

UUS RAPID Query Consolidated Report



RAPID Query Reference : UUS 001

Query : Please provide copies of the following:

- * SEA Assessment
- * HRA Assessment
- * WFD Assessment
- * NCA & BNG Assessment
- * Carbon Assessment
- * INNS Assessment

Response :

The following annex documents have been uploaded to the RAPID portal:

- * SEA Assessment
- * HRA Assessment
- * WFD Assessment
- * NCA & BNG Assessment
- * INNS Assessment

Please note:

In all cases the documents submitted to RAPID contain information that is commercially confidential. Please ensure that appropriate steps and safeguards are observed in order to maintain the security and confidentiality of this information. Any requests made to RAPID or any organisation party by third parties through the Freedom of Information Act 2000, the Environmental Information Regulations 2004, or any other applicable legislation requires prior consultation and consent by United Utilities before information is released as per the requirements under the respective legislations. The content of these reports are draft and relates to material or data which is still in the course of completion in travel to Gate 2 and should not be relied upon at this early stage of development. We continue to develop our thinking and our approach to the issues raised in the document in preparation for Gate 2.

A Carbon Assessment has not been produced however Carbon has been considered as part of the Gate 1 Submission and in the production of the Conceptual Design Report. Please see below :

UUS RAPID Query Consolidated



Report

UUS SROs Carbon Calculations:

Embodied carbon outputs produced from the UU estimating tool relate to a formula associated with each cost element. The carbon amounts are driven by the same yardsticks as those applied to the formula(s) to generate the options capex cost. It comprises an automated series of equations. These are calculated based on quantities of materials with high amounts of carbon and multiplied by carbon coefficients from the Bath University Inventory of Carbon & Energy v2.0.

Operational carbon has also been calculated from outputs produced from the UU estimating tool and includes carbon derived from electricity and chemicals. A split between fixed and variable operational carbon was calculated. Fixed operational carbon relates to any carbon related to an asset being ready to deliver water not related to the volume of water delivered (i.e. keeping a plant operational). Variable operational carbon relates to any carbon related to the volume of water delivered (i.e. pumping or chemicals).

A summary of the carbon data of the UUS source options are summarised in Table 1 below.

Option name	Embodied Carbon	Operational Carbon (fixed and variable)
Units	(tCO ₂ e)	(tCO ₂ e)
Source 1	391,399	19,163
Source 2	885	-
Source 3	93,804	12,132
Source 4	11,785	1,001
Source 5	22,516	3,726
Source 6	17,674	5,565
Source 7	10,656	4,007
Source 8	675	368
Source 9	30,447	5,892
Source 10	11,493	1,703
Source 11	4,008	987
Source 12	24,156	4,206
Source 13	29,117	4,218
Source 14	34,452	3,371
Source 15	8,104	2,149
Source 16	10,290	1,698
Source 17	6,593	4,123
Source 18	3,379	552
Source 19	3,569	740
Source 20	5,076	4,012
Source 21	14,779	2,643
Source 22	3,974	3,641
Source 23	4,153	1,341
Source 24	26,261	577
Source 25	27,743	2,871
Source 26	8,736	2,053
Source 27	16,708	2,709

UUS RAPID Query Consolidated

Report



RAPID Query Reference : UUS 002

Query Please could we receive a response to the following queries on utilisation:

a) Please explain what assumptions have been made regarding scheme utilisation to inform the Opex costs. Please explain the reasoning behind the utilisation value(s) used.

b) Please expand on what outputs from WRSE modelling have been received so far, and the assumptions (modelling or otherwise) that have lead to a 6% UUS support requirement being determined for STTs 12% utilisation.

c) Please expand on what further outputs from WRSE modelling are expected, and how these, and the regional plan outputs, will be used to calculate and refine utilisation figures for Gate 2.

