STUDY OF THE NAV MARKET

Final report prepared for Ofwat

26 May 2017

Confidential

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EXECUTIVE SUMMARY

In December 2016, Ofwat commissioned Frontier Economics (in association with law firm, Addleshaw Goddard) to conduct a study to examine the functioning of the New Appointment and Variations (NAV) market.

The NAV market was established in 1991 but has had limited impact, with only some modest development since the Cave review in 2009.[1]

NAVs represent competition 'for the market', i.e. replacing the incumbent undertaker, on a site-specific basis, for the onsite services (and sometimes for the entire value chain providing water and/or wastewater services. It has typically emerged as an option for providing new infrastructure and services for new housing and mixed developments.

The objectives of this study are to assist Ofwat in its future policy development by

- reviewing how the market is operating;
- identifying the extent to which any factors currently act to prevent, distort or restrict effective competition; and
- setting out options to address any such issues.

Our approach

The foundation of our approach is a traditional competition analysis, framework, within the relevant context of sector policies, legislation and regulation.

Competition framework

Our three-step approach closely follows the standard competition analysis framework adopted by the CMA in market investigations:

- Step 1: Define the relevant market;
- Step 2: Identify features of the market that have the potential to have an adverse effect on competition; and
- Step 3: Identify potential remedies that could address any adverse effects identified.

The principal objective is to understand whether the market is functioning well for consumers focusing on barriers to entry and vertical constraints that may have an adverse effect on competition.

Longer-term impact on the wider water sector

To provide a dynamic view of the NAV market, we have considered options to improve it against potential implications on the wider water market. These include:

- potential value transfers and redistributions;

[1] 'Independent Review of Competition and Innovation in Water Markets', Professor Martin Cave, April 2009

- interactions and interdependencies with the current regulatory regime;
- potential longer term effects on efficiency and innovation; and
- whether any proposed NAV reform would be future-proofed to potential reforms in different parts of the value chain.

Stakeholder engagement & case studies

The study also incorporated a comprehensive stakeholder engagement programme.

In addition to reviewing documentation provided by Ofwat and engaging with relevant stakeholders, we conducted case studies of the electricity and gas sectors, regarding the new connections services, similar to the activities carried out by NAVs in the water sector.

Legal framework of the NAV market

The NAV regime applies in both England and Wales. There is no equivalent to the NAV regime in Scotland.

The key elements of the legal framework that we have examined, in terms of their impact on competition, are the following:

- The criteria that must be met in order to become a NAV;
- The powers and obligations that are exercised by a NAV;
- The application process; and
- The mechanisms available to resolve disputes.

The NAV market today

There are currently 68 NAV sites operated by 8 new appointees, serving approximately 60,000 residential customers and 700 business customers.

Most of these NAVs have been granted to serve new housing or mixed developments, under the ‘unserved’ criterion. Most NAV entry has been by companies new to the water sector, including those with roots in the energy sector, offering a multi-utility service.

Most NAVs operate a ‘bulk supply’ model, buying wholesale water and wastewater services from the incumbent operator, delivered to the site boundary, and then providing and operating the ‘last-mile’ infrastructure on site and retail services. Just one NAV entrant provides a ‘full NAV’ service, including treatment services, for wastewater.

When a new development needs to be connected to water/wastewater services, the connection services can be provided by three possible parties: the incumbent, a Self-Lay Organisation (SLO) or a NAV. The property developer chooses which of the three competing types of providers to make the connections to its new development.

Market definition

We consider that the predominant relevant economic market for NAVs is likely to be:

- in product scope: the market for developer services, including incumbent suppliers, SLOs and NAVs;
- in geographic scope: a series of local markets corresponding with the geographic areas covered by regulated incumbent water suppliers.

We identify the main customer as the property developers in most cases, except when the NAV is serving a large industrial user in which case the latter would be the customer. In the majority of cases, the water/wastewater end-user customers are not the relevant customer of the NAV market.

One caveat to this is in the context of retail market opening (currently for business customers but potentially for domestic customers in future), where end customers will be able to choose retail providers.

Potential size of the NAV market

Between 2011 and 2016 about 2.7% of new developments were served by NAVs. Both NAVs and developers have expressed the view that the current number of NAVs is far from having reached its potential size.

We found that NAVs are currently not operating on the majority of the housing development sites. The average size of a NAV site is close to 1,000 residential units, while the majority of new housing developments are between 50-200 dwellings. Only 8 out of the 68 NAV sites have fewer than 200 residential customers. However, we found no evidence of intrinsic barriers of efficient scale for NAVs to serve smaller developments.

In comparison, the electricity and gas connections markets have reportedly been working better in enabling entry to the last-mile infrastructure. Ofgem has discontinued its annual connections industry review since 2010/11. However, in its 2010/2011 review, it reported the market share of new entrants in the gas and electricity connections markets were 53% and 18.2%, respectively.[2]

Benefits of a well-functioning NAV market

A range of potential qualitative benefits from NAVs can be identified.

A well-functioning NAV market could be expected to stimulate greater efficiency in the provision of new connections, ‘last-mile’ infrastructure and retail services by adding competitive pressure to infrastructure provision. Greater efficiency may be manifested in either price and/or quality of service for customers. There may also be environmental and water efficiency benefits from new entrants employing new innovations.

The benefits of NAVs would appear to more clearly relate to more efficient development and greater innovation than in prices to final consumers. We found that about half the current NAVs initially offered price discounts to

[2] Ofgem, Connections Industry Review 2010-11.

water/wastewater end customers but there is some evidence of initial discounts being discontinued.

While the end customers' interest is addressed during the NAV application process and through relative price and service regulation, there is no requirement for them to be better off, only no worse off. Several stakeholders (including CCWater) questioned the extent to which water/wastewater end customers benefited from NAVs.

Efficiency gains delivered to developers (for instance with a multi-utility solution) are seen as potentially material for developers. These benefits may have both a cost and a service dimension, assisting the overall efficiency of development activity. Developers also considered that having effective competition from NAVs (in addition to SLOs) would generally force better service from incumbent water/wastewater companies. A key benefit from improving the NAV's ability to compete might therefore be in the efficiency and speed of development and house building, a key Government priority.

NAVs that provided environmentally friendly or water efficient solutions on site, emphasised the broader benefits of innovation from their involvement particularly on 'challenging' sites. It was suggested that a NAV could usefully serve as a 'case study' or demonstration site for innovative solutions.

We considered the knock-on impact of NAVs on the wider customer base. While CCWater expressed concerns about NAVs cherry picking cheaper sites leading to higher costs for remaining customers, we identified little evidence of this occurring in practice.

Issues identified through stakeholder engagement

The stakeholder engagement has highlighted a number of issues, of which the key ones fall into two categories:

- **Process/behaviour** – the requirements and processes around applying to be a NAV operator and the transparency; timeliness and effectiveness of information provision by, and communications with, incumbent water companies; and
- **Pricing** – the margin that NAV operators are able to earn, including the underlying methodology of the incumbents' charges underpinning those margins, and whether there is a level playing field between NAVs, SLOs and incumbents regarding these charges.

Both margin and process/behavioural issues were seen by NAVs and some developers to present significant barriers to entry. They considered that the margin was significantly distorted by a number of factors. These included the incumbents' approach to bulk supply pricing and a range of connections charges; the application of the statutory rules on providing developer 'discounts' (known as

income offset), and the significant RCV discount[3] on incumbents' historical assets which is embedded into retail pricing.

NAVs and developers contrasted their difficulties with the processes for engaging a NAV against the relative ease of engaging in the similar market for connections and local infrastructure provision in the gas and electricity markets.

A lack of knowledge of and a perceived 'risk averseness' by drinking water quality, and environmental and planning regulators towards the NAV option were also seen to have contributed to the slow uptake of NAVs. Some environmental policies were also seen as inhibiting entry by 'full NAV' model entrants, such as the Environment Agency (EA)'s presumption against building of new sewage treatment works and the current lack of a market in abstraction licences.

The incumbent water and wastewater companies who engaged in the study were in general not dismissive of the concerns raised by the NAVs and developers, but there was a concern that the scale of barriers was overstated. They highlighted that some barriers might be intrinsic to the fundamental economics of a NAV, and that incumbents' behaviours and pricing approaches might reflect regulatory guidance and case law rather than anti-competitive intent.

They noted that they had little incentive to operate out of region due to the form of the price control. Despite serving 97% of development sites, they also considered they had little incentive within the existing regulatory regime to 'defend' a potential site within region. They noted that this could impact on the strength of competition.

Due to the current PR14 wholesale revenue cap, when an incumbent loses a new development site (initially forecast in the business plan) there is no adjustment to the allowed revenue through the regulatory control. This implies that the lost connections revenue and wholesale revenue is still recovered, but spread out on existing customers. This would represent a loss of value from the water sector. Ofwat has scope to address this issue if it were to become material (e.g. through an adjustment to the revenue true up mechanism).

Barriers to entry

We have identified four categories of barriers to entry. Our conclusions are as follows.

Regulatory barriers – NAV application process

- The 'unserved' criterion is unclear. This may be less of an obstacle than in the past, given the extent of Ofwat guidance and the direction given in recent legal judgements. However, some NAVs still consider requirements for expert surveys as an unnecessary and delaying burden on sites where the development is clearly new.
- NAV application process may be too long and requirements too restrictive.

[3] This refers to the fact that since privatisation, the regulatory capital values of water incumbent operators' assets have been at a significant discount to the current accounting value of these assets.

- The application process to obtain a NAV in itself does not appear to be problematic, particularly for larger development sites, but there may be a potential problem for smaller, more typical sites. The application of the financial viability and 'no worse off' assessments at a site level is a particular issue.
- There are delays to the NAV application process. The NAV application is susceptible to delay from a number of sources including Ofwat, the developers themselves, NAV applicants and incumbents and other regulators. Often this seems to be due to a lack of clarity about the requirements or, uncertainty from other regulators about the nature of a NAV.

Regulatory Barriers – EA policies and approach

Some NAVs felt that the EA's approach to abstraction licensing and discharge consents could be prohibitive to NAVs, particularly those that sought different solutions to water supply and waste water disposal from traditional ways. The EA told us that they were aware that within the Agency policy might not always be joined up, but said they were keen on innovative approaches and were receptive to engaging further with NAVs to understand their approach.

In our view, while it is not unreasonable that where innovative approaches are being proposed by a NAV the EA may wish to obtain greater reassurance, there did not seem to be an obvious mistrust of the competency of NAVs.

This barrier seemed ultimately therefore to arise from poor communication and understanding.

Strategic barriers: Information and service levels provided by incumbents

We find that there is the potential for strategic barriers in the NAV market deriving from the nature of the vertical relationship which gives rise to incentives for foreclosure.

The potential for a failure to conclude a bulk supply agreement, or to obtain from an incumbent timely point of connection information and connection and reinforcement cost information, is in our view a significant obstacle. It would be particularly concerning from a competition viewpoint if incumbents were not to provide quotes to known NAV bidders for 'non-contestable' services on an equivalent basis, compared to their quotes to developers directly on these non-contestable services when NAVs are not involved.

It appears that while the industry is starting to make efforts to improve its performance in this regard, the progress is patchy and has been slow to materialise. The new connection charges rules can be expected to have greater force, but these rules may not go far enough to ensure specific arrangements are put in place and behaviours are changed. Service levels related to bulk supply agreements have not been explicitly or substantively addressed as yet.

The scope for strategic barriers appears real and whilst progress is being made to address these issues, it may be that stronger measures may be required to accelerate action.

Intrinsic barriers

Some incumbent companies considered that because of potential economies of scale NAV entry was likely to be restricted to large sites. However, these incumbents provided no evidence to support the existence of economies of scale and NAVs denied this was the case. In particularly, we found that

- there is little evidence on economies of scale in terms of building the last-mile local infrastructure, given the extent of entry already seen by SLOs into the new connections market;
- economies of scale may be a factor in retail services, but NAV participants include players with retail activities in other sectors. Scale for operating local last-mile infrastructure may be a factor (e.g. due to fixed costs), but it is not clear that this on its own would constitute a significant barrier; and
- there may be an intrinsic efficient scale for a NAV to enter the water sector, due to business overhead considerations. We note that this should only affect how many new companies can enter the market, rather than what size of site can be efficiently operated by an individual NAV.

It is possible that over time, if the competition landscape in the NAV market improves, the number of sites being supplied by NAVs would grow faster than the number of NAV entrants.

Information barriers

A number of stakeholders cited a lack of awareness and understanding of NAV options amongst developers as a barrier to entry. This was borne out by the limited entry to date and acknowledged by the HBF.

Pricing issues

Barriers to entry arising from pricing arrangements and available margins have been cited by NAVs as key issues restricting and distorting entry.

Full NAVs – pricing issues and options

A full NAV would be economically efficient when the cost of building and operating the new site using the NAV's solution is lower than the incumbent's long run incremental cost (LRIC). Currently even when the above condition is met, a full NAV may still find itself unable to compete with the incumbent. In effect the NAV competes not against the LRIC of the incumbent but against its average cost, which embodies the RCV discount.

We identify this as a potential issue that might need to be addressed. A potential solution for this issue could be in the form of a compensation payment from the incumbent to the 'full NAV' to reflect the avoided LRIC. When implemented appropriately, the incumbent should be indifferent between paying the compensation payment or carrying out the work itself, and work would end up being taken up by the most efficient party. A similar arrangement has been

proposed in the discussions about access pricing in the water 2020 regulatory framework for wholesale markets for PR19.

Another issue related to the full-NAV model is the potential positive externalities a full NAV can impart on the incumbent's upstream network by using effective demand management. One option we have identified to at least partially internalise these externalities is for the incumbent to offer a non-peak tariff as the basis of the bulk supply price for the water services, which are typically only offered to those large industrial users without a peaky consumption pattern.

Bulk-supply NAVs: pricing issues

For NAVs that rely on a bulk supply from an incumbent undertaker ('bulk-supply NAVs'), vertical relationship issues arise. The margin for these NAVs derives from two prices, both set by the incumbent undertaker: the water/wastewater end customer price (a ceiling for NAV pricing through relative price regulation) and the bulk supply/discharge charge. This vertical relationship gives rise to incentives for foreclosure.

The NAV in this case competes with a vertically integrated incumbent for the building and running of the last-mile infrastructure. Our understanding of the current legislation on connections charging rules suggests that it would be possible for an incumbent to offer price discounts to developers on the non-contestable part of the work they carry out if the developer chooses the incumbent to carry out the contestable part of the work. Such discounts would then not be offered if the developer chooses a NAV to carry on the contestable work, therefore potentially distorting a level playing field.

We also find that often the bulk supply prices set by incumbents are unlikely to provide sufficient margin on relatively small sites, although there is evidence that on larger sites the margin may be sufficient. This may be due to the tariff structure and the existence of the RCV discount. We consider this to be potentially a contributor to the observed trend that current NAVs tend to operate on relatively larger sites.

Bulk-supply NAVs – options to address pricing issues

Ofwat's new charging rules on connection charges which come into effect in April 2018 have the potential to eliminate distortions and lack of clarity created by current legislation on new connections charging. The new charging rules require all non-contestable work to be charged by means of an 'infrastructure charge', and only the contestable work can be recovered from the 'requisition charge'. Therefore at the time of writing the charging rules imply that Incumbents' discounts to developers can only be set against the requisition charge. However, further consultation on new charging rules may be in place later, which could have an impact on which charges the discounts can be set against.

This implies that incumbents will no longer be able to leverage their quote in non-contestable work in order to disadvantage NAVs for competition for contestable work, which would improve the level playing field.

On the subject of the bulk supply price, we consider an alternative approach: the so-called wholesale-minus approach. There are other approaches (such as cost-plus) for addressing pricing issues, but in this study we focus on the wholesale-minus approach so as to examine specifically whether it is possible to develop a bulk-supply price that provides sufficient margin for NAVs. Due to the existence of the RCV discount in the water sector, the wholesale price does not necessarily reflect the modern equivalent asset value (MEAV) of the cost to provide the relevant service. This implies that a cost-reflective bulk supply price may not serve the purpose of facilitating efficient entry.

To set a wholesale-minus bulk supply price, the starting wholesale price could be the wholesale component of the incumbent's single residential customer bill (this could be the incumbent's standard business wholesale tariff). The cost of the last-mile wholesale service would then need to be deducted from this, which should include the operating and capital cost of the last-mile infrastructure.

The aim of this wholesale-minus bulk supply price would be to ensure that an equally efficient NAV would be able to recover its upfront investment (equivalent to the one that the incumbent would incur) from its margin in a similar way as the incumbent would.

Longer-term impact on the wider water sector

We highlighted three issues for investigation:

- whether NAVs enter the market by way of 'cherry picking' the cheaper to serve sites, leaving incumbents and their remaining customers with higher cost sites and therefore increasing average bills (de-averaging) over the longer term;
- the prospects for the NAV market in the context of retail market opening for business customers, and of possible future residential retail market opening; and
- the future role of NAVs in the context of upstream reform.

Impact of de-averaging

We have examined concerns that under current arrangements the conditions exist for existing customers in the water sector to be worse off due to NAV entries. This could be due to cherry-picking of lower cost to serve sites by NAVs, leaving the costly sites to the incumbents dragging up the average cost to serve for the industry. In addition, new sites are likely to be cheaper to maintain than old infrastructure, so the loss of new sites to NAVs may also serve to raise the average cost to serve of the remaining non-NAV customers.

We find that with Ofwat's new charging rules, treating the cost of non-contestable work in the infrastructure charge, any cost variations in non-contestable work are borne by the developers and therefore cannot cause any de-averaging if NAVs take up more sites.

We also found little evidence to suggest the existence (or otherwise) of a significant degree of cost variation for building onsite contestable work for

connecting new properties or to serve different new sites. However, even if onsite cost variation was an issue, a potential mitigating method is to allow/encourage the incumbent to provide tiered bulk supply charges, based on the cost of the site.

Finally, on the matter that newer sites may be cheaper to maintain than incumbents' old sites, we find this not to be an issue with the suggested wholesale-minus bulk supply pricing policy. This is because the standard wholesale charges would include the average cost to serve the incumbent's existing sites and the 'minus' component would reflect the cost to serve the new sites, and to the extent that there is a differential between the two this would be fully accounted for in the bulk supply charge and paid back to the incumbent from the NAVs.

Impact of Retail Market Opening

With the opening of the retail market (business or residential customers) to competition, the definition of the market that NAVs operate in changes in that the relevant customers are not only the property developers but also the water/wastewater end users. We note two issues arise.

The first is a problem in setting the NAV wholesale tariff, given the current bulk supply charges NAVs need to pay the incumbents, which could expose the NAV to challenge of margin squeeze by other retailers. We find that this could be remedied through, for example, the use of a wholesale-minus bulk supply pricing policy from incumbents.

The second is a need to adapt the relative price regulation method for NAVs. When regulated default retail tariffs disappear, as the market takes hold, and all retailers are free to set their retail tariffs to compete with one another, it is unclear how the 'no worse off' principle should be applied. One option would be to recalibrate the relative price control to the NAV's wholesale charge and allow them to set their own retail charges like other licensed retailers. However, there may be legislative challenges for the implementation of this option.

In any event, a competitive retail market would require NAVs to open their retail business to competition, which may mean a transition to new business models for the NAVs to something similar to those currently observed in the energy sector (IDNOs and IGTs).

Impact of upstream reform

Upstream reform which introduces competition for water resources and sludge treatment could bring changes to the current NAV operating model. This can be related to the way the NAV is charged by the incumbent for upstream services and/or the way NAVs charge their own downstream operation for upstream services.

Upstream competition would bring alternatives to the upstream service provided by the incumbent, which would imply that NAVs may no longer have to rely on a bulk supply from an incumbent undertaking. Instead NAVs would interact with incumbents via access prices for the particular elements of the service they

require. They would also need to offer access prices to others, e.g. retailers for their own local networks.

The change from bulk supply pricing rules to an access charge rule will need to be in line with Ofwat's policy on how to transition the current wholesale tariff from incumbents to an access charge for their regulated 'network-plus' part of the business. This is still in the early stages of development and further consideration is outside the scope of this study.

Options for reform

In this study we have proposed a number of options to reform the current NAV market. They can be categorised as follows:

- streamlining the Ofwat application process (potentially including longer-term legislative changes);
- facilitating an effective and enforceable code of practice for incumbents (potentially including licence modifications regarding incumbent behaviour);
- removing distortion caused by the legislative requirement for developer discounts in connections charges (largely achieved by the new connections charging rules);
- setting an appropriate framework for bulk supply pricing; and
- adjusting the price control mechanism at PR19 to address issues on value leakage and competition incentives.

The different options set out in the study may present different levels of regulatory formality, complexity in development and design, resourcing required (by Ofwat and/or market participants) and potential for unintended consequences. They could also have different expectations of impact on levels of efficient entry and the extent and distribution of benefits, including innovation.

The timing of introducing different options could also be an important consideration as some options may naturally work as a follow on measure after other options having been successfully implemented.

Behavioural and process remedies (with the exception of legislative changes and licence modifications) could be seen as lower risk measures that could be introduced early in any phased programme of market improvement.

Without pricing remedies, significant barriers to entry could nevertheless remain. Such remedies might also need more detailed assessment in terms of data and modelling. Proposals to address the revenue cap mechanism would depend on how significant the identified 'value transfer' problem is expected to be, in light of any steps eventually chosen to improve the market. In terms of timing, one approach would be to first see the effect of other competition-enhancing options on NAV entry before addressing the value transfer issue.

1 INTRODUCTION

In December 2016, Ofwat commissioned Frontier Economics to conduct a study to examine the functioning of the New Appointment and Variations (NAV) market.

The provision for NAVs to be appointed was introduced by amendments made to the Water Industry Act 1991 in the 1990s (NAVs were then known as 'inset appointments'), and has evolved in the past two decades.

NAVs represent a form of competition that is 'for the market', i.e. replacing the incumbent operator on a site-specific basis within its area of undertaking. A NAV may be appointed to provide water and/or wastewater services. It may use its own supplies or a bulk supply from the incumbent (bulk supply based NAVs are almost always the case for water and typical for wastewater). A NAV may be appointed only in particular circumstances: for new developments where there is, at the time of appointment, no public supply, sites where there is a very large user or sites where the incumbent undertaker consents to a NAV taking over supply.

Following some increase in the number of NAV sites in recent years, 68 NAV sites have been approved by Ofwat to date. Most of these sites represent new residential and mixed use developments. These are operated by 8 NAV undertakers, serving approximately 60,000 residential customers and 700 business customers in England and Wales.

Ofwat has pointed out[4] that the customers of NAVs have experienced benefits such as price discounts and enhanced service levels, and some new appointees have brought innovative solutions that deliver environmental benefits. Ofwat has also referred to the threat of a competitor entering the market having challenged existing appointees to 'raise their game'.

However, Ofwat has also received complaints from existing and would-be NAVs about the NAV application process, the duration and requirements of which are seen to inhibit effective competition by NAVs. Concerns have also been expressed to Ofwat regarding the pricing policies and alleged poor service by some incumbents in providing information and quotations. This behaviour has been seen as obstructive to competition. There have also been suggestions that the opportunity of choice of water and/or wastewater supplier through a NAV may not be well known or understood by developers, limiting demand. Developers have also had alternative options for the provision of some of the services provided by NAVs, for instance they can employ SLOs to lay the infrastructure on their sites and/or to provide new connections to the incumbent's network. The SLO market has seen significant growth.

The objectives of this study are to examine the NAV market today and to:

- identify the extent to which any factors currently act to prevent, distort or restrict effective competition; and
- set out options to address any such issues.

[4] Ofwat, New appointments and variations – statement of our policy, April 2015.

The results of this study are expected to assist Ofwat in considering if it wishes to propose actions to improve the way the NAV market functions. It would also provide relevant context for Ofwat to consider the future role the NAV market may be expected to play, within the framework of Ofwat's Water 2020 strategy and the Government's recent legislation and ongoing policy towards the water sector, such as the potential for competition for residential retail customers to be introduced. As such it would help Ofwat to ensure any actions it proposes are considered in the round and future-proofed. This would minimise the scope for unintended consequences and help Ofwat manage any relevant interdependencies in its regulatory approach.

Frontier Economics has associated with Addleshaw Goddard, a leading law firm, in order for our study to provide a combination of economics and law, when considering the examination of competitiveness of the market and the feasibility of suggested remedies to address relevant issues.

The foundation of our approach is a traditional competition analysis framework. We have built on this foundation by paying special attention to broader sector policies, legislation and regulation. Our study draws on published data and information, internal data from Ofwat and extensive stakeholder engagement.

All disclosures from stakeholders were done on a voluntary basis, and due to the limitation on the time, resource and legal context of the study, our analysis is predominantly qualitative and indicative. Our findings therefore should not be interpreted as equivalent to findings resulting from, for example, a formal market study under the powers of the Enterprise Act 2002.

The remainder of this report is structured as follows:

- Section 2 introduces our approach to the study;
- Section 3 provides an overview of the current state of the NAV market, including the legal framework, the size of the market, and the benefits that can be achieved by a well-functioning NAV market;
- Section 4 summarises the issues we have identified from our stakeholder engagement programme;
- Section 5 begins our competition assessment with consideration of the appropriate market definition;
- Section 6 discusses in detail the issues we have identified related to non-pricing barriers to entry;
- Section 7 analyses the pricing issues between NAVs and incumbents in order to address the issues related to efficient entry;
- Section 8 puts the NAV market into the wider context of the water sector as a whole and considers the interactions between a well-functioning NAV market and the longer-term regulatory and market reforms the Government and Ofwat are currently considering to introduce into the water sector; and
- Section 9 assesses in more detail the options for reform identified in section 6 and 7 and provides an overall summary of the potential steps Ofwat could take going forward regarding the NAV market.

2 OUR APPROACH

This section outlines our approach to this study, describing the analytical framework employed and the stakeholder engagement programme.

The foundation of our approach is a traditional competition analysis framework, taking account of the context of sector policies, legislation and regulation. As such we take a similar approach to that adopted by the Competition and Markets Authority (CMA) when undertaking a market study or market investigation. Our study draws on published data and information, internal data from Ofwat and extensive stakeholder engagement.

While we have conducted an extensive stakeholder engagement programme, our study is done on the basis of voluntary information disclosure. We did not have the investigative powers to require compulsory information disclosure, and it was not the intention of the study to undertake detailed quantitative analysis of the different elements of competition in the market. The analysis and options presented in the study reflect the data and evidence that is available and our assessment of the competitive and regulatory features of the market.

2.1 Analytical framework

2.1.1 Competition framework

In this report we adopt a standard analytical framework that forms the basis for the assessment of markets by competition authorities. The CMA describes a market study as "*examinations into the causes of why particular markets may not be working well, taking an overview of regulatory and other economic drivers and patterns of consumer and business behaviour*."[5]

This framework involves a three step process:

- Step 1: Define the relevant market – this step identifies the appropriate frame of reference within which competition occurs for the services under consideration.
- Step 2: Identify features of the market that have the potential to have an adverse effect on competition – these are aspects of the market (such as structural features of the market, or market behaviours by suppliers) that have the potential to prevent, restrict or distort effective competition.
- Step 3: Identify potential remedial steps that could be taken in order remove any identified adverse effects on competition and improve the functioning of the market for consumers.

This framework closely follows that set out by the CMA in its market investigation guidelines, which describe this framework in greater detail.[6] As stated above, our assessment of the NAV market in this report is not as detailed or extensive as a

[5] Market Studies and Market Investigations: Supplemental guidance on the CMA's approach (CMA3).

