Based on this review, we were able to produce a short-list of potential options to illustrate the impact of simplifying/harmonising wholesale volumetric and fixed meter charges for both water and sewerage tariffs. Options were selected to cover a range of plausible extremes – i.e. simplifying the tariff structure by implementing a small number of bands across all wholesalers, or simplification through harmonisation by adopting several common current bands across wholesalers.

We considered these tariff bands/structures in an attempt to highlight the kinds of changes that would lead to significant incidence effects (and therefore which bands should be avoided) ahead of undertaking any simplification modelling.

Step 1: Stakeholder feedback to the RWG's November 2021 Request for Information

The RWG's RFI proposed three different tariff simplification options for water:

Single unit rate for all customers

Feedback stated that although this option would be the most simple to implement and understand, the impact to customers could be significant over the long-term. At present, the dispersion of unit rates across the industry varies considerably – modelling by the wholesalers shows that adjusting these unit rates (and hence customer bills) would lead to significant "winners and losers" across companies. This would potentially cause large adverse incidence effects and a shift away from cost reflective tariffs. **We therefore ruled out this option from further consideration at this stage.**

Three bands aligned to existing NHH retail price controls

Ofwat are reviewing the price and non-price protections currently set out in the Retail Exit Code (REC) and are proposing revisions to apply to each user group: smaller consumption business customers with annual consumption below 0.5Ml; 'Group One customers' (0-0.5Ml per annum); and 'Group two customers' (0.5Ml-50Ml). The RFI considered aligning wholesale and retail consumption bands.

Several wholesalers were unsupportive of aligning tariff bands. Many were concerned that negative incidence effects and cost reflectivity issues could result from a tariff band that is considerably wide (0.5Ml – 50Ml), as well as reallocating large and intermediate customers. The bands were also not considered to be reflective of individual wholesaler customer types.

However, some wholesalers and almost all retailers were supportive of aligning to REC bands as this could ease administrative burden and improve general levels of customer understanding. It was also noted that aligning primary billing systems could reduce the likelihood of erroneous meter reads. **We therefore considered that this option had enough potential industry benefits to model the incidence effects of tariff simplification.**

Alternative numbers of bands

Several respondents noted that there is already some commonality below 10Ml and above 10Ml across wholesalers' existing tariff structures, with some wholesalers differentiating volumetric banding more towards the lower end of the spectrum and others towards the higher end.

Wholesalers displayed no common preference for a combination of simplified tariff bands, with some arguing for a more detailed split to better capture cost reflectivity, whereas others recommended fewer bands to ease the administrative burden associated in calculating charges.

Retailers expressed a general preference to align wholesaler bands to the retail sector to improve consistency across the sector and improve transparency to consumers. **Proposing an alternative number of bands was also considered when modelling the incidence effects of tariff simplification.**

In addition to the above, there were overarching themes across the majority of responses highlighting the need for any proposed tariff simplification options to:

- Reflect long-term cost impacts across individual companies – noting that common pricing levels across the industry was neither feasible nor desirable;
- Improve information transparency and better signalling to consumers;
- Balance the need for greater simplification with increased conservation benefits; and
- Reiterate an ongoing focus towards improving water efficiency.[1]

1. During ongoing discussions between PA and the RWG, the RWG had explicitly asked PA not to consider water efficiency as part of any tariff simplification and/or harmonisation options proposed as part of this study

Step 1: Stakeholder feedback to the RWG's November 2021 RFI (continued)

The RFI also ~~proposed~~ considered whether to align sewerage and water charging bands.

There was general agreement amongst wholesalers that cost drivers were less differentiated for sewerage than for water, as ultimately the cost drivers for water (peak demand) and waste (storm flows) are based on different factors. Some companies pointed out that they currently use a single unit rate when charging for sewerage and wished to maintain this going forward.

The majority of respondents recommended alignment of water and sewerage charging bands, in part due to some wholesalers (such as Yorkshire Water) already operating with aligned bandings. Wholesalers also recognised that the charge differentials for waste would be smaller than water and that some bands may have the same (or similar) charge. Retailers supported aligning bands noting it would be simpler and easier for customers to understand their bills.

However, some feedback highlighted that customers with much lower waste volume than water (e.g. where water is used as part of a 'process') could be disadvantaged if bands were to be aligned, and hence reiterated the need to consider cost reflectivity in any simplification of sewerage tariffs.

There was general agreement amongst industry that simplified wastewater volumetric and metered bands could be aligned to the proposed water simplification/harmonisation options.

The RFI proposed several options in relation to fixed meter charges, including:

Remove per site and per meter fixed charges altogether i.e. move to volumetric charges

There was a view from respondents that meter charges must be included to ensure cost reflectivity, particularly for large users charged lower unit rates.

This option was viewed to potentially generate negative incidence effects on customers, with the burden of revenue recovery shifting from high volume to low volume users. **This option was therefore ruled out from consideration.**

Consolidate meter fixed charges to 4 or 5 bands

Noting the disparity across industry at present with some wholesalers having no fixed meter charges and others having in excess of 20 separate bands, there was agreement between several retailers, wholesalers and other industry bodies (e.g. WaterScan, Wave) that this option **should be considered further for simplification.**

Apply fixed meter charge bands based on volumetric charging bands

This approach was noted to require more frequent monitoring that customers remain in the correct consumption band, leading to significantly increased administrative burden. **This option was therefore ruled out.**

Remove per site fixed charges i.e. use only meter fixed charges.

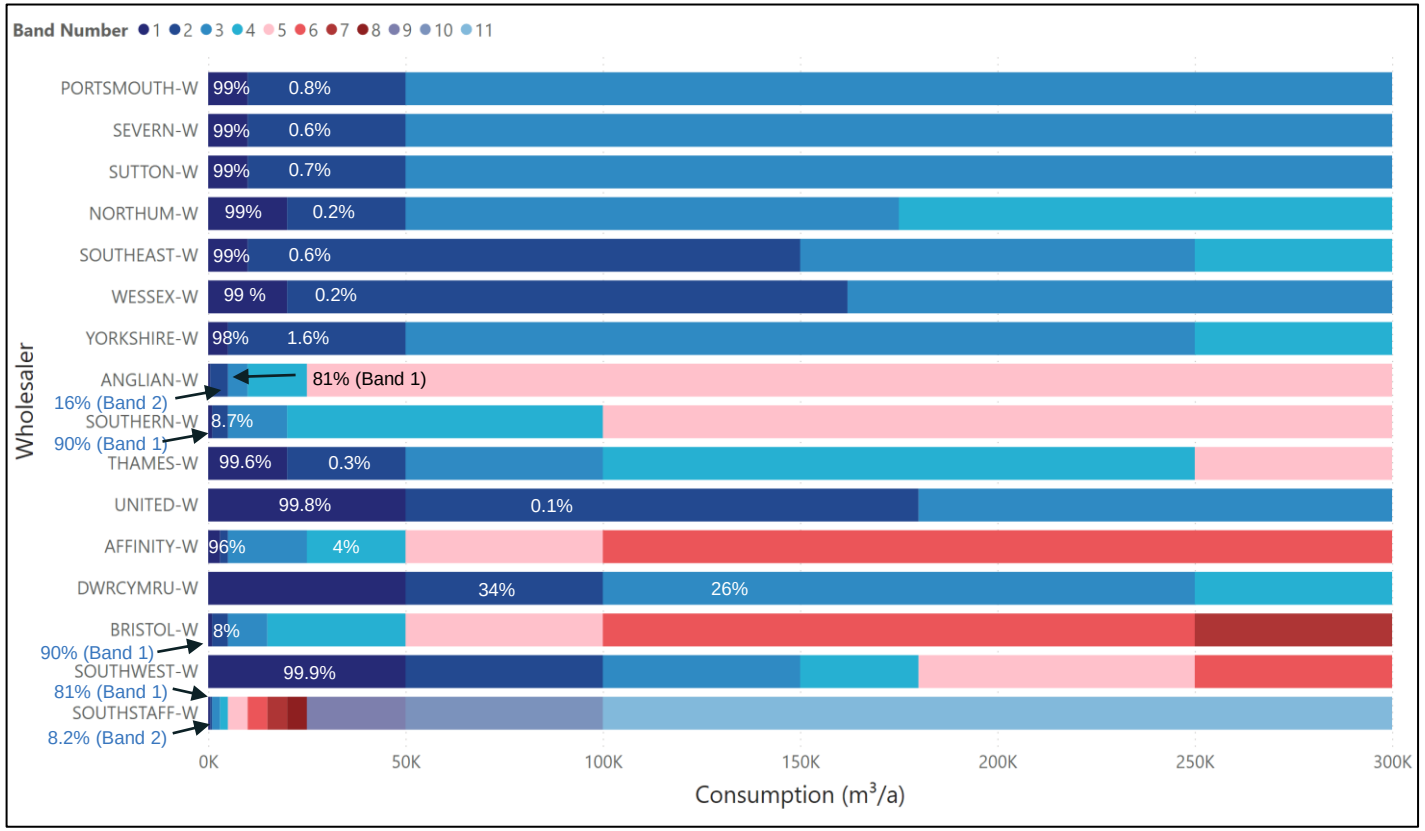
Some respondents stated that proceeding with this option would create falling block tariffs if coupled with any multi-band volumetric structure. **This option was therefore ruled out.**

There was a preference amongst the RWG sub-group overseeing the study to consider the impacts of consolidating fixed meter charges to a smaller, consistent number of bands across industry. Additional feedback included whether to remove regional variations within wholesaler areas, and to align meter sizes across water and waste to simplify bills for those customers that have different service providers.

Step 2: Review of existing tariffs: volumetric consumption bands

Our assessment of existing water volumetric bands suggested several instances of natural 'breaks' across wholesalers to help inform a view on how to simplify existing tariff structures. As shown in Figure 9, although the number of bands varies significantly (ranging from 500 - 3,000,000m^3/a), there are signs of commonality at specific intervals (e.g. 50,000m^3/a). Noting that the majority of wholesalers' responses to the RFI recommended to align water and sewerage volumetric bands moving forward, we have considered the most common existing bands for water to help infer new, simplified volumetric tariffs across both the water and sewerage sectors.

Figure 9: Detailed breakdown of consumption bands for wholesalers (water only)



Source: Individual wholesaler charging schedules for 2022-23
Note: for presentational purposes we have simplified the breakdown of volumetric consumption bands for wholesalers that also set regional tariffs:

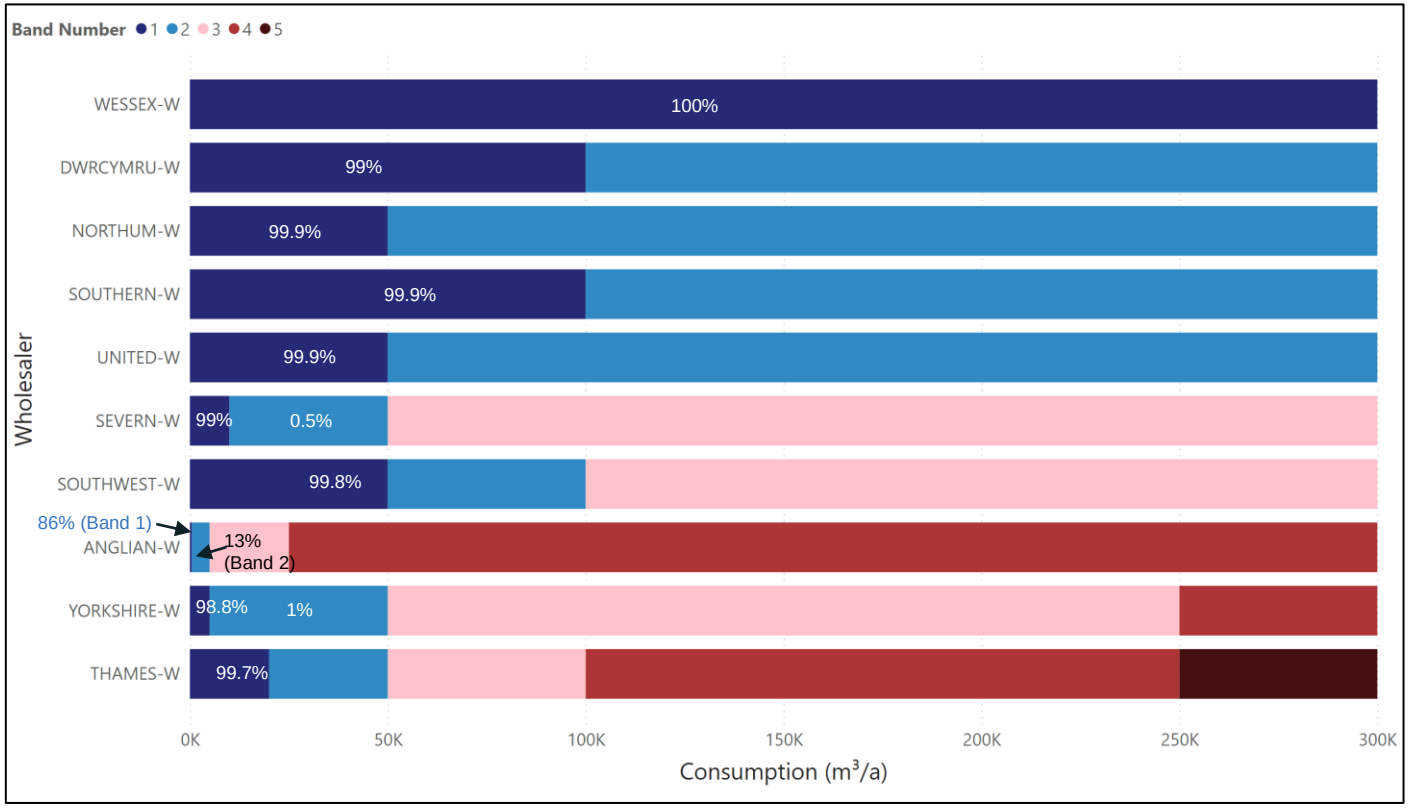
- *For Affinity, the bands shown correspond to the 'East' region only (six in total). We have not presented bands for the Central or South East region (both regions have three bands)*
- *For Anglian, the bands shown correspond to the primary Anglian region only (six in total). We have not presented bands for the Hartlepool, Northstowe or Woods Meadow & Flixton regions (two, two and four bands respectively).*
- *For Yorkshire, we only present four bands in total. The same four consumption bands are used for both the "Yorkshire" and "York" regions with different tariffs set for each area.*
- *For South East, we only present four bands in total. The same four consumption bands are used for both the "West" and "East" regions with different tariffs set for each area.*
- *For SES, we only present three bands in total. The same three consumption bands are used for both the "Northern areas 1 & 2" and "Southern" regions with different tariffs set for each area.*

The upper bands for Bristol Water, South West Water, United Utilities, Welsh Water and Wessex Water are truncated in this chart to ease comparison across wholesalers. Some bands are not shown in the visualisation but all wholesalers are ordered by increasing number of (total) bands.

Step 2: Review of existing tariffs: volumetric consumption bands (cont.)

Figure 10 presents similar analysis of existing sewerage volumetric bands across wholesalers. As shown on the previous slide there are signs of commonality at specific intervals across the companies (e.g. 50,000m³/a).