Response :

a) The selection of UU Sources is sensitive to the utilisation of Vyrnwy support for the STT. This depends not just on the volumes and overall percentage of time the support would be used, but also on the timing and duration of use relative to patterns of low flow which could affect the water resources position across the North West and North Wales. Water Resources initial modelling identified multiple configurations of the 27 UUS Source Options to build up portfolios of various water transfer volumes up to 180 MI/d using the original utilisation pattern provided by WRSE. We have then assumed a utilisation of 100% for each portfolio solely for the purposes of calculating Opex costs at Gate 1, which aided the cost benefit analysis comparison. Multiple UU Source option configuration portfolios can be created and we will refine these further during Gate 2.

b) When designing our SROs the expected utilisation patterns were a key factor in determining the configuration of options required. The number of days continuous support and level of alignment with our weather conditions were more important than headline utilisation percentages.

We have received several utilisation sequences from WRSE, the most recent of which was a 20,000y stochastic sequence provided by [redacted] in April 2021. This sequence corresponds to the 6 and 12% utilisation values quoted. It consists of a daily times series of unsupported and supported transfer flows which we can then map to our Water Resources West (WRW) stochastic hydrological dataset.

We have used the utilisation data from WRMP19 for Gate 1 as there was insufficient time to use the updated sequence, however we have compared sequences and don't believe there to be a significant difference. We will refine our SRO's with the new sequence as part of Gate 2.

c) Changes to the utilisation pattern will affect how many and which UU source options are needed to maintain resilience of supplies to UU customers. This would in turn have an impact on the cost and therefore the bulk supply price. The utilisation pattern may change depending on the combination of options selected in the WRSE plan and also other significant wider resource positions in the South East (e.g. levels of demand or major sustainability reductions)

UUS RAPID Query Consolidated Report



We would expect WRSE to review the STT utilisation patterns and confirm whether they remain valid or have changed once their options selection becomes clear and at other points where their plan may change. We will then be able to assess the materiality of any new utilisation pattern and therefore whether changes to the UU Sources may need to be selected and reflected in the costs of the option for WRSE. We would expect this confirmation through the regional plan reconciliation windows.

UUS RAPID Query Consolidated Report



RAPID Query Reference : UUS 003

B3 water resources benefits

- 1) Please explain the work undertaken to update the DO adopted from WRMP19 for the 27 sources, to align with WRMP24 processes and requirements.
- 2) Please reference in the report where the Deployable Output is stated for each of the 27 sources, under drought scenarios such as the 1:500 year event.

Response :

- 1) The DO benefit of the UU SROs is calculated by WRSE, in combination with other features of the STT scheme.

The DO benefit for the STT scheme is available within that submission, however the DO benefit of the individual components that make up the scheme are calculated by WRSE but not presented.

When selecting options for the UU Sources SRO we do not use a DO-based (i.e. aggregated) approach. We use a more sophisticated “system simulation” / “robust decision making” approach which is outlined in our WRMP19 documentation¹ and informed by the 2016 UKWIR Decision Making Processes guidance. We updated the outputs as far as possible for Gate 1 but a full refresh is planned for Gate 2.

Our approach reflects that water trading from a large conjunctive resource zone is far too complex to be represented by a single DO metric. We need to go beyond this to properly protect customers and the environment.

We would be very happy to talk through our Gate 1 approach in more detail if helpful.

- 2) As noted in our response to query UUS003 #1, we do not select options for our SROs using DO.

However, our WRMP19 approach tested the options using a considerable number of plausible droughts, including many different 1 in 500 year events. We also used three climate change scenarios.

We will refine our SRO's for Gate 2 using the approach outlined in part 1 of this response, which will support WRSE's calculation of the DO benefit of the STT scheme.

UUS RAPID Query Consolidated

Report



RAPID Query Reference : UUS 004

Query :Key risks and mitigation measures

Please can you confirm where in the submission you consider potential regulatory barriers relating to Welsh legislation, and confirm what the potential barriers are (if any).

