United Utilities Water

UUW's response to Ofwat's PR24 draft methodology - Bioresources supplementary

United Utilities

Water for the North West

Better targeted cost assessment

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

Enhancement obligations

We wish to raise a point of principle regarding Bioresources enhancement expenditure, where the legal obligation seems most applicable to Wastewater Network Plus (WwNP), but where the most efficient overall "wastewater service" solution is to invest in Bioresources assets. Compliance with phosphorus (P) standards provides a good example:

- The nutrient exists in effluent, and the standard will be measured and monitored at the point of discharge to the water course from the wastewater treatment works (i.e. within the WwNP business).
- However, most of the P flows through into Bioresources processes, and back into wastewater treatment via return liquors.
- Therefore, the ideal intervention point would be to remove the P from the return liquors within Bioresources (and therefore the most efficient intervention may be to invest in Bioresources assets).

Given that the obligation applies to Appointees as a whole (with no distinction made between Wastewater Network plus and Bioresources within the environmental obligations), the enhancement requirement will (without Ofwat intervention on how this should be accounted for) be deemed part of the Bioresources price control.

In contrast, in a competitive (fully separated) Bioresources market, if a WwNP company sought to ask an independent Bioresources provider to construct and operate assets to remove P, the Bioresources business would expect to be fully remunerated by the WwNP business, as it is not a direct obligation on the Bioresources provider. Given this, it would seem unreasonable to expect incumbent Bioresources businesses to fund such investment, as that would act to skew their prices relative to related competitive markets.

We therefore propose that, similar to liquor return costs, Ofwat directs companies to use the RAG5 transfer pricing framework to enable Bioresources to recover the cost of enhancements from WwNP in circumstances where obligations sit in WwNP (outside of Bioresources), but where solutions are most efficiently delivered within Bioresources. At PR24 (and beyond) that would then mean that the cost of those enhancements would be assessed and remunerated as part of the WwNP price control, with transfer pricing arrangements acting in parallel to transfer funding from WwNP to Bioresources. This would be the right course of action to prepare Bioresources for operating and trading within a wider competitive market. In addition this approach would ensure that there is no cross-subsidy provided between WwNP and Bioresources, allowing for comparison of costs between price controls in future.

Renewables Incentives

Ofwat raises the issue of Renewable Heat Incentives (RHI), and states it does not consider that any related mitigating action is needed to ensure the termination of this incentive negatively affects the cost assessment process. We agree with Ofwat that companies should bear the risk for their own investment decisions made in response to these incentives. However, there is a risk that the comparative efficiency assessment creates the potential for companies to be exposed to the investment decisions made by other companies operating in entirely different circumstances. This could happen in the case where the efficient comparator company has generated value from renewables incentives that existed in the past but which are no longer available to companies (for example the Green Gas Support Scheme only applies to new digestion facilities, whereas the RHI allowed existing facilities to benefit). We consider that Ofwat should make appropriate adjustments to account for the impact of historic renewables incentives. This will help to ensure that its benchmark is stretching but achievable for all companies.

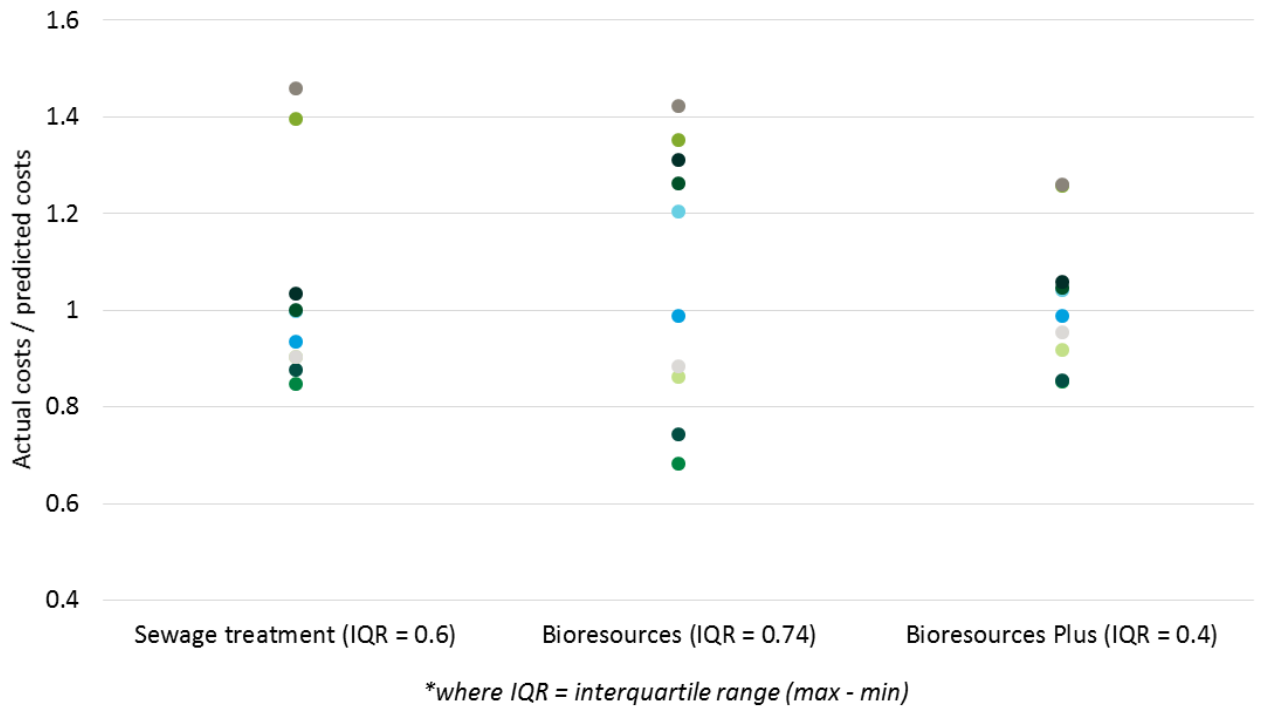
Q2.2 Do you have any further comments on our approach to a separate efficiency assessment, in particular the options we consider in section 2.4.2?