Figure 10: Detailed breakdown of consumption bands for wholesalers (sewerage only)



Source: Individual wholesaler charging schedules for 2022-23

Note: for presentational purposes we have simplified the breakdown of volumetric consumption bands for wholesalers that also set regional tariffs:

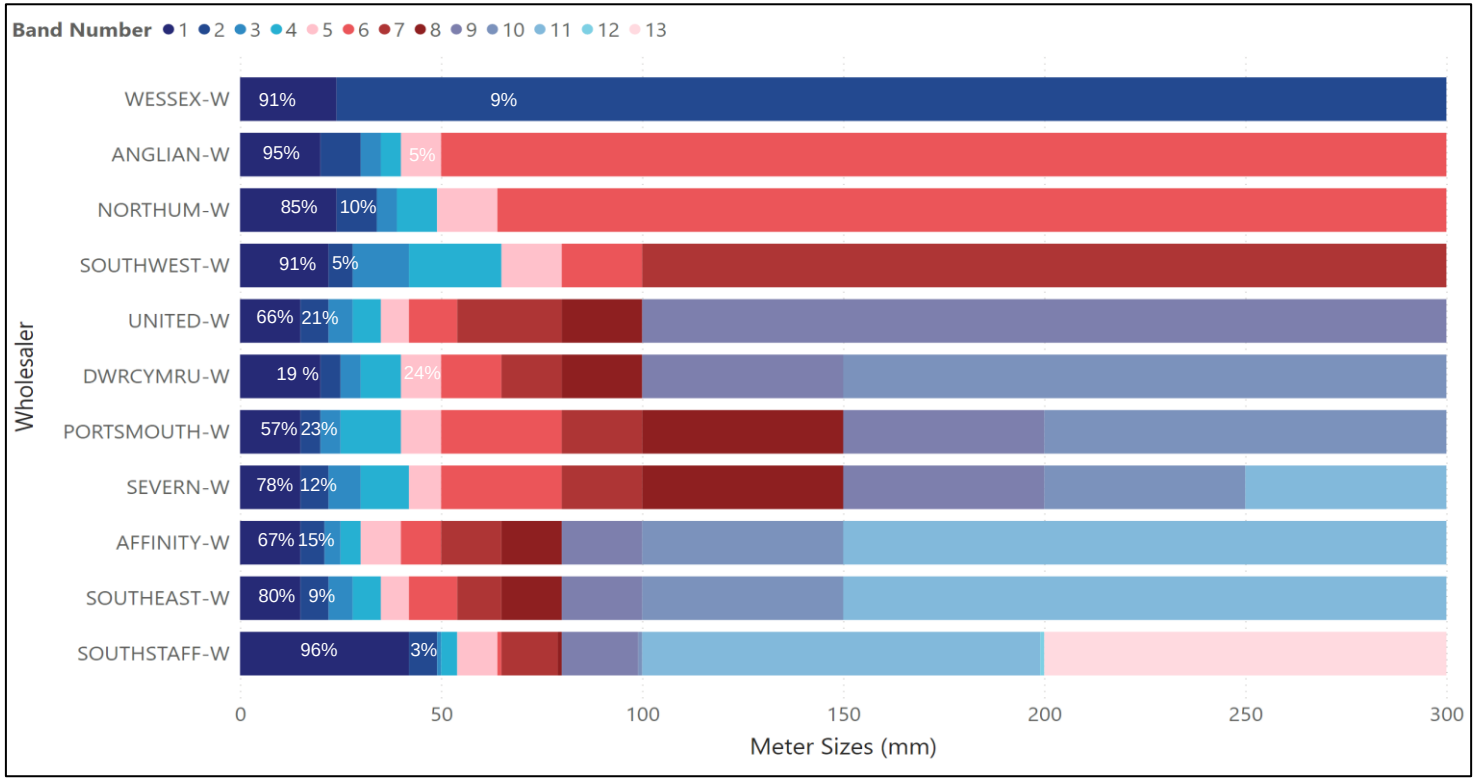
- *For Anglian, the bands shown corresponds to the primary region only (four in total). We have not presented bands for the Finningley region (one band) which is the only sub-region with volumetric sewerage charges for Anglian.*

Step 2: Review of CMOS data: distribution of SPIDs by meter size

Figure 11 shows that for fixed meter charges, a large percentage of water SPIDs are at the low end of the distribution. This is a far greater proportion than the percentage of SPIDs with a larger meter size (and hence larger fixed cost). This trend is consistent across all wholesalers, with approximately 80-85% of SPIDs falling in the 0 – 25mm meter size category. Noting that only two wholesalers currently set fixed meter charges for foul sewerage, we have not presented this breakdown on a chart, and have instead focused this analysis on water companies only.

Further, as the proportion of fixed meter charges is a relatively small proportion of the total charge issued by wholesalers (and hence end customer bill), this suggests that there is potentially greater scope to propose fewer bands when simplifying fixed meter charges across the water and sewerage sectors.

Figure 11: SPIDs by meter size, by wholesaler (water only, 2022/23)



Source: CMOS dataset

Note: for presentational purposes we have simplified the breakdown of fixed meter size bands for wholesalers that also set regional tariffs:

- *For Affinity, the bands shown correspond to the 'Central' region only (eleven in total). We have not presented bands for the East or South East region (both regions have eight bands)*
- *For Anglian, the bands shown correspond to the Woods Meadow and Flixton region only (six in total). We have not presented bands for the Northstowe, Hartlepool or Woods Meadow regions (four, one and one additional bands respectively).*
- *For Severn Trent, the bands shown correspond to Zones 1-8 only (eleven in total). We have not presented bands for Zones 9-10 (ten additional bands).*

Bristol, Southern, SES, Thames and Yorkshire Water do not set fixed meter charges and are therefore excluded from this analysis.

Step 3: Our proposed options for tariff reform (*volumetric* charges)

Having considered stakeholder feedback to the RWG's RFI and our own assessment of the CMOS data and existing tariff charges (via individual company charging statements), we have proposed a short-list of four simplification options for both water and sewerage tariffs to meet the objectives of this work.

Option 1: 0-0.5Ml, 0.5-50Ml, 50Ml+

- This option aligns wholesale tariff consumption bands to the retail sector, enabling an efficient implementation process for companies into existing billing systems. This option should also be simple for retailers to process and for customers to understand.
- By allowing for only three bands, this option does however potentially segregate a large number of users in the first tariff band (0-0.5Ml) which may cause cost reflectivity issues.

Option 2: 0-50Ml, 50-100Ml, 100-250Ml, 250Ml+

- This option is a small adjustment to that originally proposed in the RWG's RFI. Certain stakeholder feedback suggested that a structure resembling this option could improve cost reflectivity and send appropriate signals to customers incentivising greater water efficiency usage. This option would also simplify and harmonise existing tariff structures whilst still recognising the differences in costs of serving large users.

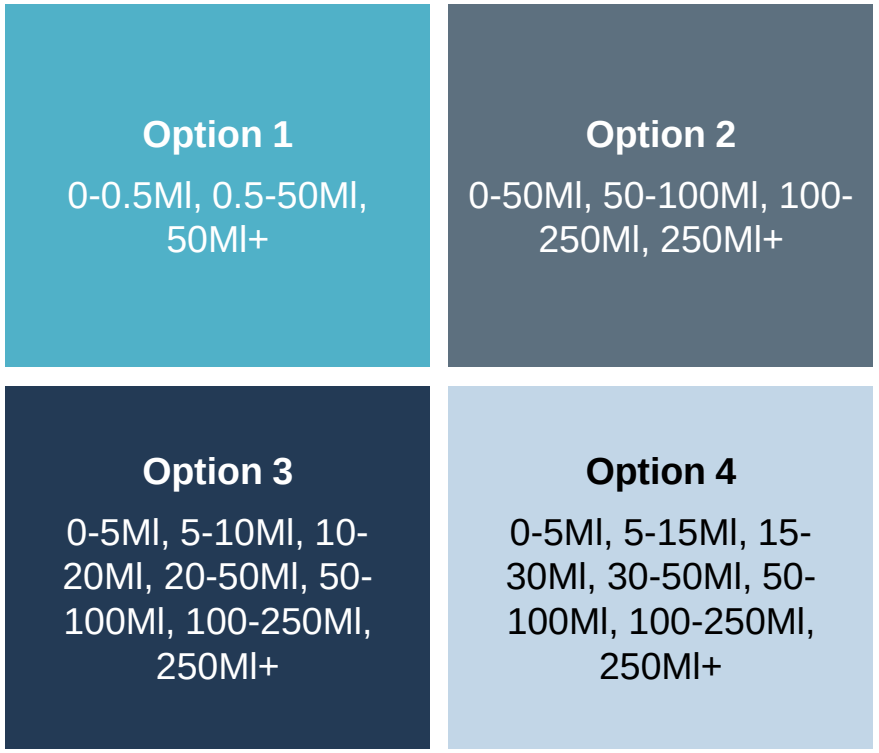
Option 3: 0-5Ml, 5-10Ml, 10-20Ml, 20-50Ml, 50-100Ml, 100-250Ml, 250Ml+

- This option is based on our assessment of existing tariff bands from wholesalers' charging statements. We have proposed the most common 'upper tariff bands' across the industry as natural break points to model simplified and harmonised tariff bands across wholesalers.

Option 4: 0-5Ml, 5-15Ml, 15-30Ml, 30-50Ml, 50-100Ml, 100-250Ml, 250Ml+

- This option is based on RFI feedback from wholesalers proposing that the options were not disaggregated enough and combined too many 'mid-users' within the 0-50Ml category.
- By providing for a greater number of disaggregated bands towards the higher end of the consumption spectrum, this should help mitigate potential harmful incidence effects from larger users and consumers should find themselves on appropriate cost-reflective tariffs as a result.

Figure 12: Short-listed options for volumetric charges simplification



Step 3: Our proposed options for tariff reform (*fixed meter* charges)

Similarly, as for volumetric consumption, we have proposed a short-list of options for simplified fixed meter charges across both water and sewerage.

Option 1: 0-25mm, 25mm+

- This option is based on our analysis of structural breaks in the CMOS meters dataset by wholesaler for 2021/22 (i.e., producing histograms for each wholesaler of SPIDs by current meter size).
- The CMOS dataset implied approximately 80 - 85% of SPIDs lie within the 0-25mm banding.

Option 2: 0-25mm, 25-100mm, 100mm+

- This option provides an additional break between 25 - 100mm to further disaggregate the meter size bandings and provide a more detailed view of potential incidence effects.
- Based on our review of the most recent NHH charging schedule documentation, fixed meter charges were considerably larger when meter sizes were in excess of 100mm, and hence this option aims to segregate those high-end customers to avoid any issues around cost reflectivity when proposing simplification options.

Option 3: 0-25mm, 25-50mm, 50-100mm, 100mm+

- This option includes an additional break for “mid-users” consuming water with a meter size between 50 - 100mm to determine whether there is any incremental benefits to including a more disaggregated split of fixed meter charges, noting the additional administrative burden this additional band may produce.

Figure 13: Short-listed options for fixed meter charges simplification

For both volumetric and fixed meter charges:

- We have designed simple options by introducing relatively few bands compared to the status quo that aim to simplify and/or harmonise charges regardless of whether there are more or fewer tariff bands for any given option.
- We have also deliberately tried to consider options to cover a range of plausible extremes – both simplifying tariff structures by implementing a small number of bands across all wholesalers, or otherwise simplification through harmonisation by adopting several common current bands across wholesalers. We considered these tariff bands/structures in an attempt to highlight the kinds of changes that would lead to significant incidence effects (and therefore which bands should be avoided).

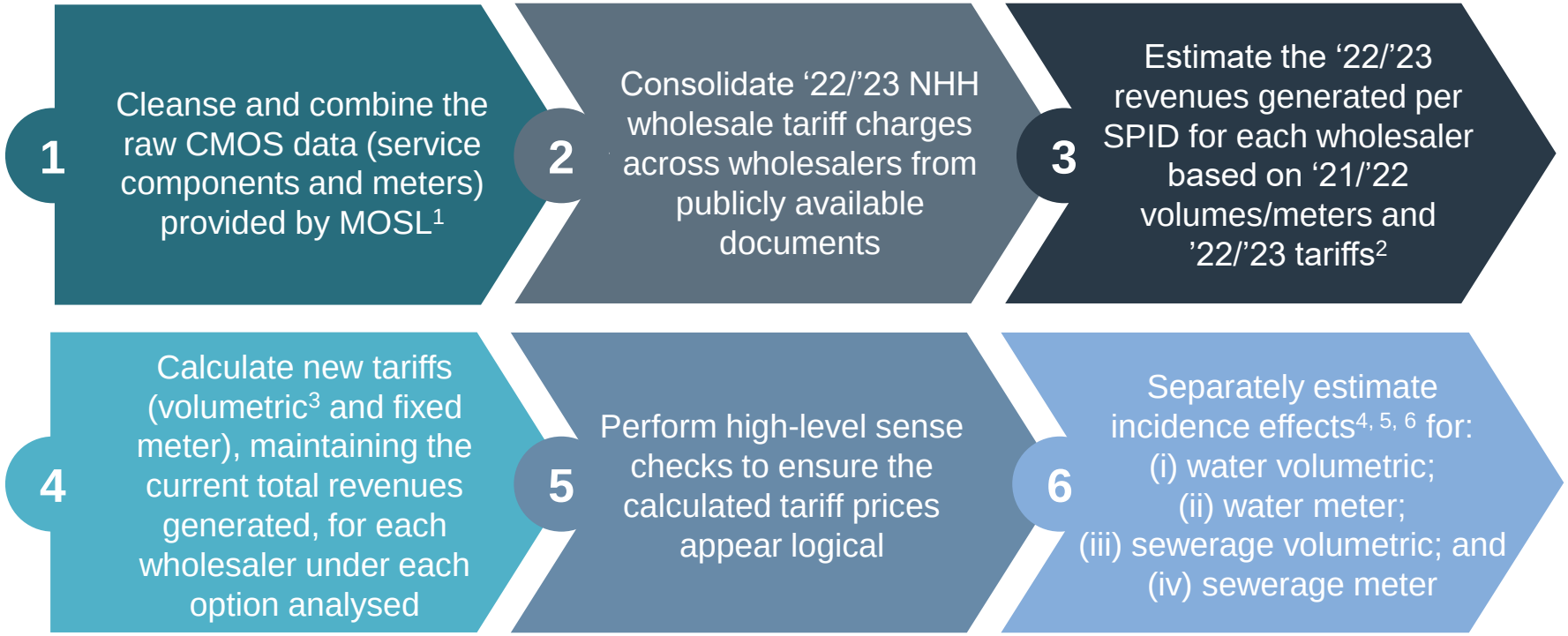
04

Modelling of options and analysis of incidence effects

Our proposed methodology to calculate incidence effects

Below we summarise the methodology that we have applied to calculate the incidence effects of implementing each short-listed option for all wholesalers, including analysis of the impact on customer bills. On the next slide we discuss each stage in further detail.

Figure 14: Overview of our methodology to calculate incidence effects



1. Details of the data cleansing steps performed and the impact on the number of SPIDs included in the analysis are provided in the Appendix.
2. As agreed between PA Consulting and the RWG on 12th October 2022, a single unit rate for all usage within each band will be calculated for new wholesaler tariff, as opposed to any "falling block" tariffs.
3. Consideration of volumetric charges did not take into account supplementary charges imposed by wholesalers
4. Incidence effects for volumetric charges were calculated for all SPIDs separately - on the rare occasions when there were multiple SPIDs for a single premise (this happens only for sewerage and on 2,554 occasions), these SPIDs were considered separately within the analysis
5. Incidence effects for fixed meter charges were calculated separately for every meter, there was no consideration of the aggregate impact on a single customer with multiple meters.
6. We have not performed any scenario or sensitivity analysis as part of our incidence effects modelling. We have focused purely on the estimated percentage change in volumetric/fixed meter charges based on how much water a customer uses. For example, we have assumed that the implied impact of customers using less water would result in a reduced overall bill, and so on

Our proposed methodology to calculate incidence effects (cont.)