Response :

We have considered the potential impacts of Welsh legislation and regulation, however at this stage we do not perceive these to be barriers to scheme progression as they can be addressed through further feasibility assessments and continued proactive engagement with the relevant regulatory bodies.

As detailed in our submission, engagement at this stage of the SRO process has primarily been through Water Resources West (WRW). As part of this engagement, we have started early conversations with both regulators and the Welsh Government to understand what would need to be considered as part of any SRO that sources water from Welsh catchments. It is recognised that any transfer must demonstrate a benefit to Wales and the Welsh people, as well as contributing towards the wellbeing goals under the Welsh Government's 'Well-being of Future Generations Act'.

WRW are working closely with Natural Resources Wales (NRW) to ensure all parties work together to identify solutions to the challenges faced with water resources. To do that WRW are mindful of the Area Statements that outline the key challenges and opportunities in the differing areas of Wales and how best any water transfer, that was selected as part of a regional plan, addresses those challenges and realises the opportunities. At an SRO level we have also engaged with NRW regarding the source options under consideration and incorporated their feedback into the development of our Gate 2 Environmental Monitoring Plan (EMP).

We also recognise there are differences in the planning regime in Wales, however only one of our source options would be within the jurisdiction of the Welsh planning process (Option 27). United Utilities have experience of securing planning consent in Wales and we do not foresee this being a barrier if Option 27 is progressed to delivery stage.

UUS RAPID Query Consolidated

Report



RAPID Query Reference : UUS 005

Query

1. Please provide a brief outline of the method used to determine the carbon emissions of the project.
2. Please provide a brief outline of how the carbon emissions of the project will be managed, highlighting how the approach will be guided by the commitments on carbon developed by the All Company Working Group.

Response :

1. Embodied carbon outputs produced from the UU estimating tool relate to a formula associated with each cost element (eg. Water Pipeline - 750mm diameter in grass in trench, Buildings and Site Infrastructure - Modular Kiosk Buildings). The carbon amounts are driven by the same measures as those applied to the formula(s) to generate the options capex cost. These carbon values are calculated based on quantities of materials (eg. m and m³ respectively) with high amounts of carbon and multiplied by carbon coefficients from the Bath University Inventory of Carbon & Energy v2.0.

Operational carbon has also been calculated from outputs produced from the UU estimating tool and includes carbon derived from electricity and chemicals. A split between fixed and variable operational carbon was calculated. Fixed operational carbon relates to any carbon related to an asset being ready to deliver water not related to the volume of water delivered (i.e. keeping a plant operational). Variable operational carbon relates to any carbon related to the volume of water delivered (i.e. pumping or chemicals). The carbon amounts are driven by the same measures as those applied to the formula(s) to generate the options opex cost. Carbon values are calculated based on quantities of materials with high amounts of carbon and multiplied by carbon coefficients from the Bath University Inventory of Carbon & Energy v2.0.

2. UU have been active participants in the All Company Working Group (ACWG) Carbon Task & Finish Group which has developed the SRO carbon ambitions shared with RAPID.

These ambitions will be considered in the development of options during Gate 2 to ensure that we minimise the carbon impact of our solution.

The 27 source options under consideration are diverse with respect to potential carbon impacts and will be assessed both individually and conjunctively. With optimum value engineering in mind, some early opportunities to mitigate capital carbon include the use of materials with lower carbon emissions (such as maximising structural efficiency and longevity by the use of polyethylene pipework instead of ductile iron or steel), optimisation of pipeline routes, lower carbon construction techniques and use of lower carbon plant and machinery.

UUS RAPID Query Consolidated



Report

With respect to operational carbon the main focus will be on minimising energy usage through use of efficient treatment processes and pumping systems. We will also apply 'systems thinking' to investigate the use of automated monitoring and control to reduce manual operational interventions. Where energy is required we will seek to source this through on site renewable generation or through purchase of renewable energy.

