



Potential approaches to Access Pricing in the UK Water Sector

17 July 2015

1. Executive Summary

Introduction

1.1 This paper sets out Anglian Water's views on the key issues Ofwat may wish to take into account as it considers the appropriate access pricing framework for the UK water sector. In developing this report, we have been informed by some descriptive reviews of other pricing situations, carried out on our behalf by NERA, represented in the attached technical annexes¹. The paper has also benefitted from peer review by the Centre for Competition Policy at UEA. However, the conclusions reached are Anglian Water's alone.

What is the issue at hand?

1.2 Currently water companies use a forward view of fully allocated cost (FAC) to inform the basis of revenue recovery within existing price controls. This has been considered "fit for purpose" in the past. However, for greater upstream competition to develop appropriately, there is a need for an access regime that facilitates efficient entry. One aspect of this which is currently underway is to move to a different access pricing approach from the "costs principle" approach that was set out in the WIA 1991 and formed the basis for access prices from then until now.

1.3 Provisions in the Water Act in 2014 paved the way for the costs principle to be removed from the legislation, and for Ofwat to bring forward charging rules and a new access pricing regime.

1.4 The introduction of a revised access pricing regime should seek to incentivise efficient entry whilst ensuring that efficient past costs and common costs can be recovered, and that incentives to invest remain in place.

1.5 In general, potential approaches to access pricing can be categorised as either "top-down" or "bottom-up". The choice will impact on both the likelihood for facilitating competition and retaining an appropriate return on investment. Within each broad approach further consideration is needed of which is the appropriate cost measure (e.g. Long-run Incremental Cost (LRIC) or Average Avoidable Cost (AAC)) to use. Consideration of which costs are defined as efficient, the relevant time horizon for assessing costs and how to deal with common costs are also of paramount importance, and will impact on both entry and cost recovery for incumbents. It is likely that the timescale for development of such approaches will be informed by which part of the value chain is being considered as likely to be contestable.

1.6 It is apparent that there will likely be a long lead time and significant effort and investment needed to generate the necessary data and improved costing systems (including significant bottom-up and

¹ As set out in the Technical annexes 1 to 5 of this report

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forward-looking costing) in order to develop good, let alone a “perfect”, models of long run costs.

1.7 Therefore, allowing for pragmatic solutions that, whilst imperfect, can still achieve the desired policy objectives seems essential, in order to meet the desired timeframes to implement the upstream entry provisions envisaged in the WA14.

1.8 The discussion above suggests that either LRIC estimates, or proxies for LRIC (for example based on AAC), may provide a better basis for access pricing in contestable markets than the FAC-based approaches used currently. For the non-contestable network areas, where in UK water and sewerage the direct LRIC or proxy may turn out to be a lot higher than the average accounting cost, it is likely to be simpler and better for integrated incumbents to price network access at the wholesale charge minus a full measure of the avoided contestable-area costs.

What should an access pricing regime for water seek to achieve?

1.9 The choice of access pricing regime should reflect the specific characteristics of the sector. It should also be based on an assessment of where the balance of benefits (including price, fairness, the social impacts of changes to averaged pricing, and security of supply and service levels) lies for consumers.

1.10 Anglian Water’s review of the evidence from other sectors suggests that the high level principles for an access pricing regime for water should be to promote the interests of consumers by:

- a) facilitating efficient entry to challenge the efficiency of incumbents;
- b) ensuring that incumbents who control essential facilities cannot foreclose the market to efficient entrants;
- c) ensuring that incumbents can continue to finance their efficient operations and earn a fair return on efficient past investment;
- d) providing better pricing signals for water, to facilitate abstraction reform and water trading and improve environmental outcomes.
- e) ensuring that all choices about pricing, including those that affect the recovery of the Regulatory Capital Value (RCV) are made in a way that maintains investor confidence;
- f) considering social fairness and protecting customers from significant bill impacts.

1.11 The emphasis on efficient entry is critical here. Our review of the evidence from other sectors and relevant Competition investigations under Article 102 TFEU suggests that no access pricing regime should promote entry at all costs. To do so would harm the long-term interests of consumers. If firms less efficient than the incumbents need to recover higher costs from consumers through higher prices, then the end result will be negative for consumers and in turn the sector as a whole.

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1.12 In absence of specifically weighting these principles, we recognise that the relative significance of these will be informed by which upstream element is being considered.

1.13 The Government's policy position on the retention of regionally averaged pricing for households is also highly relevant in relation to any future access pricing regime designed to support further competition. There is a risk that the introduction of competition will begin to unravel the inherent cross subsidies that underpin geographically averaged prices. Any access pricing approach will need to consider how such regimes benefit customers.

Defining the cost base for use in setting access prices

1.14 The NERA annexes² describe different access pricing approaches that have been adopted in other countries and other sectors. This analysis suggests that one way forward may be for companies to set their access prices by reference to either the relevant AAC or LRIC for the service in question. The right choice may vary depending on the particular areas that are being contested and the market model applying at the time. For network services, the replacement costs may be much more than the accounting values of the assets, so a telecoms-style LRIC measure can be high – meaning that if networks are genuinely non-contestable there is a case for the integrated incumbents' network access prices to be based on their wholesale charges minus the avoided contestable costs. We also recognise the difference in available information in different parts of the value chain.

1.15 As noted above, for most water companies, moving to a comprehensive and fit for purpose LRIC model across their operations would require a significant lead-time, and very considerable investment. This may also be more than is needed to deliver a successful expansion of upstream competition in those areas most likely to be contestable, such as sludge. The experience of BT, which took many years to develop its LRIC models through several versions, at significant cost, is instructive here.

1.16 There are also major existing system constraints that will limit the ability of incumbents to set "perfect" access prices. These include considering the need for new bottom-up costing analysis, and how reasonable existing cost allocation and cost recovery mechanisms are. These can and should improve over time, but quick fixes are unlikely.

1.17 Taking this into account, Anglian Water would suggest that Ofwat assess what proxy cost measures could provide a reasonable basis for access pricing. This may include considering adjustments to an FAC approach, using AAC or an adjusted AAC, or considering various forms of "minus" based approaches. Any of these could leave open the potential for LRIC-based approaches to evolve over time.

² Specifically: Nera_Access_01: Access Pricing in Liberalised Utility Arrangements

Defining the increment

1.18 Defining the increment is important for access pricing in a network industry because this can isolate the cost consequences of a particular decision an incumbent may make. It is an attempt to mirror the situation that would arise in a competitive market, and provide the basis for a fair, reasonable and non-discriminatory access price. However, the “right” choice of increment is complex, and as Bath University observed in 2004 “estimating LRIC based costs is as much an art as it is a science”. NERA’s technical annex³ describes some of the choices and complexities involved. This is an area that needs further work.

Treatment of the RCV

1.19 There are at least three options for the treatment of the RCV as a basis for access prices: Focussed RCV allocation, Unfocussed RCV allocation and alternatives to allocation, including contractual arrangements or “shadow RCV” approaches. None are straightforward, as NERA’s technical annex⁴ describes. However, on reflection, and considering the various impacts of the three options, Anglian Water believes that an approach that leaves the RCV unallocated, and uses transitional contracts to facilitate the setting of prices for contestable areas, may be preferable if it can be made to work without increasing investor risks too much, whether during transition or under enduring arrangements.

1.20 This approach of retaining an unallocated RCV has potential benefits for investment certainty, depending on the details, in turn helping retain companies’ ability to raise finance at competitive rates which benefits both shareholders and customers, relative to an approach which allocates the RCV. Addressing the investment-recovery issue through long term contracts also has the potential to reduce the risk of asset stranding.

1.21 Anglian Water would suggest that Ofwat works with the industry to develop such alternative models. This is an area for further work, perhaps through future targeted workshops.

Conclusion

1.22 Taking all the factors into consideration, Anglian Water believes that Ofwat could most usefully approach the question of access pricing by:

- a) seeking to achieve the high level principles set out in paragraph 1.10 above;
- b) adopting a pragmatic approach to the cost base for pricing, and recognising that there are long time lags, potentially large price tags and substantial changes to final customer prices attached to moving to any “ideal” standard of LRIC for pricing all services and elements of service;

³ Nera_Access_02: Incremental Cost Measure in Access Pricing

⁴ Nera_Access_03: Liberalisation and the Ratebase

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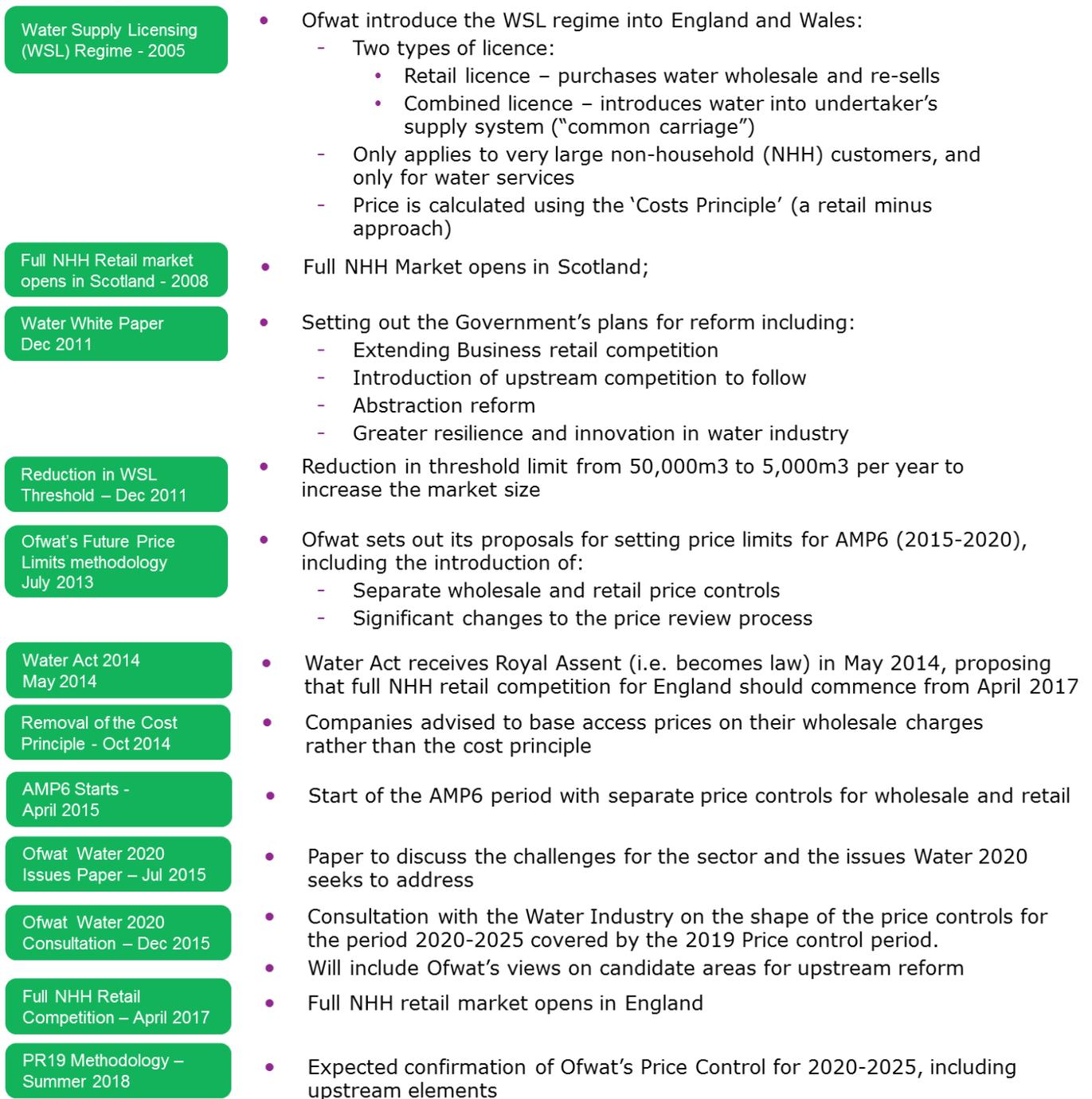
- c) avoiding problems attached to reallocation of the RCV by facilitating efficient pricing for entry through the use of transitional contracts;
- d) developing broad *ex-ante* pricing guidance to allow some flexibility, but providing sufficient detail to help all parties avoid most of the potential Competition Act disputes;
- e) relying on the Competition Act to deal *ex post* with any especially problematic complaints about access pricing, rather than imposing new regulations.