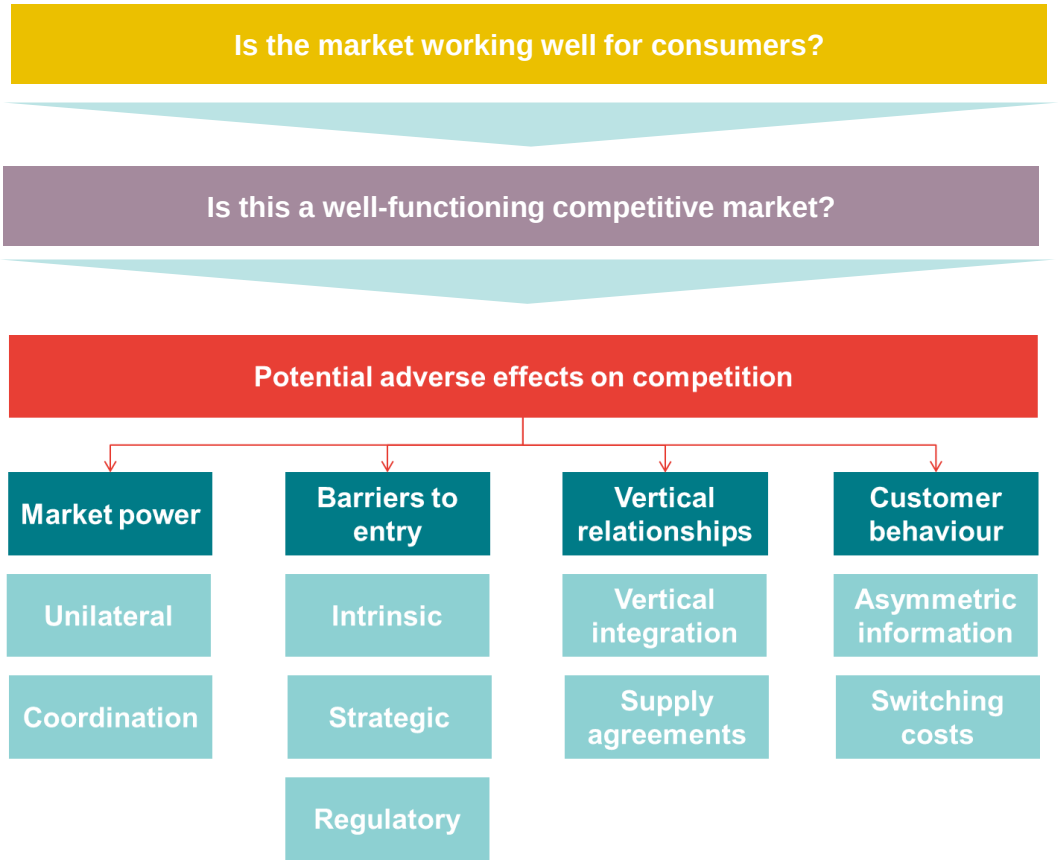
[6] See Guidelines for market investigations: Their role, procedures, assessment and remedies, April 2013 (CC3).

market study under the Enterprise Act or a market investigation of the type carried out by the CMA. A market investigation, for example, can take the CMA up to two years and involve extensive primary data collection, and in depth economic and factual analysis.

Nonetheless, the framework developed by the CMA for these detailed investigations remains a useful analytical tool even when conducting a shorter and less detailed assessment of the market.

As noted above, the principal objective of this framework is to understand whether the market is functioning well for consumers and, if not, to understand what features of the market have an adverse effect on competition.

Figure 1 Identifying adverse effects on competition



Source: Frontier Economics, for illustrative purposes only

As Figure 1 illustrates, there are a number of different types of causes of adverse effects on competition which are typically identified by competition authorities. These fall into four high level categories:

- **Market power**: if one or more firms are able to operate without facing an effective competitive constraint, this can lead to worse outcomes for consumers.
- **Barriers to entry**: barriers to entry prevent new firms from serving the market and expanding in response to demand for their services. This can lead to a lack of competition, or prevent new and innovative solutions from serving the market. Barriers to entry can take a number of different forms, and can include barriers brought about by market regulation.

- **Vertical relationships**: where competitors depend on their rivals for a key input or key route to market, those relationships have the potential to restrict effective competition – particularly in circumstances where rivals do not have access to the services they need on competitive terms.
- **Customer behaviour**: in some circumstances customers may not have the information they need, or face other barriers, meaning that they cannot discipline the market effectively.

In this report we consider the extent to which any of these features might apply to the NAV market. Based on the evidence we have gathered, we focus in particular on the potential for (i) barriers to entry and (ii) vertical relationships to result in adverse effect on competition in this market.

2.1.2 Longer-term impact on the wider water sector

The competition framework provides sound principles to assess options to improve competition in the NAV market. At the same time, the NAV market operates in a wider regulated monopolistic environment, and therefore options considered to improve entry into the market need to be assessed against potential implications on the wider water market, including elements such as:

- Any potential value transfers and redistributions;
- Any interaction and interdependencies with the current regulatory regime, such as with the revenue cap and incentive mechanisms within the sector's price controls;
- Any potential longer term effect on the cost of providing water and wastewater services; and
- Whether the current arrangement in the NAV market, and any suggested options to improve the market, will be future proofed against potential reforms in different parts of the value chain of the water sector such as retail market competition and upstream resource and bioresources reform.

2.2 Stakeholder engagement

Our extensive stakeholder engagement programme consisted of three main stages:

- Interviewing of a cross-section of stakeholders;
- Opportunities to respond to a questionnaire, aimed to reach out to a wider audience; and
- A round-table workshop to facilitate group discussions and Q&As on the topic of the NAV market.

During the first stage, we interviewed three NAV appointees, five incumbent water companies, two government agencies and regulators, two developers and developer bodies, a customer body and one trade association. Some of these interviews were face-to-face, and others were conducted over the telephone.

Interviews were followed by a questionnaire, sent to a wider list of stakeholders provided by Ofwat including NAVs, incumbent water companies, regulators and developers. We received thirteen responses to the questionnaire.

Finally, we hosted a four-hour workshop that provided further opportunities for interested stakeholders to attend and share with us their views on the NAV market. The workshop was attended by around 30 participants, representing around 20 organisations, including NAVs, incumbents, regulators, developers, customer bodies and trade associations.

Annex C provides an overview of all the stakeholders we have succeeded in gathering views from, as a result of our engagement programme.

2.3 Case studies

In addition to reviewing documentation provided by Ofwat and engaging with relevant stakeholders, we have conducted case studies from the electricity and gas sectors, regarding the new connections services (similar to the activities carried out by NAVs in the water sector).

Comparisons to these sectors, where relevant, are made in the main text of this report and the case studies are also summarised separately in Annex B.

3 WHAT IS THE NAV MARKET

3.1 Legal framework that governs the market

3.1.1 Introduction

This sub-section of the study summarises the legal framework that applies to the NAV regime in England and Wales[7] and also considers how that has been applied since its introduction, including as set out in Ofwat's published policies.[8]

In particular this sub-section reviews:

- The criteria that must be met in order to become a NAV;
- The powers and obligations that are exercised by a NAV and which are therefore relevant as Ofwat assesses a potential NAV's ability to exercise its statutory obligations;
- The application process; and
- The mechanisms available to resolve disputes, in particular in relation to access terms to the incumbent's infrastructure.

3.1.2 Eligibility to be a NAV

Under section 7(4) of the Water Industry Act 1991 (**WIA91**), Ofwat can appoint a new water only, wastewater only, or water and wastewater company in the place of an existing appointee. Ofwat may only grant a new appointment or variation (i.e. vary the geographical where an appointee has responsibility) to replace a relevant undertaker (incumbent) where:

- The existing appointed company agrees to transfer part (or all) of its area of appointment to a different company (a transfer by 'consent');
- The area is 'unserved' (it does not contain any premises that is served by an appointed water and/or wastewater company); or
- The appointment or variation only relates to an area where each of the premises are (or are likely to be) supplied with at least 50 megalitres of water a year (in England) or 250 megalitres of water a year (in Wales) and the relevant customer wants to change its supplier (a 'large user').[9]

In practice, the statutory provisions setting out the eligibility criteria have proved to be unclear in some respects.

Most notably, the correct interpretation of the 'unserved' and 'large user' criteria was the subject of litigation brought by Thames Water Utilities Limited (**TWUL**). This was in response to a decision by Ofwat granting a variation by which

[7] While the NAV regime applies in both England and Wales, the Welsh government may have different views to England from a policy perspective. There is no equivalent to the NAV regime in Scotland.

[8] Initially published in 1999, updated in January 2009, and then replaced by Ofwat's "*New appointments and variations – a statement of our policy*" and "*New appointments and variations – a statement of our process*".

[9] See also page 6 of Ofwat's "*New appointments and variations – a statement of our policy*". Previously, the thresholds were set at 100 megalitres for England / 250 megalitres for Wales, and prior to that 250 megalitres for both England and Wales.

Independent Water Networks Limited (**IWNL**) replaced TWUL as the statutory water and wastewater undertaker at a site at King's Cross.[10] The variation was granted on the basis that both the 'unserved criterion' and the 'large user criterion' were met.

TWUL challenged Ofwat's interpretation of these criteria, arguing that the fact that TWUL had historically supplied the site meant that it was not 'unserved', and drawing a distinction between brownfield sites where the incumbent undertaker had invested in infrastructure (notwithstanding later disconnection) and greenfield sites that have never been served. In addition, for the purposes of the large user criterion, TWUL argued that the reference to 'premises' should be read as meaning individual buildings, not an entire site.

The High Court and then the Court of Appeal ruled in favour of Ofwat's decision. In relation to the two criteria in question, the Court of Appeal held that:

- "The unserved criterion is … met when the premises in question are not in substance served by the sitting undertaker, and it will be for Ofwat to judge whether in any given circumstances the test is satisfied";[11] and
- In relation to the large user criterion "Ofwat were entitled to determine that the premises for the purposes of section 7(4)(bb) and (5) was the application site, and not the buildings which were to be erected on it" i.e. that in this case, Ofwat was entitled to find that the whole development site constituted a single premises.[12]

The Courts' decisions provided clarification on the ambiguities in the statutory language and confirmed Ofwat's approach as correct. It also confirmed that application of the tests is, to a degree, a question of judgment for Ofwat in the circumstances of each case. Ofwat's published policies provide extensive guidance to applicants on how it applies the criteria.

3.1.3 Powers and obligations of a NAV

Under section 7(3) of the WIA91, an appointee under the NAV regime replaces the existing relevant undertaker in relation to some or all of the undertaker's area. The NAV appointee is therefore a water and/or wastewater undertaker in its own right, with the corresponding duties and obligations relating to all the services provided at the site, including, where relevant, duties to provide new infrastructure and to maintain supply that go beyond the duties associated with purely retail services provided by a water and wastewater supply licensee, for example.

Consequently, as a core part of the application process, Ofwat assesses the applicant's ability to meet those statutory obligations, notably including the applicant's financial viability.[13]

[10] *The Queen on the Application of Thames Water Utilities Limited and Water Services Regulation Authority and Anr* [2012] EWCA Civ 218.

[11] Paragraph 20, ibid.

[12] Paragraph 31, ibid.

[13] Under section 2(2A)(c) of the WIA91 and Principle 4 of Ofwat's policy.

Further, under Ofwat's Policy Principle 3 set out in its "*New appointments and variations – a statement of our policy*", when making a new appointment Ofwat will consider the effect of the appointment on all customers (both those that would be subject to the NAV and those remaining with the incumbent undertaker) to ensure they are no worse off.[14] Specifically, Ofwat will consider the following.

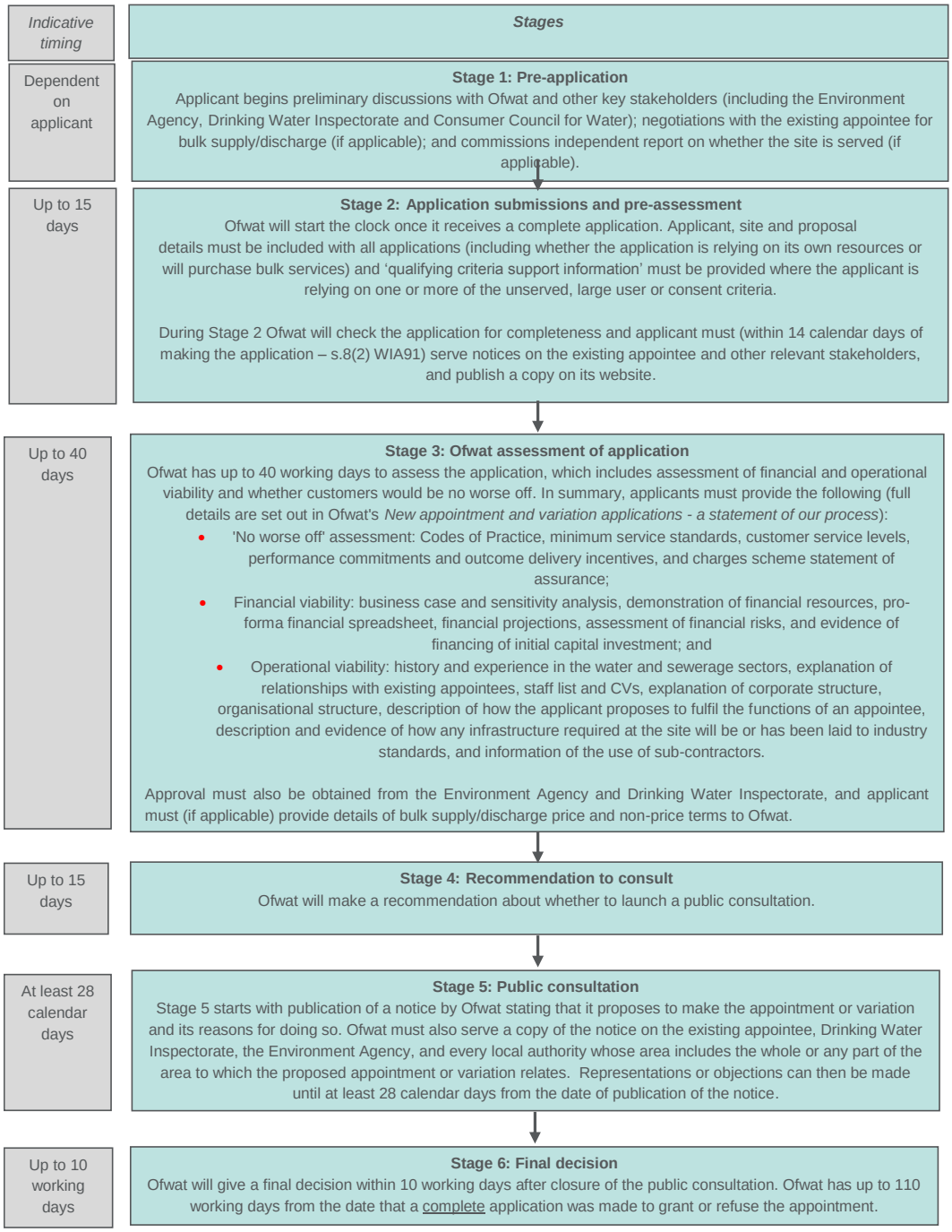
- In relation to customers on the site, Ofwat will protect their interests on an ongoing basis by ensuring that they will be at least 'no worse off' by being supplied by the new appointee rather than the existing appointee.
- In relation to price, Ofwat will compare the existing appointee's charges scheme with the applicant's proposed charges scheme to ensure that customers on the site will not pay a higher price for water and wastewater services than they would have done had they been supplied by the existing appointee.
- In relation to service, as part of the application process, the applicant must show that it will offer service levels that are at least comparable to the previous appointee's services. The application process therefore includes a comparison of service levels proposed by the applicant with that offered by the existing appointee, including outcome and delivery incentives (ODI) performance.
- While the new appointees' customers should benefit from prices and levels of service that are at least comparable to those that they would have received from the existing appointee, new appointees are not required to duplicate all services offered by the existing appointee and a better standard of service for a higher price is not inconsistent with the 'no worse off' principle. However, a new appointee is not required to improve on the price or service offer of the existing appointee.
- Ofwat will also consider the potential effect on customers remaining with the incumbent undertaker - including the impact the appointment may have on their prices.

3.1.4 The application process

Section 8 of the WIA91 sets out the procedure for an application for a NAV. Further detail is provided in Ofwat's "*New appointments and variations – a statement of our policy*", and the core stages of the application process are set out in Figure 2 below. The timetable set out is an indicative, administrative timetable.

[14] See page 22 of Ofwat's "*New appointments and variations – a statement of our policy*" and page 22 of Ofwat's "*New appointments and variations applications process*". The consistency of Ofwat's policy approach with its general duties to protect the interests of consumers under s2 WIA91 was tested and confirmed by the Administrative Court in *R (on the application of Welsh Water Limited) v Ofwat* [2009] EWHC 3493 (Admin).

Figure 2 NAV Application process



Source: Ofwat

Ofwat aims to reach a decision on whether or not to grant an application in at least 80% of all applications within the total 110 working day timescale.[15] However, Ofwat may stop the clock in certain circumstances, where Ofwat's ability to progress the application is hindered by factors outside its control or outside the scope of the application, or where progress depends on the applicant taking certain action.[16]

3.1.5 Access terms and resolution of disputes

Bulk supply agreements

The applicant will typically rely on access to services from the existing supplier e.g. for the bulk supply of water or bulk discharges.

Access to and the price of these services is critical to the viability of entry by the applicant. In certain circumstances, Ofwat has the power to determine the price and contracted terms of a bulk supply or discharge agreement where the applicant and existing supplier cannot reach an agreement.[17]

In the context of an application for judicial review brought by Albion Water, the High Court considered the factors that Ofwat should take account of in its formal determination of the terms of a bulk supply agreement under section 40A of the WIA91.[18]

Most notably, the court held that under section 40A(7) of the WIA91, Ofwat is required to have regard to the expenses incurred by the supplier in complying with its obligations under the bulk supply agreement i.e. the specific costs of the supply. However, Ofwat must still have regard to the statutory requirements when determining whether, and if so, what weight, it should attach to such considerations. The High Court did not provide further guidance on how Ofwat should have regard to expenses and in fact, confirmed that it will be for Ofwat to select the appropriate methodology.

The court found that Ofwat can exercise a reasonable amount of discretion:

- Where there is more than one approach, it is for Ofwat to choose the appropriate methodology and then gather the information and evidence relevant to that methodology;
- Ofwat will not be acting unreasonably where it accepts figures from the parties; it is not under a duty to audit the parties' accounts; and
- In the context of imposing a depreciation charge, gathering information to support an infrastructure renewal charge, imposing a return on capital and imposing indexation, the High Court confirmed that the choice of approach is a matter for Ofwat's professional judgment. Ofwat's approach therefore can only be challenged on the basis that it is unlawful or irregular, such that there

[15] See p10 of "*New appointment and variation applications - a statement of our process*".

[16] See p11 of "*New appointment and variation applications - a statement of our process*".

[17] Sections 40, 40A 110A and 110B WIA91.

[18] *Albion Water Ltd, R (on the application of) v Water Services Regulation Authority* [2012] EWHC 2259 (admin).

is evidence to conclude that Ofwat's approach was so unreasonable that it would lead it to a perverse conclusion.

Ofwat has since published its "*Bulk supply pricing – a statement of our policy principles*" which sets out the principles it will use when making determinations on, for example, bulk supply agreements under sections 40 and 40A WIA91. Section 40 empowers Ofwat to order the incumbent supplier to provide a bulk supply to an applicant, and section 40A empowers Ofwat to order a variation or termination to a bulk supply agreement (where the parties cannot reach an agreement).[19]

Ofwat subsequently published a three-step framework (as distinct from its policy principles) which it used for resolving bulk pricing disputes in the Priors Hall determination in February 2014.[20] Ofwat will firstly review the price being disputed as a starting point for its investigation. Where Ofwat's testing shows that this approach would cause material adverse effects, Ofwat will instead use its three-step framework. This framework considers whether the price in dispute:

- Is appropriate given the geographic nature of supply – the test applied by Ofwat determines whether a bulk supply price based on local costs would be more appropriate than those based on average accounting costs (Test 1);
- Would give rise to competition concerns (Test 2); or
- Would give rise to efficiency concerns (Test 3).

Ofwat must apply this framework in a way that is consistent with its obligations under sections 40, 40A, 110A and 110B of the WIA91, under which Ofwat must have regard to the desirability of:

- Facilitating effective competition within the water and sewerage industries (s40, s40A, s110A and s110B);
- The existing undertaker's or supplier's recovering the expenses of complying with their obligations by virtue of sections 40, 40A, 110A and 110B of the WIA91 (as applicable) and securing a reasonable return on their capital;
- The existing undertaker's or supplier's being able to meet their existing obligations, and likely future obligations, to supply water and/or to provide sewerage services without having to incur unreasonable expenditure in carrying out works;
- The expenses incurred by the existing undertaker in carrying out its obligations under a bulk supply agreement, including a reasonable return on capital; and
- Not putting at risk the ability of the existing undertaker or the supplier to meet their existing obligations, or likely future obligations, to supply water or provide sewerage services.

In the *Priors Hall* determination, Ofwat had regard to the first two points above in its consideration of Test 2 (competition concerns).[21] This was on the basis that Ofwat could choose to deviate from the large user tariff (LUT) if it had reason to

[19] While there are similar determination powers for sewerage services under s110A of WIA91, these have been less used and there is no current policy guidance on bulk supply pricing for such services.

[20] See http://www.ofwat.gov.uk/wp-content/uploads/2015/10/det_s40as110a140213anhiwnpriors.pdf.

[21] Paragraph 4.29.

think that using the LUT would raise material competition concerns, notwithstanding Ofwat's assessment of the geographic nature of supply which indicated that there was no reason to do so. To mitigate the risk of setting a bulk supply price that could result in a margin squeeze, Ofwat therefore checked that in the context of that case the LUT for the bulk supply of both water and sewerage services was at a level which retained a sufficient margin for an equally efficient operator.

An issue for applicants and incumbents has been to judge when Ofwat may be willing and able to get involved. A determination under sections 40, 40A or 110 of the WIA91 is only possible where a bulk supply agreement cannot be achieved by agreement between the parties, but one challenge is determining the point at which Ofwat can conclude they have failed to agree. Ofwat's practice is to ask for evidence of attempts to negotiate an agreement and for confirmation from both sides that there has been a failure to agree – but parties may have different views as to the scope for further negotiation. Further, Ofwat can only make a determination where it concludes that a supply is necessary or expedient for an efficient use of resources or supply (although Ofwat may otherwise informally encourage parties to engage in discussions and resolve disputes without use of its formal determination powers). Finally, under the WIA91 Ofwat has powers rather than an obligation to intervene.

The experience to date has been that such determinations are resource intensive and long-running.

Competition Act 1998 (**CA98**)

The Chapter II prohibition of CA98 prohibits a dominant company from abusing its dominant position, something which effectively includes imposition a margin squeeze or discriminatory pricing on its customers.[22] In the context of the NAV regime, incumbent water undertakers will normally be dominant, therefore the Chapter II prohibition gives Ofwat additional tools to address certain kinds of access issues through the use of its competition enforcement powers. The following paragraphs consider cases where Ofwat has previously used these powers.

For example, Ofwat has previously investigated whether the price offered by the existing supplier to a potential NAV for the upstream supply of water and sewerage services could amount to unlawful margin squeeze (i.e. an abuse of the existing supplier's dominant position under Chapter II CA98).[23]

In the *Fairfield* case, Anglian Water submitted bids to Redlawn, a developer, as part of a competitive bidding process for water and sewerage services. Ofwat considered whether the price for upstream water and sewerage services that Anglian Water offered to IWNL (a rival bidder) could amount to a margin squeeze.

[22] These obligations are in addition to, and separate from, Licence Condition E which prohibits undue preference to, or undue discrimination against, any class of customer or potential customer for standard charges.

[23] See Fairfield Competition Act 1998 investigation decision summary.

Anglian Water, as the appointed water and sewerage provider for the relevant region, was found to be dominant upstream for the supply of both water and sewerage services. Ofwat carried out separate margin squeeze assessments for water and sewerage services and considered whether an equally efficient operator would not have been able to trade profitably (taking into account both costs and revenues) when faced with a dominant undertaking's conduct and pricing.

In the event, on the facts of the *Fairfield* case (that Redlawn would have been reluctant to appoint separate suppliers for water and sewerage services) Ofwat ultimately did not find sufficient evidence that there had been a margin squeeze in respect of water services alone or water and sewerage services taken together and there was insufficient evidence that a margin squeeze on one service alone would cause sufficient actual or potential adverse effects to justify a finding of abuse. This does not preclude Ofwat considering in future whether any margin squeeze implemented in respect of one service might generate anti-competitive effects where there is evidence the developer may be prepared to buy water and sewerage services separately.

It is also worth noting that by contrast with a determination, consideration under the Competition Act 1998 is not well suited to Ofwat giving an answer of what the price should be. Ofwat has therefore in the past used both sets of powers in relation to disputes concerning the same site. In particular, the *Albion* case began as a margin squeeze case in the Competition Appeal Tribunal (relating to common carriage services provided to a NAV), but ultimately Ofwat still proceeded to make a determination under section 40A of the WIA91 in relation to the bulk supply agreement between the parties for the same site (albeit that the form of service proposed was different in each scenario).[24]

From the perspective of NAVs, the time and resource involved in formal access disputes of whatever form mean that they do not provide resolution of an issue in a commercial time frame for any individual supply, although they are important in establishing principles and, where necessary, sanctioning abusive behaviour.

3.2 Relevant market participants

After having established the legal framework of NAVs, we next turn to look at the incentives of the other market participants that operate in the market and their relationships with the NAVs. The relevant market participants are:

- the incumbents;
- property developers;
- SLOs; and
- water/wastewater customers.

When a site is developed by a property developer and needs to be connected to water/wastewater services, the connection services can be provided by three different parties: the incumbent, an SLO or a NAV. In the first two cases, the

[24] Final Determination of the Terms and Conditions of the Bulk Supply of Water from Dŵr Cymru Cyfyngedig to Albion Water Limited for the onward supply to UPN Shotton Paper Mill under section 40A of the Water Industry Act 1991 (as amended), which was later challenged by way of judicial review.

incumbent maintains the end customers of the water/wastewater services (as the SLO only provides the physical connections before transferring the relevant assets back to the incumbent to operate). In the latter case, however, the NAV would serve the end customers of water/wastewater services.

There are two models with which a NAV can provide water/wastewater services, either by providing the entire relevant wholesale service from scratch therefore entirely independent of the regional incumbent's upstream services, or providing only the 'last-mile' infrastructure but relying on the incumbent's upstream services by paying a bulk supply price for treated water to be distributed to the boundary of the development site or paying a bulk discharge price for untreated wastewater to be discharged into the incumbent's wastewater networks.

The property developer chooses which of three competing types of providers to make the connections to its new development. The end water/wastewater customers do not have a choice in this regards, nor do they have a say in the level of the end user tariffs which are subject to Ofwat's full price control in the case of the incumbent or an SLO providing the connections, and relative price control in the case of a NAV.

An exception to the above is when a NAV serves a large industrial user where there is no involvement of a property developer. In that case, the end customer of water/wastewater services directly chooses the provider of the new connections.

