

THE BALANCE OF CHARGES FOR DEVELOPER SERVICES

A report prepared for Ofwat

August 2020



CONTENTS

Executive Summary	5
1 Introduction	8
1.1 Background	8
1.2 The scope and structure of this report	9
2 Overview of developer services	11
2.1 Introduction	11
2.2 New connections	12
2.3 Requisitioned water mains and sewers	13
2.4 Increasing off-site capacity	13
2.5 Diversions	15
3 How costs are recovered	16
3.1 Introduction	16
3.2 Background	16
3.3 The approach from April 2020	18
3.4 New connections	20
3.5 Requisitioned water mains and sewers	20
3.6 Reinforcement of off-site local assets	24
3.7 Reinforcement of strategic assets	28
3.8 Diversions	29
3.9 Charges in Scotland	29
4 The economic rationale of the charging rules	31
4.1 Introduction	31
4.2 Should developers pay less than the full cost of developer services?	32
4.3 Conclusion	45
5 High level estimate of costs	47
5.1 Introduction	47
5.2 On-site costs and costs of network reinforcement of local assets	47
5.3 Income offset	49
5.4 Strategic assets costs	49
5.5 Estimates of the balance of charges	54
6 Evaluation criteria	56
6.1 Introduction	56
6.2 Criteria	57
6.3 Evaluation	61
7 Potential options for reform	63
7.1 Introduction	63
7.2 'Gross' off-site costs	63
7.3 Income offset / balance of charges	71
7.4 Summary table	75
8 Conclusion	79

EXECUTIVE SUMMARY

‘Developer services’ involve connecting new properties to the local water and wastewater networks. At a high level, the services can be split into two main components:

- On-site work – This relates to the physical connection between each new property and the existing network located near to the relevant site; and
- Off-site work – In some instances, in order to accommodate the extra demand brought about by the new properties, it may be necessary to add extra capacity to the existing off-site network.

We have been commissioned by Ofwat to review how the cost of providing these services is recovered in England and Wales. In practice, the cost is recovered from two separate groups:

- The developers requesting the work pay a set of ‘developer charges’¹; and
- The remainder of the cost is funded by the local water and wastewater company whose network the new properties are connecting to. This cost is then effectively recovered across all end-customers paying water and wastewater bills on the network.²

We refer to this split in costs between developers and end-customers (households and businesses paying water and wastewater bills) as the ‘balance of charges’. We find that the balance of charges is driven by two factors:

- Costs incurred as a consequence of connecting new developments: Developers are required to pay for the cost of on-site work and for the cost of reinforcing ‘local’ assets. They do not pay for the cost of reinforcing ‘strategic’ assets, which is therefore funded entirely by all end-customers on the network³; and
- Income offset: In relation to the costs that developers do pay for, they also receive a discount (an ‘income offset’). This is funded by the local water and wastewater company, with the cost then recovered across all end-customers paying water and wastewater bills on the network.

We have explored the economic rationale for developers paying less than the full cost that is incurred as a consequence of new developments. We have approached this question with an open mind and have based our analysis on economic principles. The

¹ In accordance with the Charging Rules for New Connection Services (English Undertakers), Charges Scheme Rules and provisions of the Water Industry Act 1991 (WIA91), water companies (‘undertakers’) must publish a set of developer charges to connect to their networks.

² This proportion of the cost tends to be spread out and recovered through end-customer bills over a number of years. Therefore, in practice it is recovered from “bill payers”, that is existing customers on the network and future customers too. We note that many of the future customers will also be existing customers today.

³ Local and strategic assets (which we describe in more detail in the rest of this report) serve both new connections as well as all other customers on the network. When recovering the cost of reinforcing local assets, the charging rules require companies only to recover the proportion of costs required to serve the new properties over and above that which is required to serve existing customer requirements. Developers do not pay for reinforcing strategic assets or any other off-site costs. We discuss these points, including the issue of allocating costs between new connections and existing demand, in more detail in the rest of this report.

main argument against developers paying less than the full cost is one of cost reflectiveness / cost causation. This “user pays” principle argues that costs should be recovered from the parties that are causing those costs. We have also considered a number of arguments in favour of the current charging arrangement. However, we find shortcomings with some of these arguments and a lack of strong evidence for others. Therefore, in our view, it is not clear that there is an economic rationale for developers paying less than the full cost of connecting new developments, or at the very least, further evidence would be required in order to support maintaining the status quo.

We have then considered how the approach to recovering costs could be structured in future. To help guide us, we have identified some high level evaluation criteria against which we can weigh up the pros and cons of alternative arrangements:

- Cost reflectiveness: Ideally, the charges would be cost reflective with costs being recovered from the parties that are causing those costs;
- Simplicity: Any changes should be relatively easy to implement and the resulting charges should be clear and easily understood by developers and third parties;
- Support for markets: Some of the components of developer services are contestable. An alternative approach to recovering costs should help rather than hinder competition between incumbents and third parties; and
- Public value: Alternative approaches could do more in terms of promoting social and environmental incentives and innovation.

In assessing potential future options for recovering costs, our key findings are as follows:

- Should developers contribute to the full set of off-site costs as opposed to just reinforcement of local assets?
 - Ultimately, we find that it would be more cost reflective and in line with the principle of cost causation if developers did pay for all of the off-site costs that they cause. We note that some off-site costs are driven both by demand from new developments and demand from existing connections. We recognise that in practice it may be challenging to isolate the proportion of off-site costs that are driven by new developments. However, from an economics perspective, we believe it is appropriate for developers to contribute to the additional costs required to serve the new developments over and above the existing customer requirements.⁴
- How should off-site / network reinforcement charges be structured?
 - We find that the current approach to recovering costs (which at a high level is an average cost approach where, for each company separately, the total cost is recovered across all new connections equally) does little in terms of promoting environmental incentives or user pays principles.

⁴ As discussed in more detail in the rest of this report, we note that to estimate the cost that is driven by new developments it is important to establish an appropriate counterfactual scenario. The counterfactual scenario may need to take into account that if new connections were not added then the growth in population may take place in existing connections on the network which would place a different set of pressures and costs on the network

- We recommend exploring whether charges could be higher in areas where network reinforcement costs are higher and lower in areas where costs are lower. We recognise that it may be costly to implement such an approach, and it also remains to be seen whether charges do differ materially across different zones. However, in principle, such an approach would be more cost reflective.
- We also recommend greater use of environmental incentives such as developers being charged less if they build water efficient homes, provide sustainable drainage systems, rainwater capture or grey water recycling (which we note some companies already offer).
- Should there be an income offset?
 - We have considered a number of arguments in favour of providing an income offset. However, ultimately we find the economic rationale for the income offset to be weak, or at the very least, that further evidence would be required to continue providing an income offset.
- If there continues to be a discount, how should it be calculated?
 - It could be based on a top down policy decision. It could continue to be used as a balancing item to stabilise charging levels. Or if there is a convincing economic rationale for the income offset, e.g. an argument linked to costs, then it could be calculated based on this rationale.
- And if there continues to be a discount, how should it be applied?
 - Options include applying it as a flat rate per new connection, or using it to incentivise particular behaviours such as building away from water-scarce zones and building water efficient homes to further strengthen environmental incentives.

In evaluating these options, there are various pros and cons. In general, we see the benefits of moving towards a more cost reflective approach, which would also strengthen environmental incentives. However, this generally tends to increase complexity and the cost of implementation, and it may make it harder for companies to present their charges in a simple way.

1 INTRODUCTION

1.1 Background

'Developer services' involve connecting new properties to the local water and wastewater networks. At a high level, the services can be split into two main components:

- On-site work – This relates to the physical connection between each new property and the existing network located near to the relevant site; and
- Off-site work – Where, in some instances, in order to accommodate the extra demand reflected by the new properties, it may be necessary to add extra capacity to the existing off-site network.

The purpose of this report is to review how the cost of providing these services is recovered in England and Wales. In practice, the cost is recovered from two separate groups:

- The developers requesting the work pay a set of 'developer charges'⁵; and
- The remainder of the cost is funded by the local water and wastewater company whose network the new properties are connecting to. This cost is then effectively recovered across all end-customers paying water and wastewater bills on the network.⁶

We refer to this split in costs between developers and customers as the 'balance of charges', and in practice it means that developers only pay for a proportion of the total cost that is incurred by the water company as a consequence of connecting new developments.

In principle, these costs could be recovered in many different ways, and there are various economic arguments for and against different arrangements and whether developers should receive a discount or not – which we set out in more detail in the rest of this report.

In determining how the costs should or could be recovered there are also other important policy considerations. For example:

- Competition: In England and Wales, most water and wastewater services are provided by the incumbent which is a monopoly provider in its area of appointment, meaning that, in general, there is limited scope for competition. However, some developer services are open to competition. For these, developers have a choice as to whether they buy services from the incumbent water company or from a number of third parties – including from a New

⁵ In accordance with the Charging Rules for New Connection Services (English Undertakers), Charges Scheme Rules and provisions of the Water Industry Act 1991 (WIA91), water companies ('undertakers') must publish a set of developer charges to connect to their networks.

⁶ This proportion of the cost tends to be spread out and recovered through customer bills over a number of years. Therefore, in practice it is recovered from "bill payers", that is existing customers on the network and future customers too. We note that many of the future customers will also be existing customers today.

Appointee or Variation (NAV)⁷ or from a specialist Self-lay Provider (SLP)⁸. Or the developer could carry out this work itself. In many markets, competition leads to positive outcomes including lower prices, improved service quality, and greater innovation which could potentially diffuse into the rest of the sector too. Therefore, in designing potential new ways for costs to be recovered, it is important for policymakers to support and not stifle competition. This is reflected in Ofwat's general duties, one of which is to exercise its powers and duties in the manner which Ofwat considers is best calculated 'to further the consumer objective', which, in turn, is 'to protect the interests of consumers, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the provision of water and sewerage services' (s.2 of the Water Industry Act 1991 (the 'WIA91')).⁹

- Environment: The water sector faces a range of environmental challenges, relating to climate change, water scarcity and maintaining and improving local ecosystems. In determining how costs should be recovered, it is important to note that the charging arrangements could be used to help target certain behaviours and policy objectives. For example, developers could receive discounts if they build water-efficient homes. This would impact on the structure of charges and, depending on how these discounts are funded, potentially also on the balance of charges.

1.2 The scope and structure of this report

Ofwat's charging rules¹⁰ for new connections have changed in recent years, and we understand that Ofwat is considering whether to introduce further changes. To support this, Ofwat has commissioned Frontier, supported by Atkins, to review its current approach to recovering the cost of developer services in England and Wales, focusing in particular on the 'balance of charges', as well as to consider how this approach could evolve in the future. We have approached this question with an open mind and have based our analysis on economic principles.

Frontier has led on the economic analysis, and Atkins has provided expert engineering input in specific areas.

The rest of this report is structured as follows:

- In Section 2, by way of background, we provide a high level description of the different components of developer services;
- In Section 3, we describe how these costs are recovered in England and Wales;

⁷ New appointment and variations (NAVs) provide water and/or sewerage services to customers in an area previously served by the incumbent monopoly provider. A new appointment is made when Ofwat appoints a company for the first time to provide services for specific geographic area. A variation is where an existing appointment is varied to enable the area to be served by a different appointee.

⁸ Self-lay providers (SLPs) are accredited operatives who can lay the pipework for a new water main or sewer rather than have the infrastructure laid by the water company. The water company will take over responsibility for (that is, adopt) self-laid pipes that meet the terms of its agreement with the provider.

⁹ <http://www.legislation.gov.uk/ukpga/1991/56/contents>

¹⁰ This includes the Charging Rules for New Connection Services (English Undertakers), Charges Scheme Rules and provisions of the Water Industry Act 1991 (WIA91). We describe these points in more detail in Section 3.

- In Section 4, we discuss in more detail how the charging arrangements in England and Wales give rise to a balance of charges and we comment on the economic rationale of this arrangement;
- In Section 5, to give a high level sense of scale, we provide cost estimates of the different components of developer services and estimates of the balance of charges;
- In Section 6, with a view to potentially reforming how costs are recovered in future, we define a set of evaluation criteria against which we can assess the relative pros and cons of alternative arrangements;
- In Section 7, we set out a menu of potential options for how costs could be recovered in future, discussing what different levers are available and how they could be changed. In this report we have not evaluated a shortlist of options. We understand that Ofwat will be consulting on potential options in due course; and
- In Section 8, we provide our overall conclusions.

2 OVERVIEW OF DEVELOPER SERVICES

2.1 Introduction

In this section we provide a high level overview of the different components of water company activities that are incurred as a consequence of new developments. The graphics below – produced by Ofwat – reflect the services in relation to water in Figure 1 and wastewater in Figure 2.

Figure 1 Overview of developer services – Water

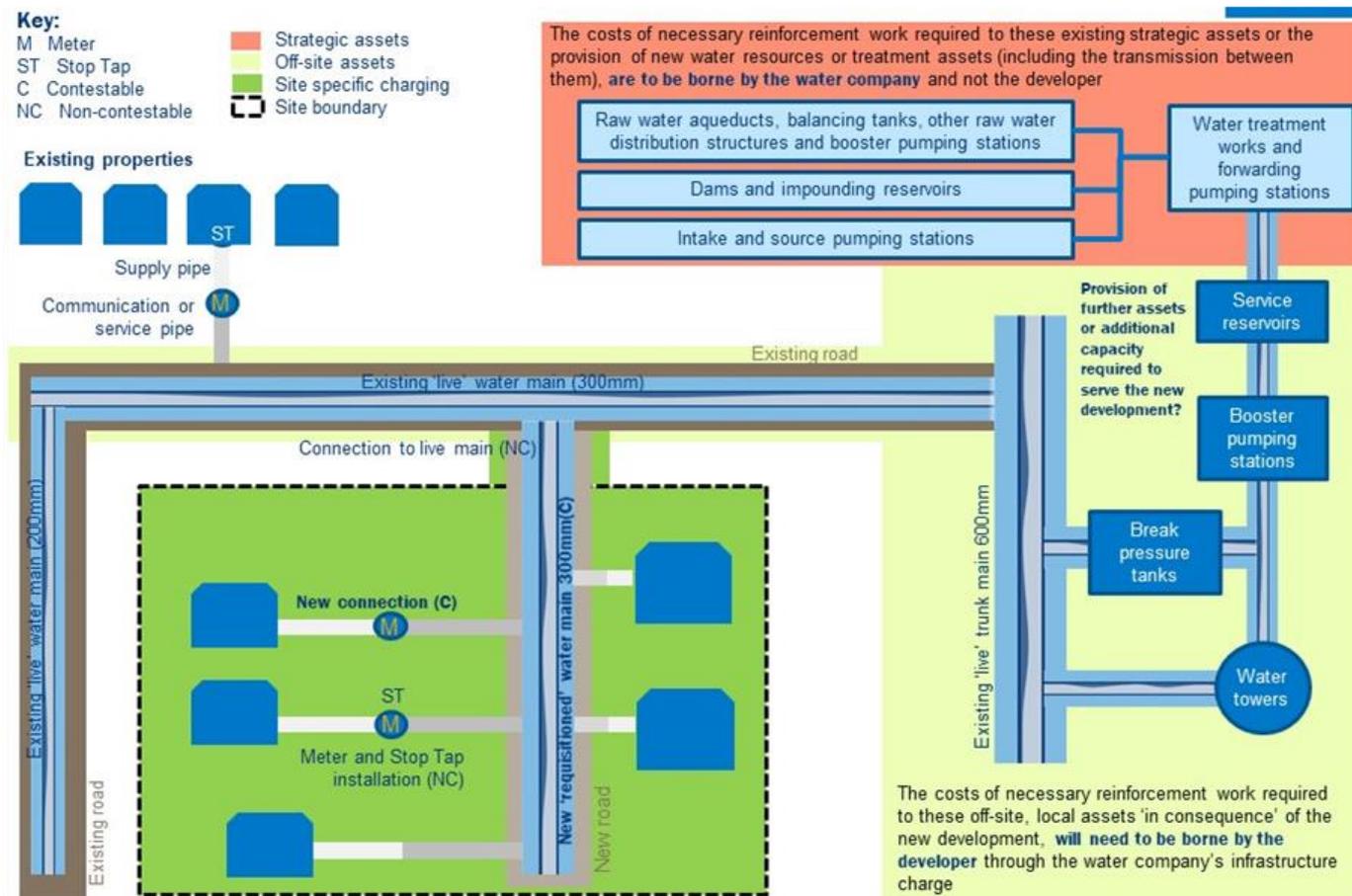
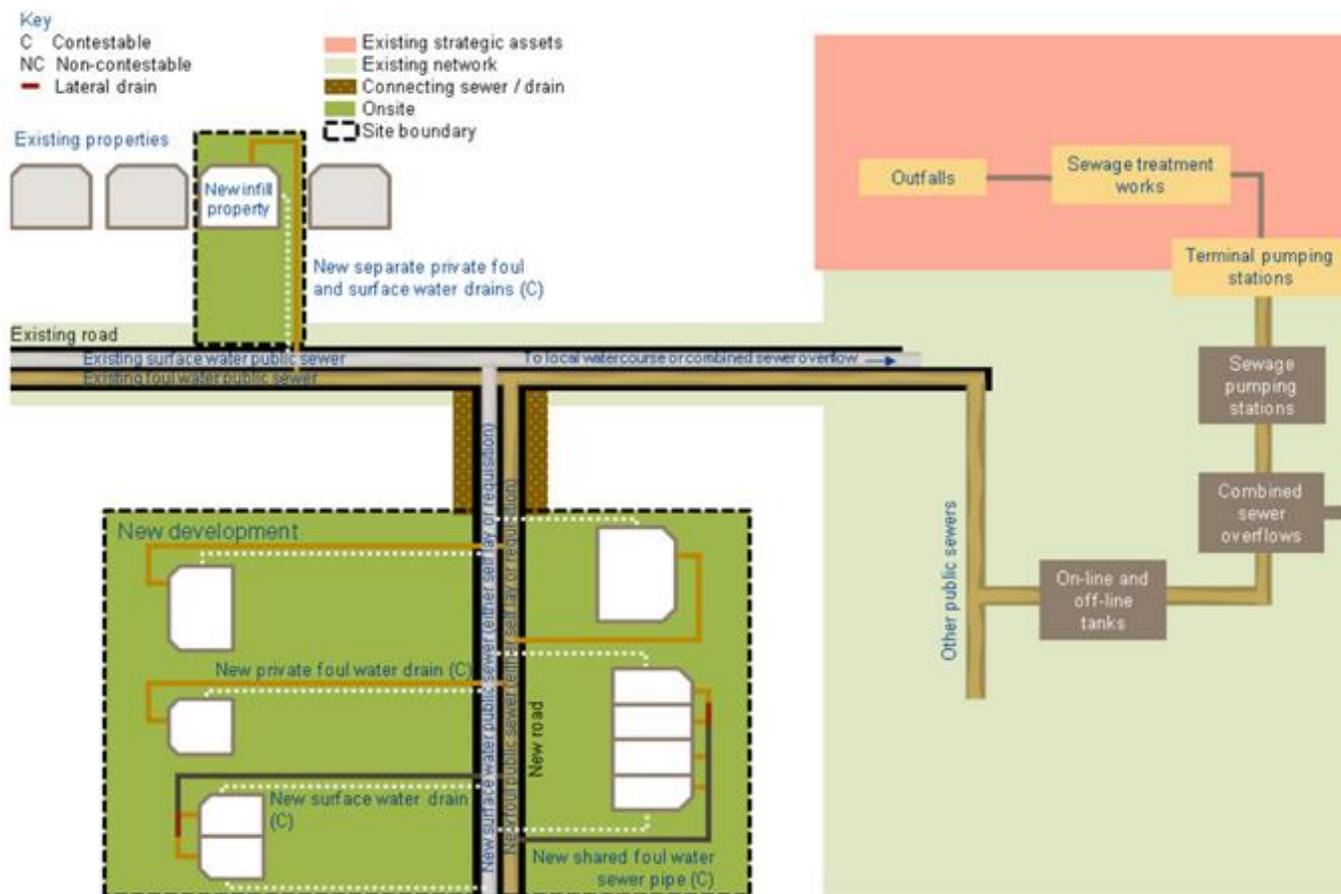


Figure 2 Overview of developer services - Wastewater



There are four main components of costs that may be incurred as a result of new developments:

- New connections;
- Requisitioning water mains and sewers;
- Increasing off-site capacity. This component can be split into:
 - Reinforcing 'local' off-site assets;
 - Reinforcing 'strategic' off-site assets.
- Diversions.

We describe each of these components in turn below.

2.2 New connections

A new connection relates to connecting new properties to a water main or a sewer. For water services, this involves laying supply and communication pipes as well as fitting water meters and stop taps.¹¹ For wastewater services, this involves laying

¹¹ Supply and communication pipes are the pipes that connect a property to a water main. Communication pipes extend from the water main to the street boundary. Supply pipes extend from the street boundary to the property's internal pipework.

private and lateral drains¹², and related ancillaries such as maintenance holes. Separate drains are laid in order to transport wastewater originating from:

- Domestic or commercial/industrial activities (conveyed in foul drains); and
- Roofs and other impermeable surfaces (conveyed in surface water (or storm water) drains).

Each new connection will require its own infrastructure and we note that a single connection may serve multiple properties – e.g. in the case of flats. The work and associated costs will vary depending on the length and the material of the pipes required, the surface material where pipes are laid, the depth at which the pipes are laid, and other factors, such as whether road traffic management is required.

