

July 2022

Creating tomorrow, together:
consulting on our methodology for PR24

Appendix 4 - Bioresources control

About this document

This appendix sets out further detail of our draft methodology for the bioresources control which is summarised in Chapter 4 (design and implementation of price controls). It reflects on stakeholder responses to our [consultation](#) on the funding of bioresources, published in December 2021. This document:

- summarises our December proposals;
- provides further clarification and refinements in several areas; and
- summarises the potential impacts of different packages of options in the annex.

We want to consider data we will receive in July 2022 before setting out our view on some issues. We therefore plan to publish a supplement to this document in September where we will set out our position regarding the type of data we could use to set our control and some example model results.

Note that the approach set out in other draft methodology documents, in particular regarding cost assessment, 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, promoting the role of markets in relation to bioresources activities 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 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 bioresources market review in May 2021. In December 2021 we [consulted on specific proposals](#) to address issues related to our funding of bioresources. The key features of our December proposals were as follows.

- **Move away from the 'building blocks' approach with its reliance on RCV to one where more costs are benchmarked together.** The way the 'building-blocks' approach was implemented could create an 'in-house bias' for new investment and so inhibit the market.
- **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.
- **Include financing costs within our econometric cost benchmarking models, rather than making a separate adjustment.** This would promote a focus on efficiency in terms of bearing down on total costs, not just a narrow subset chosen for benchmarking.
- **Setting companies' allowed revenue in the form of an average revenue control** – this is more akin to a gate price¹.
- **Provide a different level of regulatory protection for pre-2020 RCV investment.** This will help to promote regulatory certainty.
- **A separate efficiency challenge for the bioresources control to drive further efficiency.** A separate efficiency assessment would be more transparent and more likely to achieve a stretching, targeted efficiency challenge for bioresources activities.

¹ 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.

- **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.

Updated proposals

After considering stakeholders' responses we have decided to retain the key features of our December 2021 proposals in our draft methodology. These proposals best meet our objectives and are in the interests of customers. The key refinements and clarifications to our December 2021 proposals are as follows.

- **Approach to policy development.** The annex summarises the potential impacts of different packages of options. We will set out a supplementary document in September to provide additional clarity on our proposed approach.
- **Financing costs.** We would use the PR24 post-tax, notional financing rate and a bioresources asset base as the relevant inputs to our model. Our econometric cost benchmarking models would therefore generate an appropriate allowance for companies' financing costs.
- **Excluding legacy assets from the application of our catch-up efficiency challenge.** In our December document we consulted on two options to provide a different level of regulatory protection for pre-2020 RCV investment. We propose the option under which we would not apply a catch-up efficiency challenge to the elements of each company's unit cost allowance that we estimate to be for depreciation and finance costs on its pre-2020 RCV. This approach would provide a level of regulatory protection in a similar way to that for legacy residential retail assets.
- **Apply a separate adjustment for tax.** Reflecting our post-tax approach to the cost of capital, we would calculate a tax building-block revenue requirement in the financial model. This allowance would be added to the cost figures for bioresources produced by the econometric modelling.
- **Provide no cost sharing for bioresources.** This is consistent with the approach to the bioresources price control in PR19. In addition, we propose not to apply business rates cost sharing for bioresources in PR24.
- **Clarify that the asset base for bioresources from 2025 onwards would continue to be recorded as RCV.** This will ensure that an appropriate metric for gearing calculations continues to be available. The asset base will reflect companies' capital investment and depreciation.
- **Clarify we would set an end-of period reconciliation.** This would correct for any over- or under-recovery of revenue and incentivise accurate sludge production forecasts over the 2025 to 2030 period. This would retain the approach we used at PR19.

We expect companies to take a leadership role in developing the bioresources market and to fully exploit the opportunities it creates. **We expect companies' business plans to set out:**

- **a sludge strategy** – as part of this, companies should set out the steps they have already taken and are planning to take to address the expectations we set out in our [bioresources market review](#)² regarding greater sector collaboration where appropriate (and mindful of competition law considerations);
- **stretching cost forecasts** – this should take account of market opportunities and use appropriate benchmarks to demonstrate value for money; and
- **accurate sludge production forecasts** – companies should now be accurately measuring their sludge production, and this should be appropriately reflected in production forecasts. Companies should set out how they have ensured the accuracy of their sludge production figures and how any steps they have taken to improve this have impacted their reporting of sludge production.

We recognise that some of our proposals require us to undertake our benchmarking modelling in a new way. We need to ensure that this could be implemented appropriately. To help test this and clarify how our proposals could work in practice and their potential impact, we will publish a supplementary document by 2 September 2022. This supplement will set out the type of data we could use and provide some example model results. It will draw on data provided alongside companies' Annual Performance Reports in July 2022. To allow stakeholders to consider this supplement, we have extended the deadline for responses to our bioresources proposals to 5pm 16 September 2022.

² See p. 23 onwards. We set out expectations on sewerage companies to work with each other and the rest of the sector to address many of the issues identified in Jacobs' report. For example, regarding forming regional partnerships; research that could be best undertaken at sectoral level; and the development of sector level measures for sludge quality. We also set an expectation that companies consider other areas for working collaboratively, such as providing any additional market information in a standardised way and agreeing common processes or standards.

Responding to this discussion document

We would welcome any comments on this document. At the end of Sections 2 and 3 we set out specific questions for stakeholders. Please email your response to: alexandros.maziotis@ofwat.gov.uk and CostAssessment@ofwat.gov.uk.

Please provide your response to our proposals regarding bioresources separately to your response to our other draft methodology proposals. The closing date for providing a response to our proposals regarding bioresources is **5pm Friday 16 September 2022**.

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

We intend to publish responses to this consultation on our website at www.ofwat.gov.uk. Subject to the following, by providing a response to this consultation you are deemed to consent to its publication.

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.

In relation to personal data, you have the right to object to our publication of the personal information that you disclose to us in submitting your response (for example, your name or contact details). If you do not want us to publish specific personal information that would enable you to be identified, our [privacy policy](#) explains the basis on which you can object to its processing and provides further information on how we process personal data.

In addition to our ability to disclose information pursuant to the Water Industry Act 1991, information provided in response to this [type of document], including personal data, may be published or disclosed in accordance with legislation on access to information – primarily the Freedom of Information Act 2000 (FoIA), the Environmental Information Regulations 2004 (EIR) and applicable data protection laws.

Please be aware that, under the FoIA and the EIR, there are statutory Codes of Practice which deal, among other things, with obligations of confidence. If we receive a request for disclosure of information which you have asked us not to disclose, we will take full account of your explanation, but we cannot give an assurance that we can maintain confidentiality in all circumstances.

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This version of the document was published on 15 September 2022 to incorporate a correction on page 43 to our summary of views expressed by United Utilities.

1. Introduction

In this section we set out:

- the background to our work to promote the bioresources market;
- recent market developments; 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 companies³ 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); and
- sludge disposal (also known as recycling and which largely involves spreading treated sludge on agricultural land).

Bioresources activities comprise around £3 billion⁴ in total (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 on average per year for a typical household customer.⁵

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 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 achieving the benefits we envisaged at PR19 – these barriers are varied and include our economic regulation, environmental regulation, economic or technical barriers and cultural barriers.

³ 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'.

⁴ This estimate is based on our final determinations in December 2019.

⁵ 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 A1.1.1 in the annex) and our plan to implement this.

We have already addressed some key barriers through a range of improvements to bioresources regulation and market arrangements including the following.

- **Improved information remedies.** In May 2021 we published an amended [direction](#) which requires companies to publish improved information to support the bioresources market and provide us with additional information to monitor the development of the market. Companies are required to provide this information at least annually.
- **Improved cost allocation.** During 2021 we issued guidance to companies to improve cost allocation in relation to [sludge liquors](#), [energy generation](#) and [overheads](#). More consistent reporting of costs between companies can potentially help to inform potential trades and other market opportunities.
- **Establishing bidding market arrangements.** In February 2022 we published our [final guidance](#) for sewerage companies' bioresources bid assessment framework. We expect companies to publish their final bid assessment frameworks by the end of September 2022. We expect companies to make use of their bioresources bid assessment frameworks to inform their PR24 business plans where possible.
- **Encouraging greater sector collaboration.** We have continued to set a clear expectation on water companies to work together to address common issues where appropriate, mindful of competition law considerations.
- We have already seen some evidence of company collaboration.
 - i. Four companies covering the east of England are participating in [an innovation fund scheme](#) that will explore the benefits of greater trading and joint investments and how customer and environmental value can be improved.
 - ii. Inter-company trades have been announced recently, such as a trade between [Yorkshire Water and Anglian Water](#).
 - iii. Severn Trent Water and Wessex Water have issued an '[open market challenge](#)' for potential new partners to find innovative new solutions for sludge treatment.

We proposed setting companies' performance commitments in a way that supports the bioresources market. In our [draft findings](#) we raised concerns that the outcomes framework may affect trading in the bioresources market. This is because there is variation in companies' performance commitments related to bioresources. So, for example, companies

that do not have a performance commitment for reducing carbon emissions may have a lower incentive to buy bioresources than those companies that do. As set out in Appendix 6 about performance commitments, we are proposing:

- a common performance commitment on companies' operational greenhouse gas emissions following the regulatory accounting guidelines; and
- not to have a performance commitment for bioresources at PR24 for the safe disposal of sludge. We would only consider a bespoke performance commitment for this if we became aware of specific risks that a company may not deliver 100% compliance.

This approach would standardise the incentives on companies and so reduce any market distortions. That said, as mentioned in Appendix 6 about performance commitments, we would like to understand if any residual issues remain and whether further steps would be helpful to address this.

We did not propose trading incentives for the bioresources market. In our [draft findings](#) we considered that other incentives to engage with the market – notably, by promoting a bidding market in bioresources and our proposed approach to cost assessment – would provide appropriate incentives for trading. Adding a further distortion to the market would be inappropriate at this time. We therefore do not propose any trading incentives at PR24.