3.3 The NAV market today

In this section, we provide some descriptive statistics on the NAV market today. We cover the number of new appointees, current size of the market, types of NAV models, and the potential size of the market.

We consider the following two dimensions of the size of the market:

- the number of end-user customers that now take water and/or wastewater services from a NAV as opposed to from one of the original 17 incumbents; and
- the number of NAVs compared to the number of development sites with planning permission.

3.3.1 Current size of the market

The existing NAVs serve over 60,000 residential customers and 700 business customers, when all sites under current NAVs are fully developed.

The majority of water and/or wastewater customers served on NAV sites tend to belong to sites that were previously within the licensed area of one of just a few incumbents, as shown in Figure 3 below. The areas of Thames Water, Anglian Water and Southern Water account for over 60% of the residential customers served.

Figure 3 Number of NAVs and customers served by incumbent region

Existing appointee	Number of NAV sites	Residential customers	Business customers
Thames	22	25,724	467
Anglian	7	9,208	72
Southern	4	3,951	40
Thames (wastewater)	1	3,850	0
Portsmouth (water) / Southern (wastewater)	2	3,281	48
Bristol (water) / Wessex (wastewater)	2	2,337	0
Welsh	2	2,030	33
Southern (water) / Thames (wastewater)	1	1,900	0
Northumbrian (water) / Thames (wastewater)	2	1,741	0
Wessex	5	1,620	1
South Staffordshire	1	1,500	0
Severn Trent	6	1,468	3
Affinity (water) / Southern (wastewater)	1	1,050	0
Northumbrian	4	800	52
Severn Trent (water) / Anglian (wastewater)	1	629	0
Unities Utilities	1	378	0
Total	62	61,467	718

Source: Ofwat data, Frontier analysis

Note: Sites in Ofwat's archive without any customer number information are omitted in the figure, hence the total number of NAV sites is 62.

More specifically, most NAVs (by number of NAVs and number of customers served) tend to have focused on southern England. Some stakeholders have raised the question as to why this geographical difference exists.

One contributing factor could be that the regional distribution of new housing development has tended to skew towards southern England compared to other regions in the country and housing developments tend to be larger in the south. Figure 4 below shows the number of properties with planning permission in different regions in the past years, according to the Home Builders Federation (HBF), the national trade association representing the body of UK House Builders.[25] HBF told us that its members are responsible for providing around 80% of all new housing in the UK.

[25] HBF New housing pipeline Q3 2016 report.

Figure 4 Properties with planning permission in different regions[26]

	North of England	Midlands	Southern England	Wales
2009	34,644	24,584	102,976	6,272
2010	42,696	29,613	106,608	6,749
2011	40,188	29,283	106,738	9,235
2012	48,947	26,369	119,984	6,457
2013	53,500	41,117	122,871	7,821
2014	58,241	42,120	138,949	9,690
2015	66,842	48,792	145,144	8,270
2016*	59,213	33,484	118,951	5,785

Source: Home Builders Federation data, Frontier analysis

Note:2016 figures only include the first three quarters.*

This data shows that the majority of new housing development in the country does fall in southern England. This is likely to be part of the explanation.

Another contributing factor could be in relation to incumbent's pricing policy to NAVs, and in particular the bulk supply price. We discuss this in much more detail later in this report in section 7.3.

3.3.2 Size of entry by origination of the NAV

We consider the different types of origination of NAV entry. There are in general three sources that a NAV can originate from:

- New (incumbent) appointees: a new appointment that is an offshoot of an existing incumbent, e.g. Severn Trent Services;
- New (non-incumbent) appointees: a completely new appointment – the new entrants, e.g. Albion Water and SSE; or
- Incumbent appointees: where a site is served by an incumbent with a variation to its licence, e.g. Thames Water serving a site in Wessex Water's area or Anglian Water serving an area in Severn Trent Water's domain.

According to evidence collected by Ofwat, the size of NAV entry by types is summarised in Figure 5 below.

[26] Regions are as defined in the HBF's report. North of England includes North East, North West, and Yorkshire & the Humber. Midlands includes East Midlands and West Midlands. Southern England includes East of England, London, South East and South West.

Figure 5 NAV entry by types

	New (incumbent) appointee	New (non-incumbent appointee)	Incumbent appointee
Number of NAVs	1	7	7
Number of sites served	1	51	16
Number of residential customers served	3,850	55,102	2.515
Number of business customers served		662	56

Source: Ofwat

The evidence collected by Ofwat shows that the new entrant companies (i.e. new non-incumbent appointees) are: Albion Water, Albion Eco (in Wales), SSE Water, Independent Water Networks Limited (part of the BUUK group), Peel Water Networks, Veolia Water Projects, and Icosa Water. Of these, SSE, IWNL are multi-utility companies, offering energy, telecom, broadband and heating services. Additionally there is a new appointee set up by an incumbent: Severn Trent Services (Severn Trent Water).

The statistics presented above show that new non-incumbent appointee participation is by far the highest, both by number of sites served as well as residential customers.

3.3.3 Size of entry by eligibility criterion

Of the 68 current NAV sites, 54 were granted following the 'unserved' criterion, 4 were large user sites, 9 fell into the 'by consent' criterion and 1 was both unserved as well as a large-user site.

Sites that fall under the 'unserved' criterion in general are the ones that involve a property developer as explained earlier. It is therefore this model of the NAV that our study will focus on. Unless stated otherwise, our analysis on market definition in section 5, barriers to entry in section 6 and pricing issues in section 7 all refer predominantly to this type of NAV.

3.3.4 Potential size of the NAV market

NAVs and developers have expressed the view that the current number of NAVs is far from having reached its potential size.

IWNL, for example, told us that less than 2% of the total new development opportunities available in the three-year period from 2012 to 2014 have been secured by NAVs. Our own estimate is comparable. We find that between 2011 and 2016 about 2.7% of new developments were served by NAVs. This is based on a comparison of the data from HBF on the number of properties having acquired planning permission from 2011 - 2016 Q3 with the data from Ofwat on the number of residential properties that are served by NAV appointments granted within the same period. It is worth noting that this figure probably understates the share of NAVs in serving new developments, because:

- not all housing development with planning permission end up being built; and
- not all those that are ultimately built would have been eligible for a NAV to connect, due to the limitation imposed by the three criteria.

However, NAVs have argued that this provides a reasonable first estimate to understand the potential of the market.

Another proxy to understand how well the market has (or has not) developed is to look at the typical size of residential housing development, compared to the average size of NAV sites. HBF told us that the majority of housing developments are between 50-200 dwellings, while the average size of a NAV site is close to 1,000 residential units (60,000 residential units divided by 68 NAVs). Furthermore, only 8 out of the 68 sites served by NAVs have fewer than 200 residential customers. This evidence seems to suggest that NAVs are currently not operating on the majority of the housing development sites. As discussed in more detail in section 6 and 7, we have not identified convincing evidence on the intrinsic efficient scale for connecting a site so as to conclude that the current market penetration of NAVs would be due to the lack of efficient scale.

The electricity and gas connections markets have reportedly been working better in enabling entry to the last-mile infrastructure. Ofgem has discontinued its annual connections industry review since 2010/11. However, in its 2010/2011 review, it reported the market share of new entrants in the gas and electricity connections markets were 53% and 18.2%, respectively.[27]

Therefore, there are reasons to believe that there is significant potential market for the NAVs.

3.3.5 Types of NAV model

We have described how NAVs may be set up to serve a new site, a large user or by agreement, and that most existing NAVs fall into the first category.

In addition NAVs can be differentiated by the extent of the value chain that they substitute for the incumbents' network.

All NAVs provide retail services to the end-user customers on the site, and typically provide and maintain their own infrastructure on the NAV site, substituting for the incumbent's 'last-mile' water/wastewater distribution network infrastructure.

However, some NAVs will only provide these 'last-mile' services. These are the most prevalent form of NAV. They rely on a bulk supply from the local incumbent undertaker for the remaining services 'upstream' of its connection at the site boundary with the incumbent's network. In the case of a water NAV, it will buy a bulk water supply delivered to the boundary from the incumbent's 'upstream' network, and, in the case of a wastewater NAV, it will deliver sewage to the boundary for transportation upstream and treatment and disposal by the incumbent. We call this type of NAV 'bulk-supply NAVs'.

Other NAVs do not require upstream services from the incumbent but provide their own resources. In most cases, this is because these NAV sites are operated

[27] Ofgem, Connections Industry Review 2010-11.

by existing incumbent appointees outside their area and can use existing upstream resources (such as boreholes).

However, it is possible for a non-incumbent new appointee to build onsite facilities and be independent from the incumbent's upstream services. We refer to this type of NAV as a 'full NAV' in this study. Currently only Albion Water operates as full NAVs and only for wastewater services. Albion told us that its business model is to provide innovative solutions to build and operate on challenging sites.

Full NAVs compete with the incumbents' services beyond the last-mile local network and retail activities, and into the upstream wholesale activities. Albion told us that their approach is to contest the more challenging sites where incumbents' traditional approach would not be efficient. They have provided a full NAV service for wastewater on a number of sites, without use of the incumbent's system, but generally use the bulk supply model for their potable water supply. On the wastewater side they are effectively competing against the incumbents for the entire value chain. Albion has told us that, at the present time, a full NAV service is not feasible for water supply, due largely (but not only) to limitations posed by the abstraction market on water resource access.

Figure 6 below summarises the extent to which current NAVs rely on their own resource.

Figure 6 NAV sites by type of resource

Resources	Number of NAVs	Residential customers	Business customers
Bulk supply	47	51,965	268
Bulk supply / own resources	3	1,334	0
Bulk supply for water, own resources for wastewater	2	597	7
Own resources	16	7,571	443

Source: Ofwat data, Frontier analysis

As can be seen, most NAVs fall into the Bulk Supply model. This includes all the multi-utility NAVs.

3.4 Benefits of a well-functioning NAV market

From our engagement with stakeholders, we have identified a range of potential benefits from NAVs. Due to the qualitative nature of our study, we do not have robust data analysis to support an estimate of the scale of the benefits achieved.

However, our understanding is that some benefits, in particular the efficiency gain delivered to developers and environmental benefits to customers, appear to be more material than other benefits such as price discounts. We discuss these separately below.

3.4.1 Better services and discount on prices

Some NAVs offer a discount off the incumbent's charges to end user customers. According to Ofwat's official records, around 30 NAVs (out of the 68) have stated

that they would offer customers a discount, on water services, wastewater services, or both. Discounts ranged from 2.5% to 5% on volumetric or fixed charges, or in the case of one NAV a £5 discount on customers' wastewater bills.

However, according to the Consumer Council for Water (CCWater), it is not clear if these discounts offered at the start continue to be offered today. We have heard from some NAVs that due to the constraints on margins they are facing, they have had to discontinue with some of the discounts initially offered to customers.

In terms of quality of service, a few NAVs have stated that, because of their proximity to the site, they are able to provide a better service for developers whilst the site is being built out, and are able to maintain and repair assets more promptly when necessary.

3.4.2 Economies of scope

One of the popular business models NAVs operate is the so-called ‘multi-utility solution’. For instance, SSE Water and IWNL both operate with sister companies that provide last-mile infrastructure in other sectors such as electricity, gas and telecoms to the same development sites.

The advantage of this model is the economies of scope brought to the developer, who only has to deal with one supplier to take care of all its utility connections. NAVs argue that this brings real efficiency gains that cannot be achieved if incumbents were to build the network. This is seen as potentially material for developers. It would appear that these benefits may have both a cost and a service dimension, assisting the overall efficiency of development activity.

Another reason for efficiency gain introduced by NAVs can be attributed to specialisation. Some NAVs told us that they specialise in last-mile infrastructure work, and therefore can carry out the work more efficiently than incumbents, who often focus more on upstream network and resource assets. However, we have not been supplied quantitative evidence for this.

3.4.3 Innovative solutions and efficiency

Albion Water has told us that its strategy is to focus on the most challenging sites, where it would be too costly and inefficient for the incumbent to connect and manage. It uses its own onsite solutions (especially on grey-water recycling) to provide for wastewater services, and at the same time reduce demand on potable water.

CCWater agrees that environmental benefits and demand management are where NAVs can provide real benefits for water customers in the long run.

NAVs that provided environmentally friendly or water efficient solutions on site, emphasised the broader benefits of innovation from their involvement particularly on ‘difficult’ sites. They suggested that a NAV could usefully serve as a ‘case study’ or demonstration site for innovative solutions, helping in the process of spreading the adoption of innovative ideas.

3.4.4 Dynamic benefit (competition)

The majority of stakeholders interviewed mentioned long-run benefits from a well-functioning market. According to a housing developer, NAVs can often provide better quality of service compared to incumbents. Sometimes, developers can also get a better monetary deal from NAVs.

Developers also considered that having effective competition from NAVs – as well as from SLOs – would generally force better service from incumbent water/wastewater companies. Developers emphasised the importance of a well-functioning development environment, given Government's priority to support the provision of new housing.

4 ISSUES IDENTIFIED FROM STAKEHOLDER ENGAGEMENT

This section summarises the issues identified during the stakeholder engagement programme. In undertaking the engagement programme we were interested in exploring views and evidence on the following:

- factors that might be inhibiting effective competition in the market;
- potential scope for and constraints on the benefits flowing from competition; and
- implications for interactions with the wider regulatory framework, including the long term prospects and complementarity of the market with the Government's and Ofwat's longer term policy direction.

The key issues raised are summarised briefly below to provide an overview. This is then followed in Sections 6, 7 and 8 by further detail and our assessment.

4.1 Factors affecting competition in the market

The issues highlighted by stakeholders fall into a number of categories.

- The requirements and processes around applying for a NAV. This includes:
  - the criteria under which a NAV may be granted;
  - the information and assessment requirements for the award of an appointment; and
  - the timescales involved (both statutory time limits and time taken in practice).
- The transparency, timeliness and effectiveness of information provision by, and communications with, incumbent water companies; including:
  - both prior to and during the application process; and
  - whether NAVs are treated equivalently to other potential providers of developer services.
- The margin that NAV operators are able to earn, including:
  - the underlying methodology and transparency of the incumbent charges underpinning those margins; and
  - whether there is a level playing field between NAVs, SLOs and incumbents regarding these charges.
- The regulatory mechanisms that affect the incentives on incumbent companies to operate as a NAV outside their appointed region and their attitude to NAV competition within that region.
- A lack of knowledge and understanding about the NAV option and process, which could underpin risk aversion towards NAVs, including by:

  - developers and would-be NAVs; and
  - others such as quality, environmental and planning authorities,.
- The policies of environmental regulators and planning authorities, such as towards granting required licences and permissions.
- The extent of intrinsic factors e.g. in the cost structure of serving the market that might preclude entry by NAVs.

Both margin and process/behavioural issues were seen, by NAVs and some developers, to present significant barriers to entry. They considered that the margin was significantly distorted by a number of factors. These included the incumbents' approach to bulk supply pricing and a range of connections charges; the application of the statutory rules on providing developer 'discounts'; and the significant RCV discount on incumbents' historical assets which is embedded into retail pricing and may constrain margins.

NAVs and developers contrasted their difficulties with the processes for engaging a NAV against the relative ease of engaging in the similar market for connections and local infrastructure provision in the gas and electricity markets. They raised the following issues.

- Water and wastewater incumbents were relatively slow in responding to requests for quotations for connections, associated offsite infrastructure and bulk supplies (where sought) and lacked a transparent and efficient process.
- Choosing a NAV involved a longer process than using the incumbent whether as a result of the Ofwat process that had to be followed or NAVs having to reach agreements with incumbents which could derail the process.
- Developers often would 'default' to the incumbent to provide the service or an SLO which provided an intermediate option.
- NAVs were of the opinion that incumbents did not treat their requests for connections and infrastructure on a level playing field with their own quotes to developers or SLOs, both as regards requirements, costs and speed of response.

A lack of knowledge of the NAV option was also seen to have contributed to the slow uptake by developers and a perceived 'risk averseness' towards NAVs by quality, environmental and planning regulators. This could complicate, delay and sometimes reduce the chance of success in a NAV offer and application. Some environmental policies, such as the Environment Agency (EA)'s presumption against building of new sewage treatment works and the current lack of a market in abstraction licences, was also seen to inhibit entry by 'full NAV' model entrants.

The views of the incumbent water and wastewater companies who engaged in the study included the following.

- In general they were not dismissive of the concerns raised by the NAVs and developers. There was a concern that the scale of barriers was overstated.
- They highlighted that some barriers might be intrinsic to the fundamental economics of a NAV, and that incumbent behaviours and pricing approaches

might reflect regulatory guidance and case law rather than anti-competitive intent.

- They noted that they had little incentive to operate out of region due to the form of the price control; despite serving 97% of development sites, they considered they had little incentive to 'defend' a potential site within region. They noted that this could impact on the strength of competition.

Sections 6 and 7 provides further detail of the issues raised and our assessment, Section 6 focussing on 'non-price' barriers and impediments and Section 7 focussing on 'price' or margin concerns.

4.2 Benefits flowing from the NAV market

We asked stakeholders about the potential benefits that can be achieved through a well-functioning NAV market and whether they thought these were being achieved. The main responses were as follows.

- Most stakeholders were positive or neutral about the potential benefits, which we have summarised separately in section 3.4 above.
- At the same time, there was a range of views on how extensive the benefits have been or might be.
- CCWater was particularly concerned that customers should see an ongoing benefit from NAVs, rather than a one-off benefit at appointment.
- Many stakeholders recognised that the scale of benefits would depend on how the terms and conditions for entry might alter and the model of entry pursued. For instance the 'full' NAV model (i.e. not dependent on a bulk supply from the incumbent) might generate a more extensive range of benefits, in terms of innovation and environmental performance. The potential size of the market was discussed in section 3.3.4.
- CCWater and Ofwat considered the potential for NAVs to become new comparators for the water and wastewater incumbents, across the value chain elements that they serve. This could enhance comparative competition, particularly if those comparators were at the leading edge.

We explored how those benefits from NAV entry might be expected to be distributed, in particular, to what extent would water and wastewater customers benefit as opposed to NAVs, developers, landowners or property owners. This was a particular issue raised by CCWater. The main responses were as follows.

- It was widely recognised that given relative price regulation of the NAVs, customers were protected by regulation from being worse off, but there was no driver or strong incentive that would necessarily lead to them being better off as a result of competition.
- Some incumbents and CCWater also were concerned that 'cherry picking' of cheaper to serve sites by NAVs would lead to incumbents being left with the more expensive sites, raising the average cost to the incumbents' and possibly all customers (due to relative price regulation) over time. We consider these issues in Section 8.

- At the same time, a key benefit from improving the NAV market might be expected to be in the efficiency and speed of development and house building, a key Government priority.
- In addition, there could be spin-off benefits to water customers as a result of incumbents in the long term being incentivised to 'up their own game' and there being spillover effects to their own efficiency and innovation in upstream services (in the case of full NAV competition) and/or the operation/maintenance of local infrastructure.
- Linked to this area, our own analysis has highlighted an issue associated with the way the current PR14 wholesale revenue cap works in conjunction with the NAV market. Currently, when an incumbent loses a new development site there is no adjustment to the allowed revenue through the regulatory control. This implies that the lost connections revenue and wholesale revenue (to the extent that the bulk supply price is lower than the envisaged wholesale revenue for the site in the business plan, or the entire wholesale revenue in the case of a full NAV) is still recovered, but spread out on existing customers. This would represent a loss of value from the water sector. This issue may not be material yet due to the limited NAV entry to date, but it could become more problematic if significantly more NAV entry were to occur. Ofwat has scope to address this issue if it were to become material (e.g. through an adjustment to the revenue true up mechanism).

4.3 Implications for interaction of the NAV market with wider retail and upstream markets

We explored how stakeholders viewed the sustainability of the NAV market given the direction of travel in policy towards retail and upstream markets. In particular the introduction of retail competition for business customers from April 2017 (Retail Market Opening, RMO), Ofwat's proposals to introduce greater contestability to water resources and bioresources segments of wholesale services as part of the Water 2020 programme, as well as the potential extension of retail competition to residential customers in due course.

Few stakeholders commented extensively on this. However, it was interesting to note that NAVs did not generally see wider market opening as a threat, but rather as an opportunity. For instance, one NAV expressed an interest in the potential to focus on being an infrastructure provider (similar to an IDNO or IGT in the energy sector), if they were able to divest their retail arm. Another NAV indicated that with access to abstraction trading and upstream water resources, there could be greater potential for non-bulk-supply related NAV entry, greater innovation and benefits to customers.

5 COMPETITION ASSESSMENT – MARKET DEFINITION

As explained in section 2 the first step in the competition assessment is to define the relevant market. This section summarises our assessment of market definition.

5.1 Framework for market definition

The purpose of market definition is to set a frame of reference for understanding how competition operates in a market. It is not an end in itself, but provides a focus for assessing whether the competitive constraints within the market are functioning well.

The European Commission's guidelines on market definition, which also form the basis of the approach taken by the CMA, describes the process of market definition as to "*identify the actual competitors of the undertaking involved that are capable of constraining those undertakings' behaviour*".[28] The purpose of market definition is therefore to describe the range of alternatives that are capable of competing effectively. Defining the relevant market has both a product and a geographic dimension.

To define the relevant market, competition authorities, including the CMA, typically use an approach referred to as the hypothetical monopolist test (the HM test). This test identifies the relevant market as the minimal set of products for which a hypothetical monopolist of those products could profitably impose a small but significant non-transitory increase in price (often referred to as a SSNIP). The logic of this approach to market definition is to identify the narrowest set of products within which a firm could, if it had market power, exploit that power to the detriment of consumers.

For product market definition, the HM test requires the following thought experiment:

- identify a candidate product market, starting with the narrowest first;
- consider a permanent 5%-10% increase above the competitive price level for the candidate product market;
- examine the degree of substitution that might be expected away from this product in response;
- if the extent of substitution would be large enough to make the price increase unprofitable, then widen the market to include those products to which substitution may have occurred; and
- repeat this process until one identifies a product market within which a hypothetical monopolist could profitably raise prices by 5%-10%.

[28] European Commission Notice on the definition of the relevant market for the purposes of Community competition law (OJ C372, 9.12.97, p 5).

Substitution, the ability of customers to switch to a competing product, can be driven by both the *demand* side as well as the *supply* side.

5.1.1 Demand substitution

This relates to the ability of consumers located inside a putative market area to switch to a product located outside that area in response to a SSNIP. Demand substitutes therefore relate to the existing suppliers that customers already regard as effective alternatives to the product in question.

Here it is important to note that "*it is not necessary for all customers, or even the majority, to switch. The important factor is whether the volume of purchases likely to switch is large enough to prevent a hypothetical monopolist profitably sustaining prices 5 to 10 per cent above competitive levels*." Competition authorities typically regard demand substitution to be "*the most immediate and effective disciplinary force on the suppliers of a given product*".[29]

5.1.2 Supply substitution

This relates to the ability of firms outside the putative market area quickly to begin producing and supplying inside that market area in response to a SSNIP. Here UK and EU competition authorities consider that "*the competitive constraints arising from supply side substitutability…are in general less immediate"* and it is not therefore taken into account unless *"its effects are equivalent to those of demand substitution in terms of effectiveness and immediacy*". The guidelines further expand on the extent of this immediacy, stating that supply-side substitutability requires that "*suppliers be able to switch production to the relevant products and market them in the short term without incurring significant additional costs or risks in response to small and permanent changes in relative prices.*" It follows therefore that "*when supply side substitutability would imply the need to adjust significantly existing tangible and intangible assets, additional investments, strategic decisions or time delays, it will not be considered at the stage of market definition*."[30]

While supply side substitution is focused on the ability of firms to switch their activities into the putative market, it is important to note that the immediate focus remains on the customer. Supply substitution looks at the ability of firms to readily expand their activities such that they can become a viable alternative in the eyes of customers. It is therefore the customer viewpoint which ultimately matters for analysing substitution on both the demand and supply side.

Finally, the guidelines emphasize that the methodology for market definition "*might lead to different results depending on the nature of the competition issue being examined.*" This is particularly relevant to this report, where we are examining issues specifically around the services provided by NAVs in the water supply chain and NAVs' ability to compete effectively.

[29] Ibid.

[30] Ibid.

5.2 Application to NAVs

The purpose of this report is to look at the role played by NAVs in the water and wastewater sectors in England and Wales. Therefore the relevant starting point for our purposes is to consider the definition of the relevant economic market for NAVs.

This means that the relevant focal point for the application of the hypothetical monopolist test in this case is straightforward: the services provided by NAVs themselves. Because market definition analysis always starts from the narrowest possible candidate market, this means the first relevant question is whether NAVs constitute an economic market in their own right, or whether they compete as part of a wider economic market.

5.2.1 Who is the customer?

The starting point for analysing substitution when applying the hypothetical monopolist test is to understand who the customer is that is in a position to substitute away from the services provided by NAVs.

In this case, the relevant customer is the owner of the site being connected, and not necessarily the end consumer. This is particularly relevant for residential developments, where it is developers who make decisions whether to select a new appointee or the incumbent, and therefore ultimately determine whether a NAV will, or will not, serve a particular development. So although a NAV for a new development will (post-appointment) ultimately also serve end users as customers, these end retail customers are not in a position to make a choice of supplier or directly influence whether a NAV is appointed or not. Any influence that end consumers might have on the choice of appointee would be mediated via developers (e.g. if their preferences over water and/or wastewater services were a sufficiently material influence on home buying decisions that developers factored this into their appointment decisions). For large users on existing sites the site owner and the water user may be the same entity, but it is in their capacity as the site owner that a large user would potentially select a NAV.

For the purposes of the market definition exercise, the relevant customer group is therefore the developer or site owner, at the point at which it makes a decision as to whether to work with a NAV or other providers on its developments. One important caveat to this is the fact that this market definition changes when retail activities are open to competition. We address this issue in later analysis in section 8.2.1

5.2.2 What do customers care about when making decisions?

Developers' decisions are ultimately driven by the requirements of their main business activity: selling property. Having properties connected to the water supply and wastewater networks is an essential input to this service, but it represents a very small part of the overall value proposition in the end property product. So while it is a must-have service, in most circumstances it is not a material driver of value or differentiation of the end product. However, the ability

to offer cheaper water services to end consumers could help make properties more attractive to potential buyers, and often NAVs who are appointed offer a discount to end consumers.

We discussed with developers what influenced their choice of whether to use a NAV. They highlighted that their main priorities were i) development costs and profitability of the development; and ii) ensuring that connections for utilities (including water) did not delay the project timetable. The two concerns were somewhat related, since disruption or delay to the project timetable resulting from connecting water supplies would have a cost impact on the developer.

We also discussed with developers the role of innovation and differentiated service offering from NAVs. In particular two potential differentiators were identified:

- multi-utility bundling – where a single supplier connects several utilities at once for the developer, potentially including the water, gas, electricity and telecoms services; and
- environmental initiatives – additional services to reduce the environmental impact of the development, such as grey water recycling.

In both cases, developers indicated that these services were not valuable in and of themselves, but rather were relevant in so far as they impacted on the profitability of the development and the development timetable. For example, NAVs offering multi-utility services could be attractive because they minimised the time taken and the scope for disruption to the development from utilities connections because, among other things:

- developers had a single point of contact for delays or other issues; and
- activities to connect a property could be coordinated and carried out in a single visit rather than multiple visits.

These benefits were not unique to the multi-utility offer, but rather the multi-utility offer was one means of achieving a desirable outcome for the developer – namely no disruption to the development timetable.

