

May 2021

Review of the bioresources market – consultation

About this document

Following our 2019 price review (PR19) and our first '[Bioresources Market Monitoring Report](#)' we launched our review of the bioresources¹ market on 19 October 2020. The review is a more comprehensive look at the market and considers issues such as:

- the scope for bioresources competition under the current market model;
- the current barriers to competition and the development of the market;
- different forms of competition and market models; and
- the steps needed to achieve these market models and overcome any barriers.

This consultation sets out our draft findings from that review. We are publishing this document alongside:

- [PR24 and beyond: Creating tomorrow, together](#) as some of our proposals would be delivered as part of our 2024 price review (PR24); and
- [Jacobs' bioresources market review report](#) - we engaged Jacobs to provide support for our work on the review. Jacobs' report assesses the market opportunities, potential constraints and how these could be addressed. The report is referred to throughout this document.

Our proposed approach, set out in this document, is based on a strategy of:

- strengthening the incentives on companies to engage with the market;
- further development of market enablers;
- promoting greater collaboration;
- encouraging company ownership to develop the market; and
- on-going monitoring and review of market development.

¹ At PR19 Ofwat designated 'Bioresources Activities' under sub-paragraph 9.9 of Condition B as the activities carried out as part of the Appointed Business that fall within the definitions of the following services in [RAG 4.08 – Guideline for the table definitions in the annual performance report \(March 2019\)](#): sludge transport; sludge treatment; and sludge disposal.

Executive summary

Bioresources (or sewage sludge) are the semi-solid by-products of wastewater treatment. With the right conditions, a market for bioresources will help the sector to meet its potential to create economic and environmental value by enabling and incentivising:

- technological changes making treatment more cost effective and enabling greater generation of renewable energy;
- economies of scale;
- inter-company optimisation – such as through trading or development of joint capacity; and
- co-digestion of sludge with other organic waste.

Achieving this potential will play an important part in meeting the UK and Welsh governments' ambition of net zero emissions by 2050.

Since 2018, we have required companies to produce information related to i) [market information](#), and ii) [market monitoring](#) and at PR19 we introduced a separate price control for bioresources in the form of an indexed 'modified-average revenue' control².

After identifying potential issues with the operation of the bioresources market, we launched our 'Review of the bioresources market' on 19 October 2020. In summary, although there seems to be a reasonable degree of competition for sludge transport and disposal, we have found that there are a number of barriers preventing the market from reaching its potential. Some of these barriers are caused by the way we regulate.

We propose to:

- **Establish bidding market arrangements.** At PR19, companies produced Bid Assessment Frameworks for activities related to water to ensure clear, objective and non-discriminatory consideration of third party bids when tendering for significant work. We consider there is merit in companies producing a similar framework which is tailored to the bioresources market.
- **Undertake better targeted cost assessment.** An efficiency challenge tailored to the bioresources control will help to drive efficiency. To achieve this, we need to ensure that companies have allocated their costs appropriately. We have already issued guidance to companies to improve cost allocation in relation to [sludge liquors](#) and will separately consult on changes to the allocation of overheads. We will also shortly consult on methods to improve the allocation of energy costs and revenues in bioresources.

² A proportion of bioresources allowed revenues are fixed and a proportion varies with actual sludge production.

- **Consider changing the basis of our cost challenge so that it is based on average revenue requirement rather than expenditure.** An average revenue control would come closer to a ‘gate price’³ type of approach which is how waste is frequently charged for in the wider waste sector. In addition, an econometric-based approach to benchmarking companies’ average revenue requirements would introduce comparative competition on a wider set of costs than just base costs. This approach would also address any in-house bias (i.e. a preference of companies to develop their own in-house solutions that might attract RCV, rather other more innovative approaches), because in-house investment and long-term contracts would be included within the same assessment.

Under this approach, there could be a risk of stranding assets. We would consider how best to reduce the risk of asset stranding if it would be in customers’ interests. This could be through, for example, setting an appropriate level of cost challenge, using glidepaths and/or regulatory protection where companies have appropriate innovative, pro-market plans. In any case, our approach would take account of the different degree of regulatory protection that we committed to in PR19 for [pre-2020 RCV](#) and [investment after that date](#).

- **Encourage greater sector collaboration.** We expect water companies to work together to address common issues where appropriate. This could be, for example, by providing additional information to support the market, introducing standardised measures of sludge quality and considering regional collaboration.
- **Improve information remedies.** We recently 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.
- **Ensure more joined-up, pro-market outcomes.** We will look to ensure that company performance commitments related to bioresources at PR24 are more joined-up with our long term plans for the market and do not have unintended consequences for market development.

Our review also identified that there were barriers that are not to do with how we regulate. We will continue to work with environmental regulators and other stakeholders to ensure environmental regulation or other barriers are addressed as appropriate.

³ Also known as a ‘gate fee’. Gate fees are the charges for providing a range of waste treatment, recovery and disposal services. For other organic waste it is commonly expressed on a per tonne basis.

Responding to this consultation

We would welcome any comments on this document. Please email them to:

connor.ryan@ofwat.gov.uk

The closing date for this consultation is **5pm on 22 July 2021**. If you wish to discuss any aspect of this consultation, please contact Alex Whitmarsh by email at

alex.whitmarsh@ofwat.gov.uk

We will publish responses to this consultation on our website at www.ofwat.gov.uk, unless you indicate that you would like your response to remain unpublished. Information provided in response to this consultation, including personal information, may be published or disclosed in accordance with access to information legislation – primarily the Freedom of Information Act 2000 (FoIA), the General Data Protection Regulation 2016, the Data Protection Act 2018, and the Environmental Information Regulations 2004. For further information on how we process personal data please see our [privacy policy](#).

If you would like the information that you provide to be treated as confidential, please be aware that under the FoIA there is a statutory [Code of practice](#) which deals, among other things, with obligations of confidence. In view of this, it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information, we will take full account of your explanation, but we cannot give an assurance that we can maintain confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on Ofwat.

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1. Introduction

Bioresources (or sewage sludge) are the semi-solid by-products of wastewater treatment. The bioresources activities of appointed sewerage companies⁴ are split into three distinct activities:

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

Bioresources activities comprise around £3bn⁵ (6%) of companies' allowed revenue for the 2020–25 period. The annual [cost to customers](#) can vary significantly between companies' areas – ranging from as low as around £13 to over £32 for a typical household customer.⁶ Further background regarding bioresources activities are in appendix 1.

With the right conditions, bioresources activities could help to create greater economic and environmental value through:

- **technological changes**, notably shifts from traditional treatment methods (for example, incineration) to newer methods (that is, advanced anaerobic digestion) that are more cost effective and generate valuable renewable energy such as biomethane that can be injected into the gas national transmission system (NTS);
- **economies of scale**, as larger STCs provide the possibility for reducing unit costs and also provide the scale needed to make the more advanced treatment processes viable;
- **inter-company optimisation**, enabling i) companies to share or develop joint treatment capacity, increasing capacity utilisation and exploiting economies of scale, and ii) enabling sludge to be moved shorter distances if a neighbouring sewerage company's STC is closer, so reducing carbon emissions from transport; and
- **co-digestion of sludge with other organic waste** (e.g. food waste from kerbside collection), which exposes companies' bioresources activities to a wider range of competitors and enables better use of anaerobic digestion capacity, therefore driving efficiency and improving energy yield as mixing materials can improve biogas yield.

To help support these changes, we have taken a number of steps to support the functioning of the bioresources market over recent years. Notably:

⁴ In this document an appointed sewerage company is a company appointed and regulated by Ofwat to carry out sewerage functions. We refer to such companies as 'companies' or 'sewerage companies'.

⁵ This estimate is based on our final determinations in December 2019.

⁶ 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](#).

- i. Introducing information remedies.** Following the coming into effect of new powers⁷, we published bioresources market information requirements in 2017. Companies reported against these requirements for the first time in 2018. Companies were also required to provide information on their websites to support the bioresources market. To make this data more accessible, we [publish](#) links to companies' market information and a [dashboard](#) based on this information.
- ii. Updating our transfer pricing guidance:** In 2017 we updated our [transfer pricing guidance](#) for transfer prices between appointed and non-appointed businesses. Companies must comply with these guidelines when setting up trading agreements, making sure profits are shared appropriately between appointed and non-appointed businesses.
- iii. Introducing a separate price control for bioresources:** We introduced a separate price control for bioresources as part of PR19. This enables targeted regulation of companies' bioresources activities, promoting the market by revealing improved information and ensuring management focus on these activities.

Our [impact assessment](#) found that the expected benefits from the changes at PR19 were £370m to £1,390m of efficiency improvements, compared to costs ranging from £30m to £60m.⁸ Non-monetised benefits included reductions in greenhouse gas emissions from greater renewables generation and greater resilience from better integration with the wider waste sector.

Whilst the reforms described above were a crucial step in supporting the sector to meet its full potential, we consider that further action is required to maximise the benefits of these. Our reasoning for this is set out in the rest of this document, which is structured as follows:

- section 2 sets out the background in terms of our recent monitoring of the bioresources market;
- section 3 sets out how we initiated our review of the bioresources market last year and our approach to assessing whether further action is required and, if so, our approach to assessing further interventions;
- section 4 sets out our assessment of potential problems we have identified, the potential options to address these, our preferred option and how this could be implemented; and
- section 5 sets out our next steps.

