

December 2021

# **Our proposed approach to funding bioresources activities at PR24**

## About this document

Earlier this year we published our [review of the bioresources market](#) – this identified a number of issues that need to be addressed to support this market. We consulted on proposals to address these issues, including how we could improve how we determine the funding for companies' bioresources activities at our next price review in 2024 (PR24). Having considered consultation responses, this document:

- consults on [additional information](#) that companies would be expected to provide alongside their regulatory reporting for 2021-22 to improve our econometric cost benchmarking models;
- consults on more detailed proposals for a new approach to how bioresources activities could be funded at PR24; and
- includes a [request for information](#) to enable us to inform, and potentially help implement, our preferred approach.

Note that the [consultation on our general approach to base costs](#) at PR24 applies to bioresources unless indicated otherwise.

## Executive summary

Bioresources (or sewage sludge) are the semi-solid by-products of wastewater treatment. With the right conditions, a market for bioresources will help the sector to meet its potential to create economic and environmental value by enabling and incentivising technological changes, economies of scale, inter-company optimisation and co-digestion of sludge with other organic waste.

To help achieve this, we have taken a number of steps to support the functioning of the bioresources market over recent years, including introducing a separate price control for bioresources at PR19. However, after identifying potential issues with the operation of the bioresources market, we launched our 'Review of the bioresources market' on 19 October 2020.

We published the [draft findings](#) of our review in May 2021. We identified a number of issues that need to be addressed to support this market. In this document, we set out our proposals to take forward two areas we identified as follows.

### 1. Better targeted cost assessment

At PR19 we set a common efficiency challenge across companies' wholesale wastewater activities. An efficiency challenge at PR24 tailored to the bioresources control would help to drive further efficiency. We have recently provided guidance to companies on how to allocate their costs appropriately.

We are now consulting on an information request to enable us to reflect this improved guidance in our PR24 econometric cost benchmarking models and allow us to set a separate efficiency challenge for bioresources activities.

### 2. Consider changing the basis of our efficiency assessment and implement an average revenue control

At PR19, companies' allowed revenue was composed of a fixed and variable component. We used an econometric approach to benchmark companies' base expenditure and challenged companies' proposed enhancement expenditure on a case-by-case basis. Financing costs were determined by applying an allowed return on capital to companies' Regulatory Capital Value (RCV).

At PR24, we consider that a more market-based approach to setting costs and revenues would have benefits as it would:

- bring a wider set of costs into our econometric cost benchmarking models;
- provide a similar level of regulatory protection for different categories of cost, so reducing any 'in-house bias';
- broaden the data we would consider as part of our assessment of costs; and

- set companies' allowed revenue in the form of an average revenue control – this is more akin to a gate price<sup>1</sup>.

We are now consulting on more detailed proposals for how this could be implemented. Our proposed approach to implement this is to:

- **Consider using depreciation data, rather than capital expenditure data, in our econometric cost benchmarking models.** This data could be more consistent with other aspects of our proposed control (discussed below). To help ensure an appropriate level of accuracy and consistency in this data, we propose to use data that is consistent with a current cost accounting approach and straight-line depreciation.

We are requesting data from companies to inform this decision.

- **Include financing costs within our econometric cost benchmarking models, rather than making a separate adjustment.** Financing costs that would be used as an input to the econometric cost benchmarking models – and so pre-efficiency assessment – would be calculated by applying a notional financing rate to a bioresources asset base.

Our econometric cost benchmarking models would therefore generate an allowance for companies' financing costs. This would promote a focus on efficiency in terms of bearing down on total costs, not just a narrow subset chosen for benchmarking.

- **Capture a greater share of enhancement costs through our econometric cost benchmarking modelling, rather than separate assessments.** Our new form of control would mean a separate allowance for bioresources growth enhancement would no longer be appropriate. Where a separate allowance is required, we would only provide regulatory certainty over the costs that fall in the 2025 to 2030 period.
- **Consider using forecast costs in our econometric cost benchmarking models.** This would increase the amount of data we could use and help capture the impact of future efficiency improvements.
- **Provide a different degree of regulatory protection for pre-2020 RCV as we committed to in PR19.** This could be implemented either by excluding legacy assets from the catch-up efficiency challenge or through a 'value floor'.

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<sup>1</sup> Also known as a 'gate fee'. Gate fees are the charges for providing a range of waste treatment, recovery and disposal services. For other organic waste it is commonly expressed on a per tonne basis.

## Responding to this discussion document

We would welcome any comments on this document. At the end of sections 2, 3 and 4 we set out specific questions for stakeholders. Please email your response to: [enrico.devivo@ofwat.gov.uk](mailto:enrico.devivo@ofwat.gov.uk) and [CostAssessment@ofwat.gov.uk](mailto:CostAssessment@ofwat.gov.uk). The closing date for this consultation and when the required information should be submitted is **5pm 10 February 2022**.

If you wish to discuss any aspect of this consultation, please contact Alex Whitmarsh by email at [alex.whitmarsh@ofwat.gov.uk](mailto:alex.whitmarsh@ofwat.gov.uk)

We will publish responses to this document on our website at [www.ofwat.gov.uk](http://www.ofwat.gov.uk). Subject to the following, by providing a response to this discussion paper you are deemed to consent to its publication.

Information provided in response to this document, including personal information, may be published or disclosed in accordance with access to information legislation – primarily the Freedom of Information Act 2000 (FoIA), the General Data Protection Regulation 2016, the Data Protection Act 2018, and the Environmental Information Regulations 2004. For further information on how we process personal data please see our [Privacy Policy](#).

If you would like the information that you provide to be treated as confidential, please be aware that under the FoIA there is a statutory [Code of practice](#) which deals, among other things, with obligations of confidence.

If you think that any of the information in your response should not be disclosed (for example, because you consider it to be commercially sensitive), an automatic or generalised confidentiality disclaimer will not, of itself, be regarded as sufficient. You should identify specific information and explain in each case why it should not be disclosed and provide a redacted version of your response, which we will consider when deciding what information to publish. At a minimum, we would expect to publish the name of all organisations that provide a written response, even where there are legitimate reasons why the contents of those written responses remain confidential.

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# 1. Introduction

In this section we set out:

- the background to our work to promote the bioresources market; and
- the structure of the rest of this document.

## 1.1 Background

Bioresources (or sewage sludge) are the semi-solid by-products of wastewater treatment. The bioresources activities of appointed sewerage companies<sup>2</sup> are split into three distinct activities:

- sludge treatment, which makes up around three-quarters of the cost and is the most capital-intensive element;
- sludge transport (moving sludge to, between and from sludge treatment centres (STCs)); and
- sludge disposal (also known as recycling and which largely involves spreading treated sludge on agricultural land).

Bioresources activities comprise around £3 billion<sup>3</sup> (6%) of companies' allowed revenue for the 2020-25 period. The yearly [cost to customers](#) can vary significantly between companies' areas - ranging from as low as around £13 to over £32 for a typical household customer.<sup>4</sup>

With the right conditions, bioresources activities could help to create greater economic and environmental value. A well-functioning bioresources market could help achieve this.

After identifying potential issues with the operation of the bioresources market, we launched our 'Review of the bioresources market' in October 2020. We published the [draft findings](#) of our review in May 2021. After considering the evidence, we found the following.

- The bioresources market can help to deliver major benefits to customers and the environment and that this is recognised by a wide range of stakeholders.
- However, there are a number of barriers to prevent the bioresources market from reaching its full potential and achieve the benefits we envisaged at PR19 – these barriers are varied and include our economic regulation, environmental regulation, economic or technical barriers and cultural barriers.

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<sup>2</sup> In this document an appointed sewerage company is a company holding an appointment as a sewerage undertaker under the Water Industry Act 1991 and regulated by Ofwat to carry out sewerage functions. We refer to such companies as 'companies' or 'sewerage companies'

<sup>3</sup> This estimate is based on our final determinations in December 2019.

<sup>4</sup> This is the annual average bioresources bill per household over the 2020 to 2025 period. Figures are in real terms (17/18 FYA CPIH) and based on our [PR19 determinations](#).

- Companies, other public bodies and ourselves can take further action that could bring additional benefits.
- A collaborative approach will be needed to address many of the barriers.

As part of our draft findings, we set out the pillars of our bioresources strategy (see Figure 1) and our plan to implement this.

In our recent [bioresources market monitoring report](#) we provided an update on our recent work to address the market barriers we identified in our review of the bioresources market. For example:

- our recent cost allocation guidance (discussed further in Section 2);
- an updated [market information direction](#); and
- [draft bid assessment framework guidance](#).

Our market monitoring report had some of positive findings, such as a reasonable level of competition for sludge transport and disposal by third parties. However, we remain concerned that the trading of sludge for treatment is very low and falling and that companies continue to report a number of barriers to competition<sup>5</sup>. We continue to expect companies to take a leadership role in developing the market – this includes working collaboratively to address barriers.

**Figure 1: The pillars of our bioresources strategy**



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<sup>5</sup> For example, reported uncertainty due to environmental regulations (notably Farming Rules for Water), co-digestion regulation and other factors.

Our market monitoring therefore does not alter our assessment that we should continue to address the issues we identified in our market review in accordance with our bioresources strategy.

## **1.2 Structure of this document**

This document sets out how we can take forward our work to implement better targeted cost assessment and improve our assessment of companies' costs and revenue related to bioresources at PR24. These are two areas that will primarily help to implement the 'stronger incentives' pillar of our strategy, but also support some other pillars. The rest of this document is structured as follows.

- Section 2 sets out our proposals to reflect the improved allocation of companies' costs in relation to bioresources at PR24.
- Section 3 sets out of how we could implement our proposed approach to the assessment of bioresources costs at PR24.
- Section 4 sets out our assessment of how our proposed approach to the assessment of bioresources costs could impact the risk faced by companies.

## 2. Better targeted cost assessment

In this section we set out:

- a summary of the issues we identified in our review of the bioresources market;
- the outstanding issues we are aiming to address;
- our assessment of potential options; and
- our proposed implementation.