Stage 1: Cleanse and combine the raw CMOS data (service components and meters) provided by MOSL

See Annex 1 for further detail on this data cleansing exercise.

Stage 2: Consolidate '22/'23 NHH wholesale tariff charges across wholesalers from publicly available documents

For this step we obtained existing NHH tariff charges from published documents for each wholesaler. We then verified these charges with individual wholesalers to confirm that we have interpreted and reflected these appropriately within our modelling.

Stage 3: Estimate the '22/'23 revenues generated per SPID for each wholesaler based on '21/'22 volumes/meters and '22/'23 tariffs[1]

We have used 2021/22 consumption data from CMOS to model the impacts of tariff reform on customer bills and revenue at an individual wholesaler level. This is the most recent full year's worth of data on consumption, customer numbers and customer characteristics. We have cross-checked this data to each of the previous three full charging years (2018/19, 2019/20 and 2020/21) to ensure that our modelling is robust and not severely impacted as a result of COVID-19. We have assumed no change in forward-looking consumption or consumer behaviour resulting from our proposed tariff changes. We have not performed any further sensitivities on this volume data as it will not impact our final results. See the slide overleaf for further information on this step.

For the purposes of our analysis we have considered the potential impact of each short-listed option on volumetric and fixed meter charges in isolation, rather than the overall combined impact on individual wholesalers and customers. This will allow us to identify certain trends and insights that may otherwise have been harder to detect, for example, whether the greater volumetric component of customer bills may lead to a greater risk of deviations of wholesalers actual revenue versus allowed revenue.

Stage 4: Calculate new tariffs (volumetric and fixed meter), maintaining the current total revenues generated, for each wholesaler under each option analysed

When calculating new water and sewerage (volumetric and fixed meter) tariffs, we have ensured that each individual wholesalers' charges produced a revenue neutral outcome when compared to the status quo i.e. they do not lead to any differences in the final revenue totals at an industry-wide, sub-sector (water/sewerage), or individual wholesaler level. This would be an important consideration for Ofwat when assessing any wholesalers' proposed reform to existing tariff charges.

Alternative approaches to enabling revenue neutrality would be far more complex and subjective to apply. For example, if we were to increase charges and hence generate additional revenues from one set of customers, we would need to consider how to factor in any offsetting adjustments to these extra revenues from another set of customers (because the total amount of revenue that the company earns, for the purposes of our analysis, shouldn't be any different as a result of the changes we are proposing to the tariffs). As previously outlined, these decisions depend on further analysis and consideration by individual companies of their own data.

Stage 5: Perform high-level sense checks to ensure the calculated tariff prices appear logical

We then ran several cross-checks to confirm that our outputs made logical sense, for example, calculating decreasing (increasing) unit rates as volumetric (fixed meter) based consumption increases. This helped to provide confidence in our final results.

Stage 6: Separately estimate incidence effects for (i) water volumetric; (ii) water meter; (iii) sewerage volumetric; and (iv) sewerage meter

1. For clarity this step refers to the revenue from volumetric and meter charges only, and not the total revenue per SPID

Stage 3: Estimate the ‘22/’23 revenues generated per SPID for each wholesaler

Review of CMOS raw data: individual wholesaler consumption volume per annum

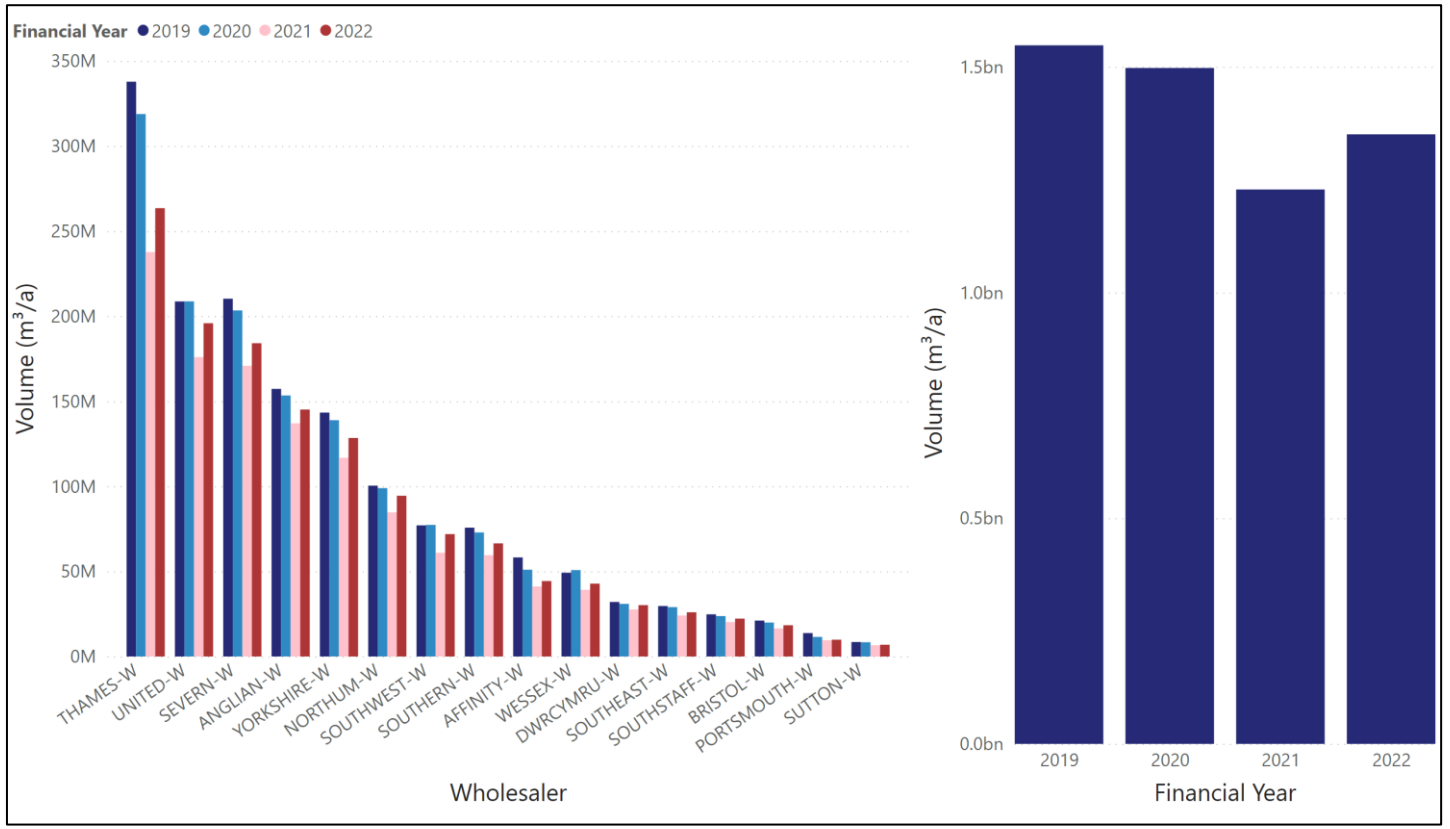
The CMOS raw data provided to us by MOSL contained 1.24 million water (potable and non-potable) SPIDs and 1.0 million sewerage SPIDs. Although there are 2.6 million registered SPIDs in total across industry as of November 2022[1], this figure factors in all service components (i.e. unmetered water and any associated paired sewerage SPIDs), both of which are out of scope for this study.

The dataset that we have used for our analysis therefore remains an exhaustive and granular set of information from which to identify appropriate options for tariff simplification.

The CMOS dataset showed that there was less measured potable water (MPW) and measured sewerage (MS) consumed during FY2020/21 across all wholesalers compared to the previous two years of full data (2018/19 and 2019/20). This was a result of reduced water consumption rather than inaccurate and/or irregular meter reads and reporting of volumes during this time period.

Individual wholesalers displayed a similar declining trend in volume across both the water and sewerage sectors over the time period assessed.

Figure 15: Volume per year (water and sewerage), by wholesaler



Source: CMOS dataset

Note the chart above reflects the raw CMOS data for water and sewerage SPIDs as provided to PA Consulting by MOSL with one data exclusion for an implausibly large volume attributed to Northumbrian Water in 2019

1. See https://mosl.co.uk/chart/chartitems/supply-points for the latest figure

Summary of calculated tariff charges for each short-listed option

The outputs below represent a sample of the new, calculated charges across each tariff simplification option (water/sewerage and volumetric/fixed meter charges). A full list of calculated tariffs by wholesaler, by option, for both volumetric and fixed meter charges are provided in the Tariff Model published by the RWG alongside this report.

Figure 16: Calculated unit rates (volumetric charges, water)

	AFFINITY-W Central					AFFINITY-W East					AFFINITY-W South East				
Consumption Band	Current	V1	V2	V3	V4	Current	V1	V2	V3	V4	Current	V1	V2	V3	V4
500 and less		£ 1.00					£ 1.69					£ 1.80			
500 to 1000															
1000 to 3000	£ 1.00					£ 1.69					£ 1.80				
3000 to 5000				£ 0.98	£ 0.98	£ 1.69			£ 1.69	£ 1.69				£ 1.78	£ 1.78
5000 to 10000				£ 0.93					£ 1.50					£ 1.68	
10000 to 15000					£ 0.93					£ 1.50					£ 1.68
15000 to 20000				£ 0.93					£ 1.50					£ 1.68	
20000 to 25000						£ 1.50									
25000 to 30000					£ 0.93					£ 1.42					£ 1.68
30000 to 50000	£ 0.93	£ 0.95	£ 0.96	£ 0.93	£ 0.93	£ 1.16	£ 1.52	£ 1.55	£ 1.22	£ 1.16	£ 1.68	£ 1.73	£ 1.74	£ 1.68	£ 1.68
50000 to 100000			£ 0.61	£ 0.61	£ 0.61	£ 1.00		£ 1.00	£ 1.00	£ 1.00			£ 1.26	£ 1.26	£ 1.26
100000 to 150000															
150000 to 162000															
162000 to 175000															
175000 to 180000															
180000 to 250000			£ 0.61	£ 0.61	£ 0.61			£ 1.00	£ 1.00	£ 1.00			£ 1.26	£ 1.26	£ 1.26
250000 to 342000															
342000 to 500000															
500000 to 750000															
750000 to 1000000															
1000000 to 3000000															
3000000 and more	£ 0.61	£ 0.61	£ 0.61	£ 0.61	£ 0.61	£ 1.00	£ 1.00	£ 1.00	£ 1.00	£ 1.00	£ 1.26	£ 1.26	£ 1.26	£ 1.26	£ 1.26

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Figure 17: Calculated unit rates (volumetric charges, sewerage)

	ANGLIAN-W ANGLIAN-W					NORTHUM-W NORTHUM-W				
Consumption Band	Current	V1	V2	V3	V4	Current	V1	V2	V3	V4
500 and less	£ 1.70	£ 1.70					£ 1.17			
500 to 5000	£ 1.65			£ 1.67	£ 1.67				£ 1.17	£ 1.17
5000 to 10000				£ 1.60					£ 1.17	
10000 to 15000					£ 1.60					£ 1.17
15000 to 20000				£ 1.60					£ 1.17	
20000 to 25000	£ 1.60									
25000 to 30000					£ 1.59					£ 1.17
30000 to 50000		£ 1.63	£ 1.64	£ 1.57	£ 1.56	£ 1.17	£ 1.17	£ 1.17	£ 1.17	£ 1.17
50000 to 100000			£ 1.56	£ 1.56	£ 1.56			£ 1.13	£ 1.13	£ 1.13
100000 to 250000			£ 1.56	£ 1.56	£ 1.56			£ 1.13	£ 1.13	£ 1.13
250000 and more	£ 1.56	£ 1.56	£ 1.56	£ 1.56	£ 1.56	£ 1.13	£ 1.13	£ 1.13	£ 1.13	£ 1.13

Summary of calculated tariff charges for each short-listed option (cont'd)

Figure 18: Calculated unit rates (fixed meter charges, water)

	AFFINITY-W Central				AFFINITY-W East				AFFINITY-W South East			
Consumption Band	Current	M1	M2	M3	Current	M1	M2	M3	Current	M1	M2	M3
15 or lower	£ 16.80				£ 16.80				£ 16.80			
15 to 20					£ 27.36				£ 27.36			
20 to 21	£ 27.36											
21 to 22												
22 to 24												
24 to 25	£ 29.40	£ 20.13	£ 20.13	£ 20.13	£ 29.40	£ 18.04	£ 18.04	£ 18.04	£ 29.40	£ 18.68	£ 18.68	£ 18.68
25 to 28												
28 to 30	£ 32.52								£ 32.52			
30 to 34												
34 to 35												
35 to 39												
39 to 40	£ 34.44				£ 34.44				£ 34.44			
40 to 42												
42 to 49												
49 to 50	£ 42.00			£ 37.15	£ 42.00			£ 37.07	£ 42.00			£ 36.81
50 to 54												
54 to 64												
64 to 65	£ 75.48											
65 to 80	£ 108.12				£ 108.12				£ 108.12			
80 to 100	£ 108.12		£ 43.59	£ 106.68	£ 108.12		£ 54.27	£ 108.12	£ 108.12		£ 50.43	£ 108.12
100 to 125												
125 to 150	£ 108.12											
150 to 199												
199 to 200												
200 to 250												
300 or higher	£ 108.12	£ 43.96	£ 108.12	£ 108.12	£ 108.12	£ 54.83	£ 108.12	£ 108.12	£ 108.12	£ 50.43	£ 50.43	£ 108.12

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Figure 19: Calculated unit rates (fixed meter charges, sewerage)

	SOUTHWEST-W			
	SOUTHWEST-W			
Consumption Band	Current	M1	M2	M3
15 or lower				
15 to 22	£ 22.07			
22 to 25		£ 22.44	£ 22.44	£ 22.44
25 to 28	£ 30.67			
28 to 30				
30 to 35				
35 to 40				
40 to 42	£ 39.06			
42 to 50				£ 39.91
50 to 54				
54 to 65	£ 64.85			
65 to 80	£ 73.26			
80 to 100	£ 81.85		£ 49.42	£ 67.18
100 to 125				
125 to 150				
150 to 200				
200 to 250				
250 or higher	£ 90.44	£ 49.78	£ 90.44	£ 90.44

KEY V1 = Option 1 (volumetric) # of SPIDs impacted '0-2% higher' = Customer bill *negatively* impacted by 0-2%

Calculated incidence effects by impact

Volumetric consumption bands, water only (option 1)

Using these calculated tariffs we were able to estimate the isolated incidence effects on customers and wholesalers from the perspective of simplifying both the volumetric and fixed meter charges.

Figure 20 presents incidence effects analysis based on volumetric consumption for water SPIDs only for Option 1. The Tariff Model presents a full suite of results in two separate forms; firstly by volume/meter (2021-22 customers are allocated a "usage bucket" based on their volume or meter size (these buckets are defined as a list of all current / new tariff upper bands under consideration[1]) with the change in unit cost calculated for a specific scenario; and secondly by impact (customers across all usage volumes and meter sizes are grouped according to the percentage change in unit costs under a given scenario). The calculations for each wholesaler are independent of one another. Annex 2 also contains additional outputs of the incidence effects analysis by volume/meter.