2.3 Requisitioned water mains and sewers

Many new development sites will require laying a new water main which connects the 'on-site' communication pipes to the existing 'off-site' distribution network. To provide wastewater services, a new sewer¹³ may be required to connect private and lateral drains to the existing 'off site' wastewater network. These are often referred to as 'requisitioned' water mains and sewers. Not all new developments will require new water mains or sewers. For example, a new property may be built on a site close to an existing water main or sewer such that only on-site connection is required to connect the new property to the existing infrastructure.

While each new connection requires its own on-site connection infrastructure, requisitions are typically shared across multiple new connections. As with on-site connections, the work and associated costs will vary depending on the length, depth and material of the pipes and sewers, the surface material, and other factors, such as whether road traffic management is required. Design and validation work of the new water main or sewer may also be involved. Requisition services will vary in nature from site to site to a greater extent than the new connection services described above. For example, where wastewater is unable to flow by gravity to the existing network, a pumping station will be required to lift the wastewater from the development and discharge it to the existing network via a pressurised sewer. This will incur significant additional costs. Costs will also be impacted by changes in labour costs and the costs of physical material.

2.4 Increasing off-site capacity

New connections place additional demand on water and wastewater networks. Therefore, planning for new connections may result in the incumbent network operator reinforcing, upgrading or otherwise modifying the existing assets to increase capacity in order to accommodate the extra demand.

Increasing infrastructure capacity is typically thought of in two parts:

¹² A drain is a pipe that is used to transport wastewater away from a single property. A private drain is the part of the drain located with a property curtilage. A lateral drain is the part of the drain that is located outside of the property curtilage.

¹³ A sewer is a pipe that is used to transport wastewater away from more than one property.

- Off-site ‘local’ assets: These are indicated in the graphics above within the lighter green areas. For water networks, these include existing water and trunk mains, break pressure tanks, water towers, booster pumping stations and service reservoirs. For wastewater networks, these include existing sewers, on-line and off-line storage tanks, combined sewer overflows, and wastewater pumping stations.
- ‘Strategic’ assets: These are indicated in the graphics above within the dark orange area. For water networks, these include new water resources, treatment assets, raw water aqueducts, balancing tanks, other raw water distribution structures, booster pumping stations, dams and impounding reservoirs, intake and source pumping stations, water treatment works, and forwarding pumping stations. For wastewater networks, these include ‘terminal’ pumping stations (those pumping stations that discharge wastewater directly to treatment works), wastewater treatment works, and the outfalls that discharge treated flows back to waterbodies.

These costs are also sometimes referred to as “shallow” and “deep” costs, respectively.¹⁴

For off-site local assets, the work and associated cost is driven by the total number of new connections added to the network and the level of headroom and spare capacity in the area close to where the new connections are added. For example, multiple large developments could be added in a part of the network where there is plenty of spare capacity, and as such no reinforcement may be required. Conversely, a relatively small number of new connections added to a part of the network with little to no spare capacity may result in network reinforcement being required. Also, in areas where extra capacity is required, the cost of adding the extra capacity may vary due to various area-specific reasons.

Unlike local assets, strategic assets are less localised in nature – i.e. they tend to be shared by connections in many different areas. Therefore, the driver of reinforcing strategic assets tends to be growth forecasts at a more aggregated level, as well as other factors such as changes to resilience requirements.

An important part of this report is to draw attention to the fact that in a wider sense, beyond just ‘network’ infrastructure, strategic assets should also include any investments which are required specifically to accommodate new connections – or in other words, investments that would not go ahead if the new connections were not added. Some investments might appear at first glance to be entirely unrelated to new connections, but the reality is more nuanced. For example, companies could reduce leakage on existing water infrastructure as a means to increase the amount of water available in order to accommodate new connections. Similarly, companies could reduce infiltration on existing wastewater infrastructure, to create additional capacity to accommodate new connections. Therefore, the costs that are incurred as a result of new developments are broader than just the costs of local and strategic assets defined in the diagrams above.

¹⁴ Defra (June 2012), Charging for water and sewerage infrastructure within new development, accessed on 13 May 2020, https://www.legislation.gov.uk/ukia/2012/2038/pdfs/ukia_20122038_en.pdf.

For simplicity, in the rest of this report we refer to all off-site costs (excluding the cost of reinforcing local off-site assets) as strategic assets.

2.5 Diversions

When a developer plans to build new properties, this may require the water company to divert existing assets to allow the work to go ahead. However, the scale of diversionary work tends to be relatively low compared to the other services described above. Many new developments may not require any diversionary work.

Diversions driven by new property developers are covered by Section 185 of the WIA91, and in this report we focus on these diversions.¹⁵

¹⁵ Diversions may also be required for other reasons. For example, the new high-speed rail link (HS2) will require many water and wastewater assets to be diverted. These diversions are not driven by new property developers and have not been considered in this report.

3 HOW COSTS ARE RECOVERED

3.1 Introduction

Before discussing how the cost of developer services could be recovered in future, in this section we first set the scene by providing an overview of how costs are currently recovered in England and Wales (as of 1 April 2020):

- First, we give some background on the set of developer charges in England and Wales; and
- Second, we describe the current approach to recovering the cost of each component of developer services in turn, in line with Ofwat's charging rules in effect from 1 April 2020.¹⁶

3.2 Background

Water companies in England and Wales were privatised in 1989. The WIA91 sets out various provisions relating to water supply and wastewater services. This included how developer charges should be set to recover the cost of connecting new properties to the local water and wastewater networks.

The WIA91 was then amended by the Water Act 2014 (WA14).¹⁷ As a result, Ofwat received powers to set charging rules relating to charges for developer services.

English water and wastewater companies

For English water and wastewater companies,¹⁸ in its Charging guidance to Ofwat (January 2016), Defra stated that Ofwat should have regard to the following high level principles when setting its charging rules:¹⁹

- Stable and predictable charges;
- Transparent and customer focused charging;
- Fairness and affordability; and
- Environmental protection.

Defra also stated²⁰ that the current 'balance of charges' between contributions to costs by developers and "bill payers" (existing/future customers) should be broadly maintained. (We discuss this in more detail below).

¹⁶ This is based on the Charging Rules for New Connection Services (English Undertakers), Charges Scheme Rules and provisions of the Water Industry Act 1991 (WIA91).

¹⁷ Accessed on 13 May 2020, <http://www.legislation.gov.uk/ukpga/2014/21/contents/enacted>.

¹⁸ Water and wastewater companies operating wholly or mainly in England.

¹⁹ Defra (January 2016), Charging guidance to Ofwat, accessed on 13 May 2020, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/496044/c-charging-guidance-ofwat-2016.pdf.

²⁰ Defra (July 2016), Water industry: guidance to Ofwat for water and sewerage connection charges, accessed on 18 May 2020, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/575368/ofwat-charging-guidance-sewerage-connection-charges.pdf

Ofwat carried out an extensive consultation process and engaged with various stakeholders before publishing its final position on charging rules for new connections for English water and wastewater companies in December 2016. Ofwat's charging rules for English water companies came into effect in April 2018.

Ofwat consulted on making further changes to reform the treatment of the income offset and published its policy decision on that in November 2017.²¹ The final position was that the income offset would be applied to the infrastructure charge from April 2020. Ofwat then consulted on changing the charging rules for new connections and new developments in England from April 2020 to give effect to the 2017 policy decision and introduce some additional clarifications and reporting requirement and set out its decision on those changes in 2019.²² This set out the new charging rules which apply to English water companies from 1 April 2020 onwards.

Welsh water and wastewater companies

For Welsh water and wastewater companies,²³ the Welsh Government, in its Charging guidance to Ofwat (2016), stated that Ofwat should have regard to the following high level principles when setting its charging rules:

- Simplicity and transparency;
- Stability, predictability, and timeliness;
- Fairness and cost reflectivity;
- Environmental sustainability.

Ofwat's charging rules relating to charges for developer services to new connection do not apply to Welsh companies. Ofwat is expected to introduce new charging rules for developer services for Welsh companies that will come into effect from April 2022.

Contestable services

Another key consideration when setting charging rules for developer services is that some the services are contestable. With respect to on-site work (new connections and requisition) developers can buy these services from the incumbent water company, or from a New Appointee or Variation (NAV),²⁴ or from a specialist self-lay provider (SLP).²⁵ Alternatively, it could also choose to carry out

²¹ Ofwat (November 2017), *New connections charges rules from April 2020 – England: Decision Document*, accessed on 13 May 2020, <https://www.ofwat.gov.uk/wp-content/uploads/2017/11/New-connections-charges-rules-from-April-2020-%E2%80%93-England-Decision-Documents.pdf>.

²² Ofwat, (April 2019), *Consultation on charging rules for new connections and new developments for English companies from April 2020*, accessed on 13 May 2020, <https://www.ofwat.gov.uk/consultation/consultation-on-charging-rules-for-new-connections-and-new-developments-for-english-companies-from-april-2020/#Consultation>.

²³ Water and wastewater companies operating wholly or mainly in Wales.

²⁴ New appointment and variations (NAVs) provide water and/or sewerage services to customers in an area previously served by the incumbent monopoly provider. A new appointment is made when Ofwat appoints a company for the first time to provide services for specific geographic area. A variation is where an existing appointment is varied to enable the area to be served by a different appointee.

²⁵ Self-lay providers (SLPs) are accredited operatives who can lay the pipework for a new water main or sewer rather than have the infrastructure laid by the water company. The water company will take over responsibility for (that is, adopt) self-laid pipes that meet the terms of its agreement with the provider.

the work itself.²⁶ Therefore, an important focus of the charging rules is to ensure a level playing field for the components of developer services that are contestable by SLPs and NAVs.

3.3 The approach from April 2020

The table below provides a high level overview of how the costs associated with the different components of developer services are recovered based on the charging rules from April 2020. Where appropriate, we also discuss in detail the historical approach to charging and how this has changed over time, including the approach to the 'income offset'.

²⁶ If the work is carried out by the developer or an SLP, the assets are then adopted by the local company, either the local incumbent water company or a NAV.

THE BALANCE OF CHARGES FOR DEVELOPER SERVICES

Figure 3 Overview of how the cost of developer services are recovered

Developer service	Contestable or not contestable	Costs involved	How costs are recovered in England	How costs are recovered in Wales	Who bears the cost? ²⁷
New connections	Contestable	Laying supply and communication pipes, fitting stop taps and water meters	Fixed, cost reflective (by materials and surface type) connection charge		Developers in full
Requisitioned water mains and sewers	Mostly contestable ²⁸	Design and laying of new water mains and sewers	For site specific services: fixed, cost reflective (by materials and surface type) requisition charge; otherwise recovered by infrastructure charges along with other off-site local assets.	Fixed, cost reflective (by materials and surface type) requisition charge Developers receive an income offset	England: Developers in full Wales: Shared between developers and other customers
Reinforcement of off-site local assets ²⁹	Not contestable ³⁰	Increasing capacity on local off-site assets, including break pressure tanks, water towers, booster pumping stations and service reservoirs	Infrastructure charges to be set according to the principle that costs net of any revenue received are recovered over a rolling five year cumulative period. Developer receive an income offset	Infrastructure charges set at £200 in 1995 and indexed over time using RPI	England: Shared between developers and other customers Wales: Developers in full
Reinforcement of strategic assets	Not contestable	Increasing capacity on strategic assets, incl. raw water distribution structures, dams, impounding reservoirs and treatment works		Not recovered through developer charges. Recovered through other customers	Other customers in full
Diversions	Not contestable	Moving existing water and wastewater assets to allow construction	Cost reflective diversion charges assessed on a case by case basis		Developers in full

Source: Frontier analysis. Note: The elements highlighted in red are funded by all other customers through customer bills and not developers. This gives rise to a 'balance of charges'.

²⁷ Depending on who makes the request, the costs could be borne by one specific developer, a group of developers in an impacted area or all developers in the company area collectively.

²⁸ The work is contestable for smaller diameter mains and some larger diameter mains. Limits are set out by each water and wastewater company.

²⁹ Excluding works to address pre-existing deficiencies in capacity or in capability unrelated to the development.

³⁰ When the development is reasonable large, NAVs may also self-supply some off-site assets.

3.4 New connections

The cost of delivering new connections is recovered from developers through connection charges. English companies are required to publish upfront new connection charges under the Charging rules for new connection services (English undertakers). In Wales, those charges are still regulated by the WIA91, which does not explicitly require the publication of upfront charges.

Companies have discretion to set these charges in a way that is transparent for developers. In practice, charges are typically split out by materials, surface type and other requirements, such as whether traffic management is required. Connection charges are borne entirely by developers.

There is a contestable market for new connections. Developers have a choice between procuring these services from some or all of:

- The incumbent company;
- A new appointment or variation (NAV);
- A self-lay provider (SLP); or
- It could choose to carry out this work itself.

In practice, incumbents tend to carry out most connections for smaller sites. Due to the additional risk of harm to consumers in the case of water connections (i.e. the risk of water quality failures) water companies typically do require third parties to be accredited before they are able to make new water connections. These accredited organisations are SLPs. SLPs and developers tend to deliver water and wastewater connections respectively for larger sites. The incumbent companies set out the design standards that new water and wastewater connections need to comply with, and they may subsequently conduct an inspection to ensure that they were built in line with these standards before adopting these assets from the developer or SLP. The share of NAVs and SLPs carrying out water connections is generally increasing over time.³¹

3.5 Requisitioned water mains and sewers

The cost of laying and connecting a new 'requisitioned' water main or sewer is recovered through a requisition charge. The approach to requisition charges in England has changed in recent years, in particular involving the treatment of the 'income offset'. Below we describe the approach currently in effect in Wales (which was also in effect in England before the introduction of the charging rules 1 April 2018), and the approach in effect in England from 1 April 2020.

We note that, like carrying out a new connection, requisition is a contestable service. Developers face a choice between procuring these services from an incumbent, a NAV or an SLP.

³¹ Between 2017 and 2019, Ofwat data shows SLPs provided infrastructure for about a third of all completed new water connections and NAVs supplied about 2% of all new properties.

Approach to requisition charges in effect in Wales (and in England before April 2018)

Requisition charges are based on a 'discounted aggregate deficit' (DAD) formula which typically result in developers paying significantly less than the full cost of the requisition service.

The fact that developers are not paying for the full cost means that the remainder is being funded by the water company, with that cost then effectively recovered from existing and future customers through customer bills.

The details of the DAD formula are set out in sections 42-43A and 99-100A of the WIA91³² and require that requisition charges must be calculated as either:

- the 'relevant deficit', paid each year over 12 years; or
- a one-off payment of the DAD.

The 'relevant deficit' in a year is calculated as the positive difference (if any) between:

- the revenue generated from properties connected to the requisitioned mains or sewer; and
- the annual 'borrowing costs' of a loan of the amount required for the provision of that main or sewer. The borrowing cost effectively relates to the annualised capital cost of the new infrastructure including interest payments.

The DAD is the net present value of all (projected) relevant deficits over a 12 year period. An illustrative example, adapted from a study by Defra, is shown below.

³² <http://www.legislation.gov.uk/ukpga/1991/56/data.pdf> (relevant sections now replaced by new provisions for England but still in force for Wales)

Figure 4 Example Relevant Deficit and Discounted Aggregate Deficit

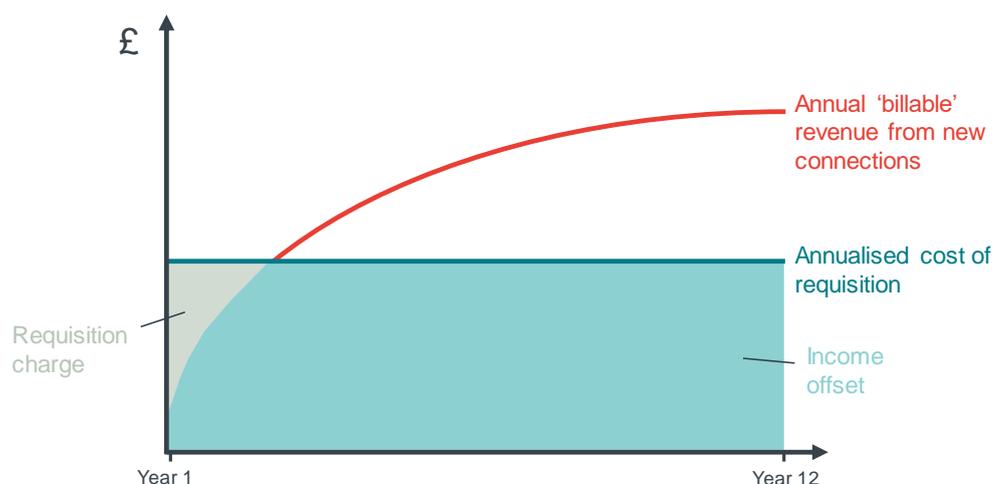
Year	Revenue	Annual Loan Repayments (incl. interest)	Relevant Deficit	Discount Factor	Discounted Aggregate Deficit
1	£1,100.00	£4,289.89	£3,189.89	0.93897	£2,995.20
2	£8,497.50	£4,289.89	£-	0.88166	£-
3	£17,504.85	£4,289.89	£-	0.82785	£-
4	£18,030.00	£4,289.89	£-	0.77732	£-
5	£18,570.90	£4,289.89	£-	0.72988	£-
6	£19,128.02	£4,289.89	£-	0.68533	£-
7	£19,701.86	£4,289.89	£-	0.64351	£-
8	£20,292.92	£4,289.89	£-	0.60423	£-
9	£21,528.76	£4,289.89	£-	0.56735	£-
10	£22,174.62	£4,289.89	£-	0.53273	£-
11	£22,839.86	£4,289.89	£-	0.50021	£-
12	£22,839.86	£4,289.89	£-	0.46968	£-
Total	£210,270.99	£51,478.63	£3,189.89	-	£2,995.20

Source: Adapted from Defra 1383 UK impact assessment, 2013

Note: This calculation is based on water main costing £35,000 serving 150 properties that pay £110 per year before inflation; a borrowing interest rate equal to the discount rate of 6.5%; and long term inflation at 3%. It is assumed that 10 properties are occupied in year 1, 75 in year 2 and 150 in years 3 to 12.

Based on this approach, developers only incur a requisition charge if, in any year of the 12 year period, the annualised cost of the new water main or sewer is higher than the revenue that is billable from the newly connected properties. For the purpose of the DAD calculation, all 'billable' properties are considered, namely those properties that are connected to the requisitioned main or sewer even if they are not yet occupied by bill-paying customers. A 'relevant deficit' typically appears in the first few years after the requisitioned mains or sewer is laid, largely driven by the fact that the number of billable properties is still growing and revenues are relatively low. This means that the build rate – i.e. the rate at which developers build the new homes – is one of the main drivers of the charges that the developers face.

A stylised graphical representation of the DAD approach to requisition charges is shown below.

Figure 5 Calculation of the income offset under the DAD formula

The amount which is funded by customers (highlighted in blue) is known as an ‘income offset’, and it gives rise to a balance of charges between developers and customers.

In Section 4, we comment on the economic rationale of this approach in more detail.

Approach to requisition charges in effect in England from April 2020

Following the introduction of the Charging Rules for New Connection Services (English Undertakers) in April 2018, English companies were no longer required to use the DAD approach for calculating the income offset.

Ofwat made a policy change regarding the treatment of the income offset for English companies in November 2017,³³ to apply from 1 April 2020 onwards. The charging rules were amended in July 2019³⁴ following a statutory consultation. The rules for requisitions are now more in line with the approach to connection charges, and require that the charge is cost reflective and that it must not include any income offset – which has now been moved to the network reinforcement / infrastructure charge (discussed below). The requisition charge must not include any costs which are already included within the connection charge, or any costs which are incurred off-site.

As with connection charges for English companies, cost reflective charges for requisition must be laid out in water companies’ charging arrangements, and are typically split out by distance, material, and surface type. While the market is contestable, third parties may still be required to pay the incumbent for various design validation and administration fees. This relates to the fact that the new infrastructure needs to connect to the incumbent’s network and the incumbent will need to undertake administrative activities such as processing applications or updating asset registers, which impose a cost on the incumbent. Similar to new

³³ Ofwat (November 2017), *New connections charges rules from April 2020 – England: Decision Document*, accessed on 13 May 2020, <https://www.ofwat.gov.uk/wp-content/uploads/2017/11/New-connections-charges-rules-from-April-2020-%E2%80%93-England-Decision-Documents.pdf>.

³⁴ Accessed on 13 May 2020, <https://www.ofwat.gov.uk/consultation/consultation-on-charging-rules-for-new-connections-and-new-developments-for-english-companies-from-april-2020/#Outcome>.

connections, in practice, incumbents tend to carry out most requisitions for smaller sites.

Removing the income offset from the charge means that developers pay for the cost of requisition in full. It has also helped to facilitate more effective competition between the incumbent, NAVs and SLPs by simplifying the charging structure, and avoiding any possibility that the income offset distorts competition. We discuss the rationale for the rule change further below.

3.6 Reinforcement of off-site local assets

The change to the income offset in England has had an impact on the network reinforcement charge and balance of charges. In this section we discuss the approach currently in effect in Wales (which was also in effect in England before 1 April 2018), and the approach in effect in England from 1 April 2020. We also discuss the implications for the balance of charges.