It is also important to note that the means in which the end consumer is served at retail level is not a principal driver of decisions for developer customers. A developer's principal concern is to take the development to the point where it is completed, connected and can be sold. Once the property is sold, the developer is no longer involved in the ongoing relationship between the property owner and their water and wastewater service supplier. This means that developers are not directly affected by:

- who wholesales or retails water to the end consumer on the development after it is sold; or
- who owns the infrastructure which is used to serve the end consumer on the development after it is sold.[31]

These factors only influence a developer to the extent that, during the development phase, they might drive the costs to the developer of connecting the

[31] We note that for non-NAVs, the water infrastructure has to be adopted by incumbent before use, but adoption of wastewater infrastructure is not mandatory in England (it is in Wales), and so a developer would need to reach an adoption agreement with the incumbent in order to no longer own the infrastructure.

properties. This in turn suggests that any connection solution which is competitive on cost and timescale will have the potential to be an effective alternative for a developer.

5.2.3 Implications for applying the hypothetical monopolist test to the product market definition

As noted above, the main factor to consider when applying the hypothetical monopolist test is the credibility of demand substitutes – i.e. those alternatives which customers regard as credible and effective. The candidate demand side substitutes for a hypothetical NAV market are principally:

- the local incumbent water and/or wastewater supplier; and
- (for new developments) SLOs.

These organisations both also provide water and wastewater connection services to developers, but do so with different models for serving the end consumer. Whereas a NAV will own and operate a distinct downstream water network and retail water business:

- an incumbent, if appointed, will absorb the development into its overall local downstream network; and
- an SLO will only carry out the infrastructure and connection works, before reselling the completed assets to the local incumbent water supplier, who will again operate them as part of its wider downstream network.

From a developer customer point of view, these differences in who ultimately owns and operates the water infrastructure has no direct impact on the services they receive – in all cases the development is connected to the water network, enabling a property to be completed and sold.

This strongly suggests that both incumbent water suppliers and SLOs are credible demand side substitutes to NAVs. If a NAV were to significantly increase its charges to a developer, or were to significantly deteriorate its quality of service to a developer, it is highly likely that a developer would instead consider using an SLO or an incumbent supplier instead. Based on the feedback we have received from developers themselves, this is likely to be the case even in circumstances where the NAV is able to differentiate its offer through offering, for example, multi-utility services.

Moreover, from a supply substitution perspective, to the extent that alternative services (such as multi-utility services) were to be important to some customers, we are not aware of significant barriers to either incumbent suppliers or SLOs from coordinating their services with the providers of these alternative services – for example through partnerships or joint ventures.

5.2.4 Geographic market definition

In general, the scope of the geographic market should be set with reference to either:

- the geographic area over which a customer can look to select its supplier; or

- the geographic area over which competitive conditions are sufficiently homogenous that they can be treated together for the purposes of competition analysis.

In this case, suppliers in this market are potentially able to operate across multiple geographies. A NAV that can supply a development in one part of the country may also be able to use the same expertise to serve developments in other parts of the country.

However, there is a local dimension to competition in this market which is driven by the geographically segmented nature of the regulated water market. The incumbent water suppliers in a given geography have a different market position to SLOs and NAVs because of their incumbent position. This means that conditions of competition are not necessarily the same in each local area – a given local area will only have one incumbent supplier, and that same incumbent supplier will not be able to compete (at least in the same role) in other geographies. This does not necessarily mean that the conditions of competition vary substantially across local areas – since every area will have one and only one incumbent supplier for each wholesale service, and that supplier will be regulated in a similar way. But to the extent that incumbent suppliers behave in different ways and/or make different strategic choices about how to compete, this would lead to geographic variation that would not be constrained by the choices made by equivalent incumbent suppliers in other areas.

5.3 Provisional views on market definition

Based on the evidence we have gathered through this study, it seems likely that the relevant economic market for NAVs is:

- in product scope: the market for developer services, including incumbent suppliers, SLOs and NAVs; and
- in geographic scope: a series of local markets corresponding with the geographic areas covered by regulated incumbent water suppliers.

6 COMPETITION ASSESSMENT – BARRIERS TO ENTRY

6.1 Introduction

In this section we consider the various concerns that have been raised by stakeholders that might be considered barriers to effective competition (excluding the 'price' or vertical relationship question which we address in section 7). We have summarised these under the following headings.

- Regulatory barriers:
  - NAV licence and application requirements and process: reflecting factors related to the NAV regime itself, such as the criteria for entry, Ofwat's assessment of financial viability, the duration of the process;
  - the policies of the EA; and
  - the form of the price control and totex cost assessment for incumbents.
- Strategic barriers:
  - Information and service levels provided by incumbents: factors related to the behaviour of incumbents who both participate in the process through providing services on which NAVs depend, and are also competitors.
- Intrinsic barriers:
  - economies of scale.
- Information barriers:
  - the information available to and understanding of the NAV market by potential customers i.e. developers and other regulators.

6.2 Regulatory barriers

6.2.1 NAV licence and application requirements and process

In general stakeholders accepted that NAVs need to be licensed and that their licences need to provide appropriate protections to customers. No major concerns were expressed about the extent of licence obligations on a NAV operating as a barrier to entry. Some concerns were expressed about obligations imposed in the context of retail market opening, and the need to provide wholesale charges, but this was not seen as a barrier to the NAV market.

NAV operators and applicants did, however, generally consider that the Ofwat NAV application process is too lengthy and uncertain. Despite a prescribed time period, and some acknowledged streamlining of the process by Ofwat, the requirements and process are still considered to impose unnecessary restrictions, delay and uncertainty, for the following reasons.

- The legal criteria for a NAV are seen as restrictive and introducing uncertainty:

  - the 'unserved criteria' remains open to debate, despite guidance and legal precedent in case law and dependent on what are seen as onerous and time consuming site engineering studies.
- The NAV application process is seen overall as being too long (110 working days, or 22 weeks), relative to both:
  - the timescales a developer needs to meet, particularly for smaller sites; and
  - those achievable for connections in the energy sector.
- The clock can be 'stopped' for specific matters (such as to agree a bulk supply with an incumbent, a process which itself lacked a consistent, rigorous and time-regulated process for agreement).
- The process can be held up and entry restricted by the need for financial viability and the 'no worse-off test' to be carried out on a site by site basis, which precluded a 'portfolio' approach to multiple site development being adopted by a NAV.
- The process can be complicated by interactions with other regulators who are not always seen to understand, or are seen to be cautious of, 'innovative' schemes suggested by NAVs.

One respondent said they thought Ofwat manages the consultation element of the application process well, but some questioned why Ofwat needs the time it does to complete certain tasks, and some also suggested practices to speed up the process and make it more transparent.

Unserved/served criterion

The lack of clarity as to the meaning of 'unserved' in practice has meant that it has provided a source of uncertainty and delay to the NAV process. It has been a requirement on a NAV to provide evidence and an independent report establishing the status of the site. In the case of brownfield sites this was not always clear cut and gave incumbents the opportunity to argue the status with the NAV. As noted earlier a greater degree of clarity has been brought as the result of a court case that was brought on this matter. Ofwat has issued more guidance as to the interpretation of 'unserved' and has also simplified the process so that a NAV applicant does not have to obtain an independent report on the site if it is 'straightforward' or 'greenfield'.

Nonetheless, some respondents still considered that the uncertainty around the criterion and the process of determining the status of the site remained a source of delay and cost. One NAV said that there was a significant burden of proof of 'unserved' status placed on the NAV when 'it should be at the developer's choice'. Several pointed out that they thought the requirement for a site study was in many cases unnecessary, especially where it was evident new houses were being built.

Some incumbents told us, however, that they took a more relaxed view of what was considered 'unserved', as they had less incentive to defend sites. This was because they were more mindful of the need to avoid anti-competitive behaviour,

and also because of the operation of regulatory incentives (described in section 4.2) which means they do not lose revenue if they lose a site to a NAV.

We observe that there have been no further legal cases on this point since the TWUL case and that the outcome of that case and Ofwat's response in terms of issuing guidance has provided considerably more clarity than in the past. We note that within the current legislation, the site survey remains Ofwat's means of satisfying itself that the legal criterion is met.

It is not clear that this issue is seen as a key obstacle to NAV entry, such as to suggest a change in legislation (to amend the criterion) might be considered. However, given that this does seem to be a somewhat arcane piece of the legislation, it may be appropriate for Ofwat to provide further clarification or guidance and to explore any opportunities for further streamlining its approach.

NAV application process too long and requirements too restrictive

Several NAVs said that the process was too long and some of the requirements too restrictive. Three months (12 weeks) rather than the 6 months (110 working days) required for the NAV process was a frequently expressed aspiration. One NAV said a period of 62 working days from section 8 notice to licence award should be feasible.[32]

It was also noted that if a developer requisitions the infrastructure from an incumbent, there is a required delivery time of 3 months. Therefore, the developer perceives a more certain period of end-to-end delivery of the infrastructure if it chooses an incumbent. (We note that in practice end to end delivery of the infrastructure by an incumbent may be longer than the 3 months, as the 3 month timescale is not from when a requisition is applied for, but from when all the conditions are met, including payment by the developer.)

The HBF indicated the following development timescale scenario.

- A period of 6 weeks was needed by a developer to undertake its due diligence before acquiring a site for development. During this time the developer would need to obtain initial indications of network connections and costings for utility provision. This was often sought from the incumbent.
- After acquisition, the development would go through the planning process with a statutory period of 13 weeks.
- Overall, the HBF indicated that a period of 20 weeks to obtain a NAV licence would work with this development cycle, if a NAV was considered from the outset.

One NAV agreed that the existing timescale for NAV application could be managed within the development timescales for a large site. However, it and other NAVs said that for smaller developments the 6 month application process would not be quick enough. For example, where a large piece of land was bought by a 'land agent', planning permission was obtained and it was then parcelled up into smaller lots for development. If it was at that point that a NAV might be approached, the developer of the site might wish to proceed more quickly.

[32] Section 8 of the WIA91 sets out the procedure for an application for a NAV.

Another NAV said that if a NAV had not been selected by the developer before the time of planning permission, then the developer might use the incumbent's proposal as a basis for seeking permission, which would then become 'baked in' and it was too difficult then for the developer to change supplier.

The HBF also commented that there was pressure on developers to accelerate house-building, and that house-building was increasingly utilising offsite modular construction which increased the speed and efficiency of build. It said that houses could be built within 6 to 8 weeks and wondered whether a prospective NAV process could respond in this context.

One NAV also reiterated, on the basis of its experience in the energy sector, the timescale of 7 weeks being required by a developer from the request for a contract offer to the issue of contract in the context of the average site size which it said was 70 houses. If the NAV expects only to get its licence after 22 weeks, it can only make its offer conditional on the NAV being granted. This creates a risk to developers in terms of potential delay in installation which developers see as significant, although utility infrastructure is a relatively small element of the total development cost.

Some elements of the application requirements were also considered too onerous, especially for smaller scale developments. Two were cited in particular (in addition to the unserved criterion): these were the need to apply a financial viability assessment on a site by site basis and the application of the 'no worse off' criterion on an item by item basis. NAVs said that the former restricted their ability to put a portfolio of sites together, including smaller sites, and hence restricted entry as well as adding to the burden of the process, while the latter restricted their ability to offer different levels of service and price for different services provided.

The process of application to obtain a NAV should enable the regulator to carry out appropriate and proportionate tests to ensure the applicant's legal eligibility and financial and technical soundness to become a water and/or wastewater undertaker. The length of process in itself does not appear to be problematic for larger development sites.

The problems are seen to arise more from the potential for the process to be delayed (discussed separately below).

However, the statutory timescale is considered a potential problem for smaller sites. In our view, this does not seem an unreasonable observation, especially where a site already has planning permission.

It appears to us that Ofwat might investigate further whether there is scope for the NAV licence and application process to be more flexible and streamlined. For instance Ofwat could consider if certain elements could be undertaken in parallel, not in sequence, and if all items of required information are required before it moves from stage to stage. Ofwat might set itself two challenges:

- First, to consider if it could aim to bring greater parity with the timescale that applies to requisitioning by an undertaker i.e. 3 months, and
- Second, to consider if it could reduce the process for site additions to established NAVs (e.g. to a 4-6 week period).

Some suggestions of this kind have been made by NAVs and these are summarised below. We assess options in more detail in our section on 'options for reform' (see section 9).

- That Ofwat adopts a lighter touch approach to the *ex ante* financial viability and 'no worse off' assessment for NAV appointment applications where the applying company has already proved operating capability in the market – in particular to limit the required process for each new site.
- IWNL has proposed an annual review process, with the majority of the NAV application requirements assessed independently of any site specific application requirements e.g. site location. This, it suggests, could be a very effective way to not only simplify the application process but also significantly reduce the amount of information that is required for site specific applications. It suggests this would enable a new site to be added as a Variation within a 4 week period, thereby fitting into the short time frame in which it says it needs to respond to developers for the 'volume' market.
- That, in the longer term, the legislative framework could be amended by Government to allow national licensing for infrastructure provision and developer choice between these duly authorised companies. This might be based on the model in the energy sector for IDNOs and IGOs where these are licensed to supply sites based on a framework and guidelines agreed with the regulator, rather than on a site by site basis.

Delays to the NAV application process

Also significant for the perceived length and uncertainty around the process of application was the potential for the process to be delayed.

Our discussions with stakeholders identified a number of causes of delay.

Several respondents said that Ofwat's tendency to seek additional information following application was sometimes a cause of delay and uncertainty in the process. Ofwat noted in response that they would seek further information if the original application was incomplete or unclear. Ofwat notes that it may extend the timescale if:

- clarification or more information is required from an applicant; this is where the initial application may not provide sufficient information for Ofwat to make its assessment in relation to:
  - the unserved criterion;
  - the financial viability principle; and
  - the no worse-off principle;
- the application raises new or complex issues; or
- more time is needed for the public consultation.

Other regulators could also introduce delay. Some stakeholders felt they may not always be aware of the technical competence of NAVs or their licence requirements, or may be cautious of more innovative solutions. This could lead to uncertainty as to whether a NAV's proposed scheme would be acceptable, which

could delay the timetable or lead to an application having to be withdrawn. As explained earlier, one NAV in particular thought the EA's approach to abstraction and discharge licences and their concerns about the potential proliferation of separate networks and treatment works could also reduce the scope for entry in the first place.

In addition, the clock can be 'stopped' by Ofwat for a number of reasons, for instance:

- Ofwat cannot make progress because of factors beyond its control or outside the scope of the application; or
- Ofwat's ability to progress the application depends on action by an applicant.

Developers themselves could cause delay. The HBF stressed that it was continually encouraging its members to adopt a more collaborative approach in working with utilities and other stakeholders. This was not just a NAV issue. The HBF said more collaboration would help to earlier crystallise the layout/design of the site and principles for the development and to manage uncertainties. They understood that utilities needed a fairly fixed layout in order to provide reliable costings. While changeable site details would affect incumbents and NAV bidders in a similar way, for a NAV, significant site specification changes could also set back the NAV application process,

The reason most frequently cited and evidenced for delay by respondents was the failure for a bulk supply agreement to be concluded quickly between a NAV applicant and an incumbent. The main sticking point was the bulk supply price. But there can also be delays in an incumbent providing a confirmed Point of Connection and/or Point of Discharge and the associated estimated costs of offsite infrastructure reinforcements. Generally all associated costs are tied up in the bulk supply agreement.

While these difficulties can delay the NAV application process, they can also have an earlier impact on the NAV's fundamental ability to compete to service the developer, to the extent that they limit the ability of the NAV to provide a robust bid to the developer within the developer's required timescale.

NAV respondents all criticised a lack of any accountable frameworks requiring incumbents to address connection and bulk supply requests from NAVs in a transparent, timely and fair way, on a level playing field with requests from SLOs or their own responses to developers seeking quotes for requisitioning infrastructure.

As these issues go beyond timing of responses to more extensive concerns about information provision, equivalence and communication, we address them further in the next subsection.

It is not unreasonable in our view that there is provision in the current NAV application process for Ofwat to be able to stop the clock due to factors outside of its control, such as incomplete material from applicants in order for Ofwat to make its assessment. Equally where there have been concerns about additional and follow up information requests from Ofwat, it would perhaps be useful for Ofwat to periodically review its performance in that regard and the reasons for requests. It may also be useful for Ofwat to explore further whether applicants

consider the information requirements sufficiently clear. In addition, concerns about the awareness or flexibility of other regulators may suggest some attention by all parties, NAVs included, to engagement and communication early on regarding proposals. Whether streamlining the process might help to address these issues might also be considered.

The potential for a failure to conclude a bulk supply agreement, or to obtain from an incumbent timely point of connection information and connection and reinforcement cost information, is in our view a significant obstacle. It would be particularly concerning from a competition view point if incumbents were not to provide quotes to known NAV bidders for 'non contestable' services at the same time and on the same basis as they provide a developer with a quote.

This issue can be addressed by appropriate rules or guidelines set out by Ofwat regarding the practice of setting the bulk supply agreement and of making point of connection offers. We consider options for addressing this in section 6.3 below and section 7 on pricing, and our assessment of options in section 9.

6.2.2 EA policies and approach

Summary of stakeholder views

Some NAVs felt that the EA's approach to abstraction licensing and discharge consents was prohibitive to NAVs, particularly those that sought different solutions to water supply and waste disposal from traditional ways.

One NAV stated the following.

- The EA had a default policy of not permitting new abstractions or new sewage treatment works on development sites.
- The EA did not recognise that the abstractions and discharges to serve local developments would tend to be 'relatively small', with a marginal impact on the water environment. Instead NAVs might offer a local sustainable approach, which might contrast with one that involved connecting to an existing water or wastewater network at some distance from site.
- The EA sometimes did not seem to apply the same consistent consent standards to a NAV discharge compared with another discharging into the same water body.
- It appeared to them that the EA was sceptical as to the technical competence of NAVs, considering them similar to private water/wastewater operators rather than the licensed and regulated companies that they were.

The EA told us that they were aware that within the Agency policy might not always be joined up. At the same time, they emphasised that each site was considered on its own merits. They appeared keen on innovative approaches and were receptive to engaging further with NAVs to understand their approach.

Our assessment

This seemed to be an issue of communication and understanding. We note that Ofwat already advises NAVs to commence engagement with other regulators early in the application process.

We note that that there is an EA presumption against new sewage treatment plant, but this did not seem to be a fixed position where local circumstances suggested an alternative more sustainable approach. Equally with abstraction licences, there appears to be a mismatch sometimes between national EA policy and a local situation. While it is not unreasonable that where innovative approaches are being proposed by a NAV the EA may wish to obtain greater reassurance, there did not seem to be an obvious mistrust of the competency of NAVs.

In our view, the main options for dealing with this issue are as follows.

- Ofwat to encourage constructive dialogue between NAVs and the EA both at a general policy level and early in the context of a potential NAV application.
- The EA to promote wider understanding of the NAV option at local and national EA level and to review its guidance on policy approach in the case of innovative solutions being proposed by NAVs.
- The EA might agree informally or perhaps through an MOU with Ofwat how it might consider the impact of its processes on competition (this might be seen to balance Ofwat's duties to have regard to sustainability for example).

6.3 Strategic barriers: Information and service levels provided by incumbents

In this section we consider whether 'strategic barriers' to entry might be evident in the NAV market. Strategic barriers to entry would be those arising as a result of deliberate action on the part of the incumbents in order to deter entry. Strategic barriers may take the form of price manipulation or the provision of low quality and/or untimely information. In terms of information provision, the incumbent may also derive the added benefit of saving some cost through delay or low quality provision.

We note that the incentives for the incumbents to act in this way derive explicitly from the nature of the vertical relationship in which they are involved with the entrant, i.e. through having monopoly control over particular inputs that the NAV requires.

We deal in this section with behaviours relating to non-price matters i.e. information and service levels, and behaviours relating to price, in section 7, although both emanate from the same vertical relationship and the incentives that provides for foreclosure.

Summary of stakeholder views

A key issue raised by NAVs was the difficulty of obtaining timely and transparent technical and costing information for connections and offsite reinforcements and

a bulk supply offer from incumbents. This could restrict the NAVs ability to assess the viability of serving a site and produce a costed offer for a developer. It could lengthen the time taken to reach submission stage of its NAV application (and hence 'starting the clock' on the NAV application process) and delay the overall process. NAVs were hopeful that Ofwat's new charging rules would bring some improvement but said that it was too early to know how they would work in practice.

At the inquiry stage for a connection, NAVs stated that incumbents often claimed not to have the required information about their networks, potential connection points, capacities, maximum loads, etc. 'on tap'. Often incumbents would insist that modelling was required, and that this was for them to do (rather than by the NAV or experts appointed by a NAV). The way in which the need for upstream reinforcements were identified and costed was unclear and NAVs had little means of checking incumbents were being reasonable or even-handed as compared with the service provided to SLOs or developers. They expressed concerns both about the timing of an incumbent's response to them, as well as design and costings. NAVs also told us that the service received varied both in quality and quantity across the country: there was little consistency. There were no universally guaranteed timescales by which an incumbent had to respond to a NAV on its connection inquiries or the inputs sought. We were told that only one or two companies had started to introduce such an approach.

A similar experience was reported in relation to obtaining a bulk supply price and a bulk supply agreement. The latter tends to wrap up all the connections, reinforcement and additional items identified as needed by the incumbent. Negotiating bespoke bulk supply and bulk discharge agreements (which differ for each region) was described as being time consuming and unnecessary. One NAV, for example, thought that all bulk services being provided to NAVs at or near the site boundaries were 'substantially the same' and they would support a standardised set of rules and terms and conditions to be used by all relevant market participants.

A particular issue raised by NAVs as exemplifying the lack of a level playing field, concerned the requirement by incumbents for NAVs to install 'boundary boxes'. When this is required, the NAV is responsible for paying this cost in full. According to the NAV, this is not an insignificant charge (we were told it can be between £30,000 to £40,000), and the NAV is fully responsible for any damage to the meter. NAVs expressed the view that this requirement distorts the playing field, as incumbents do not install similar boundary meter on housing developments where they own the site network.

The NAVs pointed to the energy sector as offering a role model. Here, after a review of the connections market, Ofgem introduced licence conditions on the Distribution Network Operators (DNOs) that introduced a code of practice on connections. Amongst other things this required the cost of a boundary box (or link box) to be paid for by the DNOs who required it. This led to the dropping of DNOs requiring link boxes to be installed. The code is described in more detail in Annex B.

More generally, a number of NAVs noted that the code had led to better and more transparent service from DNOs. This included enabling the Independent

Distribution Network Operators (IDNOs) to be allowed to do their own designs and choose their own points of connection (POCs), and facilitating the introduction of the self-serve model. For the majority of connections (that fit a standardised model) the self-serve arrangement enables an IDNO (or indeed a SLO) to access directly the incumbent's network data base in order itself (without need to engage the incumbent explicitly) to choose the POC, design its network, and establish costings. Ofgem had investigated the connections market in electricity, noting that the gas connections market had worked much better historically and attributed this to the GDNs being much less involved in the activity of connections. Self-serve is available in gas as well, and connections services are monitored by a system of guaranteed service standards and an approval process for connections charges.

Several NAVs were keen to see Ofwat introduce codes of practice in water and wastewater to cover both bulk supplies and connections.

We note that some steps are being taken by the water sector to address some of these issues.

- First, the industry has recently voluntarily established a system of published Developer Services Standards for monitoring their performance in delivering services to developers. NAVs were not initially incorporated in this framework, although some companies have it seems started to do so.
- Second, at least one water company has recently made an explicit effort and commitment to creating transparent processes around the provision of developer services (including to NAVs) which embody the principle of equivalence. These include guaranteed timescales for delivery of inputs which are backed up by ensuring a degree of separation of functions to support this (see text box below).
- Third, under the auspices of Water UK, there is currently an industry wide working group (including NAVs) reviewing the energy self-serve model and considering its appropriateness to water.
- Fourth, we also note that there is a further Water UK group considering Asset and Data Sharing (GIS), which may provide some improved effort towards improved mapping of network assets;
- Fifth, the recent Charging Rules framework developed by Ofwat is considered positively by some respondents as a means to driving greater transparency, simplification and consistency as regards connections charging.

We also note that prior to Ofgem introducing codes of practice for DNOs, there was a similar level of voluntary activity being undertaken by the DNOs, but it was felt that the pace of progress had been too slow. The DNO code took this activity further and faster and, crucially, brought enforceability.

ANGLIAN WATER APPROACH TO NAVS

Anglian's NAV approach can be viewed broadly in three phases: the provision of capacity related information and bulk supply/discharge agreements; the capital delivery process including offsite infrastructure including connection activity; and post-appointment management and on-going arrangements. Anglian's approach to the capacity element is discussed further below but

similar principles are applied to the provision of step 2 - the capital delivery process.

Capacity Information

Anglian recognises the need to provide accurate and timely information to enable the NAV to respond to the developer's requests. The provision of capacity related information is required by a range of customers; including NAVs, developers, consultants and SLOs requiring similar types of information about connection points, capacity and any reinforcements along with delivery timescales.

The timetable for the provision of this information is equivalent for all; 21 calendar days. Service levels provided to all development related stakeholders are reviewed on a monthly basis and monitored by Anglian's Wholesale Board to ensure equivalent treatment. In addition, services to developers are published in Water UK Developer Performance tables.

These services are accessed by all parties via Anglian's online portal. This system allows NAVs to monitor open services requests and raise new ones. These are captured via a standard application form and automatically time stamped with service levels populated by an automated system. NAV enquiries are then automated through workflow to the relevant technical wholesale teams. All technical input is recorded on the system for audit purposes. During this process NAVs are automatically updated on the progress as it moves through the workflow. Within 21 days the NAV will have a full NAV specific report with information on capacity, network reinforcement and estimated costs of any infrastructure. Anglian's growth enquiry management system was developed using principles of equivalence ensuring a fair and efficient service for all parties.

Should the NAV wish to progress to bulk agreement discussions, Anglian aims to provide an offer letter followed by a draft bulk agreement contract within 15 business days. The company's standard agreement has evolved over time. They now see limited changes save for the addition of site specific details or where other regulations have changed. Assuming that there were no unexpected changes a signed agreement is expected to be with the NAV no later than 15 business days.

We note that while incumbents did point out reasons why water and wastewater may present different challenges from the energy sector, they did also express a commitment to improving their service and learning lessons from energy where appropriate.

Our Assessment

A NAV operator is, depending on its business model, to a greater or lesser extent dependent on the incumbent water company for services. This may be for a bulk supply, to provide a connection to its network, to provide 'upstream' network reinforcement, as well as to provide information and design services such as detailed site and network information, modelling of network impacts and system design.

Even in the case of a 'full NAV' (i.e. where the NAV is not using any of the incumbent's offsite and upstream network), the NAV may have some interaction with incumbents which may not go smoothly. For instance, a NAV may sometimes provide a wastewater solution that involves some recycling of water on site. This would reduce the site demand for water, which might be expected to have some upstream benefits for the incumbent especially in water scarce zones. However, it may be hard for a NAV to obtain a discount from the incumbent in recognition of these positive externalities. These matters are taken up in section 7.

The 'input' services from an incumbent are required by a NAV for various aspects of, and at various points during, the application process: for instance to enable the NAV to determine its network design and costs and assess the viability of serving the site, to provide quotes to the developer, and to provide inputs to Ofwat's financial viability assessment which is required for a licence to be granted. Developers themselves, who are exploring options for serving the site, will also wish to have some clarity on respective offers. This can sometimes be at the time of land acquisition (and as part of deciding whether to proceed with acquisition), and pre and post planning applications.