### 2.1 Issues identified by our bioresources market review

At PR19 we set a separate price control for bioresources for the first time. A separate price control helps to shine a light on the costs of bioresources, focuses management attention on driving efficiency and enables targeted regulation. Where costs are comparable between companies, they help the sector to better identify relative levels of efficiency and help inform trades.

Our review of the bioresources market identified several issues with the allocation of costs between the bioresources control and other controls. A summary of these issues are as follows:

- due to differences in the cost sharing rates between the bioresources and wastewater network plus controls, companies may have an incentive to allocate costs to the control where any expenditure above our efficient allowances is shared;
- there is significant variation in the way that companies account for certain costs;
- [Jacobs' bioresources market review report](#) considered that cost allocation issues were a market constraint which rules and guidance would address; and
- a specific efficiency challenge for bioresources would be more transparent and more likely to achieve a stretching, targeted efficiency challenge for these activities. However, we were unable to do this at PR19 due to data issues related to cost allocation.

We identified many of the above issues early on within the market review process. Earlier in the year, we provided guidance on how best to account for [sludge liquor costs](#), [energy generation revenues](#) and [overheads](#). We reflected in our guidance how companies are required to report their costs in the annual performance reports.

#### 2.1.1 Stakeholders' responses

Most of the respondents supported our proposal to improve cost allocations. Comments on our specific proposals in relation to sludge liquor costs, energy generation and overheads

were considered ahead of implementing our guidance on them. We note the key points regarding our overall approach below.

Wessex Water and Thames Water emphasised the importance of accurate cost information with the suggestion from Thames Water that guaranteeing accurate cost allocations could be challenging, due to the historic set up of water operations. Southern Water, Thames Water and Wessex Water suggested that our approach should consider companies' differences in specific circumstances. (Although, Thames Water and Southern Water noted this could also be challenging for a number of reasons, for example coming to an agreement on what cost allocation assumptions are appropriate may take time.)

Anglian Water and Severn Trent Water stated that cost allocation should be applied consistently. Severn Trent Water stated that an inconsistent approach could risk affecting customers' bills negatively.

We have considered stakeholders' responses in coming to our proposed approach for cost assessment at PR24 which is discussed below.

## 2.2 Our objectives in relation to PR24

Although our recent guidance has addressed the first three of the issues noted above, further action is required to enable us to set a specific efficiency challenge for bioresources at PR24.

We continue to consider that a specific efficiency challenge would be more transparent and more likely to achieve a stretching, targeted efficiency challenge for bioresources activities. We therefore intend to move towards a separate efficiency challenge regardless of whether or how we make changes to other parts of the cost assessment for bioresources discussed in Sections 3 and 4.

To set a specific efficiency challenge for bioresources (and separately for wastewater network plus), we would need appropriate data for our econometric cost benchmarking models. This requires a time series of historical data (and potentially forecast data – see Section 3.5) that reflects our recent cost allocation guidance.

Full implementation of our recent cost allocation guidance will be reflected in companies' shadow reporting from the reporting year 2021–22 onwards.<sup>6,7,8</sup> This would provide only a small amount of historical data that we could use at PR24. (By comparison, at PR19 our

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<sup>6</sup> For sludge liquors this was reflected in [Regulatory Accounting Guidelines 4.09](#). The shadow reported recharge from wastewater network plus to bioresources is reported in table 8C line 17. Companies' reporting based on the previous methodology is reported in the imported sludge liquor treatment column of table 4E.

<sup>7</sup> For energy generation this was reflected in our [Regulatory Accounting Guidelines 4.10](#). The shadow reporting of energy information is in table 8C lines 18 to 23 and table 4K.19 and 4K.20

<sup>8</sup> Proposals for data requirements are set out in annex 1. We intend to require shadow reporting only for the current price control period to avoid any mismatch between reported figures and the PR19 determinations.

wholesale wastewater econometric cost benchmarking models included data that went back to 2011-12.) A longer dataset is beneficial as it can improve the precision of model estimates. Therefore, we consider that additional data would help ensure our econometric cost benchmarking models can estimate an appropriate efficiency challenge for bioresources and wastewater network plus activities.

## 2.3 Our assessment

We have considered four options as follows:

- **Option 1: Only use data from 2021-22 onwards.** In this option we would draw on the more accurate cost data for recent years at PR24. However, this would lead to us being able to draw on much less historical data which would reduce the explanatory power of our econometric cost benchmarking models.
- **Option 2: Use uncorrected historical data before companies' new reporting requirements took effect.** In this option we would make use of all the historical data available, but much of this would be based on uncorrected cost allocation. Our econometric cost benchmarking models could therefore generate potentially inaccurate results. (We could use a dummy variable or interaction term to capture the impact of a structure break in the data, but this may still generate inaccurate results as the impact of our recent guidance is not the same across companies.)
- **Option 3: Ofwat-adjusted historical data.** In this option we would make adjustments to companies' historical data used in our econometric cost benchmarking models. This approach could potentially address the issues with options 1 and 2. Although such a top-down approach would lead to a relatively consistent methodology being applied, it could also lead to inaccuracies given that the adjustments required will vary by company and over time. We are less well-placed to understand the appropriate adjustment required for each company.
- **Option 4: Company adjusted historical data.** In this option companies would make adjustments to their historical data to be used in our econometric cost benchmarking models. This option could potentially address the issues with all of the options above. This approach could provide relatively accurate data compared to option 3 as it would draw on companies' understanding of how they have generated their data.

Our preferred option is option 4 'Company adjusted historical data' as this appears to be the most likely to address the issues we have identified by providing accurate data. It is also consistent with companies taking ownership of their data. To ensure that companies' approaches are clear and there is no significantly undue difference in approach, companies would need to explain their methodology. Furthermore, companies would need to consider the appropriate level of assurance for this information.

We consider that adjustments should be made to the data in both the bioresources and wastewater network-plus control – this will ensure both sets of data are accurate and that companies' wholesale wastewater costs are consistent with historical data.

We would review companies' updated data and seek clarifications and additional evidence from individual companies if their approach does not seem appropriate. Furthermore, if we have significant concerns about the sector data in general, we may reconsider the above options. For example, we may apply an adjustment ourselves.

## 2.4 Implementation

To implement option 4, we therefore propose that companies provide additional historical data alongside their regulatory reporting for 2021-22. This will be the first time that companies shadow report the information required to inform this data request. The details of our proposed information request are set out in Annex 1.

We intend to collect forecast data consistent with our recent guidance on cost allocation alongside other forecast data provided by companies in their PR24 business plans submissions.

## 2.5 Consultation questions

**Question 1:** Do you have any comments on this section?

**Question 2:** Do you have any comments on our proposed information request in Annex 1? In particular, we would welcome feedback on the following areas:

- the level of accuracy of the information companies could provide;
- the types of assumptions the company may make to provide this data;
- whether we should consider any further changes to this data; and
- whether additional data may be required.

### 3. A more market-based approach to setting costs and revenues

In Section 3 we set out:

- the issues identified in our bioresources market review to the PR19 approach;
- our objectives in establishing a new form of control for bioresources;
- our previous and proposed approach to assessing companies' costs; and
- approaches to broadening the information used in cost assessment.

#### 3.1 Issues identified by our review of the bioresources market

Figure 2: The building blocks of the PR19 bioresources control

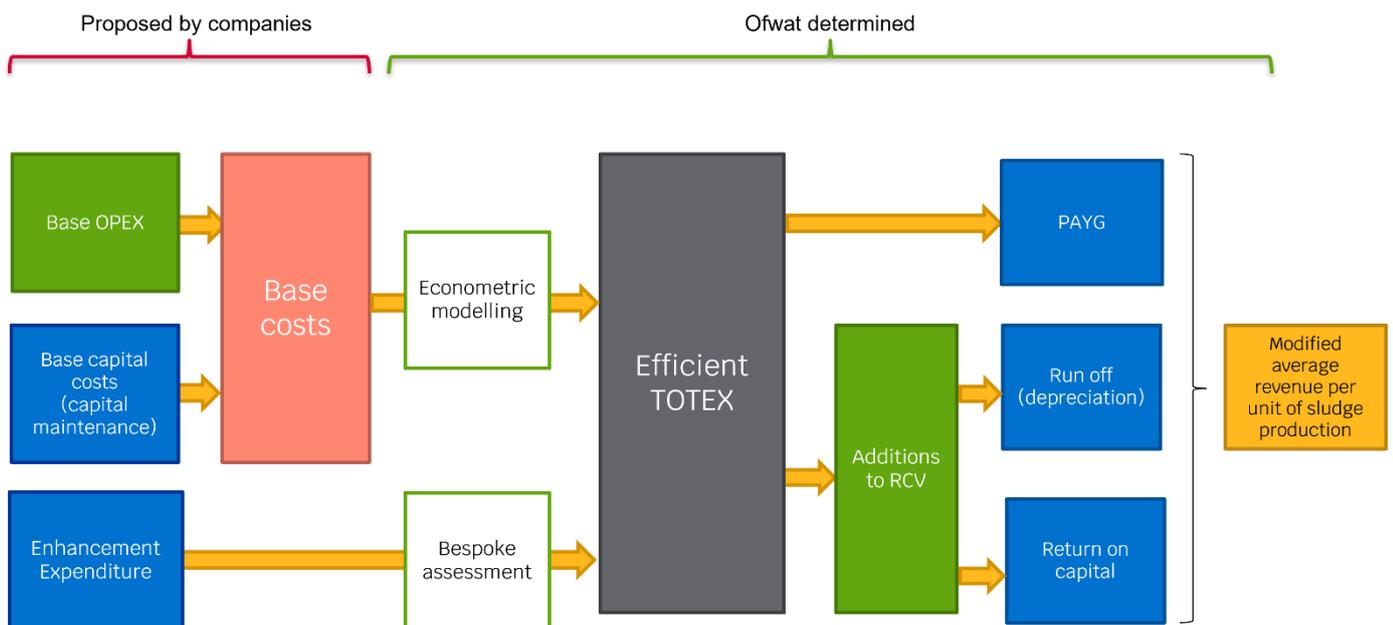


Figure 2 provides an overview of the building blocks of the bioresources control at PR19. We used an econometric approach to benchmark companies' base expenditure and challenged companies' proposed enhancement expenditure on a case-by-case basis. Financing costs were determined by applying an allowed return on capital to companies' RCV. Companies' allowed revenue is influenced by decisions around how much money to recover relatively quickly through 'Pay as you go' (PAYG) expenditure rather through the Regulated Capital Value (RCV). Although we did not provide any additional regulatory protection for new RCV, our approach did not treat this significantly differently from pre-2020 RCV.