Approach to network reinforcement charges in effect in Wales (and in England before April 2018)

In 1995, by modifying Condition C of the undertakers' Instruments of Appointment (IoA), Ofwat set a uniform maximum infrastructure charge³⁵ for all companies in the industry at £200 per new connection.³⁶ This has then been inflated in line with the increase in RPI each year. The infrastructure charge is intended to recover the cost of local network reinforcement but not strategic asset reinforcement (which is described in the next subsection). This approach to charging is not strictly cost reflective in that all companies could only set the same maximum charge regardless of the underlying costs.

While the rules for setting infrastructure charges have changed for English companies, this approach still applies for Welsh companies.

Approach to network reinforcement charges in effect in England from April 2020 and the income offset

The introduction of the charging rules for new connections in April 2018 brought a significant change to the definition of infrastructure charges - from a maximum value set out in Condition C (Infrastructure Charges) of the IoAs, to a charge based on the costs incurred by the appointee in providing offsite reinforcement works.

Infrastructure charges are set to recover the costs of network reinforcements, which are defined in the new connection rules for English companies. These are works other than site-specific work, including water mains, sewers, service reservoirs and pumping stations. Charges must only relate to costs incurred as a consequence of connecting new developments to the network (and not pre-existing constraints on the network). Based on our discussions with Ofwat we understand

³⁵ Infrastructure charge means a Water Infrastructure Charge, or a Sewerage Infrastructure Charge, as described in section 146(2)(a) and 146(2)(b) of WIA91.

³⁶ Companies could choose to charge less than the maximum charge.

that historically there was a concern in the sector that companies might have been overcharging developers for off-site work.

From 1 April 2020, in setting infrastructure charges, the Charges Scheme Rules for English companies require that:

- Charges are set such that over each period of five consecutive years cumulative revenues from infrastructure charges will recover the costs of network reinforcement that the incumbent water company reasonably incurs, before the application of any income offset.
- The incumbent may (but is not required to) provide an income offset.³⁷
- Infrastructure charges may be set as a fixed charge per connection or calculated in accordance with a formula. Infrastructure charges may vary to reflect different circumstances and, in particular, may be different in different geographical areas, as long as any differences are cost reflective.

In practice, most companies interpret these rules by:

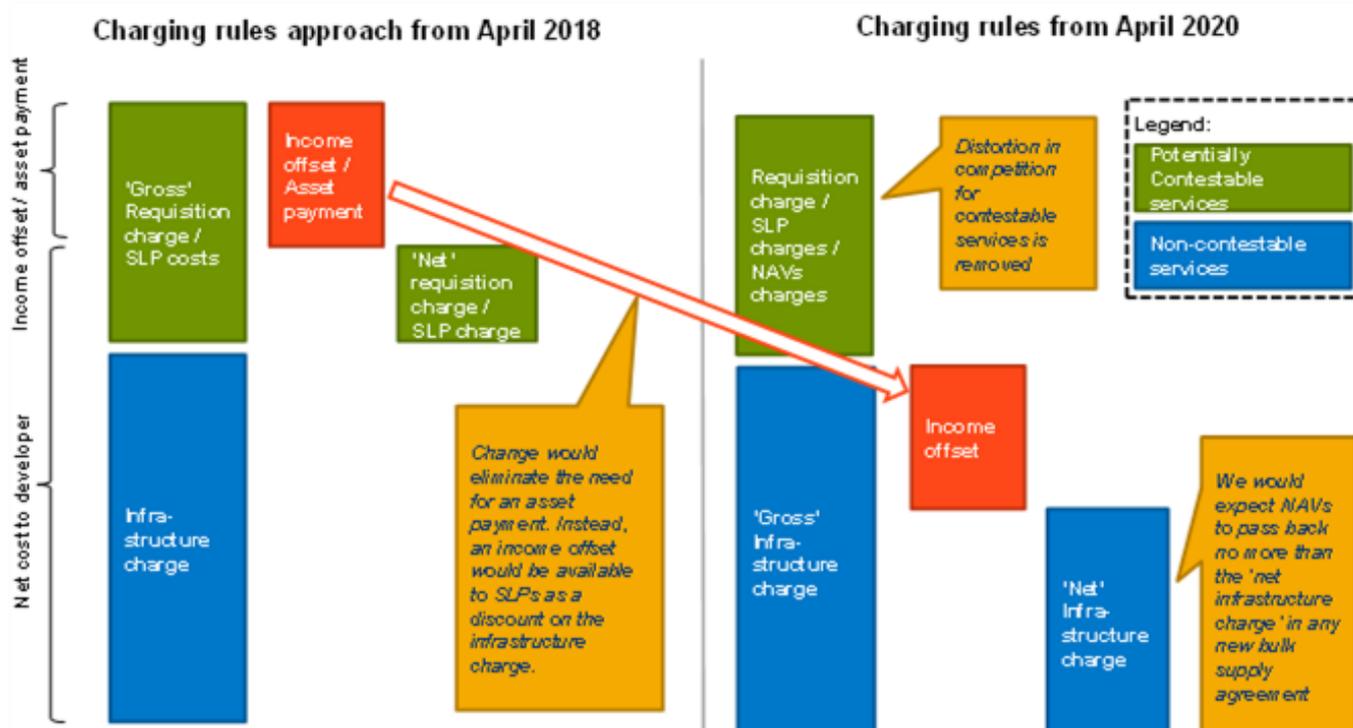
- First estimating the gross average cost of network reinforcement per new connection. This is done by forecasting the total expected gross local network reinforcement cost due to new connections over 5 years, and then dividing it by the expected number of new connections added over the same period. Incumbents will revisit this cost each year to ensure that they are on track to recover the full amount.
- In calculating this cost, incumbents attempt to control for usage by first estimating the cost of connecting a standard domestic property, and then for properties beyond this standard, companies then tend to apply a 'relevant multiplier' for larger water or wastewater connections. This has the effect of setting a higher charge for larger new connections with higher levels of water usage and wastewater discharge. The relevant multiplier is typically calculated using a formula which takes into account factors such as the number of sinks, showers and baths in the property – i.e. where having more results in a higher charge on the basis that usage is expected to be higher.
- From this figure, incumbent companies then subtract an 'income offset' to derive the final 'net' charge.

The rule change around the income offset means that the 'gross' charge (i.e. before the income offset is subtracted) is now more cost reflective as opposed to the previous requirements, where an industry wide charge was used. The charge is cost reflective over a 5 year period and on an average cost basis, whereby developers pay the infrastructure charge for every property connected irrespective of whether their development has caused the need for reinforcement or not.

An overview of the rule change for the income offset is shown in the figure below.

³⁷ In practice, we observe that most companies have income offsets in their charges.

Figure 6 The income offset was moved to the infrastructure charge



Source: 'Consultation on charging rules for new connections and new developments for English companies from April 2020', Ofwat, April 2019

An important factor in changing the rules around the income offset was to ensure a more effective competition in the contestable requisition market, so that NAVs can compete on a level playing field with incumbent water companies and SLPs.

In the context of competition, developers can procure developer services from NAVs. NAVs can come in different forms:

- 'Basic' NAVs: This is where the NAV only provides its own on-site infrastructure and services, and needs to rely on the incumbent for all off-site infrastructure, services and resources.
- 'Full service' NAVs: This is where the NAV provides all of the infrastructure, services and resources that it needs to serve its customers, and does not need to rely on the incumbent at all.
- And in principle, there are many different models in between 'basic' and 'full service' whereby the NAV provides some but not all of its own off-site services and infrastructure.

The previous rules around the income offset disadvantaged NAVs. Under the previous rules, when developers requisitioned new water mains or sewers from the incumbent they would receive an income offset, effectively a discount to the developer on the charges for the requisition. When an SLP provided the on-site work, the incumbent water company made an asset payment to the SLP when adopting the new infrastructure. The asset payment was required to be equivalent to income offset if the incumbent had carried out the work to maintain a level playing field for SLPs.

As NAVs did not receive an asset payment, because they retain control of the on-site infrastructure they provide, they did not benefit from an equivalent discount.³⁸ This meant there was not a level playing field between NAVs and incumbents and SLPs. This was discussed in greater detail in Ofwat's 2017 policy decision to reform the income offset and the 2017 study of the NAV market.³⁹

However, following changes to the charging rules from April 2020, the income offset is now discounted from the infrastructure charge instead of from the requisition charge. Given this, asset payments are no longer applicable. This increases the transparency of requisition charges, which helps to support competition in that market, and reduces the number of transactions. Because network reinforcement is not contestable, all developers must pay the infrastructure charge directly to the incumbent water company regardless of who undertakes the connection work.

Where the customer is served by a NAV that uses a bulk supply from a nearby incumbent to supply services to its customers, it is typical for the NAV to pass most or all of the infrastructure charges that it recovers from its customers to the incumbent that is providing the bulk supply. As a result, the income offset no longer has a negative impact on NAVs as the discount is against a charge that the NAV is passing through to the local incumbent company.

Balance of charges

Defra's 2016 charging guidance to Ofwat stated that Ofwat should ensure that the distribution of costs for new infrastructure between developers and current customers is 'fair'. This was similarly echoed by the Welsh Government in its Charging Guidance to Ofwat, which explained that companies should adjust the income offset to maintain the current balance of costs in aggregate if an increase in cost reflectiveness leads to an increase in infrastructure charges.⁴⁰

In its supplementary guidance on water and sewerage new connection charges Defra comments that "It is the view of government that the current balance between contributions to costs by developers and bill payers should be broadly maintained. The general customer base should not bear costs in relation to new development and developers should not bear costs associated with enhancements to the existing network that are not a consequence of their new connections."⁴¹ We observe that maintaining the balance of charges implies that bill payers would continue to pay some of the costs that developers are driving.

In line with Defra's guidance to promote 'stable and predictable prices', Ofwat initially set out that companies "should take reasonable steps to ensure that the

³⁸ NAVs did not generally receive an asset payment or equivalent reduction in their bulk supply tariff.

³⁹ Ofwat commissioned Frontier Economics in 2016 to conduct a study on the functioning of the New Appointment and Variations (NAV) market. The study was [published](#) in May 2017.

⁴⁰ Welsh Government (2017), Charging Guidance to Ofwat Relating to Developer Charges, Bulk Supply Charges and Access Charges, <https://www.assembly.wales/laid%20documents/gen-ld11331/gen-ld11331-e.pdf>.

⁴¹ Defra (2016) Water industry@ guidance to Ofwat for water and sewerage connection charges, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/575368/ofwat-charging-guidance-sewerage-connection-charges.pdf.

present balance of charges between developers and other customers prior to the implementation of these rules is broadly maintained”.⁴²

This charging rule was introduced in the Charging Rules for New Connection Services (English Undertakers) and came in effect from 1 April 2018.

This guidance was not prescriptive with respect to the income offset, and Ofwat gave companies discretion over how they calculated it. As a result, companies approached the question in different ways, with two main categories of approach emerging:

1. Some companies decided to implement the income offset as a balancing item, to ensure that the balance of charges did remain unchanged after the rule change. Under this approach, the income offset no longer reflects costs or revenues as per the DAD formula, but the balance of charges remained constant.
2. Some companies continued to calculate the income offset with regard to actual costs and revenues, similar to the DAD formula. Under this approach, the balance of charges would not necessarily remain constant.

In response to the lack of consistency across the industry, Ofwat decided to clarify its position and noted in its Charges Scheme Rules that companies should use the income offset as a balancing item to ensure that the balance of overall contributions to costs by developers and customers remains the same.⁴³ This clarification to the rule came into effect from 1 April 2020.

However, as discussed in Section 5, there is currently no precise definition of the balance of charges and, as such, there is still some ambiguity and discretion in relation to what precisely should be maintained.

3.7 Reinforcement of strategic assets

The costs of reinforcing strategic assets are currently not recovered by the infrastructure charge, or indeed any other developer charge. This means that developers do not pay for these costs, and they are effectively paid for in full by other customers. Therefore, the balance of charges between developers and other customers arises from two sources:

- Developers receive an income offset which is funded by all customers on the network; and
- Developers do not pay for the reinforcement of strategic assets which are required in response to new developments. These costs are therefore also funded by all customers on the network.

⁴² Ofwat (July 2019), Charging rules for new connection services (English undertakers) – Effective from 1 April 2020, <https://www.ofwat.gov.uk/wp-content/uploads/2019/07/Charging-Rules-for-New-Connection-Services-English-Undertakers-from-April-2020-1.pdf>

⁴³ Ofwat (July 2019), Charges Scheme Rules issued by the Water Services Regulation Authority under sections 143(6A) and 143B of the Water Industry Act 1991 – Effective from 1 April 2020, <https://www.ofwat.gov.uk/wp-content/uploads/2019/04/Charges-scheme-rules-from-April-2020.pdf>.

3.8 Diversions

The cost of diversion services is recovered from developers through diversion charges. This work is not contestable and the charging rules state that these should be set on a cost reflective basis. The cost of diversions is borne entirely by developers. Similar to new connection, the rules around diversions have remained relatively stable. We note that not all developments will require diversionary work, and it is carried out only when required.

3.9 Charges in Scotland

The text box below provides an overview of how the cost of developer services in Scotland is recovered. The approach is broadly similar to that in England and Wales, whereby (i) developers pay for the cost of on-site work in full; (ii) they receive a type of income offset; and (iii) they do not pay for the cost of reinforcing strategic assets.

COST RECOVERY IN SCOTLAND: A COMPARISON

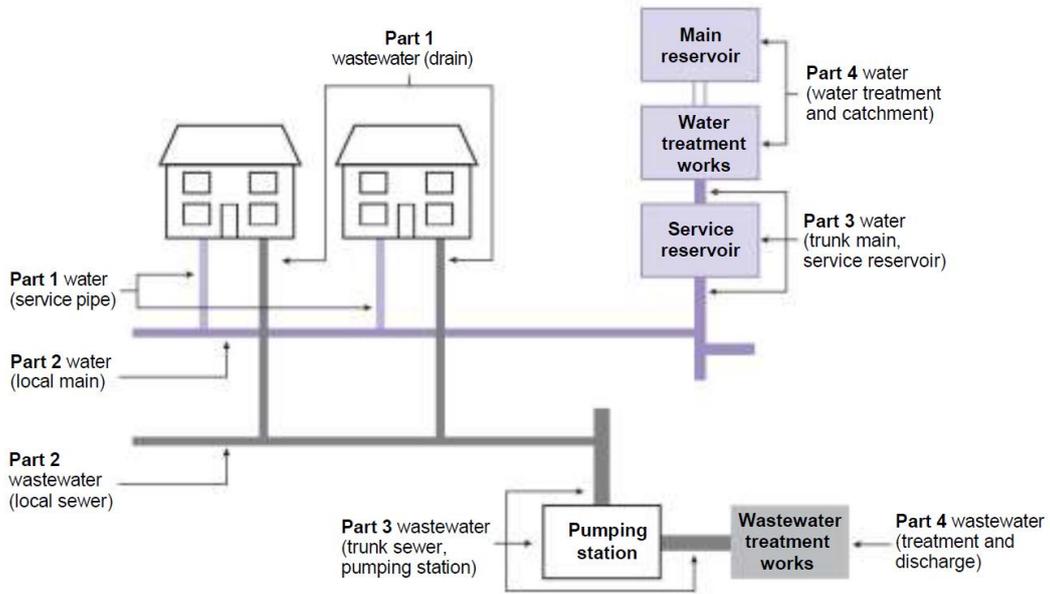
Scottish Water is the sole provider of water and sewage services across Scotland. Cost recovery for developer services in Scotland is broadly similar to the current arrangements in Wales which was also by the approach taken in England prior to Ofwat's updated guidance in April 2018:

- Developers pay for the cost of new connection in full ('part 1' of the new connection assets – see Figure below).
- Developers pay for new requisitioned water mains/sewers and local network reinforcement ('part 2' and 'part 3' of new connection assets). However, they receive a "reasonable cost contribution" (RCC). The RCC is similar to the income offset and is calculated on a basis similar to the DAD model.⁴⁴ Unlike the current income offset rules for English companies, the RCC is not used to achieve a specific balance of charges.
- Scottish Water pays for the deep costs of strategic asset reinforcement, including treatment works and water resources ('part 4' of new connection assets).

Another difference is that in Scotland parts 1, 2 and 3 are all contestable. In fact, Scottish Water does not carry out any of this work itself. All of this infrastructure is built by accredited contractors on behalf of developers. This differs from England and Wales where only parts 1 and 2 (connection and requisition) are contestable. Newly constructed infrastructure is vested in Scottish Water, transferring responsibility for the assets, subject to compliance with Scottish Water specifications.

⁴⁴ The maximum RCC is based on the net present value (NPV) of the average bill over the next 12 years and the number of connections.

Figure 7 Structure of developer services in Scotland



Source: Water Industry Commission for Scotland (WICS)

In Section 5 we provide estimates of the cost of developer services in England and Wales.

4 THE ECONOMIC RATIONALE OF THE CHARGING RULES

4.1 Introduction

Under the current charging rules developers do not pay for the full cost of connecting new developments to the local water and wastewater networks:

1. Developers do not pay for the cost of reinforcing strategic assets; and
2. Developers receive an income offset.

In this section we discuss the economic rationale of this outcome, and assess the case, from an economics perspective, for developers paying less than the full cost of developer services. (We do not comment in this section on how costs could or should be recovered in future, which is covered in later sections.)

Before presenting various arguments, we note the following points:

- First, based on our conversations with Ofwat, we are not aware of the original intention underlying the income offset. We could attempt to infer the intention from the design of the DAD formula, but this would be speculation. There have also been various changes to the charging rules in recent years meaning that the current approach may no longer reflect that original intention. Therefore, rather than focusing on the details of the income offset and then separately the cost of reinforcing strategic assets, we focus instead on the general point that ultimately the current approach results in a situation where developers do not pay for the full cost that they are driving. We have evaluated this outcome with an open mind and based on our analysis on economic principles.
- Second, the question of whether developer charges are passed through from developers to the customers that go on to occupy those homes is a second-order effect.
 - We note that the question of how water companies recover the cost of developer services is not too dissimilar, from an economics perspective, to how many other network-based companies recover the cost of connecting new users to their networks. However, in the context of developer services (including developer services for water and wastewater as well as other utilities), the dynamic is more nuanced. Developers effectively pay developer charges on behalf of the customers that will go on to occupy those properties in future. This adds an extra dynamic to the market and introduces various questions around cost pass through and the economics of the homebuilding sector. However, while this is a valid consideration, we believe it is not at the core of the issue of how to recover the cost of developer services, and instead it is a second-order effect. This is because, hypothetically, if new customers were to build new homes themselves rather than doing so through a developer (which in principle is an option and some customers do), then there would still be a question around whether the wider customer base should fund part of the total cost. In this section we first focus on the general economic arguments for whether new connections to the network (whether through a developer or a new customer

directly) should benefit from some funding from all end-customers on the network (which includes both existing and future customers), and then we consider whether this changes once factoring in that developers tend to carry out the work on behalf of many new customers.

- Third, we recognise that homebuilding is an important policy objective and there is a policy question around how much developers should contribute to the wider costs of new developments within the context of a general policy programme to help incentivise developers to build new homes. However, a detailed analysis of homebuilding as a policy objective is outside the scope of this report. Our main focus in this section is on the economic efficiency and incentive effects of the current charging arrangements.

4.2 Should developers pay less than the full cost of developer services?

In this subsection we discuss the following economic arguments:

- Cost causation – this argues that costs should be recovered from the parties that are causing those costs;
- Economies of scale – if adding new connections to the network leads to a reduction in average costs then arguably this cost saving could be passed back to developers, which can help justify developers paying less than the full cost of developer services;
- On-going costs – if the on-going cost of maintaining new connections is lower than the average cost of maintaining existing connections then this could arguably be a justification for giving developers a discount;
- Externalities – if there are wider social externalities / benefits to adding new connections to the network then this could be an argument for giving developers a discount;
- Assets – under the current charging rules, the incumbent water company adopts the new assets ‘for free’. There is an argument that water companies should compensate developers for handing over these assets; and
- Overcharging – based on our discussions with Ofwat we understand that historically there was a concern in the sector that companies might have been overcharging developers for off-site work.

We then discuss whether our conclusions related to the arguments above change when we take into account:

- The fact that some ‘new’ customers may actually be existing customers already on the network, and also that future customers also pay a proportion of the cost of connecting new properties today; and
- The fact that developers build new developments on behalf of future customers.

Finally, we also present precedents from other sectors to summarise the approach to recovering the cost of developer services in other sectors.

We discuss these points in turn below and then present our overall conclusions.

Cost causation

From an economics perspective, there is a strong argument that developers should pay for the full cost that they cause on the grounds that the work is being carried out specifically for them. (However, as discussed in more detail below, we note that it is important to isolate the costs that developers cause from the costs that would have been incurred by the company anyway). This principle of cost causation is recognised by regulators in other sectors too. For example, in the telecoms sector, Ofcom notes that:

“Where specific costs can clearly be identified as being caused solely by a particular new service or additional customer, the principle of cost causation is generally recognised as appropriate as it promotes an economically efficient allocation of resources by ensuring that each user of a service pays for the additional costs incurred in providing that service. Using this principle, incremental costs (i.e. the costs would not have been incurred if the service was not provided or the customer had not taken the service) incurred by the supplier in providing a new service or a service to a new customer would be expected to be wholly recovered from that particular service or customer”⁴⁵

In the case of developer services, the principle of cost causation would argue that the costs incurred as a consequence of connecting new developments should be recovered from developers, and costs that are not driven by developers should not be recovered from developers.