It is therefore important that incumbents provide their input services in a transparent, timely and objective way to all parties, whether they are a developer, NAV or SLO. In particular they need to ensure a level playing field in considering their own processes and quotes to developers for connections and requisitions, as to NAVs and SLOs as appropriate.

It appears that while the industry is starting to make efforts to improve their performance in this regard, we have been told that progress is patchy and has been slow to materialise. The new connection charges rules can be expected to have greater force, but some stakeholders have questioned whether these rules go far enough to ensure specific arrangements are put in place and behaviours are changed. Furthermore, it was noted that the question of service related to bulk supply agreements has yet to be addressed.

There are a number of options that Ofwat could pursue to address the issues identified here. The aim would be to ensure, in broad terms, the following.

- A level playing field in the process and service levels provided in relation to the services provided by incumbents to developers, SLOs and NAV operators and to themselves, in relation to new connections.
- Transparency of, commitment to, and transparent reporting of specified and reasonable service levels.

The options may be conceived on a spectrum of less to more interventionist, and there may be a possibility of some phasing or escalation from one level to another on a step by step basis. Possible approaches include the following.

- At the lowest level of intervention, Ofwat could allow the present initiatives being taken by individual companies and through Water UK, and the impact of the new charging rules, to take effect.
    - Ofwat could add weight to these initiatives by publishing a document highlighting its concerns with the market and the principles, behaviours

and perhaps arrangements that it wished to see the companies working towards.

  - A voluntary approach would give individual companies more flexibility in the approach they might adopt, but could be slower to develop, may lack transparency, and opportunities for useful industry wide consistency may be missed.
  - Ofwat could say that they will introduce a mandatory code if the industry does not step up to the challenge.

- If a stronger incentive were required, Ofwat could use its powers under WIA91 (see text box below) to introduce a specific code of practice in relation to incumbent dealings with NAVs. This could follow a range of models for industry involvement in development and governance.
  - Following the approach taken by Ofgem, and building on the water sectors' apparent willingness to work to address issues, Ofwat could set a requirement for the industry (perhaps working together with its customers) to develop and agree an enforceable code of practice; Ofwat could set a framework of principles and a time limit for this to be done, with 'step in rights' if the industry did not deliver.
  - Ofwat could from the offset develop and introduce a mandatory code, through which it would impose legal obligations on incumbent undertakers.
  - The code could be more or less prescriptive in terms of the arrangements it wished to see the incumbent companies put in place.
- A licence / appointment condition could be developed similar to the one under which the electricity code of conduct referred to above was issued. However, in the water sector, this would require the agreement of all licensees; otherwise it could only be imposed through a CMA reference. This is a different situation from that in the energy sector. It is worth noting that it may not be necessary for Ofwat to introduce changes to water suppliers' licence conditions for a code relating to NAVs as the scope of what is permitted by a statutory code appears wide enough to cover most interactions between an incumbent and a NAV. However, should Ofwat wish to extend the scope of the code (for instance to cover 'developer services' as well as NAVs) it may need to consider the introduction of a licence condition.
- Ofwat could publish a consultation document seeking the views of stakeholders on a range of options.

LEGAL BACKGROUND

Section 8(1) of the Water Act 2014 (WA14) amends section 40 of the WIA91 to allow for Ofwat to issue codes in respect of bulk supply agreements. Section 9(1) introduces similar powers in relation to s110A.

6.4 Intrinsic barriers

Summary of stakeholder views

Some incumbent companies considered that because of the existence of economies of scale NAV entry was likely to be restricted to large sites. However, these incumbents provided no evidence to support this claim and NAVs denied this was the case.

NAVs argued that unit costs of providing last-mile infrastructure did not vary with scale. They explained that some scale economy may exist at the company level in terms of the fixed overhead cost per connected customer, but argued that there is no reason for the incumbent to build a small site cheaper than a NAV can.

Further, some NAVs said that they were keen to develop smaller sites and noted that their advocacy for regulatory intervention (e.g. to speed up the application process and address the bulk supply pricing formula used by incumbents) was predicated on their ambition to expand into the 'volume' small-site market. They pointed to the fact that they could bundle connection services across all utilities, which gave them both the scale and financial capacity necessary to enter the NAV market and the potential to exploit economies of scope that incumbent companies by contrast did not enjoy.

Our assessment

In terms of last-mile local infrastructure build, we have seen little evidence to support the contention made by incumbents on economies of scale, given the extent of entry already seen by SLOs into the new connections market.[33]

Scale economies may be a factor in retail services, but NAV participants include players with retail activities in other sectors. Scale for operating local last-mile infrastructure may be a factor but, without evidence, it is not clear that this on its own would constitute a significant barrier. Finally, fixed costs per site such as NAV application cost may mean that only sites with certain scale may be worth going through a NAV application process for. Given that we have identified a number of potential process improvements to be considered, the requirement for scale caused by the cost of the application process may be reduced in future.

There may be an intrinsic efficient scale for a NAV to enter the water sector, due to business overhead considerations. We note that this should only affect how many new entrants can enter the market, rather than what size of site can be efficiently operated by NAVs (as existing NAV companies could operate those new sites). It is possible that over time, if strategic and regulatory barriers are addressed, that the number of sites supplied by NAVs will grow faster than the number of new entrants.

[33] A detailed study on the SLO penetration is outside of scope of our study on the NAV market, although we have been told by stakeholders that there is significant presence of SLOs in the North of England, where NAVs tend not to operate.

6.5 Information barriers

Summary of stakeholder views

A number of stakeholders cited a lack of awareness and understanding of NAV options amongst developers as a further barrier to entry. This was borne out by the limited entry to date. The HBF told us that members were interested in NAVs but agreed that the extent of knowledge was patchy – but also noted that the HBF was also making significant efforts to raise awareness amongst its members.

Some stakeholders felt it was important, in the context of perceived market dominance by incumbents, that incumbents should be required to inform developers about alternative supply options. They pointed to precedent in other regulated sectors. One stakeholder suggested, for example, that incumbents should be required to do the following.

- Advise developers that this is a competitive market and provide them with a list of NAVs.
- Advise NAVs of contacts from developers (above a given threshold for instance perhaps related to site area, numbers of properties to be developed and/ or estimated water usage).
- Publish their proposed charges for a particular development to give a NAV an opportunity to bid against this. Such a process they said would mirror that being proposed by Ofwat for the Water Resources market.

Our assessment

It would seem reasonable to suppose a lack of awareness of NAVs based on the feedback from stakeholders and the scale of entry to date. This is despite initiatives from Ofwat and the industry.

We note that there is regulatory precedent in other sectors, e.g. the electricity code for enhancing transparency about bids and alternative suppliers. For instance, in the electricity code there is a requirement for DNOs to publish 'convertible' quotations that make clear the contestable and non-contestable elements of the services sought. This would help both to ensure transparency and equivalence about charges for non-contestable services as well as highlighting where there may be opportunities for making offers on contestable services. We do not think it is necessary for incumbents to name specific alternative providers. For instance, Ofwat could list NAVs on their website and SLOs are anyway subject to an accreditation scheme which lists contact details.

We also note that it is important that such arrangements provide a balance, ensuring developer information is published with their consent and respecting appropriate levels of confidentiality.

However, we have reservations on the proposal to require water companies to publicise alternative supply options to developers, as precedent in the energy and retail banking sectors typically stops short of requiring incumbents to actually name their competitors in their offers to customers.

Options for addressing this issue might include the following.

- Ofwat to support trade bodies' efforts to raise awareness amongst members.
- Ofwat to consult with DCLG and developer representative organisations on how best to raise awareness of potential development sites.
- Ofwat to promote greater awareness through its own programme of communication and education.
- Ofwat requiring the incumbent to inform the developer when it provides a quote that this is a competitive market

Codes of practice to be developed to include requirements for incumbents to publish 'convertible quotations' when it provides developers with quotes for services, possibly including transparency about the scope of contestable and non-contestable services at potential sites.

7 COMPETITION ASSESSMENT – PRICING ISSUES

7.1 Summary of this section

In this section, we examine the pricing issues that may materially affect the ability of a NAV to compete in the markets in which they operate. The discussion is largely focussed on the market for developer services which is where there has been most entry, and which is likely to remain the area with the most potential for entry. However, we start with a short discussion of pricing issues for large user NAVs.

The discussion of NAV pricing issues in the developer services market follows the following structure. We separate out the issues for the two different models of vertical relationship that we identified in section 3.3.5:

- the 'full NAV' – where a NAV provides its own upstream services; and
- the 'bulk-supply NAV' – where a NAV pays an incumbent for upstream services through a bulk supply (discharge) price.

Since competition analysis considers whether pricing approaches inherent in the vertical relationship, result in an 'equally efficient' entrant being unable or restricted or prevented from entering the market, we consider first under what conditions an 'equally efficient' entrant should be able to enter the market. We then consider whether those conditions are met or not and the implications for entry. We identify the nature of the failure, for instance, if it reflects strategic behaviour by an incumbent, or other factors such as regulatory rules or legal requirements. In the course of this discussion we consider, among others, the impact of the following:

- incumbent operators' approaches to bulk supply pricing (price setting, rather than process which is discussed in section 6) and connections charges, which drive the input prices NAVs have been offered to date;
- legislation regarding 'income offset', which has driven approaches to connections charging;
- Ofwat's proposed new charging rules, which will change the rules and guidance around connections charging;
- the 'no worse off' criterion, which caps the prices NAVs can charge its customers;
- the RCV discount, which has a bearing on the level of end user prices and bulk supply pricing; and
- the degree to which bulk supply agreements may or may not enable NAVs to share in any positive externalities that NAVs may generate for incumbents' operations and costs.

These factors emerged as important from our analysis and stakeholder discussions. The importance of these factors differs between the two different forms of vertical relationship.

Finally, where we identify that there are factors constraining entry, we identify a range of possible remedies suited to the nature of the particular failure identified. These are then analysed in detail in section 9. We note that in considering options to encourage entry, Ofwat can balance short-term static efficiency considerations against longer-term dynamic efficiency considerations. However, those are policy judgements which go beyond the scope of this report.

7.2 Full NAVs

7.2.1 Conditions for efficient entry

When a full NAV competes with the incumbent on the entire wholesale value chain, it is only efficient if the total cost of building and operating all necessary infrastructure onsite from scratch is lower than the incumbent's own long run incremental cost (LRIC) in providing the full wholesale service to the site. The relevant cost should include capital charges and operating costs.

The LRIC may vary across an incumbent's region. It may be low where there is long term upstream spare capacity and conversely it may be high where there are capacity constraints (e.g. the catchment is fully licensed for abstraction and/or there are treatment or distribution bottlenecks) or where it is costly for the incumbent to connect, operate and maintain the site.

Only on the most challenging sites where the costs of new development are highest, could the incumbent's LRIC of connecting and supplying the sites be higher than the cost of building an onsite supply network from scratch by a full NAV (i.e. when a full NAV is more economically efficient than the incumbent). Therefore, efficient entry by a full NAV is only likely to occur on the most challenging sites. Equally, if they are able to bring innovation, the benefits in these areas may be significant.

7.2.2 Constraints on efficient entry

Stakeholders told us that full NAVs may be disadvantaged from competing with the incumbent even when they believed their ongoing cost of providing full wholesale service to the site is lower than the incumbent's LRIC.

We have identified two possible reasons why this may be the case. The first is due to the impact of end user charges being regionally averaged. The second is due to the impact of the RCV discount.

No worse-off criterion and averaged end-user prices

If end user charges are regionally averaged, then the 'no worse off' criterion means the NAV can only charge the customers at that level. So if the site is actually a high cost site and the NAV can reduce those costs but not to less than the average, then, other things being equal, it will not be able to compete. Conversely, however, if the site is a low cost site, but customers are paying average cost based bills, then a NAV could in theory enter if its cost is higher than the incumbent's as long as it is lower than the average bill. This would not be consistent with the efficient entry test.

In practice these factors are likely to be outweighed by the scale of the second factor, i.e. the RCV discount.

RCV discount and averaged end-user prices

The RCV discount embedded in water companies' existing network assets means the capital cost associated with these assets and recovered in prices is much less than that which would be associated with the new assets, such as a new entrant, or even an incumbent may need to provide for a new site.[34]

When an incumbent builds and serves a new site its bill to the customers on that site reflects the average cost across all its assets, not just the new ones on the site. The average will be lower than the new site costs, because the new site costs are added together with the existing infrastructure costs, which embody the RCV discount.

Therefore, the average cost that the NAV has to beat in supplying a new site, will be considerably lower than the incumbent's cost of serving a new site on its own, just because of the RCV discount on all its other assets which are averaged together with the new site. Even if the NAV can serve the new site more efficiently than the incumbent's LRIC this may not be enough to outweigh the impact of the RCV discount. Efficient entry could be deterred.

To identify options for reform so as to facilitate full NAV entry where it is efficient, and can lower costs to customers, it is important to consider the nature of the barrier identified. This is not a 'strategic' barrier to entry, but rather is due to the nature of regulated prices.

7.2.3 Full NAV model – pricing option remedy

The issue of the RCV discount is not new to the water sector, and the topic has been studied and debated in the context, for instance, of its being a potential barrier to upstream reform. In Ofwat's discussion of access pricing in the upstream water resource market,[35] the concept of a 'compensation payment' has been proposed to address problem the RCV discount poses to opening up the upstream market to bilateral 'in the market' competition.

A version of a similar compensation payment mechanism could, potentially, provide an option for pricing a full NAV. The text box below explains, at a high level, how this could work.

[34] The depreciation charge of these assets is less clear cut due to Ofwat's depreciation charge policy on infrastructure assets to date.

[35] Ofwat, Water 2020 regulatory framework for wholesale markets and 2019 price review – approach to access pricing

COMPENSATION PAYMENT MECHANISM FOR PRICING A FULL NAV

When a full NAV is proposing to serve a site to provide its entire wholesale service, independent of the incumbent's existing assets, the incumbent is required to provide a quote for a compensation payment equal to the difference between the incumbent's LRIC of serving the new site and the average wholesale cost, provided the former is higher than the latter.

Underlying this methodology is an assumption that when the LRIC of connecting and serving a new site is higher than the average cost of serving all existing customers, the incumbent is worse off connecting the site compared to letting a full NAV win the site.

If this methodology is followed properly, the incumbent should be indifferent from serving or not serving the site with the compensation payment taken into account. In other words, the incumbent would not have an incentive to understate the compensation, as it would mean that it ends up with serving a site more expensively than it would have been able to, if it had deferred to a full NAV to serve.

A clear challenge in this pricing option is the potential complexity involved in determining the incumbent's LRIC of serving the new site. We also note that any proposed pricing option to address the full NAV issues, needs to be consistent with Ofwat's wider policy on the pricing of upstream assets. That is beyond the scope of this study to provide a detailed analysis on that subject, and is also best addressed in the process of Ofwat developing its approach to pricing upstream assets more broadly, including wider consideration of possible alternative approaches. Given the evolving and broader nature of these pricing considerations, we do not assess this option in more detail in section 9.

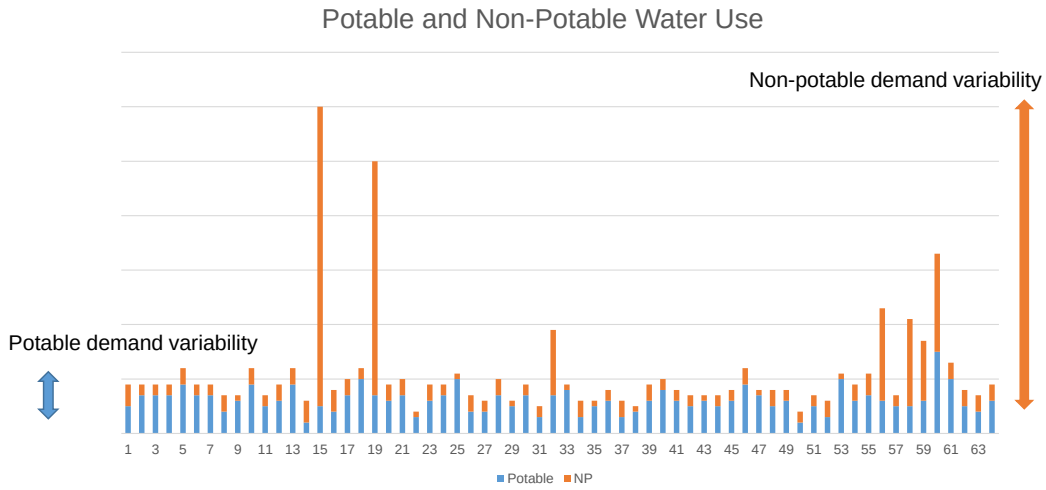
7.2.4 Full NAV model – positive externalities

Domestic water demand tends to be peaky in pattern. This may create upstream capacity constraints for incumbents. As a result, spare capacity is often built in to allow for this seasonal variation and to avoid shortages leading to demand constraint measures such as hosepipe bans, which may also attract financial penalties for the incumbent. Such measures may reduce their service performance as measured against their ODI performance target commitments.

On new sites in areas where peak capacity is already constrained, the new site's water demand could require significant investment by an incumbent in new capacity, or could bring an increased risk of service failure.

A wastewater NAV that proposes to include some recycling of the site's grey water to supply its non-potable water demand (e.g. toilet flushing and, in particular, garden use) could make the site's demand for potable water materially less peaky. Albion Water, for example, showed us its analysis of the peaky demand in water using data from its Rissington site. This is replicated in Figure 7 below.

Figure 7 Peaky demand in water



Source: *Albion Water*

Note: *This shows the effect on water demand during dry spells. Bars show water consumption per day.*

Albion's analysis shows that the peaky demand in water is predominantly in non-potable water. This is consistent with the view that hot summer days tend to require a disproportionate amount of extra water, typically due to garden hosepipe usage. With a conventional water supply system, all of the peaky demand is for potable water. The grey water recycle scheme turns that peaky demand into increased usage of non-potable water recycled onsite, which in turn results in a significant reduction in demand for potable water from the incumbent at peak times.

The benefit of lower demand for potable water (in a capacity constrained area) is two-fold:

- First, less potable water is consumed, lowering the amount the NAV would have to pay in bulk supply charges for water from the incumbent;
- Second, the incumbent avoids potential investment in upstream capacity.

Where the incumbent can avoid upstream costs, the wastewater NAV has created a positive externality for the incumbent on wholesale water services, which is currently not reflected in any price. If the NAV is only providing wastewater services, (with the incumbent providing water services), then it is arguable that some form of bilateral side payment to the NAV may be appropriate to internalise the externality.

However, an adjustment to the bulk water supply price or a side payment to a wastewater-only NAV might be challenging to implement as it might involve site by site calculation of the size of the externality. On the other hand, some incumbents have seasonal and non-seasonal (even) consumption tariffs for large business customers. The non-seasonal tariff already takes into account the fact that the user does not tend to have peaky demand (e.g. being a factory), and incorporates a discount compared to the seasonal tariff of equivalent volume.

Therefore, the incumbent's non-seasonal business tariff could, potentially, offer a starting point for assessing a proposed discount or side-payment, in recognition of the externality created by the NAV's management of peak demands.

In the case of adjustments to the bulk supply price for water, this would need to be seen in conjunction to the more fundamental reforms discussed next for pricing in relation to bulk-supply NAVs.

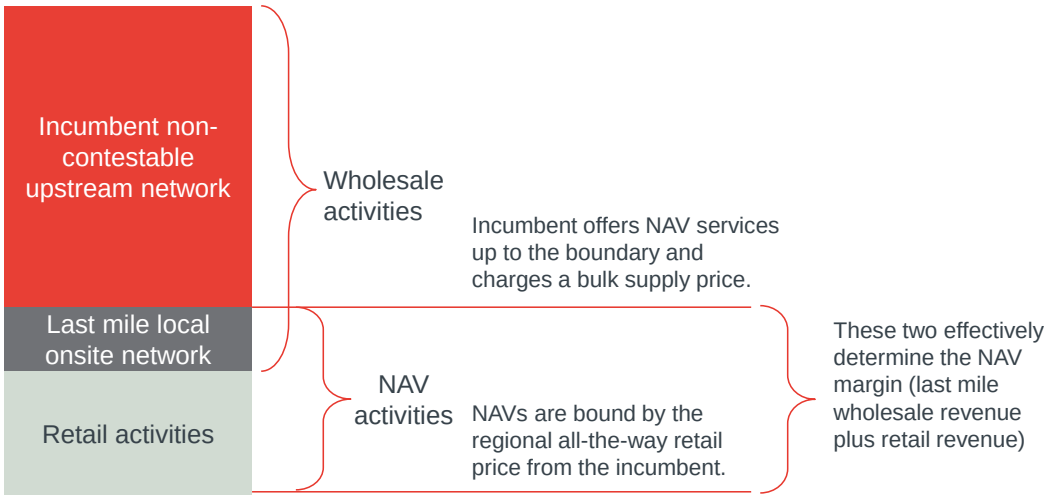
7.3 Bulk-supply NAVs - Issues on pricing

7.3.1 The vertical relationship explained

In this currently predominant model of NAV entry, NAVs operate in an environment where they are reliant on the upstream services provided by the incumbents, for which they have to pay the incumbents.

At the same time, under the 'no worse off' principle, NAVs are required to limit their retail tariffs to end customers to the incumbent's 'all-the-way' (ATW) retail tariffs. Figure 8 below illustrates the vertical relationship between a NAV and the incumbent in the area the NAV is looking to compete.

Figure 8 Vertical relationship between a NAV and the incumbent



Source: Frontier Economics, for illustrative purposes only.

As Figure 8 illustrates, the incumbents are currently the dominant players in the upstream wholesale market.[36] This implies that incumbents can set a price for the upstream service and that NAVs have no alternative supplier (other than self-supply as a Full NAV). The incumbent very often does not face competitive pressure to reduce its bulk supply price.

Meanwhile at the retail level, because the incumbents are vertically integrated, the ATW retail tariffs are also set by the same incumbents. Through the 'no worse off' principle, this sets the cap for the NAVs on the price they can charge the end customers.

These two prices mean that it is effectively the incumbent who sets the NAV margin. The only decision for the NAVs is on whether or not to enter the market.

[36] Ofwat's plan to introduce upstream competition could change this, and the potential impact is discussed in detail in section 8.

7.3.2 Conditions for efficient NAV entry

An equally efficient NAV should be able to compete with the incumbent if it can earn a sufficient wholesale margin to recover the costs of building, running and maintaining the on-site network. In particular, the two relevant factors are:

- the NAV's upfront investment costs, dependent on the total cost of building the site less the size of any contribution it can obtain from the developer; and
- the wholesale margin, dependent on how much it can charge its water and/or wastewater customers, the cost to operate and maintain the asset and how much it must pay the incumbent for the bulk supply service.

The wholesale margin needs to be sufficient for an equally efficient NAV to recover its upfront investment costs, in an equivalent way as the incumbent does.

NAVs have expressed concerns that this condition is not met, thereby constraining their ability to compete. We consider this next.

7.3.3 Constraints on efficient entry: the impact of legislation concerning 'developer contributions'

Determining the size of the upfront investment for any site is not straightforward, due to legislation which mandates a sharing of the investment costs of a new site between the incumbent water/wastewater undertaker (and ultimately its customers) and the site's developer. The drafting of the legislation is such that it is open to interpretation leading to concerns about transparency, consistency and fairness. NAVs consider that they have been unfairly disadvantaged. Ofwat's new charging rules have gone some way to addressing how the legislation is to be interpreted, and we discuss those after setting out our assessment of the existing situation.

The WIA91 stipulates that property developers are required to contribute to the costs reasonably incurred in providing the connection of public water services to the premises. The text box below sets out the legal background for such a contribution under the current charging arrangements, which are going to be replaced by new charging rules coming into effect in April 2018 for England.

LEGAL BACKGROUND

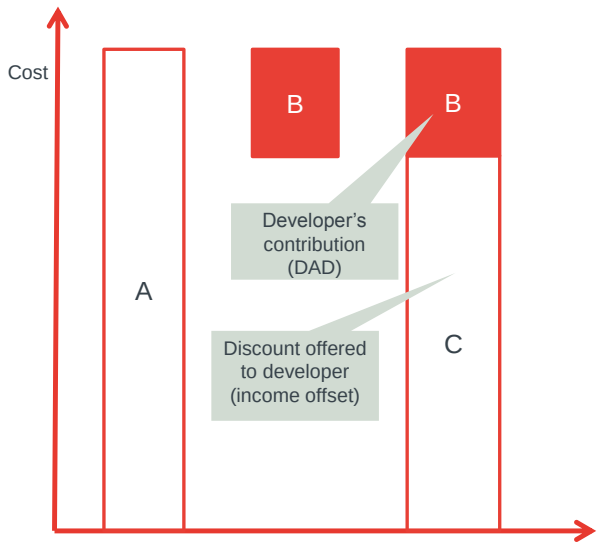
- Under sections 41 and 98 of the WIA91, owners or occupiers of premises are entitled to make a requisition request to water undertakers, and the water undertaker owes a duty to the person(s) making the requisition request to provide a water main/public sewer sufficient to supply water/drainage for domestic purposes (a main is used for a general supply to customers and opposed to a specific supply to a single customer and similarly a sewer is for general rather than specific purposes).
- Under sections 42 and 99 of the WIA91, a water undertaker can reasonably require undertakings and security for such undertakings. The undertakings

would bind the person(s) making the requisition request to pay either the relevant deficit for each of the 12 years following provision of the main or a single amount not exceeding the discounted aggregate deficit (DAD).

- Under sections 43 and 100, the 'relevant deficit' is a sum that is payable for each of the 12 years following provision of the new main/sewer. It is the amount by which the revenue in respect of the new main/sewer for the relevant year is exceeded by the 'annual borrowing costs' of a loan of the amount required for the provision of that new main/sewer (and certain other works that are necessary in consequence of the new main / sewer). In other words it is the difference between, in the case of a water supply, the capital cost of building the new main (less any additional capacity) and the water charges (over 12 years) that the water undertaker will receive in relation to the supply of water via the new main. In the case of a wastewater supply, it is the difference between the capital cost of building the new sewer (less any additional capacity) and the wastewater charges from the sewer (over 12 years) that the wastewater undertaker will receive in relation to the supply of wastewater services via the new sewer. Note that the provisions of section 51C of the WIA91 (in relation to self-lay of water mains) mirror section 43 to enable equivalence in the application of income offset.
- Under sections 43A and 100A, the 'discounted aggregate deficit' is calculated by adding together the estimated relevant deficit for each of the 12 years following provision of the main/sewer. For each relevant deficit within the calculation, a discount factor determined by Ofwat is to be applied in order to determine its net present value.
- However, the repeal of these provisions by the Water Act 2014 is expected to be in force by April 2018, and, combined with the new charging rules on connections discussed below will address most of the distortions that market participants have been concerned about.

Figure 9 below illustrates graphically how income offset and relevant deficit calculations affect how the contribution to the infrastructure cost is shared between the developer and water customers.

Figure 9 Relevant deficit and income offset



- **A**: Total cost of building the infrastructure for the site
- **B**: Relevant deficit (developer's contribution – paid to incumbent), calculated as the difference between the repayment of a 12-year loan on the cost of the site (A in chart) and all-the-way revenue from customers on the site, for the first 12 years. B in chart reflects the present value of the relevant deficit, also known as the Discounted Aggregate Deficit (DAD).
- **C**: Bill payers' contribution – goes into RCV to be recovered from incumbent's wholesale revenue.