At PR19 companies' allowed revenue was reflected in a 'modified average revenue control'. This adjusts only part of companies' allowed revenue if actual production turns out to be higher or lower than forecast. We also introduced a forecasting incentive to encourage accurate forecasts.

Our review of the bioresources market<sup>9</sup> identified the following issues with our PR19 approach to assessing bioresources costs.

- Companies' costs and revenues were determined through a regulatory process which is likely to be less customer-oriented and less efficient than a market-based one – a further consequence is that it could distort competition between sewerage companies and the wider waste sector.
- Enhancement and base costs are assessed through two different processes which could create potential distortions.
- The way the 'building-blocks' approach was implemented could create an 'in-house bias' for new investment and so inhibit the market<sup>10</sup> as undertaking investment in-house triggers a relatively large increase in RCV whereas a long-term contract is likely to be classed as base costs<sup>11</sup>.

At PR19 we said that:

- we intended to explore setting price limits based on 'gate fees' for bioresources services at PR24 as an alternative to the regulatory building-block approach; and
- we would provide a different degree of regulatory protection for pre-2020 RCV and investment after that date.

In our bioresources market review consultation, our preferred option was (if implementation issues could be addressed) to:

- benchmark companies' average revenue requirement – this would consider all companies' costs (ie depreciation, operating expenditure, capital maintenance expenditure, enhancement costs, and possibly other costs such as the cost of capital) per unit of dried sludge produced;
- potentially use supplementary approaches to inform our assessment – for example, modelling of the bioresources market<sup>12</sup> or comparison with gate prices in the wider waste sector; and

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<sup>9</sup> 'Issue 3: Approach to assessing costs'. We previously discussed this issue with stakeholders at an [industry event](#) in April 2021.

<sup>10</sup> Jacobs' bioresources market review report considers that companies' allowed revenue is only exposed to volume risk so is a lesser risk than that of revenue from a long-term contract. Jacobs recommend aligning the revenue risk between in-house and external capacity.

<sup>11</sup> Although new bioresources RCV does not benefit from the same regulatory protection as pre-2020 RCV, the way we implemented our building blocks approach at PR19 did not treat this significantly differently from pre-2020 RCV.

<sup>12</sup> For example, we could use the expected costs of an alternative party treating and disposing of the sludge, eg through a trade.

- provide pre-2020 RCV protection.

We considered that in principle this approach could, at least partially, address the issues we identified above and come closer to a 'gate price' type of approach. However, we identified a number of potential implementation issues which we would need to consider in the further development of this option.

### 3.1.1 Stakeholders' responses

We have considered stakeholders' responses in coming to our proposed approach which are summarised below. We also provide a response to these points in Annex 2.

Southern Water and United Utilities supported our proposal to protect pre-2020 RCV. Southern Water also noted our existing approach could be retained as a cross-check.

Lumpiness of investment was seen as an issue by a few respondents (Welsh Water, Wessex Water and Jacobs) with Wessex Water noting that with fewer sites to average out investment over, it is unlikely that a smooth investment programme that is appropriate for our benchmarking will be achieved.

Southern Water, Severn Trent Water, Yorkshire Water, United Utilities, Northumbrian Water, Wessex Water and Jacobs had concerns around various methodological issues such as benchmarking, which they believed would be difficult or inappropriate due to regulatory differences between the bioresources market and the organic waste market and had differing views on what costs to include in the fee. Severn Trent Water, United Utilities and Welsh Water were concerned that our move to a gate fee approach risks creating stranded assets.

Northumbrian Water and Southern Water considered that the cost of capital should be increased to reflect an increase in risks.

Northumbrian Water also commented on the administrative burden that tailoring regulatory protection to market-based solutions would create. Yorkshire Water and Thames Water also commented that the new approach would be complex and lead to increased costs while delivering uncertain benefits. Severn Trent Water and Southern Water note that the new approach should also take into account company specific or regional factors.

Southern Water and Jacobs commented that Ofwat had previously scrutinised historical expenditure and that this would not cover costs associated with complying with environmental regulations such as the Industrial Emissions Directive and Farming Rules for Water which need to be considered.

## 3.2 Our objectives in relation to PR24

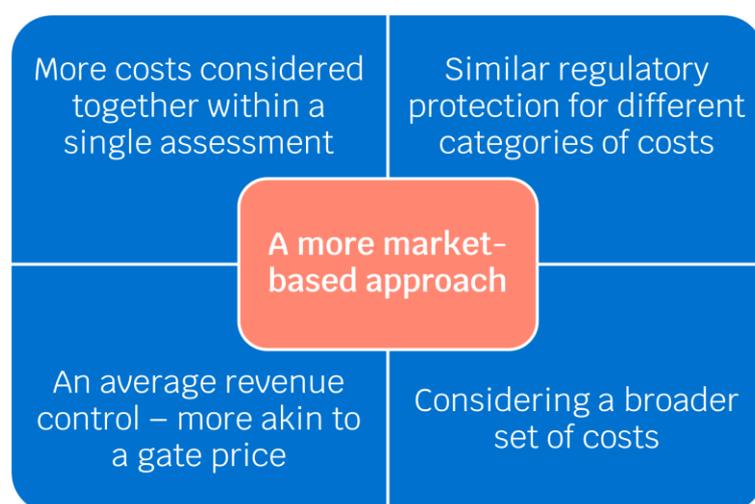
A key objective for PR24 is to set a price control for bioresources that addresses the issues noted above through the use of a more market-based approach to assessing costs and generating allowed revenue.

In a typical market, the costs of a good are reflected in its price. Through the market process, a business has an incentive to produce the good in the most cost-effective way to remain competitive. Furthermore, the prices in the market can provide information to market participants about the relative efficiency of competing businesses.

Figure 3 shows the principles of our proposed approach to achieve a more market-based, customer-oriented approach to setting costs and revenues. These principles are:

- bringing a wider set of costs into our econometric cost benchmarking models (such as financing costs and enhancement costs) – this would reduce potential distortions created by taking different approaches for different categories of cost and come closer to a market process where costs are reflected in the service's price;
- providing similar level of regulatory protection for different categories of cost, so reducing any 'in-house bias';
- broadening the data we will consider as part of our assessment of costs – for example, by potentially including forecast costs in our econometric cost benchmarking models and considering market data; and
- setting companies' allowed revenue in the form of an average revenue control – this is more akin to a gate price.

**Figure 3: Principles for our proposed approach**



In the following sections, we consider how we could potentially achieve this through a more market-based approach to assessing costs and setting revenues for bioresources at PR24.

### 3.3 Approach to funding residential retail activities

At PR14, when we set a separate control for residential retail activities for the first time, the RCV related to retail assets was not separated out from other wholesale assets. Companies continued to receive funding for these through our wholesale controls. Therefore, to avoid double funding of these assets, we removed the funding for depreciation on these assets.

At PR19 our approach to funding residential retail was based on:

- an average revenue control;
- including capital costs – in the form of an annual depreciation charge – alongside operating costs within our econometric cost benchmarking models;
- a net margin to fund companies' financing costs;
- making no separate adjustment for residential retail growth enhancement costs; and
- consideration of companies' forecast of costs when setting our efficiency challenge.

The approach we took for residential retail at PR19 provides a useful reference for an alternative approach we could take for bioresources at PR24. However, there are also a number of key differences with companies' residential retail activities that need to be considered. In particular:

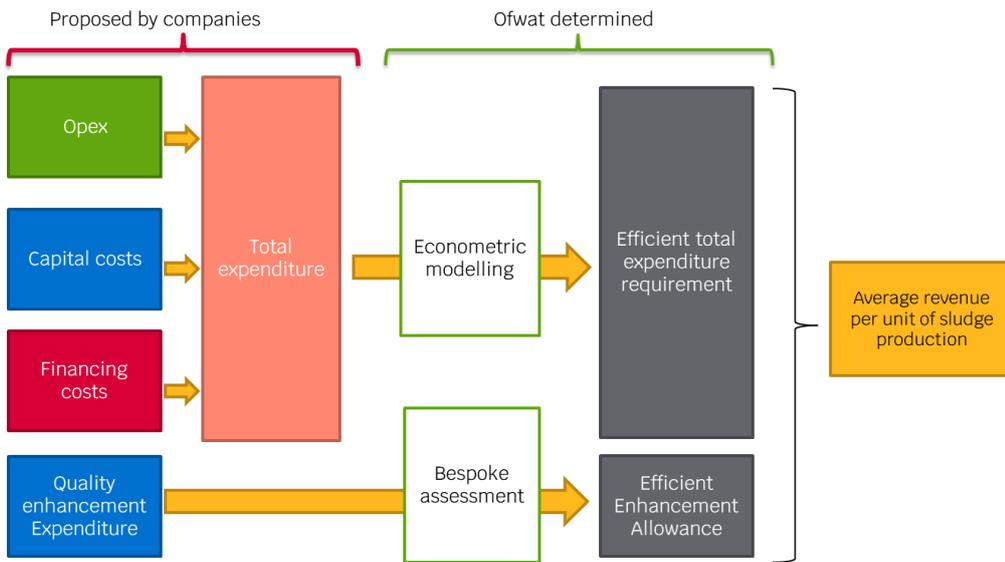
- that bioresources activities tend to be more capital intensive – these are largely sunk costs with relatively long asset lives compared to retail assets; and
- differences in companies' circumstances may mean that different levels and types of capital investment may be appropriate.

These differences mean we need to give particular consideration to how we assess capital costs, financing costs and enhancement costs that involves capital expenditure on assets with long-lives.

### 3.4 Overview of the proposed bioresources control

Figure 4 shows how the various parts of the control would interact to inform how we would set the allowed revenue for bioresources. The various components of this are discussed in more detail below (other than operating costs where there are no significant issues).