We do not consider that the options assessment presented by Ofwat takes account of all potential options available and we disagree with Ofwat's chosen course of action. In our view, a fourth, better option not considered by Ofwat, would be a catch-up efficiency challenge set at the wastewater level, as was the case at PR19. This would be our preferred approach. We understand why Ofwat would like to ensure that Bioresources acts as a separate entity to the wider wastewater operation. However, we do not share Ofwat's concerns that a wastewater-level catch-up challenge undermines this; Bioresources will still receive an appropriate efficiency challenge, and the source of this challenge will not impact management decision making in any practical sense. Moreover, the use of a wastewater-level catch-up challenge will mitigate concerns about the potentially adverse effect that asset configuration could have on the challenge.

We agree with Ofwat's observation that asset configuration can impact upon a bioresources-specific catch-up challenge. However, we disagree that the current cost drivers sufficiently account for asset configuration. Asset configuration impacts upon Bioresources costs primarily through the quality of sludge input into Bioresources' operations. It isn't clear that the models are appropriately reflecting this.

We note that the explanatory factors used by Ofwat in its models are the same as those used at PR19. The residuals from these models may provide some evidence on whether these cost drivers are appropriately capturing asset configuration. If they are, we would expect there to be a similar residual spread between a standalone Bioresources model, a standalone Sewage Treatment model and a Bioresources Plus model. This would indicate that the level of unexplained variation between the three is roughly the same, meaning that the cost drivers are appropriately reflecting differences in asset configurations. Conversely, if there were substantial differences in the residual spread, this would indicate that the models are not appropriately reflecting asset configuration. Figure 1 illustrates the residuals from Ofwat's PR19 model suite. We can see there is a clear and marked difference in the residuals between the Bioresources, Sewage Treatment and Bioresources Plus models; a wide residual spread in the sewage treatment and bioresources models can be compared with a relatively narrow spread in the bioresources plus model. This provides some evidence that the current set of cost drivers are not reflecting salient information about differences in asset configuration across the industry.

Figure 1 - Residuals from Ofwat's PR19 models (taken from Ofwat's FM_WWW2_FD file)



**where IQR = interquartile range (max - min)*

We consider that the best way for Ofwat to reassure stakeholders that asset configuration is appropriately accounted for would be to transparently present evidence or analysis that supports Ofwat's conclusions. This would provide all stakeholders with the confidence that Ofwat's assumptions are reasonable, and that its benchmark is aligned with the appropriate engineering, operational and economic rationale. This is important because companies have made historic decisions about how to efficiently structure their asset base in response to local conditions, prior to the current Bioresources boundary being implemented. This means that companies would have investment decisions at an overall wastewater level, without reference to a boundary that did not exist at the time. It does not seem appropriate for these decisions to be subject to an ex post efficiency challenge that tends to benefit companies who took the decision to build assets that were ultimately allocated to the WwNP price control. We consider that more work needs to be done to ensure that Bioresources costs are equivalent e.g. through a transfer price, through a wastewater-level efficiency challenge or through another approach. Otherwise, Ofwat's current proposals could create an unobtainable benchmark for some companies while providing a comparatively easy challenge for others.