⁷ Condition M1 came into effect on 15 April 2017 which enabled us to require this information.

⁸ 2015-16 prices, NPV over 30 years.

2. Background

Since introducing the initial measures to promote the bioresources market (described in section 1) we identified a number of areas of concern, notably: slow market development, concerns raised by companies about potential blockers and limited action that some companies had been taking to develop the bioresources market. Our work in recent years related to this is summarised below.

- i. **Initial Assessment of business plans.** We assessed companies' overall approach to the bioresources market as part of the PR19 [Initial Assessment of Plans](#) (IAP), which we published in January 2019. This covered a range of areas including the extent to which companies make appropriate use of appointed assets for non-appointed business and the extent to which they make use of third party suppliers in bioresources activities.

The majority of companies did not provide high quality business plans in this area. A key theme from [the assessment](#) was that, while companies showed they were considering making use of third party services and trading greater volumes, there was a lack of detail on actual market engagement to achieve this. Companies also provided insufficient evidence that they had considered the risks of using market options or how profits from the use of appointed assets for non-appointed business would be shared with customers. With the exception of one sewerage company, plans fell short of the required quality, ambition and innovation in bioresources.

- ii. **RISE.** In August 2020 we published the results of our [review of incumbent company support for effective markets \(RISE\)](#). In our review, we found some signs of activity in bioresources markets. We identified a number of good examples of how some companies were supporting bioresources markets. However, overall, we found that the support for markets was relatively limited in scope and scale and companies could do more to embrace these opportunities and to identify and develop new ones.

- iii. **Market monitoring report.** In October 2020 we published our first bioresources market [monitoring report](#) using the new information companies were required to submit to us each year (see section 1 for more details regarding our information remedies).

The findings of the report were mixed. Whilst we found evidence that companies were making use of market options to a reasonable degree in sludge transport and disposal, there were low levels of competition in sludge treatment. Only 0.8% of sludge was treated by other sewerage companies or third parties in 2019-20, falling from 2% in 2017-18. Companies referred to a number of barriers preventing further sludge trading, with environmental regulation and uncertainty over how to price trades being the most common.

3. Our approach and strategy

Following PR19 and our recent market monitoring report, we launched our [review of the bioresources market](#) on 19 October 2020. Our review is intended to inform how we regulate in future, including our approach at PR24. Specifically, it enables us to get a better understanding of the barriers to market development and to review how we regulate. We have done this through:

- considering previous reviews of the bioresources market (see appendix 2);
- reviewing how we regulate, including drawing on [lessons learned from PR19](#);
- engaging with the sector – this included a number of [stakeholder events and a data request](#) and reviewing submissions submitted to Ofwat;⁹
- drawing on the [consultancy work of Jacobs](#) that assessed the potential scope for market development, constraints to market development and made a number of recommendations;¹⁰ and
- reviewing the findings of the [CMA’s redetermination](#) of our PR19 final determinations.

After considering this evidence, we find that:

- the bioresources market can help to deliver major benefits to customers and the environment and that this is recognised by a wide range of stakeholders – see appendix 3 for further discussion on this;
- however, there are a number of barriers to prevent the bioresources market from reaching its full potential and achieve the benefits we envisaged at PR19 –these barriers are varied and include our economic regulation, environmental regulation, economic or technical barriers and cultural barriers;
- companies, other public bodies and ourselves can take further action that could bring additional benefits; and
- a collaborative approach will be needed to address many of the barriers.

Figure 1 Key issues identified in our review



⁹ Notably, i) United Utilities report, “[A review of options for market participation in bioresources](#)” which was submitted to our ‘[Future Ideas Lab](#)’, and ii) [Anglian Water’s letter](#).

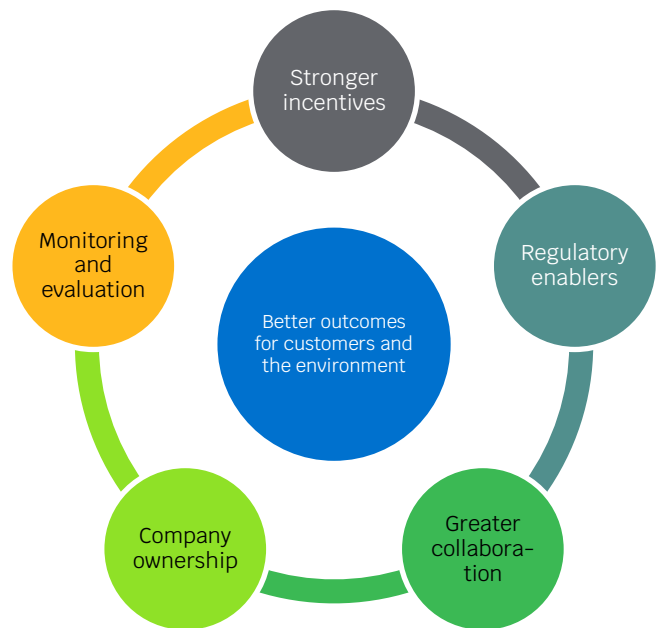
¹⁰ We cross reference these in section 4, ‘Our Assessment’.

Figure 1 shows key issues regarding the way we regulate. We discuss these issues and how we propose to address them below in section 4. Section 4 also discusses other issues raised during our review that we may consider further in due course.

Figure 2 sets out the pillars of our strategy to address our findings, which are:

- **Stronger incentives:** We will ensure companies are better incentivised to unlock the benefits of the bioresources market, e.g. through how we assess companies' costs.
- **Regulatory enablers:** We will use our powers, such as setting price controls or determining information remedies, to support the bioresources market where appropriate.
- **Greater collaboration:** We will work more closely with the sector, including other regulators and the wider waste sector, to address the issues raised. We also expect sewerage companies to work collaboratively where appropriate.
- **Company ownership:** We expect companies to play their role in addressing blockers either individually or collectively, making use of opportunities such as the innovation fund where appropriate.
- **Monitoring and evaluation:** We will keep the development of the market and the effectiveness of our policies under review. We will consider further action where appropriate.

Figure 2 The pillars of our bioresources strategy



Our proposed approach, described in more detail in the section below, would help to deliver our [strategy](#) and be in accordance with [UK](#) and [Welsh](#) Governments' strategic priorities and objectives for us. We discuss these documents in more detail in Appendix 4.

4. Our assessment

As discussed in section 3, we have identified some key issues that need to be addressed. This section discusses these issues, assesses potential options and sets out our proposals.

Issue 1: Market models

Background

Although we introduced a separate price control (that is, accounting separation) for bioresources at PR19, we do not require functional or legal separation. The current market structure is based on vertically integrated companies which have the option to trade treatment capacity or outsource some or all their capacity - this compares to water, where at PR19 we took steps to introduce a [bidding market](#) and [bilateral market](#) to yield opportunities for innovation and efficiency.

The Utilities Contract Regulations 2016 apply to procurement of goods and services by utilities, subject to various exemptions, including a value threshold. This provides some standards as to how companies should go about their procurement including for bioresources activities.

At PR19 we also introduced Direct Procurement for Customers (DPC) – an approach where discrete, large scale enhancement projects (i.e. above £100m wholelife totex) are delivered by a competitively appointed provider. DPC would not generally apply to bioresources activities due to their nature and scale.

In 2009 the [Cave Review](#) recommended changes to the market model and promoting more effective procurement through reform of the licensing regime and an economic purchasing obligation. (See Appendix 1 for more details.)

Issues

We have identified a number of issues as follows.

- One of the themes from our [initial assessment of companies' business plans at PR19](#) regarding bioresources was that, in most cases, the level of detail on approaches to third-party engagement was limited.
- At PR19 we introduced a bidding market for water resources to address concerns that potential third parties are deterred due to a lack of information, high search/bidding

costs and incumbents' bias towards their own in-house solutions – based on the evidence we have considered, we consider that the same issues are likely to apply to bioresources;

- At PR19 Anglian Water asked for funding to deliver additional digestion capacity based on an assessment of its own cost to install capacity. Anglian Water challenged our decision not to include funding for this request as part of the CMA's redetermination of its price controls. As we set out as part of the redetermination process, [we had a number of concerns](#) related to the bioresources market, i.e. that a market based solution could be appropriate, subsequent market engagement could lead to a windfall gain for shareholders and we had a lack of awareness around the earlier tendering attempts. The [CMA included funding in the redetermination of Anglian Water's price controls](#) as they were not convinced that relying on the emergence of significant bioresources suppliers was an appropriate basis for their determination. We acknowledge that the CMA could not see evidence of sufficient third part suppliers. We consider that adopting a transparent approach to market engagement and option assessment could help to avoid disagreements in future and that this will become increasingly important as the bioresources market develops.
- [Jacobs' bioresources market review report](#) considers that companies' procurement approach is a constraint as they typically take a streamlined approach to procurement which has the effect of restricting access to opportunities.¹¹ Jacobs recommend companies undertake open procurement for new capacity.¹²
- Jacobs' report considers that uncertainty around our regulation of long term contracts¹³ and an 'in-house' bias created by companies' current organisation¹⁴ could hinder the market. Jacobs' report recommends the creation of a framework to assess third party capacity efficiency¹⁵ and the creation of a bid assessment framework.¹⁶ Jacobs also set out a number of further market models as potential options, but did not assess these as this was outside of the scope of this work.
- [United Utilities' paper](#) finds that alternative market models (such as bidding, DPC and bilateral entry) could bring benefits and that in the longer term it would be beneficial to consider these.
- Jacobs' report considers the potential risk of supplier failure could suppress market activity.¹⁷ They recommend that resilience is taken into account, including diversification and emergency options, when assessing third party trades.¹⁸

¹¹ Market constraint L.