**Figure 4: Overview of the proposed bioresources control at PR24**



### 3.4.1 Capital costs: base costs vs. total costs

Our PR19 approach to assessing companies' bioresources costs included:

- the use of econometric cost benchmarking models to determine efficient base costs, that is, operating expenditure and capital maintenance expenditure; and
- a separate process to determine allowances for enhancement costs not captured by our econometric models, that is, certain bioresources growth and quality enhancement expenditure.

Under our previous approach, part of companies' costs – including their enhancements costs – could be added to their RCV and so recovered over a number of years.

In Section 3.1 we set out the issues with our PR19 approach to assessing bioresources costs – the process is likely to be less efficient than a market-based one. It could create potential distortions by assessing enhancement cost and base costs through separate processes and it could create an 'in-house bias'.

Consistent with the principles of bringing more costs into a single assessment and similar regulatory protection for different categories of cost, we propose including more enhancement expenditure within our econometric cost benchmarking models with a separate allowance for enhancements being made only in specific circumstances. Further discussion of our approach to enhancements is set out in Section 3.4.5.

### 3.4.2 Capital costs: expenditure vs. depreciation<sup>13</sup>

Depreciation is a method to allocate the cost of assets over their useful life. Depreciation therefore equals capital expenditure over time. We consider that both capital expenditure and depreciation data are legitimate inputs to our econometric cost benchmarking models.

In our PR19 base econometric models we used capital maintenance expenditure. Capital maintenance expenditure equals depreciation in steady state (that is, in the absence of enhancements).

There are advantages and disadvantages to using either depreciation or expenditure data in our econometric cost benchmarking models as noted below.

- Expenditure data is reliable financial data – however, capital expenditure can be 'lumpy' which in some circumstances can create issues. We use capital maintenance expenditure in our wholesale base econometric models.
- Depreciation smooths out capital costs – however, it can be affected by different accounting principles and policies.<sup>14</sup> We use depreciation data in our residential retail control and it was also used to set companies' capital maintenance funding requirements before PR14.<sup>15</sup>

In this context, we consider that depreciation could potentially be more appropriate, because we would need this data to:

- establish the asset base needed to inform our financing costs allowance; and
- ensure our efficiency challenge is only applied to post-2020 investment (this topic is discussed below) and therefore using depreciation data in our econometric cost benchmarking models would be more internally consistent.

However, we want to ensure that the depreciation data is appropriate before we make this decision. For example, we would consider whether there is a sufficiently long time series of depreciation, whether the data is comparable between companies and the availability of cost drivers that can explain variations in efficient depreciation between companies.

Therefore, we will consider the depreciation data we receive from companies and compare this with expenditure data before we decide which is more appropriate. The depreciation data companies should provide to us is discussed further below and in Annex 3.

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<sup>13</sup> In this document, depreciation should be taken to also include amortization of intangible assets where appropriate.

<sup>14</sup> It can become less smooth if this approach changes, or if there are significant write-downs of assets.

<sup>15</sup> Prior to PR14 we set price limits which included allowances for companies' capital maintenance needs. This was done based on two reported costs in the regulatory accounts. These were called an infrastructure renewals charge for below ground assets and a current cost depreciation charge for above ground assets.

### 3.4.3 A standardised approach to capital costs

#### Depreciation before 2020

In the past, we required companies to use current cost accounting (CCA) in their regulatory reports. CCA is a valuation method whereby assets used by water companies are valued at their actual or estimated current market prices. This gives rise to higher depreciation charges than are typically seen under an historic cost accounting (HCA) approach. CCA provided a reporting basis that aligned better with an asset intensive business where we needed to be able to identify and challenge capital maintenance projections compared with past expenditure.

The CCA reporting requirement was dropped in 2015 after we had moved to a totex approach to price limits. After that point companies have been required to produce accounts in line with that required for statutory accounts which is done on an HCA basis. This reports assets in use at their original cost.

We asked companies to carry out a valuation exercise in 2017 for the bioresources assets to inform the allocation of part of their RCV to bioresources at 2020. We stipulated that this be done on a current cost basis to give an accurate reflection of the economic value of companies' bioresources assets. HCA would not provide such an indicator of economic value.

In this context, we have considered the following options in relation to how companies can provide a timeseries of historical bioresources data.

#### 1) Current cost accounting vs. historic cost accounting

- **Option 1: Historic cost accounting.** In this option, we would use companies' historic cost accounting information to inform our approach. However, this would not address the issues discussed above.
- **Option 2: Full current cost accounting.** Under this approach, companies would be required to reintroduce and maintain a current cost asset register in respect of bioresources assets. It would also involve additional reporting. This could provide more meaningful financial information for asset intensive operations. However, it would also create a significant administrative burden on companies.
- **Option 3: Lighter-touch current cost accounting.** Under this approach, companies would provide accounting information which takes account of the valuation exercise companies undertook in 2017<sup>16</sup> (which could include a roll-forward revaluation) updated to 2020 by taking into consideration CPIH inflation and other changes in assets. Companies would have the option to reassess asset life data compared with 2017. This will enable an update

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<sup>16</sup> The approach in 2017 took account of a number of factors, including the relative efficiency of assets compared to the modern equivalent asset. Such changes in efficiency would not be captured by changes in inflation.

to the net MEAV position and will also allow us to calculate theoretical forward views of depreciation.

Our preferred option is option 3, that is, a lighter touch approach to estimating current cost accounting information. Our data request, which is set out in Annex 3, is therefore consistent with this approach. We consider this would provide information to the required level of accuracy and consistency without placing an undue burden on companies.

## 2) Alternative approaches to estimating depreciation

- **Option 1: Reducing balance method.** The reducing balance approach involves reducing the value of an asset by a constant proportion (ie x%) each year. Companies' PR19 business plan data tables suggest that most companies use this approach to run-off their bioresources RCV over the 2020 to 2025 period.

Using this approach would be consistent with the run-off of companies' bioresources RCV. However, we consider that it is a less accurate estimate of the depreciation of bioresources assets compared to other approaches.<sup>17</sup>

- **Option 2: Straight-line method.** The straight-line approach involves reducing the value of an asset by a constant amount (ie £X million) each year. This approach was considered acceptable, but not ideal, when companies revalued their bioresources assets in 2017.

Using this approach would be relatively straight forward. It would be consistent with how companies generally determine their depreciation in their statutory and regulatory accounts.

- **Option 3: Present value approach.** The present value approach takes account of the discounted benefit from holding an asset. This approach was considered to give the most accurate asset valuation when companies revalued their assets in 2017.

Using this approach adds a degree of complexity to the depreciation calculations and was not mandatory when companies revalued their bioresources assets in 2017.

We note that for the residential retail control we used smoothed depreciation levels between years to improve the results of our econometric cost benchmarking models. If we were to smooth depreciation data for bioresources, it could reduce any benefit gained from using a more sophisticated approach (eg option 3) to estimating depreciation.

Our preferred option is option 2, the straight-line method. We consider that this approach strikes an appropriate balance between consistency with the valuation exercise in 2017 and

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<sup>17</sup> The reducing balance method sees asset values fall relatively quickly in the early part of an asset's economic life. In contrast, the straight-line method sees a constant level of decline and the present value approach sees a relatively fast decline in the later years of an asset's economic life.

the approach used by companies to run off their RCV over the 2020–25 period, whilst avoiding undue complexity.

Therefore our data request, which is set out in Annex 3, is consistent with option 2, the straight-line method.

## Depreciation over the 2020–25 period

In the section above we consider how best to establish depreciation of bioresources assets before 2020 (that is, when there was no separate RCV allocated to bioresources).

At PR19 we determined the RCV for each company over the 2020–25 period. Companies chose run-off rates that they considered were broadly consistent with the 'natural rate' and were generally based on asset lives or current cost depreciation charges. However:

- this approach is different from the standardised approach we recommend in the section above; and
- we did not fully standardise companies' run off rates and so their approaches were different.

This creates a potential issue for setting allowed revenue for bioresources at PR24. For example, a company with a relatively high RCV run-off rate would have benefited from increased allowed revenues over the 2020–25 period. This company could ultimately over-recover revenue if we used the standardised approach above and made no other adjustment to address this issue.

We therefore consider the following two options.

- **Option 1: Using the standardised methodology with subsequent adjustment.** In this option, we would use the same methodology as set out in the section above, ie lighter-touch current cost accounting and straight-line depreciation. This would be used in our econometric cost benchmarking models. We would then adjust companies' allowed revenues at PR24 to take account of whether their RCV run-off over the 2020 to 2025 period was relatively fast or slow, compared to the standardised approach.
- **Option 2: Using PR19 bioresources RCV and run off.** In this option, we would use the RCV and RCV run-off established for bioresources at PR19 as an input to our econometric cost benchmarking models. This approach would avoid the need for significant adjustments to companies' allowed revenues to address differences with our standardised methodology.

On balance, our preferred approach is option 2 because:

- the run-off rates used at PR19 should still provide an acceptable estimate for the annual depreciation charge (and asset base) that we would use in our assessment and may not be significantly different from the standardised approach;
- although option 1 would provide standardised inputs to our econometric cost benchmarking models, the subsequent adjustments would introduce complexity and may not lead to a significantly different end result to option 2.

However, we will test whether our assumptions about the data are right and review whether option 2 is appropriate. Consequently, our information request in Annex 3 requires companies to provide data using our proposed standardised approach over the entire period.

## Standardising expenditure data

As discussed above, we consider that there is potentially merit in using depreciation data in our econometric cost benchmarking models and we are proposing steps to ensure companies provide historical information to us on a consistent basis. We also state that we will consider the depreciation data we receive from companies and compare this with expenditure data before we decide which is more appropriate.

If we were to use expenditure data in our econometric cost benchmarking models, we would make an adjustment to reflect the impact of inflation over time. This approach is consistent our general approach to cost modelling.

### 3.4.4 Financing costs

For residential retail, financing costs are funded through a net margin approach. Given that there are differing levels of capital intensity across companies' bioresources activities, we consider that a net margin approach would not provide an accurate estimate of companies' financing costs. A common net margin could allow too much funding for companies with low capital intensity and vice versa.