1.23 Such an approach seems consistent with Ofwat's various statutory duties, and with the principles of better regulation (i.e. that regulation should be transparent, accountable, proportionate, consistent and targeted only at cases where action is needed). Anglian Water is keen to work with Ofwat and others to develop these ideas further.

2. Introduction

2.1 Regulatory reform in the Water sector has gathered pace in the last decade and will continue to do so in future. Previous reforms included the introduction of competition into part of companies' business retail operations. The combination of Ofwat's most recent Price Determinations for the period 2015-2020 and the passing of the Water Act 2014 will allow further reform in the sector as set out in figure 2.1 below:

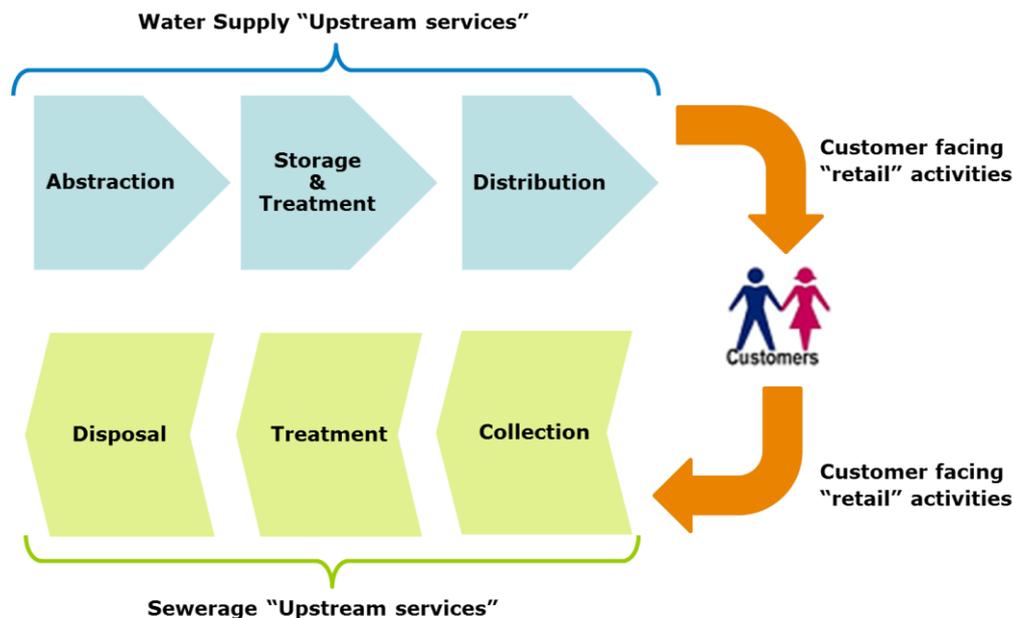
Figure 2.1 – Recent Reform timeline in Water



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2.2 We define “Upstream” as being any potential part of the companies’ existing operations which are not defined as retail activities. Figure 2.2 captures this distinction between wholesale and retail activities and is consistent with that used by Ofwat in setting the four price controls for the period 2015-2020 price control period⁵:

2.3 Figure 2.2- Defining Upstream



2.4 Further Upstream reform has been clearly signalled through the Water White Paper, the Water Act 2014 and recent regulatory Price determinations and other sign-posting from Ofwat as to how future price control periods may operate. In certain areas, such as abstraction reform, this dialogue is already underway⁶. Different parts of the value chain will have significantly different characteristics which will dictate which are the most likely to be subject to early upstream competition. For example, the assets required for the treatment of water are very different compared to those required to distribute it to customers.

2.5 The next steps for upstream reform in the water industry is likely to be further disaggregation of the value chain, identifying which of the candidate components of companies’ operations set out in figure 2.2 are best placed for removal from the regulatory ring-fence (i.e. de-regulation). Similarly, as seen in Ofwat’s most recent price control, there are questions as to how price controls can be constructed around different parts of the value chain to support competition.

2.6 The introduction of upstream competition will require appropriate supporting market and trading arrangements, including pricing principles for “access” to these components. These approaches need to be based on

⁵ Ofwat (2013) Setting price controls for 2015-20 – Final methodology and expectations for companies’ business plans

⁶ See Piure (2014) Markets water shares and drought: Lessons from Australia

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robust principles and processes, backed by empirical study, which can ensure a smooth transition to more market based approaches.

Regulatory Reform and Access Pricing - PESTLE analysis

2.7 An effective access pricing regime will need to satisfy a range of stakeholders across a range of drivers. These include, for example, the Government's policy position to retain regionally averaged charges for domestic customers and the desire to promote efficient competition and innovation where possible.

2.8 In the next section of the report we explore the variety of views held across the range of relevant stakeholders by two means:

- A PESTLE (**P**olitical, **E**conomic, **S**ocial, **T**echnological, **L**egal, **E**nvironmental) analysis of the relevant viewpoints for consideration; and
- A Stakeholder map capturing the stylised preferences of key stakeholders for an access pricing regime in Water

Potential Approaches to Access Pricing in the Water Sector

Figure 2.3 - **PESTLE** Analysis

P olitical	<ul style="list-style-type: none"> • Policy-makers (Defra) and Regulators (Ofwat) consider entry will increase innovation in the sector; • Defra are keen for innovation and increased competition whilst retaining regionally averaged prices; • Under the Water Act 2014; Defra has responsibility for producing charging guidance;
E conomic (Regulation)	<ul style="list-style-type: none"> • Economic view that access pricing and competition should lead to dynamic efficiency • Different access price approaches vary on cost recovery; ex-ante versus ex-post – these will have consequences for entry and prices themselves • Who pays – the balance between current or future customers? • How to recover historic (“sunk”) costs? • How do we reconcile the current suite of approaches applied across regulators and network industries?
S ocial	<ul style="list-style-type: none"> • Who will benefit from upstream reform and an access price regime? • Who pays for “smeared” services – e.g. water for fire-fighting, highway drainage, cross-subsidy for social tariffs? • Does access pricing naturally lead to de-averaging? • Different approaches to access prices have consequences for who pays for shared costs?
T echnological	<ul style="list-style-type: none"> • In theory, disaggregation of the value chain and respective access prices will encourage innovation in the sector; • The costs to changes to IT systems and cost capture will be significant
L egal	<ul style="list-style-type: none"> • The Water Act 2014 contains provisions to remove the current “cost principle” from primary legislation and for licensed entry upstream; • Incumbents are subject to competition law and retain responsibility for ensuring that access prices are non-excessive, non-predatory, non-margin-squeezing, non-discriminatory and non-selective
E nvironmental (Regulation)	<ul style="list-style-type: none"> • Environmental factors such as water resource constraints will influence which components of the value chain will be targeted, and subsequently inform the basis of access pricing • The role of existing non-price regulation including DWI and EA purviews needs to be reflected in decisions on upstream reform

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Figure 2.4 – Stakeholder views

Stakeholder Group	Would wish to see...	Would not wish to see...
Government and policy drivers	Government would wish to see access prices that: <ul style="list-style-type: none"> • promote <i>efficient</i> entry to new markets • create pricing signals that help to improve environmental conditions and water consumption • promote innovation and consumer choice • allow efficient companies to fully recover their costs 	Government would not wish to see access prices that: <ul style="list-style-type: none"> • inadvertently lead to increased bills for consumers; • An unravelling of regionally averaged prices for domestic customers
Regulatory perspectives (Ofwat, Drinking Water Inspectorate, Environment Agency, Consumer Council for Water)	Regulators would wish to see access prices that: <ul style="list-style-type: none"> • protect consumers from sudden or dramatic bill increases • ensure companies remain compliant with CA98 and allow efficient entry of competitors • provide better price signals for water use and subsequently the environment 	Regulators would not wish to see access prices that: <ul style="list-style-type: none"> • give rise to dominance competition cases including margin squeeze cases • that create environmental or water quality concerns with upstream competition
Incumbent companies	Incumbents would wish to see access prices that: <ul style="list-style-type: none"> • allow companies to finance their operations and recover past and future efficient costs • allow companies to remain compliant with CA98 and allow efficient entry of competitors • protect the consumer from sudden bill increases 	Incumbents would not wish to see access prices that: <ul style="list-style-type: none"> • increase sector costs • raise legitimacy concerns • create stranded assets

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Stakeholder Group	Would wish to see...	Would not wish to see...
Customers	<p>Customers would wish to see access prices that:</p> <ul style="list-style-type: none"> • either maintain bill stability or lead to lower bills through competition • promote greater choice and niche offerings from suppliers 	<p>Customers would not wish to see access prices that:</p> <ul style="list-style-type: none"> • inadvertently lead to increased bills for consumers
Potential entrants	<p>Potential entrants would wish to see access prices that:</p> <ul style="list-style-type: none"> • promote entry to new markets • allow them to compete with incumbents on price, quality and additional services. 	<p>Potential entrants would not wish to see access prices that:</p> <ul style="list-style-type: none"> • foreclose the market driving the need to raise Competition Act challenges
Investors	<p>Investors would wish to see access prices that:</p> <ul style="list-style-type: none"> • provide good assurance that they can earn a stable return on investment • allow companies to fully finance their operations and recover their costs; • Deal appropriately with the RCV 	<p>Investors would not wish to see access prices that:</p> <ul style="list-style-type: none"> • create stranded assets for incumbents • require costly transitions in financing • create regulatory uncertainty in the water industry

2.9 This discussion shows that design of an effective access pricing regime will have to satisfy a number of competition drivers, some of which inherently pull in opposing directions.

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Objectives of this paper

2.10 This report seeks to add to the discussion on how a future access pricing regime could best operate in the water sector. It is not designed to determine a single approach for water. Clearly, based on the varying characteristics of the components of companies' operations (figure 2.2), it is unlikely that one optimal approach exists for all components of the value chain.

2.11 Rather, this paper looks to narrow the potential candidate options for an access price regime for water. We do this by reflecting on a broad suite of considerations rather than focusing solely on the theoretical options.

2.12 These considerations include:

- a) The objectives an access pricing regime needs to achieve;
- b) The contrasting views of the range of stakeholders;
- c) Specific issues associated with the water sector;
- d) The experience from other sectors; and
- e) Practical issues for implementation

2.13 The choice of access pricing regime for water and wastewater services will need to reflect the specific characteristics of the sector, its costs and operating models. Suitable time horizons and definitions of costs will need to be established. It should be supported by empirical study within the sector, not just based on the experience in other utilities. These empirical studies would involve establishing a deeper understanding of the relationship between customers' behaviours and the drivers of costs which currently may not exist in the water sector.