¹² Recommendation 17.

¹³ Market constraint E.

¹⁴ Market constraint H.

¹⁵ Recommendation 9.

¹⁶ Recommendation 11.

¹⁷ Market constraint I.

¹⁸ Recommendation 13.

Options

We have considered the following options to address these issues with the current market model. We note that options 3, 4 and 5 could only be implemented with legislative change.

- **Option 1: current market model**
- **Option 2: bidding market.** This would require companies to produce a bid assessment framework and demonstrate they had adhered to this.
- **Option 3: mandatory further separation.** The bioresources activity would be functionally or legally separated from the rest of the business.
- **Option 4: bilateral market.** A third party could contract with a retailer in the business market to offer sludge treatment and disposal services using a sewerage licence with a [wholesale and/or disposal authorisation](#) if the relevant provisions of the Water Act 2014 were brought into force. The incumbent could be required to produce network access prices and be obliged to accept qualifying trades.
- **Option 5: mandatory outsourcing of bioresources activities.** This would involve companies ‘exiting’ the bioresources market. This would require a separate bioresources licence to facilitate a third party to undertake all or part of a sewerage company's bioresources responsibility.

Our assessment

Our preferred option is option 2, a bidding market, since it would address the issues we have identified. It would complement the existing market structure and help to ensure that companies procure bioresources services in a way that is transparent and promotes the market. It is consistent with our strategy to strengthen the incentives on companies to engage with the market. Further details of how this could work in practice to address the issues we have identified is discussed in the following section.

Option 1, the current market model, has no additional administrative or implementation costs. However, it does not address the issues raised above. It is therefore not our preferred option.

Option 3, mandatory further separation, could lead to greater autonomy for the bioresources part of the business. It could also mean that more decisions, such as dispatch and service procurement decisions, would be made by network-plus¹⁹. From the network-plus business perspective, this would make the company’s bioresources business more akin to a third party, drive a more commercial relationship and greater management focus on bioresources.

¹⁹ ‘Network plus’ refers to all the activities carried out by the Appointee in performance of its functions as a sewerage undertaker that are not designated as Bioresources Activities or Retail Activities.

However, further separation could reduce the economies of scope between wastewater network-plus and bioresources activities. Although separation has been used in other sectors to promote competition, such as in energy and telecoms, the market and regulatory context is different in these sectors.²⁰ Furthermore, legal separation would require legislative change. Therefore, whilst we encourage companies to consider the appropriate level of separation to promote the bioresources market, mandating further separation is not our preferred option.

Option 4, bilateral markets, if they operate effectively, could help to directly address any bias towards providing treatment in-house and promote markets. However, we note that the interest in the bilateral market for water resources was fairly limited and therefore we do not anticipate it will come into effect during the next price control²¹. Introducing a bilateral market for bioresources would be complex and time consuming to establish. The benefits of a bilateral market for bioresources may not outweigh the cost of introducing it, given that the interest from market participants is unclear. Therefore it is not our preferred option.

Option 5, mandatory outsourcing of bioresources activities, such as through an auctioning process, could introduce ‘competition for the market’ which would provide a market-based cost for providing bioresources activities and facilitate a change in market structure. However, similar to option 3, there may be economies of scope that could be lost through this approach. Furthermore, it is unclear there is sufficient interest from third parties to indicate that mandating such an approach would be successful. Finally, such a change would require legislative change. Therefore it is not our preferred option. We consider that the decision whether to outsource bioresources activities is one for sewerage companies.

Implementation

While our strengthened information remedies (see issue 5, below) will help to ensure that there is appropriate bioresources market information, this alone will not address the key issues identified above.

To support the [water bidding market](#) we required companies to produce relevant market information and a company [bid assessment framework](#). This sets out the approach that a company would follow in assessing bids to provide solutions to their future water needs (such as water trades to provide more water or water efficiency schemes to reduce the use of water).

A ‘bioresources bid assessment framework’ would help to improve information around this process, reduce search and bidding costs and help to address any in-house bias.

²⁰ Greater separation can reduce the ability of a company to discriminate in favour of a related undertaking. Such discrimination can be a particular issue where the related business can abuse its market power. However, for bioresources we intend to retain price controls in order to prevent an abuse of market power.

²¹ This is discussed in [PR24 and beyond: Creating tomorrow, together](#).

Demonstrating compliance with this would also provide assurance that market options had been considered appropriately.

A ‘bioresources bid assessment framework’ could share many features of companies’ bid assessment frameworks for water. For example, being based on the principles of transparency, equal treatment/non-discrimination and proportionality. However, it would be appropriate to consider how this approach could be adapted to bioresources. For example, by considering:

- whether companies should each design and publish their own approach (as for water bidding market) or whether a common approach can be agreed by the sector before being adopted by all sewerage companies;
- whether there are specific issues relevant to the bioresources market that merit a bespoke approach;
- learning from companies’ recent experience and best practice regarding tendering;
- recognising that in the current market, some companies will be sellers and others will be buyers, gauging what approach would work for these different groups;
- whether, and if so how, the relative resilience of third party suppliers should be taken into account;²² and
- whether this should focus only on treatment capacity or include other bioresources activities too.

We would expect companies to have implemented these measures in advance of PR24 so that they can demonstrate compliance in their business plans.

We could consider using our initial assessment of business plans or other regulatory tools to incentivise effective implementation of this framework if necessary.

Issue 2: Improving cost allocation between controls

Background

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

²² Recommendation 13.

Issues

We have identified a number of issues as follows:

- At PR19 we intended to set a specific efficiency challenge for bioresources costs. However, data issues (that is, concerns about cost allocation between controls, in particular power costs) meant we were unable to do so. Instead we set a common efficiency challenge across both wastewater network-plus and bioresources. A specific efficiency challenge for bioresources would be more transparent and more likely to achieve a stretching, targeted efficiency challenge for these activities.
- Due to differences in the cost sharing rates between the bioresources and wastewater network plus controls, companies may have an incentive to allocate cost to the control where any expenditure above our efficient allowances is shared.
- There is significant variation in the way that companies account for the costs of treating sludge liquors. The treatment of sludge liquors is undertaken by wastewater network plus assets and then recharged to the bioresources control, meaning that variation in approaches across the industry could affect the apparent efficiency of both controls.
- There is also significant variation in the way that companies account for the revenue produced from renewable energy generation in bioresources, making it difficult to accurately compare cost efficiency across companies. These revenues are expected to be equivalent to approximately 12% of companies' total allowed revenue in bioresources in 2020–25²³, indicating that accounting variation could cause significant differences in how efficient a company appears to be when the income is netted off costs.
- As part of our review of the bioresources market, stakeholders suggested that there could be potential benefits to setting a more consistent approach to allocating overheads in bioresources.²⁴
- [Jacobs' bioresources market review report](#) considered that differences in accounting for overheads and shared assets such as those used for odour control was a market constraint.²⁵ Jacobs recommend considering more prescriptive accounting rules²⁶ and providing specific guidance on shared assets and services²⁷ (covering overheads, energy and shared assets amongst others) would help address this constraint.

Our assessment

We identified many of these issues early on within the market review process and so have already undertaken work to address them. The need to resolve these issues early is

²³ Based on data submitted to Ofwat in company business plans for 2020–25.

²⁴ Stakeholders raised this point at a stakeholder event concerning bioresources market development, hosted by Jacobs on 15 January 2021.

²⁵ Market constraint K.

²⁶ Recommendation 15.

²⁷ Recommendation 16.

heightened as in order for our cost assessment method to be robust at PR24 we require data over a number of years prior to the assessment. Therefore, our steps are as follows:

- **We have implemented a standard methodology for calculating sludge liquor treatment costs.** We commissioned Jacobs to explore how companies currently quantify sludge liquor treatment costs. The [subsequent report](#) confirmed significant variation in companies' approaches and so we [decided to implement a standard methodology](#), with companies shadow reporting their costs using the methodology in 2020-25.
- **We propose to provide further guidance on energy generation revenues and overheads.** During the course of our market review, we engaged Jacobs to assess companies' approach to allocation in these areas. Jacobs confirmed there was material variation in sewerage companies' approaches. In response to this, we will shortly consult on new guidance covering the approach companies should take to allocating energy generation revenues and overheads in bioresources. We expect to include this new guidance within our 2021-22 Regulatory Accounting guidelines. We will also consult on the issue of odour control cost allocation.