This relies on being able to identify clearly the incremental costs associated with developer services. This is relatively straightforward for on-site costs. However, for off-site costs, some of the costs may relate to upgrading or adding new assets which are used by both existing users and by the new connections. In these instances, there could be a cost allocation exercise to determine how much of those costs are allocated to developers and how much are allocated to existing users. In principle, this could involve identifying (i) the level of cost that the company would have incurred anyway under a ‘counterfactual’ scenario where it was not adding new connections to the network; and (ii) the level of cost that the company does incur in order to serve the new connections. The difference between these two costs can be considered the incremental cost of serving the new connections and be recovered from developers. The counterfactual may need to take into account that if the new connections were not added then the growth in population may take place in existing connections on the network which would place a different set of pressures and costs on the network.

Ofwat has considered this question of cost allocation before, for example as part of its Wing Determination. In 2009, two developers complained to Ofwat about Anglian Water’s developer charges associated with upgrading strategic mains near to the town of Wing.⁴⁶ This is described below. This provides a clear and logical

⁴⁵ https://www.ofcom.org.uk/data/assets/pdf_file/0025/24955/tps.pdf

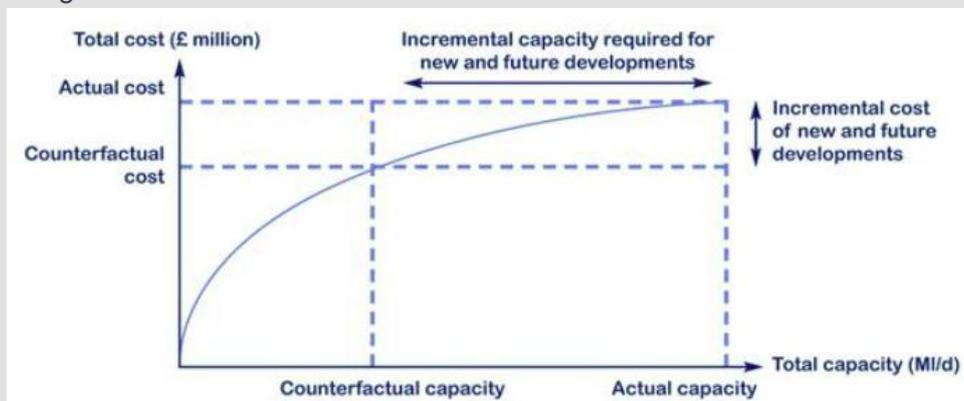
⁴⁶ https://www.ofwat.gov.uk/wp-content/uploads/2015/11/det_s42_20150825anhwing.pdf

framework for approaching the question. However, we note that the data requirements could be significant.

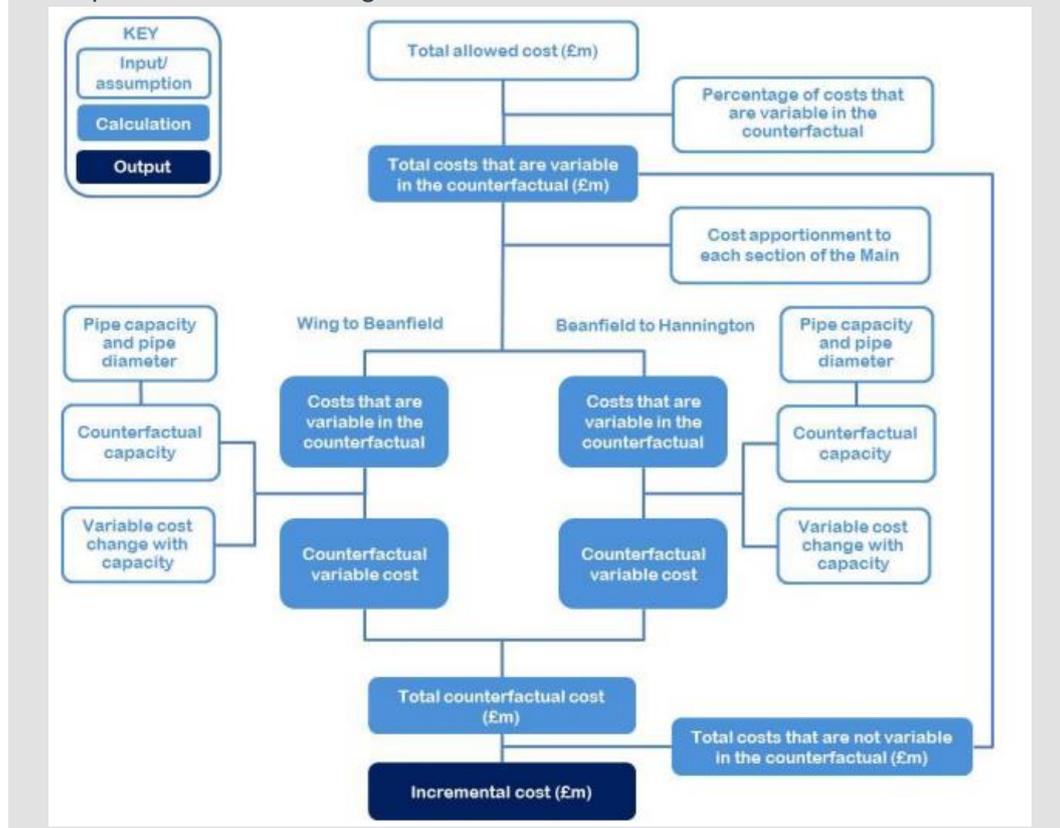
THE WING DETERMINATION

The upgraded strategic mains at Wing were required to add additional capacity to serve existing customers. However, there was also extra demand from new developments that meant that the size of the mains needed to be larger than it would have been just to serve the additional capacity requirements of existing customers.

Ofwat determined that the developers should pay the additional costs required to serve the new customers over and above existing customer requirements. It estimated the cost of works that would have taken place without any new developments (the ‘counterfactual’ scenario) and allocated this to existing customers with the rest being recovered from developers. Ofwat provided the following illustration:



And it provided the following structure on how to model the incremental costs:



Economies of scale

Adding new connections to the network may result in economies of scale – i.e. where the average cost per connection decreases as the number of connections on the network increases. This may arise because fixed costs can be recovered from a greater number of customers.

If this is the case, then it could be used as an argument to justify giving developers some form of discount on developer charges. For instance, if hypothetically there were a number of water companies in a particular region all competing to attract new connections to their networks then companies might decide to lower their developer charges below cost up to the size of the economies of scale in order to attract the new connections.

However, we see issues with this argument:

- First, it is not clear whether there are economies of scale. The evidence on economies of scale for water and wastewater companies is mixed, and a number of studies have actually suggested that, beyond a certain size, there are diseconomies of scale. We summarise this evidence in more detail in the text box below. In general, there is unlikely to be a single universal relationship between scale and efficiency that applies in all instances, and it will depend on a variety of factors, including density and the level of spare capacity in the local network. Where economies of scale do exist, they will likely vary substantially between companies, between regions and between the long and short run. Therefore, while this argument is plausible there is a lack of evidence to say comprehensively whether economies of scale do exist, if so when and where they exist and what level of discount they would justify.
- Second, if economies of scale do exist, then there is a separate question around whether developers or existing customers should benefit from them, and it is not clear who should take priority. In a hypothetical world where water companies did compete against each other for customers, companies might decide not to lower developer charges but to lower bills for existing customers in order to attract new customers from competing networks.
- Third, the logic of passing the economies of scale to developers might be seen as a ‘first mover disadvantage’ whereby existing users fund a higher share of fixed costs and subsequent new connections benefit from the economies of scale. It is not clear whether this is a desirable outcome.
- Finally, it would need to be clear that the economies of scale are driven by new connections in particular as opposed to just population growth more generally. This is similar to the ‘counterfactual’ described in the previous subsection. If economies of scale arise from population growth more generally as opposed to new connections, then it is not clear why this benefit should accrue to developers. This is because under a counterfactual scenario with no new properties, the population growth might still occur anyway, and so the economies of scale would be realised even without developers or new properties.

Therefore, while this argument has some merits, further evidence would be required to demonstrate whether economies of scale do exist. And even if they do, it does not necessarily mean that they should be passed through to developers.

ECONOMIES OF SCALE IN WATER AND WASTEWATER

There have been a number of studies assessing economies of scale for water and wastewater companies. Broadly the evidence suggests that economies of scale exist only up to a certain output level, and diseconomies of scale arise if a company increases its size above this level.⁴⁷

In an international study Ferro et al. (2011) estimate economies of scale to exist in the water sector in the range of 100,000 to 1 million people served.⁴⁸ Above this, diseconomies of scale are observed. However, there is substantial variation across countries and between short and long run returns to scale.

For England and Wales, Saal et al. (2007) estimate that between 1985 and 2000 the return to scale for the average water and wastewater company was 0.86 and statistically significantly different from one.⁴⁹ This suggests that in England and Wales the average water and wastewater company is characterised by diseconomies of scale.

This result is consistent with Saal and Parker (2001)⁵⁰ and Stone and Webster (2004)⁵¹, who also find evidence of diseconomies of scale for water and wastewater companies in England and Wales. However, Stone and Webster find some evidence of economies of scale for water only companies. Bottasso and Conti (2003) also find evidence of economies of scale in England and Wales for small water only companies.⁵²

On-going costs

A related point is that because new developments imply brand new assets, the on-going operating costs per connection once connected to the network may be lower

⁴⁷ Saal, David & Arocena, Pablo & Maziotis, Alexandros. (2013). Scale and scope economies and the efficient vertical and horizontal configuration of the water industry: a survey of the literature. *Review of Network Economics*. 12. 93-129.

https://repository.lboro.ac.uk/articles/Scale_and_scope_economies_and_the_efficient_vertical_and_horizontal_configuration_of_the_water_industry_A_survey_of_the_literature/9493664

⁴⁸ Gustavo Ferro, Emilio J. Lentini, Augusto C. Mercadier; Economies of scale in the water sector: a survey of the empirical literature. *Journal of Water, Sanitation and Hygiene for Development* 1 September 2011; 1 (3): 179–193. <https://iwaponline.com/washdev/article-abstract/1/3/179/28777/Economies-of-scale-in-the-water-sector-a-survey-of?redirectedFrom=fulltext>

⁴⁹ Saal, D., Parker, D., & Weyman-Jones, T. (2007). Determining the contribution of technical change, efficiency change and scale change to productivity growth in the privatized English and Welsh water and sewerage industry: 1985-2000. *Journal of Productivity Analysis*, 28(1/2), 127-139. https://www.jstor.org/stable/41770331?seq=1&cid=pdf-reference#references_tab_contents

⁵⁰ Saal, D. S., & Parker, D. (2001). Productivity and price performance in the privatized water and sewerage companies of England and Wales. *Journal of Regulatory Economics*, 20(1), 61-90. <https://link.springer.com/article/10.1023/A:1011162214995>

⁵¹ *Investigation into evidence for economies of scale in the water and sewerage industry in England and Wales: final report*. Stone & Webster Consultants. 2004 <https://research.aston.ac.uk/en/publications/investigation-into-evidence-for-economies-of-scale-in-the-water-a>

⁵² Bottasso, A., & Conti, M. (2003). Cost Inefficiency in the English and Welsh Water Industry: An Heteroskedastic Stochastic Cost Frontier Approach. <http://repository.essex.ac.uk/8872/>

than that for existing connections. This could be seen as a reason to give developers a discount.

However, we believe there are some issues with this suggestion:

- First, it is not clear that on-going costs are necessarily lower for new assets compared to existing assets. Existing asset that have been in the ground for many years without any issues may continue to function well for many more years to come. This argument has been noted before by Ofwat in the context of setting bulk supply charges for NAVs:
 - “...as a general principle it would be inappropriate to assume that the new assets, such as the on-site infrastructure for a new development, will have very low maintenance costs simply because they would be newer than any of the assets currently in the ground”⁵³
- Second, these cost savings do not relate to developer services themselves – i.e. connecting new properties to the network. They relate to the on-going maintenance costs once connected to the network. However, once connected to the network, companies generally have standardised customer bills (albeit varying by volume) that do not make a distinction between different customers to reflect underlying differences in the cost to serve those customers. For example, for a given level of usage, customer bills are the same for all customers in the same region regardless of whether some are more costly to serve than others. Therefore, making an exception for new connections would arguably open up this question of uniform customer bills to a number of differences in cost, and it is not clear whether this is a desirable outcome.
- Third, if on-going costs are lower for off-site infrastructure, then we would note that this infrastructure may serve both new developments as well as existing connections. Similar to the above, there would be no suggestion that existing users should receive a discount for this, and therefore it could be considered inconsistent to give a discount to developers for the same reason. If on-going costs are lower for on-site infrastructure (which is not shared with existing users), then we would note that operating costs for a given connection in this part of the network tend to be relatively low compared to overall network costs, and it is also plausible that on-site infrastructure may experience ‘snagging’ issues in the early years such that average costs may actually be greater than for older assets.

Externalities

Another possible justification for giving developers a discount on developer services is if there are positive externalities associated with developer services that benefit all customers on the network.

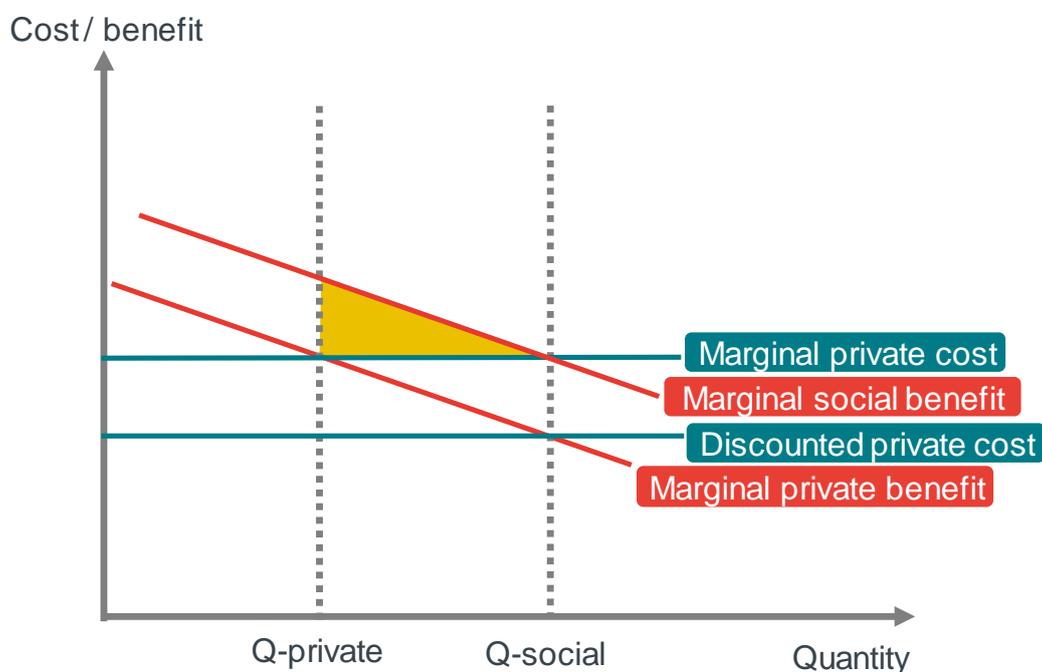
Economic theory argues that if there are positive externalities for society associated with a particular good or service then without intervention in the market there may be under-consumption of that good or service. In other words, private consumers may not take into account the wider benefits to the rest of society when deciding how much to consume, and society would be better off if they consumed

⁵³ <https://www.ofwat.gov.uk/wp-content/uploads/2018/05/Bulk-charges-for-NAV-s-final-guidance.pdf>

more. A discount / subsidy could be used to incentivise private consumers to consume up to the socially optimal amount.

This market dynamic is highlighted below:

Figure 8 Externalities



Source: Frontier illustration

- The marginal private benefit is lower than the marginal social benefit – i.e. there are externalities;
- The private consumer would consume the good or service up to level Q-private – i.e. up to the point where the marginal private benefit is equal to the marginal private cost;
- However, society would be better off if consumption was up to level Q-social;
- The highlighted triangle area reflects the forgone benefits to society when consumers consume only up to Q-private instead of Q-social;
- It follows that the marginal private cost could be lowered (e.g. by giving a discount or providing a subsidy) such that private consumers would consume up to Q-social.

A version of this argument could be used to justify giving developers a discount / subsidy for developer services. However, we would need to establish that there are externalities:

- There are health and sanitation benefits to connecting new homes to the local water and wastewater networks. However, it does not seem plausible to argue that developers would decide to under-consume developer services (e.g. not connect some households to the networks) if developer charges were higher.
- Local residents may consider there to be negative externalities – e.g. due to disruption during the construction phase and potentially the loss of wildlife, etc.

- There may be wider social benefits to having more homes. However, this is a broader question than just water sector developer services which is only one component that feeds into the overall cost base for developers when it comes to building new homes.

In summary, it is not clear whether the current approach leads to an under-consumption of developer services. There may be positive externalities, but there may also be negative externalities too. However, in both instances, we would note that these arguments mostly apply to developer services more generally, as opposed to developer services for just water and wastewater services in particular. Therefore, it is unclear why developer charges for water and wastewater services should be singled out as an area well-suited to help incentivise homebuilding, and why this should be funded by water customers in the region as opposed to general taxation and/or subsidies.

Assets

Another argument that has been made by some stakeholders is that when on-site work is carried out by a third party, the company goes on to adopt these assets 'for free', and therefore gains an income generating asset.⁵⁴ This could be an argument for giving developers a discount.

However, we note that, in practice, it could be argued that the company is taking on the liability for managing and maintaining these assets. By way of comparison, in 2011 the Government transferred the ownership of 184,000km of private sewers in England and Wales from households to wastewater companies. Government's intention was to remove the burden of owning and maintaining these assets from householders, which Defra viewed as unfair and unreasonable.⁵⁵ These sewers were transferred to the companies at zero value: wastewater companies were funded for maintaining these assets but they do not receive additional return on capital (i.e. the assets are not included in the Regulated Capital Value). Also, the companies are then required to replace these assets in future. This may be a more long term issue, but the point remains that adopting these assets 'for free' could just as equally be seen as a liability rather than a gain for water companies.

Overcharging

Based on our discussions with Ofwat we understand that historically there was a concern in the sector that companies might have been overcharging developers for off-site work, or that charges for off-site work were not transparent.

The concern was that instead of charging developers for just the incremental costs that they were causing above and beyond the costs required to serve existing demand, companies might have also been recovering some of the costs that were incurred to serve existing demand from developers too. This is related to the discussion above – around the Wing Determination – on incremental costs, and that developers should only pay the additional costs required to serve the new

⁵⁴ <https://www.ofwat.gov.uk/wp-content/uploads/2019/04/Home-Builders-Federation-consultation-response.pdf>

⁵⁵ The private sewers transfer regulations - Provisional non-statutory guidance on private sewers transfer regulations, Defra 2011
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69356/private-sewers-transfer-guidance110928.pdf

customers over and above existing customer requirements. The suggestion here is that developers might have been charged for more than this cost.

In this report we have not looked into whether developers were overcharged in the past. However, from a forward-looking perspective, we agree that under the principle of cost causation this could be a cause for concern. Off-site work is driven by new developments as well as demand from existing users, and in line with the discussion around the Wing Determination above, it is important to attempt to allocate the cost appropriately between the two groups.

New customers versus existing customers

New developments will go on to be occupied by:

- New customers to the company area, i.e. customers moving to the area for the first time; and/or
- Existing customers already living in the area. This could include families moving from one home in the area to another, etc.

Therefore, it is not strictly true to suggest that it is 'existing' customers partly funding developments for 'new' customers given that some of those 'new' customers are already paying bills. For this reason, we might be less concerned about existing customers partly funding developer services for new customers. However, it is not clear to us that this is a valid economic argument for giving developers a discount:

- First, it is unclear whether the discount would be passed on to the customers that go on to occupy the new properties (see the next subsection on homebuilding which includes a discussion on cost pass through);
- Second, as already established, some of the new developments will be occupied by customers that are new to the company area. It is not clear why existing customers in the area should be funding developments for new customers; and
- Third, even if all new developments were occupied by existing customers in the same company area, this funding mechanism, while convenient for some existing customers, lacks strong user pays / cost causation pricing signals.
- Finally, we note that this is not an argument that positively supports the view that developers should pay less than the full cost of developer services. Instead, it is more of a defensive argument that such discounts may cause less harm to existing customers if some of those existing customers are benefitting from it.

Therefore, from an economics perspective, the fact that 'new' customers may actually be existing customers does not change the other arguments described above.

As described above in the section on cost causation, there is an argument that, if new developments did not exist, then population growth in the company area may take place in existing properties in the area which would place a different set of pressures and costs on the network. This could be taken into account when identifying the appropriate incremental cost. However, once that incremental cost

has been identified, it is not clear whether the argument above would support a discount on that amount.

Future customers

As discussed earlier, the proportion of the total cost of developer services that is not funded by developers through developer charges is funded instead by the local water and wastewater company. This proportion of the cost then tends to be spread out and recovered through end-customer bills over a number of years. Therefore, in practice this share of the cost is recovered from existing customers on the network today and future customers too. (We note that many of the future customers will also be existing customers today.) Similarly, a proportion of customer bills today will in effect also be funding part of the total cost of connecting new properties in the past.

However, in our view, this dynamic does not change the question of whether developers should pay less than the full cost of connecting new properties to the network.

Homebuilding

Developers pay developer charges on behalf of the customers that go on to occupy the new properties in future. This adds an extra dynamic to the market and introduces various questions around cost pass through and the economics of the homebuilding sector.

However, ultimately the main issue still remains: should all end-customers on the network fund part of the cost of developer services? The question of whether or not this discount is then passed on to new customers is a separate issue.