We also considered several other issues which are summarised below:

- **Cost of capital:** We considered that increasing sewerage companies' allowed revenues by using an unduly high allowed return on capital to match those of other organic waste companies to promote competition would not be in customers' interests. Therefore, we do not intend to promote competition in this way by raising companies' returns.
- **'Double funding':** The Competition Market Authority, in assessing an enhancement scheme from Anglian Water, considered that there was potentially a wider issue of 'double funding'. The Competition Market Authority was concerned that companies could participate in the market by using assets funded by customers. Although we did not consider this a significant problem in the short-term, we said we would consider how we could address this in future. Our proposed approach to funding growth enhancement at PR24 would address this issue as companies' funding would be tied to how much indigenous sludge they need to treat and no separate allowance for bioresources growth enhancement expenditure would be required.
- **Pricing of trades:** Some companies raised concerns about how to price trades, in particular longer-term trades, and suggested that further guidance would be helpful. We considered that we should not amend our [transfer pricing guidance](#) or provide companies with any additional guidance on how they price their trades on this specific issue. Our

existing guidance is appropriate, there is merit in stable guidance and many companies have been working to develop their approach using the existing guidance.

1.2 Recent market developments

Our recent [market monitoring report](#) had some 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 several barriers to competition.⁶ We continue to expect companies to take a leadership role in developing the market – this includes working collaboratively to address barriers, mindful of competition law considerations.

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.

1.3 Structure of this document

This document sets out our draft methodology for the bioresources control. It does this by considering how we can undertake better targeted cost assessment and improve our assessment of companies' costs and revenue related to bioresources at PR24. The rest of this document is structured as follows.

- Section 2 sets out our updated proposals to reflect the improved allocation of companies' costs in relation to bioresources at PR24.
- Section 3 sets out updated proposals regarding how we could implement our proposed approach to the assessment of bioresources costs at PR24.
- The annex summarises the potential impacts of different packages of options.

⁶ For example, reported uncertainty due to environmental regulations (notably Farming Rules for Water), co-digestion regulation and other factors.

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;
- our objectives in relation to PR24;
- a summary of our December proposals;
- a summary of stakeholder responses, our assessment and draft methodology proposals; and
- our consultation questions.

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.
- 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.

2.2 Our objectives in relation to PR24

As we noted in our December consultation, 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. This would help to achieve economic benefits and our PR24 ambition to 'drive improvements through efficiency and innovation'.

2.3 Our December proposals

In our December document we said that 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 data that reflects our recent cost allocation guidance.

Full implementation of our recent cost allocation guidance is being reflected in companies' shadow reporting from the reporting year 2021-22 onwards.^{7,8} This would provide only a small amount of historical data that we could use at PR24. By comparison, at PR19, our wholesale wastewater econometric cost benchmarking models included data that went back to 2011-12. A longer dataset could be beneficial as it can potentially improve the reliability of model estimates. Therefore, additional data might help ensure our econometric cost benchmarking models can estimate an appropriate efficiency challenge for bioresources and wastewater network plus activities.

We considered options to address this. Our preferred option was to request that companies adjust their historical data to be used in our econometric cost benchmarking models. This option would be most likely to provide accurate data. It is also consistent with companies taking ownership of their data. We said that to ensure that companies' approaches are clear and there is no significant difference in approach, they would need to explain their methodology. Companies would need to demonstrate an appropriate level of assurance for this information.

We said that we would review companies' updated data and seek clarifications and additional evidence from individual companies if their approach did not seem appropriate. 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.

⁷ 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.

⁸ 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.

2.4 Stakeholder responses and our assessment and draft methodology proposals

In this section, we summarise stakeholder responses regarding our December proposals and set out our draft methodology proposals. Relevant issues to do with data will be covered in our September document.

2.4.1 Provision of backcasting data

Stakeholder responses

Most stakeholders supported our preferred approach which involves companies providing adjusted historical data. Some companies suggested we should take steps to ensure the data provided is accurate. Other companies were concerned about back-cast data inconsistencies and potential modelling uncertainty in cost re-allocations.

Our assessment and draft methodology proposals

Through our subsequent engagement with stakeholders, we learned that early publication of the information requirements would be helpful. We therefore announced our decision to implement our preferred option in [information notice 22/01](#).

Recognising stakeholders' request for additional guidance, we engaged with companies to answer queries and provide feedback on their proposed approach.

2.4.2 A separate efficiency assessment for bioresources

Stakeholder responses

Some stakeholders raised concerns about our proposal to set a separate efficiency assessment for bioresources. Key points were as follows.

- **Scale of efficiency challenge.** Anglian Water was concerned that two separate benchmarks and efficiency challenges might create an unrealistic efficiency challenge. Northumbrian Water said that the Competition Market Authority had raised concerns about a separate efficiency challenge.
- **Cost allocation guidance.** South West Water considered that while Regulatory Accounting Guideline 2.09 provides guidance, there were likely to remain differences in the allocation of direct and overhead costs which could affect our efficiency assessment.

- **Substitution of costs between wastewater wholesale controls.** Severn Trent Water and South West Water were concerned that poor quality sludge from wastewater network plus, specifically a high content of rags and grit, could impact the cost of bioresources activities. United Utilities considered that we should also take account of differences in asset configuration between wastewater controls and suggested that some costs, such as liquor recharges, are treated as unmodelled costs.

Our assessment and draft methodology proposals

Scale of efficiency challenge. We acknowledge that the Competition Market Authority considered setting separate efficiency challenges for each sub-model risks setting an unachievable challenge which is too heavily influenced by differences in the way companies allocate costs across activities.⁹

We consider that with the right conditions, a separate efficiency challenge for different price controls is appropriate. We note that:

- we set an efficiency challenge for retail activities at PR19 and no stakeholder challenged this approach at the Competition Market Authority;
- we have improved cost allocation guidance so that costs are more accurately allocated to the appropriate controls in our econometric modelling; and
- bioresources operates as a separate business within several water companies, so it seems appropriate to have a separate efficiency challenge.

A separate efficiency challenge also helps to achieve our objectives as explained in Section 2.2. We therefore continue to consider a separate efficiency challenge for bioresources is appropriate. That said, we would ensure that the overall efficiency challenge across bioresources and wastewater network plus is appropriate and achievable under our proposed approach.

Cost allocation guidance. We consider that the cost allocation guidance that we have provided is appropriate at this stage. There may be opportunities for further refinement in the future if material issues are identified. Our approach and implementation have been informed by expert input from Jacobs¹⁰ and involved extensive stakeholder engagement.¹¹

Substitution of costs between wastewater wholesale controls. We recognise that the issues raised by companies regarding substitution effects can potentially affect the costs allocated

⁹ See the discussion in paragraph 4.335 and the decision set out at paragraph 4.415 in the Competition Market Authority's [final report](#).

¹⁰ Jacobs, '[Bioresources Market review](#)', May 2021, recommendations 15 and 16.

¹¹ Our consultation and companies' responses can be found [here](#).

across wholesale wastewater controls. Examples of how asset configuration can affect companies' costs are as follows.

- The choice of sewage treatment process determines the type of sludge produced which might impact on calorific value and energy generation at bioresources control.
- Water content in the sludge can affect its treatability and increase transport requirements. This could impact the cost of bioresources activities. If companies choose to discharge high water content sludges (originating from smaller sewage treatment works) for wastewater treatment at a larger facility (and so remain within the network plus control) then, this could affect transport costs within network plus.

We have therefore considered the following options.

- **Option 1: Undertake a separate efficiency challenges as planned.**
- **Option 2: As option 1 but allow companies to reallocate costs between wholesale controls.** This option would enable a reallocation of costs between wastewater wholesale controls for the purposes of benchmarking. For example, a company that considers that they receive a particularly large amount of grit and rags could seek to reduce the costs allocated to their bioresources activities and increase the costs allocated to network plus activities. We would expect companies who wish to make such an adjustment to justify this. That is, explain why they consider themselves to be different from other companies. We would only make an adjustment if it met a materiality threshold of 6% of business plan bioresources totex.¹² We would also expect these companies to provide leadership (with our support) to an industry-led approach to measuring sludge quality and establishing minimum standards for sludge quality that is acceptable for bioresources intake.
- **Option 3: Exclude certain costs from our benchmarking models.** Instead, these costs would be treated as unmodelled costs.

We prefer option 1 for the following reasons.

Firstly, we consider that the optimisation of operational activities such as screening or thickening is within companies' management control. We expect companies to carry out an efficient operational and maintenance regime which applies the appropriate measures for optimum operation at both network plus and bioresources controls. We do not consider that a reallocation of cost to one control is justified if it is caused by operational and maintenance inefficiency in another control. In our view, an efficient network-plus business would maximise grit and rags removal at the inlet to the wastewater treatment works which would

¹² This threshold matches the proposed cost adjustment claim threshold for bioresources.

not only provide benefits to network plus operational and maintenance activities but would also minimise operational burden on bioresources activities.

Secondly, we consider that the PR19 cost drivers would generally capture the potential impact regarding asset configuration.¹³ Biogas yield and the calorific value is related to the type and quality of sludge received at the sludge treatment centre. The type of sludge is, in many cases, linked to the scale of the sewage treatment works which is captured by these cost drivers. Additional transport costs incurred by network-plus from moving sludge from smaller treatment plants to larger treatment plants would be associated with the cost drivers, since this cost would be linked with having a higher proportion of smaller treatment works.

We will consider appropriate cost drivers again at PR24. This process would ensure there is an opportunity for these costs drivers to be captured in our benchmarking models if appropriate. That said, we would consider evidence of where our cost drivers do not fully capture this impact.

Thirdly, treating more costs as unmodelled would not be consistent with our proposed approach of bringing a wider set of costs into our econometric cost benchmarking models. Therefore, we do not prefer option 3.

2.4.3 Renewables incentive

Stakeholder responses

Southern Water and Yorkshire Water are concerned that the termination of the Renewable Heat Incentive will mean that the net costs of bioresources activities will increase. Southern Water suggests a post-modelling adjustment as historical costs will not factor in this impact.

Our assessment and draft methodology proposals

We recognise that companies' net costs can be affected by the income they derive from renewable incentives. This issue is not directly related to our proposals as it would also impact bioresources cost assessment under the approach we took at PR19. Nevertheless, we have set out our view on this below.

We are not convinced that an adjustment (either to our econometric models, a post-modelling adjustment or a cost adjustment claim) would be appropriate for the following reasons.

¹³ We used drivers related to weighted population density, the proportion of sewage load treated at small works (bands 1-3) and sewerage treatment works per connected property.