This approach is consistent with our strategy to further develop market enablers.

Issue 3: Approach to assessing costs

Background

We used a 'building blocks approach' to setting companies' allowed revenue for bioresources. At PR19 we challenged companies' proposed total expenditure in two ways:

- we challenged proposed enhancement expenditure on a case-by-case basis; and
- used an econometric approach to benchmark companies' base total expenditure.

Companies' efficient PR19 total expenditure was allowed to be recovered within the five year period (through 'Pay as You Go') or added to a post-2020 RCV alongside the separate pre-2020 RCV so that expenditure is recovered relatively slowly (through RCV run-off and allowed return on capital). At PR19 we explained that we would provide a different degree of regulatory protection for [pre-2020 RCV](#) and [investment after that date](#).

We set a 'modified average revenue control' at PR19 using tonnes of dry solids sludge production as the units to express the revenue in. In practice, this means that should companies' actual sludge production be higher or lower than forecast there is a corresponding adjustment to their allowed revenue. This adjustment (the 'variable revenue')

reflects companies' variable costs. Linked to this, we introduced a forecasting incentive to encourage accurate sludge production forecasts.

[In our PR19 methodology](#) 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.

Issues

We have identified a number of issues as follows:

- At PR19 companies' costs and revenues were determined through a regulatory process which is likely to be less customer-oriented and efficient than a market based one. A further consequence is that it could distort competition between sewerage companies and the wider waste sector.
- At PR19 we assessed enhancement and base costs through two different processes. Firstly, if companies do not allocate their costs consistently across these two processes then this could distort our cost benchmarking. Secondly, if one process is viewed as lower risk than the other, then this would create an incentive for companies to choose solutions with costs that fall more into the lower risk process, rather than choosing the solution that is best for customers.
- The approach at PR19 required enhancements costs to be scrutinised on a case-by-case basis, which can add some administrative complexity compared to capturing all costs in a single process.
- The 'building-blocks' approach could create an 'in-house bias' for new investment.
 - i. Undertaking investment in-house triggers a relatively large increase in RCV as the asset is being constructed – this reflects the profile of the company's expenditure. This RCV a) should generate a profile of allowed revenue that is well aligned with the cost of financing the company's expenditure; and b) might be viewed by companies as being relatively low risk as there is no clear risk to the RCV.
 - ii. In contrast, a long-term contract is likely to be classed as a base costs – this could be viewed by companies as being relatively high risk as they could assume it would be subject to challenge at future price controls.

Likewise, [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.²⁸ Jacobs recommend aligning the revenue risk between in-house and external capacity.²⁹

²⁸ Market constraint E.

²⁹ Recommendation 10.

Options

We have considered the following options:

- **Option 1: Building blocks approach.** This would retain the same broad approach to determining companies' allowed revenue as at PR19, that is, i) a separate assessment of enhancement and base costs and, ii) allowed revenue principally determined by PAYG, RCV run-off and an allowed return of capital.
- **Option 2: Benchmarking of average revenue with pre-2020 RCV protection.** This would consider all companies' costs (i.e. depreciation, opex, capital maintenance, enhancement costs, and possibly other costs such as the cost of capital) per unit of dried sludge produced.

Under either option, we could use supplementary approaches to inform our assessment of allowed revenue. For example, modelling of the bioresources market³⁰ or comparison with gate prices in the wider waste sector.

Our assessment

Our preferred option is option 2, 'Benchmarking of average revenue with pre-2020 RCV protection'. We consider that, if implementation issues could be addressed (see the following section), then this option could:

- address all the issues above in whole or in part by ensuring all costs are assessed in one process;
- comes closer to a 'gate price' type of approach which is how waste is frequently charged for in the wider waste sector³¹ and be consistent with our [signalling at PR19](#) that we could move towards a 'gate fee' type approach;
- introduce comparative competition on a wider set of costs, such as enhancement costs, and so reduce the need to set these directly ourselves; and
- reduce any in-house bias – thus supporting the greater use of markets to the benefit of customers.

This option would be consistent with our strategy to strengthen the incentives on companies to engage with the market.

Option 1, 'Building blocks approach', is well understood and helps to ensure the risk of stranded assets is low. However, it does not address the issues raised above. Therefore, if the

³⁰ For example, we could use the expected costs of an alternative party treating and disposing of the sludge, e.g. through a trade.

³¹ Some differences would remain. For example, in the wider waste sector the waste price is based on wet tonnes for waste rather than dry tonnes for sludge.

implementation issues of option 2 can be addressed, option 1 would not be our preferred option.

Implementation

Our preferred option raises a number of design and implementation issues that would need to be addressed to ensure it is workable and delivers benefits for customers.

Depreciation. Under option 2, depreciation costs would be included in our benchmarking exercise alongside other costs. We use RCV run-off to reflect depreciation costs. As these costs would be compared between companies, it raises the question of whether (and if so, how) steps should be taken to ensure this is set in an appropriate way. There are a number of different considerations in how this might be achieved, e.g. whether additional guidance is required and what our role might be in challenging these figures.

Allowed return on capital: We would need to consider whether companies' cost of capital would be included within the proposed benchmarking process, or whether the allowed return on capital is determined separately, as happened at PR19. The latter approach would lead to the same allowed return on capital across all sewerage companies given the risks should be the same.

Protection of pre-2020 RCV. We would honour our commitment to protect companies' pre-2020 RCV. We could do this by generating a 'floor' to companies' allowed revenue either in total or on a per unit basis.

Risk of asset stranding. Although we would allow the efficient costs of pre-2020 RCV to be recovered, the proposed approach could (depending on how it was implemented) introduce an excessive risk of asset stranding.

In competitive markets, companies' investments are generally exposed to risk – this creates an incentive on companies to make efficient investments. However, we will consider how to reduce the risk of asset stranding if this would be in customers' interests. Options to reduce it could include:

- setting an appropriate level of efficiency challenge to strike an appropriate balance – for example, rather than setting an upper quartile cost challenge (as we did for base costs at PR19) the cost challenge could be based on average costs; and/or
- using glidepaths of an appropriate duration to avoid excessive, abrupt reductions in allowed revenue.

An alternative approach to avoid excessive risk of asset stranding could be to provide regulatory protection where companies demonstrate appropriately innovative, pro-market plans/activities and/or comply with our proposed bidding market arrangements (see issue 1,

above). This approach though would require regulatory intervention which would create some administrative burden.

Issue 4: Planning and Collaboration

Background

Companies typically plan and carry out their bioresources activities from an individual company perspective, mainly within their own areas of appointment. At previous price controls we asked companies to produce sludge strategies, but there is not the same level of planning and collaboration for bioresources activities as there is for water resources. For example, planning and collaboration for water resources occurs through:

- a statutory requirement to produce Water Resources Management Plans (WRMPs);
- a requirement to collaborate with other parties, for example the Environment Agency's (EA) National Framework;
- development over the years of regional groups;³² and
- more recently, Ofwat's Strategic Water Resource Options program.

In terms of how we collaborate, we noted in our [lessons learned from PR19](#) that companies appreciated being involved in the design of the bioresources price control (among other issues) through workshops and working groups.

Issues

We have seen evidence of some collaboration between sewerage companies. We are also note that four sewerage companies entered our Innovation in Water Challenge competition with a proposal to support growth in the bioresources market. Although this was an unsuccessful entry, we encourage these and other companies to continue to explore innovative ways to support the market.

However, [Jacobs' bioresources market review report](#) identifies a number of market constraints which will require a collaborative approach to resolve as follows.

- A lack of synchronisation and joint planning for bioresources.³³ Jacobs also identify uncertainty around the Industrial Emissions Directive (IED) as a deterrent to new market

³² Such as Water Resources South East and Water Resources East.

³³ Market constraint J.

entrants.³⁴ Jacobs recommend expanding market information and incentivising regional planning partnerships.³⁵

- Market participants are deterred from entering into long-term agreements by uncertainty around the use of biosolids on land. To address this, Jacobs' recommendations include: continuing research into the safety of biosolids, delivering the EA's [sludge strategy](#) and removing uncertainty around Farming Rules for Water³⁶.
- Technological uncertainty regarding an alternative treatment technology to anaerobic digestion.³⁷ Jacobs consider that innovation in advanced thermal treatment technologies is required at the sectoral level to address this.³⁸
- The absence of a standard measure of sludge quality which may discourage trading.³⁹ Jacobs recommend developing measures for sludge quality at sectoral level.⁴⁰
- The availability of energy generation incentives may be a barrier to greater market activity.⁴¹ Jacobs recommend reviewing the rules for energy incentives.⁴²

Options

We have considered the following options:

- **Option 1: Encourage greater sector collaboration.** We would encourage and expect companies to work with the sector in a transparent and proactive way, including through regional collaboration where appropriate. We would also continue to work closely with the sector to ensure wider goals are met whilst supporting the development of the bioresources market.
- **Option 2: Bioresources Management Plans.** We would require companies to develop and publish separate bioresources plans akin to WRMPs. They would be required to do this after consulting appropriate stakeholders. These would set out how the companies were creating and exploiting market opportunities, including regional planning of treatment capacity and opportunities for co-digestion.
- **Option 3: Formalise Regional Coordination.** We would establish a formal mechanism to facilitate coordination and collaboration between companies, e.g. to help produce additional market information on an information platform to design standardised contracts and to require companies to work together on regional plans.