2.14 It is worth noting that the timeframe to develop and generate the necessary data to inform any future access price regime could be such that interim proxy measures are likely to be required. These would also need consideration and development.

2.15 It is inevitable that as exploration of access pricing touches on many economic and accounting approaches and terminology. We have therefore included a glossary provide an overview of the most frequently used terms in this report.

3. Issues in access pricing

3.1 There are two main issues in access pricing:

1. **The competition issue:** Whether the access price is set at a level that allows competition on level playing field basis in the contestable part of the business – i.e. allows an 'efficient entrant' to compete and make a competitive rate of return.
2. **The investment issue:** Whether the access price is set at a level that allows a reasonable return to investment in the non-contestable part of the market, such that it provides appropriate future incentives to invest and innovate.

3.2 There are then two basic approaches to setting access prices:

- a. **A top-down (price minus) approach.** This addresses the competition issue directly – in that it considers whether the difference between price and access price is sufficient to allow efficient competition.
- b. **A bottom-up (cost plus) approach.** This addresses the investment issue directly – in that it considers the total costs of the non-contestable part of the business and what an appropriate return on that would be. It arguably addresses the competition issue only indirectly – In practice, it is often accompanied by some form of vertical separation and/or a non-discrimination requirement, such that (to the extent that there is still some vertical integration) the incumbent's business is on a level playing field with potential entrants.

3.3 For both the top-down and bottom-up approaches there are then questions around the appropriate cost measure to use. For the top-down (price minus) approach, there are three main alternatives proposed.

- **Price minus average avoidable cost (AAC) of the contestable business.** This is also known as the Efficient Component Price Rule (ECPR). Essentially, any price difference greater than this would be encouraging entry by firms who can't supply on as efficient a basis as the incumbent. Given that incumbents will already have sunk costs and has on-going common costs across its lines of business, entry on this basis will risk raising total costs to consumers. The problem with this is that is how to allow efficient entry where there are any sunk costs of entry or the incumbent has any significant common costs across its business lines.
- **Price minus long run incremental cost (LRIC) of the contestable business.** This approach potentially allows entrants to cover their sunk costs of entry, and therefore is more able to promote efficient competition, even if total costs do increase as a result of this entry. This is in line with recent DGComp/ECJ precedent under Article 102.

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- **Price minus LRIC+ of the contestable business.** This allows entrants to compete even where incumbents have economies of scope (e.g. common costs) across business lines.

3.4 There is also a debate around the right measure of cost for the bottom-up approach to access prices, but this is more about ensuring the right incentives for investment, including the right signals for the right sorts of investment. As such there would seem to be good arguments in favour of adopting a forward-looking LRIC (or LRIC+) approach, at least in the long term.

Specific issues in the UK water industry

3.5 There are some specific challenges in relation to the UK water and sewerage industry which should be taken into account in the design of an access pricing regime. Perhaps the most relevant challenges are that:

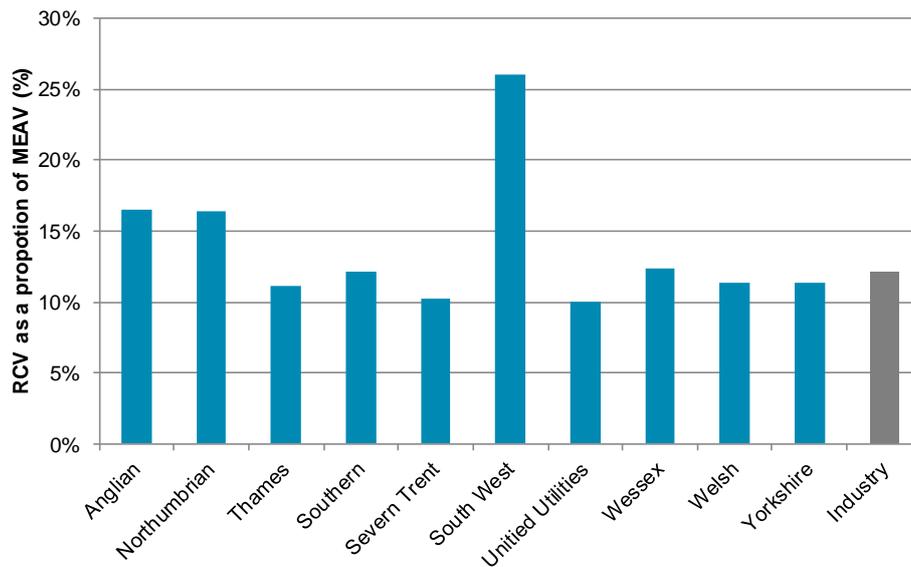
- *RCV is at a large discount to Modern Equivalent Asset Value (MEAV)/new entrant costs:* due to retail price cap arrangements and the associated business values agreed at privatisation, as well as long asset lives, the Regulatory Capital Value in the water and sewerage industry – the asset base on which company returns are calculated – is significantly less than the actual replacement value of assets. This implies that a new entrant offering an all-the-way service would necessarily incur higher costs than incurred by incumbent water and sewerage companies; a companion paper discusses the resulting issues in terms of allocating the rate base under liberalisation⁷;
- *Regional cost variation despite desired averaging of pricing:* a legislative hallmark in the water and sewerage industry is Ofwat's duty to sustain the cross-subsidy between urban and rural customers. Ofwat apply this duty through upholding regionally averaged water and sewerage wholesale and retail prices. However, this averaging masks significant regional and sub-regional cost differences in providing the water and sewerage service;
- *Scarcity and high forward incremental costs in some places:* the water and sewerage industry faces forward-looking challenges such as climate change and population growth which will put pressure on constrained resources leading to incremental costs well above average accounting costs. In addition, some water companies face high costs of adding additional capacity leading to significant import being placed on providing the right investment signals to make efficient decisions.

3.6 The key problem with this in water is that the Regulatory Capital Value (RCV) of water and sewerage companies is very low relative to MEAV and therefore to LRIC as captured in Figure 3.1:

⁷ NERA_Access_03: Liberalisation and the Ratebase

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Figure 3.1: UK Water: RCV Discount Relative to Replacement Costs



Source: NERA analysis of company accounts and Ofwat published RCV.

3.7 Figure 3.1 shows the high discount in the 2013 RCV relative to replacement cost asset values (or new entrant values). This captures an estimate of the proportion of the 2013 RCV to the Current Cost Accounting replacement costs based on company annual accounts. For the industry as a whole, RCV is estimated to be only 12% of MEAV across the industry, ranging from 10% to 26% across the WaSCs.

3.8 This matters because the treatment of this discount could potentially lead to a steep “step up” in access prices and final prices, or to problems with competition law and unfinanceable business elements. This is particularly so since, in order to ensure a level playing field in the contestable parts of the business, there is an argument how to overcome this problem. One alternative cited in the NERA technical annex⁸ is a contractual arrangement whereby the RCV is not allocated at all. Instead, the RCV is maintained in the regulated (monopoly) network and the transition to competition for the contestable business units is managed through contracts with and payments to or from the network element. Where these arrangements can be made to work, both in transition to them and then on an enduring basis, new capacity could then be open to competition, while protecting historic investment by maintaining the old RCV amongst the building blocks making up the basis for the regulated revenue requirement.

Defining Efficiency

3.9 Defining efficiency is fundamental to the discussion of both entry within liberalised market arrangements and the broader discussion of access pricing regimes.

⁸ NERA_Access_03: Liberalisation and the Ratebase

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3.10 Efficiently incurred costs are at the heart of both an ex-ante access pricing regime and also of huge significance for the ex-post assessment of Competition Act cases. In the context of the relationship between upstream (monopolist) and downstream (competitive) markets this discussion of efficiency is captured in the context of abuse of dominance and especially margin squeeze cases whereby an Equally Efficient operator (EEO) is unable to compete with an incumbent in the downstream market as a consequence of the prices it must pay for services from the upstream (monopolist) market⁹. Section four of this paper explores the relevant Deutsche Telekom and Telefonica cases.

3.11 As set out above, consideration of which costs are considered relevant for this assessment of “efficiency” is very important as they can directly impact on both the ability of an ex-ante access pricing regime to facilitate entry and the ex-post Competition Act considerations. For example, when assessing efficient costs for a contestable area, should these allow for any extra costs needed to enter into the market? And hence to be reflected in the calculation of the margin available for the contested activity? These costs are likely to be specific to an entrant and the incumbent will neither need to incur them nor know how they affect the costs of the entrant. This is why generally competition authorities base the EEO margin squeeze test on the costs of the incumbent; in order that the incumbent can determine with certainty the relevant costs for consideration in forming its access pricing regime.

3.12 Efficient costs are not just relevant in the liberalised element of the value chain, but for those incurred across the value chain. The “common costs” may not be separable in line with the separate components of the value chain which raises potential distributional issues of whether these costs (assuming efficiently incurred) are recovered from all parts of the value chain including both contestable and non-contestable aspects. These decisions will have consequences for both entry in the liberalised market and potential bill impacts for customers if cost recovery is significantly revised.

Cost recovery versus price setting

Cost Allocation

3.13 Currently companies use fully allocated cost (FAC), albeit with a forward-looking view, to inform the basis of revenue recovery within the regulatory price controls. This has been “fit for purpose” to date given the existing regulatory regime, and companies have designed and developed cost capture and allocation systems reflecting this requirement.

⁹ A specific example in the Water context is the current New Appointments and Variations (“Insets”) whereby an inset appointee purchases water and/or sewerage wholesale services from an incumbent through Bulk Supply or Discharge arrangements (wholesale) to sell to end customers. In this scenario in order to avoid accusation of margin squeeze, an efficient downstream entrant (the inset company) must be able to make an appropriate return on its downstream activity assuming it faces the same price for upstream services as the incumbent.

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3.14 For regulated undertakers the overall level of revenue that can be recovered from customers (as wholesale or retail charges) is set by Ofwat's price determinations. Undertakers have the responsibility for deciding how much revenue is recovered from each customer group and have license obligations to be fair in striking the balance between these groups.

3.15 Ofwat's focus in regulating (wholesale) tariffs implies that these should be set to recover the company's existing total cost base, reflecting a forward-looking view of those costs, and that any particular customer group's revenue is roughly in proportion to the accounting costs incurred in serving it. The result is that the average tariff recovers the expected average accounting cost.

3.16 Accounting procedures are to varying degrees designed to capture cost data that can be *attributed* to customers and services directly. The extent to which this happens at a local, functional level using an activity based costing system will reflect the level of investment and so transaction costs in obtaining the data. Where this is not available, the balance of costs needs to be *allocated* in a fair manner between customer groups. This entails a three stage process within a cost allocation model, at each of which a degree of subjectivity and judgement is required.

3.17 The output of the first stage is a re-statement of the total cost structure of the business, i.e. the revenue requirement, by activity, based on attribution or allocation to the elements of the service provided e.g. water treatment, distribution etc.

3.18 For the second stage, cost drivers should be chosen on the basis of the quantifiable characteristics of customer service use that determines the level of the cost of that activity. This shall be based wherever possible on empirically established relationships between drivers and costs. The output of this stage is a re-statement of the total cost structure by cost driver.