Instead, as shown in Figure 4, we intend to include financing costs in our benchmarking. This is consistent with the principle of including more costs within our econometric cost benchmarking model and providing similar regulatory protection for different categories of cost. Including financing costs in our econometric cost benchmarking assessment would incentivise companies to seek efficiencies across their entire cost base, reduce potential distortions created by taking different approaches for different categories of cost and come closer to a market process where efficient costs are reflected in the service's price.

We discuss below the asset base and financing rate we would use to calculate the financing costs that would be used as an input to our econometric cost benchmarking models (ie the pre-efficiency assessment inputs).

## Asset base

Under the PR19 approach, the asset base to which we applied a financing rate was companies' RCV. For the bioresources control at PR24, financing costs would be an input to our econometric cost benchmarking approach. Our new approach raises the issue of what asset base should be used to inform our benchmarking assessment.

In Section 3.4.3, we considered that the depreciation rate should be based on:

- companies' RCV run-off over the 2020-25 period; and
- for historical data, a standardised approach consistent with CCA (including our RCV allocation exercise in 2017) and using the straight-line method.

The asset base should be consistent with this approach to depreciation. Companies' asset base should be equal to the RCV over 2020 to 2025 period. For the historical period it should:

- reflect additions at cost for the other years – for the reasons discussed above, recent additions will be a good proxy for the economic value of the assets; and
- be net of accumulated depreciation (and take account of any other adjustments, such as disposals).<sup>18</sup>

Our approach is reflected in the data request in Annex 3.

## Financing costs

We have considered two options for how financing costs could be reflected:

- **Option 1: 'Actual' financing costs.** Under this option, we would use companies' reported cost of debt and our own estimate of companies' cost of equity based on the final determination WACC model but using companies' actual gearing rather than our notional assumption. We would apply this rate to the bioresources asset base corresponding to the relevant control period.

This option would use more company-specific data, and therefore potentially result in closer estimates of companies' actual costs. However, it relies on a link between companies' gearing and their cost of equity which we have some concerns over, and we are currently carrying out more work into. Furthermore, using our PR19 cost of capital estimation approach would result in more highly-g geared companies having a

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<sup>18</sup> NB Companies' RCV is net of RCV run off. Similar to using depreciation, this ensures that companies only receive financing costs on the net asset value.

higher cost of capital, placing upward pressure on the benchmarked cost. This would run contrary to the rationale for using a notional capital structure – that is, protecting customers from the financial impacts of companies' choices around financing structure.

- **Option 2: Notional financing costs.** Under this option, we would use the allowed return from previous final determinations (calculated on a fully notional basis) to estimate companies' historical financing costs. We would apply this rate to the bioresources asset base corresponding to the relevant control period.

This approach would be consistent with our longstanding approach of setting companies' allowed return based on a notional basis and would thus protect customers from bearing increased costs due to their company's financing structure decisions. The approach would also be more transparent and less data intensive than using 'actual' financing costs.

We consider that option 2, 'Notional financing costs', is the more appropriate approach as it maintains the simplicity and customer protections of a single sector cost of capital, calculated without reference to companies' actual financing decisions.

### 3.4.5 Approach to enhancements

Enhancement expenditure refers to expenditure for the purpose of enhancing the capacity or quality of service beyond existing levels. Enhancement allowances have tended to be relatively small for bioresources. At PR19, £75 million was allowed with most of this being for bioresources growth enhancement<sup>19</sup>. This compares to total allowed revenues for bioresources across companies of £3 billion at PR19. Companies are likely to need to undertake enhancement expenditure for bioresources in future.

At PR19 enhancement capital expenditure data was excluded from the costs used in our bioresources econometric cost benchmarking modelling. This reflects that the modelling focused on companies' base costs and that enhancement capital expenditure could instead be reflected in companies' RCV.

In contrast, for bioresources at PR24, we envisage more costs being captured through our econometric cost benchmarking models. We therefore intend to include historical enhancement cost data in our econometric modelling.

This raises two related questions.

- How should we treat claims for new enhancement costs at PR24?

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<sup>19</sup> This includes cost adjustment claims, such as Yorkshire Water's award of £35.6m for atypical and large expenditure to accommodate additional sludge production.

- Should we make an adjustment for enhancement schemes allowed at PR19?

As shown in Figure 4 above, our proposed approach still allows for the possibility of cost adjustment claims to be submitted and adjustments to be made where this is appropriate. However, we consider that under this new approach less enhancement expenditure will need to be assessed outside of our econometric cost benchmarking model for the following reasons.

## Bioresources growth enhancement

At PR19 we included cost drivers, such as scale and population density, in our econometric cost benchmarking models to explain variations in efficient bioresources base costs between companies and over time. We also used forecasts of cost drivers to account for future changes in the asset base and activity that would lead to an increase in base costs in our independent estimate of efficient costs. Hence, a forecasted increase in the amount of sludge produced would lead to a higher estimate of efficient base costs.

We used a modified average revenue control for bioresources – this meant that companies' allowed revenue changed in line with expected changes in companies' variable costs. These variable costs would include certain direct costs, but not fixed costs such as RCV run off and return on investment.<sup>20</sup> Consequently, the volume adjustment did not take account of all bioresources growth expenditure, that is bioresources growth capital expenditure.

At PR24 we could include sludge production or similar bioresources growth drivers in the econometric cost benchmarking models which would include a wider set of costs. Furthermore, we intend to set an average revenue control that would take account of capital costs as well as operating costs. If this is achieved successfully, our proposed approach would adequately account for all bioresources growth-related costs and so there should be no separate allowance for bioresources growth enhancement expenditure. An additional allowance for bioresources growth enhancement would double-fund companies' bioresources growth enhancement costs.

## Historical quality enhancement

If quality enhancements' capital costs are included in the historical costs that go into our econometric cost benchmarking models, then this should reduce the need for separate cost adjustment claims related to previous quality enhancement expenditure.

## New quality enhancement claims at PR24

Future quality enhancement expenditure may not be reflected in historical costs. Therefore, our econometric cost benchmarking models may not provide funding for these activities and

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<sup>20</sup> Our methodology can be found [here](#).

so an additional allowance may be appropriate. We have considered the following options in relation to new quality enhancement claims at PR24.

- **Option 1: Allowance for annualised costs over one regulatory period.** Under this option, the enhancement allowance would be set to fund the increase in efficient operating costs, depreciation and financing costs over the forthcoming regulatory period, that is, the 2025 to 2030 period.

This option would be consistent with our approach of capturing more costs in our benchmarking process (as any costs that might fall after the 2025 to 2030 period would be captured in the benchmarking process at PR29). It would therefore reduce the potential bias to develop in-house assets.

However, this option could provide companies with potentially less regulatory certainty compared with the options considered below.

We note that if the full cost of the new quality enhancements is not reflected in the available data at PR29 (for example, because the work extends over several years) then our econometric cost benchmarking models could under-fund these activities over the 2030–35 period. This could be addressed by companies applying for a separate allowance to address this issue at PR29.

- **Option 2: Allowance for annualised costs over two regulatory periods.** Under this option, the enhancement allowance would be set to fund the increase in efficient operating costs, depreciation and financing costs over the following two regulatory periods.<sup>21</sup>

This option would provide greater regulatory certainty than option 1, but less certainty than option 3. It would also provide additional time for enhancement costs to be reflected in the data we would use for our econometric cost benchmarking models.

However, it would not achieve our aim of creating a more level playing field between different types of expenditure in order to promote market-based activities as well as option 1.

- **Option 3: Expenditure allowance.** Under this option, companies' allowed revenue would be set to fund the increase in efficient expenditure in the forthcoming regulatory period. For example, it would allow all capital expenditure in the 2025 to 2030 period to be recovered, rather than be recovered over the economic life of the assets.

This approach would be more consistent with an econometric cost modelling approach based on expenditure instead of depreciation, provide regulatory certainty

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<sup>21</sup> That is, ten years assuming the next two control periods are both five years.

to companies that they could recover the costs and create a clear distinction between regulatory periods (as opposed to depreciation, where costs are recovered over a longer period).

However, the lumpiness of capex could lead to bill volatility (whilst noting bioresources is a relatively small part of companies' overall costs) and it would not achieve our aim of creating a more level playing field between different types of expenditure in order to promote market-based activities.

Our preferred option is 1, an 'allowance for annualised costs over one regulatory period'. This best meets our objectives of capturing more costs in our benchmarking process and promoting the market. We would not expect a significant increase in the administrative burden under this approach arising from companies reapplying for past enhancement activities as:

- our starting assumption is that our econometric cost benchmarking models would take account of such costs, so any such claims should be an exception;<sup>22</sup> and
- we would generally expect companies to undertake their enhancement activities within the relevant regulatory period, so minimising any data issues.<sup>23</sup>

To enable option 1, companies would need to set out the asset life of the enhancements to enable the calculation of the adjustment.

### **Adjustment for previous enhancement claims**

We will consider adjustments for PR19 quality enhancement claims on a case-by-case basis, consistent with the approach above. However, we would expect such claims to be by exception since we intend to include historical enhancement cost data in our econometric cost benchmarking models.

For PR19 growth enhancement expenditure, as these costs would be reflected in our benchmarked costs, no adjustment for these costs would be appropriate.

We consider that no adjustment is required for enhancement activities that were undertaken before 2020 since our approach would take account of the different degree of regulatory protection that we committed to in PR19 for pre-2020 RCV as discussed in Section 4.1.

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<sup>22</sup> This will particularly be the case if our approach to econometric cost benchmarking models incorporates forecast costs.

<sup>23</sup> Even if this were not correct in some circumstances, using companies' forecast costs in our econometric cost benchmarking models could help to address this issue.

## 3.5 Broadening the information used to assess companies' costs

### Use of PR24 business plan forecasts

At PR19 we relied on historical cost data to produce an independent forecast of efficient wholesale base costs. In our consultation, '[Assessing base costs at PR24](#)' we consider the potential benefits and risks<sup>24</sup> of using business plan forecast costs to inform our assessment of efficient base costs (eg to the estimates of our econometric cost benchmarking models).