³⁴ Constraint B.

³⁵ Recommendations 14 and 5.

³⁶ Recommendations 1, 2 and 3.

³⁷ Market constraint N.

³⁸ Recommendation 4.

³⁹ Market constraint O.

⁴⁰ Recommendation 20.

⁴¹ Market constraints C and D.

⁴² Recommendation 8.

Our assessment

Our preferred option is option 1, ‘Encourage greater sector collaboration’. We want companies to shape how the bioresources market develops. We consider that a collaborative approach can help to address all the issues identified above. We think this is best achieved at this stage through our strategy of strengthening the incentives on companies to engage with the market, further developing market enablers, encouraging company ownership to develop the market, and promoting greater collaboration.⁴³ Our proposals to address the other issues discussed in this document will also help achieve this. We can also use our other regulatory tools to encourage companies to demonstrate they are taking appropriate action to promote the bioresources market in a collaborative way.

Option 2, ‘Bioresources Management Plans’ is not our preferred option. We do not currently have the power to require companies to do this, nor do we think this is needed at this stage. The provision of bioresources services does not share the same long lead times as water resources development, nor the same potentially significant consequences that would transpire without proper planning to manage supply and demand.

We do not propose developing a formal mechanism for regional coordination at this stage (option 3). It is likely there would be significant work needed to understand the myriad implications of formalising greater regional coordination, and we think there are other opportunities for closer working that could be exploited first.

Implementation

Our preferred approach is option 1, ‘encourage greater collaboration’. This comprises a number of distinct activities.

Sewerage companies could work with each other and the rest of the sector to address many of the issues identified in Jacobs’ report. For example, we expect companies to consider Jacobs’ recommendations regarding:

- forming regional partnerships;⁴⁴
- research that could be best undertaken at sectoral level;⁴⁵ and
- the development of sector level measures for sludge quality.⁴⁶

We also expect companies to consider other areas for working collaboratively, such as providing any additional market information in a standardised way and agreeing common processes or standards.

⁴³ Notably our proposals to address issues 1, 2, 3, 5 and 6.

⁴⁴ Recommendation 5.

⁴⁵ Recommendation 4.

⁴⁶ Recommendation 20.

We expect companies to have demonstrated appropriate collaboration when submitting their business plan (including sludge strategies) for PR24. We would also expect companies to commit to ongoing collaboration as part of their sludge strategies and to use them to demonstrate, where appropriate, that they have considered the links with the bioresources market and the issues we have raised in our review, including Jacobs' report. Companies should also take account of changes in environmental legislation and consider how they can incorporate greater long-term collaboration between themselves and the rest of the sector.

If we see that appropriate collaboration is not forthcoming we will consider whether further action is required.

We will continue to work with environmental regulators to improve our collective understanding of how our joint interventions can improve the market for the benefit of customers and the environment. As part of this, we will give the EA and NRW the opportunity to contribute to our future market monitoring reports so that we can ensure we respond appropriately to changes over time. We will also support the EA where appropriate, on initiatives such as the sludge strategy, and NRW on analogous work in Wales.

We consider that market participants should contact the relevant public body if they need clarity about the application application of energy scheme rules. However, since receiving Jacobs' report we sought to understand this issue and so engaged with the department of Business, Energy and Industrial Strategy (BEIS). BEIS have helpfully provided the advice set out in figures 3. We consider that this advice may go some way to addressing the concerns raised in our review. In the time available we were not able to secure advice on other energy subsidy schemes.

Figure 3 BEIS' advice regarding certain scheme rules

Renewable Heat Incentive (RHI): *The use of multiple and mixed feedstocks is permitted under the RHI provided that the scheme's eligibility criteria are met, including the minimum waste threshold, land use and sustainability requirements.*

Green Gas Support Scheme (GGSS): *The GGSS aims to further increase the proportion of green gas in the grid through support for biomethane injection by the process of anaerobic digestion.*

The UK government recently published a [response to the consultation on the GGSS](#), this confirmed that the same approach to feedstocks as the RHI will be taken on the new scheme, but with more stringent Green House Gas emissions requirements for non-wastes. It confirmed that at launch only newly constructed plant will be eligible for support. It is unlikely there will be new support incentives for sewage gas electricity generation.

Ofgem are due to consult on the final details of the scheme later this year ahead of its planned launch in Autumn 2021.

We will support the sector in its initiatives for greater collaboration. Where appropriate, we will continue our open approach of working in a collaborative way, such as through using workshops and working groups, as well as other methods, to facilitate communication between companies and with sector partners.

Issue 5: Information remedies

Background

There are two key ways companies provide information related to their bioresources activities on a regular basis. Firstly, through their Annual Performance Reports (APRs) and, secondly, as required by the information remedies described in section 1. Some companies also produce additional information to facilitate the trading of sludge on a voluntary basis.⁴⁷

Issues

We have identified a number of issues as follows.

Companies' **Annual Performance Reports** cover a significant amount of information regarding bioresources at company level, however until recently there was a number of cost allocation issues present in the data. This is covered in more depth in the Issue 2: Improving cost allocation section.

Companies' published **market information** has been focused on supply-side information, for example where bioresources is produced, its quality or quantity for the prior year. However,

- there is no forward-looking information reflecting companies' supply and demand for treatment capacity – it therefore has failed to reveal the potential opportunities for trade;
- other non-confidential information, such as transport routes, that could help to indicate where trades could be beneficial are not covered; and

⁴⁷ For example, Severn Trent publish a [tracker](#) of their of their sludge trading capacity.

- more generally, there are other areas for potential improvement, such as further standardisation of companies' market information which would enable better matching of data to inform trades.

Feedback from our stakeholder event and consultation provided confirmation of these issues. Furthermore, [Jacobs' bioresources market review report](#) recommends expanding the bioresources market information⁴⁸ to

- help address a lack of market synchronisation and joint planning⁴⁹ by reducing uncertainty about other companies' plans without much additional cost; and
- support improved procurement approaches⁵⁰ by making trading opportunities more visible.

Our **market monitoring data** helps us to understand the how the market is performing and is the key input to our Bioresources market monitoring report. However,

- when reporting on outsourced services, companies do not disaggregate data based on whether the service is performed by another incumbent sewerage company or a third party. This restricts our ability to tailor our regulation to areas of the market that need it most.
- A number of companies publish this information, suggesting that is not commercially sensitive, however others do not. This restricts the ability of third parties interested in entering the market to gain a full picture of market circumstances across England and Wales and to compare across companies.
- The qualitative information we receive from companies on the market, such as barriers to market development and assurance processes, is of varying quality, reducing our ability to effectively monitor the market beyond quantitative analysis.

Our assessment

The issues above were identified early in the course of our review. This enabled us to address these issues in a timely manner as described below. After [consulting](#) with stakeholders, we published [our amended information remedies Direction](#) in May 2021. This will affect the information that companies produce by 31 July 2021. In summary, our changes will:

- **improve market information** by requiring companies to provide a) projections of supply and demand information, b) transport route information, and c) information on renewable energy incentives and to provide all information in a way that is more consistent;

⁴⁸ Recommendation 14.

⁴⁹ Market constraint J.

⁵⁰ Market constraint L.

- **improve market monitoring information** by requiring companies to a) report disaggregated data where services are provided to them by another company, b) publish market monitoring information as part of the APR, and c) report more specific qualitative information.

We think these interventions will go some way to address the issues identified above. This approach is consistent with our strategy to further develop market enablers. We will continue to work in a manner consistent with our bioresources [information strategy](#) and welcome feedback on whether further improvements are possible.

We expect more companies to consider what further information they can produce to support the market and to work together collaboratively where appropriately to achieve this. This is consistent with our strategy to encourage company ownership to develop the market and promote greater collaboration.

Issue 6: Outcomes

Background

Companies are incentivised by the Outcomes framework to achieve outcomes which are important to customers. There were no bioresources performance commitments (PCs) that were common across companies at PR19, however the majority of companies proposed at least one bespoke PC relevant to bioresources. These were typically focused around satisfactory sludge disposal or carbon emissions reduction.

Issues

We have identified the following issues:

- The current framework may give rise to perverse incentives and may not be fully joined up with our objectives for the market. For example, companies that have PCs based around reducing carbon emissions may be incentivised to hoard sludge and forgo efficient trading opportunities.
- There is some variance in bespoke PC definitions between companies that are aimed at achieving the same outcome, which may not necessarily be reflective of local context or any regional differences in customer opinion. This may make it more difficult to compare performance across companies. This is potentially a wider issue for where companies widely adopt similar bespoke PCs.

Options

We have considered the following options:

- **Option 1: Retain the current framework**, i.e. bespoke PCs subject to Ofwat challenge.
- **Option 2: Ensure definitions for bespoke bioresources PCs are appropriate.** We would intervene to ensure definitions for bespoke bioresources PCs are consistent and aligned with our market objectives.
- **Option 3: Ensure definitions for any bespoke bioresources PCs are appropriate and explore potential for common bioresources PCs.** As with option 2, but also exploring if any of the ‘most common’ bespoke bioresources PCs can be made common at PR24.