The quality of sludge received should be considered outside of the control of Bioresources

Ofwat states: "*we consider that the optimisation of operational activities such as screening or thickening is within companies' management control"*. However, we note that screening occurs within WwNP. As noted above, Ofwat would like to ensure that Bioresources acts as a separate entity to WwNP. Therefore, we consider that the quality of sludge received by Bioresources should be considered outside of Bioresources' management control. In principle, a competitive market would allocate a higher price to a product that requires additional work. This would provide appropriate incentives to upstream businesses to improve the product quality sent to downstream businesses, which in this case may involve the fitting of better screening assets. However, such incentives rely on appropriate price signals. As stated in our response to question 1.1, one way to provide such price signals could be through the use of a transfer price.

A retail-specific catch-up challenge is not equivalent to a Bioresources-specific catch-up challenge

Ofwat states that: *"We set an efficiency challenge for retail activities at PR19 and no stakeholder challenged this approach at the Competition Market Authority".* We disagree that this is analogous to a separate Bioresources catch-up efficiency challenge as Ofwat implies:

- There were no/negligible substitution effects between retail activities and wholesale activities;
- The retail/wholesale boundary was subject to a far greater level of detailed definition than has been the case for Bioresources and WwNP;
- When implementing separate household retail controls at PR14, Ofwat (a) did not apply an efficiency challenge, and (b) applied a glidepath to the average cost to serve, thus providing additional protection from any potential issues caused by the separate price controls.

Therefore, a separate efficiency challenge (applied later, at PR19) was more justified and as such was widely supported by the industry. This is not the case with Bioresources due to the presence of substantial substitution effects between WwNP and Bioresources, as discussed above.

A more market based approach to setting costs and revenues

Q3.1 Do you have any comments on this section?

It is important to consider:

(1) What the appropriate long-term approach is to regulating Bioresources as part of an increasingly contestable market; and

(2) What is the appropriate approach to regulating bioresources at PR24 as part of a reasonable transition to that future state?

In the long-term, we consider that Ofwat's preferred approach may be appropriate. However, we think that successfully implementing the approach would require the following (we consider the first three of these in more detail below):

- Reasonable stability and predictability of future Bioresources requirements across the industry;
- Appropriate incentive properties that facilitate efficient investment over the long-term;
- Greater run-down of the pre-2020 RCV will mitigate concerns about protection of the pre-2020 RCV;
- Additional time to enable better identification of the independent, comparable scope of Bioresources. For example, through better definition of the boundary between WwNP and Bioresources; a better allocation of costs and assets across the boundary (noting our point relating to P removal in question 2.1); and the creation of appropriate transfer prices to ensure price controls can be considered on an equivalent basis;
- A more mature and developed Bioresources market; and
- Additional time for companies to adapt their asset base to compete on an equivalent basis i.e. to account for the Bioresources boundary definition in their asset configuration.

We support Ofwat's objective of helping the Bioresources sector deliver greater economic and environmental value. We are vocal advocates of increased competitive activity in Bioresources, and are actively exploring ways to deliver a better service to our customers using competition. In that context, we understand the purpose of Ofwat's proposals and consider them to be an appropriate long-term ambition for the sector. However, PR24 may not be the right time to make such a fundamental change to the structure of the Bioresources price control. Ofwat's proposals are more suited to a market that can be described as being in a steady state, where there is limited potential for exogenous shocks.

Reasonable stability and predictability of future Bioresources requirements across the industry

There are a number of areas where potential legislative changes are leading to significant uncertainty about the future of Bioresources management**:**

- IED compliance requirements are still uncertain and it is possible some related activity will need to be carried out within AMP8;
- There is significant uncertainty around whether the primary outlet for sludge disposal (i.e. spreading to farmland) will still be available. Our current understanding is that the industry will have better clarity of this in September 2025, which is after companies take the decision to accept their PR24 Final Determinations. This exposes companies to the risk of regulatory change, over which they have limited control; and
- Environmental Permitting Regulations (EPR) may require fundamental changes to the way the industry spreads sludge to land. This could impact operating costs relative to past periods.

There is a risk that the impact of these legislative changes will be asymmetrically distributed across the industry. This is important because Ofwat's intended approach of only providing five years of quality enhancement allowances at PR24, and then relying on the revenue benchmark to appropriately allocate quality-related enhancement expenditure, could result in allocative inefficiency if the benchmark models do not contain a suitable factor to explain efficient variances in quality-related expenditure. This could result in companies with

extensive quality-related expenditure requirements receiving an under-allocation of revenue and companies with comparatively light requirements receiving an over-allocation. The high evidential bar applied during Ofwat's cost adjustment process may mean that this allocative inefficiency is not corrected. Given that there is no statutory distinction between the requirements implemented by either WwNP or Bioresources, we do not consider it is appropriate to implement an approach that risks materially underfunding the Bioresources sector for statutory quality enhancements in future.

