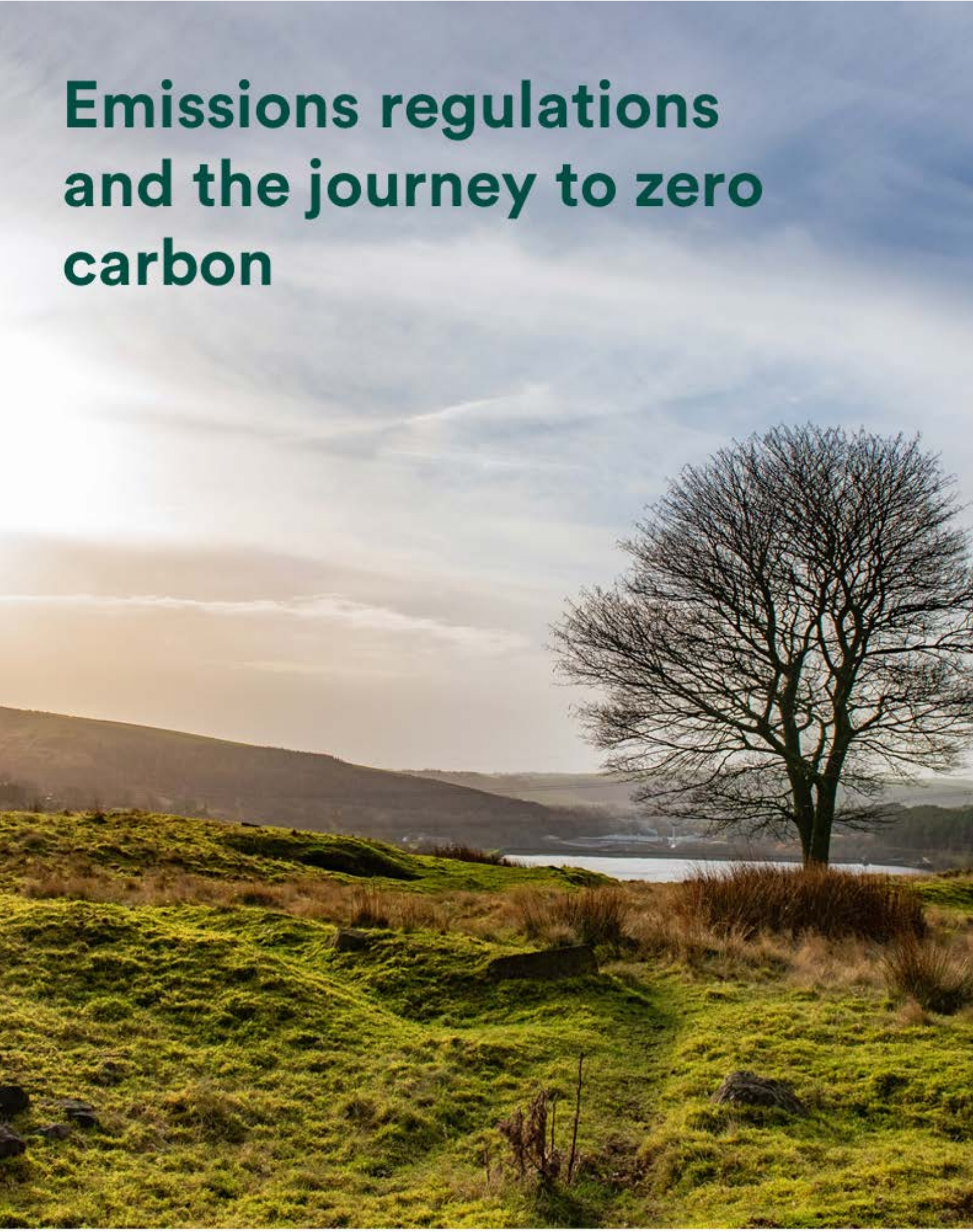
Emissions regulations and the journey to zero carbon



United Utilities

Water for the North West

Emissions regulations and the journey to zero carbon

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2. Glossary of terms

Term	Reference	Explanation
AD	Anaerobic Digestion	A process by which organic matter is broken down by microbes in the absence of oxygen to produce biogas and biosolids.
AAD	Advanced AD	A process designed to extract a greater quantity of biogas and produce enhanced quality biosolids for recycling.
AMP	Asset Management Plan (or Period)	An AMP is a water company's detailed description of its investment plans for its assets. AMP is often used as a shorthand name for the companies' business plans. See also Business Plan.
AMP7	Asset Management Plan 7	Refers to the planning period between 2020 and 2025.
AMP8	Asset Management Plan 8	Refers to the planning period between 2025 and 2030.
BAT (standards)	Best Available Techniques	BAT means the available techniques which are the best for preventing or minimising emissions and impacts on the environment. 'Techniques' include both the technology used and the way the installation is designed, built, maintained, operated and decommissioned.
BAT-AELs	Associated Emission Limits	Emission Limits set out under BAT.
BREF	Best Available Technique Reference Documents	BREFs bring together users' real-world experiences of BAT to provide reference information for regulators to use when determining permit conditions.
Cheshire Energy Hub	Cheshire Energy Hub	The Cheshire Energy Hub is an energy sector support organisation, which has been entirely funded and strategically driven by industry. It works with its member organisations and key stakeholders in promoting collaborative action, advancing the skills agenda and working towards business solutions to drive economic development in Cheshire and the wider North West region.
CCW	Consumer Council for Water	Consumer Council for Water represents the interests of water and sewerage consumers in England and Wales. It is funded directly by the Department for Environment, Food and Rural Affairs, which recovers the costs from the companies.
EA	Environment Agency	The Environment Agency is a Non-Departmental Public Body (NDPB) and carries out its statutory and regulatory functions with technical expertise, impartiality and transparency, principally across England and at arm's length from its principal sponsor, Defra. In addition, the Environment Agency also works with, and delivers duties on behalf of, a range of other UK Government departments.
Green Gas	Green Gas (biogas or biomethane)	A type of gas created from biodegradable material that offers an alternative to fossil fuel gas.
Green Recovery	Green Recovery	A joint initiative between the Government, the Environment Agency, Drinking Water Inspectorate, Ofwat and Consumer Council for Water (CCW) wherein water companies put forward proposals that can help to meet the economic and social challenges England faces building back greener from the COVID-19 pandemic, and delivering lasting improvements to the environment for current and future generations.

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Term	Reference	Explanation
IED	Industrial Emissions Directive	A European Union Directive which commits European Union member states to control and reduce the impact of industrial emissions on the environment.
IPCC	Intergovernmental Panel on Climate Change	The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations that is dedicated to providing the world with objective, scientific information relevant to understanding the scientific basis of the risk of human-induced climate change, its natural, political, and economic impacts and risks, and possible response options.
Net zero	Net Zero Carbon	Means that any carbon emissions are balanced by absorbing an equivalent amount from the atmosphere in order to meet the 1.5°C global warming target in the Paris Agreement
Normal Meter Cubed	Normal Meter Cubed	Unit of gas measurement. The 'Normal' refers to normal conditions of zero degrees Celsius and one standard atmosphere of pressure.
Northern Hub	Northern Hub	Refers to a sludge treatment solution for the North of our region to treat 30,000 tDS of sewage sludge per year. We are engaging with the market (through a Prior Information Notice) to identify the best option to deliver this capacity.
ouE	ouE	Odour concentration is expressed in multiples of European Odour Units (ouE), which is similar in concept to a 'dilution to threshold'.
physico-chemical	physico-chemical	Type of permit for sites that treat waste through a physical or chemical process
PR19	Ofwat's Price Review for AMP7 2021-2025	The process of setting appointed water companies' price limits.
PR24	Ofwat's Price Review for AMP7 2026-2030	- The process of setting appointed water companies' price limits.
RACI	Responsibility assignment matrix	A tool used to describe the participation by various roles in completing tasks or deliverables: - Responsible for action - Accountable (yes / no decisions) - Consult before (2 way) - Inform after (1 way)
tCO2e	Tonnes of carbon dioxide equivalent	Unit of measurement for greenhouse gas emission reporting.
THP	Thermal Hydrolysis Process	Thermal Hydrolysis Process is a pre-treatment for Anaerobic Digestion.
WAMITAB	Operator competence scheme	Operator competence scheme (sometimes known as 'WAMITAB') is designed to allow permitted waste facilities in England and Wales to demonstrate they employ technically competent people with the knowledge and skills to ensure waste sites comply with Environmental Permitting Regulations (2007).
WINEP	WINEP	Water Industry National Environment Programme
WISER	Water Industry Strategic Environmental Requirements	WISER is issued jointly by the Environment Agency and Natural England to describe the environmental, resilience and flood risk obligations that must be taken into account when developing business plans.

3. Introduction

3.1. Purpose of this document

3.1.1. The purpose of this document is to present the opportunity to accelerate required AMP8 enhancement investment in to AMP7 to achieve Industrial Emissions Directive (IED) regulatory compliance and reduce carbon emissions, as part of a Green Recovery programme proposed by United Utilities.

3.2. Structure of this document

3.2.1. This document sets out our Green Recovery proposal for accelerating IED compliance, why we believe this additional enhancement requirement should be accelerated from AMP8 into AMP7 and details how we will achieve this.

3.2.2. We have divided our proposal into the following sections:

(a) Section 4 summarises our case for accelerating IED enhancement requirements into AMP7

(b) Section 5 provides an overview of the IED, its implementation in the water sector and additional compliance requirements for our business

(c) Section 6 and 7 present how we have developed and defined our optimised investment programme for AMP7. Alongside this, we set out an innovative opportunity to engage with markets to deliver IED compliance across four sites and reduce carbon emissions

(d) Section 8 and 9 provides evidence of our customer support for this project and benefits of accelerating investment, e.g. job creation to support the Green Recovery

(e) Section 10 and 11 sets out our approach to demonstrating value to our customers and also further opportunity to share learning to support wider sector efficiencies for the implementation of the IED.