Exploration of low carbon opportunities will also be informed by United Utilities' climate change mitigation strategy which covers four themes: vision and visibility; ambition and commitment; demonstrating action; and beyond here and now demonstrating that we recognise that carbon management is not just greenhouse gas accounting.

We share the net zero ambition of the UK water industry launched in November 2020 as the 'Net Zero 2030 Routemap: Unlocking a net zero future' including the emission reduction hierarchy. We have committed to an ambition that our water emissions (scope 1, 2 and elements of scope 3) will be net zero from 2030 and are official members of the Water UK partnership for the UN Race to Zero.

UUS RAPID Query Consolidated

Report



RAPID Query Reference : UUS 006

Query : Please clarify the difference between capex cost values reported in Table 11 and those reported in Table 12.

Response:

Table 11 summarises the CAPEX Net Present Value (NPV) obtained by the All Company Working Group (ACWG) agreed methodology, which includes the weighted average cost of capital (WACC). Table 12 summarises the CAPEX estimates by UU's estimating team.

Query : Please clarify how your projected solution cost estimates have changed between total solution costs submitted in WRMP19 or those proposed at PR19 and the current Gate 1 submission, where possible providing a breakdown and comparison of the cost estimates where they are comparable. Please explain clearly any changes, added/eliminated cost items or activities, or developments that contributed to the difference. Where possible, please use data in WRMI tables for a more detailed cost comparison. If costs have not been published in WRMI tables, please use the next best data source available.

Response:

We are proposing 27 options which is an increase in the 11 options proposed at PR19 due to a number of factors, please refer to 11.1.2, but which will provide flexibility to accommodate environmental, engineering and customer acceptability challenges. As a result only 9 of the 27 options are comparable in the two submissions and they will require further detailed assessments as part of Gate 2.

The reasons for the changes in the costs between PR19 and the options submitted at Gate 1 are summarised below:

* Increase in options scope due to further definition in design. For example at Bold Heath BH we have increased the scope of the solution in the following areas:

- o Conversion and increase in size of GRP kiosks to steel kiosks to accommodate electrical works / transformers.

- o Provision of outfall structure in impounding reservoir embankment required to safely discharge pumped flow from Boldheath into the reservoir.

* Optimism Bias was added based on the ACWG Cost Consistency Methodology (typically 24% – 27%)

UUS RAPID Query Consolidated Report



- * Change to construction costs using latest market information
- * Change in base date of prices
- * Project risk was increased from PR19 (based on UU commercial information).
- * UU Corporate Overhead has increased from PR19.

UUS RAPID Query Consolidated

Report



RAPID Query Reference : UUS 007

Query :

- 1) Please could you indicate any societal and amenity costs / benefits that have been considered for the scheme, and how these have been included in the AISC for best value analysis (such as with the UU methodology referred to).

Response :

The UUS solutions include (where possible) the reuse of existing assets to provide a cost effective solution (for customers). As submitted as part of our query response UUS001 the SEA report has also identified additional potential social and amenity benefits associated with the UUS SRO options including in respect of the creation of recreational opportunities, investment in local supply chains and the creation of jobs.

The AISC includes electricity and carbon data to calculate societal costs. Carbon costs consist of three aspects for each option:

* Implementation Related Carbon Costs - The carbon costs attributed to the design and implementation of the option, including vehicle movements during implementation of the option.

* Fixed Operation Related Carbon Costs – Fixed power required to operate the option and the number of vehicle movements per year.

* Variable Operation Related Carbon Costs - The variable carbon costs attributed to the operation of the option, including power.

Electricity consumption is converted into CO2 equivalent using an 'electricity emission factor' which was obtained from the HM Treasury Greenbook Supplementary guidance (Data tables 1 to 19 for Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal). This emission factor is profiled over the planning period.

Societal and amenity costs / benefits will be assessed in more detail in Gate 2.