Appropriate incentive properties that facilitate efficient investment over the long-term

One feature of the regulatory model is that companies benefit from efficiency savings in the short-term, while in the long-term these are passed through to customers. We support this in principle, and consider it generally provides appropriate incentives for companies to become more efficient. However, the removal of the RCV for post-2020 investment means that companies will have to adapt their approach to capital investment, to align with a commercial model; companies operating in competitive environments won't undertake capital investment unless they are reasonably confident they will earn a return. There is a risk that companies could withhold efficient investment because of the risk that resulting efficiency savings will be passed back to customers before the efficiency savings have offset the investment cost. While we agree that customers should share in efficiency savings in the long-term, we consider that companies should receive an appropriate share in the short-term to incentivise efficient investment. Ofwat may need to explicitly account for this at future price reviews to provide companies with the confidence that efficient investment will be remunerated.

Greater run-down of the pre-2020 RCV will mitigate concerns about protection of the pre-2020 RCV

Ofwat has previously committed to protecting the pre-2020 RCV to promote regulatory certainty. While our specific comments on this topic are set out in our response to question 3.4, we note that Ofwat's proposals do create a risk that pre-2020 RCV is not protected. If the approach outlined by Ofwat were instead signalled now but implemented at PR29, then the legacy RCV would be smaller, and the issue of legacy RCV protection would be less material as a result. It would also allow time to rigorously test the effect of Ofwat's proposals on investors.

Therefore, we consider that PR29 will be a better time to consider implementing option 3. Given that this would allow longer signalling and affect a smaller proportion of historic investment, it is likely to be seen as a more reasonable approach by the industry and unless Ofwat is anticipating a high risk of significant stranding of assets or non recovery of RCV in AMP8, the practical impact of this approach on customers and markets would appear to be limited.

Q3.2 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?

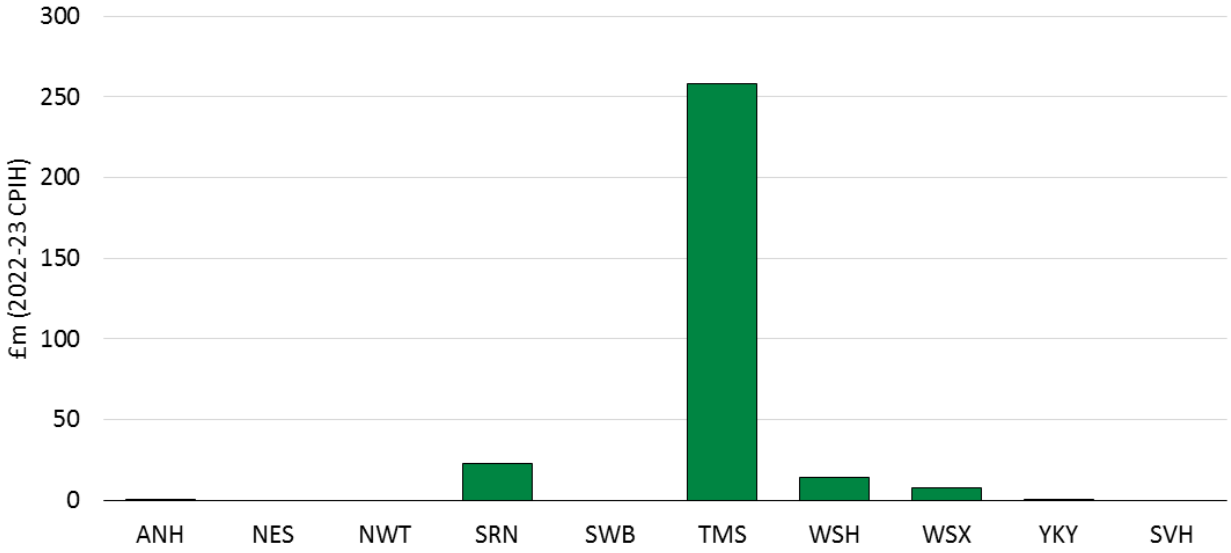
Regarding Farming Rules for Water (FRfW), Ofwat states: "The guidance will be reviewed by September 2025. This may address companies' current concerns about the use of sludge on agricultural land." We note that Final Determinations at PR24 will be set in December 2024. This means that there will still be significant uncertainty about companies' legal obligations under FRfW at the FD. For this reason, we consider an ex post adjustment mechanism is essential to ensure that companies are able to recover the efficient costs associated with FRfW compliance. The absence of an ex post adjustment mechanism would create a risk that companies are no longer able to fulfil their obligations under relevant environmental legislation. We consider that this equally applies to Industrial Emissions Direct (IED) requirements. We do not consider that the approach taken at PR19 towards anticipating emerging regulatory requirements was sufficient.