(f) Finally in Section 12 we provide an overview of our collaborative work with third parties to develop this project.

3.3. Assurance of this submission

3.3.1. We have applied an overarching assurance framework to the Green Recovery programme. This framework was managed by a dedicated assurance work stream which defined and oversaw the implementation of the governance and assurance activity. The framework identified the key deliverable components of the business case and assigned accountable owners using a RACI matrix. Each key deliverable of the business case was risk assessed against the likelihood and consequence of potential errors. This informed the minimum level of assurance that was required for each deliverable. The assurance process assessed the narrative and evidence provided for each component area against the requirements of the Green Recovery programme. Component parts identified as low have been assured by project teams, medium by the Economic regulation and corporate audit teams, and medium-high and high have received independent specialist external assurance[1].

[1] Further details of our assurance framework can be found at the following url: https://www.unitedutilities.com/corporate/about-us/performance/Assuring-our-performance-2020-25/

4. The case for acceleration

4.1.1. The Environment Agency first notified the industry in April 2019 that IED regulations apply to the biological treatment of sewage sludge. It was later confirmed in July 2019 that implementation of the regulations would commence. This was a significant development of the EA's previous guidance in 2014, which deferred the need to obtain IED environmental permits (a position that was further confirmed by it not being included within the WISER or subsequent WINEP publications). Implementation of IED will drive environmental improvements through management systems and enhancement investment to meet Best Available Technique (BAT). The BAT requirements are set out in the 2018 BAT reference document and contain additional and more onerous environmental requirements than required within our existing permits. Details relating to IED regulations is presented in section 5.3.

4.1.2. We recognise the regulators' "Green Recovery" criteria that proposals should reflect enhancement costs rather than base service costs. It is unambiguous that IED investment requirements in AMP7 and AMP8, to meet the now clarified applicability of IED regulations (2013), are legitimate enhancement costs and do not reflect base service costs. We present further evidence on this point in section 5.4.

4.1.3. The regulations are implemented through the need to obtain and operate under IED permits which determine site-specific requirements. We have identified 31 sites that require IED permits and improvement conditions. The EA has issued a permitting schedule to run from April 2021 to July 2022 for IED permits to be obtained.

4.1.4. The timescales for permitting sites runs right up to the original date for EU Member States compliance with IED, August 2022. The EA recognises that, in many cases, improvement conditions (i.e. specified interventions to ensure that works are fully compliant) will be set out within permits. For those requiring capital investment, this is then expected to be delivered after the August 2022 deadline.

4.1.5. We are keen to support the development of a pragmatic approach to setting timescales and securing the resources for capital investment related to permit improvement conditions.

4.1.6. We consider the way to do this is for the next publication of the Water Industry Strategic Environmental Requirements (WISER) to explicitly include IED to communicate requirements to the water industry. This would provide a mechanism by which the water industry could plan to meet existing and future BAT requirements.

4.1.7. Any resulting investment requirements will then be submitted into the next available price control process, to ensure that the company has sufficient resources to meet the requirements. In this case that would mean PR24, for investment to be delivered during AMP8.

4.1.8. The Green Recovery criteria include for the acceleration of AMP8 enhancement investment into AMP7. Therefore, the capital investment that is required to meet IED improvement conditions in AMP8 could be accelerated into AMP7.

4.1.9. Our experience of waste permits, particularly relating to sludge disposal through our incineration plant, has enabled us to develop the capability and use our expertise to identify the total enhancement cost that is over and above the approved AMP7 price controls to comply with existing IED permits (subject to ongoing appeals) and BAT standards prior to new requirements published in the BAT reference document (BREF) 2018.

4.1.10. We are proposing to accelerate the total enhancement investment (£61m capex and £6.2m AMP7 opex) into AMP7 by delivering a programme of £67.2m in IED enhancement at 31 sites. Our overall programme has the potential to achieve the following key outcomes:

(a) Accelerate IED asset improvements at 31 sites from AMP8 into AMP7 to increase the level of protection for the environment from the harmful effects of industrial activities. This will reduce the environmental impacts of releases to land, air and water from our sludge treatment activities. This is through combination of improvement and protection measures based around the use of Best Available Techniques. Examples of enhancements include reducing odour impacts and other air emissions, alongside improvements such as containment of sludge storage and processing equipment.

(b) Recognising and responding to the need for economic stimulus through environmental improvement, the acceleration of this investment programme will create 142 jobs between 2022 and 2025[2].

4.1.11. Whilst this proposal represents the lowest whole-life cost to deliver IED enhancement, as part of our delivery, we will also explore the potential to deliver a combined IED solution for four sites. If this is to be taken forward we will look to utilise the IED investment that would have been required from these four sites to support a more innovative approach, including testing whether the market could provide a more efficient delivery route. Whilst the additional investment (i.e. any investment above the identified IED investment for these four sites) does not form part of our Green Recovery proposals, the opportunity would nonetheless be enabled by the rollout of our Green Recovery proposals for IED investment in AMP7.

4.1.12. The innovative solution would comprise engaging the market to provide a solution for 23,000 tDS per year IED compliant sludge treatment capacity. This approach would involve the cessation of digestion at sites and the potential to deliver greater environmental benefit, e.g. green gas production leading to step-change in carbon emissions reduction. Our approach to market engagement would follow a similar process to our ongoing Northern Hub programme of work.

4.1.13. We estimate that our indicative solution for this innovative approach would require capital investment [✂] at our Ellesmere Port bioresources facility. Through this indicative solution the following could be achieved:

(a) Reduce carbon emissions by approximately 14,200 tCO2e per year. This is equivalent to approximately 9% of United Utilities total annual operational carbon footprint.

(b) If delivered at Ellesmere Port, there is potential for future integration with the Cheshire Energy Hub[3] which will deliver integrated low-carbon energy infrastructure to drive regional and UK decarbonisation.

4.1.14. The value to customers from the above indicative solution is the potential for long term environmental benefits and additional job creation. We will not seek customer funding for the additional investment but would still seek to recover – as part of this proposal - the avoided IED investment required for the four sites if they continued current operation. This is because it would be part of the case to support any possible delivery of this innovative approach.

[2] See GR0001 – Supporting a Green Economic Review in the North West for more detail.

[3] https://www.cheshireenergyhub.co.uk/

5. Evidence of need

5.1. Introduction

5.1.1. This section sets out the evidence of the statutory need to meet the requirements of the Industrial Emissions Directive.

5.2. Structure of this section

5.2.1. In this section we set out the following;

(a) The IED environmental statutory driver. This will include the regulatory background and confirmation by the EA in July 2019 that IED applies to the biological treatment of sewage sludge. It will outline the permitting requirement to meet Best Available Techniques (BAT) and the permitting schedule that will define the site specific regulatory obligations.

(b) The implementation requirements to deliver IED.

(c) The 2020-2025 Water Industry Strategic Environmental Requirements (WISER), notably the absence of IED from these requirements and the sludge related expectations that are included.

(d) Reasons why IED is legitimately AMP8 enhancement investment.

5.3. Statutory Driver - Industrial Emissions Directive (2010)

5.3.1. This section summarises the background and implementation of IED regulations by the Environment Agency (EA) and sets out the reasons why this is a legitimate enhancement investment programme to be included as part of our Green Recovery proposal.

Regulatory Background

5.3.2. This section provides a background timeline regarding the key communications from the EA in relation to whether IED applies to sludge treatment activities and when it was confirmed that it is a statutory driver that applies to our sludge activities.

5.3.3. Directive 2010/75/EU on industrial emissions (IED) entered into force on 6 January 2011 and was transposed into UK regulations on 20 February 2013. IED recast the Directive on Integrated Pollution Prevention and Control (IPPC) and introduced a revised schedule of industrial activities falling within scope of its permitting requirements. The schedule of waste management activities includes the recovery of non-hazardous waste involving biological treatment, but excludes activities covered by the Urban Waste Water Treatment Directive (UWWTD).

5.3.4. Up until 2013, a subset of our sludge treatment sites, which had a link to the disposal outlet at our incineration plant, were operating in compliance with IPPC permits. In 2013 the EA led a variation process that sought to change these permits to IED permits. We appealed the permit variations as there was much disagreement about whether the biological treatment of sewage sludge was an activity covered by the UWWTD.

5.3.5. In July 2014 the EA issued the “Industrial Emissions Directive – Waste Sector update” which formally deferred permitting requirements to allow time for further consideration of the regulations and the interpretation of the UWWTD exclusion clause[4].

[4] GR0005e - IED waste sector update - external_July 2014

5.3.6. In 2018, the EU published the Commission Implementing Decision (EU) 2018/1147[5] establishing Best Available Techniques (BAT) conclusions for waste treatment under IED. The EA deferral of permitting meant that this was not required to be implemented.

5.3.7. In 2018, the EA published the WISER, which sets out anticipated environmental improvements to be required by water companies over 2020-2025. This did not include any reference to IED, in keeping with the EA's deferral of IED permitting requirements.

5.3.8. In April 2019 the Environment Agency tabled a discussion paper at Water UK in relation to IED. It stated:

> *"All of the UK environmental regulators have now concluded that the biological treatment of sewage sludge is not an activity covered by the UWWTD and is therefore within the scope of the IED. This unanimously held view has been communicated to the UK and devolved governments with a view to commencing implementation."*[6]

5.3.9. It went on to describe the implementation as*:*

> *"Ensuring all installations involving the biological treatment of sewage sludge obtain and operate under an environmental permit in as short a timescale as can reasonably be achieved."*

5.3.10. In July 2019, the EA wrote to companies to inform us that the EA was now implementing this aspect of IED[7]. This marked the first time that the IED regulations have been formally confirmed to apply to any of our (and the whole water industry's) sludge treatment activities and has significant implications for the whole water industry. See Section 5.4 for details.

5.3.11. This change in implementation to include all biological treatment of sludge sites and the additional requirements to increase environmental protection included in the 2018 BAT reference document (BREF), along with the EA recognising the need to have improvement conditions specified in permits, makes it clear that this is enhancement and not base expenditure.