Our assessment

Our preferred option is option 3. Under option 3 we would take the same steps as in option 2, seeking to ensure that definitions for bespoke PCs are aligned with our objectives for the market and do not create perverse incentives. However, most companies signaled through our PR19 lessons learnt exercise that it would be desirable to reduce the number of bespoke PCs and/or make some of the ‘most common’ bespoke PCs into common PCs at PR24.⁵¹ We will therefore explore the possibility of common PCs related to bioresources at PR24, which are implemented in a way that supports market development. Where a bespoke PC is still required due to unique circumstances or locality of customer views, we will ensure that these also support the market. This approach is consistent with further development of market enablers whilst still encouraging company ownership to develop the market.

Under option 1, there is a risk that the outcomes proposed by companies are not fully joined up with our market objectives, as well as containing unnecessary variation in definitions. Therefore, this is not our preferred option.

Under option 2, we would ensure that definitions for bespoke PCs related to bioresources are consistent and aligned with our market objectives. We would also ensure that definitions for highly similar bioresources outcomes do not have excessive variation, to aid comparability between companies. However, this option does not build on our learnings from PR19 to a great enough extent and so it is not our preferred option.

⁵¹ [Ofwat, 'PR24 and beyond: Our reflections on lessons learnt from PR19,' December 2020](#), Section 6.2.

Issue 7: Trading incentives

Background

Companies are currently incentivised to trade in the bioresources market by the opportunity to reduce their costs, with any savings below the PR19 cost allowance retained by the company. At PR14 we implemented water trading incentives where importers and exporters of water received additional benefits for agreeing trades.

Issues

We have identified the following issues:

- As detailed in our 2019–20 market monitoring report,⁵² the level of sludge trading is very low, with only 0.8% of sludge being exported for treatment. Although this was before our PR19 reforms took effect, we consider this to be far below the optimal level of trading, suggesting that direct incentives may be required if companies are to engage fully in the market. Water trading incentives were introduced for water resources to resolve a similar issue, in that the level of trade does not reflect the economic opportunity in this area.⁵³
- Stakeholder engagement suggests that cultural barriers to trade and an in-house bias may be preventing further trading. United Utilities also included sludge trading incentives in their preferred package of measures for the future of the bioresources market.⁵⁴
- Companies have cited a lack of certainty over regulatory treatment of long term sludge trades as a barrier and this was also identified by Jacobs in their accompanying report to the market review. The introduction of trading incentives and detail on how they would work in practice could help to allay concerns over how trades may be treated in future regulatory periods.

Options

We have considered the following options:

- **Option 1: No trading incentives.** We would not introduce bioresources trading incentives.

⁵² [Bioresources market monitoring report 2019–20.](#)

⁵³ [Ofwat, 'Delivering Water 2020: Our final methodology for the 2019 price review. Appendix 5: Water resources control.' December 2017](#), Section 4.3.1.

⁵⁴ [United Utilities Water, 'A review of options for further market participation in bioresources,' December 2020.](#)

- **Option 2: Export trading incentive.** When a trade spanning multiple periods is agreed, a sewerage company would be able to claim a trading incentive proportional to the size of the trade for the remainder of the AMP that the trade is agreed in.
- **Option 3: Set target trade levels and set incentives based on these.** We would set an efficient level of trade that companies should target, based on market evidence.

Our assessment

Our preferred option is option 1; to retain the current framework and not introduce trading incentives at this time. Our other proposals strengthen the incentive on companies to engage with the market – notably, by promoting a bidding market in bioresources (see issue 1, above) and our proposed approach to cost assessment (see issue 3, above). Although trading incentives could also strengthen the incentive to engage with the market, we consider that adding a further distortion to the market would be inappropriate at this time.

Option 2 would see us adopt a similar approach to that currently used in water resources (although importers would not be eligible for trading incentives, as they are in water resources). Exporting companies would be able to claim a trading incentive until the end of the regulatory period when a long term trade is agreed that is proportional to the value of said trade. At the next price review, we would account for the trading agreement in our cost assessment, ensuring that customers benefit from the new lower cost. Importers would not be able to claim trading incentives as stakeholder engagement has indicated general willingness to import sludge where capacity allows. While this option would provide companies with an incentive to act in the long term interests of customers, we consider that work to remove current market barriers will result in existing incentives being sufficient to stimulate trade. Administering trading incentives such as this would also increase burden and place more emphasis on the regulators' involvement in the market. Therefore, it is not our preferred option.

Under option 3 companies would be required to trade a certain level of sludge that reflects our estimation of an efficient level. Where companies do not reach this level, penalties would apply and be passed to customers. This option is likely to incentivise greater levels of trade and also compensates customers for the foregone benefit of trade if companies do not take up opportunities. However, it would require a high level of certainty around the efficient level of trade and may present asymmetric risk for companies. Implementing rewards for trading above a certain level could resolve asymmetric risk, but this may then incentivise inefficient trade. For these reasons and the high level of complexity this option would entail, it is not our preferred option.

Other issues

We set out our views on a number of other areas identified in this review:

- **Cost of capital:** [Jacobs' bioresources market review report](#) noted a potential disparity between the allowed return on capital for sewerage companies and cost of capital for other organic waste (OOW) companies. A similar observation was made by the [Office of Fair Trading](#) in 2011.

We consider that OOW companies' cost of capital could be lower than the amount shown by Jacobs if they had a long-term contract to underpin the investment. In any case, we consider that increasing sewerage companies' allowed revenues by using an unduly high allowed return on capital would not be in customers' interests.⁵⁵

Therefore, we do not intend to promote competition in this way by raising companies' returns.

- **'Double funding':** The CMA, in assessing an enhancement scheme from Anglian Water, [considered that there was potentially a wider issue of 'double funding'](#). The CMA was concerned that companies could participate in the market by using assets funded by customers and recommended we consider the treatment of RCV as part of opening up the bioresources market.

We agree that where excess capacity⁵⁶ is funded through the price control then this will give companies the opportunity to use this capacity in the bioresources market. We consider that this is not a significant problem in the short-term, because:

- a. the amount of excess capacity in the bioresources market is currently limited;
- b. transfer pricing rules requires an appropriate amount of revenue to be passed back to the appointed company; and
- c. the way we set companies' price controls⁵⁷ ensures an appropriate share of the profit from trading is passed back to customers and this share [should reflect the investment risks](#) taken by both parties in order to provide the service, with a greater relative risk meriting a greater share of the reward.

We will consider whether it is appropriate to change the way we regulate in future to address the CMA's concern, particularly as we expect bioresources market activity to grow. We would welcome stakeholders' views on this issue.

⁵⁵ Companies' RCV is largely pre-2020 RCV and therefore benefits from a relatively high degree of regulatory protection.

⁵⁶ That is, where customer funded treatment capacity exceeds the amount needed to treat a companies' own sludge.

⁵⁷ The bioresources control contains a term, 'Profits from bioresources trading' – this amount is deducted from companies' allowed revenue.

- **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.⁵⁸ However, we note that:
 - i. companies' raised similar concerns about the transfer pricing rules at the time to the [Office of Fair Trading](#) in 2011. Although the OfT found issues with our previous transfer pricing approach, the [OfT considered](#) that the perception that transfer pricing rules were complicated and uncertain indicated the existence of a sectoral culture that focused on the core (regulated) business to the potential determinant of consideration of market incentives;
 - ii. we also heard that guidance on pricing needs to be stable in order for confident in setting fate fees;
 - iii. Jacobs' report found that that overcharging gate fees could suppress market activity⁵⁹ and recommends charging only the incremental cost in accordance existing guidance ([RAG 5.07](#)⁶⁰); and
 - iv. we note that many companies have been working to develop an approach to pricing recently.

We recognise that this is a complex area that can interact with other potential issues, such as the 'double funding' issue mentioned above. However, given the considerations above we are not convinced we should amend our transfer pricing guidance or provide companies with any additional guidance on how they price their trades on this specific issue. We would welcome stakeholders' views on this issue.

⁵⁸ For example, this was raised by sewerage companies as part of our [market monitoring](#), at our stakeholder event of 15 January 2021 and in [Anglian Water's letter](#).

⁵⁹ Market constraint G.

⁶⁰ Recommendation 12.

5. Next steps

We welcome feedback on the issues raised in this document and [Jacobs' bioresources market review report](#).

We will continue to work collaboratively with stakeholders to address the issues identified in this consultation. We will also publish an update in the autumn.

Furthermore, we will publish our second market monitoring report in the autumn. This is consistent with our strategy of ongoing monitoring and review of market development.

6. Consultation questions

We would welcome your feedback on this consultation or any related matters. In particular, we ask:

Q1: Do you agree with, or have any comments regarding, [Jacobs' bioresources market review report](#)?

Q2: Do you agree with, or have any comments regarding, the proposals and views we set out in this document?