Ofwat states that: "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." We agree that regulatory change should not drive enhancement expenditure of its own accord. However, we do consider that the impact of regulatory change should be considered an appropriate driver of enhancement expenditure, so long as this impact can be associated with a clear and observable metric. For example, a metric that captures changes in land bank availability could be

used to determine whether additional disposal assets are required. While this metric would not directly track whether a regulatory change has occurred, it would capture the operational impact of such changes. Monitoring this measure as part of the adaptive pathways framework (with associated mid-AMP decision points) would help to provide assurance that companies will be able to fulfil their functions should operational circumstances change. We are currently working to develop a land bank availability metric that would help us assess efficient disposal activity in the future.

We do not agree that it is appropriate to include growth-related costs within the revenue benchmark. Figure 2 demonstrates that growth expenditure has been incurred asymmetrically across the industry over the historical period. This suggests that historical growth expenditure is not a good indicator of future requirements. We do not agree with Ofwat that using depreciation (which has the effect of smoothing capital expenditure) will mitigate this issue. Recent work by Reckon[1] demonstrates that a benchmarking model will not allocate historical expenditure appropriately, where it has been incurred asymmetrically. It may be appropriate for Ofwat to provide analysis that will reassure stakeholders its models are making appropriate allocations for growth expenditure.

Figure 2 - Historic sludge growth enhancement costs (total since 2011-12)



Additionally, including growth with the overall model will only reflect the difference in ongoing cost of companies operating at different levels of scale. Those companies will have been operating at those different levels of scale for many decades, such that the difference in costs reflected full embedment of any economies of scale available. However, the actual cost of new capacity to meet a new increment of scale (i.e. investment to meet additional growth) will more likely be the same for all companies, regardless of scale. Therefore, an overall model, which reflects economies of scale, will underestimate the cost of meeting new growth (particularly for larger companies), which we consider should be modelled separate from base service costs.

We wish to ensure there is clarity about our position relating to the use of forecast costs within benchmarking models. In our consultation response, we said that: *"We do not generally support the use of forecast costs in cost assessment. However, in some circumstances a lack of suitable alternative information that will lead Ofwat to an appropriate benchmark may mean that such an approach is unavoidable… We consider that the expected environmental changes we set out above will induce companies to adopt a different Bioresources operating model meaning that backwards looking costs would not reflect the costs companies can reasonably expect to incur. Therefore, it may be appropriate to consider the use of forward looking costs in Bioresources models".* In contrast, Ofwat's summary of our response suggested we did not consider there are reasons to suspect future Bioresources operating conditions would change: *"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*

[1] Reckon (2022) *The opportunities for a more coherent regulatory approach for Ofwat's funding of base expenditure and enhancements*. Available here.

the case with the bioresources market." For clarity, we **do** consider that there is a reason to expect there will be a step change in operational requirements due to changing environmental regulations. We hope that this helps clarity the position we set in our previous consultation.

Q3.3 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?

We support Ofwat's proposal to uplift modelled revenue with quality-related enhancement allowances within AMP8. However, we do not agree that the revenue benchmark can be relied upon to appropriately allocate quality-related enhancement expenditure from AMP9 onwards.

This is because Ofwat's proposed approach uplifts modelled revenue with a quality-related enhancement allowance for AMP8 only. Depreciation related to these assets would be included within the historical dataset used to set the revenue benchmark at PR29. This means that any quality enhancements made during AMP8 are at risk in future regulatory periods. We note that this approach creates two alternate risks for the industry:

(1) The risk that, all else equal, some companies make more efficient interventions relating to quality requirements, meaning the benchmark penalises companies that have made inefficient interventions. In principle, we support this property of Ofwat's proposed approach – although it is only equitable in the event that environmental obligations on companies require similar levels of investment.

(2) The risk that that the revenue benchmark inappropriately allocates revenue relating to quality interventions in AMP8, meaning that companies that have made efficient interventions are not able to recover related costs (e.g. because the model may not recognise different levels of enhancement investment requirements between companies). We do not support this aspect of Ofwat's proposed approach.

We note that Bioresources' quality obligations would be no less binding than obligations in other parts of the business. Therefore, we consider that it would be more appropriate to align cost recovery for quality-related enhancements to that implemented within the other price controls. Additionally, we note that the benchmark company (i.e. the company considered as the efficient comparator according to Ofwat's chosen criteria) may not have implemented any quality-related projects in AMP8. This would create an unachievable benchmark if not appropriately addressed.

Q3.4 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?

In its consultation, Ofwat states that: *"Our position taken at PR19 related to the 2020 to 2025 period. Our approach at subsequent reviews was left open"*. We acknowledge this point but we do consider that the approach taken to the pre-2020 RCV at PR24 should be consistent with the approach taken at PR19. Ofwat's statement that *"For the avoidance of doubt, this does not mean complete protection against any risk"* is somewhat enigmatic and provides limited additional clarity about its approach.

In our response to Ofwat's December consultation *'Approach to funding bioresources activities at PR24'*, we noted that option 1 doesn't wholly protect the pre-2020 RCV (due to volume risk) and could create an inappropriate efficiency challenge because it would penalise companies with a larger than average Bioresources RCV. This remains our view.