5.3.12. Bioresources base expenditure approved at PR19 only included the cost of pre-existing annual permit costs, operational expenditure to undertake regulatory monitoring and reporting on pre-existing permitted sites, and additional efficient cost of sludge transport where pre-existing permit conditions prevent the acceptance of thickened sludge leading to increased haulage distance. (i.e. costs assumed at PR19 did not include any costs related to implementation of the 2013 IED Regulations.)

Implementation

5.3.13. This section explains that there are two aspects of IED that drive a new scope of environmental improvements leading to enhancement investment requirement. It sets out the permitting schedule, BAT requirements, the use of risk assessment for existing assets, the use of improvement conditions in permits to allow time to achieve BAT standards and the need for extensions beyond 2022 to be discussed with DEFRA.

5.3.14. Firstly, the extent to which the regulations applies to each site. This is not just the sites previously permitted under IPPC, rather IED regulations apply to all sites undertaking the biological treatment of sewage sludge.

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ:L:2018:208:TOC&uri=uriserv:OJ.L_.2018.208.01.0038.01.ENG

[6] A discussion paper for the April 2019 Water UK and EA Strategy Steering Group (see GR0005c – 20190402 SSG paper on IED)

[7] Letter from David Dangerfield (EA) (see GR0005i – UU 201907 IED letter to WASCs).

5.3.15. Secondly, the permit conditions are based around the use of BAT. It is unequivocal that BAT techniques and conclusions will introduce a new scope of enhancement requirements that we must comply with.

Best Available Techniques for Waste Treatment under the IED

5.3.16. It is a requirement of IED that permit conditions, including emission limit values, must be based on the Best Available Techniques (BAT).

5.3.17. The BAT reference (BREF) document for Waste Treatments Industries was published in August 2006 and this, in conjunction with the EA guidance document S5.06 "Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste"[8], formed the BAT guidance for waste treatment installations (including those UUW sludge treatment sites already permitted) until August 2018.

5.3.18. On 10 August 2018 the EU published the Commission Implementing Decision (EU) 2018/1147 establishing Best Available Techniques (BAT) conclusions for waste treatment under IED. This provides the formal BAT standards that must be applied to relevant waste treatment installation permits and member states are required to have applied these BAT standards to all relevant sites/permits within 4 years of publication of the Decision (by 9 August 2022). The EA is expecting applications from Water Companies to address the relevant BAT and BAT Associated Emission Levels (BAT-AELs) within the Implementing Decision.

5.3.19. The Implementing Decision includes a range of BAT conclusions and emission levels associated with BAT (BAT-AELs) that go above and beyond BAT guidance within the original BREF and S5.06. These include (but are not limited to):

(a) An inventory of waste water and waste gas streams

(b) Periodic monitoring of odour emissions where an odour nuisance at sensitive receptors is expected and/or has been substantiated

(c) Treatment of channelled emissions to air from biological treatment of waste to BAT-AEL (e.g. odour concentration 200 – 1,000 ouE/Nm[9])

(d) For AD, monitor and/or control the key waste and process parameters

(e) Undertaking a leak detection and repair programme for diffuse emissions to air

(f) Containment, collection and treatment of diffuse emissions, in particular dust, organic compounds and odour

(g) Application of BAT-AELs for odour being applied at the end of the stack rather than considering impacts at the nearest sensitive receptors.

5.3.20. Guidance on IED and BAT following the UK withdrawal from the EU is summarised as follows:

> *The EU Withdrawal Act 2018 maintains established environmental principles and ensures that existing EU environmental law will continue to have effect in UK law, including the IED and BAT Conclusion Implementing Decision made under it…. The UK government has made*

[8] https://www.gov.uk/government/publications/sector-guidance-note-s506-recovery-and-disposal-of-hazardous-and-non-hazardous-waste

[9] The odour concentration is expressed in multiples of European Odour Units (ouE), which is similar in concept to a 'dilution to threshold'.

secondary legislation to ensure the existing BAT Conclusions continue to have effect in the UK, to provide powers to adopt future BAT Conclusions in the UK and ensure the devolved administrations maintain powers to determine BAT through their regulatory regimes[10].

5.3.21. Following notification by the EA of its intent to commence implementation of IED, we have identified the sites that now require IED permits. This generates an increase in the number of our sites that fall within the scope of IED regulations and require permits. We confirmed 24 sites require a permit variation and 7 anaerobic digestion sites need permits for the first time.

5.3.22. The EA has set out a permitting schedule in November 2020, covering all water and sewerage companies operating in England, to run from April 21 to July 22[11]. This will therefore formally establish the requirement of IED regulations and BAT obligations for our activities across 31 sites by July 2022.

5.3.23. We have been working with the EA and others to understand how to apply the latest BAT standards. We have been able to develop site specific proposals by drawing from the precedent of existing permits we hold, subject matter experts within the business, third party consultants with extensive permitting experience, non-intrusive site surveys and available technical guidance.

5.3.24. Some BAT requirements will involve changes to procedures. We will make modifications to operational processes to manage environmental risk in the short term. Where it is appropriate, we will prioritise management and monitoring techniques to demonstrate BAT compliance on an ongoing basis in preference to capital investment works.

5.3.25. The EA recognises that many sludge treatment facilities were constructed prior to the current permitting requirements and their design may not be compatible with the Best Available Techniques as described in the BREF documents. Where this is the case, risk assessments can be used to demonstrate that an equivalent level of environmental protection is being or can be achieved.

5.3.26. After the risk assessment process has been applied, in many cases the BAT enhanced environmental standards drive the need for capital investment. The EA recognises that there may be a need for some significant capital projects and have stated that, where additional measures are required, it will use improvement conditions within permits to allow time to achieve the BAT standard.

5.3.27. We have discussed our approach, rationale and assumptions for developing the scope of work to deliver BAT requirements with the EA. This is set out in more detail in section 7. The discussion was very constructive and confirmed to us that the process we had followed and key assumptions we had used to scope BAT requirements is aligned with their high level expectations. This gives us confidence that the investment programme set out in this proposal meets the EA expectation that companies should begin planning for large infrastructure projects, if necessary in advance of receiving a permit.

5.3.28. This overall approach will ensure we comply with the aim of obtaining and operating under an IED permit by the August 2022 deadline.

5.3.29. Considering the timescales for permitting sites runs right up to the August 2022 deadline, it is clear that improvement conditions that will be set out within permits, particularly those requiring capital investment, and will go beyond the August 2022 deadline.

5.3.30. Without the need to support UK economic recovery through Green Recovery, investment needed for IED enhancement requirements would be submitted as part of our PR24 business plan for delivery in

[10] https://www.gov.uk/guidance/industrial-emissions-standards-and-best-available-techniques

[11] GR0005h – Permitting schedule tranche list.

AMP8. The "Water Industry Strategic Environmental Requirements (WISER)" is the route to support this.

Water industry strategic environmental requirements (WISER)

5.3.31. IED is not explicitly identified in the current Water Industry Strategic Environmental Requirements (WISER)[12]. The WISER Appendix lists many Directives and Regulations but Directive 2010/75/EU on industrial emissions (IED) is not listed, and whilst there is a reference to Environmental Permitting Regulations which links to other guidance, there is no reference to IED.

5.3.32. The absence of IED from the WISER is in line with the EA deferral position in place at the time the WISER was produced. The next publication of the WISER should explicitly include IED to reflect the change in regulatory implementation position; that IED applies to the biological treatment of sewage sludge.

5.3.33. The WISER does identify good practice in relation to sludge; the EA expect to see the development of new markets and the wider use of sludge, including renewable energy production via advanced anaerobic digestion. The innovative opportunity we have outlined aligns with this good practice (Option 3 in section 6.4).

5.3.34. Although IED is not explicitly identified in the WISER, the environmental improvement that will be delivered through implementing IED permits, especially improvement conditions requiring capital investment, is a valid enhancement requirement. The next section sets out the reasons why IED is legitimately enhancement investment.

5.4. Reasons why IED is legitimately enhancement investment

5.4.1. As we have set out above, IED regulations were enacted in 2013 and then implementation formally deferred by the EA in 2014. The EA decision to implement IED was communicated to companies in July 2019.

5.4.2. At that point the EA clarified the applicability of IED requirements (i.e. all sites which undertake the biological treatment of sewage sludge). We have identified:

(a) 7 Anaerobic Digestion (AD) sites required to be permitted under IED for the first time.

5.4.3. The EA also clarified the permitting requirements, including improvement conditions, by which investment requirements are established. It also clarified the BAT standard by which we need to comply, which was updated in 2018, 5 years after the regulations were enacted. We have identified a further;

(a) 9 AD sites, holding existing IED permits (in abeyance), will need to re-apply for permits to demonstrate compliance with the standards set out in 2018 BAT conclusions document.

(b) 15 physico-chemical sites, which hold existing IED permits (under appeal), will need to re-apply for permits to demonstrate compliance with the standards set out in the 2018 BAT conclusions document.

5.4.4. To demonstrate the scale of this change, it is worth noting that these 24 existing IED (under appeal) sites (linked to our now closed incineration plant at Shell Green) that we had already made compliant

[12] https://www.customer-panel.co.uk/media/1017/water-industry-strategic-environmental-requirements-wiser.pdf

with previous BAT standards (2006) now require a further £15m of additional improvements across those sites to meet the 2018 BAT.

5.4.5. The IED permits are due to be in place by July 2022 (albeit that these will specify further improvement conditions to be met. It is the cost of implementing these enhancement improvement conditions that we are stating are AMP8 enhancement investments, which could be accelerated into AMP7 as part of our Green Recovery proposals).