A1 The current operation of the market

Bioresources forms a key part of the water and wastewater value chain. At PR19 it constituted around 6% of companies' total allowed revenue, in comparison to 6% and 7% for water resources and residential retail, respectively. The average bioresources bill is forecasted to be approximately £23 over 2020-25. However, the cost to customers can vary significantly between companies - ranging from as low as around £13 to over £32 for a typical household customer. These figures would have been higher if the value of treated sludge as a resource had not been taken into account - renewable energy generation and fertiliser production from sludge is expected to account for an estimated £366m over 2020-25.

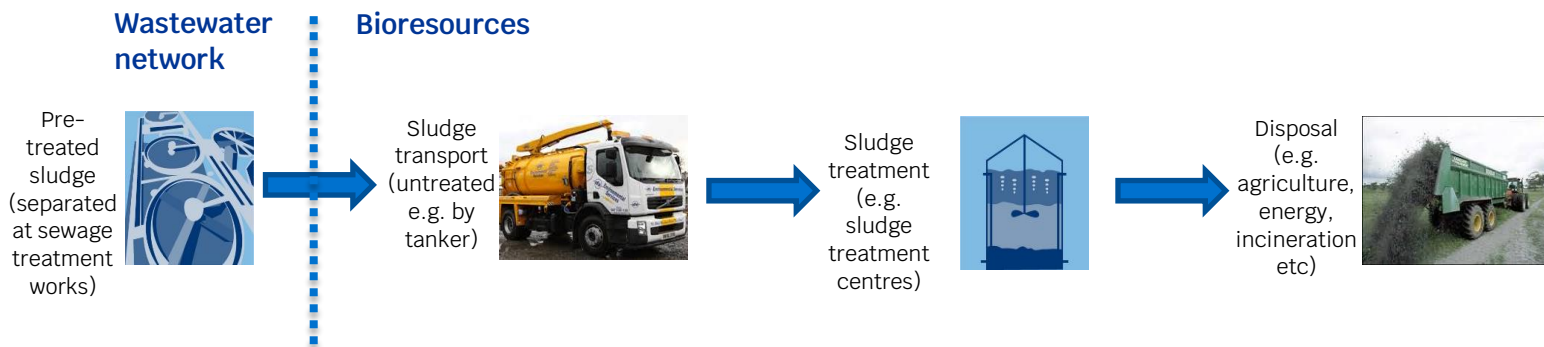
It was estimated that in 2018 that the wider waste and recycling sector in the UK is worth approximately [£7.8bn of Gross Value Added](#) to the economy.

Structure of the industry

Bioresources (or sewage sludge) are the semi-solid by-products of wastewater treatment. Sewerage companies' activities within the bioresources revenue control can typically be split into three distinct activities:

- **Sludge transport** – the transportation of untreated sludge from wastewater treatment sites to sludge treatment centres (STCs). This typically takes the form of truck or tanker haulage, or via pipeline in the case of co-located wastewater treatment sites / STCs;
- **Sludge treatment** – processes applied to sludge to reduce health hazards and make it safe to dispose of. Companies use a range of processes to treat sludge that vary in complexity, from relatively crude sludge liming to sophisticated advanced anaerobic digestion (AAD).
- **Sludge disposal** – disposal / recycling of sludge matter. The majority of sludge is converted to renewable energy through the treatment process or is spread to land as fertiliser. A small amount is incinerated.

Figure A1.1 Bioresources value chain

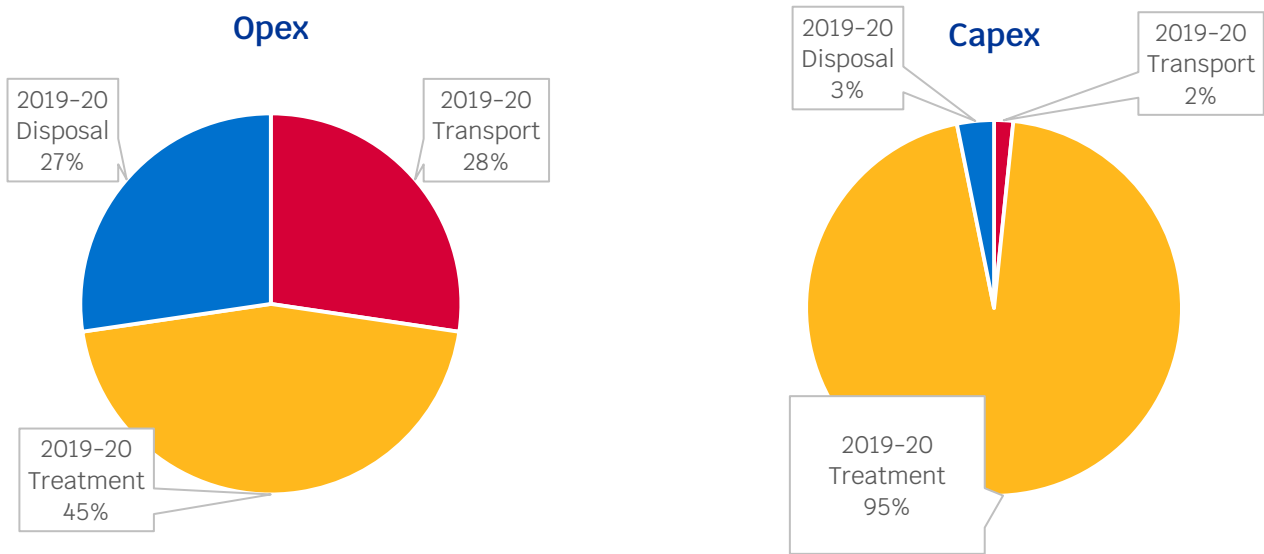


Sludge was previously considered a waste product, however it is now being seen increasingly as a valuable resource. It is used in two main ways; conversion to renewable energy as part of the treatment process, and the solid products being spread to land as fertiliser as part of the disposal process. Advances in technology have been key to this. For example, more advanced treatment technologies, such as thermal hydrolysis, have allowed companies to convert a greater proportion of sludge into renewable energy, which can then be used on site or exported to the national grid. This in turn makes sludge disposal easier as there is less end product to dispose of.

Companies can take advantage of market options in all three of these activities. For example, in sludge treatment incumbent companies have the choice to trade sludge with other sewerage companies across company borders, or to contract out these services to third party waste firms such as other organic waste (OOW) providers, or to treat sludge in-house. Historically, companies have made some use of third party provision for sludge transport and sludge disposal, but the vast majority of sludge treatment is handled in-house.

The costs of bioresources are relatively evenly split between operating expenditure (opex) and capital expenditure (capex). The yearly average for industry opex was £297m in AMP6, compared to £319m for capex. It should be noted though that this is net opex, after income from treatment and disposal activities has been accounted for, and that the capex figure is somewhat dependent on company capitalisation policies. Opex and capex is not spread evenly between the three distinct bioresources activities, with sludge treatment being the most valuable activity by far. Figure A1.2 shows that 95% of bioresources capex is spent on sludge treatment.

Figure A1.2 Bioresources opex and capex splits 2019-20

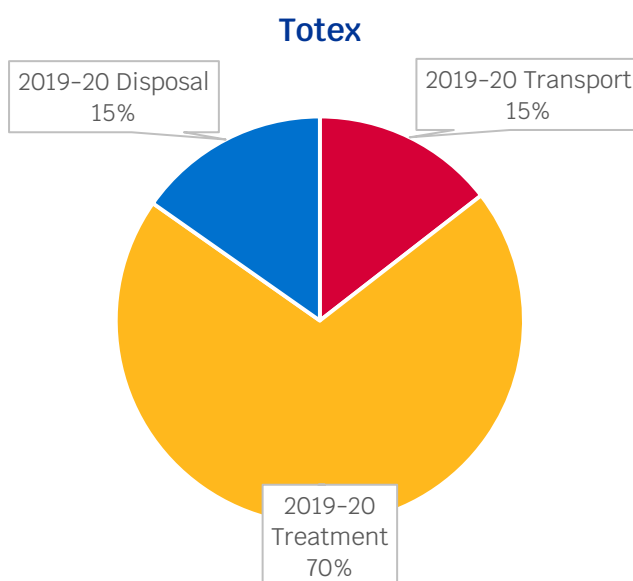


Data source: Companies' APRs, Table 4E

The weighting towards treatment in opex between the three activities is less pronounced, however it is still responsible for the largest portion of operating expenditure. Sludge transport and sludge disposal are largely evenly weighted on both types of expenditure.

At the totex level, figure A1.3 shows that treatment is the dominant activity in terms of expenditure, whereas transport and disposal are equally weighted.

Figure A1.3 Bioresources totex split 2019-20



Data source: Companies' APRs, Table 4E

A2 Previous assessments of the bioresources market

The scope for competition in the bioresources and related markets has been reviewed on a number of occasions in the past. These reviews have all found that greater competition is both achievable and beneficial.