Source: Frontier Economics, for illustrative only.

Area A represents the total cost of building the infrastructure to connect the new property development to the incumbent's upstream network. The developer is then asked to pay the difference between the cost of building the infrastructure for the site (broken down into 12 equal annuity payments with interest) and the estimated annual ATW revenue the incumbent is expecting to get from the future customers on this new site. If the latter is larger than the former, the relevant deficit is zero (i.e. there is no negative contribution). When all 12 years of relevant deficit is converted to a present value, this is known as the discounted aggregate deficit (DAD), represented by the red area B in the figure. C is then the income offset that the incumbent is offering the developer for building the infrastructure for the site.

In summary, B (the DAD payment) is the developer's contribution to the total cost of the site, and C (income offset) is the incumbent's contribution. The latter is added onto the incumbent's RCV and ultimately paid by the water customers.

It is this area C that constitutes the upfront investment for the incumbent and the recovery of it follows the standard regulatory treatment of the recovery of new infrastructure capex.

Once a NAV has been appointed, the incumbent does not have a duty to respond to a requisition (which will be outside of the incumbent's area of appointment). The text box below sets out the relevant legal context for a NAV.

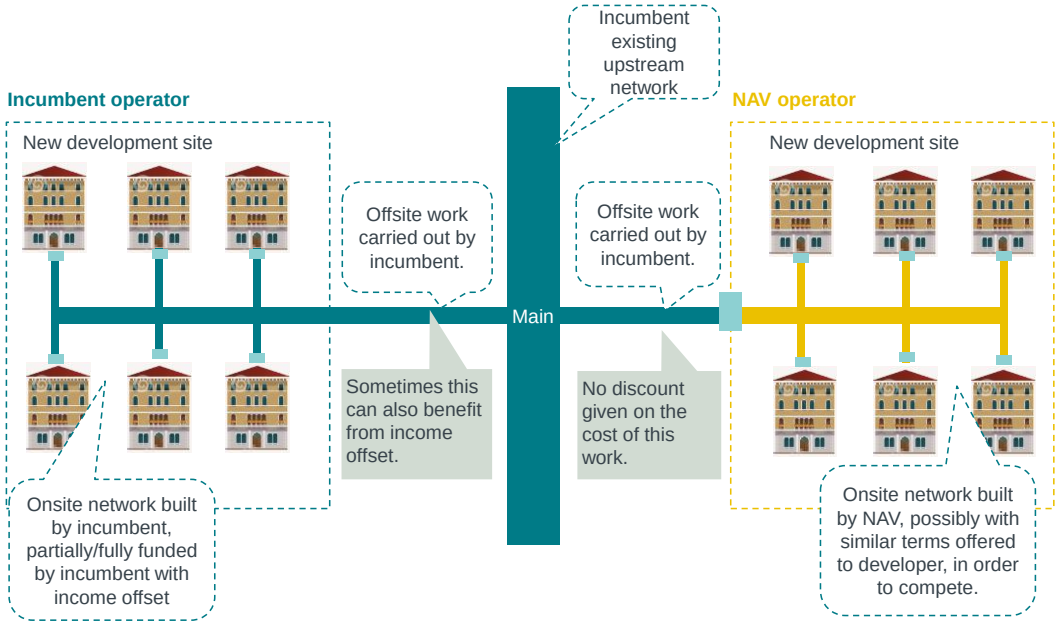
LEGAL BACKGROUND

- In contrast to a situation where a developer either makes a request to the incumbent water undertaker or appoints a third party to provide new connections (i.e. self-lay of water mains/sewers), where a NAV is appointed it will become responsible for providing the water mains/sewers as the new undertaker for the site.
- A NAV is not an owner or occupier within the meaning of sections 41 and 98 of the WIA91, so it cannot make a requisition request to the incumbent water undertaker. Instead, it has the responsibility of providing the water mains/sewers if it receives a requisition and must also pay charges to the incumbent water undertaker under the bulk supply arrangements.
- As opposed to the income offset approach for developers set out in the previous text box above, the WIA91 does not require the equivalent income offset approach to be applied to a NAV. The NAV will however receive the revenues from supplying the site.

The lack of 'eligibility' for an income offset for a NAV would not, in principle, be problematic for the NAV. An equally efficient NAV could incur the infrastructure cost of A, offer the developer a discount of the area C as a part of the 'deal' (so the developer pays the same area B as it would to an incumbent), and then recover the remaining cost C from its margins in future from the end customers on the site.

However, there is a complexity. When a NAV serves a site, there is often a part of the work related to connecting the site to the existing network that is done by the incumbent. This is generally offsite (e.g. reinforcement) work, with associated costs, we use the term here 'offsite costs'. The incumbent carries out the offsite work regardless of who is serving the relevant site. Figure 10 below illustrates this relation using a stylised example.

Figure 10 Onsite and offsite work with income offset



Source: Frontier Economics, for illustrative purposes only.

The calculation of income offset (expected revenue from the site for 12 years) is made against the total costs of both the contestable onsite work (that the NAV is competing to provide) and the non-contestable works (that only the incumbent can do to reinforce the existing network in the incumbent's area).

The income offset therefore could provide a discount against offsite works if, for example, the income offset is larger than the entire onsite cost. The onsite cost would be completely waived by the income offset, and some of the offsite cost would then benefit from the remaining income offset. However, if the site in question is to be served by a NAV, the best the NAV can offer the developer would be to bear the entirety of the onsite cost, but would not be able to provide an additional discount on offsite costs. This results in there not being a level playing field between the incumbent and the NAV for the competition of the contestable onsite work.

We consider that it is not the income offset *per se*, or the precise calculation of the quantum of the contributions from the developer or the bill payers that may have to date contributed to potential distortion of effective competition. Rather it is the fact that incumbents have the possibility to tilt the playing field of the contestable part of the market (onsite work) by providing differentiated offerings on the non-contestable part of the market (offsite work).

7.3.4 Constraints to efficient entry: the interplay of bulk supply prices and the 'no worse off' condition on NAV margins

The NAV margin is determined by the wedge between the bulk supply price and the incumbent's standard wholesale tariff (assuming equally efficient retail activities), given the 'no worse off' criterion on NAV end user pricing.

The relevant competition policy question is whether an equally efficient NAV is able to recover its last-mile cost with the margin set by the incumbent.

In the water industry, there has been no fixed rule on what the most appropriate bulk-supply price is for incumbents to charge NAVs for the upstream wholesale services they provide. In principle, the exact terms of the bulk supply price is subject to commercial negotiation between the NAV and the incumbent. However, in practice, NAVs told us that because of the incumbent's monopoly position, the bulk supply price was largely determined by the incumbent.

Before incumbent companies were required to publish separate wholesale tariffs starting from PR14, we understand that the retail large user tariff (LUT) was used by many incumbents as the default option for bulk supply pricing towards the NAVs.

A number of incumbents have defaulted to their retail large user tariff (LUT) schemes as the basis of setting a bulk-supply price for NAVs operating in their areas.

Incumbents point to Ofwat guidance as underpinning their approach.[37]

Ofwat explains in its guidance that, in many respects, a new appointee may often share the same cost characteristics as a large user from the relevant incumbent's point of view, such as:

- the delivery of a large amount of water to a single point of supply;
- one customer to manage; and
- no use of the local distribution network.

In conclusion, Ofwat states that:

> *"We therefore consider it sensible for parties to use the relevant large user tariff as a basis for negotiations where the new appointee's forecast demand qualifies. Any costs that the relevant appointed water company will incur or not incur as a result of the new appointee serving the site should be added or deducted, respectively from the bulk price."*

We note that Ofwat's guidance suggests the LUT as a 'basis for negotiations' rather than being the rule, default or benchmark for pricing and that it should be adjusted to take into account any costs that the incumbent will incur or not incur.

Incumbents have also expressed their concern over offering anything else than the LUT as the bulk supply price to NAVs operating in their areas, as they argue that they are required by regulation not to exercise undue price discrimination with respect to customers who require similar services at similar cost levels.

By contrast, NAVs generally perceive a bulk-supply price based on a retail LUT from incumbents as not fit for purpose within a competitive environment. They consider that in many cases it forecloses NAVs' potential entry into the developer service market.

The main issue with the LUT identified by this study is that it may not provide sufficient NAV wholesale margin for small and medium-sized property development sites. The LUT is usually designed assuming a large volume of consumption and, with a high fixed charge and low volumetric charge, large users can benefit from an overall lower wholesale charge compared to a standard wholesale tariff at that volume level.

[37] Ofwat website, NAV section on bulk supply pricing negotiation approaches.

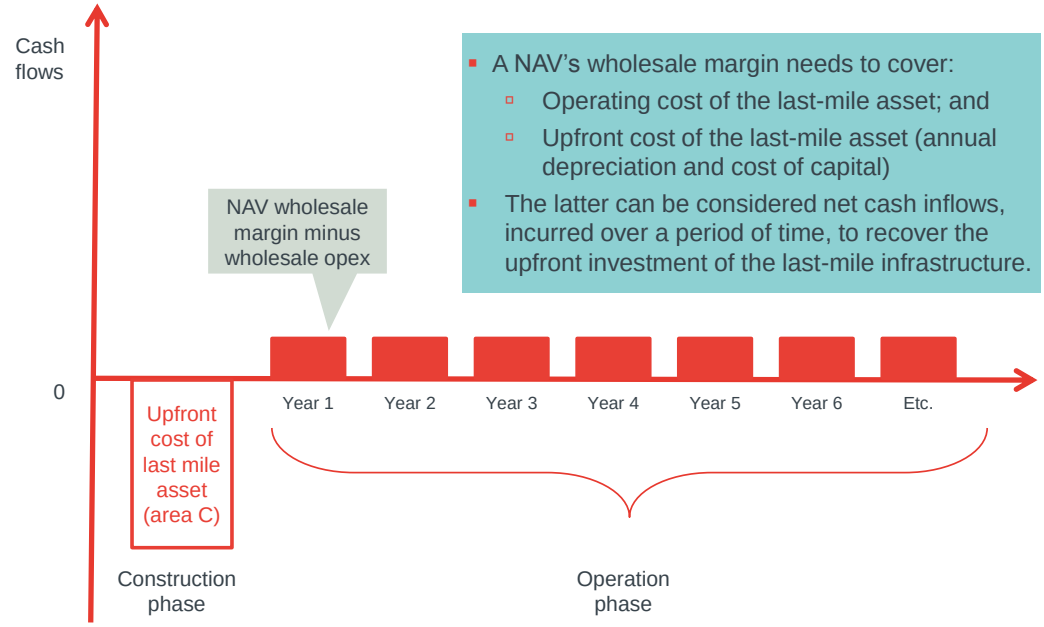
As such the LUT may only represent a discount over the standard wholesale tariff after a certain size threshold is reached. Given that not all sites that NAVs could potentially operate in will be larger sites, with the same high levels of consumption, the LUT is not ideal as a one-size-fits-all solution bulk supply price for NAVs.

Since PR14, with the required separation of wholesale and retail tariffs, some companies have switched to using the business wholesale tariffs (according to appropriate volume bands) as a basis for the bulk supply price for NAVs. However, this may also lead to an insufficient level of margin for NAVs for the smaller development sites. This is because on smaller sites, the consumption volume is unlikely to be high enough to qualify for volume discount, meaning that the wholesale tariff would be at a similar level as the one applied to single residential customers. This would leave the NAV no margin to recover its last-mile cost, including:

- operating cost of last-mile infrastructure asset;
- the recovery of the principal plus a return on the upfront investment related to the construction of the last-mile asset, which can be expressed as a stream of future cashflows;

Figure 11 below illustrates this concept in a stylised cashflow chart.

Figure 11 Recovery of a NAV's upfront investment cost



Source: Frontier Economics, for illustrative purposes only.

The red bars represent the positive cash flow needed from the wedge between the bulk supply price and an equivalent of a residential wholesale tariff (the wholesale charge component of the incumbent's residential customer bill). This is needed in order to recover the two elements of the last-mile wholesale costs explained above. It is clear that when this wedge is zero (i.e. if the standard business wholesale tariff is equal to the residential wholesale tariff), the red bars would be zero and no upfront investment can be recovered.

However, as the size of site increases, the volume discount in the business wholesale tariffs comes into effect. It is then less clear whether or not at higher volume bands the business wholesale tariffs still provide insufficient NAV margins. The fact that some NAVs currently operate at higher volume bands using business wholesale tariffs as bulk supply price may suggest that the margin at those levels are less of a concern.

The NAVs we interviewed stated that, in their view, current industry practice on bulk supply charge renders any development sites below the size of roughly 500 properties economically unviable.

The HBF has told us that the majority of new developments are between 50 and 200 properties. This is consistent with the view held by NAVs that they cannot compete for the majority of potential sites due to the current the bulk supply prices offered by the incumbents.

IWNL has shown us its own calculation based on the volumetric charge on different wholesale tariff bands (which could be potentially used to set bulk supply charges) for incumbents from different regions. We report its analysis in Figure 12 below.

Figure 12 Volumetric tariff bands by number of properties

VOLUMETRIC THRESHOLD	0 m3	500 m3	750 m3	1000 m3	2000 m3	3000 m3	4000 m3	5000 m3	10000 m3	20000 m3	25000 m3	50000 m3	100000 m3	150000 m3	162000 m3	175000 m3	180000 m3	250000 m3	342000 m3	500000 m3	750000 m3	1000000 m3	2800000 m3	3000000 m3
APPROXIMATE SITE SIZE	1 plot	5 plots	7.5 plots	10 plots	20 plots	30 plots	40 plots	50 plots	100 plots	200 plots	250 plots	500 plots	1000 plots	1500 plots	1620 plots	1750 plots	1800 plots	2500 plots	3420 plots	5000 plots	7500 plots	10000 plots	28000 plots	30000 plots
Affinity Central	1	1	1	1	1	2	2	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4
Affinity East	1	1	1	1	1	2	2	3	3	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
Affinity South East	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
Anglian	1	2	2	2	2	2	2	3	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Anglian Hartlepool	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Bournemouth & West Hampshire	1	1	2	2	3	3	4	4	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6
Bristol	1	1	1	2	2	2	2	3	3	3	3	4	5	5	5	5	5	6	6	6	6	6	6	6
Cambridge	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Dee Valley Chester	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Dee Valley Wrexham	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3
Dwr Cymru	1	1	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	4	4	5	5	6	6	6
Northumbrian	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	4	4	4	4	4	4	4	5	5
Northumbrian Essex	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	4	4	4	4	4	4	4	4	4
Northumbrian Suffolk	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	4	4	4	4	4	4	4	4	4
Portsmouth	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
Severn Trent	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
South East	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	4
South Staffordshire	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
South West	1	1	1	1	1	1	1	1	1	1	1	2	3	4	4	4	4	4	4	4	4	4	4	4
Southern	1	1	1	2	2	2	2	3	3	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5
Sutton East Surrey	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
Thames	1	2	2	3	3	3	3	4	4	5	5	6	7	7	7	7	7	8	8	8	8	8	8	8
United Utilities	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	5
Wessex	1	1	1	2	2	2	2	3	3	3	4	5	6	6	7	7	7	8	9	10	10	10	10	10
Yorkshire	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3

Source: *IWNL*

Note: *Numbers and colour code denote different tariff bands – a higher number indicates a lower volumetric charge per m^3 of consumption.*

IWNL told us that there is no uniformity in the structure of charges for large industrial and commercial users. Different incumbents would offer different bulk supply charges to NAVs in their area based on different tiers of their tariff structure. As a result, according to IWNL, NAVs are more likely to operate viably in regions where the wholesale tariff falls into a relatively high band with relatively small size of development, such as Thames, Anglian, Southern and Wessex shown in the table.

The above table does not explicitly take account of the scale of discount between each band, which could vary materially. However, we note that most NAVs do appear to operate in the Thames, Anglian, Southern and Wessex regions.

This pricing structure may be one of the factors contributing to the current situation that most NAVs are concentrated in the south of England, while the north of England has gravitated towards the SLO model for local infrastructure (as SLOs are not affected by the bulk supply price).

Apart from the pricing structure, there is another element that may constrain efficient entry, which is to do with the RCV discount in the water sector. Due to the RCV discount, the wholesale price (and therefore ATW price) does not necessarily reflect the MEAV of the cost to provide the relevant service, i.e. if someone were to build all the assets from scratch today the cost of providing the current service would be higher than the price customers are currently paying. Although this in itself can be beneficial to water customers, one of its implications is that a cost-reflective bulk supply price may not serve the purpose of facilitating efficient entry. This is because a cost-reflective bulk supply price would result in a NAV margin that also contains an element of RCV discount, due to the ATW price containing the RCV discount. An equally efficient NAV would not be able to benefit from any RCV discount on its asset, and therefore would find the margin provided by a cost-reflective bulk supply price insufficient for it to compete.

In conclusion, it would appear that neither the retail LUT nor the standard business wholesale tariffs are likely to provide sufficient margin on relatively small sites, although there is evidence that on larger sites the margin may be sufficient. We consider this to be potentially a contributor to the observed trend that currently NAVs tend to operate on relatively larger sites.

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7.4 Bulk-supply NAVs: options for pricing remedies

7.4.1 Options to address the impact of the income offset

Income offset is provided to developers towards the cost of the work carried out by incumbents, according to the requirement set out in legislation. As explained in section 7.3.3, it is not always clear whether or not the offsite cost has benefited from income offset. We have explained above that that would distort the playing field as between incumbents and NAVs in serving a developer.

We consider that there is a strong case for considering income offset separately for onsite and offsite work:

- Onsite work is the contestable part of the market, for which income offset is directly linked to the calculation of an appropriate NAV wholesale margin as explained in section 7.4.2; whereas
- Offsite work is non-contestable (carried out by the incumbent regardless of who operates the site).[38]

[38] We have been made aware by some incumbents that in fact there are 'off site' works that NAVs can carry out as well, but NAVs seem to choose not to do it for unknown reasons. For the purpose of this discussion,

Ofwat's new charging rules on connection charges which will come into effect in April 2018 will eliminate most of the potential distortion created by the income offset that incumbents could hitherto provide on offsite/non-contestable work. The new charging rule requires all offsite cost to be charged by means of an infrastructure charge, and only the onsite cost (contestable) can be recovered from the requisition charge. At the time of writing, Income offset is only allowed to be set against the requisition charge.

This implies that incumbents will no longer be able to leverage their quote in offsite work in order to disadvantage NAVs for competition for onsite work. An equally efficient NAV would be able to offer an equivalent amount of income offset for the onsite work as the incumbent, and recover this from its margin in future years.

The new charging rule has also made it possible for companies to determine their infrastructure charges more flexibly, reflecting all the offsite cost on a site-specific basis. We understand Ofwat intends to consult on a proposal, for year 2020 onwards, to require incumbents to provide income offset only on the infrastructure charge, rather than the requisition charge. This would mean that developers might pay lower infrastructure charges (i.e. encompassing offsite work, less the income offset) but would be required to pay all of the onsite costs (with no income offset). Companies would need to comply with Government's requirement that any changes to how income offset is addressed must overall maintain the current balance between what developers and water customers pay for new site development.

Under this Ofwat proposal, NAVs would no longer contribute to the onsite cost of development, which would be entirely borne by the developer. For offsite costs a NAV would attract the same infrastructure charge (and discount) as would the developer going straight to the incumbent for services.

One caveat to note is that the new charging rules only apply to companies whose areas are wholly or mainly in England. Ofwat is looking to set new charging rules for Wales when the Welsh Government has put in place its guidance to allow this to happen. The analysis on pricing options in this study therefore only applies to companies in England.

We evaluate the two options in setting income offset (i.e. based on setting it against the requisition or infrastructure charges) in more detail in section 9.

Finally, a NAV has proposed an alternative option to resolve the income offset issue. This involves all existing suppliers paying into a fund on a proportionate 'per connected property' basis. When a new site is built the fund goes to the party who wins the contract to build the site. Although interesting, we consider this model a significant departure from the underlying established government policy principle of any new infrastructure cost being shared between the property developer and new customers. This is because, in this model, it would be the existing customers rather than the new site's customers who will pay for the site. We therefore do not consider it in more detail.

we will detract from this consideration, and treat any work that is done by the NAV as onsite and then all work done by the incumbent as offsite.

7.4.2 Options to address the impact of bulk supply pricing

To address the question as to what is an appropriate basis for the incumbent to set its bulk supply price for the NAVs we return, as a starting point, to the concept of the margin that facilitates efficient NAV entry. More specifically, if the incumbent itself can operate the last-mile service using the margin derived by its ATW customer price and its bulk supply price to the NAV, then the incumbent is setting a bulk-supply price that would allow an equally efficient NAV to enter the market and compete for the last-mile service.

We now turn to discuss options for pricing policies that could help encourage efficient entry. The text box below describes Ofwat's legal powers to set pricing rules for the bulk supply price.

LEGAL BACKGROUND

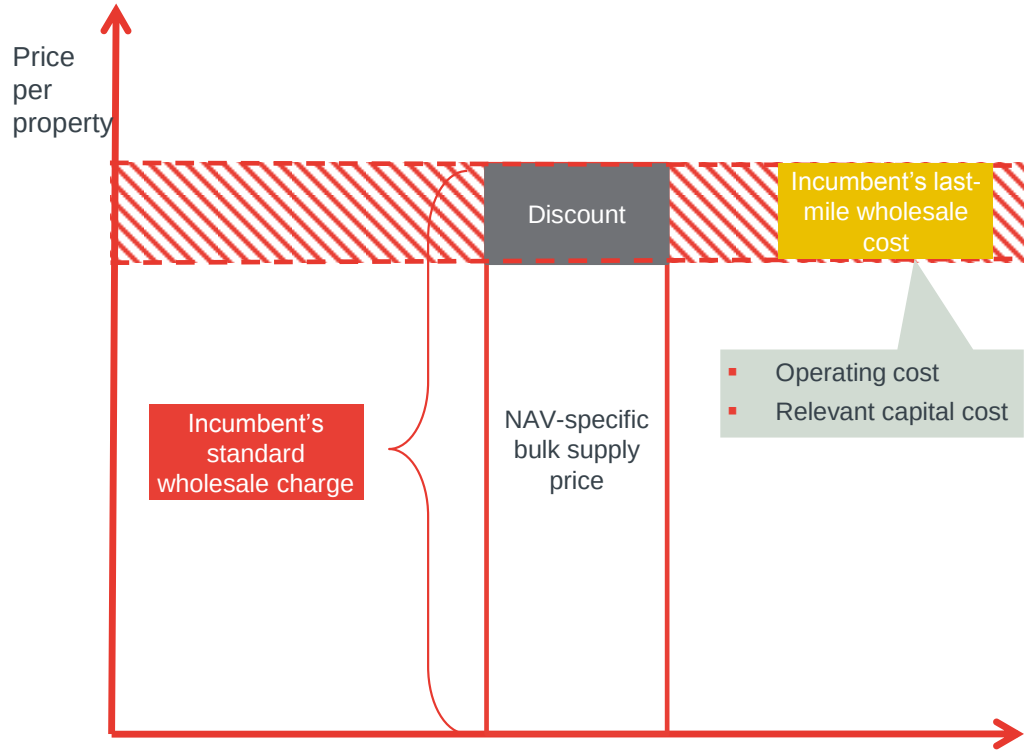
- Ofwat has powers under section143B of the WIA91 to make rules about charges schemes made by an undertaker under section 143, which may include fixing the charges to be paid for any services provided by the undertaker in the course of carrying out its functions).
- Section 8(1) of the Water Act 2014 (WA14) amends section 40 of the WIA91 to allow for Ofwat to also issue charging rules in respect of bulk supply agreements. These powers are described in more detail in Annex A. Section 9(1) introduces similar powers in relation to s110A.
- Parallels can be drawn with Ofwat's new connections charging rules, and wholesale charging rules and it may be worth considering whether aspects of those rules could be adapted for the bulk supply regime.
- As Ofwat will have the power to introduce a statutory code of practice and statutory charging rules when the relevant provision in WA14 is commenced, and there would be no need for Ofwat to introduce changes to water suppliers' licence conditions in order to address price and non-price terms of bulk supply (in contrast with Ofgem).
- There is no obligation on Ofwat to issue codes and rules and there is nothing that would preclude Ofwat from considering whether to introduce guidance and/or voluntary industry measures as an alternative.
- However, any guidance or other measures issued by Ofwat could not contradict any legislation, including in relation to any changes to the ability to charge for infrastructure services.

Earlier in this section we identified that current pricing on the basis of average costs, encompassing the RCV discount, would not enable an equally efficient NAV to recover a margin sufficient to recover efficient last-mile costs.

In this context, we consider a wholesale-minus approach could offer a reasonable starting point for considering how to set the bulk supply price, as illustrated in Figure 13 below. The purpose of this approach would be to ensure that the discount to the wholesale tariff for bulk supply reflects the efficient costs of serving the last mile for new sites by the incumbent. In that way, given the 'no

worse off criterion' as a constraint on end user pricing, it could help to that the margin for an equally efficient NAV would be adequate.

Figure 13 Wholesale-minus bulk supply pricing



Source: Frontier Economics, for illustrative purposes only.

The approach might be described as follows:

- The starting point could be the wholesale component of the incumbent's single residential customer bill. This could be equal to the standard business wholesale tariff.
- Estimate the last-mile wholesale cost that the incumbent would incur if it were to serve the site. As explained in section 7.3.4, NAVs' wholesale costs include the operating costs of the last mile and the capital cost for the asset. The relevant components of these need to be subtracted from the wholesale charge, as explained below.
- Regarding the capital cost, it should reflect the long run average incremental cost of providing the last-mile wholesale services. Even though it can be estimated using historical data, it should focus on recent new builds. In other words, it should not involve taking an average of the incumbent's existing legacy last-mile network. By focusing the estimate on recent new builds, it sets a benchmark that an efficient entrant can reasonably hope to out-perform and consequently compete against. In contrast, if the estimate incorporates historic elements (such as the RCV discount in the water sector), it can result in distortion of the actual cost of providing the last-mile wholesale services.
- In principle, the discount could be calculated on a site-by-site basis, for efficient entry to be facilitated on each site. However, this can be

cumbersome and time-consuming to the detriment of all parties involved. Therefore, an average approach may be a more reasonable option.

- If the wholesale cost of serving the last-mile is not entirely proportional to the number of properties on the site, the calculation of this discount may need to be tiered such that it reflects the situation that cost per property might be different as the size of the development increases.
- Furthermore, to convert the upfront investment cost into an appropriate stream of future cashflows in the form of a wholesale margin, an appropriate discount rate and asset life need to be assumed in the calculation. One reasonable way to define these assumptions is to mirror what the incumbent does when converting the equivalent cost of building the asset into capex rolled into the RCV in the regulatory accounts. The same treatment could be used to calculate the discount for the NAV.
- Under the current and new charging rules for April 2018, it is important to only account for the income offset component of the last-mile capital cost and not the entirety of it. The part that is paid by the developer should not count towards the last-mile upfront investment cost for the incumbent (or the NAV).
- Alternatively, if a proposed new charging rule for 2020 is effective such that income offset is put against the infrastructure costs (non-contestable work), there will be no more upfront investment as all of the onsite cost would be paid by the developer. In that scenario, the wholesale-minus bulk supply price simplifies to standard business wholesale tariff minus the operating cost of the last-mile assets.
- Once the above discount is estimated appropriately, it can be applied to the standard business wholesale tariff, and the resulting tariff can then be used as the bulk supply price from the incumbent to the NAV.