3.19 In the final stage, the total costs for each driver are allocated to customer classes using data on customer class characteristics.

3.20 Responding to the challenges posed by the reforms underway in the industry may require increasing recourse to forward-looking, geographically granular, service-specific measures of cost that can be readily allocated to specific customers in a transparent fashion.

Price Setting

3.21 The process by which cost allocation translates into price and tariff setting for individual customer groups is based to varying degrees on either a formalised or computational process.

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3.22 Tariffs look to recover the relevant costs to serve each customer group. These groups should be chosen on the basis of having different, observable and quantifiable, underlying cost characteristics. Customer groups are thus defined by weighing the gain of aligning price more closely, on average, to the cost of serving customers, against the transaction costs of data gathering to differentiate these groups. Charges should be cost reflective for most members of each group, and in its structure, price signal the resource cost so customers can respond in their pattern of usage to the value of the resource.

3.23 The setting of tariffs involves decisions on two issues, firstly the level i.e. the revenue requirement or average price implied by the tariff, as discussed above and secondly the structure i.e. whether the tariff has one, two, or more components, and the proportion of revenue to be recovered from each component.

3.24 The justification for the precise split between revenues recovered from each component can give rise to potential conflicts between various objectives. Cost reflectivity within customer groups suggest volumetric tariffs be set in proportion to the incremental costs incurred through usage or peak demand; efficient usage incentives require these to be aligned with marginal costs; and regulatory guidance introduces some further constraints (e.g. that tariffs exceed avoidable costs, that charge structures reflect long-run costs and that large user (discount) tariffs do not unduly incentivise high use).

3.25 Economic efficiency suggests that the tariff structure reflects the cost drivers that determine the outcome of the cost allocation process. In this way customers can directly relate their behavioural response to these price signals to their resulting charges. Thus in setting charges, companies need the flexibility to reflect improved data (e.g. from smart metering) in developing "richer", multi-part tariff structures, capturing potentially local, incremental and social costs, that improve cost reflectivity for individual customers with differing usage characteristics.

3.26 In setting charges, companies need also to manage the short-term bill incidence effects that may arise, necessitating that bill impacts are managed through glide-paths over time, which result in greater cost-reflectivity being phased. There may be other regulatory requirements such as maintaining "differential" pricing tests that could be contradictory to the aims of fully cost reflective charging. These potential conflicts mean that it will be beneficial for future regulatory guidance to be clear as to how companies should balance priorities. This will assist in resolving many of these issues on an ex ante basis rather than the costly and time-consuming alternative of relying on disputes and case work to develop a body of case specific ex post determinations to answer these questions.

4. Setting out the potential approaches

Objectives of an access pricing regime

4.1 There are a range of examples in regulated sectors in the UK and overseas where regulators have sought to address the complex issues of setting a regime for access pricing where one or more companies enjoy significant market power, and where access to their networks or services is essential for new entrants to create viable business offerings.

4.2 In all cases, the regime is trying to balance the interests of different market operators, consumers, and in many cases wider economic, environmental or social consequences too. However, the evidence suggests that it is difficult for regulators to balance the various interests in what is often a fast-changing environment where political imperatives can shift rapidly, and technological and market developments evolve in unpredictable ways.

4.3 Informed by our research, Anglian Water's view is that the key success criteria for any access pricing regime should be that it is seen to promote the long term interests of consumers by appropriately facilitating efficient entry into contestable markets, without endangering service quality and without a large extra burden of transition and transactions costs, whilst allowing incumbent firms to earn a fair return on efficient investment.

4.4 Building on the PESTLE analysis in Chapter 2, we have also sought to analyse what an access pricing regime would deliver from the viewpoint of different key stakeholders.

4.5 Taking all these considerations into account, Anglian Water would suggest that the high level principles access pricing regime for the water sector should seek to promote the interests of consumers by:

- facilitating efficient entry and challenging the efficiency of incumbent firms;
- ensuring that incumbent firms who control essential facilities cannot foreclose the market to efficient entrants;
- ensuring that incumbent firms can continue to finance their efficient operations and earn a fair return on efficient past investment;
- providing better pricing signals for water, to facilitate abstraction reform and water trading and improve environmental outcomes;
- Ensuring that choices about the treatment of the RCV are made in a way that maintains investor confidence; and
- considering social fairness and protecting customers from significant bill impacts

4.6 If an access pricing regime can achieve these objectives, then this should help to deliver a level playing field for competition in the contestable parts of the market, whilst avoiding hikes in the cost of

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capital, and ensuring that the long term interests of consumers, investors and the environment can be advanced. In absence of weighting these principles, we recognise that their relative significance will be informed by which upstream element is being considered.

4.7 The basis for considering how to promote efficient entry should start with a consideration of the equally efficient operator (EEO) principle.

The main options for pricing access services

4.8 The table below summarises the main options for setting access prices in network industries.

Pricing Options	Cost Basis	Description
"Minus" suite, including "Wholesale Minus"	<ul style="list-style-type: none"> • RCV-based profit and loss • "Minus" from management accounts • And / or from forward plans 	<ul style="list-style-type: none"> • All start with incumbent's retail or wholesale tariffs and subtract costs avoided as a result of not supplying one or more service elements
Current WSL Costs Principle		<ul style="list-style-type: none"> • Under old WSL cost principle (as interpreted) the subtracted costs are only a "thin" sliver
Wholesale minus "More"		<ul style="list-style-type: none"> • Subtracted costs can be a larger amount, perhaps most of average cost in some situations
AW's Economic Pricing Model		<ul style="list-style-type: none"> • Specific to the pricing of bulk supplies to insets
Fully Allocated costs (FAC)	<ul style="list-style-type: none"> • RCV-based profit and loss • Activity cost analysis 	<ul style="list-style-type: none"> • Total profit and loss costs are allocated to service elements / customer classes using accounting rules to form service element prices
Long Run Incremental Costs (LRIC) suite	<ul style="list-style-type: none"> • Forward-looking, efficient costs • MEA valuation OR: proxy by today's avoided cost (AAC) for the service element concerned 	<ul style="list-style-type: none"> • All based on the additional costs of supplying the service or increment of service in question, holding the supply of all other services constant
LRIC (shallow)		<ul style="list-style-type: none"> • Only include costs directly attributable to the service, no common costs (e.g. corporate overheads)
LRIC (deep)		<ul style="list-style-type: none"> • Includes a share of common costs
LRIC (adjusted)		<ul style="list-style-type: none"> • LRICs are marked up / down to ensure full (RCV) cost recovery overall
"Wholesale minus" and LRIC applied to different elements of service	<ul style="list-style-type: none"> • Hybrid approach 	<ul style="list-style-type: none"> • Wholesale = retail tariffs minus all retail costs • Network access for water = wholesale tariffs minus LRIC of zonal resources Bulk supply = LRIC of resources plus average cost of treatment and distribution

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An exploration of retail minus

4.9 Retail minus is inherently about the margin available to a potential competitor created by the subtraction of specific cost components. The premise being this minus provides sufficient margin for entry. On this, it naturally links to the discussion of the ex-post margin squeeze assessments under Competition Law.

4.10 In terms of the potential approaches to constructing the “minus” component, there are possibilities, e.g.

- Avoided on a backward looking basis, which will be artificially deflated due to the RCV
- Average Avoidable Costs (AAC) on a forward looking basis
- LRIC, which allows for the recovery by a competitor of it’s the incumbent’s efficient sunk costs
- LRIC+ which allows for the recovery by a competitor of an allocation of the incumbent’s common costs

4.11 AAC is the closest to an Efficient Component Pricing Rule (ECPR), the idea being that if an entrant has costs higher than the incumbent’s AAC then its entry will raise prices.

4.12 This creates a challenge in the scenario that an ‘equally efficient’ entrant has sunk costs of entry (which aren’t included in AAC but are in the entrant’s LRIC) and also that it might cause some additional costs which for the incumbent are shared with other services (and thus don’t appear in either the AAC or LRIC. In this case, competition may not occur, even from efficient entrants, unless a relatively generous version of LRIC+ is adopted. However there may also be extra costs the incumbent needs to bear solely to deal with an entrant, that aren’t seen as part of the EEO downstream cost calculation, and which won’t be recovered from the entrant if access prices are set to give margins at that level.

Balancing ex-ante and ex-post - Relevant casework examples – Deutsche Telekom & Telefonica

4.13 When creating an access price regime, consideration should be given to the balance between introducing new ex-ante access pricing regimes and relying on the ex-post Competition Act framework.

4.14 Recent casework, such as the Deutsche Telekom and Telefonica cases¹⁰ demonstrate that the European Court of Justice (ECJ) and General Court (GC) may conclude that, even in circumstances where the conduct of a national regulatory authority may be regarded as having encouraged a dominant company to act in a particular way, this does not absolve a company from responsibility under Article 102 TFEU¹¹. Nor can the decisions of national regulatory authorities in any way affect DG Comp’s power to find infringements of the EU competition rules.

¹⁰ (October 2010) Case C-280/08 - European Court of Justice’s (‘ECJ’) judgment on Deutsche Telekom case;

¹¹ Treaty for the Functioning of The European Union

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4.15 In the Deutsche Telekom (DT) case, since the late 1990s DT was obliged to provide competitors with local access to its network. Both the retail and wholesale access prices were regulated; Wholesale prices were fixed by the then German telecoms regulator whilst retail prices were subject to a price cap.

4.16 The Commission established in Deutsche Telekom that the Equally Efficient Operator¹² (EEO) imputation test is the appropriate approach for competition law. The Commission concluded that DT had abused a dominant position because there was an insufficient margin between the wholesale price and the tariff for retail access. In particular, the difference between retail and wholesale prices was insufficient to cover the product-specific costs to DT of providing its own retail services on the downstream market. The ECJ upheld the Commission's finding in 2010.

4.17 Similarly in the case of Telefonica, the GC upheld the original decision by the DG Comp that Telefónica's pricing had been exclusionary and thus abusive (by way of Margin Squeeze) despite it being approved by the regulator. Telefonica was found to have abused its dominant position on the wholesale broadband markets (national and regional) by imposing unfair prices on its competitors in the form of a margin squeeze between the prices for retail broadband access and the prices for wholesale broadband access. The GC upheld the use of the EEO test as being the relevant approach to assessing the infringement.

4.18 In its application of EEO, the Commission adopted the long run average incremental costs ("LRAIC") measure in the calculation of the above analysis. LRAIC essentially means average variable costs, including fixed costs to be avoided in the long run, and sunk costs of entry into the market.

4.19 The Commission and the GC both rejected Telefonica's arguments in favour of upholding the previous decision in the Deutsche Telekom case, which dictates that it is the relationship between the two prices - the spread - that is the relevant source of liability, irrespective of whether or not either the wholesale or the retail price in isolation is anti-competitive. Thus, the decision in the Telefonica case is additionally significant for its vindication of Deutsche Telekom's proposition that margin squeeze is assessable on the basis of the spread between the two prices and is in itself capable of constituting an abuse of dominant position under Article 102 TFEU.

¹² Referred to in the case as Equally Efficient Competitor (EEC) but has the same meaning as EEO.

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4.21 In the UK water sector, Ofwat was previously limited by law to the 'WSL Cost Principle' which Ofwat interpreted as a 'retail minus' approach. A retail-minus approach is a form of access price where the regulated retail price forms a starting point, from which the costs the incumbent avoids by an entrant providing the retail and possibly other elements of service ("avoidable costs") are subtracted. Retail minus or "top-down" approaches are also often referred to as the Efficient Component Pricing Rule (ECPR).