In some markets, prices are directly linked to costs, such that if input costs change then prices also change by the same amount. However, in other markets the relationship is more nuanced. This is especially the case in markets with relatively long lead times, with relatively fixed supply and where end-prices may reflect willingness to pay more than underlying costs.

It is unclear whether developer charges are passed through to new customers in the form of higher or lower house prices. Therefore, if an economic rationale or policy decision for giving developers a discount is based on the idea that it will lower house prices for new customers, then we would note that this may not always materialise in practice.

Precedents

Aside from just water and wastewater, developers make contributions to other developer services and local infrastructure in other sectors too. We review some of these arrangements here by way of comparison.

ELECTRICITY CONNECTIONS

To connect to electricity distribution networks, developers are required to pay a charge based on the ‘minimum scheme’ – that is, the lowest overall capital cost.⁵⁶ This means that if the local electricity distribution network operator (DNO) were to take the opportunity to add extra capacity to benefit the wider network (‘an enhanced scheme’), the developer of the new connection would only be required to pay the cost that would have arisen if the objective was to just connect the new connection to the network.

In addition to the assets needed to connect the customer to the existing network, developers also pay a proportion of the cost of network reinforcement at the same voltage level as their connection, plus a proportion of any reinforcement at one voltage level above. This proportion is set as the ratio of the development’s required capacity over the total new network capacity provided. The remainder of the cost of the reinforcement at these levels is funded by the DNO and recovered from all customers through their network charges

Any reinforcement more than one voltage level above the point of connection has wider benefits for all customers and is therefore not paid by developers but ultimately by all other customers through bills.

In electricity there is no explicit discount to developers or any form of income offset as in water and wastewater, despite the sectors having many similarities in terms of their economics.

However, we note that electricity distribution networks only cover distribution and do not include transmission and generation whereas in water, the equivalent services (transmission and water resources etc.) are provided. This means that while there are some parallels between the networks, off-site reinforcement costs in water and wastewater cover a wider set of services and infrastructure than in electricity distribution.

Taken all together, this means that developers pay for (an estimate of) all the costs of connection and local reinforcement. They do not pay for deeper reinforcement to the extent that this has wider benefits for all customers.

Given significant pressures on electricity networks due to the need to support decarbonisation, Ofgem is currently consulting on how developers should contribute to the reinforcement of the local network.⁵⁷ On the one hand, Ofgem notes that it gives important incentives for developers to provide energy efficient homes and to build in areas with spare capacity. On the other hand, there is need for DNOs to approach the question of reinforcement in a more strategic way rather than just in response to new developments. It may be that funding more of the cost of the reinforcement themselves would give DNOs more incentive to consider alternative approaches to traditional network development.

However, we note that the challenges of decarbonisation do not have an obvious application in water and wastewater services.

⁵⁶ https://www.ofgem.gov.uk/system/files/docs/2019/12/winter_2019_-_working_paper_-_existing_arrangements_publish.pdf

GAS CONNECTIONS

Gas Distribution Networks (GDNs) are obliged to offers terms to connect new customers under the Gas Act 1986.⁵⁸ However, the GDN is exempt from this requirement if it determines that adding the new connection would compromise its requirement to maintain an efficient and economical gas pipeline system.

The costs of developer services are shared between the developer and the wider customer base. For example, if a domestic customer within 23 metres of an existing GDN pipelines requests a new connection, then the first 10 metres of pipeline is paid for by the wider customer base and the rest would be paid by the connecting customer.

There is competition for connecting services. Utility Infrastructure Providers (UIPs) and licensed Independent Gas Transporters (IGTs) compete with GDNs to provide some of the connection services.

GDNs and IGTs must meet a set of service levels, called Guaranteed Standards, when providing connections. Failure to meet these standards for any individual connection can result in the connecting customer being eligible for a payment for inconvenience caused.

Companies are also subject to a quotation accuracy scheme. Under this scheme, if a developer challenges a quotation and it is found to be inaccurate, then the company in question is required to make a payment to the developer.

Ofgem does not approve the specific prices that GDNs and IGTs charge for connections. But it does approve the methodology that they use to calculate these charges – and they must publish this methodology on their website.

There is no income offset in gas.

⁵⁷ https://www.ofgem.gov.uk/system/files/docs/2019/12/winter_2019_-_working_paper_-_connection_boundary_note_publish_0.pdf

⁵⁸ https://www.ofgem.gov.uk/system/files/docs/2017/05/how_do_i_obtain_a_one_off_gas_connection.pdf

SECTION 106 AND COMMUNITY INFRASTRUCTURE CONTRIBUTIONS

The question of developer contributions to infrastructure has been discussed extensively in the context of The Ministry of Housing, Communities & Local Government's aim to build 300,000 homes a year by the mid-2020s.

A report from the National Audit Office (NAO) found that the way infrastructure for new homes is funded is complex and lacks cohesion and certainty.⁵⁹ This includes funding for public and private transport, healthcare and schools.

While the Ministry of Housing, Communities & Local Government's intention is that public sector bodies will fund most infrastructure, the NAO found that there is scope for developers to contribute more as developer contributions are not keeping pace with increasing house prices.

The two main systems to get contributions from developers are planning obligations (mostly section 106 agreements) and the Community Infrastructure Levy (CIL). The CIL is a charge to developers based on land values to support local infrastructure provision and is voluntary for local authorities to implement. While it was expected when the CIL was introduced that around 85% of authorities would implement the CIL, the NAO found that only 47% of local authorities have done so.

The NAO also finds that developers are using the planning system to renegotiate lower than agreed contributions through section 106 on the grounds of financial viability. It is noted that local authorities may be unable to negotiate effectively with developers and that "if developers do not contribute, this results in either less infrastructure, or local authorities or central government paying more towards infrastructure, which could increase financial pressures on them".

These findings are supported by the National Infrastructure Commission (NIC) in its report on the Cambridge-Milton Keynes-Oxford arc.⁶⁰ The NIC argue that infrastructure funding should not depend exclusively on central government and the general taxpayer. It is suggested that because planning permission increases land values substantially, there is scope to 'recapture' this land value to help fund local infrastructure, so long as it does not jeopardise the viability of development projects.

⁵⁹ <https://www.nao.org.uk/wp-content/uploads/2019/02/Planning-for-new-homes.pdf>

⁶⁰ <https://www.nic.org.uk/wp-content/uploads/Partnering-for-Prosperty.pdf>

NATIONAL INFRASTRUCTURE COMMISSION

The National Infrastructure Commission (NIC) has recently (March 2020) published a report on “Infrastructure to support housing”.⁶¹ The report discusses how developers face a number of issues in connecting new developments to local utility networks. This covers not just water and wastewater services but other utilities such as energy and telecoms too. The main findings of the report are as follows:

- **Transparency and information:** The report finds that the information flows between developers, local authorities and infrastructure providers are often inadequate, and that there is a lack of clarity about different roles and responsibilities, as well as identifying where to obtain the information needed. The report calls for increased engagement from infrastructure providers and local planning authorities.
- **Charging and service:** The report argues that developers are often confused about what they will be asked to pay for when requesting a connection because the initial information they receive from providers can change. It notes that infrastructure providers should be incentivised to deliver their services to a high level of service. We note that Ofwat has introduced ‘D-MeX’⁶², a measure of companies’ service quality in providing developer services, with scope for financial rewards and penalties based on performance. This should provide a strong incentive for companies to provide developer services to a high standard.
- **Coordination:** The report argues that for large scale developments, there should be a coordinating body that brings together relevant parties ahead of the development starting, when they otherwise lack the incentive to engage.
- **Risk and investment:** The report argues that “infrastructure providers and developers are reluctant to carry the risk of investment in infrastructure until there is certainty that it will be used and that the investment can therefore be recouped.” It notes that this issue is particularly prevalent in electricity – as opposed to water. And it notes that the approach in water (i.e. where companies forecast the cost of reinforcement over a number of years and then recover the average cost across all developers) allows for more strategic planning.

We note that the recommendations made in the NIC report focus less on the details of the approach in water and wastewater sector specifically, and focus more on coordination across the different utilities.

4.3 Conclusion

In this section we have considered the economic rationale for developers not paying the full cost of developer services.

⁶¹ <https://www.nic.org.uk/wp-content/uploads/NIC-Infrastructure-to-Support-Housing.pdf>

⁶² <https://www.ofwat.gov.uk/wp-content/uploads/2019/03/D-Mex-Shadow-Year-Guidance.pdf>

The main argument against this arrangement is one of cost reflectiveness / cost causation. This principle argues that costs should be recovered from the parties that are causing those costs.

We have considered a number of arguments for the current arrangement. We find shortcomings with some of these arguments and a lack of strong evidence for others. Therefore, we ultimately find that the economic rationale for the current arrangement is weak, or at the very least, that further evidence would be required to justify maintaining the status quo.

5 HIGH LEVEL ESTIMATE OF COSTS

5.1 Introduction

In this section we present high level estimates of the costs of the different components of developer services for both water and wastewater services. The purpose of this exercise is to provide a high-level sense of scale of the different types of costs.

We have produced these estimates by combining various data sources available in the public domain as part of Ofwat's PR19 Final Determinations. Our estimates are therefore based on forecasts costs over the period 2020-2025 (known as asset management plan 7 (AMP7)).⁶³ Details of our approach, including data sources and assumptions, can be found in Annex A.

The rest of this section is structured as follows:

- First, we present our estimates of on-site costs and costs of network reinforcement of local asset;
- Second, we set out estimates of the income offset;
- Third, we present a range for the costs of network reinforcement of strategic assets and other deep costs; and
- Finally, we combine this information to present estimates of the balance of charges.

5.2 On-site costs and costs of network reinforcement of local assets

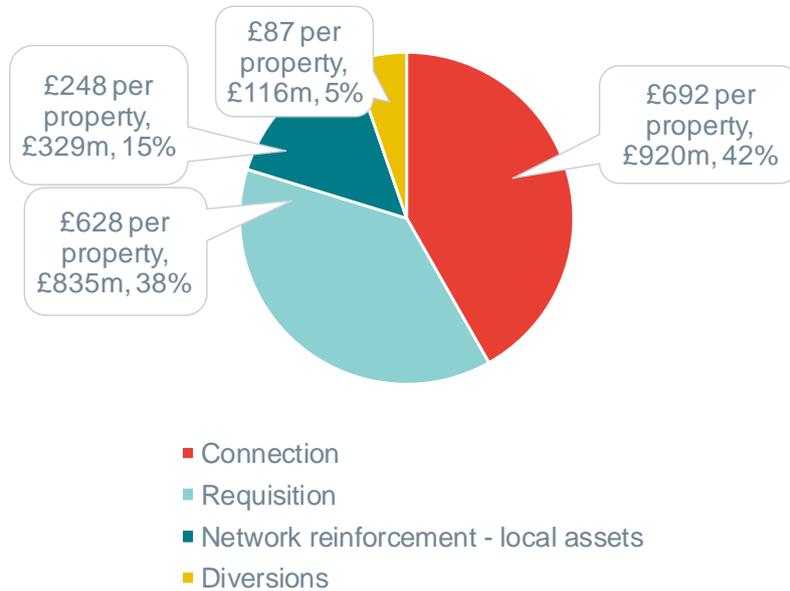
In England and Wales, we estimate the total cost over AMP7 (2020-25) of connection, requisition, network reinforcement of local assets and diversions to be around £3.7 billion, of which £2.2 billion⁶⁴ relates to water services, and £1.5 billion⁶⁵ relates to wastewater services. (These estimates do not take into account the income offset). Dividing by the forecast number of total new properties added over the same period, this equates to around £2,850 per property, of which £1,655 per property for water services, and £1,196 for wastewater services. Connection and requisition combined represent around 80% of these costs for water services, and 62% of these costs for wastewater services. The charts below show our estimates of the forecast of these costs (excluding the income offset) over AMP7 for water and wastewater services, respectively.

⁶³ Our estimates are based on forecasts that were produced before the coronavirus pandemic. While forecasts will change, we consider that the implied unit costs still provide a high-level sense of scale of costs.

⁶⁴ We note that with respect to diversions, this total figure only includes diversions which are required to connect new developments to the network – which are covered under Section 185 of the Water Industry Act 1991. This figure does not include non Section 185 diversions costs because these costs are not recovered from property developers, which we discuss in more detail in Section **Error! Reference source not found.** Non Section 185 diversions costs for water services are estimated to be about £195m over AMP7.

⁶⁵ As above. Non Section 185 diversions costs for wastewater services are estimated to be about £158m over AMP7.

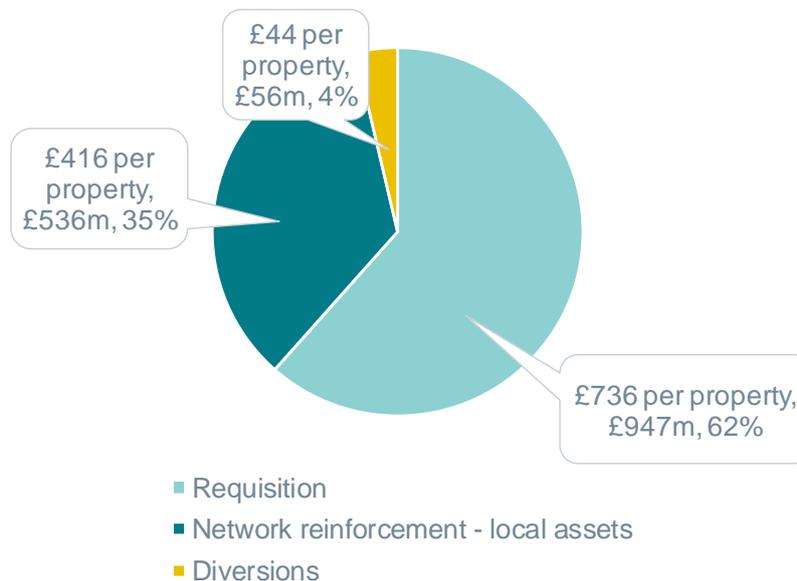
Figure 9 Forecast of on-site costs and costs of network reinforcement of local assets and diversions in England and Wales over AMP7 – Water services



Source: Frontier Economics

Note: Costs in 2017-18 FY (CPIH deflated). The CPIH is the Consumer Price Index including Housing costs.

Figure 10 Forecast of on-site costs and costs of network reinforcement of local assets and diversions in England and Wales over AMP7 – Wastewater services



Source: Frontier Economics

Note: Costs in 2017-18 FY (CPIH deflated). The CPIH is the Consumer Price Index including Housing costs.

Note: We have not included the cost of wastewater new connection costs. In most cases developers tend to provide their own sewers. Hence, we cannot observe wastewater connection costs from the data in the companies' business tables.

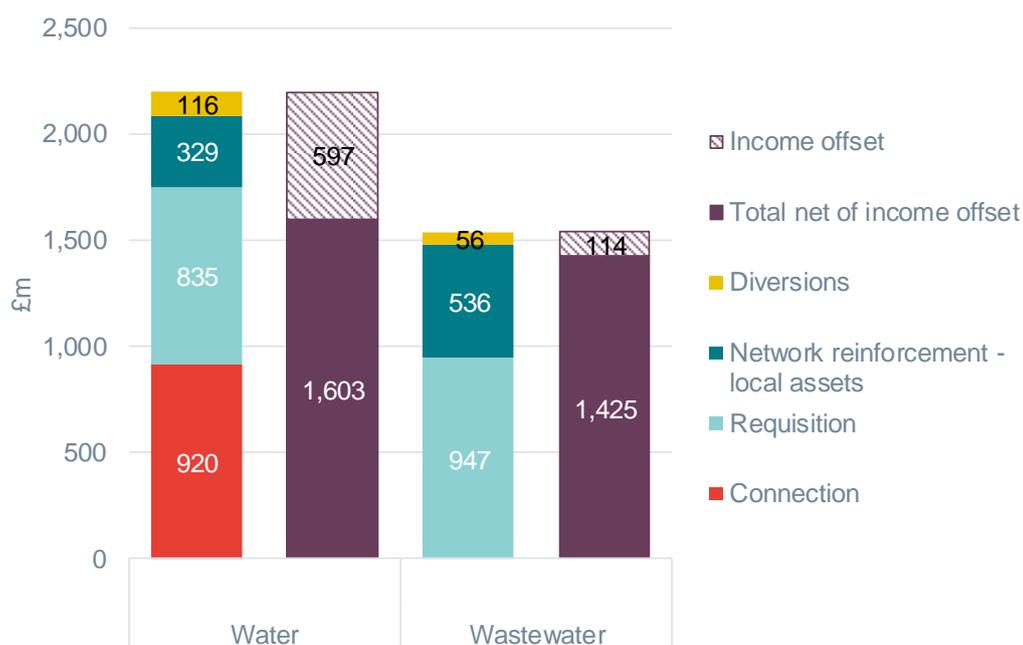
As explained in the previous sections, it is important to note that the charts presented above show only a partial picture of the full costs incurred as a result of new developments. It does not include the cost of reinforcing strategic assets or

other deep costs – which we discuss below. However, only the costs presented above are recovered through developer charges (albeit the income offset is then subtracted from the cost of network reinforcement of local assets in England, and from requisition in Wales).

5.3 Income offset

By reviewing Ofwat’s Final Determination Grants & Contributions models we have also estimated the total income offset forecast to be discounted off costs over AMP7. For water services, this amounts to about £600 million in total, or £450 per new property. For wastewater services, this amounts to about £110 million in total, or £90 per new property. This implies that of the costs presented above (which again we note is only a subset of the full scope of costs), developers effectively receive a discount of around 27% for water services, and 7% for wastewater services. The chart below summarises our estimate of the forecast of on-site costs and costs of network reinforcement for the industry for both water and wastewater, and shows the grand total income offset forecast.

Figure 11 Income offset across industry over 2020-25 (£m)



Source: Frontier Economics

Note: Costs in 2017-18 FY (CPIH deflated). The CPIH is the Consumer Price Index including Housing costs. Note: We have not included the cost of wastewater new connection costs. In most cases developers tend to provide their own sewers. Hence, we cannot observe wastewater connection costs from the data in the companies’ business tables.

5.4 Strategic assets costs

As explained in the previous sections, developers do not pay for the cost of all off-site work. They pay for reinforcing local network assets, but not strategic network assets. We cannot observe these costs directly because companies do not report the required breakdown (i.e. it is not included in the PR19 data tables). In an

attempt to estimate these costs, we have reviewed each company's forecast (over 2020-25) of those categories of enhancement costs which are likely to be more closely driven by new developments. In the following two sections we describe the costs we have considered for water and wastewater services, and how we have estimated costs associated with strategic assets driven by new connections.

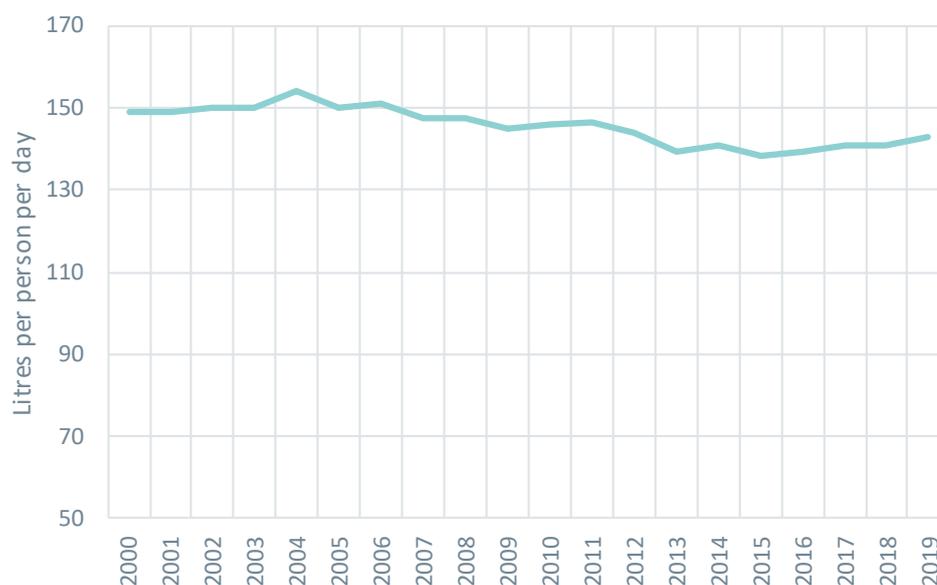
Also, as discussed in the previous section, we note that in estimating the cost of developer services it is important to take into account an appropriate counterfactual. Arguably, the counterfactual should not just be a scenario in which no new connections are added, but it should be in a scenario in which (i) no new connections are added; and (ii) where the population growth that would have occurred in new connections still takes place, but it occurs in existing connections, which would place a different set of pressures and costs on the network. This is relevant in the context of strategic assets, because the cost of reinforcing strategic assets is arguably driven more by aggregate demand (population) as opposed to the number of connections. However, in this section we have not sought to control for this dynamic. Instead our estimates presented below are based on allocating a share of off-site costs to growth more generally as opposed to new connections in particular.

5.4.1 Water services

We have reviewed each company's forecast over 2020-25 on enhancement costs related to addressing the 'supply-demand balance' (SDB). This spending is designed to ensure that companies are resilient to accommodate demand over time. It includes spending on network reinforcement (excluding the cost of network reinforcement related to local assets which is reported separately), as well as spending on water resources.