- Companies were aware that incentive payments were for fixed periods. The choice of sludge treatment technology, including energy conversion technology, is under company control. Companies should bear the risk for these investment decisions.
- The Green Gas Support Scheme, which follows the Renewable Heat Incentive, provides tariff support for biomethane produced via anaerobic digestion which is injected into the gas grid. Tariffs are calculated to compensate plants for the building of new infrastructure to produce biomethane and ongoing operation costs. This will provide a potential source of additional funds for sewerage companies for generating renewable energy.
- Energy prices are currently high. This could help to offset the potential impact on companies' bioresources activities.

We will continue to consider evidence on this issue submitted by stakeholders as part of our PR24 cost assessment process.

2.4.4 Publication of data

Northumbrian Water considered that we should publish the data. We agree this would be appropriate. We aim to publish an updated base cost modelling dataset in Autumn 2022 as discussed in Chapter 7 on costs.

2.5 Consultation questions

Q2.1: Do you have any comments on this section?

Q2.2: Do you have any further comments on our approach to a separate efficiency assessment, in particular the options we consider in section 2.4.2?

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 relation to PR24;
- stakeholder responses to our December proposals, our assessment of these and our draft methodology proposals;
- our updated proposals; and
- our consultation questions.

3.1 Issues identified by our review of the bioresources market

Figure 3.1: The building blocks of the PR19 bioresources control

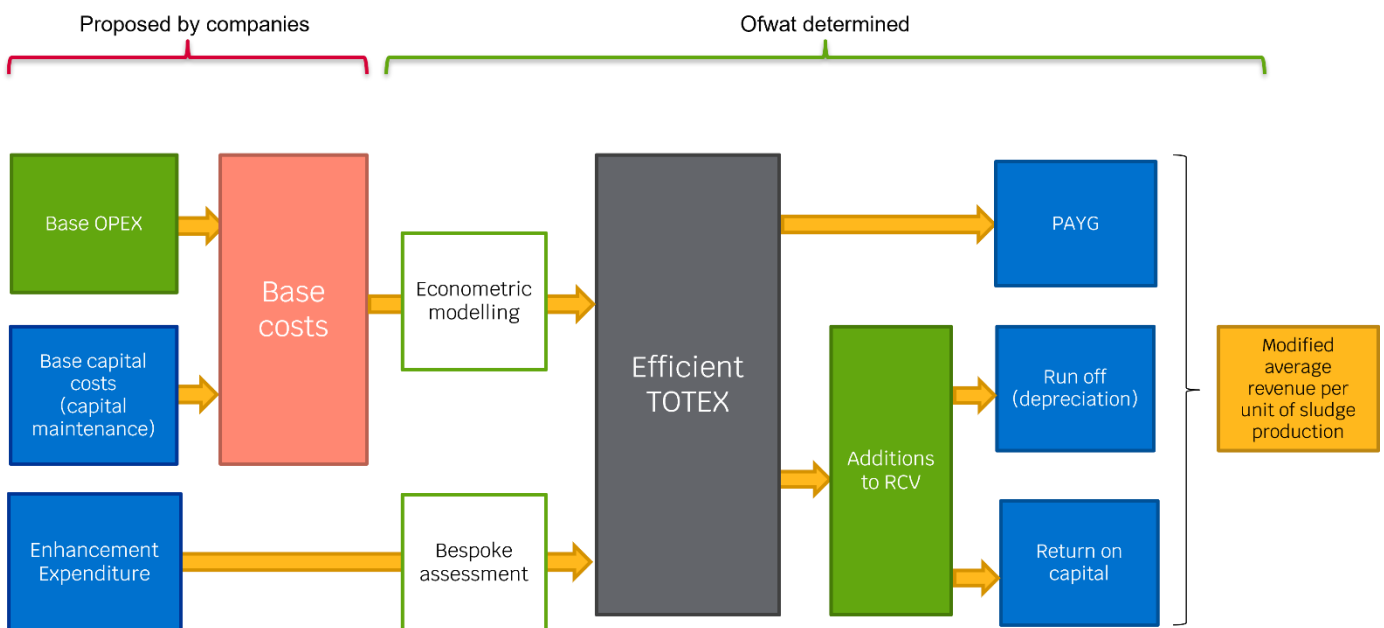


Figure 3.1 provides an overview of the building blocks of the bioresources control at PR19. We used an econometric approach to benchmark companies’ base expenditure and challenged companies’ proposed enhancement expenditure on a case-by-case basis. Financing costs were determined by applying an allowed return on capital to companies’ Regulatory Capital Value (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

RCV. Although new RCV does not receive the same degree of regulatory protection as pre-2020 RCV, we did not treat pre-2020 RCV significantly differently from post-2020 RCV.

At PR19, companies' allowed revenue was reflected in a 'modified average revenue control'. This adjusts 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 market¹⁴ 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.¹⁵ This is because undertaking investment in-house triggers a relatively large increase in RCV whereas a long-term contract is likely to be classed as base costs.¹⁶

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 from 1 April 2020 over the 2020 to 2025 period.

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

- benchmark companies' average revenue requirement – this would consider all companies' costs per unit of dried sludge produced;

¹⁴ 'Issue 3: Approach to assessing costs'. We previously discussed this issue with stakeholders at an [industry event](#) in April 2021.

¹⁵ 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.

¹⁶ 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.

- potentially use supplementary approaches to inform our assessment – for example, modelling of the bioresources market¹⁷ or comparison with gate prices in the wider waste sector; and
- provide a different level of protection for pre-2020 RCV.

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 several potential implementation issues which we would need to consider in the further development of this option.

3.2 Our objectives in relation to PR24

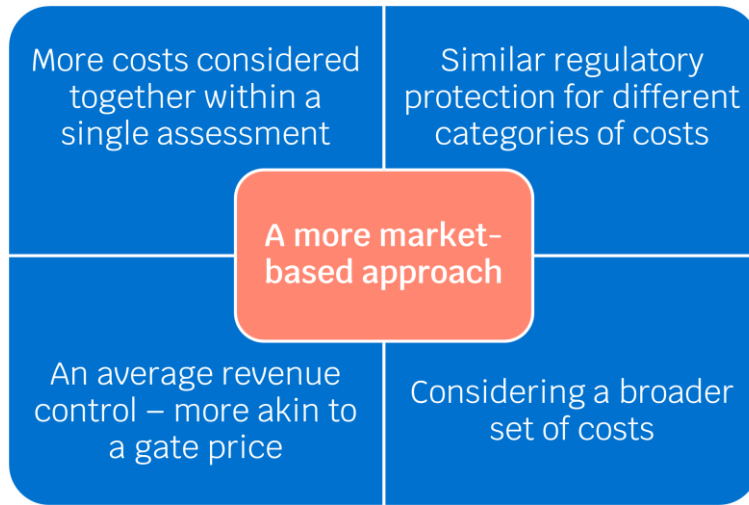
As set out in our December consultation, a key objective for PR24 is to set a price control for bioresources that encourages the development of the market through the use of a more market-based approach to assessing costs and generating allowed revenue. This would help to achieve economic and environmental benefits and meet our PR24 ambitions ‘Driving improvements through efficiency and innovation’ and ‘Delivering greater environmental and social value’.

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. The prices in the market can provide information to market participants about the relative efficiency of competing businesses.

Figure 3.2 summarises the principles of our proposed approach to achieve a more market-based, customer-oriented approach to assessing costs and setting revenues at PR24.

¹⁷ For example, we could use the expected costs of an alternative party treating and disposing of the sludge, eg through a trade.

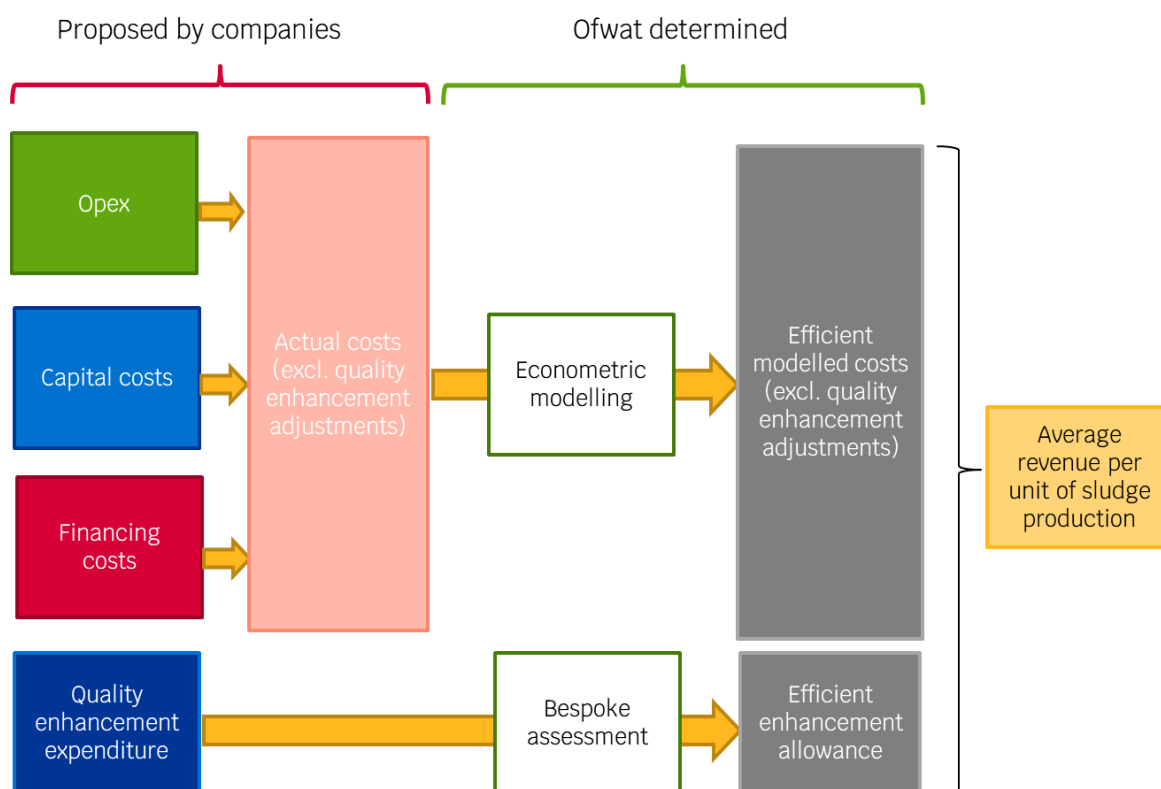
Figure 3.2: Principles for our proposed approach



3.3 Our December proposals

Figure 3.3 shows how we proposed the various parts of the control to interact to inform how we would set the allowed revenue for bioresources.¹⁸ We proposed to include financing costs and more enhancement costs in our econometric benchmarking models. Our proposed approach would still allow for the possibility of cost adjustment claims to be submitted and separate adjustments to be made where this is appropriate.