We were expecting the approach to pre-2020 RCV protection to be clarified by this consultation. However, without a clear, unambiguous worked example we are unable to explain how Ofwat's approach sufficiently protects the pre-2020 RCV. As we set out in our response to December's consultation, at that time we did not

consider Ofwat's approach did this, and it isn't clear from the draft methodology how or whether any changes have been made to the approach that may mitigate this issue. We therefore cannot support Option 1 as it stands.

Q3.5 Do you agree with, or have any comments on, our updated proposals for modelling financing costs in our benchmarking models?

The approach to estimating finance costs seems reasonable, although we note there may be viable alternatives. As a general comment, we consider that adding additional information to the dependent variable without an appropriate explanatory variable could lead to poor model fit.

Q3.6 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?

We support Ofwat's provisional decision of option 2. This will mitigate any potential incentive to under forecast sludge volumes, and is consistent with our response to Ofwat's previous consultation.

Q3.7 Do you agree with, or have any comments on, our proposals to make a separate adjustment for tax?

Ofwat states that: *"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 [emphasis added] figures for bioresources produced by the econometric modelling*". We consider that this statement could benefit from additional clarity. Our understanding is that Ofwat intends to use econometric modelling to set an average revenue benchmark, not a cost benchmark. On the presumption that this is Ofwat's intended sentiment, then we agree that tax should be dealt through an unmodelled adjustment.

Q3.8 Do you agree with, or have any comments on, our proposals to continue to refer to the post-2020 asset base as RCV?

Ofwat's approach to the post-2020 RCV is entirely new, so it is hard to forecast how markets or ratings agencies will assess post-2020 investment in Bioresources. If the ratings agencies do not consider post-2020 investment as part of the Bioresources RCV, then this may damage key financial indicators like debt to RCV. However, the agencies' approach in this area isn't clear. There is also a risk that Ofwat's approach could impact on industry debt covenants, but maintaining the term 'RCV' may mitigate this risk.

Q3.9 Do you have any comments on our option assessment in the annex?

We would reiterate the points made as part of our response to question 3.1:

- The uncertainty surrounding Bioresources operations means such a fundamental change may be better suited to a time when this uncertainty is resolved;
- Ofwat should carefully consider how its proposals can create appropriate incentives to invest over the long-term;
- The proposed approach to quality-related enhancements at PR29 and beyond creates a risk that companies are not funded commensurate to their obligations;
- Implementing the approach at PR29 will mean that legacy RCV recovery is a less material issue; and
- Revenue benchmarking models may benefit from the collection of more robust data over the next few years.

We also note that the options assessment does not consider whether its proposals sufficiently enable companies to fulfil their obligations and duties, or whether the proposals are aligned with Ofwat fulfilling its functions and duties. We consider that this should be explicitly considered as part of the assessment.

Bioresources control: supplementary document (published September 2022)

Q4.1 Do you have any comments on the type of data used for the example model results? Whist recognising the proposed refinements to establishing standardised depreciation in annex 6, do you have further comments on whether RCV and RCV run-off would provide an acceptable and/or more appropriate input to our econometric cost benchmarking models over the 2020 to 2025 period?

We note that, in the past, RCV run-off has been used as a lever to address financeability concerns. This could cause RCV run-off to deviate from depreciation in the short-term. If so, there would be a structural break within the cost data, and this may lead to poor model results.

Q4.2 Do you have any comments on the econometric models and results? How could our models be improved? For example, should we consider alternative specifications or cost drivers?

As a general comment, we note that the Bioresources models at PR19 had a large residual spread relative to models of other value chain splits. This suggests that a large portion of costs were unexplained. Ofwat's approach, as set out in this consultation, could be characterised as focusing upon the same set of explanatory factors, whilst adding additional elements to the dependent variable (i.e. depreciation and financing costs). As a result, we do not see any principled reasons to expect the inclusion of a 'revenue' dependent variable to lead to a better performing model. In fact, we would expect this to lead to a worse performing model, all else equal, because we are asking the same set of explanatory factors to explain additional (and fundamentally different) information.

As we stated in our Future Ideas Lab paper[2], benchmarking models should be based upon strong engineering, operational and economic priors. We consider that the following factors drive costs in Bioresources (note this is not an exhaustive list). We note that Arup and Vivid Economics have previously analysed this topic in some detail[3].

Scale

It is reasonable to expect that companies dealing with larger amounts of sludge will have higher costs, all else equal. We note that economies of scale cannot be assumed to correlate with company size. As Arup and Vivid demonstrated[2], economies of scale in Bioresources exist at an asset level i.e. a small company with one single, large treatment works may have a lower unit cost than a large company with many small works.