Figure 20: Incidence effects by impact (volumetric charges, water, option 1)

Option:	V1												
Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
AFFINITY-W	Central	-	-	-	8,893	-	-	36,594	-	2,098	-	-	-	-
AFFINITY-W	East	510	-	-	-	-	-	2,882	35	-	-	-	-	9
AFFINITY-W	South East	-	-	-	-	620	-	3,375	-	110	-	-	-	-
ANGLIAN-W	ANGLIAN-W	17,884	-	1,070	-	-	-	90,317	-	-	-	-	-	647
ANGLIAN-W	Hartlepool	-	-	-	-	-	-	1,554	-	-	-	-	-	-
ANGLIAN-W	Woods Meadow & Flixton	-	-	-	-	-	-	17	-	-	-	-	-	-
ANGLIAN-W	Northstowe	-	-	-	-	-	-	3	-	-	-	-	-	-
BRISTOL-W	BRISTOL-W	-	-	-	21	4,592	354	23,779	11	-	-	4	-	82
DWRCYMRU-W	DWRCYMRU-W	77	-	12	-	-	-	27	-	7	-	-	-	5
NORTHUM-W	NORTHUM-W	93	-	-	-	-	16,262	67,034	-	-	140	32	-	-
PORTSMOUTH-W	PORTSMOUTH-W	-	-	-	-	-	2,394	9,730	-	97	-	-	-	-
SEVERN-W	SEVERN-W	-	-	-	29,619	-	-	128,078	-	-	-	-	-	991
SOUTHEAST-W	East	-	-	-	5,241	-	13	23,453	4	1	-	-	-	132
SOUTHEAST-W	West	-	-	-	2,764	11	-	9,515	5	-	-	-	-	77
SOUTHERN-W	SOUTHERN-W	-	36	-	3,966	-	-	37,051	3,758	703	21	-	98	-
SOUTHSTAFF-W	SOUTHSTAFF-W	-	-	-	-	-	-	33,276	-	-	-	-	-	-
SOUTHWEST-W	SOUTHWEST-W	-	5	38	2	-	-	64,990	-	-	-	-	-	4
SUTTON-W	Southern	-	-	-	-	1,425	-	4,769	-	-	-	-	-	51
SUTTON-W	Northern areas 1&2	-	-	-	-	918	-	3,284	-	-	-	-	-	20
THAMES-W	THAMES-W	-	-	-	161	-	33,231	113,188	-	-	-	484	-	12
UNITED-W	UNITED-W	211	-	-	-	-	-	143,813	-	-	-	-	-	11
WESSEX-W	WESSEX-W	-	28	-	-	-	6,372	31,503	-	10	-	-	-	59
YORKSHIRE-W	YORKSHIRE-W	113	-	-	-	-	-	101,231	-	-	-	28	-	-
YORKSHIRE-W	York	-	-	-	-	2	-	4,155	-	1	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Note: Hafren Dyfrdwy have been excluded from the incidence effects analysis for water on the basis that they had 16 SPIDs in the CMOS dataset and hence the modelled outputs could not be robustly interpreted

1. For example, the volumetric consumption "buckets" are defined as: 'up to 500m³/a'; '500-1000m³/a'; '1000-3000m³/a'…through to '3,000,000m³/a and above', whereas meter "buckets" are defined as 'up to 15mm'; '15-20mm'…through to '300mm and above'

Detailed insights from incidence effects analysis

Volumetric consumption bands, water only (option 1)

In summary, there are a small number of customers across specific wholesalers who are materially negatively impacted as a result of the proposed simplification and/or harmonisation of volumetric charges.

Below we provide additional detail and interpretation of the key insights generated from our incidence effects modelling for simplifying volumetric consumption bands under Option 1 for water.

Volumetric charges – Option 1 (water)

- Under each of the modelled simplification options, the vast majority of customers (especially the smallest customers) remain unaffected – and only a very small percentage of those that are adversely affected exhibit an increase in their volumetric charges in excess of 5%
- Option 1 negatively affects the fewest SPIDs of all 4 modelled options, however, the proportion of revenue affected was the highest of the modelled options
- Option 1 (as well as Options 3 and 4) had more “winners” than “losers”. This suggests that the “losers” lose by more than the “winners” win
- A small number of large or very larger users pay higher prices whereas a higher number of smaller or medium consumers pay lower prices

- Option 1 adversely affects the fewest SPIDs of all 4 modelled options, however, the proportion of revenue affected was the highest of the modelled options. This is because there are relatively few incidence effects from inserting a threshold at 0.5Ml because for most wholesalers, the same volumetric unit rate continues to apply either side of this band, and therefore the vast majority of existing customers fall within this band.
- Most wholesalers also already have a threshold at 50Ml, and therefore there are few incidence effects as a result of creating this threshold. However, there are some incidence effects observed in wholesalers where Option 1 merges existing bands. The most significant incidence effects in Option 1 arise from merging together all existing bands above 50Ml, which in most wholesale areas leads to a new average tariff rate that covers a much greater volume of consumption compared to the status quo.
- Consequently, under each proposed simplified and/or harmonised consumption band, users towards the upper limit or bound within each banding (in this case 50Ml+) will be paying more than before relative to those users closer to the lower end or average within the same band. This is because the prevalence of economies of scale/cost abatement regarding the small-bore network for larger customers is diluted when combined with smaller network users. Although the unit cost paid will be the same within each proposed band, those consuming more water will be paying a higher absolute amount overall.
- The effect is greatest in wholesale regions that currently have the greatest number of large user bands and/or currently have the greatest differential between medium and large user tariff rates. The largest subset of customers most positively impacted under Option 1 were registered with Anglian Water, where almost 18,000 SPIDs saw a relatively large (>10%) reduction in the volumetric element of their water bill. This cost reduction was funded by 647 larger users for Anglian paying >10% more on their volumetric consumption for water. Almost 30,000 Severn Trent SPIDs were estimated to pay 4-6% less on their volumetric consumption which was to be funded by 991 medium user customers paying >10% more.
- The magnitude of this impact on large users is noticeably less in each of the other modelled options, as Options 2-4 all disaggregate users over 50Ml into 3 bands.

KEY V2 = Option 2 (volumetric) # of SPIDs impacted '0-2% higher' = Customer bill *negatively* impacted by 0-2%

Calculated incidence effects by impact (cont.)

Volumetric consumption bands, water only (option 2)

Figure 21: Incidence effects by impact (volumetric charges, water, option 2)

Option: V2

Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
AFFINITY-W	Central	-	-	-	-	45,420	-	67	-	2,098	-	-	-	-
AFFINITY-W	East	-	3,387	-	-	-	-	5	-	35	-	-	-	9
AFFINITY-W	South East	-	-	-	-	3,987	-	8	-	110	-	-	-	-
ANGLIAN-W	ANGLIAN-W	90,166	17,884	-	-	1,070	-	151	-	-	-	-	-	647
ANGLIAN-W	Hartlepool	-	-	-	-	-	-	1,554	-	-	-	-	-	-
ANGLIAN-W	Woods Meadow & Flixton	-	-	-	-	-	-	17	-	-	-	-	-	-
ANGLIAN-W	Northstowe	-	-	-	-	-	-	3	-	-	-	-	-	-
BRISTOL-W	BRISTOL-W	-	-	-	-	26,061	2,664	36	-	-	-	-	-	82
DWRCYMRU-W	DWRCYMRU-W	12	-	-	-	7	-	104	-	-	-	5	-	-
NORTHUM-W	NORTHUM-W	-	-	-	35	-	83,296	83	-	-	140	-	-	7
PORTSMOUTH-W	PORTSMOUTH-W	-	-	-	-	-	12,099	25	-	97	-	-	-	-
SEVERN-W	SEVERN-W	-	-	-	157,521	-	-	176	-	-	-	-	-	991
SOUTHEAST-W	East	-	-	-	-	28,694	2	12	4	-	-	-	-	132
SOUTHEAST-W	West	-	-	-	-	12,279	2	11	3	-	-	-	-	77
SOUTHERN-W	SOUTHERN-W	-	-	-	3,966	-	-	57	40,809	703	-	-	98	-
SOUTHSTAFF-W	SOUTHSTAFF-W	-	-	-	-	-	-	33,276	-	-	-	-	-	-
SOUTHWEST-W	SOUTHWEST-W	-	-	-	-	5	-	65,020	12	2	-	-	-	-
SUTTON-W	Southern	-	-	-	-	6,191	-	3	-	-	-	-	-	51
SUTTON-W	Northern areas 1&2	-	-	-	-	4,199	-	3	-	-	-	-	-	20
THAMES-W	THAMES-W	-	-	-	-	-	146,419	173	-	-	-	484	-	-
UNITED-W	UNITED-W	23	-	-	-	59	-	143,917	-	-	25	-	11	-
WESSEX-W	WESSEX-W	-	-	10	-	-	37,875	22	-	-	6	-	1	58
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	-	-	101,372	-	-	-	-	-	-
YORKSHIRE-W	York	-	-	-	-	-	-	4,158	-	-	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Detailed insights from incidence effects analysis

Volumetric consumption bands, water only (option 2)

Volumetric charges – Option 2 (water)

- Option 2 has the greatest incidence effects across each modelled option
- The most positive incidence effects were for SPIDs registered to Anglian Water and Severn Trent
- However, there were also examples of increased adverse incidence effects, particularly for those wholesalers with existing bands below 50Ml

- Option 2 affected more SPIDs than Option 1, however, these changes impacted smaller customers and the total water usage with positive / negative incidence effects remained similar. This is because Option 2 merges all SPIDs below 50Ml, and therefore the greatest impacts are observed in wholesalers that currently have existing bands below 50Ml.
- Option 2 has the greatest incidence effects across each modelled option, with the majority of SPIDs positively impacted i.e. estimated to pay less on the volumetric element of their water bill.
- For example, similar to Option 1, although the most positive incidence effects were seen by SPIDs registered to Anglian Water and Severn Trent, in both cases the increase in charges for the same large user customers were now funding an even larger proportion of SPIDs who were now paying reduced unit rates on their volumetric consumption of water.
- However, there were also examples of increased adverse incidence effects under this option. Southern Water saw 37,000 more SPIDs paying 0-2% higher on their unit rate of consumption compared to Option 1 as a result of the additional band modelled under this option.
- The impact of this option is less severe for larger customers for wholesalers such as United Utilities and Thames, as these companies already have existing bands which disaggregate very large users.

KEY V3 = Option 3 (volumetric) # of SPIDs impacted '0-2% higher' = Customer bill *negatively* impacted by 0-2%

Calculated incidence effects by impact (cont.)

Volumetric consumption bands, water only (option 3)

Figure 22: Incidence effects by impact (volumetric charges, water, option 3)

Option: V3

Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
AFFINITY-W	Central	-	-	-	-	-	45,420	1,200	-	-	965	-	-	-
AFFINITY-W	East	3	-	-	-	-	-	3,424	-	-	9	-	-	-
AFFINITY-W	South East	-	-	-	-	-	3,987	66	-	-	52	-	-	-
ANGLIAN-W	ANGLIAN-W	87	-	-	90,166	-	-	1,643	-	17,884	-	-	-	138
ANGLIAN-W	Hartlepool	-	-	-	-	-	-	1,554	-	-	-	-	-	-
ANGLIAN-W	Woods Meadow & Flixton	-	-	-	-	-	-	17	-	-	-	-	-	-
ANGLIAN-W	Northstowe	-	-	-	-	-	-	3	-	-	-	-	-	-
BRISTOL-W	BRISTOL-W	-	-	-	87	-	26,061	344	2,310	-	-	41	-	-
DWRCYMRU-W	DWRCYMRU-W	12	-	-	-	7	-	104	-	-	-	5	-	-
NORTHUM-W	NORTHUM-W	-	-	-	35	-	-	83,519	-	-	-	-	-	7
PORTSMOUTH-W	PORTSMOUTH-W	-	-	-	-	-	-	12,221	-	-	-	-	-	-
SEVERN-W	SEVERN-W	-	-	-	-	-	-	158,688	-	-	-	-	-	-
SOUTHEAST-W	East	-	-	-	-	-	2	28,838	4	-	-	-	-	-
SOUTHEAST-W	West	-	-	-	-	-	2	12,367	3	-	-	-	-	-
SOUTHERN-W	SOUTHERN-W	-	-	-	-	3,966	-	858	-	40,809	-	-	-	-
SOUTHSTAFF-W	SOUTHSTAFF-W	-	-	-	-	-	-	33,276	-	-	-	-	-	-
SOUTHWEST-W	SOUTHWEST-W	-	-	-	-	5	-	65,020	12	2	-	-	-	-
SUTTON-W	Southern	-	-	-	-	-	-	6,245	-	-	-	-	-	-
SUTTON-W	Northern areas 1&2	-	-	-	-	-	-	4,222	-	-	-	-	-	-
THAMES-W	THAMES-W	-	-	-	-	-	-	147,076	-	-	-	-	-	-
UNITED-W	UNITED-W	23	-	-	-	59	-	143,917	-	-	25	-	11	-
WESSEX-W	WESSEX-W	-	-	10	-	-	-	37,955	-	-	6	-	1	-
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	-	-	101,372	-	-	-	-	-	-
YORKSHIRE-W	York	-	-	-	-	-	-	4,158	-	-	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

KEY V4 = Option 4 (volumetric) # of SPIDs impacted '0-2% higher' = Customer bill *negatively* impacted by 0-2%

Calculated incidence effects by impact (cont.)

Volumetric consumption bands, water only (option 4)

Figure 23: Incidence effects by impact (volumetric charges, water, option 4)

Option: V4

Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
AFFINITY-W	Central	-	-	-	-	-	45,420	1,200	-	-	965	-	-	-
AFFINITY-W	East	-	-	-	9	-	-	3,425	-	-	-	-	-	2
AFFINITY-W	South East	-	-	-	-	-	3,987	66	-	-	52	-	-	-
ANGLIAN-W	ANGLIAN-W	-	232	1,070	90,166	-	-	240	-	17,884	-	-	-	326
ANGLIAN-W	Hartlepool	-	-	-	-	-	-	1,554	-	-	-	-	-	-
ANGLIAN-W	Woods Meadow & Flixton	-	-	-	-	-	-	17	-	-	-	-	-	-
ANGLIAN-W	Northstowe	-	-	-	-	-	-	3	-	-	-	-	-	-
BRISTOL-W	BRISTOL-W	-	-	-	-	-	26,061	472	2,310	-	-	-	-	-
DWRCYMRU-W	DWRCYMRU-W	12	-	-	-	7	-	104	-	-	-	5	-	-
NORTHUM-W	NORTHUM-W	-	-	-	35	95	-	83,353	-	71	-	-	-	7
PORTSMOUTH-W	PORTSMOUTH-W	-	-	-	-	-	152	12,023	46	-	-	-	-	-
SEVERN-W	SEVERN-W	-	-	1,602	-	-	-	156,617	-	-	-	-	-	469
SOUTHEAST-W	East	-	-	-	263	-	2	28,519	4	-	-	-	-	56
SOUTHEAST-W	West	-	-	-	176	-	2	12,158	3	-	-	-	-	33
SOUTHERN-W	SOUTHERN-W	-	-	-	-	4,043	-	734	-	40,856	-	-	-	-
SOUTHSTAFF-W	SOUTHSTAFF-W	-	-	-	-	-	-	33,276	-	-	-	-	-	-
SOUTHWEST-W	SOUTHWEST-W	-	-	-	-	5	-	65,020	12	2	-	-	-	-
SUTTON-W	Southern	-	-	-	66	-	-	6,152	-	-	-	-	27	-
SUTTON-W	Northern areas 1&2	-	-	-	-	40	-	4,174	-	-	-	-	-	8
THAMES-W	THAMES-W	-	-	-	331	-	-	146,445	-	-	300	-	-	-
UNITED-W	UNITED-W	23	-	-	-	59	-	143,917	-	-	25	-	11	-
WESSEX-W	WESSEX-W	-	-	42	-	-	-	37,889	-	-	40	-	1	-
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	-	-	101,372	-	-	-	-	-	-
YORKSHIRE-W	York	-	-	-	-	-	-	4,158	-	-	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Detailed insights from incidence effects analysis

Volumetric consumption bands, water only (options 3 and 4)

Volumetric charges – Options 3 and 4 (water)

- Options 3 and 4 have very similar incidence effects due to the small difference in bands modelled (7 bands in each)
- Relative to Option 1, Options 3 and 4 had more SPIDs impacted in terms of incidence effects, but the magnitude of these were smaller (very few SPIDs saw a change in excess of 6%)
- Under all options there are more “winners” than “losers”. This suggests that the “losers” lose by more than the “winners” win

- Options 3 and 4 generated very similar incidence effects. Both options have a large proportion of customers volumetric element of their water bill unchanged due to the higher number of disaggregated bands modelled within each option (7 bands in total).
- Relative to Option 1, Options 3 and 4 had more SPIDs impacted in terms of incidence effects, but the magnitude of these were smaller, and hence the revenue impact was smaller i.e. a greater proportion of SPIDs were estimated to pay *slightly more* or *slightly less* than their status quo position, as opposed to more significant changes to the volumetric element on their existing bill (very few SPIDs saw a change in excess of 6%).
- This is because of the greater number of consumption bands that were modelled in Options 3 and 4 relative to Options 1 and 2, which meant that if customers were estimated to be moved onto a different tariff (whether that be higher or lower), the change in the volumetric unit rate that these customers would be paying for water was smaller compared to an Option with fewer disaggregated bands where the magnitude of the change in the unit rate would be more significant.