5.4.6. Therefore, a number things make it clear that this is enhancement investment:

(a) It is the result of new regulations (i.e. IED Regulations in 2013), albeit there has been a significant delay in their implementation.
(b) We have not, to date, been required to invest in sludge treatment centres to meet those regulations (i.e. the enhancement requirements from the 2013 Regulations have not yet been implemented).
(c) The IED expenditure allowed at PR19 only reflected the ongoing maintenance of our existing permits. To be clear, the implementation of the new 2013 Regulations (and 2018 BREF) had also not been applied to the works operating those permits. This is because they were also covered by the EA's deferral (as the EA had agreed to hold in abeyance the appeal of IED permits originating from PPC permits, pending its review of the applicability of IED to sludge treatment). Hence, the EA only clarified that IED related investment to meet the 2013 Regulations was required once it had clarified its position in July 2019.

5.4.7. Therefore, for these reasons, it is unambiguous that any IED investment requirements in AMP7 and AMP8, to meet the (now clarified) 2013 IED regulations, must be enhancement, and not base service costs.

5.4.8. The EA has stated "This does not reflect a change in regulatory position[13]" as for the EA it represents confirmation of its original intention for IED. It is nonetheless confirming, for the first time, the need for the water industry to comply with the 2013 IED regulations. Therefore the July 2019 notification presents a new enhancement requirement to meet those regulations. It would certainly be incorrect to imply from the EA's statement that this was merely the continuance of an already established regulatory requirement.

5.4.9. The fact that the Regulations were enacted in a different AMP to the investment requirements does not justify these requirements being considered as base cost. By way of comparison, the Urban Waste Water Treatment (England and Wales) Regulations were enacted in 1994, and yet have led to enhancement requirements being recognised in the EA's National Environment Programmes over the course of many subsequent AMPs (including AMP7).

5.4.10. Therefore, it is reasonable for us to expect that investment required to meet the 2013 IED regulations should be enhancement expenditure. This appears to be in line with Ofwat's recently published comments as part of the current CMA hearings on PR19.

> *"We do not consider it appropriate to treat this provisional allowance as an unmodelled base cost allowance. In our final determinations we allowed some companies unmodelled opex costs relating to the costs of administering existing IED permits. We consider capex costs to meet new IED requirements are enhancement costs and therefore not necessarily*

[13] GR0005b – 060121 UU Green Recovery and IED Response.

governed by the same cost sharing regimes as other unmodelled costs area. If the CMA continues to make an allowance it should be considered as an enhancement allowance" [14].

5.4.11. Furthermore, the omission of IED requirements from the WISER and subsequent WINEPs covering AMP7 (which is the route by which the EA communicates required enhancements) had previously led us to the reasonable conclusion that the EA was not going to be requiring the resulting investment to be implemented in AMP7.

5.4.12. Considering the timescales for permitting sites runs right up to the August 2022 deadline, it seems clear that improvement conditions that will be set out within permits, particularly those requiring capital investment, would be expected to go beyond the August 2022 deadline.

5.4.13. We are keen to support the development of a pragmatic approach to setting timescales and securing the resources for capital investment related to improvement conditions.

5.4.14. We consider the way to do this is for the next publication of the WISER to explicitly include IED to communicate requirements to the water industry. This would provide a mechanism by which the water industry could plan to meet existing and future Best Available Technique (BAT) requirements.

5.4.15. Any resulting investment requirements would be submitted into the next available price control process, to ensure that the company has the sufficient resources to meet the requirements. In this case that would mean PR24, for investment to be delivered during AMP8.

5.4.16. The Green Recovery criteria includes for the acceleration of AMP8 enhancement investment into AMP7. Therefore the capital investment that may have been expected to meet IED improvement conditions in AMP8 could be accelerated into AMP7. We consider this programme to represent the best opportunity to implement IED in as short a timescale as can reasonably be achieved.

5.4.17. In the event that the business case is not progressed through the Green Recovery, we intend to submit these enhancement requirements for inclusion in the next price review submission at PR24, with delivery in AMP8. We do not see any other reasonable way of managing the delivery of change in requirements, other than as part of AMP8, or as part of Green Recovery.

[14] https://assets.publishing.service.gov.uk/media/5f97f5f7e90e077b01f69a42/Costs_and_Outcomes_-_response_to_CMA_provisional_findings.pdf

6. Evidence of optimised option

6.1. Introduction

6.1.1. This business case relates to meeting environmental regulations for the treatment of sewage sludge. This requires interventions on existing operational sites. As such, it is consistent with the proper functions of a sewerage undertaker. This section describes the approaches that have been considered to deliver IED enhancement requirements.

6.2. Structure of this section

6.2.1. This section sets out the options that have been considered, including a description, cost, advantages and disadvantages. A summary is then provided to compare the options, establish the preferred option and set out an opportunity to reduce carbon emissions in line with the Climate Change Act.

6.3. Options assessment

6.3.1. The focus of optioneering has been to identify the best approach to meeting IED requirements whilst also applying the principles of systems thinking to deliver an efficient solution across all of our sites. We have considered 5 options and through a subject matter expert review process narrowed the options to a short list of 3:

1. IED investment at all 31 sites.
2. IED investment at 28 sites, with sludge from 3 sites that have limited asset life exported to reclamation outlets.
3. IED investment at 27 sites, with sludge from the remaining four sites treated in a combined solution (which would be market tested to identify the best solution available).

6.3.2. The following options were identified and discounted at the early stages of the optioneering process:

4. Do nothing: this option was discounted as we must operate our assets to meet legal requirements and “do nothing” would result in environmental non-compliance.
5. Alternative treatment for all sludge: this option was discounted as the additional costs involved in delivering IED compliance are small when compared to the cost of building new assets to treat the sludge.

6.3.3. We have followed two separate processes to estimate costs. The first relates specifically to IED requirements (set out in Section 7) and the second is for a reference solution at Ellesmere Port which has been developed based on previous competitive tender submissions received for similar work.

6.3.4. During the optioneering process, a financial assessment of the options was completed using the UU Investment Appraisal Model (IAM). The model uses the estimated capital and operational costs to generate a Net Present Value (NPV) which reflects the whole life costs of each option.

6.4. Options

This section sets out the three options that we considered in more detail.

Option 1 - IED investment at all 31 sites

6.4.1. In this option, every site requiring a permit and improvement conditions is addressed on a site by site basis. The capital cost for IED compliance across the 31 sites is £61.0m and the IED opex in AMP7 is £6.2M (the annual IED opex cost of £2.3m is incurred from August 2022), therefore the total enhancement cost in AMP7 is £67.2m. A table of the estimated costs for IED enhancement is shown in Section 7.3.

6.4.2. The main advantage of this option is that it is the most straightforward in terms of identifying scope and estimating the capex and opex enhancement costs. The investment delivers IED compliance across all 31 sites to which IED requirements apply. The main disadvantage is that it will commit current and future investment to all 31 sites.

Option 2 - IED investment at 28 sites, sludge from 3 sites exported to reclamation.

6.4.3. In this option, IED enhancement investment is undertaken at 28 sites in the same way as option 1. This option is different in that IED investment is not made at the three digestion sites which have been identified for potential cessation of digestion in the longer term (due to efficiency to operate and maintain). Instead, biological sludge treatment activity at those sites is ceased so waste permitting (IED) requirements are reduced and the raw sludge is exported to reclamation outlets. The volume to be exported would be circa 8,000 tDS per year, approximately 4% of regional sludge produced in 2020.

6.4.4. This option is straightforward in terms identifying scope and estimating the costs to deliver IED compliance at the 28 sites that will continue to treat sludge. It also achieves this with a lower capital cost than option 1, as IED costs at 3 sites are avoided. The capital cost of this option is £51.5m. The annual opex is £4.3m, which is £2.0m higher than option 1 as a result of IED opex costs being incurred at 28 sites rather than 31, plus the opex impact of taking additional sludge to reclamation. Therefore the total enhancement cost in AMP7 is £63.1m, which is £4.1m lower than option 1.

6.4.5. In terms of disadvantages, whilst this option has a low initial capital requirement, the high opex cost of exporting sludge to reclamation sites and the associated loss of energy generation revenues results in the 20 year NPV of option 2 being £20.2m worse than option 1. In terms of non-financial performance, reclamation outlets are not attractive from an environmental sustainability perspective and they do not provide the resilience that the business requires, as they do not provide guaranteed capacity in the long term.

Option 3 - IED investment at 27 sites, plus sludge from four sites treated in a combined solution.

6.4.6. In this option, IED enhancement investment is undertaken at 27 sites. The IED investment is not made at the three digestion sites summarised in option 2. In addition, the IED investment is not made at Ellesmere Port. Instead we would engage the bioresources market to find a solution to manage 23,000 tDS/year of sludge. This represents approximately 12% of regional sludge produced in 2020 and is equivalent to the capacity of the four digestion sites. The solution would also provide resilience to the regional system.

6.4.7. Climate change is an important driver with implications for bioresources activities which accounted for 46% of our company operational carbon emissions in 2019-2020. The UK Government created a legally binding net-zero carbon target by 2050 via an amendment to the Climate Change Act. The WISER references the need to comply with the Climate Change Act. It sets out an expectation that we

should continue to contribute to the government's emission reduction targets. This option 3 will enable us to develop a low carbon solution now that supports both short and long term government targets to mitigate climate change.

6.4.8. This option creates the opportunity to engage with the wider bioresource market to explore alternative routes for potentially innovative and more efficient sludge treatment capacity. We would compare the best option that the market can provide to the most efficient solution that we could deliver, which is an advanced anaerobic digestion and gas to grid (biomethane) plant at Ellesmere Port sludge treatment centre, which would be built to meet IED requirements.

6.4.9. This option is difficult to fully evaluate as the whole life cost cannot be determined at this stage. There is uncertainty over how the market would provide sludge treatment capacity, what it would cost and what the environmental benefits might be. However the reference solution has indicated in an initial capital requirement [✂] and a potential annual carbon reduction of 14,200 tCO_2e.

6.4.10. We are proposing to continue to progress this work to understand the market interest, the costs and benefits of alternative solutions.