4.22 The more recent Water Act (2014) removed the cost principle from UK water legislation¹³. Potential candidates to replace it include Fully Allocated Cost (FAC) and Long Run Increment Cost (LRIC) approaches. Average Avoidable Costs (AAC) may also be a useful approach.

4.23 A review of the evidence to hand would suggest that, on balance, access pricing regimes that set prices by reference to the relevant long run incremental costs ("LRIC") or the average avoidable costs ("AAC") attached to the service in question are the closest to mirroring competitive markets.

4.24 However, for the UK water industry, moving to fully worked-up LRIC models would be a significant, costly and lengthy task given the lack of homogeneity in networks relative to other network utilities. There are also significant existing system constraints that will constrain the ability of incumbents to set "perfect" access prices. These include how far specific approaches will require new bottom-up costing analysis to be done, and how accurate existing cost allocation and cost recovery mechanisms are. These can and should improve over time, but it is unlikely that there will be a quick fix available.

4.25 Taking this into account, it seems desirable to explore what proxy cost measures for LRIC could be used. Whilst these would be less economically "perfect" they could nonetheless provide a reasonable basis for access pricing that achieved the objectives set out above.

4.26 As noted in the table above, adjustments to a FAC approach, or various forms of "wholesale minus" based approaches, could provide a good starting point. This could leave open the potential for LRIC-based approaches to evolve over time as the market develops.

4.27 Another alternative is to assess the average avoidable cost (AAC) related to the service in question, and use this as the basis for an access price for an entrant operating only in the upstream market. We consider below – in a stylised example - how this could operate in a contestable market for sludge.

¹³ Although at the time of writing this section of the Water Act has not been enacted. The enactment of this section of the Act will be dependent on the production of Ofwat's forthcoming Charging Rules

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Sludge: a potentially contestable market

4.28 Some opportunities currently exist which would lead to the development of some increased transactions. This could involve, for example, neighbouring companies exchanging sludge at sites close to the border where such an exchange was economically beneficial. We anticipate, this would only relate to a small proportion of total sludge.

4.29 Another alternative, may involve a company with a strong retail position for biosolids taking digestate from other companies so as to take advantage of its retail strength. As the retail value of biosolids sales is small by comparison to total costs relating to sludge transport and treatment, the impact of such retail sales expansion would be small. Such opportunities would be informed by the legacy characteristics of incumbent companies existing sludge operations (for example, size of existing sludge centres and the proportion of sludge transported) which we know varies across the sector.

4.30 Promoting contestability for sludge could involve third parties in one or more of the following service elements:

- Raw sludge transport
- Sludge treatment
- Biosolids sales and distribution

4.31 It is likely that the proportion of sludge transported, which is informed by the volume of sludge arriving at sludge treatment plants from large co-located sewage treatment plants will have an impact on contestability given the large cost associated with transporting sludge.

4.32 There are two possible future approaches for promoting contestability in sludge treatment. The first option is more straightforward and could be implemented relatively quickly. This would be to only allow contestability for non-indigenous sludge. Third parties would be responsible for raw sludge transport from all sewage treatment facilities which do not have co-located sludge treatment facilities. They would be then be responsible for treatment of the sludge and disposal of the biosolids residue, both in terms of the digestate and the sludge liquors which might need to be returned to sewage treatment facilities for further treatment.

4.33 This first option would necessarily create spare capacity at incumbent's sludge treatment plants as these have been optimised to handle the current requirement for sludge capacity. This in turn would incentivise incumbents to find ways of utilising the new spare capacity.

4.34 The second option would be to put the management of co-located sludge treatment plants out to tender. As by definition these plants are integrated with the indigenous sewage plants, the physical split of sites would be more complicated. The contractual framework would also take considerable effort to define and then refine. Given that the management of the sewage treatment and sludge treatment parts of currently

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integrated plants are closely intertwined, defining the mutual obligations and the consequent service level agreements would be difficult.

4.35 Disaggregating the wholesale value chain for sludge would necessarily raise questions of cost allocation and price setting. Given the current integrated nature of sewage and sludge treatment, incumbents would have a considerable task to split the cost of operation and assets in such plants on an objective, measurable basis.

4.36 As a general stance, Anglian Water's view is that the cost measure most relevant for pricing contestable services should in the first instance be average avoidable costs (AAC). This merely recognises the fact that moving to a Long Run Incremental Cost (LRIC) basis universally is in itself a long term aspiration. When the complexities of LRIC have been successfully resolved, we would expect that our cost assessment may move to a LRIC basis.

4.37 Audited regulated costs for individual services are now produced annually by each company. These could form the basis for initial cost floor assessments. Moreover, under the pre PR14 cost setting regime, Ofwat and individual companies had developed a detailed understanding of special factors faced by specific companies. Anglian Water, by virtue of its large area and low population density, had a special factor to take account of the additional transport costs incurred.

5. Policy considerations for access prices - evidence from other sectors

5.1 This section of the report describes different access pricing approaches that have been used at various times in other sectors. We then attempt to draw out relevant lessons from the case studies that can be applied to the water sector. The paper does not provide a comprehensive set of case studies, but instead focusses on those that may have most relevance to the UK water and sewerage industry.

“Retail-minus” access pricing

5.2 This section describes liberalised utility regimes where some form of minus approach (e.g. retail minus, wholesale minus) has been used. The following are the main themes that are apparent from exploring these approaches:

Retail Minus - Lessons for Water

- **Avoiding margin squeeze.** The DG Comp Telefonica case suggests that dominant incumbent firms should set access prices that enable an “as efficient” entrant to cover the incremental costs it would have to incur to provide a service. The benchmark which DG Comp will generally rely on to determine the costs of an “as efficient” entrant is the LRAIC of the downstream part of the incumbent. Similarly to the ACCC, this suggests that efficient entry is fostered by a retail-minus approach with the “minus” constructed based on a measure of avoidable (forward-looking) costs;
- **Applying LRIC-based approaches for all service elements would probably lead to higher total costs than using the RCV as a base.** This is because the RCV is at such a large discount to MEAV, as discussed earlier in this paper;
- **Minus approaches have sometimes been considered most appropriate where the overall price is either regulated or subject to competition.** This was the case under the previous WSL cost principle and for Sydney Water.
- **The water sector could use a minus approach as a transitional arrangement.** Both New Zealand and US Telecommunications have used minus approaches as a transitional arrangement prior to adopting LRIC based network access pricing.
- **The existence of monopoly rents is often discussed when considering the merits of a retail-minus approach.** For Sydney Water, the absence of monopoly rents through regulation of the retail price was seen as a precondition for using retail minus. Conversely, in New Zealand Telecommunications, the existence or otherwise of monopoly rents in the retail price was judged by the Privy Council to have no bearing on the use of retail minus approaches.

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Case Study: Sydney Water, Australia

5.3 This case study relates to an arbitration made by the Australian Competition and Consumer Commission (ACCC) over access to Sydney Water's sewerage transportation and treatment network and the pricing of this access. In this instance, Services Sydney, an entrant, had disputed Sydney Water's usual practice of pricing access based on a retail-minus approach with the ACCC taking the judgement that the retail minus approach should be used. The ACCC then calculated the appropriate price which calculated avoidable costs of sewage treatment. Avoidable costs in this context were construed as the costs that a vertically integrated access provider would otherwise incur in the provision of a good or service that could be avoided if it ceased provision of the relevant contestable services completely in respect of the good or service in question. These costs were then subtracted them from the retail price, and finally facilitation costs connected with providing access were added on.

5.4 Services Sydney and the ACCC disagreed on whether the retail-minus approach or the bottom up methodology would be more costly to administer. The ACCC concluded that the retail minus approach would be no more costly to implement than a bottom-up LRIC approach.

5.5 Key questions for the water industry from this case are that:

- The ACCC judged that efficient entry is fostered by a retail-minus approach with the "minus" constructed based on a measure of avoidable (forward-looking) costs;
- The ACCC saw a regulated retail price as an important pre-condition for retail-minus approaches: it considered this ensured the absence of monopoly rents (although this is a contentious point); and
- The ACCC concluded that neither retail minus nor LRIC approaches are more costly to implement than the other.

Case Study: Ofwat's approach to Bulk Pricing Determinations

5.6 Prior to 2010 in England and Wales, competition had mostly been restricted to new developments or individual large businesses changing supplier. Prices used to be set based on retail-minus approaches, which followed from Ofwat's interpretation of previous legislation. However, the Water Act (2014) removed the 'cost principle', the piece of legislation interpreted to require retail minus approaches from primary legislation. This leaves Ofwat to set guidance on access prices.

5.7 Ofwat has provided interim guidance on access pricing through bulk price determinations for the two previous Determinations¹⁴¹⁵ In both cases Ofwat described a general framework for setting/assessing access charges

¹⁴ Ofwat (Dec 2014) Final determination of bulk supply prices charged by Anglian Water to Independent Water Networks Limited for the supply of potable water and the discharge of wastewater to the Priors Hall site, in Corby Northamptonshire, under sections 40, 40A and 110A of the Water Industry Act 1991

¹⁵ Ofwat (Oct 2014) Draft determination of price of the supply of non-potable water from United Utilities Water to Iggesund Paperboard (Workington) Limited under section 56 of the Water Industry Act 1991

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as an interim approach, subject to future development. Ofwat seems to be adopting an approach based on testing to be sure of avoiding margin squeeze, by looking to assess whether an entrant can make a reasonable return. The framework does not specify a single network or bulk access pricing standard (such as retail minus or TSLRIC), but suggests that retail minus could be a reasonable approach, with the opening price based on the incumbent's most relevant service price, itself usually currently based on fully allocated costs (FAC).

Case Study: New Zealand Telecommunications

5.8 At different times, New Zealand Telecommunications has used both a 'retail minus' and TSLRIC approach. New Zealand Telecoms has used the 'Economic Component Pricing Rule' (ECPR) in the past for some network access services, but later switched to TSLRIC. In 1994, ECPR pricing was upheld by the Privy Council in London in a dispute between the incumbent operator 'Telecom' and new entrants. The dispute centred on whether Telecom had abused its dominant position by using ECPR in access pricing for connections.

5.9 The Privy Council judged that Telecom had not abused its dominant position, for the following reasons:

- ECPR pricing would yield the same outcome as if a hypothetical company was setting prices in a perfectly contestable market
- The validity of ECPR for setting access charges is not affected by the presence of monopoly rents. A core argument against ECPR was that if ECPR access charges contained monopoly rents (because they were in the retail price), this would affect the development of competition. The Privy Council concluded that, since both Telecom's downstream operator and new entrants were paying the same access price, the presence of monopoly rents in the access price was not relevant to whether ECPR should be used.

5.10 Subsequently however, Telecom's ECPR was overturned by the Telecommunications Act (2001) which required interconnections to be priced based on the TSLRIC. The Act defined TSLRIC as the following:

"means the forward-looking costs over the long run of the total quantity of the facilities and functions that are directly attributable to, or reasonably identifiable as incremental to, the service, taking into account the service provider's provision of other telecommunications services; and includes a reasonable allocation of forward-looking common costs."