KEY 'Vx' = Option x (volumetric) # of SPIDs impacted '0-2% higher' = Customer bill *negatively* impacted by 0-2%

Calculated incidence effects by impact (cont.)

Volumetric consumption bands, sewerage only (options 1 and 2)

Figure 24: Incidence effects by impact (volumetric charges, sewerage, option 1)

Option:	V1												
Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
ANGLIAN-W	ANGLIAN-W	-	-	-	-	-	14,598	95,668	1,090	-	81	-	-	-
NORTHUM-W	NORTHUM-W	-	-	-	-	-	-	44,002	-	-	-	-	-	-
SEVERN-W	SEVERN-W	-	-	-	-	-	24,328	123,194	718	-	-	-	-	-
SOUTHERN-W	SOUTHERN-W	33	-	-	-	-	-	70,122	-	-	-	-	-	14
SOUTHWEST-W	SOUTHWEST-W	-	-	-	-	27	-	36,013	28	-	-	-	-	-
THAMES-W	THAMES-W	-	137	-	-	-	-	198,829	-	-	-	-	-	55
UNITED-W	UNITED-W	-	-	-	-	-	-	122,773	-	-	-	-	-	-
WESSEX-W	WESSEX-W	-	-	-	-	-	-	52,025	-	-	-	-	-	-
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	41	-	88,232	-	5	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Figure 25: Incidence effects by impact (volumetric charges, sewerage, option 2)

Option:	V2												
Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
ANGLIAN-W	ANGLIAN-W	-	-	-	-	95,602	14,598	66	-	1,090	81	-	-	-
NORTHUM-W	NORTHUM-W	-	-	-	-	-	-	44,002	-	-	-	-	-	-
SEVERN-W	SEVERN-W	-	-	-	-	-	147,426	96	718	-	-	-	-	-
SOUTHERN-W	SOUTHERN-W	-	-	-	-	-	-	70,169	-	-	-	-	-	-
SOUTHWEST-W	SOUTHWEST-W	-	-	-	-	-	-	36,068	-	-	-	-	-	-
THAMES-W	THAMES-W	-	-	-	-	-	-	199,021	-	-	-	-	-	-
UNITED-W	UNITED-W	-	-	-	-	-	-	122,773	-	-	-	-	-	-
WESSEX-W	WESSEX-W	-	-	-	-	-	-	52,025	-	-	-	-	-	-
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	-	-	88,278	-	-	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

KEY 'Vx' = Option x (volumetric) # of SPIDs impacted '0-2% higher' = Customer bill *negatively* impacted by 0-2%

Calculated incidence effects by impact (cont.)

Volumetric consumption bands, sewerage only (options 3 and 4)

Figure 26: Incidence effects by impact (volumetric charges, sewerage, option 3)

Option: V3														
Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
ANGLIAN-W	ANGLIAN-W	-	-	-	-	39	95,602	1,117	14,679	-	-	-	-	-
NORTHUM-W	NORTHUM-W	-	-	-	-	-	-	44,002	-	-	-	-	-	-
SEVERN-W	SEVERN-W	-	-	-	-	-	-	148,240	-	-	-	-	-	-
SOUTHERN-W	SOUTHERN-W	-	-	-	-	-	-	70,169	-	-	-	-	-	-
SOUTHWEST-W	SOUTHWEST-W	-	-	-	-	-	-	36,068	-	-	-	-	-	-
THAMES-W	THAMES-W	-	-	-	-	-	-	199,021	-	-	-	-	-	-
UNITED-W	UNITED-W	-	-	-	-	-	-	122,773	-	-	-	-	-	-
WESSEX-W	WESSEX-W	-	-	-	-	-	-	52,025	-	-	-	-	-	-
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	-	-	88,278	-	-	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Figure 27: Incidence effects by impact (volumetric charges, sewerage, option 4)

Option: V4														
Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
ANGLIAN-W	ANGLIAN-W	-	-	-	-	-	95,719	1,089	14,598	31	-	-	-	-
NORTHUM-W	NORTHUM-W	-	-	-	-	-	-	44,002	-	-	-	-	-	-
SEVERN-W	SEVERN-W	-	-	-	-	-	1,246	146,610	384	-	-	-	-	-
SOUTHERN-W	SOUTHERN-W	-	-	-	-	-	-	70,169	-	-	-	-	-	-
SOUTHWEST-W	SOUTHWEST-W	-	-	-	-	-	-	36,068	-	-	-	-	-	-
THAMES-W	THAMES-W	-	-	-	-	-	-	199,021	-	-	-	-	-	-
UNITED-W	UNITED-W	-	-	-	-	-	-	122,773	-	-	-	-	-	-
WESSEX-W	WESSEX-W	-	-	-	-	-	-	52,025	-	-	-	-	-	-
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	-	-	88,278	-	-	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Note:

- *As opposed to the incidence effects analysis for the water companies, the incidence effects analysis for sewerage presents outputs for only those wholesalers registered as regional sewerage undertakers as according to the Water Industry Act 1991, as of 19 December 2022*
- *Welsh Water and Hafren Dyfrdwy have been excluded from the incidence effects analysis for sewerage as the CMOS dataset showed disproportionately few SPIDs for these wholesalers*
- *With the exception of Anglian Water, each wholesaler that carries out sewerage activities has one geographical region that it provides services to (Anglian also covers the Finningley region). However, as the CMOS dataset showed no registered SPIDs associated with Finningley, we only display one region for Anglian Water in the incidence effects analysis above*

Detailed insights from incidence effects analysis

Volumetric consumption bands, sewerage only

Volumetric charges (Options 1-4, sewerage)

- Under each of the modelled simplification options, the vast majority of customers (especially the smallest customers) are unaffected
- Option 1 had the least impact on customers volumetric element of their sewerage bill
- As with the volumetric consumption incidence effects analysis for water, Option 2 has the greatest positive incidence effects across each modelled option
- As with the volumetric consumption incidence effects analysis for water, Options 3 and 4 for sewerage have very similar incidence effects
- The incidence effects analysis indicates Anglian Water and Severn Trent have the most impact on their sewerage SPIDs under each of the modelled options

- Under each of the modelled simplification options, the vast majority of customers (especially the smallest customers) are unaffected – and only a very small percentage of those that are negatively affected exhibit an increase in their volumetric charges in excess of 5%
- For sewerage, Option 1 had the least impact on the volumetric element of customers' sewerage bills. Anglian Water and Severn Trent have a proportion of their SPIDs paying less as a result of this modelled option, funded by a smaller proportion of customers who were paying between 0 – 6% higher as a result. Several wholesalers including United Utilities, Wessex and Northumbrian have no change to their sewerage charges under this modelled option.
- As with the volumetric consumption incidence effects analysis for water, Option 2 has the greatest positive incidence effects across each modelled option, with a significant proportion of Anglian Water and Severn Trent's customers estimated to pay less on the volumetric element of their sewerage bill. The remaining wholesalers have no impact on their sewerage charge under this modelled option.
- Options 3 and 4 have very similar incidence effects for sewerage and hence we only present detailed analysis for Option 3 on the previous slide. Each option has a large proportion of customers with unchanged volumetric elements of their sewerage bills due to the higher number of disaggregated bands modelled within each option (7 bands in total).
- As with Option 2 for sewerage, only Anglian Water and Severn Trent showed any resulting impact on the volumetric element of their sewerage charge under these Options 3 and 4. Under Option 3, Anglian Water were the only wholesaler to show any impact on their customers. The bill impacts were relatively small under each option, with 39 SPIDs (positively) impacted by more than 2% (2-4%) under Option 3, and 31 SPIDs (negatively) impacted by more than 2% (2-4%) under Option 4.

Incidence effects: customer impact of each option for *volumetric* charges

Below we present industry aggregate incidence effects for volumetric consumption based on the short-listed options on page 33 compared to wholesalers existing tariff structures. The stylised modelling results show that for example, under Option 1 for water, 13% of SPIDs see a reduction in their current bill (i.e. are "positively impacted").

Figure 28: Summary of incidence effects on customers (volumetric charges)

	Option 1 0-0.5Ml, 0.5-50Ml, 50Ml+	Option 2 0-50Ml, 50-100Ml, 100-250Ml, 250Ml+	Option 3 0-5Ml, 5-10Ml, 10-20Ml, 20-50Ml, 50-100Ml, 100-250Ml, 250Ml+	Option 4 0-5Ml, 5-15Ml, 15-30Ml, 30-50Ml, 50-100Ml, 100-250Ml, 250Ml+
Water				
# SPIDs			**1,080,303**	
Positively* impacted	136,938 (13%) *(39% total volume)*	683,333 (63%) *(40% total volume)*	169,932 (16%) *(9% total volume)*	173,900 (16%) *(13% total volume)*
Unchanged	933,618 (86%) *(38% total volume)*	350,083 (32%) *(39% total volume)*	847,859 (79%) *(76% total volume)*	842,694 (78%) *(70% total volume)*
Negatively impacted	9,747 (1%) *(23% total volume)*	46,887 (4%) *(21% total volume)*	62,512 (6%) *(15% total volume)*	63,709 (6%) *(17% total volume)*
Sewerage				
# SPIDs			**872,013**	
Positively impacted	39,164 (4%) *(16% total volume)*	257,654 (30%) *(18% total volume)*	95,669 (11%) *(3% total volume)*	96,993 (11%) *(5% total volume)*
Unchanged	830,858 (95%) *(75% total volume)*	612,470 (70%) *(77% total volume)*	761,665 (87%) *(92% total volume)*	760,007 (87%) *(90% total volume)*
Negatively impacted	1,991 (0%) *(9% total volume)*	1,889 (0%) *(5% total volume)*	14,679 (2%) *(5% total volume)*	15,013 (2%) *(5% total volume)*

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

**Positively* impacted in this context means that end bills are *lower; negatively* impacted means that end bills are *higher*

Note: Where the consumption volume is recorded as zero the SPIDs associated with these volumes have been removed from the volumetric analysis to ease the calculation of unit costs

KEY M1 = Option 1 (meters) # of SPIDs impacted '0-2% higher' = Customer bill *negatively* impacted by 0-2%

Calculated incidence effects by impact (cont.)

Fixed meter charges, water only[1] (option 1)

Below we present incidence effects analysis for fixed meter charges for water SPIDs only for option 1. Options 2 and 3 can be found on the subsequent slides.

Figure 29: Incidence effects by impact (fixed meter charges, water, option 1)

Option:	M1												
Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
AFFINITY-W	Central	14,979	-	-	-	-	-	-	-	-	1,382	-	-	37,137
AFFINITY-W	East	441	-	-	-	-	-	-	-	-	-	3,360	-	72
AFFINITY-W	South East	805	-	-	-	-	-	-	-	-	-	-	-	3,974
ANGLIAN-W	ANGLIAN-W	-	-	-	-	-	-	126,077	-	-	-	-	-	-
ANGLIAN-W	Hartlepool	-	-	-	-	-	-	1,848	-	-	-	-	-	-
ANGLIAN-W	Woods Meadow & Flixton	-	-	-	-	-	-	21	-	-	-	-	-	-
ANGLIAN-W	Northstowe	-	-	-	-	-	-	7	-	-	-	-	-	-
BRISTOL-W	BRISTOL-W	-	-	-	-	-	-	34,404	-	-	-	-	-	-
DWRCYMRU-W	DWRCYMRU-W	148	-	-	-	-	-	-	-	-	-	17	-	223
NORTHUM-W	NORTHUM-W	10,419	-	-	-	-	-	-	-	-	-	83,156	-	4,794
PORTSMOUTH-W	PORTSMOUTH-W	1,924	-	-	-	-	-	-	-	-	-	-	-	12,383
SEVERN-W	SEVERN-W	7,840	-	-	-	-	-	-	167,713	-	-	-	-	12,084
SOUTHEAST-W	East	4,492	542	-	-	-	-	-	-	-	-	-	-	29,056
SOUTHEAST-W	West	3,103	2	-	-	-	-	-	423	-	-	-	-	11,222
SOUTHERN-W	SOUTHERN-W	-	-	-	-	-	-	52,194	-	-	-	-	-	-
SOUTHSTAFF-W	SOUTHSTAFF-W	461	-	-	-	-	-	35,464	-	-	-	-	-	2,675
SOUTHWEST-W	SOUTHWEST-W	4,904	-	-	-	-	-	-	-	70,700	-	-	-	1,722
SUTTON-W	Southern	-	-	-	-	-	-	6,927	-	-	-	-	-	-
SUTTON-W	Northern areas 1&2	-	-	-	-	-	-	4,583	-	-	-	-	-	-
THAMES-W	THAMES-W	-	-	-	-	-	-	178,612	-	-	-	-	-	-
UNITED-W	UNITED-W	14,643	1,757	-	-	-	-	-	-	-	-	36,085	112,211	4,878
WESSEX-W	WESSEX-W	2,301	-	-	-	-	-	1,628	-	-	-	-	-	40,754
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	-	-	121,444	-	-	-	-	-	-
YORKSHIRE-W	York	-	-	-	-	-	-	4,860	-	-	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

1. Noting that only two wholesalers' set fixed meter charges for sewerage (i.e. other wholesalers remain unaffected from the incidence effects analysis), we have not presented this detailed analysis. The results can however be found in the Tariff Model published alongside this report.

KEY M2 = Option 2 (meters) # of SPIDs impacted '0-2% higher' = Customer bill *negatively* impacted by 0-2%

Calculated incidence effects by impact (cont.)