Complexity

Where treatment requirements are more complex, then we would expect bioresources costs to be higher. For example, a lack of arable land may lead companies to adopt more complex treatment because this will produce a better quality biosolids product that is suitable for use on grassland. Equally, where the sludge produced 'product' received by Bioresources is of poorer quality, then associated transport, treatment and disposal costs will also tend to be higher. For example, where there is a high concentration of phosphorous within sludge, potential for energy generation is reduced and the available land bank is further restricted. Or alternatively, where the sludge has a low dried solids content, Bioresources' costs will tend to increase because more thickening work is required.

[2] UUW (2021) *The principles of regulatory cost assessment.* Available here.

[3] Arup and Vivid Economics (2018) *Use of econometric models for cost assessment at PR19*. Available here.

Density

Companies with a more densely populated region may be able to benefit from economies of scale at treatment assets, which could reduce treatment unit costs, all else equal and could generate co-location opportunities, which could reduce transport costs, all else equal. Equally, companies in less densely populated regions may face lower sludge disposal transport costs.

As noted above, Arup and Vivid Economics have demonstrated that economies of scale exist at an asset level, not a company level. It would be beneficial to reflect this within the explanatory drivers used within the model.

Agricultural outlet availability

Arup and Vivid Economics noted[4] that the distribution of arable land and grassland is a material driver of treatment and disposal costs: *"Arable land is the cheapest disposal route, offering significantly greater and lower cost capacity per hectare than grassland, so its availability affects the costs of both treatment and disposal. The costs associated with disposal to arable land tend to be less than that to grassland for a variety of reasons including: the presence of livestock manures reducing pastures' capacity to receive sludge; more onerous processes for handling and application mandated by the Safe Sludge Matrix (ADAS, 2001)…This means companies with less suitable arable land available near sludge treatment centres will either face higher costs of transporting sludge longer distances to land or find it efficient to adopt more expensive treatment and disposal routes."* Therefore, it is the combination of land availability and the type of land available that impacts Bioresources treatment and disposal costs. We are working to develop a dataset that reflects the industry variation in the type and availability of land bank.

Rainfall

Arup and Vivid Economics note[4] that spreading to grassland has a *"…Higher susceptibility to interruption during periods of rainfall".* This would require Bioresources to travel further to dispose of sludge, build additional storage assets or adopt alternative disposal routes. Therefore, a higher proportion of grassland within the available land bank can be associated with higher disposal costs.

Given this brief restatement of the engineering, operational and economic drivers of Bioresources costs, we consider that Ofwat's model suite may benefit from including these additional cost drivers:

- **Phosphorous concentration within sludge produced by WwNP** – Higher concentrations of phosphorous within each unit of sludge produced means that Bioresources will receive a lower quality product with more inert material, delivering a lower gas yield. This could help to improve the external validity of the Bioresources model because it would reflect future cost pressures created by a more stringent P removal requirements within WwNP.
- **Co-located assets** – the more co-located assets a company has, we expect that sludge from the wastewater process would be supplied more frequently and generally be of better quality, which would support a lower treatment cost. In addition, the co-located sludge would not tend to be transported to the treatment works via road, which would reduce transport costs. It's likely that this effect is captured through cost drivers already included within Ofwat's model suite, but an alternative driver may help to capture a different dimension of the relationship between cost and cost driver.
- **Land bank availability** – the availability of land, and the type of land available, will impact the treatment adopted by Bioresources and disposal costs. We are working to develop a dataset that reflects the industry variation in the type and availability of land bank.

This is our initial appraisal, and we may propose additional drivers as we further develop our understanding in this area.

[4] Arup and Vivid Economics (2018) *Use of econometric models for cost assessment at PR19*. Available here.

Our comments on Ofwat's modelling approach set out in its supplementary document

We have the following comments about the modelling approach set out in the supplementary document:

- Ofwat's option 3 model contains an array of cost drivers, which all appear to reflect density. As a result, these cost drivers are highly correlated with each other, a feature which Ofwat recognises. The rationale for including all these drivers in the same model isn't clear, and including all of them in a single specification may result in multicollinearity. We suspect this may be one cause of poor model results.
- Ofwat attempts to reflect economies of scale (in part) through a company-level driver (i.e. the inclusion of TDS within a unit cost model). As Arup and Vivid demonstrated, economies of scale exist at an asset level and so the inclusion of a company level driver doesn't appear to align with engineering rationale.
- There is no clear engineering, operational or economic rationale for the exclusion of pre-2017 data. There is a risk that excluding data for the sole purpose of making a model 'work' will tend to emphasise 'internal validity'. As we discuss in a Future Ideas Lab paper[5], prioritising internal validity may well lead to good statistical fit for the historical period modelled, but not future periods. Therefore, this could result in an inappropriate future benchmark.
- Sludge quality received by Bioresources is a key determinant in Bioresources costs, but this is not explicitly considered by Ofwat's model suite:
  - More phosphorous removal reduces the capacity for energy/revenue generation due to more inert components. Therefore, a phosphorous removal driver may be appropriate. This could be calculated using information readily available in the APR on load treated at works with a phosphorous consent.
  - A lower dried solids content will increase transport and disposal costs and will increase treatment costs due to the need to reduce water content. This factor may be correlated with the density drivers used across all specifications, but given option 3 includes all these drivers in a single specification, it's hard to assess how well option 3 reflects this cost driver.
- Ofwat does not explain how its model accounts for the asset configuration between WwNP and bioresources. Ofwat is proposing a significant change to its methodology, and so we consider that stakeholders will benefit from seeing any evidence that supports the assumptions the new approach requires. For example, if it considers that the current set of cost drivers reflect asset configuration, then we would welcome transparent presentation of the evidence that justifies this viewpoint.