Figure 3.3: Overview of the proposed bioresources control at PR24



In the rest of this section, we summarise stakeholder responses to our December document and set out our assessment and draft methodology proposals in relation to these. Note that:

- we provide a more detailed summary of stakeholder responses in Section 3.4 where this relates to our updated proposals; and
- issues to do with data will be covered in our September document.

¹⁸ We have made minor changes from the figure we published in December 2021 to aid clarity.

3.3.1 Approach to developing our proposals

Stakeholder responses

In general, stakeholders support our aim of helping the bioresources sector to generate economic and environmental value. Severn Trent Water said that our overall approach was theoretically reasonable. Thames Water said it understood the theory of what we were doing. In some cases, whilst expressing concerns, Dŵr Cymru, Severn Trent Water and Southern Water wanted to better understand the proposals before providing a definitive view. That said, all companies expressed concerns with aspects of our proposals.

Several companies made points around the development of our proposals such as suggesting further development, engagement and an impact assessment. A few companies considered that our proposals were disproportionate and we should consider other options. Affinity Water suggested comparing the revenue allowance between the PR19 and PR24 approaches.

Our assessment and draft methodology proposals

We recognise that our proposed approach is different from the PR19 approach. We have previously said that we want to develop a market for bioresources which will bring benefits to customers and the environment. Since PR19, we have taken steps to develop our proposed approach as discussed in previous sections.

We recognise that our proposals require further development and engagement. In this document we provide further clarifications on several of our proposals. To further engage with stakeholders, we plan to publish a supplement to this document in September 2022. In that document we will discuss the type of data we could use, publish the data received on companies' depreciation and asset values and provide some example model results.

We continue to consider different options for our proposals and assess the potential impact of these proposals. The potential impacts of different packages of options is summarised in the annex.

3.3.2 The uncertainty around environmental requirements for bioresources

Stakeholder responses

Most companies expressed concerns with respect to the uncertainty around environmental requirements for bioresources. The key areas raised are as follows.

- **Farming rules for water (FrW):** Anglian Water, Dŵr Cymru, South West Water and United Utilities stated that farming rules for water are likely to place limitations on the disposal of treated sludge to land. Companies may therefore need to find alternative and potentially more expensive solutions to dispose of sludge.
- **Industrial Emissions Directive (IED):** Anglian Water, Southern Water, South West Water and United Utilities stated that significant investment is required to meet compliance with the Industrial Emissions Directive.
- **Other regulatory requirements:** Anglian Water, Thames Water and United Utilities made points around the potential impact of future regulatory changes such as the introduction of the Environmental Permitting Regulations or energy policy. Suggestions included an agile regulatory model and ensuring that companies are investing toward a low carbon operational model.

Our assessment and draft methodology proposals

We provide our response to the key areas of concern regarding environmental regulation raised by stakeholders¹⁹:

- **Farming rules for water (FrW):** The Department for Environment Food & Rural Affairs' (Defra) recent guidance '[Applying the farming rules for water](#)' sets out the criteria that the Environment Agency should consider when they assess if they should take enforcement action under the regulations. The guidance will be reviewed by September 2025. This may address companies' current concerns about the use of sludge on agricultural land.
- The Environment Agency's Water Industry National Environment Programme (WINEP) sludge driver aims at delivering improvements in the resilience of the sludge management chain. This process provides a framework for addressing risks related to the use or disposal of sewerage sludge over 2025 to 2030 period.

¹⁹ We welcome water companies' initiative to develop a national bioresources strategy. We understand that the Chartered Institution of Water and Environmental Management (CIWEM) will act in an independent capacity to coordinate the development of a long-term bioresources strategy. We support working with the sector and will engage with CIWEM work.

- We do not recommend that companies use our adaptive planning framework to address risks regarding the use or disposal of sludge. Forecasting regulatory changes is too speculative to drive enhancement funding at PR24. As set out in our final guidance on long-term delivery strategies, trigger points should be based on clear and observable metrics, supported by a monitoring plan.²⁰
- **Industrial Emission Directive (IED):** We note that the implementation of the Industrial Emission Directive is not a new obligation. Therefore, companies should already have considered how to meet the relevant requirements. We expect companies to meet existing obligations within the 2020–25 period.
- **Other environmental requirements:** We agree our approach should support companies to undertake investment and help to protect the environment as appropriate. We are proposing a common performance commitment on companies' operational greenhouse gas emissions to encourage a reduction in emissions. WINEP driver guidance covers micro-plastics and chemicals and provides a framework for addressing this risk.

We recognise that there are related issues about the funding for quality enhancements. We discuss our approach to new quality enhancements in Section 3.3.5.

3.3.3 Financing costs

We proposed to include financing costs in our econometric benchmarking models. To implement this, we considered two options for how financing costs could be reflected in our econometric models – using actual financing costs or notional financing costs.

Stakeholder responses

Companies raised theoretical and technical issues with the inclusion of financing costs. All stakeholders apart from Affinity Water supported the use of notional rather than actual financing costs in modelling.

Our assessment and draft methodology proposals

We continue to consider that the general principle of including financing costs in our benchmarking models is reasonable. This 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 replicating a market process where efficient costs are reflected in the service price.

²⁰ Ofwat, '[PR24 and beyond: Final guidance on long-term delivery strategies](#)', April 2022, pp. 19, 49.

We continue to consider that notional financing costs would be more appropriate than actual financing costs. It maintains the simplicity and customer protections of a single sector cost of capital, calculated without reference to companies' actual financing decisions.

We discuss the potential impact of using the allowed return on capital used in previous price reviews and our approach to tax in Sections 3.4.3 and 3.4.7, respectively.

3.3.4 Bioresources growth enhancement

At PR19 we used a shallow and deep dive approach²¹ to assess companies' proposed [bioresources growth enhancement](#). We allowed expenditure where companies provided sufficient evidence of population growth and evaluated the impact of this on sludge production. We also assessed how well the companies had engaged with the bioresources market to provide a cost-effective solution, for example whether they had considered third party provision of additional treatment capacity. Where companies did not provide such evidence, we applied a cost challenge to their proposed expenditure and made a lower allowance. Where we considered it appropriate, we provided funding for the operating costs associated with a contract with a third party rather than expenditure required to build capacity in-house.

In our December document we proposed to include growth enhancement in our econometric cost benchmarking models and make no separate allowance for these costs at PR24.

Stakeholder responses

There was general support for the inclusion of growth enhancement within our econometric model. Thames Water agreed that growth enhancement could be included in the econometric model. Anglian Water retained an open mind about whether growth variables in the models can accurately control for future growth-driven investment. Severn Trent Water supported our proposal provided that the correct scale drivers are included in the model and unused capacity is taken into consideration. Northumbrian Water and Yorkshire Water noted that if historical growth capital expenditure is included in our models, then this may provide a sufficient cost allowance for companies. However, they stated that this needs to be tested.

Our assessment and draft methodology proposals

We continue to consider that our approach is reasonable. At PR24 we expect to capture the volume of sludge that a company produces as a cost driver in the econometric cost benchmarking models. We intend to set an average revenue control that would take account of capital costs as well as operating costs. This would mean that companies automatically get higher total revenue allowances as the volume of sludge they produce increases. The

²¹ A shallow dive was used for low materiality costs and a deep dive approach was used for high materiality costs.

increased revenue would reflect the estimated long-term economic cost of treating and disposing of additional volumes. It would then be for companies to assess the best way of accommodating that growth either by creating capacity themselves or by finding capacity through the market. Compared to the PR19 approach, this would reduce the risk to companies that we reduce allowances if we do not think that companies had explored market options sufficiently.

If depreciation was used to capture capital costs for the purposes of benchmarking analysis, then this would mitigate some of the difficulties that are faced under the current approach of benchmarking expenditure (which may include lumpy capital enhancement expenditure).

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. Indeed, an additional allowance for bioresources growth enhancement would double-fund companies' bioresources costs.

This approach would also address the Competition Market Authority's concern regarding 'double funding' discussed in Section 1.1. We note stakeholder feedback regarding implementation of our proposed approach and will consider the issues raised by stakeholders as we develop our approach (including the econometric model specifications).

3.3.5 New quality enhancement claims at PR24

In our December document we said that future quality enhancement expenditure may not be reflected in historical costs, so our econometric cost benchmarking models may not provide funding for these activities. Therefore, an additional allowance may be appropriate. We considered three options to address this issue, with a preference that we should provide an allowance for annualised costs over one regulatory period as this would best meet our objectives of capturing more costs in our benchmarking process and promoting the market.

Stakeholder responses

Most companies supported options for longer-term funding rather than our preferred option. Thames Water was the only company who supported our preferred option, although it expected some commitment that any spend beyond the PR24 period would be funded later as well. Dŵr Cymru and Wessex Water stated that companies might choose short-term solutions that could lead to higher costs. United Utilities stated that limited regulatory protection on new quality enhancement would increase uncertainty and disincentivise water companies and third parties to get involved with trading. Other companies stated that our preferred approach would not encourage investment in long-life assets. WaterUK, Anglian Water, Severn Trent Water and Wessex Water noted that if not all enhancement costs are recovered it might increase the risk of asset stranding.

Severn Trent Water considered that historical expenditure may not be a good predictor of future expenditure. Therefore, our proposed approach may reduce the robustness and predictive capability of models and require separate and frequent cost adjustment claims at future price reviews.

Our assessment and draft methodology proposals

Providing an allowance for annualised costs over one regulatory period would best meet our objectives of capturing more costs in our benchmarking process and promoting the market. In future periods we could consider cost adjustment claims to the extent that our models failed to address these costs adequately. This approach would ensure that efficient enhancement costs can be recovered by companies.

We do not agree that our preferred option would drive short-termism. We consider that firms operating in a market – which our proposed approach aims to replicate more closely – would aim to choose the most efficient solutions including by exploring trading opportunities and making long-term investments.

That said, we would welcome suggestions on how this could be implemented in a way that achieves our objectives whilst addressing the concerns raised by stakeholders. We set out in Section 3.3.9 our view on the potential impact on investment of our approach more generally.