Fixed meter charges, water only (option 2)

Figure 30: Incidence effects by impact (fixed meter charges, water, option 2)

Option:	M2												
Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
AFFINITY-W	Central	14,955	-	-	-	-	-	24	-	1,382	-	-	-	37,137
AFFINITY-W	East	440	-	-	-	-	-	1	-	-	-	3,360	-	72
AFFINITY-W	South East	805	-	-	-	-	-	-	-	-	-	-	-	3,974
ANGLIAN-W	ANGLIAN-W	-	-	-	-	-	-	126,077	-	-	-	-	-	-
ANGLIAN-W	Hartlepool	-	-	-	-	-	-	1,848	-	-	-	-	-	-
ANGLIAN-W	Woods Meadow & Flixton	-	-	-	-	-	-	21	-	-	-	-	-	-
ANGLIAN-W	Northstowe	-	-	-	-	-	-	7	-	-	-	-	-	-
BRISTOL-W	BRISTOL-W	-	-	-	-	-	-	34,404	-	-	-	-	-	-
DWRCYMRU-W	DWRCYMRU-W	115	-	17	-	-	-	33	-	-	-	-	-	223
NORTHUM-W	NORTHUM-W	10,348	-	-	-	-	-	71	-	-	-	83,156	-	4,794
PORTSMOUTH-W	PORTSMOUTH-W	1,917	-	-	-	-	-	-	-	-	412	-	-	11,978
SEVERN-W	SEVERN-W	7,776	4	-	-	-	-	-	167,773	-	-	-	-	12,084
SOUTHEAST-W	East	4,490	542	-	-	-	-	2	-	-	-	-	-	29,056
SOUTHEAST-W	West	3,091	-	-	-	423	-	-	-	14	-	-	-	11,222
SOUTHERN-W	SOUTHERN-W	-	-	-	-	-	-	52,194	-	-	-	-	-	-
SOUTHSTAFF-W	SOUTHSTAFF-W	431	-	-	-	-	-	35,464	-	-	-	-	-	2,705
SOUTHWEST-W	SOUTHWEST-W	4,884	-	-	-	-	-	20	-	70,700	-	-	-	1,722
SUTTON-W	Southern	-	-	-	-	-	-	6,927	-	-	-	-	-	-
SUTTON-W	Northern areas 1&2	-	-	-	-	-	-	4,583	-	-	-	-	-	-
THAMES-W	THAMES-W	-	-	-	-	-	-	178,612	-	-	-	-	-	-
UNITED-W	UNITED-W	16,260	-	-	-	-	-	140	-	-	-	36,085	112,211	4,878
WESSEX-W	WESSEX-W	2,301	-	-	-	-	-	1,628	-	-	-	-	-	40,754
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	-	-	121,444	-	-	-	-	-	-
YORKSHIRE-W	York	-	-	-	-	-	-	4,860	-	-	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

KEY M3 = Option 3 (meters) # of SPIDs impacted '0-2% higher' = Customer bill *negatively* impacted by 0-2%

Calculated incidence effects by impact (cont.)

Fixed meter charges, water only (option 3)

Figure 31: Incidence effects by impact (fixed meter charges, water, option 3)

Option:	M3												
Wholesaler	Region	> 10% lower	8-10% lower	6-8% lower	4-6% lower	2-4% lower	0-2% lower	Unchanged	0-2% higher	2-4% higher	4-6% higher	6-8% higher	8-10% higher	> 10% higher
AFFINITY-W	Central	15,953	-	-	-	-	367	24	-	-	-	2,250	-	34,904
AFFINITY-W	East	442	-	-	-	-	-	24	-	-	-	3,407	-	-
AFFINITY-W	South East	819	-	-	-	-	-	34	-	-	-	85	-	3,841
ANGLIAN-W	ANGLIAN-W	-	-	-	-	-	-	126,077	-	-	-	-	-	-
ANGLIAN-W	Hartlepool	-	-	-	-	-	-	1,848	-	-	-	-	-	-
ANGLIAN-W	Woods Meadow & Flixton	-	-	-	-	-	-	21	-	-	-	-	-	-
ANGLIAN-W	Northstowe	-	-	-	-	-	-	7	-	-	-	-	-	-
BRISTOL-W	BRISTOL-W	-	-	-	-	-	-	34,404	-	-	-	-	-	-
DWRCYMRU-W	DWRCYMRU-W	171	-	-	-	-	-	33	-	-	38	-	-	146
NORTHUM-W	NORTHUM-W	9,713	-	-	-	-	-	706	-	-	-	83,156	-	4,794
PORTSMOUTH-W	PORTSMOUTH-W	2,211	-	-	-	-	-	-	-	-	-	-	-	12,096
SEVERN-W	SEVERN-W	6,828	4	-	-	263	-	-	168,458	-	-	-	-	12,084
SOUTHEAST-W	East	4,941	-	-	-	-	-	2	-	87	-	-	637	28,423
SOUTHEAST-W	West	3,451	-	-	-	-	-	-	-	14	-	-	-	11,285
SOUTHERN-W	SOUTHERN-W	-	-	-	-	-	-	52,194	-	-	-	-	-	-
SOUTHSTAFF-W	SOUTHSTAFF-W	3	-	77	-	-	-	38,139	351	-	-	-	-	30
SOUTHWEST-W	SOUTHWEST-W	4,200	-	-	181	-	-	20	-	71,203	-	-	-	1,722
SUTTON-W	Southern	-	-	-	-	-	-	6,927	-	-	-	-	-	-
SUTTON-W	Northern areas 1&2	-	-	-	-	-	-	4,583	-	-	-	-	-	-
THAMES-W	THAMES-W	-	-	-	-	-	-	178,612	-	-	-	-	-	-
UNITED-W	UNITED-W	15,151	-	335	-	-	-	140	-	774	-	40,904	112,211	59
WESSEX-W	WESSEX-W	2,301	-	-	-	-	-	1,628	-	-	-	-	-	40,754
YORKSHIRE-W	YORKSHIRE-W	-	-	-	-	-	-	121,444	-	-	-	-	-	-
YORKSHIRE-W	York	-	-	-	-	-	-	4,860	-	-	-	-	-	-

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Detailed insights from incidence effects analysis

Fixed meter charges, water and sewerage (options 1-3)

Below we summarise the key insights generated from our incidence effects modelling for simplifying fixed meter bands across both water and sewerage charges.

Fixed meter charges

- Given the magnitude of fixed meter charges as a proportion of the overall bill, the actual impact on customers of any changes to these charges is relatively very small
- Each modelled option has more “losers” (i.e. customers paying a higher fixed charge) relative to “winners” (i.e. customers paying a lower fixed charge)
- Larger users benefit through simplification under each option (i.e. paying less); whereas a higher proportion of smaller users would be paying more
- Several wholesalers do not apply any fixed meter charges for water at present, whereas only two wholesalers set fixed meter charges for sewerage (i.e. other wholesalers remain unaffected from this analysis)
- For the purposes of this study we have assumed that where an existing wholesaler does not set fixed meter charges this will continue to be the status quo going forward

- Users with smaller meter sizes will lose more through the proposed simplification and/or harmonisation of fixed meter charges (i.e. those customers would be moved onto meter sizes associated with higher fixed charges). In comparison, those users with larger existing meter sizes (and hence higher charges) will pay relatively less fixed charges as a result of the proposed simplification and/or harmonisation as these users will be moved onto a new fixed charge that is lower relative to their existing fixed charge.
- Those specific wholesalers with a large number of existing bands for fixed meter charges and large price differences between these existing bands (e.g. Wessex, South East and Affinity) would see particularly large incidence effects under the options considered. This is because each simplification option has proposed at most four bands, and therefore the difference for those specific wholesalers between their existing bandings and the modelled bandings for fixed meter charges are more pronounced.
- Several wholesalers (Bristol, SES, Southern, Thames and Yorkshire) don’t currently apply any fixed meter charges for water and therefore see no impact from the proposed changes. Similarly only two wholesalers set fixed meter charges for foul sewerage.
- If we were to introduce meter charges for those water and/or sewerage companies that do not currently have them, then we would be creating revenue for those companies that doesn’t currently exist, and we’d need to consider how to factor in any offsetting adjustments to the revenues that they earn through volumetric charges (because the total amount of revenue that the company earns, for the purposes of our analysis, shouldn’t be any different as a result of the changes we are trying to make to the tariffs). This would be a complicated exercise given the need to try and predict how wholesalers would decrease volumetric charges to offset new revenues from meter charges e.g. whether the wholesaler would reduce all volumetric charges by the same percentage or make some other kind of adjustment. Therefore to keep the analysis simple, for the purposes of this study, we have assumed that where an existing wholesaler does not set fixed meter charges this will continue to be the status quo going forward.

Incidence effects: customer impact of each option for *fixed meter* charges

Below we present industry aggregate incidence effects for fixed meter charges based on the short-listed options on page 34 compared to wholesalers existing tariff structures. The modelling results show that for example, under Option 1 for sewerage, 6% of SPIDs see a reduction in their current bill (i.e. are "positively impacted").

Figure 32: Summary of incidence effects on customers (fixed meter charges)

	Option 1 0 - 25mm, 25mm+	Option 2 0 - 25mm, 25 - 100mm, 100mm+	Option 3 0 - 25mm, 25 - 50mm, 50 - 100mm, 100mm+
Water			
# meters	**741,902** (wholesalers with fixed meter charges only)		
Positively impacted	68,761 (9%) *(13% meter charges)*	68,799 (9%) *(12% meter charges)*	67,411 (9%) *(12% meter charges)*
Unchanged	37,120 (5%) *(6% meter charges)*	37,411 (5%) *(7% meter charges)*	40,778 (6%) *(9% meter charges)*
Negatively impacted	636,021 (86%) *(81% meter charges)*	635,692 (86%) *(81% meter charges)*	633,713 (85%) *(79% meter charges)*
Sewerage			
# meters	**40,613**[1] (South West only)		
Positively impacted	2,258 (6%) *(7% meter charges)*	2,244 (6%) *(7% meter charges)*	1,829 (5%) *(5% meter charges)*
Unchanged	0 (0%) *(0% meter charges)*	14 (0%) *(0% meter charges)*	14 (0%) *(0% meter charges)*
Negatively impacted	38,355 (94%) *(93% meter charges)*	38,355 (94%) *(93% meter charges)*	38,770 (95%) *(95% meter charges)*

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

1. South West are the only wholesaler who currently sets fixed charges for sewerage meters. The meters included in this analysis are those sewerage meters contained within the meters dataset provided by MOSL and any proxy sewerage meters introduced to enable the service components and meters datasets to be combined (as advised by MOSL). Further details of the approach used to join these datasets are provided in Annex 1.

Overall conclusions

The objective of this analysis was to consider the impact of various options for simplifying and aligning wholesalers' existing tariff structures. Our findings uncovered several interesting and useful insights. For example, if altering a volumetric charging band leads to some "winners" as some customers are moved onto lower tariffs, this "win" is partially offset by those same customers (or at least a large proportion of those same customers) now paying a higher fixed meter charge. We do, however, note that fixed meter charges make up a relatively small component of the customer bill, and hence the magnitude of this offset will be smaller than the "gain" from paying less towards the volumetric element of overall consumption.

We have focused on calculating incidence effects of the proposed simplification options for volumetric and fixed meter charges across both water and sewerage, rather than making any definitive recommendations from concluding this analysis. The choice of tariff reform are a matter of next steps for the RWG, in consultation with a wider set of stakeholders including Ofwat, wholesalers, retailers and other industry bodies, and will require further incidence effects analysis by the individual companies of their own data. For example, in our analysis we have focused on incidence effects as a percentage of the revenue associated with the element of the bill considered e.g. the volumetric charge or the fixed meter charge. However, further consideration needs to be given as to whether these impacts would be affordable for customers (e.g. how important are water costs as a percentage of a customer's total costs, and so on).

Below we summarise the overarching outcomes from our incidence effects analysis:

Under each *volumetric* option the majority of customers are unaffected

In addition only a very small percentage of customers for specific wholesalers are worse off under these simplification options (even where this is the case and customers are worse off, these customers are not significantly worse off). Options 1, 3 and 4 have the lowest impact on SPIDs' charges relative to the status quo.

Each proposed *fixed meter charge* option generated similar incidence effects

Fixed meter charges are a small proportion of overall customer bills, so changes to these tariffs have less incidence effects.

There is also less diversity of fixed meter charges across the sector, meaning that any changes to these tariff components have similar incidence effects across all options.

Changes to volumetric and fixed meter charges should not be considered in isolation

Changes to volumetric and meter charges need to be combined with supplementary/standing charges and drainage charges in order to measure the overall incidence effects on customer bills.

This is an area for further consideration by the individual companies.

Incidence effects vary across wholesalers

Wholesalers with fewer existing tariff bands tends to have fewer incidence effects than those with more existing tariff bands. Simplification through tariff harmonisation could mean some wholesalers end up with more bands than currently, but this may still reduce overall administrative burden for the industry and create a more easily understood tariff landscape for customers.

05

Potential mitigating strategies for tariff simplification

Potential mitigating strategies for proposed tariff simplification

While there are only a small percentage of customers that are worse off under the simplification options we have proposed (and those which are worse off are typically only very marginally worse off), there are several possible methods that could be introduced to mitigate the negative incidence impacts on these particular customers as presented in Section 4 of this report. These include:

Transitional arrangements

Where incidence effects are significant, particularly if certain customer groups would be made materially worse off as a result of tariff simplification, it may be appropriate to adopt transitional arrangements to either avoid those incidence effects altogether or to at least only introduce them gradually. The transitional arrangements would be applied to those customers who would be negatively affected by the changes to tariffs, but at the same time it is important to avoid a situation where wholesalers and retailers are negatively impacted by lowering tariffs for some groups without compensating increases in tariffs for other groups. For those customers whose bills would increase as a result of tariff simplification, it is also important to consider if the changes should be phased in gradually over time. Feedback and acceptance would also be required from wider industry stakeholders ahead of suggesting any transitional arrangements.

Increase tariffs for specific user groups

Given that the incidence effects analysis suggests the most material adverse customer impact would be on larger users' volumetric rates, one mitigating strategy could be to decrease unit rates for this element of wholesale tariffs. However, in order to maintain both cost reflectivity and revenue neutrality, wholesalers may also then need to increase tariffs for other (or indeed all) users. This consideration would ultimately be for the individual companies to determine.

Consider impact of standing or "supplementary" charges

In addition to volumetric charges based on the amount of water supplied, some wholesalers also set standing charges based on either the size of the meter or on a per site basis. There is no common or standardised approach in how different wholesalers set standing charges across the industry (otherwise referred to as "supplementary" charges), and hence they have not been considered for simplification purposes as part of this analysis.

These standing charges could, however, mitigate to some degree the extent of incidence effects generated through each modelled simplification option. This will in part be dependent on how many consumption bands are being proposed, and the step change increase in standing charges between these bands. Under this mitigation approach wholesalers may look to rebalance or reweight the amount of revenue that they recover between the volumetric charge element and the standing charge component, depending on the breakeven point to dampen the overall incidence effects from adjusting volumetric tariffs.

On the next slide we provide an illustrative example for Thames Water using their 2022-23 tariff charges to show how including standing charges could to an extent mitigate the incidence effects arising from volumetric charges:

Illustrative example: including the impact of "supplementary" charges for the *volumetric* consumption analysis

Implementation of Option 2 at Thames Water could see some customers facing an 8% increase in the their volumetric charges for metered water. To maintain parity between customers at the top of one usage band and those at the bottom of the next usage band, supplementary charges would also need to be revised. The illustration below shows how the recalculation of these supplementary charges for Thames Water customers could interact with changes to the volumetric charges; in this example the greatest price increase faced by any customer would be reduced to 4.1%. Application of an identical logic to United Utilities suggests there would be similar opportunities to balance out the large volumetric incidence effects through the adjustment of fixed charges.

Whilst for some customer groups the incidence effects from volumetric charges may be dampened, other customer groups may see an increase in their incidence effects – individual wholesalers will need to perform their own analysis to determine how best to manage the interaction between these charging elements.