The potential arguments for including forecast data in our econometric cost benchmarking models for bioresources may be stronger than for wholesale econometric base models, as:

- due to the additional data required to implement our proposed approach for bioresources, we may have access to less historical data to inform our econometric cost benchmarking models for bioresources compared to the wholesale econometric base models – therefore, the increase in data from using forecast cost data may be particularly beneficial for bioresources; and
- we would expect a better functioning bioresources market to lead to greater efficiency improvements in future – this would be reflected in forecast cost data, but not historical cost data.

Therefore, we will consider including business plan forecasts into our bioresources econometric cost benchmarking models.

### Use of market data

We will consider whether to use market information, such as gate prices in the wider waste sector. We recognise the challenges involved in this, as noted by stakeholders, and will take this into account when considering this approach.

## 3.6 Consultation questions

**Question 3:** Do you have any comments have on this section?

**Question 4:** Do you have any comments on our proposed objectives and principles for PR24?

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<sup>24</sup> For example, we note that the inclusion of forecast data reduces the independence of the benchmarking process, and may reduce the incentive on companies to reveal efficient costs, which may not be aligned with our cost assessment principles.

**Question 5:** Do you have any comments on the design of our proposed control, including whether:

- depreciation data or expenditure data is more appropriate to reflect companies' capital costs;
- our proposed approach to standardising capital costs data before 2020 is appropriate, including our proposal to base this on lighter-touch current cost accounting and straight-line depreciation;
- our proposed approach to using companies' RCV run-off as our measure of depreciation over the 2020-2025 period is appropriate;
- our proposed approach to standardising expenditure data is appropriate;
- our proposed approach to capturing financing costs in our econometric cost modelling is appropriate; and
- our proposed approach to enhancements is appropriate.

**Question 6:** Do you have any comments on our information request in Annex 3?

**Question 7:** Do you have any comments our proposal to broaden the information we use in our assessment of companies' costs?

## 4. Implementing the new bioresources control

In Section 4 we set out:

- potential implementation issues identified in our bioresources market review;
- our approach to protecting pre-2020 RCV;
- our assessment of cost risk; and
- the impact of our proposed approach on cost of capital and financeability.

### 4.1 Approach to pre-2020 RCV

In our bioresources market review, we said our approach would take account of the different degree of regulatory protection that we committed to in PR19 for companies' pre-2020 RCV. Southern Water and United Utilities supported this proposal.

There are different ways we could achieve this. In this section, we consider two potential options. In both options, when considering the regulatory protection for pre-2020 RCV we would:

- use a forecast level of sludge production to convert the required amount into a unit rate;<sup>25</sup> and
- use the same cost of capital that we would apply to other wholesale activities at PR24.

In the section below 'legacy assets' refers to assets existing before April 2020 and 'new assets' refers to assets existing on or after 1 April 2020.

#### Option 1: Excluding legacy assets from the catch-up efficiency challenge

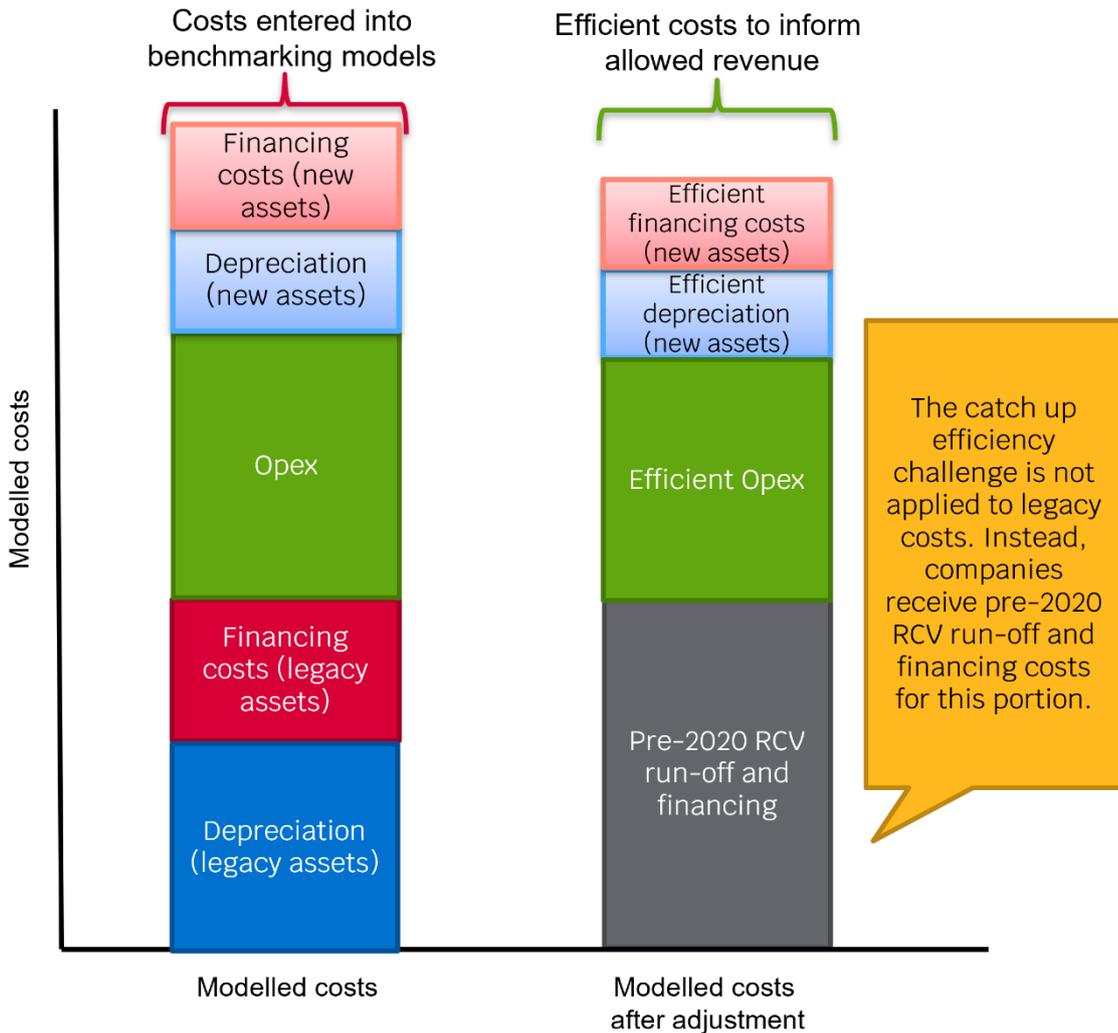
In option 1, 'Excluding legacy assets from the catch-up efficiency challenge', we would undertake an efficiency assessment on companies' operating costs, capital costs and financing costs as discussed in Section 3. However, rather than using the estimated efficient level of depreciation and financing costs on legacy assets to inform companies' allowed revenue, we would instead use an amount consistent with companies' 2020 RCV. The efficiency challenge would only be applied to companies' other costs (that is, modelled operating costs and the financing and depreciation costs of new assets).

This option is shown in Figure 5, below. We also include a worked example in the text box below.

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<sup>25</sup> We note that the use of forecast sludge production to fund legacy investment could create an incentive on companies to under-forecast future sludge production. This is discussed in section 4.2 along with other issues to do with volume risk

**Figure 5: Excluding legacy assets from the catch-up efficiency challenge**



**Worked example 1: Excluding legacy assets from the catch-up efficiency challenge**

**Input assumptions**

A company's modelled costs used in our benchmarking are £500 per TDS (tonnes of dried solid) of which:

- Operating costs = £170 per TDS;
- Financing costs on legacy assets = £125 per TDS;
- Financing costs on new assets = £40 per TDS;
- Depreciation on legacy assets = £125 per TDS; and
- Depreciation on new assets = £40 per TDS.

The run-off and financing costs on the company's bioresources pre-2020 RCV for the particular year is reflected in an allowance of £250 per TDS, taking account of the forecast level of sludge production.

### Calculations

We estimate that the efficient level of costs should be £450 per TDS – a fall of 10%. We apply this catch-up efficiency challenge of 10% to all the modelled costs other than legacy depreciation and financing costs. Instead of using legacy depreciation and financing costs, we use the run-off and financing costs on the company's bioresources pre-2020 RCV to inform the company's allowed revenue (£250 per TDS).

The allowed revenue becomes £475 per TDS  $(£170 + £40 + £40) \times 90\% + £250$ . Therefore, although the efficiency challenge is 10%, the company's allowed revenue per unit falls by 5%.

The effect of this option is similar to our approach to the RCV of residential retail assets at PR14 where:

- the RCV for residential retail assets was included with the RCV of wholesale assets in the wholesale control (and so shielded from any efficiency challenge generated by our approach to retail); and
- to avoid double counting, we did not provide companies with an allowance for the depreciation on legacy residential retail assets.