An approach such as this should ensure that the resulting bulk supply discount for NAVs reflects the true incremental cost for the incumbent to add this site into its existing wholesale price control. By removing this site and not carrying out the work, the incumbent's average cost of serving its existing customers will remain the same.

One caveat on this pricing model for the bulk supply agreement is that this would be applicable only to NAVs serving domestic and small businesses, where the NAVs would build onsite assets and the water customers themselves are not eligible for volume discount. The circumstance would be different if the NAV is serving a large user, where the NAV would not need to invest in local onsite infrastructure. In that case, the appropriate bulk-supply price would be the relevant wholesale tariff for large users.

8 LONGER-TERM IMPACT ON THE WIDER WATER SECTOR

This section discusses the longer-term impact of the NAV market on the wider water sector as a whole. More specifically,

- It addresses one concern pointed out by some stakeholders that a thriving NAV market would imply that only cheaper-to-serve sites would be taken up ('cherry-picked') by NAVs, leaving the most expensive ones with the incumbents (an effect known as de-averaging);
- It considers the prospect of NAVs in the context of the retail market opening for business customers, and in particular the potential residential retail market opening; and
- It considers the future role of NAVs in the context of water upstream reform, and examines potential adaptations to the charging arrangement for NAVs.

8.1 Impact of de-averaging

The concern of de-averaging relates to the situation where there is a variation in cost to connect and serve a new site, and with a thriving NAV market, the lower cost sites would be most contested by NAVs. Because the incumbent has the statutory obligation to connect any site in its area, it follows that the incumbent would be left with the most expensive sites. In the longer term, this would increase the average cost base of the incumbent and would lead to an increase in standard wholesale cost/price and, assuming a constant retail margin, an increase in end user prices for the incumbent's remaining customers.

These are reasonable concerns regarding the longer-term interest of the wider water sector. It is therefore worth considering in further detail the conditions under which these concerns could become material. Ofwat could then take into consideration any trade-off between this potential issue and the potential benefits which could arise from a thriving NAV market, when making policy decisions affecting the future of this market.

To assess the potential materiality of the de-averaging issue, we examine two potential sources of cost variation between sites:

- The likely impact of any variation in the cost of connecting new sites to the existing network;
- The likely impact of any variation in the cost of maintaining different sites (cost to serve); and

In assessing the likely impact of the above, we take account of the context of the new charging rules and a bulk supply pricing policy based on a wholesale-minus approach.

8.1.1 Variation in cost of building and operating the last-mile infrastructure

Stakeholders suggested that the cost of connecting a site to an existing network may vary significantly. It could depend on factors such as the proximity of the site to existing infrastructure, the topography of the area between the existing infrastructure and the site, and other geographical or human-related obstacles between the existing infrastructure and the site (e.g. rivers, roads, tunnels, contaminated land).

Most of these costs can be classified as offsite cost, which under Ofwat's new charging rules will be treated in the infrastructure charge levied by the incumbent (including any discount) regardless of who the supplier is. And the wholesale minus approach would mean these costs were not included in the margin available to the NAV, so any averaging would not affect their entry incentives.

Once onsite, the connection of each property to the boundary would appear to be relatively homogenous in cost for the NAV or incumbent, regardless of the nature of the site. To the extent that the physical characteristics of the site may differ (such as different soil types or contaminated land), NAVs have informed us that it is normally up to the developer's own construction team to provide the necessary trench for the water connection company only to lay down the mains. In that sense, the nature of the onsite work would not appear to impose a significant degree of cost variation from site to site.

Apart from the anecdotal evidence above, we have not found any evidence to suggest the existence (or otherwise) of a significant degree of cost variation for building onsite work for connecting new properties.

Even if the degree of onsite cost variation were nevertheless a real issue, a potential mitigating method would be to allow/encourage the incumbent to provide tiered bulk supply charges, based on the cost of the site. For example, there could be two bulk supply prices, calculated based on high and low cost scenarios and offered accordingly to the NAV depending on the nature of the cost of the site. This tiered bulk supply charges could also be used where there is evidence of a non-linear last-mile cost per property in relation to the size of the development site.

Furthermore, if the proposed new charging rule regarding setting the income offset against the infrastructure charge is put in place from 2020, then any cost variation on onsite cost would become irrelevant as the entirety of onsite cost would be borne by the developer, and the NAV would have no more headroom to cherry pick.

8.1.2 Variation in cost of serving different sites

Stakeholders also suggested that long term escalation of existing incumbent customers' cost to serve and bills, as a result of NAV entry, could come from two sources:

- either the NAVs exploiting sites with lower than average new site costs to maintain, or

- the fact that NAV sites are by virtue of their being new, cheaper to maintain than the stock of incumbent old sites.

During the course of our review, we were not presented with evidence that the maintenance costs for new sites varies between sites. Again, if there was an issue, a potential mitigating method would be to allow/encourage the incumbent to provide tiered bulk supply charges, based on the cost of the site, similar to the above.

On the matter that newer sites may be cheaper to maintain and if NAVs take all new sites this might leave incumbents with old sites, we find this not to be an issue with the suggested wholesale-minus bulk supply pricing policy. This is because the standard wholesale charges would include the average cost to serve the incumbent's existing sites and the 'minus' component would reflect the cost to serve the new sites, and to the extent that there is a differential between the two this would be fully accounted for in the sulk supply charge and paid back to the incumbent from the NAVs.

8.1.3 Conclusion on de-averaging

Hence we can conclude at a high level that, assuming the new charging rules eliminate the distortion caused by income offset on offsite costs, and the RCV discount issue is addressed via a wholesale-minus approach, for example, there is likely to be little impact on the wider water sector and water customers from greater NAV entry, in respect of de-averaging.

8.2 Impact of retail market opening

In this section, we examine the impact on the NAV market of the retail market being opened to competition. The business retail market is now open to competition since April 1st 2017 and the opening of the residential retail market is under review by Government. Here we suggest a number of options that could be considered to improve the way the NAV market functions, in the context of the retail market being opened to competition.

8.2.1 Change in market definition

With the opening of the retail market (business or residential customers) to competition, the definition of the market that NAVs operate in changes. In particular, the customers of a NAV will be free to choose their retailer, leaving the NAV as the provider of wholesale services (and operator of the local network). The NAV will be free to choose whether it stays in the retail market or exits.

The opening of retail markets extends the markets that NAVs operate in from two to four different markets.

- First, it operates in the developer services market as usual, competing with SLOs and incumbents to build or build and operate the site;
- Second, as an individual very large user, it competes with the incumbent to take over the water and/or wastewater supplier role;

- Third, it now also competes with licensed retailers for the business customers on its site (unless it exits the retail market); and
- Fourth, it may in future also compete with licensed retailers for the residential customers on its site (again, unless it exits the retail market).

8.2.2 Change in pricing

The change in market definition, however, would not introduce substantive additional complexity to the bulk supply pricing options discussed in section 7 to facilitate efficient entry. This is because the options are in any event based on wholesale charges.

In our discussion of bulk supply pricing in section 7 we assumed an equally efficient NAV in retail activities can enter and compete with the incumbent as long as the wholesale bulk supply price is appropriate.

This principle still holds with retail market opening. If the NAV is at least as efficient as other licensed retailers, if would be able to compete with them to keep its customers. Currently, however, we have heard concerns expressed by NAVs regarding the wholesale charge they are required to set to allow retail licensees to compete for the business retail customers on their sites.

The issue, we understand, stems from the fact that the current bulk supply price offered by the incumbent is the standard wholesale tariff (see section 7.3.4). When required to set its own wholesale tariff, the NAV has to set it at the same level as the incumbent's standard wholesale tariff. This means that it would in effect have to provide the last-mile wholesale service free of charge (opex and capital charge), as the standard wholesale tariff offers no discount to reflect the fact that the incumbent does not have to provide last-mile services. This would lead to a loss that the NAV would need to absorb.

In contrast, if the NAV sets its wholesale tariff at a level equal to the bulk supply price plus its last-mile wholesale cost it could be exposed to margin squeeze complaints from retailers for setting a wholesale tariff which is higher than the incumbent's, as the retail licensees would not be given sufficient retail margin to compete in the NAV's area given the NAV's wholesale price and the retail ATW price set by the incumbent.

In the event of full residential retail market opening, this would potentially become a much more significant issue for NAVs. The issue, in our view, could be mitigated if the bulk supply price were set according to one of the two options discussed in section 7.4.2.

8.2.3 Implications for NAVs in future

With retail market opening, retail charges are no longer regulated, except in the early stages of the market opening, by default tariffs for business customers. An immediate ramification is that the relative price control for the NAVs might need to be re-examined.

In the early market stage, with default tariffs in place, the incumbent's default tariff might provide an interim benchmark for the 'no worse off' criterion.

However, when regulated default retail tariffs disappear and all retailers are free to set their commercial retail tariffs to compete with one another, it is unclear how the 'no worse off' principle should be applied. This is a policy question that Ofwat has already identified for resolution in the near future. The same question will become more relevant if regulated residential retail tariffs also disappear.

One option would be to recalibrate the relative price control onto NAV's wholesale charge, and allow them to set their own retail charges like other licensed retailers. However, there may be legislative challenges for the implementation of this option. It is beyond the scope of this study to analyse this in further detail.

In any event, a competitive retail market would require NAVs to open their retail business to competition, which would sometimes mean that they lose their retail business to licensees. A NAV without a retail business could be considered an appointed operator of the local infrastructure. Some NAVs have told us that they would actually prefer this model, where they do not operate in the retail business but specialise in the building and operating of the local infrastructure. Multi-utility NAVs such as IWNL and SSE Water already operate local infrastructure in the energy sector without the retail arm. Going forward, with retail competition this could be the model some NAVs adopt in the water sector as well.

8.3 Impact of upstream reform

Upstream reform which introduces competition for water resources and sludge treatment could bring changes to the current NAV operating model. This can be related to the way the NAV is charged by the incumbent for upstream services and/or the way NAVs charge their own downstream operation for upstream services.

Upstream competition would bring alternatives to the upstream service provided by the incumbent, which would imply that NAVs may no longer rely on incumbents' bulk supply.

Instead, considering first the case of water supply, if NAVs choose to purchase water resources in the competitive upstream resource market, they would only need to pay access charges to incumbent(s) through whose network the resource needs to be distributed. Indeed, if some do not operate in the retail market, they may need to charge the retailer an access price for the use of their own last-mile infrastructure.

Similarly for wastewater, if NAVs choose to purchase bioresources in the competitive upstream bioresources market, they would only need to pay access charges to incumbent(s) through whose network the bioresources needs to be distributed.

In the electricity market, retailers pay a regulated distribution use of system charge regardless of whether or not the last-mile distribution network is built by the incumbent (DNO) or a new entrant (IDNO). In the case of an IDNO, the DNO pays the IDNO a share of that income according to the proportions of usage and customer numbers between the DNO and the IDNO.

However, some additional complexity may be involved if the same model is applied in the water sector. For example, NAVs' access price (i.e. price for accessing its local network) may not include any averaging as it will be site specific, whereas an incumbent's access price will most likely involve averaging, and potentially a degree of RCV discount reflected in the capital charge. This could imply that, to encourage efficiency, the appropriate way to set the NAVs' access charge might be the total 'network-plus' charge (i.e. the charge for upstream water network plus treatment) minus a discount calculated specifically for the NAVs to reflect an efficient forward looking cost of water resource supply.

This will need to be in line with Ofwat's policy on how to transition the current wholesale tariffs to access charges for incumbents' regulated 'network-plus' part of the business. This is still in the early stages of development and further consideration is outside the scope of this study.

9 OPTIONS FOR REFORM

9.1 Introduction

We identified in section 6 and 7 that there were a number of factors that stakeholders considered were causing an impediment to effective competition by NAVs in the relevant developer services market. On the basis of the evidence we have reviewed, there appear valid reasons to believe such factors are holding back NAV participation in the market. We note however, that this assessment is based largely on qualitative and only limited (and confidential) quantitative evidence received.

In this section we now bring together the various options that could be considered to address these issues. These were identified in sections 6 and 7, but are assessed in more depth here. We provide first some general considerations that underpin our assessment. We then bring together the options for reform to address first the non-pricing and secondly the pricing related identified barriers to effective entry and competition. In the concluding part of this section we consider the sequence and timing of reforms.

9.2 General principles for our assessment

In making our assessment we have considered the following:

- remedies may impose costs which may outweigh any benefit. Therefore, it may not be the case that every problem identified needs a solution;
- where Ofwat may decide to take ex ante action, rather than rely on ex post regulation via challenge under the Competition Act, it may choose between an approach that is either more formally regulatory, with powers of enforcement or more informal, based on voluntary self-regulation;
- the approach could be more prescriptive or more light touch. For instance, whilst in some cases there could be a specific solution, in others, Ofwat could have a choice between determining the solution, providing guidance, or setting expectations;
- many of the issues are inter-linked, so that one option might be ineffective without others, while in other instances, a number of issues might be addressed by a single remedy;
- there could be consequences for other reforms or other parts of the value chain that need to be factored in; and
- there could be merit in an incremental approach e.g. building on the Cave Review approach, a ‘test and learn’ approach could reduce risk of unintended consequences and generate information about the market.

Before turning to our assessment of the range of options that could be considered to address the issues identified, we provide some thoughts on possible further data requirements, regulatory precedent for certain approaches,

and possible policy vehicles that could facilitate Ofwat taking forward action to progress its policy conclusions and proposals in relation to this market.

We note that on issues relating to bulk supply pricing and income offset, we have presented a number of high level options. However, these would require more detailed modelling, based on accurate data, in order to define particular solutions. Ofwat could choose whether to direct such an exercise itself or to instruct the companies to embark on a process to develop appropriate solutions. It could also consider the extent to which Water UK's consultation on connections charging options indicates that a voluntary approach could have sufficient weight and impetus.

As regards the income offset, Ofwat has already suggested it could consider options for its future application and that provides a ready process for building on the ideas presented here, and inviting other suggestions. For bulk supply pricing, the Water Act 2014 gave Ofwat the facility to develop codes and charging rules, which provides a ready vehicle to take forward that option. We have noted in section 8 above, that Ofwat will already need to be reviewing its bulk supply approach independently, because of the subdivision of the price controls for example, on the water side, into retail, network plus and water resources and in order to make them consistent with the development of access pricing.

A similar question as to the degree of regulatory intervention and prescription arises in relation to the behavioural and information remedies that are presented, for example, if a code of practice is considered desirable, whether this should be more or less prescribed by Ofwat.

We note that in the energy sector, in its review of the connections market, Ofgem faced a similar question, as that sector had also been making some voluntary efforts to change practices and behaviours to address identified concerns and some examples of good practice were emerging. However, Ofgem's conclusion was that it was too slow, and that the sector had had a long time to address the issues already. Licence conditions were introduced, and the development and operation of an enforceable code was made a requirement within those.

As regards the price cap mechanisms (i.e. the revenue control and the totex incentive), these are both mechanisms that are solely in Ofwat's remit to investigate further and adapt as it considers appropriate. The PR19 methodology consultation, scheduled for summer 2017 could be an appropriate place to take these forward as this could enable integration with wider considerations for the review.

In the following section, we outline the pros and cons of the various options outlined in sections 6 and 7.

Potential remedies can be grouped under the following headings:

- Remedies that focus on the legal framework and Ofwat's process and approach to applications;
- Remedies that focus on the price regulation of incumbents;
- Remedies to address concerns with EA policies;
- Remedies to address the behaviour of incumbents in the provision of information and services to NAVs;

- Remedies to improve information and understanding about the NAV market;
- Remedies to address bulk supply pricing; and
- Remedies to address the income offset.

Section 9.9 considers whether there is an optimal order in which to undertake any programme of reform.

9.3 Legal framework and NAV application process

Figure 14 below shows our assessment of potential remedies that focus on the legal framework and the NAV application process.

Figure 14 Options focusing on the legal framework and application process

Remedy	Pro	Con	Impact
Ofwat undertakes a systematic review of its application process to introduce more efficient practices	Largely falls to Ofwat, perhaps with some consultation, may be able to focus it.	Ofwat may feel this is going over old ground and inefficient use of resource	Could be important in changing perceptions of the ease and certainty around process and timing, especially combined with other measures
Served/unserved – Ofwat clarifies the process and policy around determining the status of the site, highlighting situations which can attract a more streamlined approach; Ofwat also explores potential for use of 'consent' criterion.	May remove some delay / uncertainty over process	May be difficult to pin down definitions more than currently; may be high effort for low impact; a legislative vehicle would need to be found	Low but could have more significance if incumbents become more defensive in future
Financial viability assessment – Ofwat clarifies the process & policy, including exploring options for streamlining for smaller and additional sites for established NAVs	Meets significant concern of NAVs, may have material impact on entry, precedent to learn from in electricity and gas	Needs resource and care in consideration, legislative option not immediate and would need appropriate vehicle	Could have an incremental impact together with other remedies e.g. price; On its own could perhaps open up small sites in areas where margin not a barrier.

Source: Frontier Economics

The first option is aimed at a general level, for Ofwat to review its current application process to identify any potential for streamlining. It may improve perceptions and certainty around processes. One example is to provide clearer guidance on the information they will need to provide and the process that Ofwat will follow during a NAV application. Ofwat could also separately consider providing additional guidance on the process a dispute on the bulk supply

agreement, so as to help to minimise the delay this can have on a NAV application.

The second option is to improve the process around the served/unserved criterion. There are a number of actions that could potentially be taken.

- Ofwat could review and consolidate its guidance to see if there is scope for further clarity.
- Ofwat could consider whether there is any benefit in including in a possible statutory code of practice that incumbents should set out their process and benchmarks for identifying 'unserved' properties.
- A change in requirement could remain a possibility to be introduced in future legislation if this re-emerges as a more significant block to entry in the future.

This may remove some delay/uncertainty over the current process. However, it may be difficult to pin down definitions more than currently, and it may be high effort for low impact. Furthermore, a legislative vehicle may be required to implement this properly.

The third option is related to the current requirement on the financial viability assessment. Potential actions include the following.

- Ofwat adopting a lighter touch approach to financial viability and 'no worse off' assessment for NAV appointment applications where the applying company has already proved operating capability in the market.
- An *ex post* annual review process, with the majority of the NAV application requirements are assessed independently of any site specific application requirements e.g. site location.
- Longer term, legislative framework could be amended to allow national licensing for NAVs, based on a framework and guidelines agreed with the regulator, rather than on a site by site basis.
- Another option (not raised by stakeholders, but considered in the Cave Review) might be, within the context of Water 2020 and upstream reforms, for new licences to be created for infrastructure provision, which could be combined with other licences to replicate a NAV or used on their own.

Reforms in this area would meet a significant concern of NAVs and could have a material impact on entry. There are lessons that can be learned from the energy sector, to mitigate the potential risk associated with an annual review process. However, this option would require resource and care in consideration. If legislative changes are necessary, it is unlikely that these options could be implemented in a short time scale.

9.4 Price regulation of incumbents

As discussed in section 4.2, to prevent the current value transfer out of the water sector caused by the fact that incumbents can recover revenue lost to NAVs from its remaining existing customers, a revenue adjustment (true up) mechanism to claw back revenues lost to NAVs may be considered.

This would prevent further value transfer, but might also change incumbents' incentives and attitude towards NAVs. The current perceived indifference may

morph into a more competitive attitude. This may cause incumbents to be more aggressive in competing with NAVs, and to the extent that there is still barriers to entry, further prevent efficient entry.

9.5 Policies and approach of EA

In order to encourage greater understanding of the NAV option within and across the relevant parts of the EA, and to encourage a more flexible approach to innovation, options focusing on the policies and the approach of the EA include the following.

- Ofwat could encourage constructive dialogue between NAVs and the EA both at a general policy level and early in the context of a potential NAV application.
- Ofwat could engage with the EA to foster and promote wider understanding of the NAV option at local and national EA level and the EA to review its guidance on policy approach in the case of innovative solutions being proposed by NAVs

This could fit into the 'business as usual' activities, and could encourage wider review of joined up regulation and innovation.

A possible outcome would be a more streamlined process, allowing more flexibility on a site-specific basis. This is particularly important for the Full NAV model where the application for licences from the NAV can put it at a disadvantage compared to the incumbent who can benefit from existing licences.

9.6 Behaviours of incumbents

We have considered a range of options to address the issue of potential strategic barriers to entry caused by incumbents' behaviour in dealing with potential NAVs. The overall objective of these options is to create a level playing field in relation to the services provided by incumbents to developers, SLOs and NAV operators; and promote transparency and delivery of specified, measurable and improved service levels.

The following could be adopted in sequence, giving the industry a reasonable amount of time to respond, before proceeding with statutory measures.

- At the lowest level of intervention, Ofwat could allow the present initiatives being taken by individual companies and through Water UK, for instance considering the application of the self-serve model to water and the inclusion of NAVs in developer services quality of service metrics, and the impact of the new charging rules, to take effect.
- It could add weight to those initiatives by publishing a document highlighting its concerns with the market and the principles, behaviours and perhaps arrangements that it wished to see the companies working towards.
- If a stronger incentive were required, Ofwat could introduce a specific code of practice in relation to NAVs, but preferably, developer services. This could be a requirement for the industry to agree a code of practice or a regulatory led

initiative. The requirement could be more or less prescriptive in terms of the arrangements it wished to see the incumbent companies put in place.

- Ofwat could use its powers under WIA91 to introduce a code of practice for incumbents dealings with NAVs, or propose new licence conditions to encompass a code of practice as well as broader (enforceable) expectations. This might depend on the desired scope of the code of practice.

The first two options fall under the 'business as usual' approach, and will require careful monitoring to assess whether improvements are taking place. The stronger 'code' option has been successfully implemented in other sectors and could also be the gear shift needed to accelerate behaviour change in the water sector. This could also ensure greater speed of change and consistency and transparency across the industry. A code could also be used to 'tidy up' a range of issues across developer services, not just NAVs. Incumbents that we have talked to are not necessarily averse to this.

However, a slower step-by-step approach could exasperate NAVs forcing them to pursue other avenues/actions to address their concerns about barriers to effective competition in the market. A code, on the other hand, may need significant resource input, but that would be need to be weighed against the likelihood of prolonged piecemeal oversight and soft intervention to 'chivvy' progress, 'name and shame' etc., and the risk of further time consuming case work and dealing with complaints. Considering that it will take time to implement a code, there may be a case to take action straight away rather than 'wait and see'. Another consideration regarding resourcing is the ramp up to PR19.

The options discussed here could have a significant impact in circumstances where entry is inhibited by delays in service provision and uncertainty about the terms of entry (rather than margin). This could be particularly relevant on larger sites. By itself these measures may have limited effectiveness, but when coupled with options on pricing discussed below, there could be a significant additional impact on the extent of new competition in the NAV market.

9.7 Information and understanding about the NAV market

There are a number of options that could be considered to address concerns about the lack of information and understanding about the NAV market. We have considered the following examples:

- Ofwat to support trade bodies' efforts to raise awareness amongst members;
- Ofwat to consult with DCLG on how best to raise awareness of potential development sites and developer options; and
- Ofwat to promote greater awareness through its own programme of communication and education.

These could be useful if combined with other measures, but on their own, might not be sufficient to address the underlying issues in the market.

9.8 Pricing policy

In section 7.3, we identified two aspects of the pricing policy that could distort efficient entry of NAVs and discussed options to address them. In this section, we assess the pros and cons of the options discussed, and consider any further implications if any of these options were to be put into place.

In section 7, we also distinguished between the two distinct forms of NAVs i.e. the bulk-supply NAV and the full NAV. As we have not presented options for the pricing of the full NAV, and an assessment of the compensation payment mechanism is already discussed in section 7.2.3, we focus on the pricing options for the bulk-supply NAVs in this section.

In keeping with the principle of encouraging only efficient entry, any option we discuss on treating the bulk supply price and income offset needs to fulfil the condition that NAVs are given a wholesale NAV margin exactly equal to the incumbent's long run incremental cost of providing the last-mile wholesale service on new development sites contested by NAVs.

In section 7.4 we discussed the following options for treating the income offset and bulk supply price, dependent on the charging rules:

1. Under the new charging rule effective in April 2018, income offset is only calculated on the onsite cost, which eliminates the possibility for the incumbent to put itself at an unfair advantage by applying a discount on offsite costs when the developer chooses it over a NAV or an SLO. Furthermore, the incumbent offers a wholesale-minus bulk supply price to the NAV where the discount takes into account the incumbent's operating cost of the last-mile asset and a capital cost reflecting the income offset the incumbent would have made available against the onsite cost.
2. If the proposed charging rule for 2020 is put in place, where income offset is paid against infrastructure charges (for offsite costs), rather than against requisition charges (for onsite costs), incumbent offers a wholesale-minus bulk supply price to the NAV where the discount takes into account its operating cost of the last-mile asset only.

9.8.1 Assessment for the short term

Figure 15 below summarises the pros and cons of these two options in the short term.

Figure 15 Summary of pricing options for bulk-supply NAVs

Option	Income offset	Bulk supply price	Pro	Con
1	Against requisition charge	Wholesale charge – opex – capital cost reflecting incumbent's income offset on onsite cost	▪ Most economically appealing: efficient NAVs build, finance, and operate the last-mile assets and recover their costs from customers with a return.	▪ Complexity and opacity in estimation of income offset based on onsite costs
2	Against infrastructure charge	Wholesale charge – opex	▪ Simple to implement and transparent	▪ Only facilitates entry by efficient constructor and/or operator of the last-mile asset, but not efficient investor.

Source: Frontier analysis

Option 1 is the more economically appealing one as it separates what are contestable and non-contestable parts of the network, and enables the NAVs to build, finance and operate the last-mile asset and earn a return while operating it in future. The non-contestable part (offsite) is built by the incumbent in any event, and therefore should be treated equally by the incumbent regardless of who wins the site.

However, this option would require new rules to set out how incumbents need to estimate the capital charge based on the income offset on the onsite costs (average of all new sites) for the purpose of designing the wholesale minus bulk supply price. This can be complex and open to interpretation.

Option 2 could be more straightforward in implementation and determination of bulk supply price, as it only requires the operating cost of the last-mile asset to be deducted from standard wholesale tariff.

However, it may the effect of slightly changing investment incentives. In other words, it could potentially alter NAVs' business model from last-mile infrastructure investment into last-mile infrastructure construction and operation.

- The former model involves financing and investing into building the last-mile infrastructure, and subsequently operating it while earning an annual return (akin to incumbent water companies). Income offset is set again requisition charge and when a NAV builds a site there will be no requisition charge to the incumbent and hence no income offset will be paid by the incumbent, and therefore it would be the NAV who pays the developer an amount equivalent to the income offset that would have been provided by the incumbent had the developer requisitioned the incumbent.
- The latter model involves building the last-mile infrastructure, recovering the cost upon completion, and providing ongoing operation (akin to an SLO

except for the operational part). Income offset is set against the infrastructure charges and is paid by the incumbent in any event. The NAV therefore no longer needs to offer an equivalent of the income offset to the developer but instead gets the full funding upon completion.

Consequently, although option 2 would match option 1 in facilitating entry by a more efficient constructor and/or operator of the last-mile asset, it could not match option 1 in facilitating entry by a more efficient *investor* of the last-mile asset (e.g. someone with more efficient financing cost).

9.8.2 Assessment for the longer term

In assessing the two options on pricing, we have also taken into consideration their potential long-term impact on customers and the extent to which they are future-proof in regards to the various reforms under consideration by Ofwat.