Analysis of options

6.4.11. This section sets out the analysis of the three options and a comparison is summarised below in Table 1 - Comparison of options.

Table 1 - Comparison of options

	Option 1	Option 2	Option 3
Description	IED investment at all 31 sites	IED investment at 28 sites, sludge from 3 sites exported to reclamation.	IED investment at 27 sites, plus sludge from four sites treated in a combined solution *
IED compliant	Yes	Yes	Yes
Bioresources market opportunity (proportion of regional sludge production)	No	No	Yes - 11.6% of regional sludge production
UU carbon emissions reduction	No change	Reduce renewable energy generation	Reduce carbon emissions by 9%
Initial capex (£m)	61.0	51.5	[✂]
Annual opex cost (£m)	2.3	4.3	To be determined
Total AMP7 Cost (£m)	67.2	63.1	To be determined
20 year NPV (£m)	71.8	91.1	To be determined

* Option 3 shows capex and carbon values for the reference solution (AAD and gas to grid at Ellesmere Port)

6.4.12. All 3 options would deliver IED compliance, albeit with different costs, benefits and risks.

6.4.13. Whilst option 1 has a higher total cost in AMP7 than option 2 (£67.2m vs. £63.1m) it delivers a more sustainable outlet for biosolids at a lower whole life cost (the 20 Year NPVs are £71.8m vs £91.1m respectively).

6.4.14. In comparison to option 3, option 1 has greater certainty of scope and delivery route, therefore we have a higher degree of understanding and confidence in the cost estimates and financial analysis of option 1.

6.4.15. Option 1 is our selected option for this Green Recovery business case.

6.4.16. Whilst option 1 is our selected option we will continue to explore option 3 to establish whether it could deliver better value. If it can, then option 3 would be taken forward and we will look to utilise the IED investment that would have been required from the four digestion sites to support this more innovative approach. This would include a market test to ensure the most efficient solution was identified. Whilst the additional investment for option 3 (i.e. any investment above the identified IED investment for the 31 sites) does not form part of our Green Recovery proposals, the opportunity would nonetheless be enabled by the rollout of our Green Recovery proposals for IED investment in AMP7.

7. Evidence of efficient delivery

7.1. Introduction

7.1.1. This section sets out how we have ensured that we have developed both; an efficient scope of works across the sites to demonstrate IED compliance; and that the cost of delivery is efficient.

7.1.2. The requirements for IED compliance will be site specific and will only be finalised once IED permits are in place. However, the permitting process does not start until April 2021. In addition, some EA technical guidance are not yet available, such as the 'Appropriate Measures for the Biological Treatment of Waste' publication. Therefore in developing our proposal, we have had to make a series of assumptions about the likely scope of works that will be required at each site. The approach we have followed has been endorsed by the EA, more details are included in section 12.3, Third Party Views.

7.1.3. As we will set out in section 11, we will ensure that customers are protected by only recovering costs which are actually incurred once IED permits have been finalised. We will set up a third party assurance process to ensure that the outturn scope and implementation costs are efficient.

7.2. Structure of this section

7.2.1. This section sets out a cost summary table for IED compliance across the 31 sites. The section will then set out the process followed to develop these costs and how the scope of works has been derived. We will discuss the overarching principles and rationale we have followed in developing estimates and how, in lieu of permits or available technical guidance, we have validated this process and our assumptions with the EA. We will then go on to discuss industry benchmarking for IED costs and how we will demonstrate the efficiency of our costs.

7.3. United Utilities' contribution to delivery

Summary of costs

7.3.1. The cost of this programme of work is shown in Table 2 and Table 3. A summary of how the costs have been derived is provided in the following sections.

Table 2 - Summary of IED Implementation capex across the UU Asset Base

Site Type	No. Sites	Average cost per site (£m)	Total capex cost (£m)
First time IED permit for an AD Site	7	£6.6	£46.1
Existing IED permit (held in abeyance) for an AD Site	9	£1.0	£8.8
Existing IED permit (held in abeyance) for a physico-chemical site	15	£0.4	£6.2
Total	**31**	**£2.0**	**£61.1**

Table 3 - Summary of additional on-going annual opex costs resulting from compliance with the new IED permits

Site Type	No. Sites	Average cost per site (£m/yr.)	Total opex cost (£m/yr.)
First time IED permit for an AD site	7	£0.14	£0.98
Existing IED permit (deferred) for an AD site	9	£0.09	£0.81
Existing IED permit (deferred) for a physico-chemical site	15	£0.035	£0.52
Total	31	£0.075	£2.31

7.3.2. Cost estimates for compliance with existing IED permit conditions (currently held in abeyance) are excluded. Cost estimates have only been developed for the additionality associated with:

(a) Confirmation that IED applies to all sites undertaking the biological treatment of sewage sludge;

(b) Meeting standards required within the 2018 BAT conclusions document;

7.3.3. The costs included in our Green Recovery submission are those costs associated with the acceleration of anticipated AMP8 enhancement only (i.e. the delivery of improvement conditions that we otherwise expect to deliver in AMP8);

7.3.4. Our existing planned AMP7 spend is outside of the scope of Green Recovery and will be funded from our base allowance (as set out in section 10.4 company contribution) and includes:

(a) IED permitting costs (application fees and consultants fees)

(b) Costs to develop IED Improvement Plans for each site

(c) Survey works, as required, to develop permit applications. This will typically be visual inspection and use of historic information. Full survey works, e.g. CCTV of drainage systems, drain down of tanks etc. is included in the Green Recovery costs. These would normally be undertaken once permits have been received to support the demonstration of compliance with the permit conditions.

7.3.5. Our Green Recovery proposals therefore only include the enhancement investment that will be required in AMP8 to meet improvement conditions at each of our works.

Non-financial contribution to delivery

7.3.6. United Utilities has held multiple IED permits (in abeyance) since 2013. As such we have developed considerable internal capability in order to deliver the additional IED compliance work set out in this submission. We have experience in developing IED permit applications, undertaking risk assessments to avoid unnecessary capital investments and ensuring that we continue to comply with our permits.

7.3.7. Appropriate staff are WAMITAB[15] qualified and designated as technically competent persons in order to hold the permits. We have a dedicated internal team who fully understand our operating procedures and manage compliance with our permits. Furthermore, we have engaged and secured the resource of third party consultants to support our IED permit applications to ensure that we have the appropriate resource available to be able to deliver this work within the timescales set out within this document.

7.3.8. We will seek to re-use available information and data, such as odour modelling, air quality modelling, CCTV surveys and structural surveys inspections. Through re-use of this company information we will minimise the work required to demonstrate compliance with IED and the costs to our customers.

7.3.9. Delivery of this scheme will be through our engineering framework supplier. The nature of the work will require development of a portfolio of multiple projects, across 31 sites. We have experience of delivering work at all these sites, and project managing the work to ensure that it is delivered effectively and efficiently and as such we are confident that we have the technical skills and capabilities to deliver this work. Furthermore we will drive delivery efficiencies through batching at a programme level or with other on-going projects at site level.

7.3.10. Our internal subject matter experts across multiple engineering disciplines will oversee asset surveys and any subsequent capital investment to ensure that the work meets the requirements of BAT.

7.4. IED investment programme at 31 sites

7.4.1. This section sets out how we have developed the appropriate scope and cost to meet IED requirements so that sludge treatment can continue as it does now.

Overarching principles for developing cost estimates

7.4.2. The full scope of works for ensuring IED compliance will not be finalised until the joint EA / UU permitting process is complete in 2022. A series of assumptions have been made over the likely works that will be required. This is based on precedent of the existing IED permit applications held in abeyance, subject matter experts within the business, third party consultants with extensive permitting experience, non-intrusive site surveys and available technical guidance.

7.4.3. We will use management and monitoring techniques to demonstrate BAT compliance in preference to capital investment works. We will seek to minimise scope wherever possible in order to ensure we are efficient in delivering IED compliance.

7.4.4. We will use risk assessment to demonstrate the environmental benefits of any investment that will be made, and to ensure we will only invest where there is demonstrable reduction in risk to the environment.

7.4.5. The costs to be included within our Green Recovery submission are those costs associated with the acceleration of anticipated AMP8 spend only. Our planned AMP7 spend is outside of the scope of

[15] WAMITAB - Operator competence scheme designed to allow permitted waste facilities in England and Wales to demonstrate they employ technically competent people.

Green Recovery and will be funded from our base allowance. The work to be accelerated from AMP8 is capital investment in assets required to meet BAT compliance or the capital costs of installation of monitoring to comply with new permit conditions.

7.4.6. The cost estimates developed for the Green Recovery submission are programme level costs across the 31 sites identified by the EA as requiring permitting under IED. Cost estimates include both capital and operational expenditure.

Process followed to develop cost estimates

7.4.7. We have followed a robust process to identify the scope of works and develop cost estimates to meet standards required by IED. The process we have followed is summarised in Table 4 below.