5.11 This change of approach seemed to be driven by the desire to increase competition in the sector, which was a defined objective within the Telecommunication Act. Another driver to implement TSLRIC may have been the prevalence of other industries in UK, Europe and the US beginning to implement LRIC-based approaches.

5.12 In summary:

- The Privy Council viewed that ECPR was equivalent to allowing efficient entry;

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- The Privy Council viewed that monopoly rents were an irrelevant consideration for deciding whether ECPR was appropriate; and
- The Privy Council then used the TSLRIC definition (but note that if this approach were used in water it would be expected to lead to higher costs than allowed for under the RCV)

Case Study: US Telecommunications

5.13 The Telecommunications Act (1996) defines three routes through which incumbent telecommunication companies (ILECs) must provide access to other entities. The aim of all three routes is to encourage market entry and facilitate efficient competition:

- **Resale**, where ILEC offers wholesale telecoms services to new telecommunications providers who then sell services to end customers;
- **Interconnection**, where ILEC provides, for the facilities and equipment of new telecommunications providers, interconnection with the ILEC's network; and
- **Unbundled access**, where ILEC provides new telecommunications providers with non-discriminatory access to its network elements on an unbundled basis.

5.14 The Act clearly provisions that resale should be priced using a retail minus approach. This differs from the Act's stipulations for interconnection and unbundled access provision, which must reflect Total Service Long-Run Incremental Costs (TSLRIC). There is no explicit justification for the adoption of different approaches. However, this may follow from the increased difficulty of measuring TSLRIC for the entire service, versus just measuring it for unbundled elements. A further reason for the choice of retail minus is that it may have been selected for the practical purposes of easing arbitration.

Entry and Exit Charging

5.15 Another method of access pricing is entry and exit charging, which is typically used in the electricity and gas industries. However, in these cases the firms are vertically separated, so there is no risk of margin squeeze.

Case study: UK electricity

5.16 Entry and exit charges in the UK electricity industry use LRIC estimates. These approximate the actual costs on the network and are designed to allow cost recovery. Due to the small units of measure (megawatts (MW)) used within this LRIC, This methodology is more akin to Long Run Marginal Cost (LRMC).

5.17 These charges for the industry's transmission system are set equal to the National Grid's estimate of LRIC. These estimates are used to calculate the variable charge to access the network and the remaining

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revenue requirement being recovered through a fixed charge. Entry charges are calculated using a model of network flows estimating the increased flow of electricity to each network circuit based on an additional megawatt (MW) added to the network, multiplied by a conversion factor. This conversion factor reflects the costs associated with running additional electricity flows in any circuit, given the technology that is available at the nodes in question. Exit charges are calculated by estimating the increased flows at all network nodes when removing an additional MW of electricity from a given exit point.

5.18 The application of LRIC within the UK electricity sector is viewed as being effective. The simplifications made in the calculation of the network flows, could lead to the actual signals differing from the true economically efficient signals however these simplifications made are not viewed as being significant, not likely to impact the price signals and hence efficiency. However, the fundamental differences in the water sector (vertical integration, no national grid, bigger constraints on where capacity can be added) mean that the read-across is limited.

Case Study: UK gas

5.19 Access charges within the UK gas industry are based on charges developed within the UK electricity industry. Given the very different characteristics between the two industries, it is debatable whether the access charges provide efficient price signals.

5.20 The capacity of the National Transmission System (NTS) is based around an "entry-exit" system meaning that all gas is forced to be sold through one point of sale, the National Balancing Point (NBP). Entry capacity through this system allows shippers access from points of entry into the NTS to the NBP, whilst the exit capacity offers access from the NBP to points of exit from the NTS which is either then entered onto distribution networks or goes directly to consumers connected to the transmission grid.

5.21 This set up, means that the NTS has a number of ways in which entry and exit capacity can be provided. Short term access arrangements (annual and monthly tariffs for entry/exit capacity) are approved by the Regulator, allowing new entrants to acquire network access when they acquire a new customer and capacity auction are also held.

Case Study: US gas

5.22 Access prices in the US gas industry are based on established property rights and the pipelines owner's right to recover their costs, something that might be applicable to the water and sewerage industry.

5.23 The methodology creates precise economic signals for capacity as the contracts purchased by suppliers provide them with residual rights over the specific pipelines that they use to transport gas and hence the price of the contracts provides capacity signals. This procedure gives providers two options to purchase the rights to the pipeline capacity;

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- They can purchase directly from owners; or
- They can purchase pipeline capacity through secondary markets.

5.24 When buying the capacity directly from the owners, the suppliers agree to pay for the complete costs of building and using some capacity in return for an asset life long contract for the complete amount of capacity created by their investment. Purchasing pipeline capacity through secondary markets allows customers to sell the capacity to other users within the market at the market prices.

5.25 Suppliers in this process have the right to the pipeline for the full accounting life of the asset, however if the asset lasts longer than their accounting life then the network operator makes the capacity available to new users via some non-discriminatory process. Any spare capacity on the network is publicised and sold through the network operator, ensuring that any spare capacity is made available within the market. This is an interesting approach, and further thought could be given as to whether it can be applied in the context of UK water.

Access Pricing in Telecommunications and Post

5.26 This section highlights the different approaches that have been taken in the telecommunications sector to construct versions of LRIC cost estimates. The applications and implications for water on how LRIC could be used are:

- **The construction of LRIC estimates can vary significantly depending upon the method used.** It is important to recognise that the adoption of LRIC can vary by method.
- **There is some uncertainty in other sectors around LRIC's reliance on revaluing asset values, which led to changing access prices.** This could have implications for the use of LRIC in water. As noted in the case study above, Australian Telecommunications reverted from LRIC based pricing to an accounting approach because LRIC was causing uncertainty over future access prices.
- **Using a range of adjustments to Fully Allocated Costs (FAC) may be a reasonable transitional arrangement in the water sector.** For the UK post sector, Ofcom took the view that a reasonable interim approximation for LRIC was 50% of Fully Allocated Costs (FAC) providing their stance on the relationship between FAC and LRIC.

Case Study: UK telecoms

5.27 Access pricing in the UK telecoms industry has evolved over time moving from operators paying Access Deficit Contributions (ADC) to an LRIC plus mark up methodology. ADCs are charges for the difference between the amount that is recovered by British Telecom (BT) on the retail services and the costs of providing the wholesale services. The transition to LRIC was driven by the ADC system being perceived as too complex, poorly understood, deterring entry and from pressure from new entrants. This pressure from entrants was driven by a lack of

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transparency in the ADCs and these not representing the the true costs of providing interconnection and access services to BT.

5.28 Oftel's 1996 price determinations moved from ADCs to an LRIC plus mark-up methodology for non-contestable services. This was driven by the belief that this methodology is more approximately close to an efficient market environment. This methodology has been used since in the telecoms industry. Along with the charge control, Oftel applied a "floor to ceilings" test as a first order test for any competition proceedings, where any prices that fell below the floor to ceiling range, where the floor was set at LRIC and the ceiling at stand-alone costs, would be looked into further.

Case Study: US telecoms

5.29 As set out in the "Retail-Minus" section, access pricing within the US telecoms industry uses a Total Element Long-Run Incremental Cost (TELRIC) approach. One criticism of this methodology is that TELRIC is capable of being able to produce costs well below the service cost, which could lead to inefficient entry, as it did not capture common costs.

5.30 Total Service Long-Run Incremental Cost (TSLRIC) is potentially a better approach, as it should capture relevant common costs.

Case Study: Australian telecoms

5.31 Access pricing methodologies used in Australian telecoms have moved from a TSLRIC plus a mark-up for common costs to an efficient FAC basis. The main drive behind this change was due to the TSLRIC+ method needing continuous revaluation of the network asset values which was leading to uncertainty around future access charges. The ACCC made note that the Fully Accounted Cost approach reduces the risk of efficient expenditure not being recovered and so promotes efficient investment within infrastructure as well as competitive entry and competition within the relevant markets.

Case Study: UK Post

5.32 Historically, access prices in the UK mail sector have been based upon FAC. However industry regulators have more recently suggested that LRIC is an important long-term goal for prices. Ofcom has noted that Royal Mail currently does not have sufficient and robust LRIC information. In the interim, a LRIC proxy of 50% FAC has been used. Ofcom's drive for an LRIC goal seems to be due to the desire to promote competition. However, the declining revenues of Royal Mail are also a key driver.

5.33 Royal Mail is slightly different in that it is allowed to set cost-oriented geographically varying access charges. However, Ofcom wishes to ensure that the company does not set these prices below LRIC within contested areas but then recover its common and fixed costs through higher than efficient charges in less contested zones. Ofcom has therefore specified that Royal Mail should set its access charges based on cost

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rations, so that the difference between access charges in any two zones should be proportionate to the cost differences between those two zones.

Key points of relevance for the Water Sector

- **A Minus approach can be used in transitional arrangements.** Using this approach can provide sufficient protection to incumbents whilst transitioning to market liberalisation. This was evidenced in telecommunications in New Zealand and US before they moved to LRIC based access pricing. However applying such transitional arrangements to the water sector may be different due to the differing sector characteristics, especially in technology.
- **Water sector characteristics are unsuitable for entry and exit charging, used alone.** Entry and exit charging is mainly used within the electricity sector as electricity can be added and removed anywhere on the network. This can not be done in the water sector, where an extra "transport" step (possibly infeasible) between zones would be needed at least, and as seen in the gas sector, using this method can raise questions around the efficiency of the economic signals created.
- **Monopoly rents.** There is a difference of views regarding monopoly rents, with the Privy council in New Zealand taking the view that monopoly rents were irrelevant in considering whether Economic Component Pricing Rule (ECPR) was appropriate, whilst Sydney Water took the view that an absence of monopoly rents were viewed as critical for the decision to use ECPR.
- **Point to Point systems and the water sector.** The US Gas transmission uses a system of pipe to pipe rights purchase & trading system, which provides efficient economic signals. This system may be applicable to the water sector as there are similarities between water and gas transportation, e.g. long-lived assets and strong regional variation in cost. However, it may be a challenge for the sector to transition to this system, due to the historical design of the network and most especially to the potentially prohibitively high set-up and transaction costs.
- **The role of the RCV in competition and access pricing decisions.** It has been noted that where the RCV is at a significant discount to possible new entrant costs, as in UK water, there may be a greater risk of competition model failure.
- **Water industry networks and Total Service Long Run Incremental Costs (TSLRIC).** The definition of TSLRIC used in telecoms would be likely to lead to higher costs than allowed for in the RCV-based regulation currently.

6. Practical considerations for access prices - Evidence from other sectors

Practicalities for access pricing

6.1 This section highlights practical problems that have been found in setting access prices in other industries and seeks to highlight any implications that these would have if applied in the water sector.

Incremental Costs

6.2 Incremental costs are important for pricing because they reflect the cost consequences of decisions. A firm deciding whether to continue providing an increment of service, however that increment is defined, will only provide that increment if it receives for it more than its incremental cost. Under perfect competition, firms are forced down to pricing at marginal cost by the need to compete. As a result, incremental costs are seen as the theoretical gold standard for setting access charges; these costs however become mired in practical controversy.

6.3 As soon as we attempt to estimate incremental costs, we are presented with a range of empirical and modelling assumptions which can entirely shift the meaning of what we describe as incremental costs as well as the consequences for economic efficiency. These challenges can make constructing incremental cost models very challenging and assumption intensive. The large degrees of additional definition necessary in measuring incremental costs are acknowledged by the academic literature, leading some to think:¹⁶

"estimating LRIC based costs is as much an art as it is a science. This being the case, the implication is that it is better to be approximately right, rather than exactly wrong."