Both options have the property of facilitating efficient entry, and therefore they share similar long term dynamic benefit. However, due to the discount element of the bulk supply being calculated by an averaging method, there is a question as to what degree this would foster cherry-picking by the NAVs leading to d-averaging. Even though, as discussed in section 8.1 earlier, there is no strong evidence that the issue of de-averaging is a material concern. We examine the degree to which the two options presented here differ in their impact on potential issues of de-averaging.

Furthermore, as discussed in section 8.2, with retail market opening and upstream reform, the pricing rule for the NAVs may have to adapt in the longer term. We examine the degree to which the two options need to be adapted in the context of full residential retail market opening and competition in upstream markets.

Figure 16 below summarise our assessment.

Figure 16 Longer term assessment of the pricing options for bulk-supply NAVs

Option	De-averaging	RMO and upstream competition
1	Moderate, due to cost variation limited to onsite	NAV network charge relatively high
2	Relatively low, due to cost variation only limited to opex	NAV network charge low

Source: Frontier Analysis

On the subject of de-averaging, the same underlying principle is shared by both options in that the NAVs would always find the lowest cost to serve sites most viable to enter. However, the degree to which this would become an issue for the water sector depends on the degree of cost variation on serving different sites.

Option 1 is less prone to cost variation, as developers are paying all the onsite costs. There is therefore no material cherry-picking left for NAVs to do, apart from any variation in operating cost.

Option 2 would be slightly more prone to de-averaging, as the onsite cost (or the income offset of it) is averaged when the incumbent takes this into consideration for the determination of the bulk-supply price.

As discussed in section 8.1, a potential remedy for de-averaging if it becomes prevalent is a tiered bulk supply charge. For example, if option 1 on bulk supply is chosen, where the incumbent does not pay income offset at all, the bulk supply it offers can be tiered for high-cost and low-cost sites. This would reduce the amount of de-average. If necessary, more than one tier could be used.

In respect of retail marking opening without upstream competition, no major adaptation would be envisaged as the NAVs would charge the standard wholesale tariff to the licenced retailer under both options.

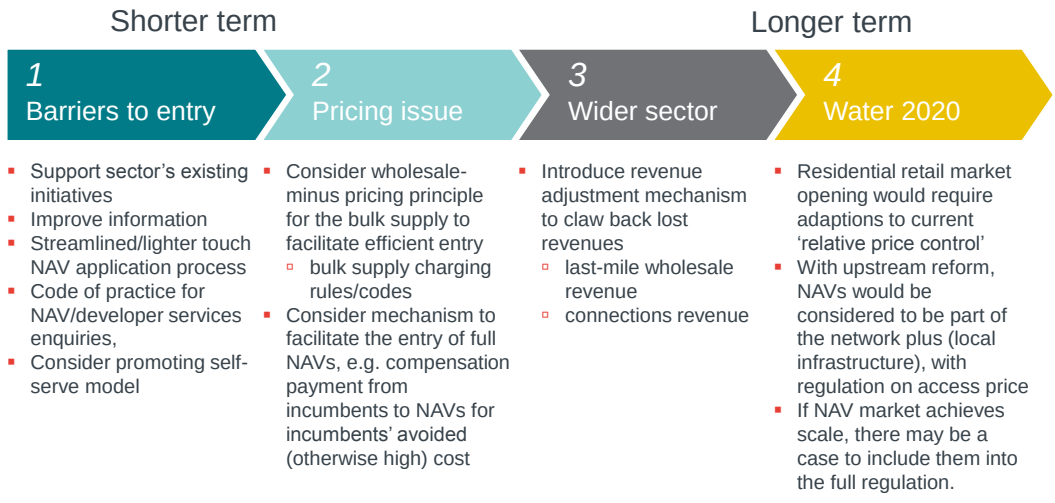
In the context of upstream competition, both options would need to be adapted to take account of the situation that bulk supply is no longer necessarily applicable to NAVs, and in its place a charging scheme for the 'network plus' is needed.

Option 1 would require the NAV network to charge the higher level of network charge compared to option 2. This is due to the difference in upfront investment by the NAV. The required adaptation should be in line with the relevant methodology within the wider context of the upstream competition, the detail of which is beyond the scope of this study. However, we do not anticipate any significant difference to arise between the two options presented here, in terms of the adaptation needed to suit upstream competition.

9.9 Concluding remarks

Our assessment shows that the different options set out in this report may present different levels of regulatory formality, complexity in development and design, resourcing required (by Ofwat and/or market participants) and potential for unintended consequences. They could also have different expectations of impact on levels of efficient entry and the extent and distribution of benefits, including innovation. The timing of introducing different options could also be an important consideration as some options may naturally work as a follow on measure after other options having been successfully implemented. Figure 17 below illustrates a possible time profile of the reform options identified.

Figure 17 Potential timing profile of reform options discussed



Source: Frontier economics

Behavioural and process remedies (with the exception of potential legislative changes for the application process and potential licence modification for restricting incumbent behaviour) could be seen as lower risk measures that could be introduced early in any phased programme of market improvement.

Without pricing remedies, significant barriers to entry could remain. Such remedies might also need more detailed assessment in terms of data and modelling. Proposals to address the revenue cap mechanism would depend on how significant the identified ‘value transfer’ problem is expected to be, in light of any steps eventually chosen to improve the market. In terms of timing, one approach would be to first see the effect of other competition-enhancing options on NAV entry before addressing the value transfer issue.

ANNEX A RELEVANT LEGAL ISSUES

OFWAT'S LEGAL POWERS IN RESPECT OF BULK SUPPLY CHARGES

Codes in respect of bulk supply agreements (section 40B)

Ofwat can issue (and revise) codes regarding:

a) Procedures in connection with making a bulk supply agreement;
b) Procedures in connection with varying or terminating a bulk supply agreement;
c) Procedures to be followed by Ofwat in determining whether to make an order under section 40(3) or 40A(1) of the WIA91;
d) The terms and conditions of a bulk supply agreement, including terms as to the duration of such an agreement;
e) Principles for determining the terms and conditions that should or should not be incorporated into a bulk supply agreement; and
f) The steps to be taken by Ofwat in determining whether a person is complying with a code.

The codes must include a provision requiring persons proposing to make, vary or terminate a bulk supply agreement to consult the Environment Agency (or the NRBW, in Wales).

Ofwat may issue directions to an undertaker to do or not do a specific thing (although the power to issue directions does not extend to requiring a person to enter into, vary or terminate an agreement). Such directions are enforceable by Ofwat under section 18 of the WIA91.

Charges (sections 40E and 40F)

Ofwat can issue rules about charges that may be imposed by a water undertaker under a bulk supply agreement, including:

a) The types of charges that may be imposed;
b) The amount or the maximum amount, or a method for determining the amount or maximum amount, of any type of charge;
c) The principles for determining what types of charge may or may not be imposed;
d) The principles for determining the amount of any charge that may be imposed; and
e) Publication of the charges that may be imposed.

Ofwat can also make rules that provide for a reduction of charges.

Ofwat can make a direction where an undertaker is not complying with the rules, requiring them to do or not do a specific thing. Such a direction is enforceable under section 18 of the WIA91.

Procedure (sections 40C, 40D, 40G and 40H)

Before issuing a code or rules, Ofwat must first consult the appropriate persons (and the Environment Agency/NRBW in the case of a code), and allow time for representations to be made, although this does not apply to minor or urgent revisions of a code or rules.

ANNEX B CASE STUDIES FROM OTHER SECTORS

New residential and commercial developments have the option to not rely on the incumbent for electricity and gas connection services. This annex provides case studies on the electricity and gas connections markets, setting out an overview of the market, competition issues and recent remedies to improve competition.

Electricity connections market

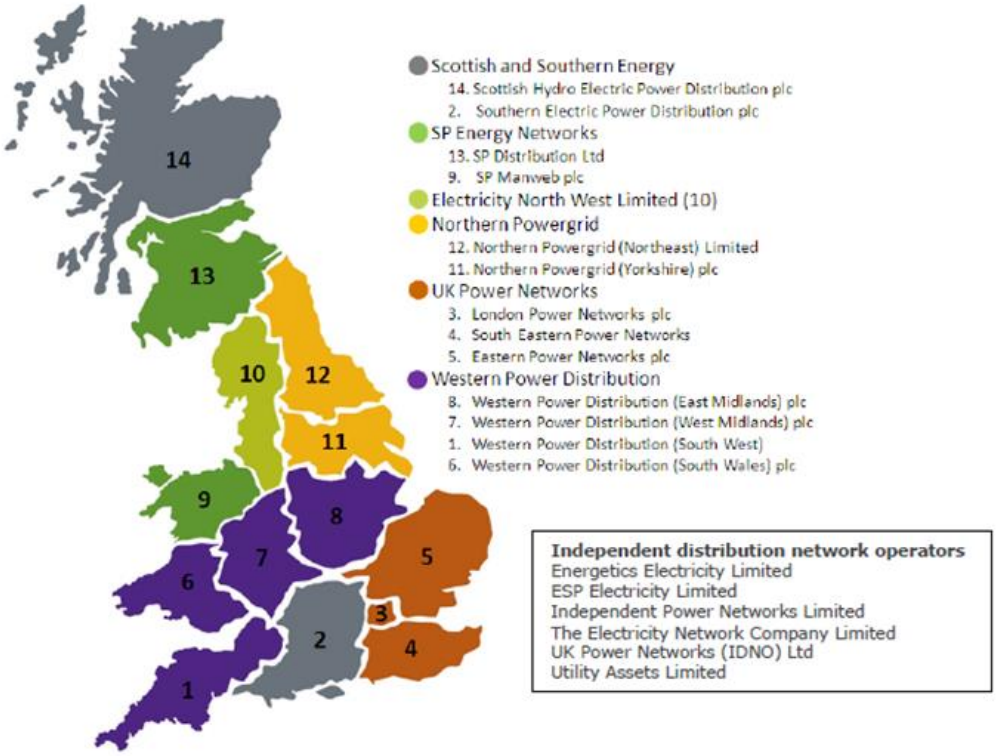
Overview of electricity connections

The electricity distribution network is primarily owned and operated by Distribution Network Operators (DNOs) acting as regional monopolies in 14 separate geographical regions. However, DNOs must compete with Independent Distribution Network Operators (IDNOs) and Independent Connection Providers (ICPs) for some connections work known as ‘contestable work’.

Customers seeking a new connection to the DNO’s network can select an ICP to complete some of the connection work otherwise completed by the DNO. After completion of the connection works by the ICP, the connection can either be taken over by the DNO or an IDNO, which owns and operates a smaller network that serves as an extension to the DNO network for new residential and commercial developments. Therefore, roughly speaking IDNOs are the electricity counterparts to NAVs, and ICPs to SLOs.

Figure 18 below shows the regional DNOs as well as listing the six of current eight IDNOs in the UK, the other two IDNOs being Harlaxton Energy Networks Limited and Peel Electricity Network Limited.

Figure 18 DNOs operating in GB



Source: "A guide to electricity distribution connections policy", Ofgem 16 April 2014.

When a customer wants a new connection, the DNO of the given area is required to offer a connection at a price. The DNO's charges are based on the cost of a 'minimum scheme' designed to provide the connection at the lowest capital cost. Charges consist of the full costs of assets, a proportion of the cost of network reinforcement and a rebate for connections using assets installed previously. This charging methodology falls under the requirements of the DNO's licence conditions. Other conditions include providing specific information about the connection and not discriminating between customer types.

Like a DNO, an IDNO is regulated but with fewer license conditions. IDNOs face a 'Relative Price Control' where charges are capped at a level consistent with the DNO equivalent charge.

While competition between DNOs, IDNOs and ICPs was introduced in 2000, competition in the £500 million connections market has been slow to develop, even though millions of connections are made yearly. To help improve competition, in 2010, Ofgem introduced measures to remove regulatory barriers to competition and to provide strong incentives for DNOs to support competition. The primary measure was a 4 per cent regulated margin that DNOs must charge on contestable connections, with the option to remove the margin when competition proves sufficient.

Issue on boundary meter

In 2009, Ofgem reassessed its decision in 2005 on the equipment required at the boundary of DNO and IDNO networks to measure electrical flows.[39] It analysed the benefits universal half-hourly (HH) meters can provide compared to their costs and the costs of alternatives and presented conclusions based on this analysis.

Ofgem explained that evidence indicates that the HH boundary meters required by DNOs are not justified in terms of their benefits, particularly as any benefits seem to flow to the DNO and not the IDNO who bears the costs. Furthermore, Ofgem was concerned that the level of charges on IDNOs for boundary metering compared to revenues they can earn, were stifling competition and denying customers the benefits which IDNOs can potentially provide. Consequently Ofgem outlined a position that should this issue ever be submitted to the Authority for formal determination, it would be minded to conclude that universal boundary metering is discriminatory and disproportionate. Ofgem concluded that more proportionate arrangements, able to facilitate competition, would be achieved if DNOs funded the equipment used to measure flows at the boundary themselves.

Issue on boundary charges

Boundary charges from DNOs to IDNOs or other DNOs operating outside their areas – collectively termed Licensed or LDNOs – have evolved to embody a fixed national percentage discount on equivalent charges at the end user level that is based on the proportion of the length of high voltage infrastructure provided by the LDNOs compared to DNOs operating in-area.

The rules implementing this policy in electricity are part of the governed distribution connection and use of system agreement (DCUSA).[40]

The Common Distribution Charging Methodology (CDCM) charges to LDNOs are calculated as a discount from the DNO CDCM charge to an equivalent end customer. The discount is intended to reflect which network voltage tiers are provided, respectively, by the DNO and LDNO in providing distribution services to the customer.

Ofgem considered that it is appropriate that DNO charges take into account the fact they will provide less High Voltage (HV) network on average per Low Voltage (LV) end customers when the customer is connected to an LDNO network.

Barriers to competition

Despite the changes in 2010, competition for electricity connection remains limited in some sections of the market. In response, Ofgem completed a market review in 2015 for the electricity distribution network. The review found problems that combine to limit the development of competition. Together, these can make it hard to compete against the DNO on price and the timeliness of connection.

[39] Ofgem, 2009, Consultation on IDNO/DNO boundary equipment and which parties should fund this equipment.

[40] Ofgem, 2011, DCP 071 and DCP071A – Allocation of Cost to HV Connected IDNOs with LV End Users

The review found numerous issues affecting competition, which can be grouped in two areas. The first area involves issues relating to the DNOs. The DNO provides inputs necessary to make a connection to both its own customers and its competitors. Thus, the DNO can limit the ability of competitors to control the delivery of their connections. For example, the DNO selects the point of connection (PoC) to their network used by competitors adding time to the connection process which may deter customers from choosing independent providers. The second area of issues limiting competition is those not relating to the DNO, ranging from problems with customer engagement to regulatory frameworks. For example, ICPs do not have statutory power so they face more difficulties in securing land rights and road closures compared to DNOs and IDNOs. A full description of both types of issues limiting competition can be found in the text box below.

ISSUES LIMITING COMPETITION IN ELECTRICITY CONNECTIONS

The Ofgem connections market investigation found the following competition issues related to the behaviour of DNOs :

- "Accreditation. A DNO's approach to testing competitors' staff, before they can work on the network, can create a barrier to entry and expansion for competitors.
- Determining point of connection. DNOs determine the point of connection (PoC) to their network that competitors must assume when making connection offers to a customer. This adds time to the connection process, which may deter customers from using independent providers. There is also a risk that a different PoC is used by the DNO to that which has been provided to their competitors.
- Convertible quotes. In some DNO areas, problems can arise when customers accept a non-contestable quote from a DNO – but decline the contestable element (choosing to use an independent for the contestable work instead). If this happens, some DNOs may reissue the quote and change the costs for the non-contestable works.
- Design approval. Most DNOs insist on approving the network design that their competitors use as part of the connection offer to the customer. Getting the design approved can cause delays for competitors. There is a risk that a DNO's staff could use this approval process to delay their competitor, reducing their attractiveness to customers.
- Link boxes. DNOs may require an IDNO to pay for a link box to be installed between the DNO/IDNO networks. This creates a cost for independents of around £2,000 which would not be faced if the DNO did the work (if it builds the network, it does not need the link box). This may reduce the independents' ability to compete – especially for lower value works.
- Inspection. Most DNOs insist on auditing the completed connection assets that have been built by their competitors. There is a risk that this adds unduly to the timescales for independent connections, or even that DNOs

staff could in some circumstances use this auditing process as an opportunity to delay the energisation of the assets. Such delay may dissuade a customer from using the independent provider again."

Similarly, the Ofgem report found the following competition issues that were not related to DNOs :

- "Statutory rights. As licensed companies, DNOs and IDNOs have statutory powers. These powers cover a range of different areas (e.g. wayleaves, easements and street works). Non-licensed companies (ICPs) face a more onerous process (in time and cost) to secure land rights and road closures which can affect their ability to compete.
- Customers' awareness of alternative providers. Some customers do not realise they have a choice of connection provider. Customer failure to engage with the market reduces the volume of work for independents. This deters entry and expansion.
- Customers' understanding of how to use alternative providers. Some customers are aware that competition exists, but do not understand the process for using an alternative connection provider. This can create a perception that using alternative connection providers is too much hassle.
- Emergency response obligation. In the event of a fault on the network, DNOs and IDNOs are required by their licence to provide certain services to customers on their network. IDNOs argue that the cost of providing these services disproportionately affects them due to the economies of scale possessed by the DNO (i.e. because the DNOs have a large number of customers relative to a new entrant IDNO, the average cost of emergency response provision is lower for them than for the new entrant).
- Unmetered supply inventories. Billing arrangements between a supplier and a large customer (e.g. a local authority) may become more complex and costly if the customer has unmetered assets (i.e. street lighting) on both a DNO and an IDNO network. As a result, some customers may be reluctant to adopt assets on an IDNO network."

The study also found that from a customer perspective, barriers to competition exist in the form of risk, hassle and lack of need. For example, many customers felt that dealing with an ICP or IDNO was more risky than using the local DNO with which the customer was already familiar. Customers also felt that using an alternative provider was too much hassle requiring additional time and effort. Finally, customers satisfied with the DNO were less likely to consider alternatives.

Remedies to improve competition

As a result of the market study, Ofgem has introduced a new licence condition for DNOs to reduce the extent to which competitors rely on them for essential services and ensure that when the DNO does provide essential services that it does so equally for its competitors and its own connections business. As part of the conditions, DNOs are required to comply with a new Code of Practice in order

to facilitate competition. The Code of Practice covers the entire connections process, from application to adoption. The following are examples from the code:

- Connection application: When a customer requests a connection, the DNO must provide a 'convertible quotation' which details charges for both contestable and non-contestable works as well as the point of connection to the distribution system (PoC). Customers can take the PoC to an ICP for a quote of the contestable works. Should the ICP carry out some or all of the contestable works the DNO will deal with the ICP as if it were the customer. Moreover, the quote for the non-contestable work is fixed regardless of if the customer uses the ICP for the contestable work.
- Determining the PoC: In most circumstances, the ICP will now be able to determine the PoC if it chooses. DNOs will be required to make information needed to determine the PoC available to ICPs.
- Construction works: ICPs will be able to carry out construction work related to the extension of the DNOs system so long as work follows the specifications and standards of the DNO. All works will be subject to audit by a NERS service provider and inspection regimes by the DNO.
- Design approval: DNOs will set out criteria for design approval. While previously DNOs have insisted on approving network design of ICPs, ICPs that meet the DNO criteria will not need the DNO to approve the design.
- Auditing: ICPs accredited under NERS will be subject to audit by NERs, but DNOs will not undertake additional audits. DNOs will be able to inspect ICP works and should appoint an independent inspector.
- Land rights: DNOs will provide land rights documentation for ICPs.
- Reporting: Each DNO will be required to publish an annual report demonstrating their compliance with the codes of practice.

Gas connections market

Overview of gas connections[41]

In the gas market, a developer wanting to connect new customers to the distribution network faces different alternatives. The first option is for the developer to ask the local gas distribution networks (GDN) to quote and install the different assets necessary to connect the site to their network. The GDN charges a customer an upfront connection charge. This is a contribution for the capital costs associated with the installation process. Charges are based on the Licence Condition Charging Statement, publicly available on GDNs' websites.

A second option is for the developer to ask for a connection quote to an independent gas transporter (IGT). These companies often specialise in connecting new housing premises and large non-domestic single connections. IGTs' infrastructure covers the last mile of the distribution network and is considered 'inset' in the local GDN's network. The same industry standards apply

[41] Getting Connected Utilities Connections: A Guide for Developers, July 2011. Available at http://www.bpf.org.uk/sites/default/files/resources/BPF-Getting-Connected-Utilities-Connections-a-guide-for-developers.pdf.

on both IGTs and GDNs. Similarly to a GDN connection, IGTs charge the developers an up-front connection charge.

Currently about half of all new connections are undertaken by an independent operator.[42] While it could be considered that competition in the gas connections market is now working reasonably well, this has not always been the case. This section explores the various steps taken in the industry to reach the current state of the market.

Introducing competition in the gas connections market

Competition in the gas connections market was introduced in the mid-1990s. When the market was first opened, new entrants had to compete with Transco, the monopolist operator in GB.

During the course of 1997 and early 1998, various concerns were raised as market participants were frustrated with an overall inability to compete for new connections. Ofgas received a series of complaints and as a result opened an investigation in relation to Transco's connections operations.[43]

The investigation found:

- shortcomings in the administrative system in Transco's offices;
- inconsistency in the formulation of quotations for connections, with instances of significant over-quoting and instances of under-charging when Transco was directly offering the connection service;
- failure to respond to requests for quotations within Transco's own standards.[44]

According to Ofgas findings, the shortcomings in Transco administrative system had the likely effect of making new entrants appear less efficient than they actually were. Because of its inefficient office administration and quotation system, Transco was not providing the necessary information to independent operators in a timely manner. Furthermore, to be able to deal with the additional administrative burden from Transco, some IGTs have had to hire extra personnel. As a result, the new entrants complained that they could not compete with the incumbent on a level playing field.

Inconsistency in formulation of quotations for connections was also found to be anticompetitive. Transco's over-quoting for connections for IGT and self-lay installers led certain end-customers to pay more than necessary for their connections. Furthermore, Transco's under-charging for its directly undertaken connections was resulting in a comparative disadvantage for new entrants, unable to offer similar deals.

Ofgas also collected evidence that Transco had provided misleading information to new entrants regarding the source of pressure on site. Transco was providing inaccurate information, resulting in networks being over or under engineered. The

[42] See Ofgem website, available at https://www.ofgem.gov.uk/gas/distribution-networks/connections-and-competition/independent-gas-transporters.

[43] Ofgas Investigation of Transco's Connection Operations, January 1999. Available here https://www.ofgem.gov.uk/ofgem-publications/79341/investigations-transcos-connections-31-01.pdf.

[44] *Ibid*.

consequence of this anticompetitive behaviour was twofold: (i) it was putting entrants at an economic disadvantage; (ii) it could have led to a system failure.

Following a five month investigation, Ofgas concluded that Transco was breaching:

- section 9(2)(a) of the Gas Act, as it failed to avoid undue discrimination against a number of IGTs and self-layers;
- standard condition 11(1) of its Public Gas Transporters' Licence, by means of which Transco had committed to conduct its transportation business in the best and more secure manner, ensuring that no party obtained an unfair commercial advantage; and
- the Competition Act of 1980.

In a later document, Ofgas confirmed that the market study revealed that there had been unacceptable delays in Transco's quotations for connections, often resulting in overcharged quotations.[45] To put a stop to Transco's anticompetitive behaviour, Ofgas introduced the following remedies on the company:

- obtain ISO 9001 certification to ensure compliance with Transco's own standard conditions;
- introduce a scheme for paying compensations to third parties receiving late or incorrect quotations;
- introduce an audit process of Transco's own performance;
- publish a statement in relation to its connections charges and comply to it, with any deviation from it attracting the possibility for further enforcement action.[46]

At the end of the investigation process, Transco refunded £10 million in connections charges to customers and competitors. The market investigation was followed by an enforcement order of the Gas Act 1986, which was made against Transco in 1999.[47] These market interventions were effective and in the early 2000s Transco took actions to ensure that the market was more open to competition.

Recent developments

Competition in the gas connections market has improved since then, and Ofgem continues to strongly encourage competition in the provision of new and modified connection.[48] IGT networks are directly connected to the GDN via a Connected System Entry Point or indirectly, via another IGT. The number of customers currently estimated to be connected to IGTs in GB is around one million.[49]

[45] Transco Connections Investigation Decision Document, 7 January 1999, available at https://www.ofgem.gov.uk/sites/default/files/docs/1999/02/2594-finaldec_0.pdf

[46] *Ibid*.

[47] The Gas Act 1986 (General Restrictions on Disclosure of Information) (Modification) Order 2000, available at http://www.legislation.gov.uk/uksi/2000/1122/pdfs/uksi_20001122_en.pdf.

[48] See Ofgem website, available at https://www.ofgem.gov.uk/gas/distribution-networks/connections-and-competition/competition-connections.

[49] See Ofgem website, available at https://www.ofgem.gov.uk/gas/distribution-networks/connections-and-competition/independent-gas-transporters.

Both GDNs and IGTs have to meet a certain service level, known as Guaranteed Standard, to be able to provide a connection. While GDNs are subject to a full price control, the amount that IGTs can charge their customers for using their network is regulated via a 'Relative Price Control' (RPC). The current system requires IGTs charges for new customers to be capped at a level broadly aligned with the GDN equivalent charge. On legacy sites, IGTs continue to charge under the legacy arrangements until the migration to RPC is completed. These charges are monitored by Ofgem on a periodic basis, with the regulator's main objective being to protect the interest of end-customers, to create incentives for IGTs to operate efficiently, and to provide cost-reflective charges.[50]

[50] Independent Gas Transporters' Relative Price Control – Consultation on revising the guidance document and potential changes to Special Condition 1 of the IGT licence, 29 May 2013, available at https://www.ofgem.gov.uk/ofgem-publications/48891/rpc-consultation-letter-final29.05.13.pdf.

ANNEX C LIST OF CONTRIBUTING STAKEHOLDERS

In this annex, we list all the contributing organisations to our study. Contributions have been made in various forms such as face-to-face interviews, telephone calls, response to our questionnaire, and attendance to our workshop, as explained in section 2.3.

Figure 19 List of contributing stakeholders

Type of engagement	Name of organisation
Face-to-face interview	Independent Water Networks Ltd
	Albion Water
	SSE Water
	Environment Agency
	CC Water
	Anglian Water
	Severn Trent Water
	Thames Water
	United Utilities
Telephone interview	Persimmon Homes
	Welsh Water
	Water UK
	Home Builders Federation
Response to questionnaire	Affinity Water
	Anglian Water
	Home Builders Association
	Albion Water
	Yorkshire Water
	Icosa Water
	Portsmouth Water
	Wessex Water
	Severn Trent Connect
	Independent Water Networks Ltd
	Thames Water
	South East Water
	Veolia
	SSE Water
Attendance at workshop	Affinity Water
	Albion Water
	Anglian Water

	Bristol Water
	CC Water
	Environment Agency
	Icosa Water
	Independent Water Networks
	Northumbrian Water
	Severn Trent Water
	South East Water
	South West Water
	Southern Water
	SSE Water
	Thames Water
	Water UK
	Welsh Water
	Wessex Water
	Persimmon Homes

Source: Frontier Economics