Figure 33: Illustrative example of the interaction between volumetric and supplementary charges for water

	VOLUMETRIC CHARGES			"SUPPLEMENTARY" CHARGES			COMBINED IMPACT		
21-'22 Volume Bucket	Current	V2	Impact (V)	Current	V2	Impact	Net Impact	# SPIDs	Revenue impact
500 and less	£ 1.54	£ 1.52	-1.2%	£ -	£ -		-1.2%	113188	£0
500 to 1000	£ 1.54	£ 1.52	-1.2%	£ -	£ -		-1.2%	13704	£0
1000 to 3000	£ 1.54	£ 1.52	-1.2%	£ -	£ -		-1.2%	13108	£0
3000 to 5000	£ 1.54	£ 1.52	-1.2%	£ -	£ -		-1.2%	3049	£0
5000 to 10000	£ 1.54	£ 1.52	-1.2%	£ -	£ -		-1.2%	2318	£0
10000 to 15000	£ 1.54	£ 1.52	-1.2%	£ -	£ -		-1.2%	721	£0
15000 to 20000	£ 1.54	£ 1.52	-1.2%	£ -	£ -		-1.2%	331	£0
20000 to 25000	£ 1.41	£ 1.52	8.0%	£ 2,620	£ -	-100.0%	-1.2%	196	-£513,520
25000 to 30000	£ 1.41	£ 1.52	8.0%	£ 2,620	£ -	-100.0%	0.5%	104	-£272,480
30000 to 50000	£ 1.41	£ 1.52	8.0%	£ 2,620	£ -	-100.0%	1.7%	184	-£482,080
50000 to 100000	£ 1.16	£ 1.16	0.0%	£ 15,340	£ 18,355	19.7%	4.1%	105	£316,619
100000 to 150000	£ 1.16	£ 1.16	0.0%	£ 15,340	£ 18,355	19.7%	2.3%	36	£108,555
150000 to 162000	£ 1.16	£ 1.16	0.0%	£ 15,340	£ 18,355	19.7%	1.6%	3	£9,046
162000 to 175000	£ 1.16	£ 1.16	0.0%	£ 15,340	£ 18,355	19.7%	1.5%	5	£15,077
175000 to 180000	£ 1.16	£ 1.16	0.0%	£ 15,340	£ 18,355	19.7%	1.4%	1	£3,015
180000 to 250000	£ 1.16	£ 1.16	0.0%	£ 15,340	£ 18,355	19.7%	1.3%	11	£33,170
250000 to 342000	£ 0.92	£ 0.92	0.0%	£ 73,140	£ 76,155	4.1%	1.0%	3	£9,046
342000 to 500000	£ 0.92	£ 0.92	0.0%	£ 73,140	£ 76,155	4.1%	0.8%	4	£12,062
500000 to 750000	£ 0.92	£ 0.92	0.0%	£ 73,140	£ 76,155	4.1%	0.6%	4	£12,062
750000 to 1000000	£ 0.92	£ 0.92	0.0%	£ 73,140	£ 76,155	4.1%	0.4%	1	£3,015
1000000 to 3000000	£ -	£ -	0.0%						
3000000 and more	£ -	£ -	0.0%					TOTAL	-£746,413

Largest impact

Largest impact

Source: Extension of analysis shared by Thames Water on 3 November 2022. Supplementary charges were calculated for V2 such that they smoothen the transition across volumetric bands. The lowest usage band was assumed to have no supplementary charge, the supplementary charge for each band in turn was calculated such that a customer on the threshold between bands would pay the same total charge irrespective of which band they were allocated to

Regulatory and wider economic considerations

Aside from the incidence effects arising directly from the simplification of wholesale tariffs discussed in this report, there may be wider changes in market conditions that also impact on the tariffs paid by customers and which therefore need to be taken into consideration when evaluating incidence effects and the potential need for mitigation mechanisms.

PR24

Ofwat published their PR24 Final Methodology in December 2022. This document sets out the final proposals on how Ofwat intends to carry out the next periodic price review for water and wastewater undertakers and the methodology used to set allowed revenues for wholesalers, as well as the outcomes that they will need to deliver during the period from 2025 to 2030.

Ofwat has not yet provided detail on each wholesaler's draft totex allowance or allowed revenue, but has provided an early view on the allowed WACC during PR24 (noting this is subject to revision based on changing market conditions ahead of the Final Determinations in 2024). There are several underlying factors that will influence water wholesalers' allowed revenues following PR24, however the overall impact on to what extent these will be higher or lower than PR19 remain unclear at this stage. The changes in allowed revenue, and by extension in wholesale tariffs, may exacerbate or mitigate any changes in wholesale tariffs stemming from simplification of wholesale tariff structures.

Inflation

Water tariffs are indexed to inflation, so changes in wholesale tariffs structures and levels may be exacerbated or mitigated by inflation indexation, depending on the rate of inflation prevailing at the time.

Annex 1

Modelling assumptions

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Overview of CMOS data files provided to us by MOSL

MOSL provided PA Consulting with four datasets with information as reported in CMOS up until 01/04/2022:

1. *'SPID/Service Components'*
    - Snapshot of customer data for active tradeable Supply Point IDs (SPIDs) - both if connected to a single or multiple meters - and active service components relating to measured potable water (MPW), measured non potable water (MNPW) and measured sewerage (MS), for each active wholesaler.
2. *'Meters'*
    - Snapshot of all meters linked to SPID records that exist in the SPID/Service Components output. This excluded meters with no associated MS charges.
3. *'Tariffs'*
    - Tariff charging data for years 2019-20, 2020-21, 2021-22 and 2022-23.
    - The structure and variety of charging components included in the Tariffs data provided made using this dataset challenging. It was agreed that current tariff prices would instead be sourced from tariff documents published by each wholesaler and the Tariffs data used to perform selected cross checks / help resolve ambiguities in interpreting the published tariffs.
4. *'Settlement'*
    - Overall annual charge calculated for charging year 2021/22, by SPID.

Aggregation and cleansing of datasets provided

The “Service Component” dataset provided by MOSL contained **2,246,423 SPID premises**, the subset of the 2.6m SPIDs with a MPW, MNPW or MS service component

Step	Modelling assumption	Supporting justification	# SPID premises removed	# SPID premises remaining
0	Initial “Service Components” dataset provided	-		**W: 1,253,378** **S: 993,045**
1	Only include the following wholesalers: 'SEVERN-W', 'THAMES-W', 'UNITED-W', 'ANGLIAN-W', 'YORKSHIRE-W', 'NORTHUM-W', 'SOUTHWEST-W', 'AFFINITY-W', 'SOUTHERN-W', 'SOUTHEAST-W', 'WESSEX-W', 'SOUTHSTAFF-W', 'BRISTOL-W', 'PORTSMOUTH-W', 'SUTTON-W’, 'DWRCYMRU-W' This results in the following ‘wholesalers’ excluded from our analysis: 'INDWATER-W', 'VEOLIA-W', 'SEVERNCON-W', 'ALBION-W', 'ICOSA2-W', 'SSE-W', 'DEEVALLEY-W', 'MOSLTEST-W', 'ALBIONECO-W', 'SmokeTestWSL'	Removing NAVs and MOSL “test” data from our analysis as these were not the focus of this study. Dee Valley was also excluded as there were only 16 associated SPIDs.	W: 1,375 (0.1%) S: 958 (0.1%)	W. 1,252,003 S. 992,087
2	Only include the following service components: ‘MPW’, ‘MS’	Measured non-potable water (MNPW) is not relevant to this study.	W: 106 (0.01%) S: 0	W: 1,251,897 S: 992,087
3	Consolidate information from the ‘Meters’ and ‘Service Components’ datasets	To match sewerage SPIDs across these two datasets, MOSL advised that it was necessary to match water SPIDs in the meters dataset with both water and sewerage charges within the service components dataset. This was performed by matching on SPID premise (the first 10 digits of the SPID) and introduced a small number of additional SPID premises associated with sewerage charges.	W: 0 S: -900 (0.09%)	W: 1,251,897 S: 992,987
4	Remove negative volumes and data anomalies	Negative and implausibly large volumes are attributed to erroneous meter readings.	W: 10,306 (0.8%) S: 8,451 (0.9%)	W: 1,241,591 S: 984,443
5	Remove irrelevant tariff codes	Remove tariff codes associated with special agreements as they are not within the scope of this work	W: 394 (0.03%) S: 93 (0.01%)	**W: 1,241,197** **S: 984,443**
6	Remove rows where volume is equal to 0 m³/a	Where the consumption volume is recorded as zero the SPIDs associated with these volumes have been removed from the volumetric analysis to ease the calculation of unit costs	W: 160,895 (12.8%) S: 112,340 (11.3%)	**W: 1,080,302** **S: 872,103**

The combined dataset forming the basis of the analysis consists of **1,241,197 (water) / 984,443 (sewerage) SPID premises** for *meter fixed* charges; and **1,080,302 (water) / 872,103 (sewerage) SPID premises** for *volumetric* charges, respectively.

Tariff prices[1] – volumetric charges (water)

Wholesaler	Region	Charging component description	Source[3]
Affinity	Central / East / South East	Metered Charges – Non-household volumetric charge	LINK (p.21 / 22 / 23)
Anglian	Anglian / Hartlepool / Northstowe / Woods Meadow & Flixton	Non-household – Measured water charges (potable water)	LINK (p.62 / 65 / 67 / 68)
Bristol		Measured water – non-household customers (volume charges)	LINK (p.8)
Dwr Cymru		Standard wholesale measured charges – Standard volumetric rate; Wholesale industrial tariffs	LINK (p.8-9)
Northumbrian		Measured charges for potable water	LINK (p. 54)
Portsmouth		Primary non-household tariffs – Metered water supplies – Volume charge (July '22 – June '23)	LINK (p.15)
Severn		Metered water supply volumetric charges for Zones 1-8 (unable to identify SPIDs in Zones 9-10); Intermediate and large user tariffs	LINK (p.45, 47)
South East	East / West	Block tariff (monthly read) – Volumetric charges (East / West)	LINK (p.17)
Southern		Measured water supplies – Standard tariff / large user unit volume charge	LINK (p.8-9)
South Staff		Non-household measured – Volumetric charges (fixed band)	LINK (p.7)
South West		Wholesale non-household measured water supply charges 2022-23 - Large user falling block tariff [2]	LINK (p.34)
Sutton and East Surrey	Northern 1&2 / Southern	Measured charges for business customers – Volume charges	LINK (p.6)
Thames		Volumetric charges – Non-household – Water service	LINK (p.31)
United Utilities		Measured water charges – Volumetric charges [4]	LINK Wholesale water charges scheme 2022/2023 (p.13-14)
Wessex		Measured wholesale water charges – non-interruptible supply of measured water – Volume charge [3]	LINK (p.29)
Yorkshire	Yorkshire / York	Non-household wholesale charges – Measured non-household – Volumetric charge [2]	LINK (p.12 / 14)

1. Please note that the embedded source links to each wholesalers' relevant charging statement was checked and verified as of 22 November 2022
2. The falling block tariff was converted to an indicative unit rate for each volumetric band by assuming the average customer's usage is 25% of the way through the band. As the upper limit of the largest band is infinite, the average unit cost was (over-) estimated by assuming the average customer's usage aligned to the lower tariff boundary. For Yorkshire the average unit cost for the largest band assumed 50ML of usage beyond the lower tariff boundary to ensure the falling block tariff was represented within the analysis
3. Following a request from Wessex, average consumption volumes for each usage band (provided by Wessex) were used instead of applying an assumption that an average customer is 25% of the way through the band
4. The analysis does not include consideration of the lower volumetric rate of £0.416 which is paid on any usage in excess of 3,000,000 Ml, the average unit rate for the three customers in this band was (over-) estimated as £0.85 in alignment with the lower band.

Tariff prices – meter fixed charges (water)

Wholesaler	Region	Charging component description	Source
Affinity	Central / East / South East	Metered Charges – Non-household fixed charge	LINK (p.21 / 22 / 23)
Anglian	Anglian / Hartlepool / Northstowe / Woods Meadow & Flixton	Northstowe / Woods Meadow & Flixton – Non-household – Measured water charges – Standing charges N/A – Anglian, Hartlepool	LINK (p.67 / 68)
Bristol		N/A	
Dwr Cymru		Standard wholesale measured charges – Service charge (water)	LINK (p.8)
Northumbrian		Measured charges for potable water – Fixed charge per potable meter per year	LINK (p. 54)
Portsmouth		Primary non-household tariffs – Metered water supplies (July '22 – June '23)	LINK (p.15)
Severn		Metered standing and fixed charges – Meter charges (standing charges) for Zones 1-8	LINK (p.45 / 46)
South East	East / West	Metered water supplies – Annual standing charge	LINK (p.16)
Southern		N/A	
South Staff		Non-household measured – Standing charges	LINK (p.7)
South West		Wholesale non-household measured water supply charges 2022-23 – Metered fixed charges	LINK (p.34)
Sutton	Northern 1&2 / Southern	N/A	
Thames		N/A	
United Utilities		Measured water charges – Standing charges	LINK Wholesale water charges scheme 2022/2023 (p.13)
Wessex		Measured wholesale water charges – Non-interruptible supply of measured water – Measured charge	LINK (p.29)
Yorkshire	Yorkshire / York	N/A	

Tariff prices – volumetric charges (sewerage - foul water)

Wholesaler	Region	Charging component description	Source
Anglian	Anglian / Hartlepool / Northstowe / Woods Meadow & Flixton	Non-household – Measured sewerage charges (foul water drainage) N/A – Hartlepool	LINK (p.63)
Dwr Cymru		Standard wholesale measured charges – Standard volumetric rate (foul only)	LINK (p.8)
Northumbrian		Measured charges for sewerage – Domestic foul sewage	LINK (p. 54)
Severn		Metered used water charges for Zones 1-8 – Volumetric charges	LINK (p.46)
Southern		Sewerage services - Standard tariff unit volume charge – foul water drainage; Large User Tariff unit lower volume charge – foul water drainage [1]	LINK (p.10-12)
South West		Wholesale non-household measured wastewater charges 2022-23 - Volumetric charges [2]	LINK (p.35)
Thames		Volumetric charges – Non-household – Wastewater service	LINK (p.31)
United Utilities		Measured sewerage charges Sewerage charges (foul drainage) [3]	LINK Wholesale sewerage charges scheme 2022/2023 (p.15)
Wessex		Measured wholesale wastewater charges – Charges for a measured wastewater service – Volume charge	LINK (p.31)
Yorkshire	Yorkshire / York	Non-household wholesale charges – Measured sewerage charges – Volumetric charge (foul) [2, 4]	LINK (p.17)

1. The large user tariff was applied to all customers producing 100ML or more of foul water, based on discussions with the Charges and Revenue team at Southern Water
2. The falling block tariff was converted to an indicative unit rate for each volumetric band by assuming the average customer's usage is 25% of the way through the band. For South West and Yorkshire the average unit cost for the largest band assumed 50ML of usage beyond the lower tariff boundary to ensure the falling block tariff was represented within the analysis
3. The large user rate was applied to all customers producing 50ML or more of foul water, based on discussions with the Economic Regulation and Strategy Team at United Utilities
4. A "foul only" charge is only provided in Yorkshire Water's published documentation for <50Ml, the "total measured sewerage" unit cost was used as a proxy for higher usage bands.

Tariff prices – meter fixed charges (sewerage - foul water)

Wholesaler	Region	Charging component description	Source
Anglian	Anglian / Hartlepool / Northstowe / Woods Meadow & Flixton	N/A	
Dwr Cymru		Standard wholesale measured charges – Service charge (sewerage foul)	LINK (p.8)
Northumbrian		N/A	
Severn		N/A	
Southern		N/A	
South West		Wholesale non-household measured wastewater charges 2022-23 – Metered fixed charges (foul only)	LINK (p.35)
Thames		N/A	
United Utilities		N/A	
Wessex		N/A	
Yorkshire	Yorkshire / York	N/A	

Annex 2

Additional incidence effects outputs

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KEY V1 = Option 1 (volumetric) # of SPIDs impacted

Incidence effects analysis (cont.)