3.3.6 Historical quality enhancement

In our December document, we said that:

- there should be no separate adjustment for historical growth enhancement costs;
- no separate adjustment is required for enhancement activities that were undertaken before 2020; and
- we would consider adjustments to our PR24 allowance for PR19 quality enhancement claims on a case-by-case basis, but we would expect such claims to be by exception.

Stakeholder responses

Stakeholders did not raise concerns with the proposed approach for PR24.

Our assessment and draft methodology proposals

No separate adjustment would be appropriate for growth enhancement. These costs would be captured through our benchmarking model and average revenue control as discussed in Sections 3.3.4.

No separate adjustment would be appropriate for enhancement activities before 2020. These would be reflected in companies' pre-2020 RCV. We are proposing a different level of regulatory protection for pre-2020 RCV as discussed in Section 3.4.1.

We would consider adjustments to our PR24 allowance for PR19 quality enhancement claims on a case-by-case basis. 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. There was little quality enhancement expenditure for bioresources at PR19. We therefore consider that there should be no significant issues for our modelling for PR24.

3.3.7 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 base cost consultation, '[Assessing base costs at PR24](#)', we considered the potential benefits and risks²² of using business plan forecast costs to inform our assessment of efficient base costs (for example, to the estimates of our econometric cost benchmarking models).

In our December document we said we would consider including business plan forecasts into our bioresources econometric cost benchmarking models.

Stakeholder responses

Yorkshire Water supported the use of forecast cost data in our models as this would be consistent with a market-oriented approach. Dŵr Cymru and Thames Water stated that the use of forecast data may represent a mix of risk and uncertainty as well as efficiency. Therefore, forecast data may not represent an efficient business plan. Thames Water stated that we could run the models using two different samples, one including historical data and one including forecast data. An efficiency catch-up challenge could then be calculated using both approaches.

Anglian Water stated that forecast cost data is under management control and not reliable. It noted that there is often a large gap between companies' outturn costs and those they proposed in their business plans. United Utilities stated that the use of forward-looking costs is suitable when there is a structural break or step change in operational requirements in the future, but considered that this is not the case with the bioresources market. Affinity Water and Northumbrian Water stated that the inclusion of forecast cost data might change incentives towards revealing efficient cost projections. Northumbrian Water also noted that the use of historical data back to 2011 will provide enough observations to use for

²² 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.

econometric modelling so there is no need to use additional data. Southern Water and South West Water stated that the use of forecast data may ensure that future cost pressures are considered. However, they urge a cautious approach to the inclusion of future costs. They stated that to ensure that forecast cost data are comparable across companies, we should consider providing reporting guidance.

Our assessment and draft methodology proposals

We will continue to consider whether to include business plan forecasts in our bioresources econometric cost benchmarking models. Due to the different data needed to apply our proposed approach for bioresources, we may have access to less historical data to use in our models. Therefore, the use of forecast data would allow us to address any issues regarding the sample size used to inform our benchmarking models. We note that forecast data (that is, forecast cost drivers) are used to set companies' future allowances. We agree that if forecast cost data should be used in our models, it should be comparable across companies. We also note that we would expect a better functioning bioresources market to result in greater future efficiency improvements. These improvements would be reflected in forecast cost data but not historical cost data.

3.3.8 Use of market data

In our December document we said we would consider using market information, such as gate prices in the wider waste sector. We recognised the challenges involved in this and said we would take this into account when considering this approach.

Stakeholder responses

Dŵr Cymru supported using external market data to assist in the derivation of price controls. However, it noted that market data would need to be relevant and consistent with the gate fee derived by our approach. Some companies suggested several reasons that made a comparison with the wider waste industry problematic, such as the different regulatory and market arrangements, differences in the nature of the waste and challenges in being able to identify appropriate price data.

Our assessment and draft methodology proposals

There are potential benefits to using market information. However, we recognise that there are potential challenges with this approach at the current time, for instance in terms of comparability of expenditure. We therefore propose to deprioritise the use of this data for PR24. We will continue to review this for future price controls.

3.3.9 Approach to regulating post-2020 RCV and the risk of asset stranding

In our December document, we proposed an approach that was different from the building blocks approach used at PR19. We said there would be no risk of asset stranding since companies would still not face a direct threat from competitive entry.

Stakeholder responses

Northumbrian Water stated that companies would not have an incentive to build any new assets. Yorkshire Water stated that a new entrant wanting to develop new capacity would require long-term certainty to secure low-cost funding. It questioned how this can be achieved by limiting protection for companies' new investment.

Southern Water, South West Water, Wessex Water stated that removing RCV protection for new investment and exposing it to competitive pressure would increase cost risk and result in a higher cost of capital for bioresources. These companies along with Dŵr Cymru and United Utilities also stated that if new investment is not subject to the same regulatory protections, then this could adversely affect the ratings agencies' view of financeability.

Thames Water, Northumbrian Water and Southern Water said it is unclear that efficiently incurred costs for newly created assets will be recoverable, for example if a new technology is developed. United Utilities stated that the risk of asset stranding remains due to the proposed change to an average revenue control.

Our assessment and draft methodology proposals

Our proposed approach would determine companies' allowed revenue and provide an efficiency challenge in a different way. This includes assessing more costs as part of a single assessment to reduce distortions and is intended to provide similar levels of regulatory protection for different categories of cost. Our approach is intended to encourage companies to explore more market-based options. This may lead to companies reducing their in-house capital investment but is not intended to deter them from doing so where this is the most efficient approach.

Our proposed approach retains a strong commitment to companies being able to recover their efficient costs.²³ Although we would not use companies' RCV in the same way as previously, companies' costs would still be a key input into determining allowed revenue. Previous regulatory requirements would be captured in historical companies' costs and so would influence their allowed revenue. Note that, as discussed in Section 3.4.1, we propose providing a different level of regulatory protection for pre-2020 RCV.

²³ That is, it still addresses the so called 'time inconsistency' issue.

Indeed, there may be some advantages to companies from our proposed approach, particularly in the context of the bioresources control where we propose no cost sharing. For example, under the PR19 approach our estimate of companies' efficient costs would affect their RCV. RCV impacts allowed revenue for potentially multiple regulatory periods. Therefore, under the PR19 approach any company overspend gets 'locked in'. In contrast, under our proposed approach, companies' actual capital expenditure would get added on to the asset base. This would provide an opportunity to reconnect companies' allowed revenue with actual costs at future price reviews. Our approach for setting companies allowed revenue after 2030 will be set out at PR29.

Companies' bioresources RCV at 2020 is based on the Modern Equivalent Asset Value (MEAV).²⁴ If we used depreciation in our benchmarking, then this should already account for modern technologies. In any case, since our proposed approach for benchmarking at PR24 is based on sewerage companies' costs, allowed revenue would only reflect regulations and technology used in the sector.

We recognise that there are related issues about the funding for quality enhancements which are discussed in Section 3.3.5. We consider our proposed PR24 approach to bioresources would not lead to a significant increase in cost risk or a higher cost of capital as set out in Sections 3.3.10 and 3.3.11, respectively. As set out in Section 3.4.5, we consider that a degree of volume risk is acceptable.

3.3.10 Cost risk

In our December document we said that there would not be a significant increase in the total risk faced by companies, although quantitative analysis would help give a better sense of the potential impact of the level of risk for individual companies and we would keep under review other mechanisms to manage risk across the sector.

Stakeholder responses

Thames Water, Southern Water, Wessex Water and Yorkshire Water said that cost risk will increase because of the move away from the building blocks approach, the use of more costs in the econometric models, the lack of protection of RCV for new investment and asset stranding. Anglian Water and Severn Trent Water noted that cost risk will increase if our econometric models are not robust, pre-2020 RCV is not protected, financing costs are included in the model and not all enhancement costs are recovered.

Northumbrian Water did not agree with our comment that any inefficiency should not be reflected in RCV. This is because at the time of the RCV allocation in 2017, the proposed

²⁴ The Modern Equivalent Asset Value is what it would cost to replace an old asset with a technically up to date new asset with the same service capability.

approach as set out in the December consultation was not available. It noted that the cost assessment method would determine if companies' historical assets are efficient or not. Thames Water wanted to ensure that efficient investments made during 2020–25 would not be subjected to a double efficiency challenge.

Severn Trent Water and United Utilities noted that cost risk will increase because of volume risk.

Our assessment and draft methodology proposals

Companies faced cost risk under our PR19 approach. We remain of the view that we set out in our December document that there would not be a significant increase in the overall risk faced by companies under our proposed approach. However, quantitative analysis would help to give a better sense of the potential impact of the level of risk for individual companies and we would keep under review other mechanisms to manage risk across the sector.

The supplementary document we will publish in September 2022 will set out our position regarding the type of data we could use to set our control and some example model results.

We set out our view regarding asset stranding, indexation and volume risk in Sections 3.3.9, 3.4.4 and 3.4.5, respectively. We are proposing to provide a different level of regulatory protection for pre-2020 RCV in Section 3.4.1.

Companies allocated RCV to bioresources at 31 March 2020 in a way that reflected the economic value of their existing bioresources assets. The approach used should mean that any identified inefficiency in terms of how existing assets compare with their modern equivalent should not be reflected in the bioresources RCV (any inefficient costs that were identified in respect of bioresources assets were, in effect, allocated to the wastewater network plus control). We recognise though that this asset valuation was not done on a 'scorched earth' basis, that is, it took no account of the relative efficiency of companies' existing asset configuration. We agree therefore that companies' RCV will reflect the level of efficiency of their asset configuration, at least as viewed and understood from the time of the valuation exercise in 2017 and 2018.

3.3.11 Cost of capital

In our December document we said that our proposed approach to bioresources would not lead to a significant increase in risks to companies compared to our PR19 approach. Even if incremental risk were demonstrated, we do not consider it would be appropriate to

remunerate the sector for these risks through adjustments to the way we set the allowed return on capital.

Stakeholder responses

Several companies²⁵ argued that our proposals increase the risk around the returns on investing in bioresources, so the cost of capital would be higher for bioresources than other wholesale controls. Thames Water and Southern Water noted equity and financeability risks in addition to revenue risks, arguing that these would also increase the cost of capital. Northumbrian Water argued that the share of unprotected bioresources RCV would increase as a share in total RCV, increasing the relevance of any higher risk in bioresources to the overall allowed return.