Table 4 - Summary of process followed to estimate the costs of IED Implementation

Process step	Description
1	Development of BAT Checklist. Checklist produced by third party consultants based on latest technical guidance to identify requirements for a site to meet BAT.
2	Survey of 31 UU sites by third party consultants (Sept to Nov 2020). BAT checklist used to identify any BAT non-conformances.
3	Development of 31 IED Improvement Plans by third party consultants (Nov to Dec 2020). Review of BAT surveys in conjunction with available desk based information to identify improvement actions required to demonstrate BAT. Improvement actions categorised as follows: 1. Identified issues/potential defect. Does not require any immediate rectification but should be monitored 2. Identified issue/defect. Requires rectification. 3. Major issue. Defect identified and needs to be rectified. 4. Catastrophic failure/major issue. Needs rectification either immediately or within 7 days. Identified improvements are a combination of survey work or capital improvements to demonstrate BAT compliance.
4	**Development of Level 1 Cost Estimates** Level 1 'top down' programme costs are based on WaterUK Cost estimates for IED Compliance. Water industry average costs for compliance were produced at an IED Costing Workshop in February 2020. This has been used as it is an industry benchmarked scope and cost for IED Compliance. Scale of need assigned for each element of scope, for each site. This is based on information from improvement plans and site surveys, precedent of previous IED permit application (currently held in abeyance) by UU, subject matter experts within the business and third party permitting experts. Requirement for each scope item at each site was categorised as follows: 0. No improvement needed 1. Minor Improvement 2. Does Not Meet Required Standards Cost were proportionally applied based on the categorisation.
5	**Development of Level 2 Cost Estimates** Detailed costing for 7 out of 31 sites. Cost estimates developed using UU estimating database. Scope of works derived from site specific Improvement Plans. Costs have been estimated as a proportion of full replacement costs from the UU estimating database, depending on the scale of the issue (inferred from Improvement Plan categorisation). Cost estimates have been assured using standard estimating processes.
6	**Development of IED Permit Monitoring Costs (capex and opex)** The specific requirements for site monitoring and control which will be included in permits to meet BAT standards are unknown. The requirements have been inferred from the BREF conclusions document and the first available permit to review (Hull STW, operated by Yorkshire Water). This permit has been reviewed by subject matter experts to identify the additionality in these permit requirements, over and above the existing IED permits that we hold in abeyance.

Process step	Description
	This scope of works has been developed and an asset review completed across the 31 sites to build up a cost estimate for installing monitors and future operational monitoring costs, based on the site specific asset base (type of asset, number of assets, monitoring already installed).
7	**Development of Opex Costs for sites which don't currently hold and IED Permit** Step 6 has identified the additionality in opex costs expected from meeting the latest BAT compliance, over and above existing IED permit requirements. 7 of 31 sites don't have an existing IED permit in place. For these sites an additional opex uplift is calculated to identify the additional cost of complying with current IED standards
8	**Overall Green Recovery Cost Calculation** Costs have been compared from Step 4 and Step 5. The costs developed in step 5, based on UU estimating database costs have been used to validate the costs developed in Step 4 at a programme level. Programme level costs have been added to capex and opex costs calculated in Step 6 and Step 7 to identify a total Green Recovery cost. Cost estimates for compliance with existing IED permits (in abeyance) or existing permit issues are excluded. Planned AMP7 costs such as permitting and survey costs to support permit applications have also been excluded from the total Green Recovery costs.

7.4.8. The process we have followed for identifying necessary IED improvement works was endorsed by the EA (Clive Humphreys) through an email confirming the minutes of a meeting on 6th January 2021. Further information is set out in section 12.3, Third Party Views.

7.4.9. At this meeting the EA further validated the specific technical assumptions we have made to ensure that the EA is in broad agreement with the scope we have developed as part of our Green Recovery submission. This covered specific areas around covering tanks, odour control and secondary containment of assets.

Cost Benchmarking

7.4.10. There are currently no agreed industry benchmarks for cost of compliance against the 2018 BAT reference document as this is a new regulatory requirement.

7.4.11. WaterUK completed a costing exercise for an AD site requiring an IED installation permit for the first time, using data from across the sector. This resulted in a capital cost estimate of almost £10m per site. This can be considered at the high end of the range as the exercise assumed a likely worst case scenario leading to a significant scope of improvement investments. However, it provided comparative costs across the sector for delivering IED compliance and the output was an average of company costs for each type of asset intervention.

7.4.12. We have used these average industry costs as the basis of our Level 1 programme level cost estimates. However, only a proportion of the scope, rather than the full scope has been applied for each site, using the intelligence gathered from the site surveys and IED improvement plans.

7.4.13. The WaterUK costs have then been validated using bottom up cost estimates, from our estimating database. The cost models to price the cost of interventions uses market tested information to develop robust cost estimates.

7.4.14. Our average outturn costs per site range from £400k for a physico-chemical site, already holding an IED permit in abeyance, to £6.6m for an AD facility which doesn't already hold an IED permit. This is significantly less that the WaterUK costing exercise.

Finalising of scope and costs

7.4.15. For IED investment we will work through the permit programme defined with the EA to confirm the scope of improvement and those improvements requiring capital investment. This will be conducted

over the period from April 2021 to July 2022. This will be undertaken in batches so investment needs will be defined as these are progressed. Once the investment needs are defined, we will conduct the required work to confirm the capital required.

7.4.16. We will ensure that we have an agreed permit with the EA, stating improvement requirements, before commencement of capital works to ensure that we deliver the site specific scope to meet IED requirements.

7.4.17. Costs will be managed at a programme level across the 31 sites. We anticipate that once intrusive survey work is complete we will adjust our scope and cost estimates for each site and manage the cost at a programme level.

7.4.18. The assurance process we propose in Section 11 Customer Protection, will ensure that only the efficient cost to deliver compliance will be paid for by customers. So in the scenario where the permit improvement conditions are delivered for less than £67.2m in AMP7, we will only pass through the costs we incur to customers.

7.4.19. For any projects that are still ongoing on 1st April 2025 we will set this out in our PR24 proposals to ensure that customers are not paying twice for the same investment.

7.4.20. Despite the publication of the 2018 BAT Conclusions document, it is still not clear how some of the BAT standards will be applied for sewage sludge treatment permits. The EA has yet to publish guidance including:

(a) Application of odour BAT-AELs[16] at end of stack rather than considering the impacts at nearest sensitive receptors. It is unclear whether the EA's previous H4 guidance (the methodology to which our sites are currently permitted) will still be applicable.

(b) Publication of Standard Rules permits. Draft permits were consulted upon in 2020[17] but a consultation response has not yet been published.

(c) Publication of the Appropriate Measures for the Biological Treatment of Waste guidance document. A draft document including many requirements was consulted upon in 2020[18] but a consultation response has not yet been published.

7.4.21. Once this guidance, and other clarifications from the EA are available, this may impact on the scope of works to demonstrate IED compliance at our sites. Based on best available information, we have made a series of exclusions from our scope of works in order to derive the cost to deliver IED compliance. These assumptions have been reviewed by the technical lead at the EA, recognising that each permit will need to be reviewed on a site by site basis. Specific exclusions we have made include:

(a) Retrofitting covers to any open tanks.

(b) Provision of sludge cake storage buildings.

(c) Odour control over and above the existing odour control in place at our IED (held in appeals) permitted facilities. We will undertake modelling to demonstrate the effectiveness of current odour control arrangements.

[16] Associated Emission Limits set out under BAT.

[17] https://consult.environment-agency.gov.uk/environmental-permitting/standard-rules-consultation-no-20/

[18] https://consult.environment-agency.gov.uk/environment-and-business/appropriate-measures-for-the-biological-treatment/

(d) Full replacement of below ground infrastructure in order to provide secondary containment. We will seek to establish an on-going routine CCTV inspection programme.

7.4.22. Should the guidance, when it is published, require additional scope over and above the scope proposed in this submission, we will seek to include the requirements in the next available price control process, to ensure that the company has sufficient resources to meet the additional enhancement requirements. In this case that would mean PR24, for investment to be delivered during AMP8.

7.5. Delivery schedule

7.5.1. A 15 month permitting schedule has been agreed with the EA, starting on 1st April 2021 and concluding in July 2022. The permits will set out improvement conditions with specific completion dates. The delivery of IED capital improvement actions will follow the completion of permitting activity. Therefore, delivery of capital solutions has been profiled over 2022-2025m. The total IED costs (including both capex and opex) is profiled below:

Table 5 - Delivery profile

	2020/21	2021/22	2022/23	2023/24	2024/25	**Total**
IED Totex (£m) (17/18 prices)	0.00	0.00	21.87	22.65	22.65	**67.2**

7.6. Contributions from external sources

7.6.1. Delivery of the IED scope of works set out in this submission is dependent upon EA and National Permitting Service resources to complete the permitting process in a timely manner. We have a permitting schedule agreed with the EA, which seeks to process almost 20 applications per quarter nationally. Should this schedule slip this may delay our overall programme.

8. Evidence of customer support

8.1. Introduction

8.1.1. This section sets out the various evidence that shows customers support the proposal to deliver improvements to meet IED requirements and to reduce carbon emissions. Furthermore it explains customers' support for an accelerated delivery programme and willingness to pay.

8.1.2. Full information on the customer research undertaken in respect of our Green Recovery proposals can be found in GR0010 – Green Recovery customer research support.

8.2. Structure of this section

8.2.1. This section outlines each element of customer research in turn. It explains the nature of the research that was conducted, the results of the research and the key conclusions. We consider existing PR19 customer research relating to customers views about environmental protection and improvement to be relevant and compelling. We have supplemented this with a review of wider third party research into reducing carbon emissions, and conversations with our online customer panel. The final piece of Green Recovery specific research considers customer willingness to pay for the improvements under AMP8 and accelerated delivery scenarios. The key findings from the different customer research is summarised in the conclusion.

8.3. PR19 customer support for delivering environmental protection and improvement

8.3.1. In order to understand customer views, over the course of the last AMP, and in preparation for the PR19 process, we undertook customer research in the form of a simple survey mechanism. The customer engagement undertaken by United Utilities and Delineo in November and December 2017 consisted of over 28,000 interactions and completion of over 2,000 surveys across a range of engagement activities.

8.3.2. One significant forum was held with the Youthforia network in December 2017 where, when asked why they chose environmental improvements as a focal area for improvements, most respondents cited the need to protect the environment now and for future generations.

8.3.3. Customer Priorities research, carried out in November 2016, identified that United Utilities is seen to have a duty of care to manage the environmental impact of sewage treatment. The research confirmed that 63% of respondents thought all environmental improvements should be prioritised.

8.3.4. This, coupled with the key finding from the Sustainable Land and Waste Management research undertaken in July 2017, that importance is placed on a sustainable and socially responsible approach to waste management, enables us to conclude that customers expect compliance with all environmental regulations that apply to the treatment and disposal of sludge as it is defined as a waste in legislation. As the principle objective of IED, as originally laid out by the European Commission[19], is to achieve a high level of protection of human health and the environment by reducing harmful industrial emissions, we can infer that the implementation of IED has the support of customers.