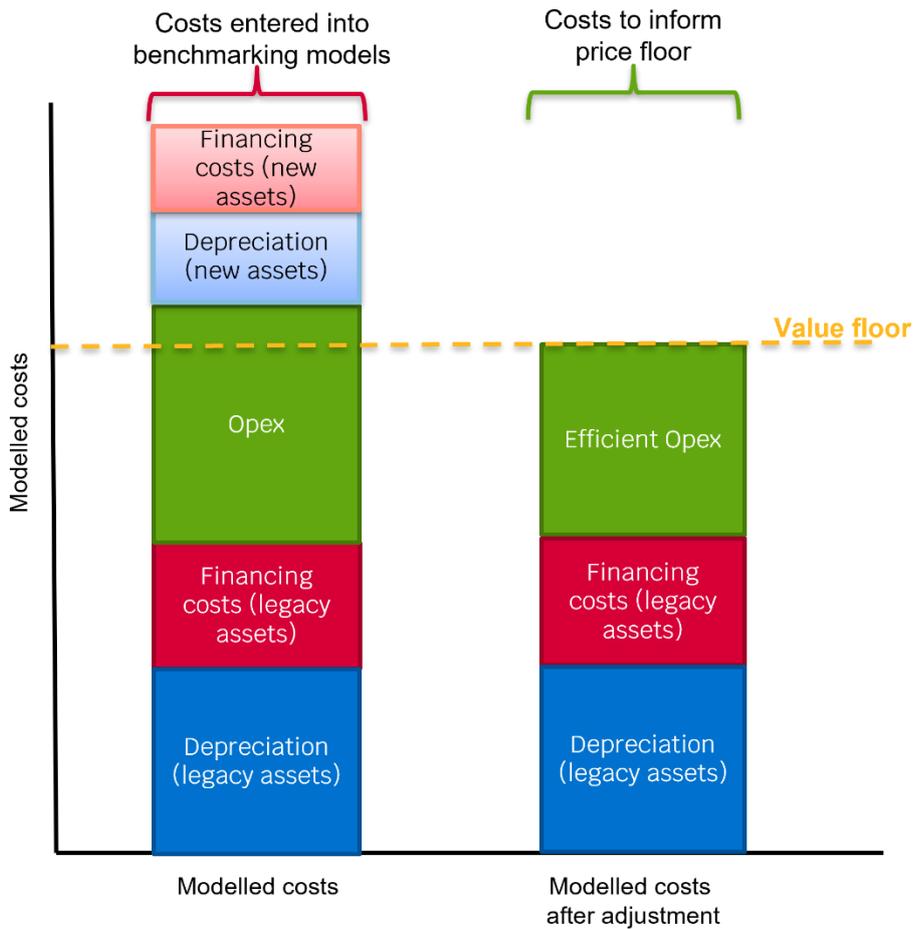
### Option 2: Value Floor

In option 2, we would undertake our efficiency assessment on companies' operating costs, capital costs and financing costs as discussed in Section 3. However, we would set a floor to ensure that:

- the capital and financing costs at risk are limited to new investment; and
- operating costs are affected by the efficiency challenge and an appropriate adjustment is made for any difference in the modelled costs of legacy investment and protected RCV.

To achieve this, the floor would be set by adding the implied efficient operating costs on a per unit basis to the financing and depreciation costs (pre-efficiency assessment). This is shown in Figure 6 below.

**Figure 6: Value floor**



The average revenue would be the greater of the amount implied by our efficiency challenge and the value floor. We would then make a separate adjustment to reflect the difference between the efficient costs of legacy investment and the RCV run-off and financing costs of pre-2020 RCV. The worked example below shows how this could be applied.

**Worked example 2: Value floor**

Assume the company's modelled costs and efficiency challenge as per worked example 1.

**Calculations**

The 10% efficiency challenge is applied to the company's operating costs by unit of sludge production (£170) to find the post-challenge level (£153). This is then added to the financing costs and depreciation on legacy investment (£250 per TDS). The value floor is therefore £403 per TDS.

In this case, the floor is below the value calculated ( $£500 \times 90\% = £450$  per TDS), so no adjustment is needed.

## Our assessment

We consider that there is potential merit in both the options considered above. They both ensure that companies' pre-2020 investment is protected from new efficiency challenges.

Under option 1, 'excluding legacy assets from the catch-up efficiency challenge' the protection provided is symmetric in the sense that, in relation their cost of legacy assets, companies can neither gain nor lose from our efficiency assessment.

Under option 2, a value floor, protection would be asymmetrical (namely, it would provide protection for companies, but not to customers) although it would only take effect in limited circumstances and so companies' allowed revenue would generally better reflect the efficient level. This would benefit customers and also come closer to how a market would operate.

At this stage, we do not have a preferred option. We wish to consider stakeholders' views and the potential impact of each approach in light of the data we are requesting from companies.

## 4.2 Our assessment of cost risk

### Asset stranding

In our bioresources market review, we said that under our proposed approach, "... there could be a risk of stranding assets. We would consider how best to reduce the risk of asset stranding if it would be in customers' interests...In any case, our approach would take account of the different degree of regulatory protection that we committed to in PR19 for pre-2020 RCV and investment after that date."

Stranded assets are assets that experience a reduction in economic value (that is future earning potential) as a result of a fall in demand and where the assets have little or no value in an alternative use.

We consider that companies' allowed revenue should be based on how much sludge is produced. This is a measure we used at PR19 to take account of changes in companies' variable costs, where actual sludge production deviated from forecast sludge production.

We consider that sludge production remains an appropriate driver of the cost that the business will incur to transport, treat and dispose of its sludge. This measure also means that a company's allowed revenue would not depend on whether it chooses to undertake these activities itself or, for example, chooses to use a third party to treat its sludge. Furthermore, our benchmarking of companies' bioresources costs would reflect the amount of sludge produced (or similar bioresources growth drivers). Our cost assessment would not be undertaken, for example, at the level of the individual sludge treatment centre, nor would

water companies be obliged to send sludge to be treated by third parties' sludge treatment centres.

A consequence of this proposed approach is that companies would still not face a direct threat from competitive entry. We therefore consider that our approach would not strand companies' assets.

## **Cost risk arising from our new approach to cost challenge**

Our proposed approach would see us challenge companies' costs in a different way than before. Under our new approach, more costs would be included in our econometric cost benchmarking models and we would set a specific efficiency challenge for bioresources.

We consider that this will provide an efficiency challenge in a different way than previously, but do not consider this will lead to a significant increase in the total risk faced by companies.

In assessing this risk, we note that:

- exposing capital expenditure to a cost challenge through our econometric cost benchmarking models is not new since capital maintenance was included in our PR19 cost assessment<sup>26</sup>;
- if companies are efficient in their use of capital assets we would expect them to gain out of the approach;
- companies allocated RCV to bioresources at 31 March 2020 in a way that reflected the economic value of these assets<sup>27</sup> – this approach means that any inefficiency should not be reflected in this RCV; and
- in any case, we would take into account the different degree of regulatory protection that we committed to in PR19 for companies' pre-2020 RCV – this will remain the bulk of companies' bioresources RCV over the 2025–30 period, so only a fraction of companies' bioresources RCV would be at risk.

We recognise that we will get a better sense of the potential impact of the level of risk for individual companies when we have undertaken quantitative analysis using the additional data we are requesting from companies. We will therefore keep under review how we set an appropriate level of efficiency challenge and whether other approaches, for example using glidepaths, would be appropriate to manage risk across the sector.

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<sup>26</sup> We applied a cost challenge to enhancement capital expenditure too, although this was not through our econometric cost benchmarking models.

<sup>27</sup> This economic approach is similar to our previous guidance, RAG 1.05, which applied until the requirement for WaSCs to prepare annual current cost balance sheets was withdrawn. This made it clear that the context of net value of the tangible assets should reflect what potential competitors would find it worth paying for them, even if the competition was hypothetical.

## Volume risk

Under our proposed approach, we would set an average revenue control based on companies' actual sludge production. This would be intended to cover companies' fixed costs as well as variable costs. This approach would create some volume risk since a change in sludge production would lead to a change in revenue that would exceed the change in companies' variable costs.

We consider that an average revenue control supports our objectives described in Section 3.2. We consider that a degree of volume risk is acceptable and note that prior to 2010 companies were exposed to volume risk across all price controls.

However, we are also mindful that concerns about the incentives on companies to under-forecast their sludge production led us to adopt a modified average revenue control at PR19. We note that:

- at PR19 there was particular uncertainty around the Water Industry National Environment Programme and the impact this could have on sludge production to meet new phosphorus removal consents – we do not expect this level of uncertainty at PR24;
- the increase in the amount and accuracy of historical data available should enable more accurate forecasts than at PR19 and allow us to better check whether they are accurate;
- the incentive to under-forecast is linked to the amount of pre-2020 RCV which continues to decline each year<sup>28</sup>; and
- there are still incentives under a modified average revenue control for companies to under-forecast sludge production.

Our view is that an average revenue control at PR24 is appropriate. However, we would review whether mechanisms such a cap and collar on allowed revenue and how a forecasting incentive could be applied at PR24.

## 4.3 Impact on the cost of capital

In response to our bioresources market review consultation, Northumbrian Water and Southern Water considered that the cost of capital should be increased to reflect an increase in risk.

Our proposed approach at PR24 is for companies' financing costs to be reflected in the average revenue determined through econometric cost benchmarking models.

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<sup>28</sup> This is because companies' forecasts would inform the calculations to set the level of protection for pre-2020 RCV.

As discussed earlier in Section 4, our proposed approach would:

- not increase the risk of asset stranding through competitive entry;
- not necessarily increase the cost risk faced by companies as a result of our new approach to cost assessment;
- lead to a modest increase in volume risk (with limited downside, as our approach protects companies' pre-2020 RCV), whilst noting that volume risk has been a feature of previous price controls.

We therefore do not consider that our proposed PR24 approach to bioresources would lead to a significant increase in risks to companies compared to our PR19 approach. However, even if that were the case, we do not consider it would require us to make a special adjustment to the way we set the allowed return on capital for two main reasons.

Our long-standing practice at past price reviews has been to estimate the cost of capital equity at the overall company (or 'appointee') level – reflecting investors' risk perception of all business activities, including bioresources. As a forward-looking measure, beta captures investor risk perceptions about the regulatory framework at PR24 and beyond. Our proposed PR24 approach to bioresources has been well trailed. Therefore, to the extent that our proposed bioresources changes increase perceptions of risk, we would expect this to be picked up in beta data for the appointee several years before data cut-off for our final determination allowed return – and thus that it would already be reflected in our allowed return for the appointee.

Even if there were additional risks from our approach not reflected in our estimate of the PR24 allowed return, we consider that the impact on the cost of capital would be insignificantly small. This is because the bioresources RCV on 31 March 2021 was only 5% of sector RCV, with most of this being pre-2020 RCV benefiting from our proposed protections over the 2025–30 period. Any higher risks would only apply to the much smaller residual share of post-2020 RCV, meaning they would be significantly diluted at the appointee level in terms of their impact on the cost of capital.

## 4.4 Assessing financeability

Our financeability assessment considers whether, when all of the individual components of our determination are taken together (including totex, allowed return and retail margin, PAYG rates and RCV run-off), an efficient company with the notional capital structure will be able to generate cashflows sufficient to meet its financing needs.