Dŵr Cymru, Thames Water and Severn Trent Water stated that everything else being equal, the gearing ratio will increase as the size of post-2020 RCV is reduced due to the implementation of an efficiency challenge. They stated this could result in companies being unattractive to investors.

Thames Water said that it is unlikely that markets have priced risks of our proposed new approach efficiently through the forward-looking beta. Anglian Water likewise said that betas are averaged over periods of up to 10 years and investor expectations might not crystallise until the final determination. Moreover, it stated that beta is only estimated by reference to two companies whose sludge business might not be representative of the wider water sector. Yorkshire Water stated that further evidence, such as benchmarking betas of bioresource and other organic waste companies with those of water companies would also be beneficial.

Anglian Water, Dŵr Cymru, Northumbrian Water, and Yorkshire Water stated that the risk and return profile of bioresources should be viewed on a standalone basis and that this should inform the bioresources allowed return. Dŵr Cymru noted that the type and tenor of debt available to finance a bioresources project are likely to be quite different from those that typically characterise existing water company debt.

Our assessment and draft methodology proposals

We remain of the view that there would not be a significant increase in the overall risk faced by companies as set out in Section 3.3.10. However, even if our proposals were to give rise to increased risk, we disagree that the appropriate response would be to remunerate the sector for these risks through adjustments to the way we set the allowed return on capital.

For PR24 we will estimate the cost of capital based on appointee-level data, as this is in practice the level at which companies raise capital, rather than hypothecated to individual controls. Calibrating an adjustment to reflect higher bioresources risk would be speculative,

²⁵ Thames Water, Northumbrian Water, Severn Trent Water, Southern Water, Wessex Water and United Utilities.

not least because sufficiently similar listed bioresources comparators do not exist to inform the calibration of an uplift to compensate for this risk.

We contend that beta data for our listed comparators should pick up any increased risk over time and reflect it in our sector allowed return. This would make a separate adjustment to the bioresources allowed return unnecessary – indeed to do so would potentially introduce an element of double counting. When we set final determinations, investors will have had at least three years' visibility of our proposals to absorb the implications for risk. While we agree betas may not fully embed risks that materialise in the ensuing control, a decision to not make an adjustment to the allowed return for higher bioresources risks would still be justified in our view due to:

- the low level of any incremental risk implied by our proposals, given pre-2020 RCV has a different level of protection and costs would continue to be based on companies' historical expenditure;
- the small slice of overall RCV affected – essentially post-2020 bioresources RCV;²⁶ and
- consistency with prior price review policy where we have not made adjustments due to policy changes that have reduced risks (for example, move to a revenue control, cost of new debt indexation).

3.3.12 Our overall assessment

After considering stakeholder responses we propose to retain the key elements of our December proposals, as discussed above, at this stage. Our reasoning is also set out in the annex which summarises the potential impacts of different packages of options.

However, we do recognise that our proposals need to be further tested and developed. To address this:

- We are proposing refinements and clarifications to some of our December proposals as discussed in the following section. We welcome feedback from stakeholders where we can improve and clarify our proposals further.
- We recognise that some of our proposals require us to undertake our benchmarking modelling in a new way and we need to ensure that this could be implemented appropriately. To help test this and clarify how our proposals could work in practice and their potential impact, we will publish a supplementary document in September 2022.

²⁶ We project, based on PR19 final determinations that this would represent 1% of sector RCV on 31 March 2025.

3.4 Updated proposals

In this section we set out our updated proposals.

3.4.1 A different level of protection for pre-2020 RCV

In our December document we considered we should provide a different degree of regulatory protection for pre-2020 RCV in line with the commitment we made in PR19 when setting price controls for the 2020-25 period. We consulted on specific options to achieve this.²⁷

- **Option 1: Excluding legacy assets²⁸ from the catch-up efficiency challenge.** In this option we would undertake an efficiency assessment on companies' operating costs, capital costs and financing costs. 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).
- **Option 2: Value floor.** In this option we would undertake our efficiency assessment on companies' operating costs, capital costs and financing costs. However, we would set a floor to ensure that i) the capital and financing costs at risk are limited to new investment; and ii) 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). 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.

We did not indicate a preferred option.

Stakeholder responses

Dŵr Cymru, Southern Water, South West Water and Yorkshire Water preferred option 1. No company supported option 2 because they were concerned that the value floor did not include revenue allowed for depreciation and financing costs of new assets.

²⁷ We subsequently also published [illustrative examples](#).

²⁸ 'Legacy assets' refers to assets existing before April 2020 and 'new assets' refers to assets existing on or after 1 April 2020.

Anglian Water, Northumbrian Water, Wessex Water and United Utilities considered that neither option provided appropriate protection. Anglian Water and United Utilities stated that both options did not offer any clear protection because legacy assets are used to quantify the efficiency challenge and so influence the allowance for non-protected assets. Wessex Water stated that with respect to option 1, if all costs are modelled as one, a capital-intensive company may look inefficient due to higher legacy costs, even with efficient future operating expenditure (opex). Since legacy costs are used to inform the efficiency challenge, it is concerned that legacy RCV is not protected, and that efficiency challenge might be overstated. Consequently, the efficiency challenge placed on the new assets might be unfeasible.

Dŵr Cymru and Severn Trent Water stated that the proposals for protecting pre-2020 bioresources RCV were unclear and could be interpreted in different ways. Anglian Water and Severn Trent Water questioned whether modelled costs can be decomposed into legacy and new assets.

Our assessment and draft methodology proposals

Degree of regulatory protection

We think that it is helpful to set out in more detail what we mean by providing a different level of regulatory protection to pre-2020 RCV for the 2025–30 period. This will provide a clearer framework against which to assess whether our PR24 proposals in relation to pre-2020 RCV are appropriate.

To promote regulatory certainty, at PR19 we decided not to expose bioresources investment made prior to 2020 to new risk from opening bioresource markets. We therefore retained protections for the RCV allocated at 31 March 2020 for the 2020–25 period. We considered that this approach had benefits to companies and investors by enhancing the predictability of our regulation and so would help maintain a low cost of capital, even as elements of the value chain are opened to markets. In our PR19 [final methodology](#), we also said that,

"if we move to setting more 'gate fee' type charges derived from evidence of efficient costs (including post-2020 investment) then an efficient company should be able to recover past efficiently incurred expenditure, subject to volume changes".

Prior to this, in our May 2016 [Water 2020 document](#) we said that,

"Our price control framework for PR19 will provide the same nature and degree of regulatory protection as at present for the RCV allocated to water resources and bioresources at 31 March 2020".

Our position taken at PR19 related to the 2020 to 2025 period. Our approach at subsequent reviews was left open.

We have also considered the approach we took at PR14 when we first introduced separate controls for retail activities. In our [PR14 methodology document](#) we confirmed we would allocate all of the existing RCV to the wholesale business, including for existing residential retail assets. Previously, [we stated](#) that such an approach would protect all the existing capital investment made in these assets from any risk that they will become stranded.

After considering the approach we have taken in the past, we are proposing a higher level of regulatory protection at PR24 for pre-2020 bioresources RCV compared to post-2020 bioresources RCV. For the avoidance of doubt, this does not mean complete protection against any risk. In practice, this means:

- our treatment of pre-2020 RCV for bioresources has similarities to how we intend to treat wastewater network plus RCV. This is in terms of using the same approach to indexation and incorporating the run-off and financing cost on this investment in companies' allowed revenue;
- legacy costs can feature in our assessment of companies' efficiency – this is consistent with the approach we have taken to pre-2015 residential retail assets²⁹;
- a frontier shift is applicable; and
- allowed revenues being affected by volume changes.

Approach to providing additional regulatory protection

Our preferred option is option 1, 'excluding legacy assets from the catch-up efficiency challenge'. This option is better aligned to our proposal to provide a different level of regulatory protection for legacy assets, discussed above.

Although legacy costs would inform how the efficiency catch-up challenge is calculated, the challenge would not be applied to these costs. The inclusion of legacy costs in the econometric model would allow us to properly estimate the level of costs required for the provision of bioresources services. Companies made investments in the previous regulatory regime to provide bioresources services. Excluding legacy assets from the econometric model would not appropriately reflect how much it costs to provide bioresources services. This could understate the price for providing bioresources activities and distort competition.

As noted in our December document, the effect of this option is similar to our approach to the RCV of residential retail assets at PR14 where i) 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 ii) to avoid double counting,

²⁹ We also note that our approach at PR19 used companies historical capital maintenance expenditure to inform our catch-up efficiency challenge and therefore allowed revenue.

we did not provide companies with an allowance for the depreciation on legacy residential retail assets.

Modelled costs could be split between modelled operating costs, depreciation and financing costs based on the actual data used in the econometric model. For instance, the split could be based on the percentage of each cost item in total costs. Modelled depreciation and financing costs could be split between legacy and new assets based on PR19 information on pre-2020 and post-2020 bioresources RCV and RCV run-off. As stated in our December document, companies' allowed revenue will not be calculated based on the modelled level of depreciation and financing costs of legacy assets. Instead, this estimated level of legacy costs will be replaced with an amount consistent with companies' pre-2020 RCV. We will not apply the efficiency challenge to this amount. The efficiency challenge would be applied to other costs, that is, the modelled operating costs and costs of new assets. Therefore, under option 1 legacy assets get a different level of protection.

We propose not take forward option 2 'value floor'. This is less well aligned with the different level of regulatory protection for legacy assets discussed above.

3.4.2 Frontier shift

Frontier shift, also known as dynamic efficiency, refers to improvements in productivity over time. These improvements could come for instance from improvements in technology, education and investment. At PR19 the same frontier shift was applied across all wholesale controls.

In our December document we did not discuss our approach to applying a frontier shift for bioresources activities at PR24.

Our assessment and draft methodology proposals

We will explore setting a specific frontier shift for bioresources that is separate from other wholesale activities. This would be consistent with our proposed approach to setting a separate catch-up efficiency challenge and the proposed new approach to determining allowed revenues for bioresources at PR24.

We note that companies' forecast costs will include dynamic efficiency gains. Therefore, if we use forecast costs to set the catch-up efficiency challenge, this would potentially reduce the need for a separate adjustment for frontier shift. This approach would be analogous to retail where we did not set a separate frontier shift. Otherwise, we could make a separate adjustment to reflect frontier shift in bioresources activities.

3.4.3 Estimating financing costs

In our December consultation, we said that financing costs would be estimated by multiplying the asset base and allowed return from previous final determinations to estimate companies' historical financing costs. We did not set out our position regarding the financing costs for enhancement costs that are not part of our benchmarking models.