[19] https://ec.europa.eu/environment/industry/stationary/ied/legislation.htm

8.3.5. The outcome of this research led to the development of a number of company commitments aligning to the customer outcome "protecting and improving the natural environment in the way we deliver our services" which was accepted by Ofwat in the PR19 Final Determination.

Key conclusions of the research

8.3.6. We consider this PR19 research is still relevant and can be relied upon to give an insight into customers' views on these proposals. The review of PR19 research has demonstrated the proposals set out in this business case relating to IED align unequivocally with customer priorities and preferences. A majority of customers consistently state that they believe environmental improvements should be prioritised to protect the environment now and for future generations. Due to customer expectation of compliance with all environmental regulations, it is clear that implementation of IED is supported by our customers.

8.4. Customer support for reducing carbon emissions

8.4.1. Whilst the focus of this proposal is to deliver enhancements to meet IED requirements, there is an option to consider an alternative innovative solution that could reduce carbon emissions significantly. We wanted to understand what customers thought about the carbon benefits of that option. Therefore, we have conducted two pieces of research to understand customers' and the wider public's views on reducing carbon emissions.

(a) A literature review of carbon and climate change using publicly available information

(b) Customer comments about carbon and climate change

Literature review of carbon and climate change using publicly available information

8.4.2. In order to understand public views, we completed a review of relevant, publicly available literature involving general survey data sources from the YouGov website and the Going Greener report published this year by Bright Blue Campaign and for water customers specifically, a Consumer Council for Water (CCW) Watervoice research report.

8.4.3. The YouGov website confirmed that 67% of respondents care what their carbon footprint is.

8.4.4. The Going Greener report[20] undertaken by Opinium Research and published this year by Bright Blue Campaign, was conducted in June 2020 and consisted of over 3,000 UK adults, who were surveyed online through a panel and the data has been weighted to be representative of the UK adult population.

8.4.5. Key findings from this research are as follows:

(a) 82% of the UK public attributes a high degree of responsibility to business for taking action to achieve net zero

(b) There is a high level of support for specific actions by businesses to help achieve net zero greenhouse gas emissions. A majority support businesses making emissions a key factor in decision making (62%).

(c) However, support for increasing charges to customers to cut emissions is low (29%).

8.4.6. The CCW undertakes customer research and describes their online research community, WaterVoice as:

[20] http://green.brightblue.org.uk/publications/2020/10/12/going-greener#:~:text=Public%20attitudes%20to%20net%20zero,-Patrick%20Hall&text=The%20UK%20has%20made%20a,businesses%20will%20be%20highly%20disruptive.

"Launched in 2020 to help us keep our finger on the pulse of water consumers' views. The reports summarise the views of people in this community. It is made up of hundreds of water bill payers from across England and Wales whose views we regularly seek on issues relating to the water industry and the work of CCW itself."[21]

8.4.7. Key findings from this research are as follows:

(a) Climate change is seen as the most important environmental issue facing Britain today (from a list of issues presented).

(i) 48% selected climate change, above waste generation (34%), air pollution and flooding (both 29%).

(ii) By comparison, other environmental problems related to water are less likely to be seen as the most important – for example water pollution (9%), water shortages (8%) and poor quality drinking water (6%).

(b) 88% agreed that "Generating 'green' renewable energy, such as energy from sewage, solar and wind energy within the water sector could "make a difference" to carbon emissions (of which 44% said it could make "a great deal of difference")

(c) Participants are most likely to say that water and sewerage companies (32% rank these 1st) the Government (30% rank 1st) and regulators (26%) should take most responsibility for reducing carbon emissions related to water and its supply – above consumers and businesses.

(d) 26% think the 2030 'net zero' target for UK water companies is about right.

(i) 35% think companies should bring their emissions to zero earlier than 2030, explaining the issue is urgent, and tackling it seems achievable in a ten year period.

(e) However, less than half (48%) are confident that water companies will achieve net zero by 2030, 30% are not confident and a significant proportion don't know (21%).

Key conclusions of the research

8.4.8. The research has shown that, customers and the public in general are very concerned about climate change and reducing carbon emissions. People think that Companies, Government and Regulators are all responsible for taking action to reduce carbon emissions. There is support for accelerated delivery of net zero carbon by 2030 or sooner, reflecting a level of urgency. There is very strong support for generating green renewable energy, including energy from sewage sludge.

Customer comments about carbon and climate change

8.4.9. We launched a forum discussion topic with our online 'Water Talk' customer panel between 17th December and 4th January. We invited customers to offer their opinions around our goal to become carbon-neutral by 2030 and our commitment to delivering this 20 years earlier than the government's goal of 2050.

8.4.10. The Water Talk Customer Panel is an online community of United Utilities customers designed to reflect the views of those in the North West. Almost 8,000 customers are members of the panel and over 3,000 are active members who have taken part in a research topic in the last 6 months. The methodology allows us to have rapid access to qualitative customer feedback and hear customer reactions and opinions to our zero carbon goal in their own words.

[21] https://www.ccwater.org.uk/research/watervoice-june-2020

8.4.11. Key findings and verbatim quotes from this research are as follows:

(a) Customers are pleased that United Utilities set out a clear target to be carbon neutral. Most customers consider this as an achievable target while those with general trust in United Utilities feel very hopeful that we can achieve this goal.

- Customers react well to the proposed target for carbon neutrality by 2030. It is an ambitious enough target to be lauded as a worthy aim.
- There is a sense that this can be achieved by United Utilities because they are just the right sort of organisation who should be setting these targets and they trust their ability to meet targets.
- The target also sets a good example for other companies as it encourages other organisations and businesses to follow suit with similar objectives. As such, it will help the UK overall with its own contribution and effect on others; individuals and organisations alike.
- Comments included:

"It's admirable for UU and other utilities companies to aim to be carbon neutral by 2030 and I hope they're successful"

"I'm glad to hear that UU has pledged to go carbon-neutral by 2030. I hope this encourages lots of other businesses, organisations, and individuals to do the same"

(b) While customers are happy to see the commitment to go carbon neutral, more is needed from this commitment before it receives their full backing. Customers are curious as to whether this commitment could go a step further towards being carbon negative, while some would like to see evidence of steps taken to position this proposal as a statement of action rather than an empty promise.

- Some wonder whether being carbon neutral is enough, or can carbon emissions be offset so far as to become carbon negative?
- Good to see actions outlined such as planting trees, but customers hope that the plan to be carbon neutral is implemented effectively within a balanced management plan rather than a box ticking exercise.
- Customers want to see the words backed up by action otherwise it could be seen as an empty target. This includes outlining how the target can be achieved and why we believe it will be successful. In actuality it is difficult for customers to say whether the 2030 target really would be achieved without seeing an action plan come into place.
- Comments included:

"I think it's a great idea – I wonder whether there would be scope for setting a target for 2035 to be carbon negative rather than carbon neutral"

Key conclusions of the research

8.4.12. This research has demonstrated that customers support our goal to become carbon-neutral by 2030 and that they wish to see us go even further and become carbon negative if possible. In order to fulfil this aim we must therefore reinforce our target with demonstrating action.

8.5. Willingness to pay for IED and carbon proposal

8.5.1. We want to support the Government Green Recovery initiative by accelerating AMP8 enhancement expenditure into AMP7 to deliver benefits to customers, the local economy and the environment sooner. Primary research was required to establish levels of support from UU customers for investment in each Green Recovery proposal, coupled with their willingness to accept a small bill increase.

8.5.2. Research objectives:

(a) Understand levels of customer support for investing in each of the Green Recovery proposals earlier than planned.

(b) Understand whether customers are willing to accept an increase in their annual bill from 2025 to help support these investments earlier than planned

(c) Understand whether customers are willing to accept an additional increase in their annual bill from 2025 to help support these investments earlier than planned, with work starting from 2021

8.5.3. In order to do this, we conducted a regionally representative online survey of 2054 customers to ensure we have robust numbers by which to evidence levels of customer support and willingness to pay. Accent (a market research agency) were commissioned to design the research for United Utilities. The research targeted a regionally representative household sample of decision makers (joint or sole bill payers) across the UU region. We were looking to ensure sufficient coverage of each of the following groups to allow for robust analysis by each subgroup: Rural/Urban; Metered/Unmetered; Vulnerable customers and low income groups.

8.5.4. Key findings from this research are as follows:

(a) 78% supported the need for IED investment before a bill impact was revealed.

(b) 56% considered a bill impact of £2 a year (in 20/21 prices) from 2025 to be acceptable.

(c) When presented with an additional cost of £1.50 (across the whole programme) for early delivery of the Green Recovery programme, 57% of customers supported accelerating delivery to start in 2021.

Key conclusions of the research

8.5.5. The research has shown that customers strongly support the need to improve industrial emissions and to reduce carbon emissions. The majority of customers accept a small bill increase to support an accelerated delivery programme.

Scope confirmation impact on customer research conclusions

8.5.6. In parallel with conducting the customer research we were continuing to develop the programme of investment to comply with IED. As a result, at the point of conducting the customer research, we had not finalised our preferred option. To ensure we didn't underestimate the bill impacts during the research, we used the cost of option 3 which is the highest cost option (details of this option are provided in section 6 of this document).

8.5.7. Subsequently we have refined our work and established that option 1 is our preferred solution for this Green Recovery proposal, [✂].

8.5.8. The research demonstrated strong majority support for the original proposal, however the change in scope means that the information we had shared with customers to conduct willingness to pay

research is no longer fully aligned with the refined solution we are now proposing. We were unable to conduct further research in the time available leading up to Green Recovery proposal submissions. We have therefore considered the impact of this change on the validity of the customer research we conducted.

8.5.9. A review of customer comments on the project indicates that the small number of customers that opposed the scheme predominantly did so either because they are sceptical of the need for reductions in carbon emissions, or because they are concerned with the associated bill impact of the project. As the modified scope reduces the focus on carbon reduction, and reduces the cost of the scheme we think it reasonable to conclude that the research results would likely be improved by the changes made.