Ultimately, the process of developing robust revenue benchmarking models for the Bioresources price control will probably require significant time to develop, test and implement, and we do not consider it is one that should be rushed. We would welcome the opportunity to contribute to the model development process.

[5] UUW (2021) *The principles of regulatory cost assessment.* Available here.

Q4.3 Do you agree with, or have comments on, the proposed, updated approach to calculating asset values and CCA depreciation as set out in annex 6? In particular, do you:

A) Agree with, or have any comments on, our proposed approach to calculating GMEAV and the alternative approach considered?

B) Agree with, or have any comments on, our proposed approach ('gradual unwinding') and alternative approach to estimate changes in the value of the NPV adjustment?

C) Agree with, or have any comments on, our proposed approach ('bottom-up method) to recording CCA depreciation?

D) Agree with, or have any comments on, our proposed approach to the rules on asset life assumptions?

E) Have any comments on the options to generate backcasting estimates of asset values and depreciation?

We will provide a more complete response to this question with the submission of our data table for the 'New Depreciation and Net Modern Equivalent Asset Value approach' on 23 September 2022. The key issues identified to date with this element of the consultation are similar to those included in our 'UUW response to PR24 Draft Methodology' (page 50) submitted earlier this month.

Do you agree with, or have any comments on, our proposed approach to calculating GMEAV and the alternative approach considered?

Neither agree/disagree. As the March 2020 asset valuation is based on hypothetical assets, there is a disconnect between the value of subsequent disposals using actual asset data and the asset values in the March 2020 register. We consider that the guidance requiring companies to "*use all available evidence to report*" disposal values could benefit from additional clarity as it may lead companies to adopt materially different assumptions.

Do you agree with, or have any comments on, our proposed approach ('gradual unwinding') and alternative approach to estimate changes in the value of the NPV adjustment?

Agree. The proposed approach appears reasonable given the scale of the adjustments.

Do you agree with, or have any comments on, our proposed approach ('bottom-up method) to recording CCA depreciation?

We do not have comments on this at this time.

Do you agree with, or have any comments on, our proposed approach to the rules on asset life assumptions?

We do not have comments on this at this time.

Have you any comments on the options to generate backcasting estimates of asset values and depreciation?

Disagree. The key issues with the proposed approaches are:

- Average asset lives for depreciation forecasting – the use of average asset lives will tend to overstate depreciation in the earlier periods and understate depreciation in later periods. The 'bottom-up method to calculate depreciation' proposed in the consultation document would require companies to maintain a version of the PR19 asset valuation for 2020-21 onwards. The PR19 valuation information was provided at a

site/process level with a single asset life. Therefore, the 'bottom-up method' still relies on averaged data. Any averaging of asset lives could materially impact on depreciation. There is no simple solution to this but consideration should be given as to whether an asset life allocation based on the old June Return Table 34 categories (Very Short, Short, Medium etc) could be used.

- Depreciation on post 2020 expenditure – with reference to section A6.3.1. Any forecasting of depreciation would need to take account of assumed commissioning dates. Some projects can take several years from commencement to commissioning with the project value remaining in assets under construction (AUC) for several years. The consultation document makes no reference to commissioning periods or AUC assumptions, both of which would materially impact on depreciation. The proposal in section A6.3.2 of maintaining a spreadsheet asset register based on enhancement capital expenditure would be complex. Projects are allocated between maintenance and enhancement but once the projects are commissioned assets are not classified in the same way. Consequently identification of the value of disposals of 'enhancement assets' would be difficult.

In summary, this exercise has revealed that there is likely to be consistency issues across the industry relating to depreciation data with implications for a benchmarking approach. If it isn't possible to gather consistent, robust data before PR24, then we consider it may be more appropriate to implement this approach at PR29. As well as mitigating issues like environmental uncertainty and legacy RCV protection, this will allow Ofwat time to develop good quality data, which stakeholders will have confidence in. A further response will be provided with the Annex 6 data submission on 23 September.

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