Below we present incidence effects analysis based on volumetric consumption for water SPIDs only by volume. Customers are allocated into the "usage buckets" based on their volume (these buckets are defined as a list of all current / new tariff upper bands under consideration) with the change in unit cost calculated for a specific scenario. The calculations for each wholesaler are independent of one another. The percentages highlighted in green represent those customers that are better off as a result of simplification (i.e. lower bills), whereas those percentages highlighted in red represent customers worse off as a result (.e. paying more as a result of simplification).

Figure 34: Incidence effects by volume (water)

Option: V1

	AFFINITY-W Central					AFFINITY-W East					AFFINITY-W South East					ANGLIAN-W ANGLIAN-W				
21-'22 Volume Bucket		**Old**	**New**	**£ Delta**	**# SPID Prem.**		**Old**	**New**	**£ Delta**	**# SPID Prem.**		**Old**	**New**	**£ Delta**	**# SPID Prem.**		**Old**	**New**	**£ Delta**	**# SPID Prem.**
500 and less	0%	1.00	1.00	£ -	36,527	0%	£ 1.69	£ 1.69	£ -	2,877	0%	£ 1.80	£ 1.80	£ -	3,367	0%	£ 1.45	£ 1.45	£ -	90,166
500 to 1000	-4%	1.00	0.95	-£ 137,692	4,647	-10%	£ 1.69	£ 1.52	-£ 34,409	277	-4%	£ 1.80	£ 1.73	-£ 15,884	332	-12%	£ 1.34	£ 1.18	-£ 1,019,506	8,892
1000 to 3000	-4%	1.00	0.95	-£ 299,988	4,246	-10%	£ 1.69	£ 1.52	-£ 53,566	188	-4%	£ 1.80	£ 1.73	-£ 33,157	288	-12%	£ 1.34	£ 1.18	-£ 2,034,963	7,491
3000 to 5000	3%	0.93	0.95	£ 95,463	965	-10%	£ 1.69	£ 1.52	-£ 30,596	45	3%	£ 1.68	£ 1.73	£ 8,816	52	-12%	£ 1.34	£ 1.18	-£ 938,312	1,501
5000 to 10000	3%	0.93	0.95	£ 124,155	705	1%	£ 1.50	£ 1.52	£ 1,696	22	3%	£ 1.68	£ 1.73	£ 8,393	26	-7%	£ 1.27	£ 1.18	-£ 664,105	1,070
10000 to 15000	3%	0.93	0.95	£ 60,897	192	1%	£ 1.50	£ 1.52	£ 594	4	3%	£ 1.68	£ 1.73	£ 4,316	8	24%	£ 0.95	£ 1.18	£ 765,615	277
15000 to 20000	3%	0.93	0.95	£ 39,574	89	1%	£ 1.50	£ 1.52	£ 1,223	6	3%	£ 1.68	£ 1.73	£ 5,398	7	24%	£ 0.95	£ 1.18	£ 570,805	145
20000 to 25000	3%	0.93	0.95	£ 29,436	51	1%	£ 1.50	£ 1.52	£ 786	3	3%	£ 1.68	£ 1.73	£ 7,159	7	24%	£ 0.95	£ 1.18	£ 445,342	87
25000 to 30000	3%	0.93	0.95	£ 13,806	20	31%	£ 1.16	£ 1.52	£ 20,116	2	3%	£ 1.68	£ 1.73	£ 3,598	3	104%	£ 0.58	£ 1.18	£ 798,185	49
30000 to 50000	3%	0.93	0.95	£ 74,350	76	31%	£ 1.16	£ 1.52	£ 94,156	7	3%	£ 1.68	£ 1.73	£ 11,361	7	104%	£ 0.58	£ 1.18	£ 2,076,939	89
50000 to 100000	0%	0.61	0.61	£ -	42	0%	£ 1.00	£ 1.00	£ -	5	0%	£ 1.26	£ 1.26	£ -	4	0%	£ 0.58	£ 0.58	£ -	79
100000 to 150000	0%	0.61	0.61	£ -	16	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ 0.58	£ 0.58	£ -	31
150000 to 162000	0%	0.00	0.00	£ -	-	0%	£ -	£ -	£ -	-	0%	£ 1.26	£ 1.26	£ -	1	0%	£ 0.58	£ 0.58	£ -	5
162000 to 175000	0%	0.61	0.61	£ -	1	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ 0.58	£ 0.58	£ -	2
175000 to 180000	0%	0.61	0.61	£ -	1	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ 0.58	£ 0.58	£ -	1
180000 to 250000	0%	0.61	0.61	£ -	3	0%	£ -	£ -	£ -	-	0%	£ 1.26	£ 1.26	£ -	2	0%	£ 0.58	£ 0.58	£ -	18
250000 to 342000	0%	0.61	0.61	£ -	3	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ 0.58	£ 0.58	£ -	5
342000 to 500000	0%	0.00	0.00	£ -	-	0%	£ -	£ -	£ -	-	0%	£ 1.26	£ 1.26	£ -	1	0%	£ 0.58	£ 0.58	£ -	4
500000 to 750000	0%	0.61	0.61	£ -	1	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ 0.58	£ 0.58	£ -	3
750000 to 1000000	0%	0.00	0.00	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ 0.58	£ 0.58	£ -	1
1000000 to 3000000	0%	0.00	0.00	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
3000000 and more	0%	0.00	0.00	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ 0.58	£ 0.58	£ -	2
				-£ 0	**47,585**				**£ 0**	**3,436**				**-£ 0**	**4,105**				**-£ 0**	**109,918**

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

KEY M1 = Option 1 (meters) # of SPIDs impacted

Incidence effects analysis (cont.)

Below we present incidence effects analysis based on meter sizes for water SPIDs. Customers are allocated into the "usage buckets" based on their meter size (these buckets are defined as a list of all current / new tariff upper bands under consideration) with the change in unit cost calculated for a specific scenario. The calculations for each wholesaler are independent of one another. The percentages highlighted in green represent those customers that are better off as a result of simplification (i.e. lower bills), whereas those percentages highlighted in red represent customers worse off as a result (.e. paying more as a result of simplification).

Figure 35: Incidence effects by meter (water)

Option: M1

21-'22 Meter Bucket	AFFINITY-W Central					AFFINITY-W East					AFFINITY-W South East				
		Old	New	£ Delta	# SPID Prem.		Old	New	£ Delta	# SPID Prem.		Old	New	£ Delta	# SPID Prem.
15 or lower	20%	£ 16.80	£ 20.13	£ 115,663	34,756	7%	£ 16.80	£ 18.04	£ 4,151	3,360	11%	£ 16.80	£ 18.68	£ 7,217	3,830
15 to 20	-26%	£ 27.36	£ 20.13	-£ 68,922	9,530	-34%	£ 27.36	£ 18.04	-£ 2,685	288	-32%	£ 27.36	£ 18.68	-£ 4,442	512
20 to 21	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
21 to 22	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
22 to 24	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
24 to 25	-32%	£ 29.40	£ 20.13	-£ 46,741	5,041	-39%	£ 29.40	£ 18.04	-£ 1,466	129	-36%	£ 29.40	£ 18.68	-£ 2,775	259
25 to 28	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
28 to 30	35%	£ 32.52	£ 43.96	£ 1,498	131	0%	£ -	£ -	£ -	-	55%	£ 32.52	£ 50.43	£ 197	11
30 to 34	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
34 to 35	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
35 to 39	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
39 to 40	28%	£ 34.44	£ 43.96	£ 21,417	2,250	59%	£ 34.44	£ 54.83	£ 958	47	46%	£ 34.44	£ 50.43	£ 1,359	85
40 to 42	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
42 to 49	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
49 to 50	5%	£ 42.00	£ 43.96	£ 2,707	1,382	31%	£ 42.00	£ 54.83	£ 321	25	20%	£ 42.00	£ 50.43	£ 405	48
50 to 54	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
54 to 64	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
64 to 65	-42%	£ 75.48	£ 43.96	-£ 536	17	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
65 to 80	-59%	£ 108.12	£ 43.96	-£ 17,516	273	-49%	£ 108.12	£ 54.83	-£ 1,172	22	-53%	£ 108.12	£ 50.43	-£ 1,154	20
80 to 100	-59%	£ 108.12	£ 43.96	-£ 6,031	94	-49%	£ 108.12	£ 54.83	-£ 53	1	-53%	£ 108.12	£ 50.43	-£ 808	14
100 to 125	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
125 to 150	-59%	£ 108.12	£ 43.96	-£ 1,283	20	-49%	£ 108.12	£ 54.83	-£ 53	1	0%	£ -	£ -	£ -	-
150 to 199	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
199 to 200	-59%	£ 108.12	£ 43.96	-£ 257	4	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
200 to 250	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
250 to 300	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
300 or higher	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
				£ 0	53,498				£ 0	3,873				-£ 0	4,779

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

Incidence effects analysis (cont.)

KEY V1 = Option 1 (volumetric) # of SPIDs impacted

M1 = Option 1 (meters)

Below we present incidence effects analysis based on both volumetric consumption and meter sizes for sewerage SPIDs.

Figure 36: Incidence effects by volume (sewerage)

Option: V1

	ANGLIAN-W					NORTHUM-W					SEVERN-W					SOUTHERN-W				
	ANGLIAN-W					NORTHUM-W					SEVERN-W					SOUTHERN-W				
21-'22 Volume Bucket		Old	New	£ Delta	# SPID Prem.		Old	New	£ Delta	# SPID Prem.		Old	New	£ Delta	# SPID Prem.		Old	New	£ Delta	# SPID Prem.
500 and less	0%	£1.70	£1.70	£ -	95,602	0%	£1.17	£1.17	£ -	36,043	0%	£1.11	£1.11	£ -	123,098	0%	£1.98	£1.98	£ -	58,699
500 to 5000	-1%	£1.65	£1.63	-£ 435,993	14,598	0%	£1.17	£1.17	£ -	7,260	0%	£1.11	£1.11	-£ 65,355	23,082	0%	£1.98	£1.98	£ -	10,590
5000 to 10000	2%	£1.60	£1.63	£ 130,129	799	0%	£1.17	£1.17	£ -	462	0%	£1.11	£1.11	-£ 17,359	1,246	0%	£1.98	£1.98	£ -	519
10000 to 15000	2%	£1.60	£1.63	£ 51,532	174	0%	£1.17	£1.17	£ -	113	1%	£1.10	£1.11	£ 29,726	384	0%	£1.98	£1.98	£ -	140
15000 to 20000	2%	£1.60	£1.63	£ 32,764	78	0%	£1.17	£1.17	£ -	41	1%	£1.10	£1.11	£ 14,441	133	0%	£1.98	£1.98	£ -	69
20000 to 25000	2%	£1.60	£1.63	£ 21,237	39	0%	£1.17	£1.17	£ -	26	1%	£1.10	£1.11	£ 11,159	78	0%	£1.98	£1.98	£ -	26
25000 to 30000	5%	£1.56	£1.63	£ 60,970	31	0%	£1.17	£1.17	£ -	9	1%	£1.10	£1.11	£ 7,056	41	0%	£1.98	£1.98	£ -	24
30000 to 50000	5%	£1.56	£1.63	£ 139,361	50	0%	£1.17	£1.17	£ -	20	1%	£1.10	£1.11	£ 20,333	82	0%	£1.98	£1.98	£ -	55
50000 to 100000	0%	£1.56	£1.56	£ -	33	0%	£1.13	£1.13	£ -	15	0%	£1.05	£1.05	£ -	52	-15%	£1.98	£1.69	-£ 639,072	33
100000 to 250000	0%	£1.56	£1.56	£ -	31	0%	£1.13	£1.13	£ -	12	0%	£1.05	£1.05	£ -	33	18%	£1.43	£1.69	£ 499,333	12
250000 and more	0%	£1.56	£1.56	£ -	2	0%	£1.13	£1.13	£ -	1	0%	£1.05	£1.05	£ -	11	18%	£1.43	£1.69	£ 139,740	2
				-£ 0	111,437				£ -	44,002				£ 0	148,240				-£ 0	70,169

Figure 37: Incidence effects by meter (sewerage)

Option: M1

	ANGLIAN-W					NORTHUM-W					SEVERN-W					SOUTHERN-W				
	ANGLIAN-W					NORTHUM-W					SEVERN-W					SOUTHERN-W				
21-'22 Meter Bucket		Old	New	£ Delta	# SPID Prem.		Old	New	£ Delta	# SPID Prem.		Old	New	£ Delta	# SPID Prem.		Old	New	£ Delta	# SPID Prem.
15 or lower	0%	£ -	£ -	£ -	100,274	0%	£ -	£ -	£ -	36,053	0%	£ -	£ -	£ -	129,511	0%	£ -	£ -	£ -	58,942
15 to 22	0%	£ -	£ -	£ -	11,797	0%	£ -	£ -	£ -	6,476	0%	£ -	£ -	£ -	21,997	0%	£ -	£ -	£ -	10,650
22 to 25	0%	£ -	£ -	£ -	6,418	0%	£ -	£ -	£ -	5,215	0%	£ -	£ -	£ -	3,179	0%	£ -	£ -	£ -	5,001
25 to 28	0%	£ -	£ -	£ -	66	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	9,098	0%	£ -	£ -	£ -	39
28 to 30	0%	£ -	£ -	£ -	567	0%	£ -	£ -	£ -	745	0%	£ -	£ -	£ -	144	0%	£ -	£ -	£ -	72
30 to 35	0%	£ -	£ -	£ -	1	0%	£ -	£ -	£ -	44	0%	£ -	£ -	£ -	74	0%	£ -	£ -	£ -	1
35 to 40	0%	£ -	£ -	£ -	2,512	0%	£ -	£ -	£ -	2,182	0%	£ -	£ -	£ -	1,074	0%	£ -	£ -	£ -	2,259
40 to 42	0%	£ -	£ -	£ -	25	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	3,457	0%	£ -	£ -	£ -	17
42 to 50	0%	£ -	£ -	£ -	2,530	0%	£ -	£ -	£ -	774	0%	£ -	£ -	£ -	2,455	0%	£ -	£ -	£ -	1,365
50 to 54	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
54 to 65	0%	£ -	£ -	£ -	13	0%	£ -	£ -	£ -	14	0%	£ -	£ -	£ -	1	0%	£ -	£ -	£ -	3
65 to 80	0%	£ -	£ -	£ -	671	0%	£ -	£ -	£ -	259	0%	£ -	£ -	£ -	773	0%	£ -	£ -	£ -	374
80 to 100	0%	£ -	£ -	£ -	190	0%	£ -	£ -	£ -	63	0%	£ -	£ -	£ -	270	0%	£ -	£ -	£ -	84
100 to 125	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
125 to 150	0%	£ -	£ -	£ -	66	0%	£ -	£ -	£ -	14	0%	£ -	£ -	£ -	72	0%	£ -	£ -	£ -	18
150 to 200	0%	£ -	£ -	£ -	12	0%	£ -	£ -	£ -	4	0%	£ -	£ -	£ -	2	0%	£ -	£ -	£ -	2
200 to 250	0%	£ -	£ -	£ -	1	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	-
250 or higher	0%	£ -	£ -	£ -	-	0%	£ -	£ -	£ -	1	0%	£ -	£ -	£ -	1	0%	£ -	£ -	£ -	1
				£ -	125,143				£ -	51,844				£ -	172,108				£ -	78,828

Source: PA Consulting analysis of CMOS dataset and wholesaler charging statements

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