

## Wessex Water Severn Trent joint bioresources market exploration - Questions

The questions below have been asked by market participants, either during the webinar or after in the question period. We have left the questions as unedited as possible so you can identify your specific query, but we have also grouped them into relevant themes where appropriate. There are a couple where we are either confirming the answer, or going through the appropriate governance internally to be able to share the data and will update as soon as these are available. Apologies for the delay in these.

Question	Answer
Re. dewatering - can the sludge be dewatered to a lower moisture content e.g. 20% moisture?	<p>Dewatering sludge to 80% DS would be incredibly beneficial when looking at storage volumes and transportation costs but it is something we would expect the market solution to include in their service offering, or at the very least include options for proven technology we could implement on our sites to meet this requirement.</p> <p>Previous attempts to get sludge this dry have resulted in auto-ignition or aerosol dispersion. It is also usually a very energy intensive process that would not immediately align with cost / carbon ambition. If these issues were addressed it would be an excellent solution to pursue, but we would expect some level of technical assurance.</p>
Does 100% of STW Cake currently go to agriculture?	<p>Yes. 100% of Wessex Water and Severn Trent's cake currently gets recycled to agriculture and we are both assured under the Biosolids Assurance Scheme.</p>
Will there be a required framework/format for submissions?	<p>There is no specific framework or format; we don't want to be too prescriptive and increase the burden on market suppliers by specifying a particular format. Just please make sure your submission highlights the key themes we are looking for detailed on the challenge pages.</p> <p>However, we do ask that submissions are limited to 10 pages as we could have a large number of options to review and we want to be able to give them a fair consideration. Obviously, if you have more than one option available you may go above 10 pages, but please be pragmatic in how long your submission is.</p>
Hi, as an OEM equipment supplier, are you looking for us to provide details of the equipment solutions we can offer that would form part of a wider solution via a total solution delivery partner? <i>And</i> Do you envisage pre-formed consortium submitting proposals at this stage or are you open to introducing interested parties to one another to form the optimal offering later in the procurement process?	<p>Our preference would be for people to come forward as a group having joined up their offerings for a turnkey package. This could be for part or all of the sludge treatment process. If there are equipment solutions that we can implement independently on our sites without a wider partnership that will make a material difference to the 10-25kTDS challenge that has been articulated we are interested in hearing about these.</p>
Re 10 to 25 kTDS scale is this as stand alone or an additional expansion of an existing sludge treatment system? <i>Linked to this</i> To manage 5tonnes per hour, our plant requires 100m*100m footprint. do you have that amount of real estate? <i>Linked to</i> Do you have any preferred locations or are you able to define where this sludge will be produced to allow evaluation of optimal location?	<p>We're happy to have proposals for expansions of our existing sites, or for entirely new installations.</p> <p>If you need equipment to be installed on our sites, please make it clear the footprint needed and that it must be located on an existing site. If it can be located anywhere and you have no specific location in mind, please also make this clear.</p> <p>In terms of locations, we don't have a specific site (new or existing) in mind. Anywhere that makes logical sense to address the shared 10-25kTDS between Wessex Water and Severn Trent (the map below is a good indication of possible areas).</p> <p>The bioresources market information here <a href="https://www.ofwat.gov.uk/regulated-companies/markets/bioresources-market/bioresources-market-information/">https://www.ofwat.gov.uk/regulated-companies/markets/bioresources-market/bioresources-market-information/</a> should provide a useful resource in terms of existing sites and sludge volumes.</p>