This spending will be driven by a number of factors, including climate change, and not just increased demand. However, we would note that, of the extra demand for water, in practice this will largely be driven by new connections. This is for the following reasons:

- *Changes in consumption per person:* In principle, the increase in demand for water could be driven by an increase in per capita consumption (PCC). However, we would note that PCC has fallen since the peak observed in 2004. From 2013, PCC remained relatively flat in England and Wales, although we observed an increase in the past few years. The chart below shows PCC from 2000 to 2019.

Figure 12 Water PCC in England and Wales

Source: Frontier analysis based on data from Ofwat and Discover Water.

It is also the intention of the industry to decrease PCC over the coming years, and indeed Ofwat has set stretching targets for each company to achieve lower PCC throughout AMP7 (in Germany, PCC is 121⁶⁶ litres per person per day, which compares to 143 in England and Wales). This highlights that there could be scope for a reduction in England and Wales). Therefore, if demand from existing customers is decreasing – or remaining broadly constant – then the stress on the supply-demand balance would be more largely driven by population growth as opposed to existing connections.

- *Changes in household composition:* Furthermore, the number of inhabitants per household in the UK has generally decreased over time. This means that population growth is more likely to take place through there being extra new connections rather than through an increase in inhabitants per household.⁶⁷

The SDB costs are split out into the following components:

- supply enhancement;
- demand (non-leakage) enhancement;
- leakage enhancement;
- long-term enhancement;
- internal interconnections; and
- investigations and future planning.

Some of these cost categories can be more directly linked to new connections. For example, internal interconnections tend to be used to address local imbalances due to new connections as well as improving supply resilience. However, for other

⁶⁶ See Discover Water, accessed in March 2020, <https://discoverwater.co.uk/amount-we-use>

⁶⁷ We discuss population growth versus new connections growth in more detail in Section 4.2.

cost categories it is less clear how much is driven by new connections and how much by other factors.

Moreover, an assessment of the supplementary information that water companies submitted to Ofwat in support of expenditure forecasts within their business plan submissions, revealed that these costs are not always related to strategic assets. However, the data available lacks sufficient detail and consistency to draw firm conclusions.

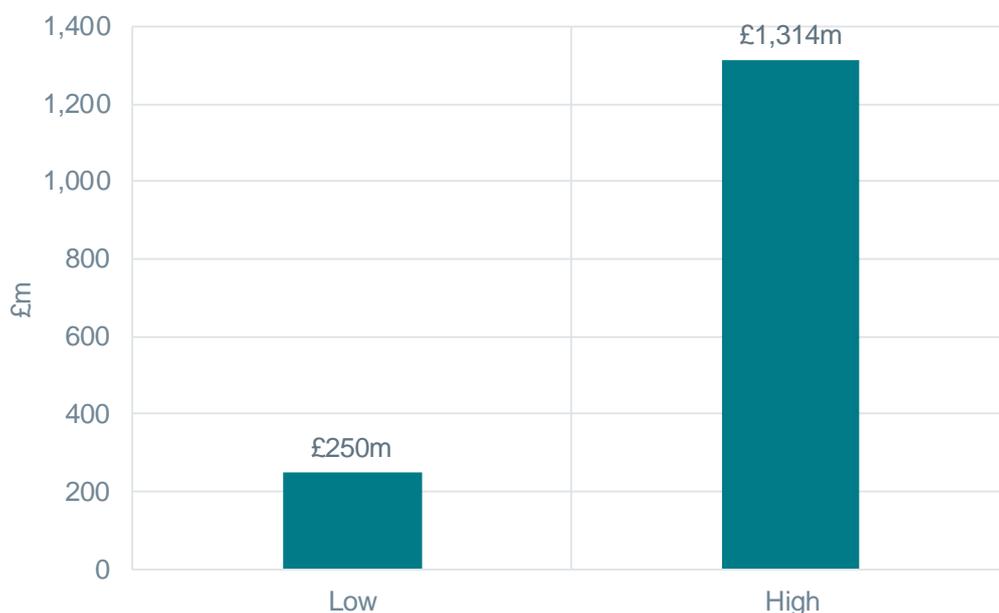
Therefore, while we recognise that total SDB enhancement costs over AMP7 are likely to be an overestimate of network reinforcement of strategic assets and other deep costs, internal interconnections cost alone is likely to be an underestimate.

In the absence of more detailed information, we have therefore produced a range of estimates:

- High – this includes all SDB costs (i.e. all 5 categories listed above).
- Low – this only includes internal interconnection costs.

The chart below reports the total SDB costs under the high and low scenarios across the whole industry.

Figure 13 Estimated range of costs related to strategic assets and other ‘deep’ costs across industry over AMP7 (£m) – Water services (England and Wales)



Source: Frontier Economics

Note: Costs in 2017-18 FY (CPIH deflated). The CPIH is the Consumer Price Index including Housing costs.

As can be seen from the chart, the total SDB costs across the industry vary between £250m and £1,314m. Divided by the forecast number of total new properties added over the same period, this equates to about £990 per new property under the high scenario, and about £190 per new property under the low scenario.

While these strategic asset costs are lower than the average cost per property for on-site and local assets estimated in the previous section (£195-£990 per new

property for costs associated with strategic assets compared to £1,655 per new property for on-site costs and costs associated with local assets), they are non-trivial in scale.

5.4.2 Wastewater services

We have reviewed each company's forecast over 2020-25 on enhancement costs related to growth. In particular we have considered the following cost categories:

- 'Growth at sewage treatment works'. According to the definition in the business table, this expenditure is associated with meeting or offsetting changes in demand from new and existing customers at sewage treatment works. Costs related to sludge treatment centres are excluded.
- 'New developments and growths'. According to the definition in the business table, this expenditure is associated with 1) the provision of local network assets for sewerage services to provide for new customers with no net deterioration of existing levels of services (new development) and 2) with changes in sewage collected from new and existing customers whilst maintaining existing levels of service (growth).

As for water, we recognise that not all costs allocated to the two cost categories listed above will be driven by new connections. An assessment of the supplementary information that water companies submitted to Ofwat in support of expenditure forecasts within their business plan submissions revealed the following:

- 'Growth at sewage treatment works'. The majority of this expenditure forecast was found to be driven by new developments, with allowances for growth such as urban creep and climate change, as well as allowances for post AMP7 development.⁶⁸
- 'New developments and growths'. There were large differences in the costs included within this expenditure forecast across companies, with some costs related to strategic assets, whereas others not. Amongst the companies we have reviewed we identified that a relatively small proportion of investment was allocated to strategic assets. However, as for water, the data available lacks sufficient detail and consistency to draw firm conclusions.

Based on this analysis, we identified that costs reported in the first category are more closely related to new developments. In the absence of more detailed information, we have decided to use this cost category as an indicative estimate of the cost of network reinforcement of strategic assets for wastewater services.

The total costs across the industry is estimated to be £1,132m. Divided by the forecast number of total new properties added over the same period, this equates to £880 per new property. This compares to £1,196 per new property for on-site costs and reinforcing local assets.

⁶⁸ We note that it is challenging to isolate the cost impact of new developments in particular as opposed to population growth more generally.

5.5 Estimates of the balance of charges

The balance of charges is driven by two factors:

1. Costs incurred as a consequence of the new development: Developers are required to pay for the cost of on-site work and of reinforcing 'local' assets; they do not pay for the cost of reinforcing 'strategic' assets or other deep costs, which is therefore funded entirely by bill payers; and
2. Of the costs that developers do pay for, they also receive an income offset which in effect is also funded by existing and future customers.

We note that there is currently no set methodology on how to estimate the balance of charges. In this section, we define the balance of charges in two ways, depending on whether the cost of reinforcing strategic assets and other deep costs are included in the total:

- Option 1 is a narrow definition which effectively expresses the total charges that are paid by developers as a percentage of the cost of connection, requisition and reinforcement of local assets, whereby the difference between the former and the latter is the income offset.
- Option 2 is a broader definition which effectively expresses the total charges that are paid by developers as a percentage of the cost of connection, requisition and reinforcement of local assets plus the cost of reinforcement of strategic assets and other deep costs, whereby the difference between the former and the latter is the income offset plus the cost of reinforcement of strategic assets and other deep costs.

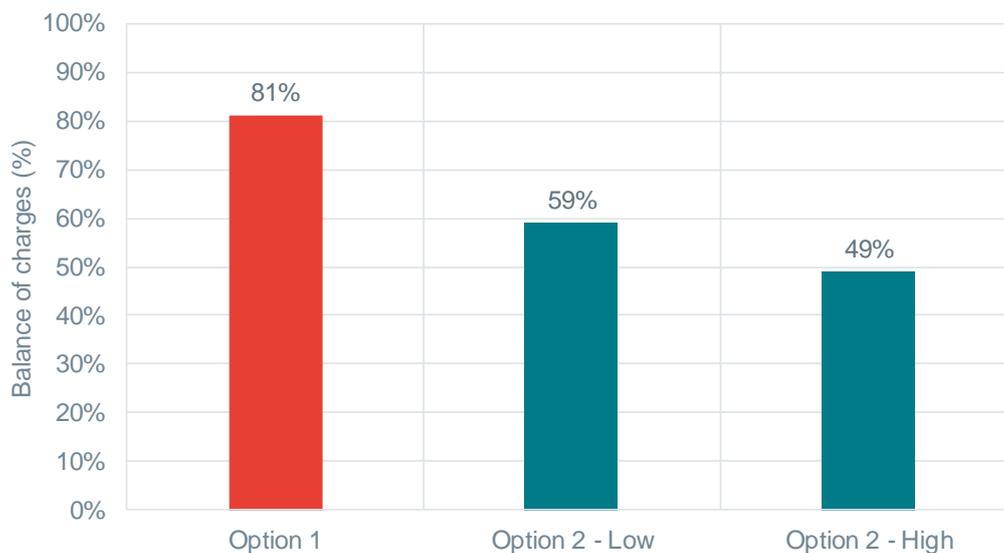
The figure below summaries how the balance of charges is defined under the two options presented above.

Figure 14 Balance of charges for Option 1 and Option 2

$$\begin{aligned}
 \text{Option 1} &= \left(1 - \frac{\text{Income offset}}{\text{Connection cost} + \text{Requisition cost} + \text{Reinforcement of local assets costs} + \text{Diversions}} \right) \times 100 \\
 \text{Option 2} &= \left(1 - \frac{\text{Income offset} + \text{Reinforcement strategic assets and other deep costs}}{\text{Connection cost} + \text{Requisition cost} + \text{Reinforcement of local assets costs} + \text{Diversions} + \text{Reinforcement strategic assets and other deep costs}} \right) \times 100
 \end{aligned}$$

By applying these definitions to the costs we have estimated in the previous section, we were able to calculate the balance of charges across the whole industry and for water and wastewater services combined. The chart below shows our estimate of the balance of charges over AMP7.

Figure 15 Balance of charges for water and wastewater services over AMP7



Source: Frontier Economics

The chart shows that:

- Under the narrow definition (Option 1), developers currently pay 81% of costs;
- Under the broader definition (Option 2), developers currently pay:
 - 59% of costs – when we take the ‘low’ estimates of the cost of reinforcing strategic assets and other deep costs for water, and our estimate of these costs for wastewater; and
 - 49% of costs – when we take the ‘high estimates of the cost of reinforcing strategic assets and other deep costs for water, and our estimate of these costs for wastewater.

This highlights that the balance of charges is broader than just the income offset.

6 EVALUATION CRITERIA

6.1 Introduction

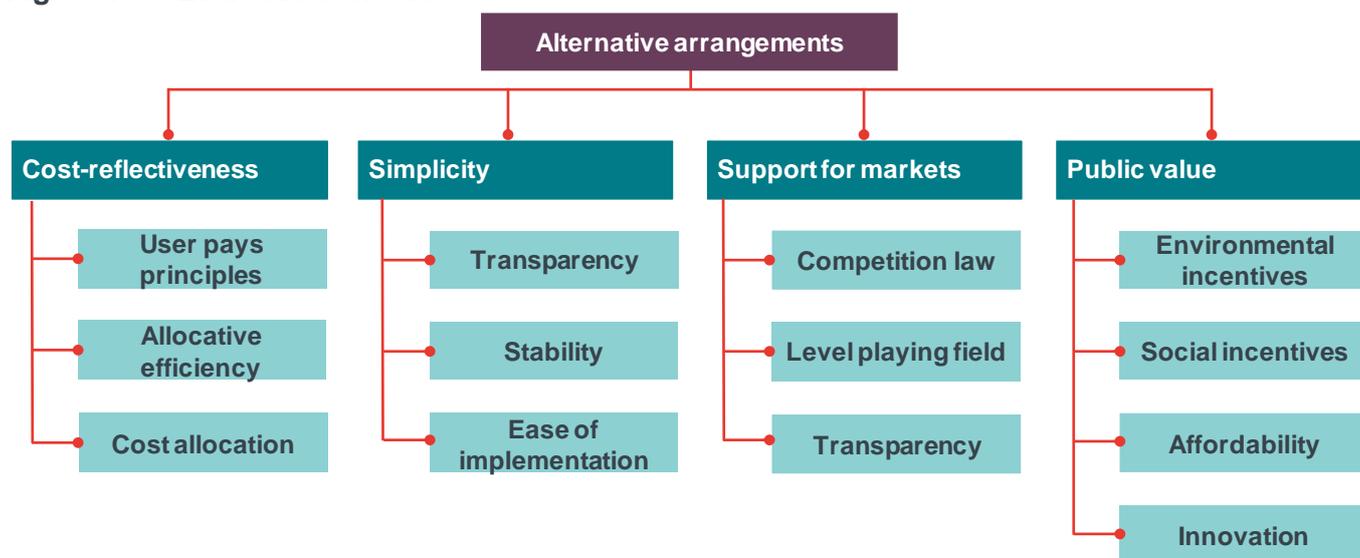
In this section we set out a set of evaluation criteria against which we can assess the relative merits of alternative arrangements for the recovery of the cost of developer services.

We have identified four high-level criteria:

- cost reflectiveness;
- simplicity;
- support for markets; and
- public value.

This is shown below. We also note that there will, inevitably, be trade-offs between these different criteria.

Figure 16 Evaluation criteria



Some of these criteria are in conflict with each other and require a trade off

Our criteria are aligned with Defra’s ‘Charging guidance to Ofwat’ (January 2016), Defra’s ‘Guidance to Ofwat for water and sewerage connections charges’ (June 2016)⁶⁹ and the 2017 Welsh Government’s ‘Charging guidance to Ofwat relating to developer charges, bulk supply charges and access charges’.

In particular, Defra’s guidance notes that “this guidance establishes principles for fair, stable, predictable, transparent and customer focused charging, and for environmental protection and sustainable growth. The guidance is part of a framework of tools to encourage growth by enabling developers to better plan for

⁶⁹

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/696389/ofwat-guidance-water-bulk-supply-discharge-charges.pdf

connections to water and sewerage systems by identifying, quantifying and planning for the costs associated with doing so.”⁷⁰

Similarly, the Welsh Government gives guidance to Ofwat to ensure charging rules “provide a transparent, efficient, fair, reasonable and effective charging system” and as far as reasonably practicable to provide undertakers with “flexibility to deliver charging arrangements in line with customers and stakeholders views.”⁷¹

Our proposed criteria are also set in accordance with the UK’s 2020 Better Regulation Framework, produced by BEIS.⁷² This provides guidance on how to best deliver the UK Government’s commitment to provide more effective regulation by understanding the costs, benefits and risks of any regulatory measures. According to this framework, an appraisal of options needs to cover a wide range of issues such as any impact on competition in existing markets, environment, and sustainable development.

These criteria also take into account Ofwat’s 2019 strategy ‘Time to act, together’. In particular, this strategy sets as one of Ofwat’s main goals ‘for water and wastewater companies to provide greater public value for customers, society and environment’.⁷³ It also recognises that the challenge for companies in future will be to reconcile this goal with other objectives such as keeping services affordable for all and promoting competition in markets for new connections.

The rest of this section is structured as follows:

- First, we discuss each criterion, including potential trade-offs; and
- Second, we discuss how to use these criteria to evaluate alternative cost recovery arrangements.

6.2 Criteria

6.2.1 Cost reflectiveness

Cost reflective charges would promote user pays principles, achieve allocative efficiency, and remove cross-subsidies, both between different developers and also between developers and current and future bill-paying customers on the network.

In line with the discussion in the previous section on cost causation, this means that charges should reflect all of the incremental costs associated with connecting new properties to the network and they should be recovered from the parties that are driving those costs.

This was also echoed by Defra in its 2016 guidance, in which it commented that:

⁷⁰ https://consult.defra.gov.uk/water/draft-developer-charging-guidance-to-ofwat/supporting_documents/20160609%20FINAL%20Consultation%20%20Water%20Industry%20draft%20guidance%20to%20Ofwat%20for%20water%20and%20sewerage%20connection%20charges.pdf

⁷¹ <https://gov.wales/sites/default/files/publications/2019-06/water-charging-guidance.pdf>

⁷² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872342/better-regulation-guidance.pdf

⁷³ <https://www.ofwat.gov.uk/wp-content/uploads/2019/10/Time-to-act-together-Ofwats-strategy-1.pdf>

- *“It is right that developers should bear the costs associated with connections to, or adoption of, water and sewerage systems. Charges should ensure that the distribution of costs for new infrastructure between developers and current customers of water and sewerage companies is fair. Cross subsidy between developers and water customers should be limited.*
- *Charges that are clearly reflective of the work involved will build confidence within the developer community. It will also allow developers to plan and budget for new developments more effectively. Ofwat should set rules that enable water and sewerage companies to recover the costs reasonably incurred in the provision of infrastructure. Where infrastructure is provided that has a greater capacity than needed for a specific new development, the rules should ensure that costs are appropriately apportioned and allocated to the new development.”⁷⁴*

Defra also notes in its supplementary guidance on water and sewerage new connection charges⁷⁵ that:

- *“The general customer base should not bear costs in relation to new development and developers should not bear costs associated with enhancements to the existing network that are not a consequence of their new connections.”⁷⁶*

Ofcom and other regulators in the UK consider additional principles of cost recovery. The text box below sets out other principles considered by Ofcom.

⁷⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/575368/ofwat-charging-guidance-sewerage-connection-charges.pdf

⁷⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/575368/ofwat-charging-guidance-sewerage-connection-charges.pdf

⁷⁶ However, as discussed earlier in Section 3 we note that the guidance appears to contain some contradictory statements. Above, it argues that parties should pay for the costs that they are causing. However, in the same guidance it then comments that “It is the view of government that the current balance between contributions to costs by developers and bill payers should be broadly maintained.” These statements appear to be contradictory: maintaining the balance of charges implies that bill payers would continue to pay some of the costs that developers are driving.

OFCOM PRINCIPLES OF COST RECOVERY

Ofcom (and its predecessors) have established 6 principles of cost recovery:

1. Cost causation - costs should be recovered from those parties whose actions cause the costs to be incurred at the margin. This is in line with our criterion on cost reflectiveness / cost causation.
2. Cost minimisation - the mechanism for cost recovery should ensure that there are strong incentives to minimise costs. This is related to our criterion on cost reflectiveness / cost causation in that if developers pay for the costs that they are driving then they have an incentive to minimise the charges that they pay / costs that they are driving.
3. Distribution of benefits - costs should reflect benefits received. This is related to our criterion on cost reflectiveness / cost causation: developer services benefit developers (aside from some potential second-order effects) and therefore developers should pay for them;
4. Effect on competition - the mechanism for cost recovery should not undermine or weaken the pressures for effective competition. This is in line with our criterion on support for markets which we discuss below;
5. Reciprocity - where services are provided reciprocally, charges should also be reciprocal. This is relevant in the context of the telecoms sector where there are competing mobile and fixed network operators that need to reciprocate network services (such as off-net calls) but is less relevant in the case of water and wastewater; and
6. Practicability - the mechanism for cost recovery needs to be practicable and relatively easy to implement. This is in line with our criterion on simplicity discussed below.

The most appropriate basis for allocating costs for a particular product needs to be considered on a case by case basis. In practice, different approaches to cost recovery will imply different levels of emphasis on the principles set out above.

Costs can vary significantly from site to site depending on the location (e.g. whether there is enough spare capacity in that part of the network), scale and complexity of the work. If charges are not cost reflective, then individual developers are shielded from the true cost that they are causing, and they would have little incentive to keep costs down which increases costs for all developers and existing customers.

However, we recognise that the desire to have cost reflective charges could require companies to build sophisticated cost models which are currently not required. Cost reflective charges could also be less predictable given that costs may change over time.

Cost reflectiveness also requires some judgement over questions with no single right answer:

- How common costs are allocated amongst different users. This is especially relevant in the case of reinforcement of local and strategic assets that are common to the whole customer base – i.e. where services and infrastructure are used by multiple customer groups meaning that they cannot be directly

attributed to a single customer group. As mentioned earlier, in the Wing Determination, Ofwat provides a framework for thinking about how to allocate common costs between developers and existing customers;

- The time period over which cost reflectiveness is assessed; and
- The standard of cost that is used – e.g. fully allocated costs, standalone costs or incremental costs.

6.2.2 Simplicity

Developer charges should be simple and transparent. This makes it easier for developers to estimate in advance the costs that they will face, and it also supports competition by making it easier for third parties / competitors (SLPs and NAVs) to estimate the charges that the incumbent will quote to developers. Simple charges can be clearly traced back to the costs incurred by companies and minimise administrative burden in terms of data collection, forecasting revenues and estimating charges. Charging rules should also be stable so that companies can plan ahead and make long-run decisions without the risk of fundamental changes in the regulatory framework. This criterion aligns with guidance both from Defra and the Welsh Government.