The Cave Review (2009)

The [Cave Review](#) identified a number of barriers to upstream competition. These include:

- incumbents having regulatory and legal incentives to develop their own capacity;
- buying other supplies rather than developing their own resources would increase an incumbent's operating expenditure, reducing their comparative efficiency; and
- there are significant information asymmetries, meaning that alternative suppliers often have little information to decide whether, where and how to enter;

The review made a number of recommendations to improve competition and innovation in the water sector. These recommendations included the following examples relevant to bioresources:

- An economic purchasing obligation which would require incumbents to consider schemes that were proposed by alternative suppliers, with best value assessed and challenged by a procurement panel of external members. Where it represented best value, the incumbent would be expected to contract with alternative suppliers and where it was unable to justify its decision not to use such a supply, Ofwat would fund the requirements of an efficient company.
- Reform of the licensing regime. In the case of bioresources, this included a new upstream licence for companies wishing to treat and dispose of sludge.

London Economics (2010)

[London Economics](#) found a number of barriers to competition for sludge treatment and disposal - these included:

- 'habitual barriers'⁶¹ and risk aversion;

⁶¹ The report explains that the market for the treatment and disposal of sludge has not traditionally been organised along competitive lines and that the sludge treatment function was integrated with the sewage treatment process.

- economic barriers⁶² leading to co-location of sludge treatment centres with wastewater treatment works;
- environmental regulation inhibiting co-digestion of sludge with other organic waste;
- planning permission issues; and
- that sewerage companies retain a ‘duty of care’ (i.e. face potential liability for breaches of environmental rules) even if sludge is outsourced to another company.

At that time, London Economics found no evidence of any competition in sludge treatment. However, they found that there was potential for competition, noting that it occurs in other countries where there is significant outsourcing.

To address the regulatory barriers to competition, London Economics recommended a transfer of liability to the party treating sludge and addressing the regulatory issues concerning the mixing of sludge and other types of waste.

Office of Fair Trading (2011)

The [Office of Fair Trading](#) (OFT) identified similar barriers to competition as the London Economics study. They also identified that:

- our approach to regulation at the time produced a bias towards capital expenditure which reduced incentives to consider the use of other businesses to treat their sewage sludge, even if these might be more efficient from an economic viewpoint;⁶³ and
- Sewerage companies have a competitive advantage as they can borrow at a lower cost of capital than is available to other waste companies.

The OFT considered that although some companies expressed concerns that cost allocation and transfer pricing rules (that apply when using regulated assets to perform non-regulated activities) were complex, time-consuming and uncertain, these comments indicated the existence of a sectoral culture that focuses on core (regulated) businesses to the potential detriment of consideration of market incentives.

The OFT found that opportunities to compete did not appear to be utilised and that the outsourcing of sludge treatment to another sewerage company could provide some significant efficiency gains.

⁶² Notably, economies of scale, economies of scope and transport costs.

⁶³ We took steps to address this at PR14 by moving to regulating based on a total expenditure based approach.

The OFT made a number of recommendations to address concerns around environmental regulation, convergence of quality standards for sludge and other organic waste (OOW) and the planning system. They also recommended we consider our approach to regulation – an aspect of this was ensuring there is no artificial cost advantage for sewerage companies compared with other waste companies, i.e. through how the sewerage companies' allowed return on capital is calculated and applied (e.g. in transfer prices and the allocation of costs when providing non-regulated activities).

The OFT did not recommend rolling back the scope of regulated activity, noting that there remained considerable potential for sewerage companies to exert substantial market power.

Water 2020 (2015 and 2016)

As part of our Water 2020 work considered a wide range of issues, including those raised in previous reviews and by stakeholders.⁶⁴ [Our decision document](#) found that additional competition would bring significant benefits.

Our impact assessment for PR19 is described in section 1 and Annex 3. Section 1 also summaries the key steps we have taken to support the functioning of the bioresources market over recent years.

⁶⁴ As part of this we considered helpful contributions from sewerage companies, including through our 'marketplace for ideas'. For example, [United Utilities' paper](#) and [Wessex Water's paper](#).

A3 The potential for market development

As noted in section 1, our [impact assessment](#) found:

- that the expected benefits from the changes at PR19 were £370m to £1,390m of efficiency improvements compared to costs ranging from £30m – £60m;⁶⁵ and
- non-monetised benefits included reductions in greenhouse gas emissions from greater renewables generation and greater resilience from better integration with the wider waste sector.

Our approach assessed the benefits from trading using three approaches:

- bottom-up modelling of operating cost efficiency benefits using industry cost data;
- bottom up calculation of the benefit from the WaSCs delaying investment in new assets; and
- a top down model of dynamic and productive efficiency gains based on regulatory precedent for introduction of markets in areas with monopoly economic regulation.

We consider that this assessment remains appropriate. We also note the following additional considerations based on more recent assessments of the market.

Jacobs' assessment

Jacobs articulate the benefits of the market in terms of six key market opportunities:

- **Joint capacity.** The coordination of two or more parties (e.g. water companies) to procure capacity in a geographically optimal location.
- **Co-treatment (including co-digestion).** The co-mingling of sludge with other treatment feedstocks.
- **Collocation.** The bringing together of two different treatment streams on a single site taking advantage of shared assets (e.g. energy generation assets).
- **Project finance.** Bringing forward future benefit by using third party finance to invest in assets.
- **Headroom trades.** The use of the unused appointed capacity of another water company (or vice-versa).

⁶⁵ 2015–16 prices, NPV over 30 years.

- **Outsourcing.** Using markets to deliver services which would otherwise be delivered in house.

Jacobs consider the potential benefits of joint capacity, co-treatment and collocation as high. At the other end of the spectrum, they consider that the benefits of outsourcing may in some areas be marginal.

Jacobs' assessment, whilst being consistent with previous analysis, is a helpful way to consider the market opportunities and then assess potential market constraints.

Implications of companies' site-level cost data

In December 2020 we requested companies' data on their capacity, transport routes and operating costs. With companies' agreement we [published](#) the non-confidential elements of this. We did not publish information regarding companies' operating costs. However, this information, and information previously gathered to inform the allocation of RCV to bioresources, together indicates to us the following.

- The variation in operating costs between sites can be large, particularly when energy subsidies are included. This suggests that **trading of sludge to exploit this could make commercial sense, even if the sludge needs to be transported for significantly longer and further than at present.**
- In some instances, cost differentials seem to be so significant that even **exporting sludge from co-located wastewater treatment works could make commercial sense in some instances.** These opportunities would tend to be greater for sites which are closer to other companies' sites.
- **Capacity constraints pose both a limit and motivation for trading.** Capacity constraints could limit the ability of companies to arbitrage sites' relative cost effectiveness. However, they could also pose a motivation to trade, i.e. as a means to avoid or delay costly new investment.
- In the longer-term, current capacity levels can be addressed through further investment (although other constraints, such as planning, could be a limit expansion on some circumstances). This would enable a **much larger volume of sludge to be traded in the long-run.** Companies could use this to exploit differences in long-run costs, i.e. not just differences in operating costs but capital expenditure too.

A4 Our strategy and governments' strategic policy statements

Time to act, together

Our strategy sets out our ambition for the sector: providing the very best service for customers, improving the environment and improving life through water, both now and in the future – and the role we will play in achieving it. Our strategy sets out our three goals:

- to transform companies' performance;
- to drive companies to meet long-term challenges through increased collaboration and partnership; and
- for companies to provide greater public value, delivering more for customers, society and the environment.

As part of our strategy we made specific commitments in relation to the bioresources market. We committed to:

- explore and encourage the trading and other market mechanisms for bioresources – recognising that competition and markets can deliver significant benefits for the sector by bringing about cost efficiencies and encouraging higher service levels, while also incentivising innovation; and
- examine if a modified approach to setting price controls may be appropriate given market developments in bioresources.

Our review of the bioresources market takes forward these commitments. Our review of the bioresources market also interacts with other elements in our strategy which frame our approach. These include, for example:

- meeting long-term challenges, for example because companies' sludge treatment centres can generate renewable energy (for example, from biogas through anaerobic digestion) but transport activities can generate greenhouse gases (for example, by using tankers to transport sludge); and
- open data, for example because more accessible market information could facilitate a bioresources market.

UK and Welsh government strategic policy statements

The UK and Welsh governments can set out strategic priorities and objectives for us, which we are required to act in accordance with in carrying out our relevant functions.

Furthermore, an important part of our strategy is to recognise the specific circumstances in

Wales and to regulate in a way that reflects any policy differences between the UK and Welsh governments.

The UK government's [strategic statement](#) recognises that markets are a vital tool in how we secure a fair deal for everyone. It states that we should promote competition in the bioresources market to drive innovation and achieve efficiencies in a way that promotes resilience and protects vulnerable customers. The strategic policy statement also states that we should sustain long-term investor confidence in the sector including protecting the interests of consumers. And we should continue to make sure our reforms uphold the public health and environmental standards that customers expect.

The Welsh government's [strategic statement](#) recognises the potential role that markets can sometimes play in raising performance standards and driving efficiency. It states that our regulatory approach to markets should seek to ensure a level playing field between new entrants and existing undertakers. The Welsh government's strategic statement also states that we should not introduce competition where the activity of new entrants would reduce undertakers' overall accountability for the delivery of excellent services to customers and the environment, and threatens the integrity and efficiency of the management of the network systems as a whole.

**Ofwat (The Water Services Regulation Authority)
is a non-ministerial government department.
We regulate the water sector in England and Wales.**

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