Stakeholder responses

Severn Trent Water, Northumbrian Water, Southern Water, South West Water and Yorkshire Water considered that historical levels of the allowed return would not be a good guide to future financing costs. Dŵr Cymru and Wessex Water suggested a forward-looking assessment of allowed return on capital. Severn Trent Water and United Utilities noted that cost drivers related to financing costs should be considered if they were to be included in the model.

Affinity Water, Anglian Water, Thames Water and Yorkshire Water stated that the allowed return and asset base has already been set at an efficient level in previous price reviews, so an additional efficiency challenge on historical allowed return on capital and asset base implies double counting.

Our assessment and draft methodology proposals

We recognise the potential issues with using historical allowed returns in our model. We agree with stakeholders that it is appropriate to use a measure of financing costs that is forward looking. We therefore propose to use the PR24 post-tax allowed return on capital. We would multiply this with the asset base to provide an estimate of companies' financing costs that we can use in our benchmarking models. This approach is appropriate for the following reasons.

- The PR24 allowed return on capital is an appropriate indicator of the future costs of providing bioresources services over the 2025 to 2030 period.
- Using a consistent allowed return on capital across all companies ensures that the efficiency challenge we apply to companies is not affected by the cost of capital we choose.
- Using a consistent allowed return on capital over time will avoid any step changes in our estimated financing costs.
- It is more accurate and simpler to implement than adjusting the historical allowed return on capital in our benchmarking models and then making a subsequent adjustment to ensure this is appropriate for future regulatory periods.
- Cost drivers to capture the future cost of financing could include factors such as a company's credit rating and equity beta, which are under management control.

- It also avoids any perceived double counting issues that might be caused by using the allowed return on capital from past price reviews.

The estimate of financing costs would be included along with operating costs and capital costs in our modelling.

We would ensure that an appropriate allowance is made for the financing costs for companies' enhancements. This may involve a separate adjustment for the enhancements costs that are not funded through our benchmarking models, for example for new quality enhancement claims at PR24.

3.4.4 Indexation of allowed revenues

In our December document we did not set out a proposed approach regarding indexation.

Stakeholder responses

Anglian Water stated that the recovery of allowances under the PR19 approach and our new bioresources approach should be net present value neutral. It argued that this is not the case with our new approach as there is no clarity on RCV indexation and the notional financing costs are not based on ex-ante analysis. It said that our new approach does not use the RCV concept, but instead uses depreciation based on assets recognised at historical cost. South West Water and United Utilities also stated that our approach does not clarify how the indexation of RCV would work.

Our assessment and draft methodology proposals

We have set out our proposed approach to financing costs above. Sewerage companies' historical bioresources RCV would be indexed in the same way as companies' other RCV.

We propose indexing companies' allowed revenue for bioresources to CPIH. This approach would be consistent with the approach we took at PR19 and consistent with the approach we are taking to other wholesale controls at PR24. More information on our proposed approach to RCV indexation is set out in [Appendix 10 – Aligning risk and return](#).

3.4.5 Managing volume risk

In our December document we proposed 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 could exceed the change in companies' variable costs.

We said an average revenue control supports our objectives, a degree of volume risk is acceptable and noted that before 2010 companies were exposed to volume risk across all price controls.

We said that 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 noted the following.

- At PR19 there was particular uncertainty around the WINEP 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 that is 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.³⁰
- There are still incentives under a modified average revenue control for companies to under-forecast sludge production.

We said we would review whether mechanisms to manage volume risk, such a cap and collar on allowed revenue and a forecasting incentive, could be applied at PR24.

Stakeholder responses

Severn Trent Water and United Utilities noted that they will be unable to appropriately recover fixed costs if volume decreases. South West Water stated that regional or economic factors could lead to higher volume risk because of volatility in outturn sludge. Anglian Water, Dŵr Cymru, Southern Water and Yorkshire Water stated that setting companies' allowed revenues in the form of an average revenue control will introduce full exposure to volume risk for companies.

Thames Water, Severn Trent Water and United Utilities stated there is volume risk due to the WINEP which could affect sludge production. United Utilities also stated that the potential increased use of nature-based solutions might materially impact future sludge produced and therefore customers or companies may be exposed to inappropriate levels of risk.

³⁰ This is because companies' forecasts would inform the calculations to set the level of protection for pre-2020 RCV.

United Utilities considered that our proposals may create a potential incentive for companies to underestimate their tonnes of dried solid (TDS) forecasts.

Dŵr Cymru, Thames Water and United Utilities noted that an average revenue control should be supplemented by a forecasting accuracy incentive. Northumbrian Water did not support the use of a complex cap and collar approach.

Our assessment and draft methodology proposals

We have considered the following three options.

- **Option 1: No additional adjustment in relation to volume risk.** Under this approach we could estimate the unit cost rate directly from our econometric models to inform allowed revenues. We would not introduce a forecasting incentive or cap and collar that could affect allowed revenue.
- **Option 2: As option 1 but retain the forecasting incentive as at PR19.** We may consider reviewing the level of financial penalty and the deadband associated with the forecasting incentive.
- **Option 3: As option 2 and implement a symmetrical cap and collar type approach.** Under this approach we could implement a supplementary adjustment related to companies' fixed costs as an end-of-period reconciliation. The adjustment would mean that companies' allowed revenue would move in line with their estimated variable cost outside of the caps and collars. It would be applied if actual sludge production deviates too far from forecast sludge production. This would have the effect of acting as a 'pure' average revenue control within the deadband, but a more cost-based control outside of the deadband.

Under a 'building blocks' approach for setting companies' bioresources funding, companies' efficient expenditure are generally not all recovered in the following regulatory period. Instead, a major part of allowed revenue depends on the opening level of RCV. Setting an average revenue control in this context requires dividing companies' allowed revenue by forecast sludge production. A lower forecast creates a higher allowed revenue per unit of sludge. If companies' actual production exceeds their forecast sludge production, then they can over-recover their fixed costs (and vice versa). This approach creates an incentive on companies to under-forecast sludge production.

Under our proposed approach we would set allowed revenues as shown in Figure 3.3. Companies' allowed revenue per unit of sludge would be determined more directly from our econometric benchmarking models. The estimated unit cost from our benchmarking models would depend on companies' historical costs and historical sludge production. During the price control period, a company's total revenue allowance for bioresources in each year would

be calculated by multiplying the average revenue control for that company and year by the outturn volume of sludge produced in that year. Therefore, this approach is less reliant on sludge forecasts.

Companies could still retain an incentive to misforecast their sludge production forecast for the following reasons.

- Any enhancement allowances that are set through a bespoke assessment, if set on the basis of total costs, would need to be converted into a unit rate on the basis of forecast sludge production. There is a similar issue regarding the adjustment for tax as set out in Section 3.4.7. Our proposed approach to providing a different level of regulatory protection for pre-2020 RCV could also create this incentive as discussed above.
- Unless our econometric models indicate constant returns to scale (that is, the allowed revenue per unit is not affected by the level of sludge production), companies' modelled cost would depend on the forecast sludge production.

In light of these considerations and those in our December document, our preferred option is option 2 for the following reasons.

- A forecasting incentive provides a proportionate incentive on companies to provide accurate sludge production forecasts.
- A cap and collar approach might be appropriate if we were retaining a 'building blocks' approach. However, it is disproportionate under our proposed approach. It would add complexity and have the effect of moving away from an average revenue control if actual sludge production is too different from forecast sludge production.
- As discussed in Section 3.4.1, we do not intend to protect pre-2020 RCV from volume risk.
- We consider that a degree of volume risk is acceptable.

We do not consider that the WINEP/NEP and nature-based solutions create a source of uncertainty with regards to sludge production that is so large or predictable as to justify a move away from an average revenue control. We acknowledge that, based on the relevant WINEP driver guidance, one of the main impacts on sludge production variation relates to phosphorous removal or stringent ammonia permits at the sewage treatment works. However, we do not consider that the level of uncertainty in determining the sludge make has increased when compared to estimates in previous years.

We acknowledge that the implementation of nature-based solutions may slightly affect the sludge make and the type of sludge produced. However, due to the nature of these solutions and the way that sludge is managed within this type of applications, we do not consider that nature-based solutions will have a material impact on sludge quantities to be treated at sludge centres.

3.4.6 Revenue reconciliation

At PR19 we introduced a mechanism to correct for any over- or under- recovery of bioresources revenue over the 2025 to 2030 period. In our December document we did not set out a proposed approach regarding revenue reconciliation.

We consider that the mechanism encourages companies to collect an appropriate amount of revenue and address any imbalances in a timely way. We therefore propose to retain this mechanism at PR24.

3.4.7 Applying a separate adjustment for tax

We propose funding companies for tax costs. In our December consultation, we did not cover this issue.

Stakeholder responses

Northumbrian Water, South West Water, United Utilities and Wessex Water stated that we did not provide any guidance as to how the issue of taxation would be dealt with at PR24.

Northumbrian Water mentioned that it would favour adding the taxation from the financial model to the efficient gate fee cost assessment in the same way an unmodelled cost would be. It does not favour including taxation as part of the efficient gate fee cost assessment as this would favour highly geared companies.

Our assessment and draft methodology proposals

We will adopt a post-tax approach to allowed return on capital and calculate a tax building-block revenue requirement in the financial model. This would be added to the cost figures for bioresources produced by the econometric modelling. See Chapter 8 of our draft methodology, *Aligning risk and return*, for more details.

3.4.8 Nomenclature for the post-2025 asset base

In our December document, we said that one option for assessing the gearing measure in our financeability assessment was to include post-2025 bioresources investment after taking account of depreciation. We did not state how we would refer to the asset base for bioresources from 2025 onwards.

Stakeholder responses

Dŵr Cymru asked if we intend to calculate figures for the bioresources RCV for 1st April 2025 and beyond. Dŵr Cymru and Yorkshire Water stated that financeability analysis will be weakened as core financial metrics will no longer be able to be calculated appropriately if post 2025 RCV is not reported. Northumbrian Water stated that companies need to report separate pre- and post-2020 RCV in the annual performance report tables so that stakeholders can conduct appropriate analysis. It further noted that there might be issues with some companies' debt covenants if they are linked to the RCV which under our approach will not report post 2020 investment. Therefore, Northumbrian Water suggested that we should consider the magnitude and likelihood of any potential mismatches between costs incurred and cost recovery to allow an assessment of financeability to be undertaken.