Simplicity covers the following aspects:

- Does the approach result in a clear and transparent set of charges which are easily understood by developers and other parties?
 - Developers benefit from having a clear set of published charges which they can use to estimate better the charges that they will face, which is an important input into their decision to build new developments.
 - We note that this point can be in conflict with cost reflectiveness. For example, a truly cost reflective approach would be to set charges on a case by case basis rather than through a set of published fixed charges. However, this would be less transparent for developers, or third parties intending to understand what the incumbent is charging, even if the published charges included examples based on typical developments. The charging rules should ideally strike a proportionate balance between cost reflectiveness and simplicity.
- Is the approach likely to lead to stable charges over time?
 - The approach would ideally result in relatively stable prices over time. This is particularly relevant in the context of network reinforcement charges (for both local and particularly strategic assets) where the cost can be driven by large lumpy investments. Ideally the approach would smooth the recovery of any large fixed and common costs over many developers over a number of years rather than recovering them from a smaller number of developers over fewer years.
- Will the approach be reasonably straightforward for companies to implement?
 - The approach should strike the right balance between being clear for incumbents to implement while not being overly prescriptive. Giving

companies discretion in some instances can help to achieve more flexible outcomes.

- The cost of implementation would ideally be low. This covers upfront cost as well as on-going costs. As mentioned above, some approaches could require the incumbent to build sophisticated cost models, which are currently not required.
- The cost recovery arrangement would ideally minimise administrative burden in terms of data collection, forecasting revenues and estimating charges.

6.2.3 Support for markets

The charging framework should avoid distorting competition in contestable markets and causing unintended consequences or perverse outcomes for third parties (including on competition between the incumbent and NAVs for both on- and, where relevant, off-site costs). This approach should also be clear and simple such that the administrative burden for third parties to understand the rules is low.

An important factor in changing the rules around the income offset in England was to ensure more effective competition in the contestable market for requisition by ensuring that NAVs can compete on a level playing field with incumbent water companies and SLPs. And any future changes should continue to foster effective competition rather than to hamper it.

6.2.4 Public value

The current charging rules do not promote strong environmental or social incentives. For example, within a given company area, network reinforcement charges are the same in water-scare zones as they are in areas where there is plenty of spare capacity. Therefore, developers have little financial incentive to take water scarcity into account.

Ideally a new approach would introduce the right incentives to support environment and social objectives, and to promote innovation in the water and wastewater sector. This includes:

- Incentivising developers to locate their developments away from areas with water scarcity and capacity constraints; and
- Incentivising developers to build developments with water efficient homes or other water-saving strategies, or sustainable drainage, where practicable.

These incentives should ideally be cost reflective (e.g. it is less costly to build developments in areas with spare network capacity) rather than an artificial incentive that distorts other pricing signals.

6.3 Evaluation

In the next section we discuss how the approach to recovering costs could change in future. These options can be evaluated against the criteria discussed in this section. However, we note that judgement will be required:

- Within a given criterion: It will not be possible to precisely quantify how different options perform relative to individual criteria above. Instead, a more qualitative approach will be required, such as categorising options as red / amber / green.
- Weighting different criteria: Some of the criteria above are in conflict with each other and require a trade-off. For instance, a cost reflective approach may be more complex. Therefore, there is a question around how the different criteria should be weighted to come to an overall view. Ultimately, this will require judgement and would benefit from views from a wide range of stakeholders.

7 POTENTIAL OPTIONS FOR REFORM

7.1 Introduction

In this section we consider different options for how the cost of developer services could potentially be recovered in future. Based on discussions with Ofwat we have focussed our analysis on the following components:

- 'gross' off-site costs; and
- the income offset.

While the income offset is currently subtracted from the network reinforcement charge in England, we first consider how the 'gross' cost of off-site work could be recovered i.e. before subtracting any income discount. We also refer to them here as 'off-site' costs as opposed to 'network reinforcement' to reflect the fact that these costs may extend beyond just network costs. This covers reinforcement costs of local assets and strategic assets.

We focus on these components because ultimately these are the two areas which result in developers paying less than the full cost of developer services. For this reason, we do not discuss in detail on-site costs (connection and requisition) or diversions. For these components, developers already pay for the full cost of the work, with the exception of requisition in Wales where developers receive an income offset. However, we discuss this point under the income offset.

In this section we consider different approaches to structuring each of these components separately, (albeit, as discussed below, we recognise in certain instances the decision made for one component may impact on another). This gives rise to a menu of choices, whereby different options can be pieced together to form complete packages for how the full cost of developer services is recovered. However, given the potential number of combinations, we have not sought to evaluate complete packages. We understand that Ofwat may consult on shortlist of potential packages in future.

We discuss each of the components in turn below. We also provide a summary table at the end of this section which summarises some of the key questions to consider, evaluated against the criteria defined in the previous section.

7.2 'Gross' off-site costs

In this section we consider how off-site costs associated with developer services could be recovered. In the first instance, we consider the gross costs (i.e. before applying any discount / income offset) and in the next section, we then consider potential options for the income offset.

We have considered the following points:

- The scope of costs to be recovered through developer charges;
- The time horizon over which costs are recovered;
- How those charges should be recovered; and

- Whether competition could be introduced into off-site work on the incumbent's network.

We discuss these points in turn below.

The scope of costs to be recovered

As set out earlier, developers in England and Wales currently pay for a proportion of the total cost of off-site work. They make a contribution to the cost of reinforcing 'local' assets, but not for reinforcing the cost of reinforcing 'strategic' assets. Given that one of our key evaluation criteria relates to cost reflectiveness, a key question in evaluating potential future options is, ranging from shallow costs to deep costs, how much should be recovered by developers?

Part of the original rationale for developers only contributing to the cost of local assets was because of the complexity in attempting to isolate the proportion of the deep off-site costs that is driven by new developments as opposed to existing customers. This continues to be a complex question. However, in the context of cost reflectiveness and user pays principles, it does not seem reasonable that developers pay for none of these costs.

Clearly, widening the scope of costs to be recovered through developer charges will increase the level of charges to developers. Also, we recognise that in practice it may be challenging to isolate the proportion of off-site reinforcement costs that are driven by developers. However, isolating this cost and then recovering it from developers would be in line with cost causation.

In our view, this debate would benefit from water companies revisiting the question and providing analysis on the proportion of all deep costs that are driven by new developments relative to an appropriate counterfactual. This should in principle take into account all costs, with an assessment then made as to whether new developments are driving the cost, even indirectly. For example, reducing leakage on existing infrastructure is arguably also driven by new developments insofar as it is an alternative to investing in new water resources which might otherwise be required to accommodate new developments. The Wing Determination can also help provide guidance to companies on how to allocate costs which are shared between developers and existing customers.

We note that companies are already required to produce detailed modelling analysis as part of their Water Resource Management Plans (WRMPs). Each water company is required to produce a WRMP every 5 years which sets out how the company is planning to ensure that the supply-demand balance is maintained over the long run (over the subsequent 25 years). These plans include various options including new resource capacity and measures to reduce demand and leakage. Future deficits are driven by a combination of new connections, changes in consumption from existing customers and changes to the capacity from existing resources. Companies could use these models to run scenarios with new connections included and a counterfactual without new connections, whereby the difference in cost between these two scenarios could be attributed to new connections. When running models without the new connections it may also be appropriate to assume that the population growth (or a proportion of the population growth) takes place in existing households as opposed to just assuming that no

growth takes places. Guidance on WRMP comes from Defra and the Environment Agency (EA), rather than Ofwat. Therefore, in principle, Defra and the EA could include an amendment in their WRMP guidance to require companies to carry out this analysis.

Alternatively, the charging rules could be changed to include a requirement on incumbents to provide more details on the scope of costs that are recovered from off-site charges.

The arguments presented above would hold for both England and Wales.

Time horizon

Water companies in England are required to balance their network reinforcement costs with revenue recovered from infrastructure charges over a rolling five year cumulative period. It could be appropriate to revisit this time horizon. This is because companies typically make investment decisions taking account of planned developments over a longer time period. Therefore, the current approach could be seen to result in an intertemporal cross-subsidy between developers:

- First, developers in certain areas may benefit from infrastructure that other developers have funded in previous periods; and
- Second, those same developers that benefitted from investments funded by other developers in previous periods may themselves also need to pay for investments that will also go to benefit other developers in future.

This gives rise to ‘first mover disadvantages’ and ‘second mover advantages’, and in principle, for a given new development the two often do not necessarily cancel each other out. Companies could have discretion as to how they approach this question.

One approach could be to smooth out the cost recovery of each asset in line with the expected profile of new connections associated with that asset over time.

This approach would improve the level of cost reflectiveness, albeit it would marginally increase the cost of implementation for companies. The approach would also need to co-exist alongside the price review process which requires assumptions to be made about how much cost is incurred each year and how much is recovered each year.

The structure of charges

We have considered the following points related to the structure of developer charges for off-site costs:

- Geography – whether companies should recover costs across all customers in their region;
- Usage – whether charges should relate to consumption; and
- Unbundled charges – whether NAVs should pay for all off-site costs if they self-provide some of their own off-site infrastructure.

We discuss these points in turn below.

Geography

In practice, network reinforcement charges in England tend to be recovered on an average cost basis – i.e. for each company, the total cost divided by the number of new connections (less the income offset). In Wales, it is levied as a flat charge, indexed over time.

As described earlier, the scale of network reinforcement required in response to adding new connections will depend on precisely where in the network the new connections are added. It is plausible that many new connections could be added in a part of the network close to existing infrastructure where there is plenty of spare capacity, meaning that little to no network reinforcement may be required. And conversely, it is plausible that if only relatively few new connections are added in a part of the network with little spare capacity or at added some distance from existing infrastructure then the amount of network reinforcement required could be more significant. Also, while this refers to ‘network’ reinforcement, as described above, the same argument would hold with respect to the full scope of off-site costs.

For this reason, levying charges on an average cost basis, while simple and cost reflective in aggregate, is likely to lead to cross-subsidies between developers. It also does little in terms of promoting environmental incentives / pricing signals whereby large developments could be built in areas with water scarcity / limited capacity, but the costs would then be recovered across all developers. In principle, charges could be levied on a case by case basis. (This is broadly in line with the current approach in Wales and the previous approach in England for off-site water mains and sewers that required reinforcement as a clear result of new developments requiring additional capacity, and is the current approach in both England and Wales for diversions.) This approach would significantly reduce the level of transparency in the market, both for developers and also for third parties who benefit from knowing what the incumbents are charging for comparable work. This approach could also introduce competition concerns whereby it would not be clear or readily verifiable whether the incumbent is breaching competition law, and Ofwat and competition authorities could potentially receive a number of complaints which they would have to assess on a case by case basis.

Therefore, on balance, we believe the benefits of having published charges are likely to outweigh the benefits of moving towards this alternative approach. Also, in the case of off-site costs, charging on a case by case basis could result in significantly increased charges for some developers – especially if the cost of entire investments falls upon a small number of developers. This also overlaps with the discussion above on time horizons and would result in a ‘first mover disadvantage’ whereby due to the lumpiness of costs, the first developer that causes the need for off-site investment would in principle need to pay for the full cost, with ‘second movers’ then free-riding on those investments. Assessing these costs over a longer time horizon would help to smooth the recovery of costs over a greater number of developers.

The table below provides details on the ‘second comer’ rule used by Ofgem in charging to connect new customers to electricity distribution networks.

THE REBATE IN THE ENERGY SECTOR: SECOND COMER RULE IN THE UK

In the electricity sector, reinforcement costs are split between connecting customers and the Distribution Network Operators (DNO). Developers are required to pay a proportion of the reinforcement costs at the same voltage level as their point of connection plus a proportion of any reinforcement at the level above. These costs are associated with assets installed to add network or fault level capacity to the existing distribution system.

This charging rule creates a risk of free rider problems because there must be a 'first comer' who triggers the reinforcement to the network. When additional capacity is created to accommodate new connections it could generate enough headroom for a subsequent customer to benefit from these assets.

To mitigate free rider problems, Ofgem introduced the Electricity (Connection Charges) Regulations 2002 and 2017, known as the 'second comer' rules. When a new connection connects to existing reinforcement assets that were previously installed and paid for and there is still spare capacity, then this new customer needs to reimburse the 'first comer'. This cost recovery arrangement is considered over a period of five years.

Source: Electricity (Connection Charges) Regulations 2002, 2017

A compromise could be to introduce zonal charging. This is not precluded in the current charging rules in England, although in practice companies tend to just publish a flat rate. This approach would have the effect of charges being lower in areas where there is plenty of spare capacity, and higher in areas where there is capacity constrained, both in terms of network capacity and also water resources. Such an approach would be more cost reflective on a case by case basis, and also help to promote environmental incentives. With respect to zones, this does not necessarily need to be at the level of Water Resource Zones (WRZ) as included in companies' Water Resources Management Plans (WRMPs). Instead, companies could have discretion to divide their region into a different set of zones better tailored to reflect the costs incurred by new developments. Similarly, companies could have discretion to have different zones for water and wastewater services if this is more practical and meaningful.

However, we note that strategic assets are less location-specific than local assets. Therefore, it may not be possible to allocate investments in strategic assets to different zones. One approach could be to allocate the cost of reinforcing local assets to individual zones, and to recover the cost of reinforcing strategic assets across all zones. Also, investments in strategic assets tend to be lumpier (i.e. a larger in scale and cost but required less frequently) than investments in local assets, and therefore recovering the cost across more new developments would result in lower average charges.

This approach would increase the cost of implementation for companies by potentially requiring them to develop cost models. However, if promoting environmental incentives is a key evaluation criterion, then this could be considered appropriate. (It also remains to be seen whether the differences in charges between different zones is actually large enough to provide real incentives

for developers.)⁷⁷ Also, if companies do report charges for a number of zones then there would be a challenge for them to ensure that the charges are clear and transparent in the charging documents.

Also, it remains to be seen whether charges would be significantly different from one zone to another, albeit this could help inform how zones are defined – e.g. if differences in cost between two zones are very small then it could be practical to group them together into a larger zone.

Charges based on consumption

Companies could set charges related to off-site costs based on consumption and usage. Some companies already provide discounts in their infrastructure charges for developers that build water-efficient homes. The rationale behind such discounts is that by building water-efficient homes or providing sustainable drainage systems (SuDS), or rainwater capture and grey water recycling, the demand on the network will be lower and reinforcement costs that would otherwise be required can be avoided.

Such an approach can be considered cost reflective and also promote environmental incentives. Ofwat currently gives companies discretion as to how they implement such an approach. The current approach taken by some companies is to provide a fixed percentage reduction to the charges if developers build homes to different standards.

One approach could be to recover costs not on a ‘per connection’ basis, but on a ‘per expected PCC’ basis. We note that there is some precedent for such an approach in the use of ‘relevant multipliers’ for network reinforcement charges (described earlier in Section 3.6).

This approach could complement the zonal charges described above. Zonal charges could help to provide stronger location incentives, which could be useful to reduce the need for reinforcing local assets, whereas consumption-based incentives more generally reduce demand for off-site work, covering both local assets and strategic assets

In order to comply with the user pays principle, it would be important to ensure that these ‘discounts’ and the cost savings associated with the more sustainable developments are taken into account when calculating the balance of charges – i.e. developers that build water-efficient homes pay a lower share of the total cost, and those that do not pay a higher share.

As mentioned above, some companies already take into account usage / consumption when setting charges for developer services. The approach varies from company to company. Therefore, we see some merits in having the various individual company approaches formalised / standardised across the industry.

⁷⁷ Recognising that the costs of developer services represent only a small proportion of the total costs of a property development. Nevertheless, differentiated zonal charges may have some impact on marginal developments.

Unbundled charges (NAVs)

As described earlier, we note that NAVs can range from ‘basic’ NAVs to ‘full service’ NAVs.

Clearly, for full service NAVs, it would not be appropriate to contribute to any of the off-site costs that the incumbent incurs in response to new developments, since the NAV is not actually using any of the incumbent’s network. This could also distort competition between the NAV and the incumbent if the NAV effectively has to self-provide its own off-site infrastructure and also partly fund the incumbent’s. Conversely, for basic NAVs, we see no issue in the NAV paying for these costs provided that none of these costs are also already double-counted in the NAV’s bulk supply agreement.

Therefore, given the spectrum of potential NAV business models between basic and full service, in our view it would be appropriate for the incumbent to unbundle its off-site charges in order to allow NAVs to pick and choose the elements that it does need. This could also help to promote efficiency whereby, when faced with the incumbent’s unbundled charges, a NAV may decide to self-provide some of the services instead if it believes that this would be less costly. As discussed in Section 3, we note that in Scotland, parts of off-site work are also contestable. Therefore, there is a separate policy question as to whether competition should also be introduced to more parts of the off-site value chain in England and Wales.

Publishing unbundled charges would increase complexity and the cost of implementation for incumbents by requiring them to provide a detailed breakdown of costs (which would be compounded if the incumbent also introduces zonal charging and potentially also includes a share of deeper costs into its charging). There is also a question around whether a NAV should pay for the average cost of individual elements, or only the cost related to the precise services and infrastructure that it actually uses. In practice, we understand that NAVs have a relatively low market share of customers, and this costing exercise could arguably be considered disproportionate if the take up of certain unbundled services is relatively low or potentially even zero in some areas. Therefore, in these instances, it could be preferable for the incumbent to provide bespoke quotes rather than a set of published fixed charges.

Competition for off-site services

NAVs and SLPs compete with incumbents to provide on-site developer services. However, off-site work on the incumbent’s own network is not contestable. There is some competition for off-site work in that NAVs could self-provide off-site services and infrastructure instead of relying on the incumbent. However, in the vast majority of cases, new connections are connected to the incumbent’s network.

Competition could potentially be introduced to off-site work. As discussed earlier (in Section 3.9), in Scotland, off-site network reinforcement is contestable. In fact, Scottish Water does not carry out any of this work itself. All of this infrastructure is built by accredited contractors on behalf of developers – albeit we understand that WICS may be revisiting its policy in this area. This differs from the approach in England and Wales where only new connection and requisition services are contestable.

There could be some benefits to introducing competition for off-site work in England and Wales too. In many markets, competition leads to positive outcomes including lower prices, improved service quality, and greater innovation. However, we note that competition is a means to achieve these positive outcomes, as opposed to being a positive outcome in its own right. And in some markets, competition works less well than in others. In the case of off-site work, while competition may lead to positive outcomes, it is also plausible that it may not be an improvement relative to the status quo. For instance, there could be benefits to having one single operator with sole responsibility for carrying out off-work: a single operator may be able to approach the question of reinforcement in a broader more strategic way rather than on a case by case basis. Therefore, it would need to be clear that introducing competition can help better achieve the positive outcomes described above.

First, we understand that many water and wastewater companies in England and Wales outsource network reinforcement work to contractors. This means that there is already competition between contractors in bidding for work, which should result in lower costs for companies. In England, where network reinforcement charges must be cost reflective, this means that developers already benefit from this competition between contractors, in that the lower costs incurred by the company are passed through to developers in the form of lower charges. (This is not the case in Wales where charges are set at a uniform rate and indexed to inflation over time – i.e. they are not directly linked to costs).

There could be scope to introduce competition for the market. For larger scale projects, it may be appropriate to consider the Direct Procurement for Customers (DPC) model – i.e. where third parties compete to finance, deliver and operate a new asset in return for a future income stream.⁷⁸ Ofwat provided the following criteria for projects that could be well suited for delivery through DPC:

- For projects that are above £100m in totex;
- Where there are limited economies of scale and scope with the rest of the appointees' network system (or where such economies could be maintained through contracts).
- Where there are simple or limited, well understood and manageable physical and operational interactions with the appointees' network.
- Where there are assets with capacity that is shared by multiple appointed companies.
- Where there are assets that are more 'passive' and are not actively managed as part of the overall system.

If individual off-site schemes perform well against this list, then they could potentially be suitable for delivery through DPC.

⁷⁸ <https://www.ofwat.gov.uk/wp-content/uploads/2017/12/Appendix-9-Direct-procurement-FM.pdf>

7.3 Income offset / balance of charges

In England and Wales, we have found find that the balance of charges is driven by two factors:

1. Developers do not contribute to the cost of reinforcing strategic assets incurred as a result of connecting new developments, which is therefore funded by existing and future customers; and
2. Developers receive an income offset, which in effect is also funded by existing and future customers.

In Section 4 we have assessed the economic rationale for whether developers should pay less than the full cost of developer services. Ultimately, our main conclusion is that there is no clear evidence to support developers paying less than the full costs incurred as a result of new developments.

In this section, we consider the following:

- The definition of the balance of charges;
- Whether the income offset should be removed; or
- If it is retained, then how it could be calculated, and how it should be applied.

We discuss these points below.

The definition of balance of charges

We understand that there is currently no agreed common definition of the balance of charges. Therefore, the concept of keeping the balance of charges broadly maintained is ambiguous, because it is not clear precisely what should be broadly maintained. In Section 5 we have presented two potential options:

- Option 1 is a narrow definition which effectively expresses the total charges that are paid by developers as a percentage of the cost of connection, requisition and reinforcement of local assets, whereby the difference between the former and the latter is the income offset; and
- Option 2 is a broader definition which effectively expresses the total charges that are paid by developers as a percentage of all the cost incurred as a result of new developments, namely connection, requisition and reinforcement of local assets plus the cost of reinforcement of strategic assets and other deep costs, whereby the difference between the former and the latter is the income offset plus the cost of reinforcement of strategic assets and other deep costs.