6.4 Given this view of incremental cost estimates as an art, some of the key variables and practicalities that need to be considered are:

- The size of increment used
- The degree of network optimisation
- The amount of common costs allocated to the access price

6.5 If a LRIC approach were to be used in the water sector, decisions around each of these variables could have significant impact on how effectively access prices are set.

Increment Size used to model LRIC

6.6 From the case studies, different sectors use different sizes of increment to calculate LRIC. The practicalities of different sectors can be a constraint on the level of increment chosen. Theoretically smaller

¹⁶ Bath University, "the development of telecommunications regulation – a collection of reviews", May 2004, page 83.

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increments allow more accurate LRIC estimates to be generated but are practically more difficult to model and calculate. Conversely, large LRIC increments are more feasible but introduce some historical inefficiency into the calculations.

Small increments

6.7 National Grid use small increments to estimate LRIC and can do this because it can obtain an accurate measure of network flows at all parts of the network. Practically, this may be much more complex a task for water and sewerage. The increased complexity of modelling perturbed water and sewerage flows might make an equivalent of National Grid's small increment approach unviable in water and sewage. Water is costly to transport and travels over specific pipes only, rather than being easily transferable to other links in the network. Thus constructing such a model as in energy, with incremental costs reflecting flows, might not be practically implementable in water and sewerage as in energy. The existing degree of inter-connectivity is also a relevant consideration.

Large increments

6.8 BT uses large increments to set LRIC and adds "fixed common costs" to these. Fixed common costs are the fixed costs that are common across services or subservice. In water and sewerage, BT's approach would be equivalent to using water distribution, water treatment etc. as increments. This approach would make implementing LRIC much easier as it could be done using top-down regulatory accounts rather than building extensive (and likely expensive) hydrological flow models. However, it would come at the expense of potentially enshrining inefficiency in the cost estimates and being overly reliant on historical data.

6.9 Additionally there is some existing water evidence in favour of this approach. The Australian Competition and Consumer Commission (the ACCC) in its determination on an access pricing dispute between Sydney Water and Services Sydney determined that a retail minus approach where the minus was defined using LRIC was appropriate.

Degree of network optimisation

6.10 Optimisation refers to the notional network used to estimate LRIC. In the limit, an entirely new hypothetical network could be used to form estimates of LRIC i.e. the cost of rebuilding the network from scratch to provide the increment. At the other end of the range is not optimising at all, which would imply costs based on the existing network. Re-engineering the network in such a way would never be feasible, and therefore it is unrealistic to price on this basis. This is why no cases use fully re-optimised network configurations (referred to as "scorched earth" measures of LRIC).

"In the real world, however even in extremely competitive markets, firms do not instantaneously replace all of their facilities with every improvement in technology. Thus even the most efficient carrier's network will reflect a mix of new and older technology at any given time."

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6.11 For prices to reflect efficient network decisions, the incremental cost should be estimated based on some reasonable view of the current network reconfiguration, allowing for some, feasible network re-configuration. To encourage efficient entry either upstream or downstream, prices should reflect what network reconfiguration may be possible over the long term for the network provider. This introduces a further consideration as to what the appropriate definition or “long-term” is, which is likely to vary by industry.

6.12 BT uses a “modified scorched node” approach – where more of the network is allowed to be re-optimised. The modified scorched node can be defined as starting from a scorched node approach and then eliminating inefficiencies in the current network configuration according to some criteria. On this choice, BT notes the following principles:¹⁷

- a. *“Scorched node should usually be the starting point,*
- b. *When adopting LRIC for the first time it is good practice for the National Regulatory Authority to analyse whether a modified scorched node assumption would give significantly different results,*
- c. *The modified scorched node approach should be assessed, as the PIB already indicates, using a bounded rationality approach.*
- d. *If there are found to be significant efficiencies from a modified scorched node approach, then this should be reflected in future LRIC assessments,*
- e. *If there are no significant benefits from a modified scorched node approach, it is acceptable for top-down LRIC models to be prepared on a scorched node basis.”*

6.13 Therefore, some form of network optimization would be desirable in the water sector. BT’s ‘modified scorched-node’ approach may be a good model to emulate given that this approach is already working in practice and is feasible to implement.

Common Costs

6.14 The main approaches to allocating common costs observed are as follows:

- a. Not including common cost: this produces the price consistent with economic theory under perfectly competitive conditions, although tends not to be seen given its inconsistency with cost recovery;
- b. Full common cost recovery, allocated according to demand elasticity for the service: according to economic theory, services with the most elastic (most responsive to price changes) demand profile should bear the least common costs. This is because consumption decisions for such services are most affected by price changes, increasing the chance that consumption will be skewed away from the efficient level as a result of the price change;

¹⁷ BT: “Response to the ERG consultation document on LRIC principles of implementation and best practice (PIB)”, September 2003, page 4.

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- c. Full common cost recovery, allocated pro-rata to incremental costs: this is the most utilised method, mostly because it is the most practical to implement, and is often referred to as the “equal proportionate mark-up” (EPMU) approach. However, its impact on economic decision making is indeterminate, and thus does not enshrine the efficiency properties which were the goal of pricing at incremental costs in the first place. LRIC with common costs allocated according to this rule have been labelled LRIC+.

6.15 There are many references to common costs allocated by demand elasticity (sometimes referred to as Ramsey pricing) in the LRIC literature but it is seldom applied in practice. By far the most common method is using an equal proportional mark-up to allocate common costs. BT uses this approach (LRIC+) in UK telecommunications, and it was combined with a ceiling/floor test in Oftel’s early regulation.¹⁸ The floor for the test was pure incremental costs, while the ceiling was stand-alone costs – the cost of providing the service in isolation, thus including all relevant common costs as well as incremental costs.

6.16 Ideally, water and sewerage would use elasticity based adjustments to ensure common cost were covered by prices. However, this standard is likely to run into the same estimating challenges as in other sectors and therefore the more implementable option seems likely to be the equal proportionate mark-up approach. It is also unclear how this would align the governmental and societal objectives to retain aspects of geographically averaged pricing.

Setting appropriate costs

6.17 LRIC estimates must be set for the particular sector in which they will be used, otherwise if these are not implemented correctly or modified away from the sector in which they will be used, then there is potential for them to lead to inappropriately high or low access prices and a resultant impact on efficient entry.

6.18 For example, in New Zealand Telecommunications, TSLRIC is defined as:

“(a) means the forward-looking costs over the long run of the total quantity of the facilities and functions that are directly attributable to, or reasonably identifiable as incremental to, the service, taking into account the service provider's provision of other telecommunications services; and (b) includes a reasonable allocation of forward-looking common costs.”

6.19 If this definition was applied in the water and sewerage industry, then it would likely lead to LRIC much higher than the RCV due to the cost of new mains (notionally rebuilt from scratch along the same routes)

¹⁸ Bath University, “the development of telecommunications regulation – a collection of reviews”, May 2004, page 93; and Oftel: “Pricing of telecommunications service from 1997 – controls and consultative document on BT price interconnection charging”, 1995, paras 5.46-5.49.

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being much higher than the heavily discounted cost of existing mains as captured in the RCV.

6.20 Similarly, in US Telecommunications, scholars have inferred that TSLRIC has been implemented incorrectly. One of the key conclusions from the decline in resale competition, of 5.4m lines in 2000 to below 3.5m lines in 2002, and rapid increase in unbundled network elements, from 1.5m to 11.5m lines, was that unbundled network elements had been mispriced. This would have resulted either from TSLRIC being the incorrect standard, or TSLRIC being implemented incorrectly. In this case, the reason for the increase was due to the FCC's use of TELRIC which may have under priced interconnections and unbundled access, prompting new entrants to provide these services when it may have been efficient to use entry in resale. It should be noted that this is an on-going practical issue as TELRIC is still being used within US telecommunications.

Transitional Asset Issues in Liberalisation

6.21 The introduction of competition into parts of a previously vertically integrated business and the resulting separation of integrated utilities into standalone business units at different parts of the value chain can raise transitional issues¹⁹. Well before the limiting case of separation of integrated utilities into standalone business units at different parts of the value chain.

6.22 In dealing with transitional issues, key considerations are the importance of providing investors with a fair return on efficient past investment, but also to facilitate competition in parts of the value chain with the aim of improving service levels and/or reducing bills for customers.

6.23 In the specific discussion of assets, it is important that the introduction of competition, does not result in either:

- The creation of "stranded assets" associated with inability to recover the value of efficient historic investment decisions made for a pre-competitive situation; or
- The creation of "stranded benefits" in the form of windfall gains if assets in newly contestable units are allocated a below-market value in separating the RCV or divesting the business unit, but now can raise prices above the level at which charges had been set under the regulatory contract. (If they raise prices, final customers will be paying more overall. If they do not raise prices to the entrant level, there may be competition law issues.); or
- Large costs from needing to transition the financing arrangements, because the nature of the business and the risk-reward balance has

¹⁹ See NERA_Access_04: Broader Transitional Issues in Utility Reform , for a fuller discussion

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been changed or because previous financing metrics relied on in financing instruments no longer have their original meaning.

6.24 In water and sewerage in England and Wales the transitional asset stranding and financing issues are partly a function of how the RCV is dealt with under the introduction of competition, which we explore in more detail below.

Key points of relevance for the Water sector

- **LRIC estimates are as much an art as a science.** Estimating LRIC involves making modelling and empirical assumptions. The variables and specifics of the water sector will help to determine how LRIC could be implemented. Evidence suggests a broad range of considerations across potential LRIC parameters.
- **Using small increments to determine LRIC would not be readily practicable in the water industry.** Constructing such a model as in energy, with incremental costs reflecting flows, might not be practically implementable in water and sewerage because Water and sewerage flows are more difficult to model than electricity flows.
- **Using large increments to determine LRIC would be easier to implement.** LRIC based on large increments, similar to BT's approach, could be based on top-down regulatory accounts. However, this would introduce some inefficiency by using historical cost data.
- **Some form of network optimisation is desirable in forming LRIC estimates for the water sector.** BT's 'modified scorched-node' approach may be a good model to emulate. It is an approach that is already working in practice and assesses whether a modified scorched node approach would deliver significant benefits versus a top-down LRIC model.
- **Water and sewerage sector should use the equal proportionate mark-up approach (LRIC+) to allocate common costs.** This is the most common approach used in other sectors. Ideally, the water sector should use elasticity based adjustments to ensure common cost were covered by prices. However, this standard is likely to run into the same estimating challenges as in other sectors and is not implementable.

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Regulatory Capital Value (RCV) Allocation

6.25 As outlined in section 3, in the UK water industry the RCV is at a significant discount to the MEAV. However the access prices are set this could lead to a potential problem, one which Ofwat recognises²⁰. In this section, we explore the problem and potential methods for dealing with this. The problem can be characterised as:

- If RCV were to be simply allocated in an unfocussed way between various business components, pro-rata to MEA values, service element prices at this level would arguably give the incumbent an unfair competitive advantage in the potentially contestable markets against any potential entrants, and we would never see competition emerge – but the likely competition law problems inherent in that position would mean that service element prices would rise to entrant or MEA levels, increasing sector costs and prices to customers overall (stranded benefits); or
- On the other hand, if RCV is allocated in a focussed market-value based way to the contestable parts, such that there is a more level playing field for competitors in this part of the market, with the network taking the residual, it would leave only a small part of the RCV in the non-contestable part of the business – that part might not be financeable. This would in turn put a significant proportion of the RCV in the business subject to erosion by competition, with potential for stranded costs. Moreover, to the extent that the non-contestable business receives a revenue that is massively below its own LRIC, this will not send the correct pricing signals for future investment in the network and substitutes for it.