Maximising energy- is this focused on gross energy production (e.g. favouring THP, but not exporting all that much extra beyond the site boundary due to steam boiler use) or net energy production, which may favour high efficiency, conventional AD? Is the goal energy produced, or energy exported for use beyond the biosolids treatment system?	Our aim is to treat the waste to the highest standard for the lowest possible carbon / financial impact. Net energy generation is a clear preference, but would need to have some assurances around product quality and suitability for land disposal. This does not mean we need an enhanced product but it should provide some resilience against the changing sludge legislative landscape. The key is providing capability to treat sludges in a sustainable way that improves our environmental performance. There is no technological preference in how we deliver these outcomes.
Is there more of a focus on solutions for large or small works as the challenges are different?	<p>We are looking for this challenge to have a material impact on the 10,000kTDS requirement. Therefore is it likely that the focus will be on larger works – but we are open to suggestions if you think you have a solution that may be appropriate.</p> <p>We have created a large-scale opportunity based on approaches from the wider market and the scales at which it was suggested we would see interest. This does not preclude us from reviewing smaller, more localised opportunities that might be better aligned to our carbon ambitions but it does create the top end opportunity in terms of volume to allow us to understand all potential market routes.</p>
Would there be an opportunity (assuming you like our proposal) to run a trial site before rolling it out over multiple locations?	Ideally we are looking for a ready to go solution that can, as per the challenge details, address the issue of 10kTDS by 2030. We would wonder whether a solution that requires a trial would allow us to rapidly implement a solution at this scale.
We suspect the best option will be to locate the operation on your sites (minimising vehicular movements). Are there sites with space available or are they all filled with existing infrastructure?	That being said, if the technology proposed does have the potential to address the requirements of the challenge in this timescale then we would be willing to consider a trial. However, these trials must be robust and safe to operate.
Would you have a preference between large and small sites for trials and implementation?	We are happy to consider it on our sites, but this is dependent on size. Sites do have space for some pieces of process plant, but typically not vast areas of land. Please make it clear in your proposals what is required. We have no preference between large and small sites - please use your expertise to address the challenge requirements.
Would existing biosolids recycling infrastructure (transport, farm liaison officers, analysis team) be something we could dovetail into?	Yes, this is potentially available. We will however flag that as per the challenge we are keen to see a diversification of approaches rather than the continued reliance on sludge to land. Any product must be compliant with all required legislation.
In terms of finance, are you expecting a stand alone venture or are you considering a JV?	At this stage we are open to all options - our initial aim is to find technically viable solutions.
Are we able to ask more questions as we work through our proposal? These would be specific, operational type queries.	As flagged in the webinar, we can't answer specific queries from every company post the FAQ period (and we can't answer really company/technical specific queries in the FAQs) to be fair to all as we wouldn't be able to deal with the volume of queries that come through.
How much sewage liquid is transported between processing plants per annum? Tonnes and miles.	Please see the spreadsheets published for the Bioresources market information - section B and section E on the WwTW.
What is the calorific value?	We estimate our combined primary / secondary sludges to have a CV of Undigested – 18 MJ/kg and Digested – 13 MJ/kg.
Does your license or environmental permits include incineration?	No, we do not currently incinerate any of our sewage sludge, and therefore our permits do not currently allow for this - a new permit would be required.
What is the current and expected population in the catchment area? -	We believe that tKTDS is the critical driver behind this challenge. However, the populations for Wessex Water waste is 2.8m people and c. 400k for this part of the STW region (Neth 171k, Hay 121k and Stroud 67k + imports)

<p>Although the information provided on the Bioresources Market Information tables is extensive, there are a few specific points we request additional data on, specifically of the Sludge Treatment Centres:</p> <p>Number of Anaerobic Digester Vessels  Design working volume of digesters  Digester feed DS</p> <p>Digester feed volume (m3/day or other appropriate unit)</p> <p>Installed biogas utilisation capacity (CHP generation capacity and/or biomethane upgrading capacity)</p>	<p>Please see the second page of this document for the summary information. However, please note that we are not expecting submissions to go to this level of detail at this stage. Whilst we are happy to provide this information, please do not feel that your proposals must go down to this level of information. As this stage we are wanting outlines of options and a proportionate level of detail for us to review.</p>
<p>What is the cost in processing and transporting sewage from WTW to farmland? -</p>	<p>Please see the table on the third page that shows the cost breakdowns. These are taken from our Annual Performance report tables (4E.6) which can be found here for Wessex Water <a href="https://corporate.wessexwater.co.uk/our-performance/annual-review">https://corporate.wessexwater.co.uk/our-performance/annual-review</a> and here for Severn Trent: <a href="https://www.stwater.co.uk/regulatory-library/regulatory-library-documents/">https://www.stwater.co.uk/regulatory-library/regulatory-library-documents/</a></p>

## Additional data requests

### Digester data

	Severn Trent - Netheridge	Severn Trent - Hayden	Severn Trent - Stanley Downton	Wessex Water - Avonmouth	Wessex Water - Trowbridge
Although the information provided on the Bioresources Market Information tables is extensive, there are a few specific points we request additional data on, specifically of the Sludge Treatment Centres:					
Number of Anaerobic Digester Vessels	4	2	1	8	2
Design working volume of digesters	12016	6028	1750	21600	7000
Digester feed DS	4.15	3.28	4.78	5.44	6.18
Digester feed volume (m3/day or other appropriate unit)	672	350	104	1800	500
Installed biogas utilisation capacity (CHP generation capacity and/or biomethane upgrading capacity)	1672kW TIC CHP (2 engines)	499 kW TIC CHP	165 kW TIC CHP	CHP: 5750 kW (5 engines) Biomethane upgrade: 60000m3/d	CHP: 1200 kW Biomethane upgrade: 15600m3/d

### Cost data

Costs are provided based on APR Table 4E; Sludge figures from 8A

It is worth looking at the APR data tables listed below for further information if the figures provided are not exactly what you are after.

	SVT		WSX		APR Ref
Annual cost of transport	£	17,611,000	£	6,806,000	4E.4
Annual cost of treatment	-£	15,522,000	£	7,658,000	4E.5
Annual cost of disposal	£	8,850,000	£	4,780,000	4E.6
DS produced		260,500		61300	8A.3
DS disposed		141000		42600	8A.8
Avg %DS		22.60%		25%	Can be calculated from Market Info
£/t DS produced	£	33.97	£	77.98	
£/t DS disposed	£	62.77	£	112.21	
£/wet t disposed	£	14.19	£	28.05	