Within our financeability assessment, we look at a suite of financial ratios including gearing. Our gearing measure is defined as net debt divided by RCV. For the purposes of our gearing calculation, one option would be to include within the calculation pre-2025 bioresources RCV plus post-2025 bioresources investment after taking account of depreciation (equal in total

to the bioresources asset base as set out in Section 3.4.4). Whilst the pre-2020 bioresources RCV is protected, expenditure on assets added post-2020 (including in the period 2020-25) may be subject to future efficiency challenges. We welcome views on alternative approaches.

## 4.5 Consultation questions

**Question 6:** Do you have any comments have on this section?

**Question 7:** Do you have any comments on our options for providing a different level of protection for pre-2020 RCV?

**Question 8:** Do you have any comments on our assessment of cost risk?

**Question 9:** Do you have any comments on our assessment of the impact on the cost of capital?

**Question 10:** Do you have any comments on assessing financeability?

## A1 Proposed information request: Reallocation of costs between price controls

As stated in Section 2 of this document, we intend to request additional information from companies. This would be provided at the same time as their regulatory reporting for the 2021-22 year. We would use this information to reallocate companies' operating costs between wastewater network-plus and bioresources in the dataset we would use to assess companies' costs at PR24.

Our information request would require companies to provide data relating to Table 4K both before and after taking account of our recent cost allocation guidance. This would form the basis of the reallocation as we anticipate that our recent guidance would be ultimately reflected in this set of costs.

We would also request:

- additional information regarding sludge liquors and energy in the spreadsheet consistent with recent reporting changes – this would allow us to understand what is driving the reallocation of these costs; and
- a short summary of any assumptions or other information that could help explain the reallocation of costs.

The rest of this annex sets out further details of our proposed information request. A link to the draft excel version of [the information request is here](#).

### Sludge Liquors

Companies are required to shadow report the 'Recharge to Bioresources by network plus for costs of handling and treating bioresources liquors' in Table 8C, line 17 of their annual performance reports. This recharge would be classed as an operating cost to bioresources and negative operating cost to network-plus.

We would request information on the recharge companies would make using our new guidance and would have made in the absence of this guidance. This will help explain the change in costs reported in Table 4K.

In terms of understanding companies' reporting to date, we would expect that when companies report costs in Table 4K (and 4E), in particular the operating expenditure in column 'Import of Sludge Liquors for Treatment', that these should be net of their recharge to bioresources (so that the net amount in this column is zero, or close to zero). If this is not the case, companies should explain how they have been accounting for this in their consultation response.

### Energy Generation

Companies are required to shadow report energy information in Table 8C lines 18 to 23 and Table 4K.19 and 4K.20 of their annual performance reports. Energy provided to network plus

by bioresources should be recovered by a recharge. Companies will shadow report this as 'Energy generated by bioresources and used in network plus control' in Table 8C line 20. This recharge would be classed as an operating cost to network-plus and a negative operating cost to bioresources. Our guidance will affect this recharge.

We consider that this reallocation caused by our guidance would primarily affect lines 4K.1 and 4K.2 in our information request. However, we consider our recent guidance could also affect other data companies report. We are therefore requesting that companies provide information on how their operating costs and income would be different under our new guidance. We would welcome views on whether this is the case and, if so, whether the additional data we are seeking to collect would address this issue.

## Overheads

On 26 October 2021 we published [IN 21/03 Regulatory accounting guidelines 2021-22](#) which included our revised [RAG 2.09 – Guideline for classification of costs across the price controls](#). This sets out our revised approach to allocating overhead costs which will apply at PR24<sup>29</sup>. RAG 2.09 gives enhanced guidance to the allocation of General and Support expenditure and new guidance for the allocation of regulation costs.

We have not implemented additional reporting in companies' annual performance report to monitor the impact of this change and we would not request that companies provide a separate estimate of the impact of this change in our information request. However, for the avoidance of doubt, companies would be required to ensure that the impact of this change is captured in their figures for 4K.

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<sup>29</sup> We do not intend that companies should change to this new methodology for reporting in the APRs in the current price setting period. We will make this clear in our annual information note which sets out expectations for company reporting early in 2022.

## A2 Stakeholders' responses to our consultation and summary of our response

Issue	Our view
<b>Support for our proposal to protect pre-2020 RCV</b>	We confirm we will take account of the different degree of regulatory protection that we committed to in PR19 for pre-2020 RCV for bioresources. In section 4.1 we set out two options to achieve this.
<b>We should retain our existing approach to cost assessment as a cross-check.</b>	Using multiple approaches would add complexity, but we recognise there may be value in such a cross-check.
<b>Lumpiness of investment</b>	Our PR19 econometric cost benchmarking models included capital expenditure in the form of capital maintenance expenditure. Although we propose to include enhancement capital costs in our models at PR24, this is a relatively small amount of companies' capital expenditure. Therefore, we do not consider that there is a particular issue regarding the lumpiness of investment under our new approach. Furthermore, we consider that a potential benefit of using depreciation data in our models is to make allocate capital costs over time which has the effect of smoothing costs.
<b>Benchmarking to other sectors is difficult/inappropriate.</b>	We discuss this issue in Section 3.5. In principle we consider that benchmarking against the other sectors where competition is more developed can provide additional useful information. We recognise that there are challenges to benchmarking against other markets which we will need to consider as we develop our methodology.
<b>Our proposed approach could create stranded assets</b>	We address this issue in Section 4.2. We have clarified that we intend companies' allowed revenue to be based on their sludge production. Consequently, companies' allowed revenue would continue to be unaffected by use of third

	<p>parties and they would still not face a direct threat of competitive entry.</p>
<p><b>The cost of capital should be higher to reflect an increase in risks.</b></p>	<p>We consider this issue in Section 4.3. We consider that that our proposals should not require an uplift to the cost of capital as risks should be picked up through our econometric estimates of equity beta.</p>
<p><b>Tailoring regulatory protection to the degree of market-based solutions would be too administratively burdensome</b></p>	<p>In our bioresources market review, we proposed a possible approach to mitigating excessive risk of asset stranding by providing regulatory protection where companies demonstrate appropriately innovative, pro-market plans/activities and/or comply with our proposed bidding market arrangements.</p> <p>We agree that this approach would create an additional administrative burden and, as noted above, have now clarified that our proposed approach would not create a direct threat of competitive entry.</p> <p>Therefore, in this document we no longer propose this alternative approach. However, if companies consider that there are simple proposals in this area we would consider these.</p>
<p><b>New approach should consider company specific, or regional factors</b></p>	<p>We propose an approach where more costs are considered together within our econometric cost benchmarking models. We will continue to consider appropriate cost drivers in these models and would welcome stakeholders' proposals on additional drivers that meet the criteria set out in our <a href="#">consultation on our general approach to base costs</a>. Companies will also be able to raise cost adjustment claims.</p>
<p><b>The new approach raises implementation costs and complexity, but benefits are uncertain</b></p>	<p>We have set out the potential benefits of a bioresources market in our bioresources market review document and the benefits of our proposals in this document.</p>

	<p>Although our proposed approach would involve companies providing additional information, we consider that the cost of this is low.</p> <p>Note that we do not consider the potential impact of environmental regulations here.</p>
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## A3 Information request: Depreciation and net MEAV estimates

We [include a request](#) for an update to the Modern Equivalent Asset Value (MEAV) data for Bioresources at 31 March 2020. In our information request we broadly retain the classifications used when we first established the Bioresources RCV split (which was based on the economic value of bioresources assets). The original data request was then updated by business plan information for PR19 using Table WWS12. This information was in 2017-18 financial year end prices.

When we published the Bioresources RCV included in the final determination, we included adjustments and used a 2017-18 year average price base. We subsequently provided an update in our annual publication of RCV values to 2019-20 year-end price base – we ask that this be used as the price base for the submitted information.

Tabs 6-10 are entirely calculated and merely provide a basic forward projection of the depreciation and NMEAVs using the asset values and asset lives recorded in tab 1. These can be used as a basic check against the depreciation forecasts which should be recorded in tab 5.

We have stated in the main document that the NMEAV as analysed above should equal the bioresources RCV that we have published. We are aware that adjustments were made to the submitted values over the various stages of the price review, including adjustments for the IFRS16 implementation. However, such changes are relatively small and our preference is that you should be able to submit a valuation in line with the published RCV. If this is not possible, then you should include reasons for the calculated difference in tab 1 in a commentary alongside these tables.

In the worksheet, '5.Depreciation & NMEAV' we request that companies provide depreciation estimates that are consistent with the CCA approach proposed in this document, including that these estimates reflect the revaluation of bioresources assets undertaken in 2017 to estimate the value of companies' assets in 2020. To aid companies' understanding of how to go about this, we have provided a worked example below.

### **Worked example 3: CCA depreciation and net MEAV values**

Note that the relevant measure of inflation is CPIH.

A revalued asset

Assume a company built a sludge treatment centre in 2004-05 for £10 million in 2019/20 price. The asset has an economic life of 20 years.

During the 2017 revaluation exercise the company revalued the asset such that its GMEAV is £8m in 2019-20 prices in 2020.

The company needs to estimate the NMEAV and annual depreciation charge from 2011-12 (the first year of the information request) to 2024-25 (when the asset is expected to be fully depreciated). The GMEAV of the asset is assumed to be £8 million over this period in real terms. Depreciation is calculated on a straight-line basis, i.e. £400,000 p.a. in real terms. The NMEAV is calculated accordingly.

#### A recent asset

Assume a company built a sludge treatment centre in 2017-18 for £10 million in 2019-20 prices. The asset has an economic life of 20 years.

The asset was not revalued in 2017. That is, the GMEAV is assumed to equal the book cost.

The company needs to estimate the NMEAV and annual depreciation charge from 2017 (when the asset was developed) to 2029-30 (the last year of the information request). The GMEAV of the asset is assumed to be £10 million over this period in real terms. Depreciation is calculated on a straight-line basis, i.e. £500,000 p.a. in real terms. The NMEAV is calculated accordingly.

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**OGI**