Unfocussed RCV Allocation

6.26 This approach allocates the rate base to each of the business units as a proportion of their shares of the total MEAV or the new entrant value, ensuring a consistent treatment of all parts of the value chain. However, there is a risk of under valuing the assets at all parts of the value chain, relative to their replacement costs. This may mean that new entrants are unable to compete with business units whose asset values are allocated at a substantial discount relative to replacement costs, with the problems mentioned above.

Focused RCV Allocation

6.27 The focussed approach to RCV allocation is one which allocates values to the contestable parts of the asset base using market values with the non-contestable part allocated residually.

6.28 A focused RCV allocation approach can raise financeability questions within the non-contestable network segment, and without further measures the cash flows and capital base may leave the business with

²⁰ Ofwat (2011) "Financeability and financing the asset base – a discussion paper"

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little ability to withstand shocks, leading to increased financing costs even in the regulated business.

6.29 This approach allows a market based approach to be adopted for the business units open to competition and the regulatory framework can be adapted to ensure a fair rate of return on the non-contestable business units, however there is a concern over the balance between introducing efficient competitions whilst protecting historical investments in the contestable units.

6.30 In the case of Sydney Water, the ACCC set out considerations when looking at the appropriate valuation for the treatment and disposal assets which were potentially subject to competition from Services Sydney;

- A value of the Sydney Water treatment and disposal assets lower than their efficient forward looking cost could result in a margin between “all the way” retail prices and access prices which could deter an efficient asset seeker from entering into the sewerage treatment market; and
- A value of the treatment and disposal assets which is higher than their efficient forward looking cost could result in a margin between retail prices and access prices which could encourage inefficient entry within the sewerage treatment market.

6.31 Scottish Electricity used the Current Cost Accounting asset valuation as the starting point for calculating the Regulated Asset Base for the distribution businesses of the Scottish companies rather than an apportionment of market value at privatisation. This approach is transparent and highlights the need for financeability of the standalone business units when market or contestable values are below asset replacement costs.

6.32 Agreeing on the value of stranded assets depends on which past investments which will no longer provides a return should be protected.

6.33 Two of the main critical issues in asset stranding are;

- Defining the value of stranded assets; and
- Setting out a mechanism for cost recovery

6.34 In the US electricity sector, two approaches were used for stranded cost recovery; a cost reflective price cap with netbacks and a price cap with no netbacks.

6.35 A cost reflective price cap with netbacks method doesn't require any an ex ante estimate of the utility's total amount of stranded costs as the recovery of stranded costs moves in the opposite direction with the market price. Whilst price cap with no netbacks method involves rates being unbundled into separate charges for generation, transmission and distribution services and a stranded cost access charge. These stranded costs are recovered through a non-bypass able access charge which is

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estimated ex ante as the difference between the utility's revenue requirement under regulation and the estimated market price.

Contractual arrangements

6.36 There is a family of alternatives to allocating the RCV that might be able to be developed to avoid some of the problems listed above. This would leave the RCV within the regulated network and managing the transition to competition for the contestable business units through contracts involving payments to or from them to the network business element. For example, the contestable business could be allocated a "shadow RCV" based on an unfocussed allocation. This shadow RCV remains part of the existing RCV. However, as the contestable business grows the shadow RCV (e.g. by growth in net fixed assets). In parallel, the monopoly business accounts for RCV in the normal way by subtracting the shadow RCV for the purpose of revenue setting. The contestable business could then be contractually obliged to pay to the monopoly business an amount equal to the return on capital (on the basis of the regulatory WACC) of the shadow RCV, making this act like inter-company debt, and the payment would be similar to an interest payment.

6.37 On this basis, contestable area prices could be at entrant levels, and would avoid windfall returns (as those sums would be paid to the network business and deducted from the network revenue requirement). New capacity could then be open to competition, while historic investment would be protected by maintaining the old RCV as the basis for the regulated revenue requirement.

6.38 The UK Electricity sector and Dutch Gas sector²¹ provide evidence of alternatives to RCV allocation that are similar to these. We therefore believe this option warrants further discussion, given the potential benefits in providing continued surety for the existing RCV in the Water sector. However this idea would need to be developed to test whether in water and sewerage the set-up and transactions costs would in practice be prohibitively high, whether the changed business risk profiles can be made low enough to be acceptable given the use of markets and contracts to govern some elements of prices and returns (instead of use of the well-known regulated asset base and price limits), and whether the costs of any necessary transition in the financing arrangements could be kept acceptably low.

Key points of relevance for the Water sector

- **Approaches to RCV allocation can have significant impacts.** These include affecting entry prospects in contestable part of the value chain and also financeability concerns elsewhere in the value chain.
- **Alternatives to allocating the RCV have been employed in other sectors.** These include the contractual approaches. These seem to be well worth further exploration and development.

²¹ See NERA_Access_03: Liberalisation of the Ratebase for details

7. References

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8. Glossary of frequently used terms

Access Deficit Contributions (ADCs)

ADCs are the contributions required to meet BT's access deficit. BT's access deficit arises in part from previous regulatory restrictions on BT's price charges to customers for line connection and line rental, which mean that BT funds its access deficit from call revenues. By paying ADCs as part of the interconnection payment, other operators pay out of their call profits contributions to the funding of BT-Network's access deficit equivalent to those paid out by BT-Retail.

Average Avoidable Cost (AAC)

This is a cost that will not be occurred if a particular activity is not performed, or a service not provided. It is usually in relation to variable costs.

Efficient Component Pricing Rule (ECPR)

The ECPR is also referred to as the 'retail-minus' approach. It is a top down method of calculating an access price, starting with the retail price to customers, subtracting any retail costs that were deemed avoidable, and then adding back on any expenses of dealing with the licensee, as opposed to the customer.

Equally Efficient Operator (EEO)

An EEO is a theoretical downstream competitor who is as efficient as the vertically integrated firm's own operation. This gives rise to the "as efficient" or "equally efficient" operator standard which determines whether a downstream competitor that is at least as efficient as the vertically integrated firm could cover its costs given the prices set by the vertically integrated firm.

Fixed and variable costs

Costs can vary with different measures of demand. But some costs do not vary at all and are fixed. When considering which costs are fixed and which are variable the relevant time period is key. In the short term, some costs (particularly capital costs) are fixed. The shorter the time period considered, the more costs are likely to be fixed. In the very long term, all costs are considered to be variable, although in the water sector some network assets have lives of 100 years or more.

Focussed RCV

The focussed approach to RCV allocation is one which allocates values to the contestable parts of the asset base using market values with the non-contestable part allocated residually.

Fully allocated cost (FAC)

This is an accounting approach under which all of a company's costs are distributed between its various products and services. This ensures that companies do not recover too much or too little of the revenue they need to finance their existing functions overall.

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Incremental cost

This is the cost of producing a specified additional amount ('increment') of product, service or output over a specified time period. Another way of expressing this is that the incremental costs of a service are the difference between the total costs in a situation where the service is provided and the costs in another situation where the service is not provided. Incremental costs are often assessed where particular investment decisions are being considered (for example, to serve new customers).

Long run marginal cost (LRMC)

This is the additional cost of providing an extra unit of service or product in the long term. But LRMC pricing creates a disconnect between the costs a company currently faces (driven by its existing network) and the prices it sets (reflecting potentially different future network decisions). This can create issues of companies either recovering too much or too little of the revenue they need to finance their functions overall.

Long run incremental cost (LRIC)

This is the additional cost of meeting a defined sustained increment of demand for services or products in the long run. For example, it would include the capital and operating costs of a new asset required to meet demand over the long term.

Modern Equivalent Asset Value (MEAV)

The capital cost of replacing an existing asset with a technically up-to-date new asset with the same service capability.

Modified scorched node

A modified scorched node approach assumes that the location of the nodes is as in the current network (as with Scorched Node) but that the activities at the nodes can be re-optimised. These assumptions or constraints can be developed within both a Top Down model that takes forecasts of future

Regulatory Capital Value (RCV)

The RCV is the capital base used in setting price limits and represents the value of the appointed business, which earns a return on investment. It represents the initial market value (200-day average) including debt at privatisation, plus subsequent net new capital expenditure including new obligations imposed since 1989.

Scorched node

A scorched node approach assumes that the number and location of the nodes and their activities remain as currently defined within the network. These assumptions or constraints are implicitly made in top down models that use historic cost accounting information.

Scorched earth

A Scorched Earth approach to optimisation refers to using an entirely new hypothetical network or "blank slate" which could then be used to form

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estimates of LRIC i.e. the cost of rebuilding the network from scratch to provide the increment.

Short run marginal cost (SRMC)

This is the additional cost of providing an additional unit of service or product in the short term, assuming there is no change to companies' fixed assets. SRMCs are often used where maximising the use of existing capacity is identified as a key objective. Setting prices at SRMCs ensures that anyone wanting to buy a particular product or service is able to do so at a price that will cover the short-term costs of providing that service. SRMC pricing means that prices will not cover a company's fixed costs. As well as potentially creating financing issues for existing assets, this can lead to limited incentives for companies to invest in new assets.

Stand-alone cost (SAC)

This is the cost of meeting a defined demand for a particular service on its own. These are the costs incurred by a new entrant in a given market with no existing customers for the service concerned. It is therefore often important to consider the SAC when considering whether it is possible for an alternative company to enter a market and provide a given service.

Total Element Long Run Incremental Cost (TELRIC)

The TELRIC method was developed in the U.S. as an approach to calculating prices based on the increment of the unbundled elements used to provide the service. In other words, it measures the incremental cost of adding or subtracting a network element from a hypothetical efficient system using current technologies. It is therefore a form of LRIC that uses smaller increments than TSLRIC.

Total Service Long Run Incremental Cost (TSLRIC)

The TSLRIC method is similar to TELRIC in that it also estimates forward-looking common costs; however, incremental cost is based on the service, not the element. This method is essentially the same as one developed by the European Union called long-run average incremental cost (LRAIC) in that it measures the incremental costs of providing the total service, including service-specific fixed costs.

Unfocused RCV

This approach allocates the rate base to each of the business units as a proportion of their shares of the total MEAV or the new entrant value, ensuring a consistent treatment of all parts of the value chain.

Water Supply Licensing (WSL) Regime

Introduced by the Water Act 2003, the WSL regime enables non-household customers in England and Wales who are likely to use at least 5Ml of water a year at each premise to choose their supplier. New companies can supply water to eligible customers once they have a Water Supply Licence. Existing water companies who are appointed under WIA91 can compete by setting up associate companies. Their licence will allow them to operate anywhere in England and Wales, except in the supply region of their associate water company.

9. Annexes - Nera issues papers

NERA_Access_01: Access Pricing in Liberalised Utility Arrangements

NERA_Access_02: Incremental Cost Measures in Access Pricing

NERA_Access_03: Liberalisation and the Ratebase

NERA_Access_04: Broader Transitional Issues in Utility Reform

NERA_Access_05: Capacity Issues in Access-Entry Situations