An important part of this report is to draw attention to the fact that the balance of charges is not driven solely by the income offset, but also by the fact that developers do not contribute to the cost of reinforcing strategic assets or other off-site costs not captured under local assets. While these extra costs incurred as a result of new development may be difficult to quantify precisely, in our view, it is still worth shining a spotlight on these costs to draw attention to the fact that the balance of charges is broader than just the income offset.

The income offset is removed

For the reasons set out in Section 4 the income offset could be removed on the grounds that there is no convincing evidence to support the underlying logic. We also note that there is no equivalent income offset in the energy sector. For companies that currently apply an income offset, if no other changes were made, this would result in a change in the balance of charges as there will be an increase in contributions from developers.

If developers were to also pay for all off-site costs too then developers would pay for all costs incurred as a result of new developments and there would be no contribution from other customers. To limit the increase in charges, another approach could be that in light of the difficulties in estimating the size of the relevant off-site costs, the income offset could be removed but developers could still continue to not pay for off-site costs. In practice, this would mean that developers still do implicitly receive a discount (i.e. they do not pay for off-site costs). Strictly speaking this would not be cost reflective, but it would limit the increase in charges and be relatively simple to implement.

Also, if the income offset cannot be justified on the basis of cost or some other economic rationale, then this could be seen to create an uneven playing field between incumbents and NAVs that self-provide their own off-site infrastructure – i.e. incumbents would be able to provide a discount to off-site charges, whereas NAVs may not be able to.

We note that there could be a glidepath to help gradually transition between the current approach and any new approach.

The income offset is retained

How is it calculated?

If the income offset is retained, then it could be calculated in the following ways:

- First principles:
 - Companies may be able to provide evidence to support a discount – e.g. that there are economies of scale. This could require each company to produce complex cost models (potentially needing to be updated each year) which would increase the cost of implementation, presenting a trade-off between cost reflectiveness and simplicity. To overcome this, one approach could be for Ofwat to review the evidence presented from the industry and to apply an average proportion for all companies.
 - We note that in this instance, the income offset would be justified by a new and objective rationale. For this reason, it could be appropriate to rename the ‘income offset’ to distance it from the original meaning and interpretation. For example, it could become known as the ‘economies of scale’ discount.
 - Depending on how the income offset is justified and calculated, this could result in a change in the balance of charges.
- A policy decision:

- In principle, Ofwat or the governments in England and Wales could decide to continue allowing an income offset, even if this is not strictly supported on economic grounds. This could be on the grounds that homebuilding is an important policy objective and this would help incentivise developers to build new properties. If this is the case, then the current approach could continue as is (e.g. the income offset is used as a balancing item – as it is in England – or that it is estimated using the DAD formula with reference to the cost of requisition – as it is in Wales). Under this approach, the balance of charges would remain broadly unchanged.
- Alternatively, the approach could be updated – e.g. it could be set at a fixed amount at the industry level and indexed over time, much like the approach to setting the maximum amount of the infrastructure charge in Wales, or indeed through other top down considerations. Again, depending on how it is calculated, it is unclear what impact this will have on the balance of charges.
- In this instance it could be appropriate to rename the ‘income offset’ to distance it from the original meaning and interpretation. For example, it could become known as the ‘company contribution’.
- The box below describes how developer charges in parts of New South Wales, Australia were scrapped on the grounds of promoting homebuilding to assist the development of affordable housing in very high property cost areas. In this example the policy focus was on homebuilding and new connection costs are fully funded by general customers

ZERO DEVELOPER CHARGES POLICY IN GREATER SYDNEY AND THE HUNTER REGION

In 2008, the New South Wales (NSW) Government decided to set developer charges for Sydney Water and Hunter Water to zero within their ‘Development Servicing Plans’⁷⁹ (DSP). The cost of new connections is recovered from the general customer base through customer bills.

The rationale for the ‘zero charges’ policy was to ensure affordable housing in Greater Sydney and the Hunter region. In these areas the cost of land acquisitions required in large greenfield development areas is relatively high compared to other areas in NSW and Australia.

The Independent Pricing & Regulatory Tribunal (IPART) has expressed its concerns about the ‘zero charges’ policy because it reduces price signals for developers and creates a cross-subsidy.

Sources: IPART (2018) Final Report – Maximum prices to connect, extend or upgrade a service for metropolitan water agencies. IPART (2012) NSW Planning System Review. Sydney Water (2017) Response to Draft Determination.

Under either scenario it would be helpful to be clear about the rationale underlying the discount.

⁷⁹ The DSP describe the developer charges that are required to be paid by developers towards the provision of existing and future water supply and sewerage infrastructure for specific cities and broader areas. Each water and wastewater company needs to review its DSP every 5 years.

How is the discount applied?

If developers do receive a discount there is a question as to how it should be applied. Options include:

- A flat rate: It could be paid out to all developers equally as a flat rate per new connection. This is broadly in line with the current approach today. For each company, this could be calculated by first defining (either through a top down approach or on a more detailed bottom up basis) the total income offset to be paid out across all new connections over a given period and dividing by the forecast number of new connections added over the same period to derive the average rate.
- Proportional to costs: In Wales (and the old approach used in England), the income offset is proportional to the gross cost of requisition. Such an approach could continue – e.g. it could be proportional to off-site costs. In practice, this could be calculated by (i) defining the total income offset to be paid out across all new connections over a given period; (ii) estimating the total cost of developer services relating to off-site work only over the same period; and (iii) expressing the income offset as a percentage of that cost. The income offset could then be paid out to developers as a percentage of the network reinforcement charge. However, this approach could dampen environmental incentives. For example, if zonal charges were introduced and the off-site costs were higher in one zone, due to it having limited spare capacity, then applying a larger absolute discount to this charge would therefore dampen the incentives for developers to build away from these areas.
- Based on environmental factors:
 - Following on from the above, the discount could be used to promote incentives. This could include discounts to provide sustainable drainage systems, or to encourage building homes away from water-scarce zones / areas with capacity constraints. If off-site charges were to also be set in line with the zonal approach described above, then applying a discount on top of this would further increase environmental incentives – i.e. the charges are lower in these areas in the first place, and then a discount is applied on top.
- Linked to first principles:
 - If the discount is estimated based on first principles, then that approach could give some guidance on how it should be paid out. For example, if economies of scale are shown to arise in a particular part of the network, then the discount could be given just to new connections added in that area. This approach would depend on the rationale that was used to justify the discount in the first place.

In England the income offset is subtracted from the infrastructure charge from April 2020. Similarly, in Wales it is subtracted from the gross cost of requisition. In our experience, this sometimes causes confusion as to whether costs are gross or net of the income offset (e.g. in the PR19 data tables). Therefore, one approach would be to not subtract the income offset from one of the existing charges but rather to simply present it as a separate line in the published charges. This would also give

greater transparency to developers and third parties on the underlying costs. We understand that this is the approach taken by some companies in England in their published charges from April 2020.

If the discount is to be subtracted from an existing charge, then to help ensure a level playing field between the incumbent, SLPs and NAVs, for practical reasons it would be preferable to continue applying the discount to off-site charges as opposed to on-site charges. However, there is no practical difference if the income offset is subtracted from the network reinforcement charge or presented as a separate – i.e. in both instances developers benefit from it.

7.4 Summary table

The table below provides a high level summary of the key issues to consider, evaluated against the criteria defined in the previous section. We have colour coded each option against the evaluation criteria. We note that the colour coding is not relative to the status quo or compared to different options, but rather it denotes how well that option in isolation performs relative to the criteria:

- Red: The option performs poorly relative to the evaluation criterion;
- Amber: The performance is mixed relative to the evaluation criterion; and
- Green: The option performs very well relative to the evaluation criterion.

We note that this assessment is based our judgement of the merits of the options against the criteria.

Figure 17 Options summary

	Cost reflectiveness	Simplicity	Support for markets	Public value
Should developers pay for all off-site costs?				
Status quo - developers only pay for the cost of reinforcing local assets	This cost is driven at least partly by new connections. The principle of cost causation would suggest that developers should fund the share that they are driving	Simple. In line with the status quo	Potentially some market distortion with full service NAVs. If all customers fund reinforcement of strategic assets then developer charges to connect to the local sewage treatment network may be lower than connecting to a full service NAV that could deliver a lower total cost solution.	Developers would be shielded from the full cost that they are causing. This gives no incentive to build away from water scarce areas. However, this also reduces the cost of developer services which may stimulate homebuilding
Developers pay for the cost that they drive of reinforcing both local & strategic assets	Most cost reflective. In line with user pays principles	Companies would be required to isolate the impact of, and estimate the cost of reinforcing strategic assets that is driven by new connections	By paying the full cost of developer services, this could avoid the distortion described above	By paying the full cost of developer services, this could send sharper pricing signals to developers to build in lower cost areas. (However, this depends on how charges are structured). However, this increases the cost to developers which may dampen the incentive to build homes
How should the gross off-site charge be structured?				
Flat rate	Cost reflective in aggregate but not on a case by case basis. Some developers would be cross subsidising others	Simple. In line with the status quo	Potentially some market distortion with full service NAVs. An average cost approach may result in charges being lower than the true cost in some areas, which may distort competition with full service NAVs in those areas	Some developers would be shielded from the full cost that they are causing. This gives no incentive to build near existing infrastructure.
Zonal charges	More cost reflective, limiting cross subsidies between developers	Companies would need to carry out cost allocation exercises between different zones. Developer charges would need to clearly set out the charges in different zones	More cost reflective than a fixed cost approach means that companies would be competing on a more level playing field with full service NAVs	Zonal charges could send strong environmental pricing signals to developers

Figure 17 Options summary	Cost reflectiveness	Simplicity	Support for markets	Public value
PCC discounts - which could be added on top of the previous two approaches	Depending on how it is applied it could be more in line with usage and cost reflectiveness	Depending on how it is applied it could require companies to allocate costs based on volume	Depending on how it is applied it could be more in line with usage and cost reflectiveness leading to a more level playing field with full service NAVs	PCC related discounts would send strong environmental pricing signals to developers
<i>Should the income offset be retained?</i>				
Income offset is removed	If the income offset cannot be justified in cost terms then removing it makes charges more cost-reflective	Simple. Charges would be in line with costs	Full service NAVs may not be able to fund an income offset. Therefore, charges in line with costs would result in a more level playing field	Removing the income offset promotes user pays principles and allocative efficiency. However, this also increases the cost of developer services which may impact homebuilding negatively
Income offset is retained	This may vary from company to company. However, there is clear cut evidence either for or against income offsets	In line with the status quo, but requires extra steps compared to an approach without an income offset	This could potentially distort competition with full service NAVs who may not be able to fund an income offset	The income offset shields developers from the full costs which dampens environmental pricing signals. However, this also decreases the cost of developer services which may stimulate homebuilding
<i>If so, how should it be calculated?</i>				
First principles	If the income offset can be justified on the basis of economies of scale then this would be more cost reflective	This may require detailed modelling analysis to estimate economies of scale	Charges in line with the true level of cost would result in a more level playing field	This approach would ensure that developers pay for the true level of cost. If a discount can be justified, it is unclear how large the discount would be and whether this would result in developers paying more or less than the status quo
Policy decision	This would not be based on cost	This could be simple depending on how it is implemented	If this is not justified, then it could be distorting competition with full service NAVs	The income offset shields developers from the full costs which dampens environmental pricing signals. However, this also decreases the cost of developer services which may stimulate homebuilding

Figure 17 Options summary	Cost reflectiveness	Simplicity	Support for markets	Public value
Balancing item	This would not be based on cost	This would require a clear definition of the balance of charges to understand what precisely should be balanced	If this is not justified, then it could be distorting competition with full service NAVs	The income offset shields developers from the full costs which dampens environmental pricing signals However, this also decreases the cost of developer services which may stimulate homebuilding
How should it be applied?				
Fixed discount per new connection	If the rationale is not based on cost then this would not be cost reflective	Simple. In line with the status quo	Potentially some market distortion with full service NAVs if charges are lower than costs	The income offset shields developers from the full costs which dampens environmental pricing signals However, this also decreases the cost of developer services which may stimulate homebuilding
Based on environmental consideration	If the income offset is based on usage or location then this could be more cost reflective. However, this might already be captured through zonal pricing or PCC discounts	Depending on how it is applied it could require companies to allocate costs based on volume or location	Potentially some market distortion with full service NAVs if charges are lower than costs	This could send strong environmental pricing signals to developers. And in total it would lower charges for developers compared to not having an income offset

8 CONCLUSION

We have been commissioned by Ofwat to review the current approach to recovering the cost of developer services in England and Wales.

In practice, the cost is recovered from two separate groups:

- The developers requesting the work pay a set of ‘developer charges’; and
- The remainder of the cost is funded by the local water and wastewater company whose network the new properties are connecting to. This cost is then effectively recovered across all end-customers paying water and wastewater bills on the network.

We refer to this split in costs between developers and customers as the ‘balance of charges’. We find that the balance of charges is driven by two factors:

- Costs incurred as a consequence of connecting new developments: Developers are required to pay for the cost of on-site work and of reinforcing ‘local’ assets. They do not pay for the cost of reinforcing ‘strategic’ assets, which is therefore funded entirely by all end-customers on the network; and
- Income offset: In relation to the costs that developers do pay for, they also receive a discount (an ‘income offset’). This is funded by the local water and wastewater company, with the cost then recovered across all end-customers paying water and wastewater bills on the network.

We have explored the economic rationale for developers paying less than the full cost that is incurred as a consequence of connecting new developments. The main argument against this arrangement is one of cost reflectiveness / cost causation. This principle argues that costs should be recovered from the parties that are causing those costs. We have considered a number of arguments in favour of the current arrangement. However, we find shortcomings with some of these arguments and a lack of strong evidence for others. Therefore, it is not clear to us that there is an economic rationale for developers paying less than the full cost of developer services. Or at the very least, further evidence would be required to support maintaining the status quo.

We have then considered how the approach to recovering costs could be structured in future. Our key findings are as follows:

- Should developers contribute to the full set of off-site costs as opposed to just reinforcement of local assets?
 - Ultimately, we find that it would be more cost reflective and in line with the principle of cost causation if developers did pay for all of the off-site costs that they cause. We note that some off-site costs are driven both by demand from new developments and demand from existing connections. We recognise that in practice it may be challenging to isolate the proportion of off-site costs that are driven by new developments. However, from an economics perspective, we believe it is appropriate for developers to

contribute to the additional costs required to serve the new developments over and above the existing customer requirements.⁸⁰

- How should off-site / network reinforcement charges be structured?
 - We find that the current approach to recovering costs (which at a high level is an average cost approach where, for each company separately, the total cost is recovered across all new connections equally) does little in terms of promoting environmental incentives or user pays principles.
 - We recommend exploring whether charges could be higher in areas where network reinforcement costs are higher and lower in areas where costs are lower. We recognise that it may be costly to implement such an approach, and it also remains to be seen whether charges do differ materially across different zones. However, in principle, such an approach would be more cost reflective.
 - We also recommend greater use of environmental incentives such as developers being charged less if they build water efficient homes, provide sustainable drainage systems, rainwater capture or grey water recycling (which we note some companies already offer).
- Should there be an income offset?
 - We have considered a number of arguments in favour of providing an income offset. However, ultimately we find the economic rationale for the income offset to be weak, or at the very least, that further evidence would be required to continue providing an income offset.
- If there continues to be a discount, how should it be calculated?
 - It could be based on a top down policy decision. It could continue to be used as a balancing item to stabilise charging levels. Or if there is a convincing economic rationale for the income offset, e.g. an argument linked to costs, then it could be calculated based on this rationale.
- And if there continues to be a discount, how should it be applied?
 - Options include applying it as a flat rate per new connection, or using it to incentivise particular behaviours such as building away from water-scarce zones and building water efficient homes to further strengthen environmental incentives.

In evaluating these options, there are various pros and cons. In general, we see the benefits of moving towards a more cost reflective approach, which would also strengthen environmental incentives. However, this generally tends to increase complexity and the cost of implementation, and it may make it harder for companies to present their charges in a simple way.

⁸⁰ To estimate the cost that is driven by new developments it is important to establish an appropriate counterfactual scenario. The counterfactual scenario may need to take into account that if new connections were not added then the growth in population may take place in existing connections on the network which would place a different set of pressures and costs on the network

ANNEX A ESTIMATE OF COSTS

A.1 Introduction

In this annex we provide further details on our methodology, data sources, and assumptions that we have used to estimate the costs and the balance of charges presented in Section 4.

A.2 On-site costs and costs of network reinforcement of local assets

We have estimated on-site costs and network reinforcement of local asset costs using information available in Ofwat's Final Determination Grants & Contributions models (G&C)⁸¹ and the companies' Developer Services Data Requests (DSDR).⁸² These models contain each company's forecast of the total revenue generated from developer services over AMP7 (2020-2025) and information on number of activities undertaken by Self-Lay Providers (SLPs).

Connection and requisition costs

We have estimated connection and requisition costs by applying the following four steps:

- **Estimation of costs for incumbent.** We have estimated the total connection and requisition costs incurred by the incumbent company as the total revenue generated from connection and requisition charges, respectively. This is because these charges need to be cost reflective and, therefore, revenue can be thought as a reasonable proxy of the underlying costs. The revenue was taken from the G&C models. We have not estimated connection costs for wastewater as these are negligible compared to the other costs.
- **Adjustment of requisition costs for Welsh companies.** Welsh companies report revenue from requisition charges net of income offset. Therefore, for these companies we have estimated the gross cost of requisition charges by adding their forecast of the income offset (which is also available in the G&C models) to the revenue generated from requisition charges.⁸³
- **Estimation of incumbent market share.** We note that because connection and requisition are contestable services,⁸⁴ the incumbent company does not undertake all of the work in the market. Therefore, to get a sense of the total size of the market, we need to scale up these cost estimates by taking into account the incumbent's forecast share of the market. The market share was calculated using information on the number of connections undertaken by self-

⁸¹ <https://www.ofwat.gov.uk/final-determinations-models/>. Section 19 'Grants and contributions'. Accessed on 17 December 2019.

⁸² Most companies published the Developer Services Data Request on their websites. Ofwat provided us the Developer Services Data Requests for those that do not.

⁸³ The description of charges and income offset in the DSDR indicates that requisition costs are reported net of income offset, and that the income offset is against the network reinforcement charge for English companies, while it is against the requisition charge for Welsh companies.

⁸⁴ Only a small proportion of connection and requisition services is non-contestable, which we have not considered for the purpose of obtaining a high-level estimate of these costs.

lay providers (SLPs) from the DSDR.⁸⁵ We estimated that the average market share across incumbents is 63%⁸⁶ for water services and 13%⁸⁷ for wastewater services. We note that this implicitly assumes that the incumbent's average connection and requisition costs per new connection is the same as that of the other players in the market.⁸⁸ It also assumes that the incumbent market shares for connection and requisition are the same. We recognise that this may not always be the case.

- **Estimation of total costs.** We have estimated total connection and requisition costs by scaling up the estimates derived at the first step by the market shares calculated at the second step.

Diversion costs

We have estimated diversion costs as the company's forecast of the total revenue generated from diversion charges. Diversion charges need to be cost-reflective, and so we assumed that the total revenue is a reasonable proxy for the underlying costs. Unlike connection and requisition described above, because this work is not contestable, we consider the forecast revenue to be a reasonable proxy for the total cost incurred across the market. We have not included non-price control diversions costs as new developments are unlikely to be the main driver of these costs

Costs of network reinforcement of local assets

We have estimated the costs associated with network reinforcement of local assets as the company's forecast of the total revenue generated from infrastructure charges. These charges are designed to recover the cost of network reinforcement for local assets (but not for strategic assets). Note that English companies report this revenue net of the income offset. Therefore, for these companies we have estimated the gross cost of network reinforcement for local assets by adding their forecast of the income offset to the revenue generated from network reinforcement charges.

A.3 Income offset

Each company provides a forecast of the total income offset in the G&C models.

A.4 Costs of network reinforcement of strategic assets

The costs associated with network reinforcement of strategic assets driven by new connections are not captured by Ofwat's G&C models. To estimate these costs,

⁸⁵ The DSDR reports each company's forecast of the number of new connections undertaken by SLPs split out by whether the SLP provides (i) less than 25% of activities; (ii) between 25% and 75% of activities; or (iii) more than 75% of activities. However, the exact proportions are not reported. To calculate the market share we have assumed that the SLPs undertake 12.5%, 50%, and 87.5% of activities, respectively. We recognise that this might not be reflective of the actual shares for all companies.

⁸⁶ If different assumptions on the shares of activities undertaken by SLPs are used, the estimated market share of incumbent water companies varies between 50% and 76%.

⁸⁷ As above. The estimated market share of incumbent wastewater companies varies between 0% and 25%.

⁸⁸ We note that, in reality, the requisition cost per connection for SLPs will be significant less, as SLP requisitions will, in most cases, be of limited length, as they will construct on-site pipework themselves. However, we were unable to obtain data to quantify this impact.

we have reviewed the company's business plan tables, and Ofwat's enhancement allowances feeder models.⁸⁹

Our approach to estimating the cost of network reinforcement of strategic assets and other 'deep' costs is outlined in Section 5.4.1 for water services, and in Section 5.4.2 for wastewater services.

⁸⁹ <https://www.ofwat.gov.uk/final-determinations-models/>. Section 7 'Wholesale Water Enhancement feeder model: Supply demand balance' and 'Section 12 'Feeder model: Enhancement aggregator'.