Our assessment and draft methodology proposals

We clarify that the asset base for bioresources from 2025 onwards would continue to be recorded as RCV. This would address concerns that abandoning a reference to RCV might affect debt covenants and ensure that an appropriate metric for gearing calculations continues to be available.

As set out in our proposed business plan table guidance, for each wholesale control we are separately recording RCV from 2025 onwards as 'Post-2025 RCV'. Companies' bioresources 'Post-2025 RCV' would reflect their capital investment and depreciation.

3.4.9 Cost sharing

At PR19, the costs of providing bioresources activities over the 2020 to 2025 period were not subject to cost sharing. An exception to this were companies' business rates.

Stakeholder responses

Dŵr Cymru asked if we intended to apply cost sharing at the end of the 2025 to 2030 period. Anglian Water mentioned that the new approach for funding bioresources activities lacks regulatory protection compared to appointees' other regulated activities. This includes a lack of cost sharing mechanisms, exposure to volume risk and new efficiency challenges for financing costs. United Utilities stated that if the new approach does not develop robust econometric results, then it would not be able to robustly predict efficient variances in revenues. This could lead to significant winners and losers, with no customer/company sharing to appropriately share the risk that the benchmarking approach results in a misallocation of cost. Northumbrian Water stated that the bioresources control already had a 100% company cost sharing rate that was introduced in 2020. Therefore, the incentives for efficiency are already very high and should be given time to have effect over 2025 and beyond. Thus, companies should be given time to respond via a glidepath for instance.

Our assessment and draft methodology proposals

As we are retaining a volumetric control, we propose to retain the PR19 approach not to apply cost sharing to the bioresources control at PR24 in relation to the 2025 to 2030 period. We also propose that bioresources business rates should not benefit from cost sharing in PR24 (see [Appendix 9 – Setting expenditure allowances](#) for more detail on our overall approach to cost sharing).

3.5 Consultation questions

Question 3.1: Do you have any comments on this section?

Our December proposals

Question 3.2: Do you have any further comments on the draft methodology proposals which we propose to retain from our December document and our reasons for doing so?

Question 3.3: Do you have any suggestions on how our approach to PR24 quality enhancements could be implemented in a way that achieves our objectives whilst addressing the concerns raised by stakeholders?

Updated proposals

Question 3.4: Do you agree with, or have any comments on, the degree of regulatory protection we propose for pre-2020 RCV? Do you agree with our proposal to implement option 1 to achieve this?

Question 3.5: Do you agree with, or have any comments on, our updated proposals for modelling financing costs in our benchmarking models?

Question 3.6: Do you agree with, or have any comments on, our proposals in relation to managing volume risk? Do you agree with our preferred option, that is, option 2?

Question 3.7: Do you agree with, or have any comments on, our proposals to make a separate adjustment for tax?

Question 3.8: Do you agree with, or have any comments on, our proposal to continue to refer to the post-2020 asset base as RCV?

Summary of potential impacts of different options

Question 3.9: Do you have any comments on our option assessment in the annex?

A1 – Summary of potential impacts of different options

In this annex we assess the potential impacts of different packages of options we could take to funding bioresources at PR24. Although we assess the potential impact of our proposals in the rest of this appendix, we think it is helpful to bring the individual proposals into packages and provide a summary assessment of these packages.

A1.1 Rationale and objectives for the policy

Bioresources can stimulate a circular economy as they can be used to create renewable energy and the spreading of sludge to land sequesters carbon and acts as a fertiliser used for farming. Bioresources can therefore play a role in helping to meet the UK government's 2050 net zero target. Increasingly sludge is being treated by anaerobic digestion. This is more capital intensive than some other treatment technologies, but it can be more efficient at a sufficiently large scale.

Traditionally, sewerage companies have undertaken bioresources activities themselves as part of a vertically integrated business. However, this is not always the most efficient way of providing these services.

Across England and Wales there are around 300 sludge treatment centres which produce one million tonnes of treated sludge per year.³¹ The [annual cost to customers](#) for a typical household customer from bioresources ranges **from £13 to over £32**, depending on which sewerage company provides this service.

A market-based approach can improve the productive, allocative and dynamic efficiency of sewerage companies. With the right conditions, promoting the role of markets in relation to bioresources activities will help the sector to meet its potential to create economic and environmental value. Customer interests are likely to be best protected by promoting the role of markets in relation to bioresources activities.

The scale of potential benefits in the bioresources market can be demonstrated through the estimated benefits of the proposals we made at PR19. In our [2017 impact assessment](#) we estimated that the potential benefit of these changes would be between £400m and £1,400m.³² These estimates related just to the benefits in terms of operating costs and so did not include the benefits from more efficient capital expenditure.

To help unlock these benefits, we have taken several steps to support the functioning of the bioresources market over recent years. At the 2019 price review we changed the way we

³¹ Source: [Bioresources market dashboard](#).

³² 2015–16 prices, net present value over 30 years.

regulate. We introduced a separate binding price control for bioresources activities to create greater transparency. This aims to help drive more commercial arrangements for how different activities interact with each other. Sewerage companies now receive revenue from customers to safely treat the bioresources they produce and are better incentivised to look for the most efficient option for dealing with bioresources.

However, our [bioresources market review](#) found there are several barriers to prevent the bioresources market from reaching its full potential and achieving the benefits we envisaged at PR19.

Although we have recently addressed some of the remaining barriers, we still need to address the way we regulate companies at price reviews. Our price control framework for bioresources (for example, the structures of the control and how the control remunerates companies for their costs) affects the extent to which markets in relation to bioresources activities are promoted and how well those markets protect customers.

Addressing these remaining barriers would help to achieve our overall objectives which is to achieve economic and environmental benefits through:

- further promoting the bioresources market, consistent with our statutory duties and the [UK government SPS](#);
- promoting our four ambitions for PR24 – in particular, 'Driving improvements through efficiency and innovation' and 'Delivering greater environmental and social value'; and
- helping to implement the pillar of our bioresources strategy (see Figure A1.1.1), in particular the 'stronger incentives' pillar.

Figure A1.1.1: The pillars of our bioresources strategy



A1.2 Approach to achieving these objectives

Our approach to achieving these objectives is to set companies bioresources' funding in a more market-based way. This means both how we assess costs and the form of control for bioresources. The principles of our proposed approach is to:

- bring 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 price;
- provide similar level of regulatory protection for different categories of cost, so reducing any 'in-house bias';
- broaden 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
- set companies' allowed revenue in the form of an average revenue control – this is more akin to a gate price.

We also consider that a separate efficiency challenge for bioresources activities would allow companies to achieve further efficiencies in these activities.

A1.3 Policy Options

We have considered the following policy options. In all options we would retain a revenue reconciliation, forecasting incentive and a separate adjustment for tax.

Options package 1: Business as usual approach. This would maintain the same approach as PR19, that is:

- a building blocks approach based on the recovery of allowed revenue through PAYG, a return on capital and RCV run-off;
- a common efficiency challenge for bioresources and wholesale wastewater network-plus;
- a separate assessment of base (that is, opex and capital maintenance capex) costs and enhancement costs;
- any bespoke cost assessment would consider whether there had been appropriate engagement with the market;
- no cost sharing for bioresources other than business rates; and
- a modified average revenue control.

Options package 2: Partially reformed approach. Under this approach, we would have:

- a building blocks approach as option package 1;
- a separate efficiency challenge for bioresources (and wastewater network plus);
- an assessment of base costs and growth enhancement capex within a single econometric benchmarking model;
- a separate allowance for annualised costs over one regulatory period for new quality enhancement;
- any bespoke cost assessment would consider whether there had been appropriate engagement with the market;
- no cost sharing for bioresources including business rates; and
- an average revenue control.

Options package 3: Fully reformed approach. Under this approach, we would:

- have the same features as option 2 in terms of the efficiency challenge, cost sharing, new quality enhancements and average revenue control;
- include opex, depreciation and financing costs in our econometric benchmark modelling;
- consider using forecast costs in our econometric benchmark modelling;
- exclude legacy investment from the catch-up efficiency challenge; and
- move away from the PR19 building blocks approach.

A1.3.1 Assessment

Table 1 provides our summary assessment of the different options packages.

Our assessment is that option package 3 best achieves our objectives. Although there are some downsides to this approach in terms of practicality, on balance we consider that this is in the best interest of customers.

We recognise that option package 3 has potentially more implementation challenges and we need to ensure that this could be addressed appropriately. To help test this, clarify how our proposals could work in practice and provide some example model results, we will publish a supplementary document in September 2022.

Table A1.3.1: Assessment of options

	Achieving our objectives	Practicality
Options package 1: Business as usual approach	<ul style="list-style-type: none"> • Fails to address the issues we identified. • Although there are no costs relative to PR19, we would not achieve our objectives. 	<ul style="list-style-type: none"> • No implementation costs or issues relative to PR19.
Options package 2: Partially reformed approach	<ul style="list-style-type: none"> • Partially achieves our overall objectives, consistent with our principles and addresses the issues we identified. • There would also be no impact on the cost of capital. • Volume risk would increase. • However, it would not fully achieve our objectives. 	<ul style="list-style-type: none"> • Backcasting of companies' costs to facilitate a separate efficiency challenge creates some administrative burden and data issues, but we have already taken steps to deal with this. • As more enhancement costs would be assessed within our benchmarking models this would reduce any complexity on assessing these costs separately. • Assessing remaining enhancement costs may be somewhat more complex as the asset life would need to be considered.
Options package 3: Fully reformed approach Preferred option	<ul style="list-style-type: none"> • Fully achieves our overall objectives, is consistent with our principles and addresses the issues we identified. • There would be an administrative cost on us and companies to implement this new approach. • Insufficient evidence of higher risk compared to our PR19 approach. We assess any higher risk would in any case be captured in our appointee-level estimate of equity beta, which would feed through to the PR24 allowed return on capital applied to all non-retail controls. 	<ul style="list-style-type: none"> • This has the same impacts as option 2 in terms of backcasting data and impact on enhancements. • Implementing our proposed approach to providing a different level of regulatory protection for pre-2020 RCV adds complexity. • A key change would be using depreciation data instead of capex data. Depreciation data has the benefit of being generally smooth. But there are several complex implementation issues to consider. • We need to understand and test the impact of this approach.

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