8.5.10. Furthermore, recourse to customer bills has now been restricted to only the amounts required to deliver the enhancement spend required to efficiently deliver the regulatory IED requirements. Our expectation is that if these were not approved as part of the green recovery proposal, they would be included as enhancement spend in our AMP8 business plan. As the need to make the investment appears mandatory, the key question which appears to most pertinent to customer preferences is whether we should undertake the investment in AMP8 or look to bring it forward to AMP7. Support from customers is whether or not they support bringing forward the investment rather than whether to undertake the investment itself. We note that the costs of bringing forward the proposed IED investment to AMP7 amounts to a 14 pence increase in customer bills from AMP8, which is a very small increase to the average household bill. On this basis we are therefore confident that in the round the research taken together is sufficient to represent a satisfactory level of customer support for the proposal.

8.6. Overall Conclusions from customer research

8.6.1. The breadth of research has demonstrated that there is strong customer support for a programme of IED investment that will protect and enhance the environment.

8.6.2. The research has confirmed that the proposal aligns with customer priorities and preferences.

8.6.3. Customers and the wider public are also very concerned about climate change, with Companies, Government and Regulators sharing responsibility for taking action to reduce carbon emissions.

8.6.4. There is support for accelerated delivery of net zero carbon by 2030 or sooner, reflecting a level of urgency. There is very strong support for generating green renewable energy, including energy from sewage sludge.

8.6.5. The willingness to pay research has shown that the majority of customers accept a small bill increase to support an accelerated delivery programme in AMP7. The cost of bringing forward the investment in AMP7, rather than waiting until AMP8, represents a small increment of 14pence on the average bill.

9. Additional benefit of acceleration

9.1.1. Accelerating the investment programme from AMP8 into AMP7 will increase the level of protection for the environment from the harmful effects of industrial activities through the delivery of compliance with new IED requirements at 31 sites. This will reduce the environmental impacts of releases to land, air and water from our sludge treatment activities. This is through combination of improvement and protection measures based around the use of Best Available Techniques (BAT). Examples of enhancements include reducing odour impacts and other air emissions, alongside improvements to containment of sludge storage and processing equipment.

9.1.2. In addition to environmental benefits, accelerating this activity from AMP8 into AMP7 will provide an IED scope and cost that could be used, or contribute to, benchmark data for the industry.

9.1.3. If the innovative option (option 3) is delivered, it may provide other benefits that are not yet fully defined. For example we have indicated a significant reduction in carbon emissions could be possible.

9.2. Economic recovery benefits

9.2.1. We estimate that this Green Recovery proposal will support 142 jobs at UUW and with suppliers during AMP7.

10. Sources of funding

Introduction

10.1.1. This section sets out sources of funding for the proposal. It considers three potential contributions; sources of third party funding, customer funding and the estimated impact on customer bills and the company contribution.

10.2. Third party funding or other support

10.2.1. In the development of this proposal we have, and will continue to, engage and collaborate with third parties to reduce the cost impact to customers in the long term.

10.2.2. We have worked directly with the EA to develop the requirements for IED compliance and now have their endorsement of both the programme assumptions and approach. We have also worked directly with WaterUK and other water companies to review and validate the proposed scope of work. We will continue to engage with the EA, WaterUK and other water companies throughout the permitting process to ensure that our scope is consistent with the industry overall and that we share lessons learned with other companies going through the same process. By doing so this will help minimise the cost of our IED programme and therefore minimise the cost impact to our customers. We also propose that we share our future IED compliance reports and the lessons learned from the delivery of our IED programme with the water industry. By sharing our lessons learned and welcoming collaboration with others we aim to help minimise the burden of IED compliance for the industry overall, thereby minimising the long term cost burden to customers.

10.2.3. In addition to proactive communication and collaboration with the EA, WaterUK and other water companies, we are also engaging with wider markets to explore alternative, and potentially more efficient, ways to deliver bioresource services. This is specifically in reference to option 3 described in this proposal, which would include a market test for the required treatment capacity. By undertaking the market test we are inviting other companies to bring innovation and efficiency that has the potential to outperform our traditional delivery options. The market test benefits customers in the long term irrespective of the outcome, as it either identifies a more efficient solution from the market or validates that the traditional delivery route is the most efficient. We are therefore minimising future costs and maximising future efficiency, which in turn delivers the lowest long term cost impact to customers.

10.3. Customer funding and bill impact

10.3.1. This programme requires investment in site-based assets and permits. It is appropriate that customers fund the cost of enhancement activities to meet IED permit improvement conditions. The cost of the programme is £67.2m, which results in an AMP8 average bill impact of £1.74 per year (20/21 prices).

10.3.2. If the Green Recovery proposal is not approved, we will be seeking an enhancement claim for this activity at PR24, for delivery in AMP8.

10.3.3. Customer funding and bill impact across all Green Recovery proposals is discussed in the Green Recovery overview document[22].

[22] GR0001 – Supporting a Green Economic Recovery in the North West

10.4. Company contribution

10.4.1. The cost to undertake investigations and complete the permitting process for 31 sites that require new, or variations to existing permits, is forecast to be £1.8m. We will absorb this cost in the AMP7 totex allocation, as the activity needs to be undertaken in AMP7 and will be used to inform the PR24 enhancement claim in the event that this Green Recovery proposal is not approved. We are not including IED permit preparation and submission costs as part of this proposal.

10.4.2. The process we have used to identify and estimate the capital investment requirement relating to the implementation of BAT standards ensures that only enhancement costs are proposed in this business case. It is possible that in the course of preparing permit applications we will generate information on our assets condition. We will follow existing business processes to manage asset health risk, maintenance activities and prioritise investment from our existing AMP7 price control.

11. Customer protection

11.1. Introduction

11.1.1. We have considered how customers can best be protected from any unwarranted or inefficient expenditure. We propose a two-step assurance approach to ensure that the scope is appropriate and the cost of delivery is efficient. By following this process we will ensure that customers only pay for the efficient investment to meet the new IED regulatory requirements. In this section we set out each assurance step in turn and demonstrate how together they will ensure that customers are protected.

11.2. Assurance

Assurance of Scope

11.2.1. The scope of work required to demonstrate Best Available Technique compliance is site specific and will be determined through the site permitting process. A 15 month permitting schedule has been agreed with the EA, starting on 1st April 2021 and concluding in July 2022. This will enable us to agree the scope of each site solution.

11.2.2. This assuring of scope confirms we are delivering the necessary enhancement investment to achieve compliance.

Assuring Delivery of Work

11.2.3. A third party organisation will be appointed to review the efficient expenditure of the programme and report on delivery as part of our PR24 business plan submission. The programme of delivery extends across AMP7. As we will recover costs through PR24 not all work will be completed at the time of the PR24 submission. Therefore we will provide assurance on completed work and also the remaining programme of work to be completed. This will protect customers by ensuring that the cost to deliver the output is efficient.

11.2.4. If required we would also be able to provide an update on performance and delivery as part of the subsequent “blind year” submission process in order to ensure that recovery from customers reflects work that has been completed.

Assurance Outcomes

11.2.5. Following these assurance steps we will be able to demonstrate efficient investment to customers. Customers would be protected from a reduction in scope, where outturn costs are lower, then recovery from customers will be reduced by the full amount (enhanced cost sharing on underspend). Customers will also be protected through the PR24 process for any investments proposed for delivery in AMP8.

11.2.6. If we progress our innovative opportunity (including market engagement) we will define the costs for IED enhancement at the four sites and this will be externally assured. The recovery of this cost, although not incurred, is necessary to recover from customers as it would form part of the business case to support the innovative option. The assurance provided ensures customers are protected from any additional capital cost (beyond the assured avoided cost) for the delivery of the innovative opportunity.

11.3. Performance Reporting

11.3.1. This section discusses any impact on existing AMP7 performance commitments and future performance reporting for IED.

Impact on AMP7 Performance Commitments

11.3.2. We have two AMP7 Bioresource performance commitments; Recycling Biosolids and Better Air Quality. Performance against IED compliance is not in scope of either performance commitment and we do not foresee a need to make any adjustments to the performance targets.

IED Performance reporting

11.3.3. Public reporting of performance is an excellent approach to demonstrate to customers and stakeholders that we are compliant with our regulatory obligations. We have an excellent record of performance in relation to the Environment Agency Environmental Performance Assessment (EPA).

11.3.4. In October 2020, the EA shared the latest version of the EPA methodology (version 8). In it, the EA set out its intention to develop a waste management permit compliance metric with a view to having it in place for reporting publicly in 2027. It will cover compliance with waste management permits and exemptions held by water and sewerage companies, including IED permits.

11.3.5. In developing the metric, the EA will assess what breaches will be included in the assessment, focussing on the main environmental impacts and potentially including for example, pollution incidents, emission limit breaches and odour.

11.3.6. If this IED Green Recovery proposal is approved, we would publish our performance with IED compliance on our website. Transparent reporting on an annual basis will support customer confidence in the delivery of IED benefits. The reporting will be superseded by the introduction of the publicly reported EA EPA waste management permit compliance metric in 2027. We will work collaboratively with the EA to feedback our lessons learned thereby helping the EA in the design and implementation of the EPA metric.

12. Third party assurance or views

12.1. Introduction

12.1.1. This section sets out the views of the Environment Agency in relation to this Green Recovery proposal.

12.2. Environment Agency Views

12.2.1. We have been communicating with the Environment Agency regarding IED regulations through multiple routes for a number of years. This includes sector wide statements by the EA; direct communications between our organisations; and communications between the EA and the Water Industry through Water UK governance groups including the Water UK and EA Strategic Steering Group and the Waste and Recycling Network. Aspects of these communications are described in Section 5.3 Statutory Driver - Industrial Emissions Directive (2010)

12.2.2. We wrote to the EA in December 2020[23] to share our proposed approach to ensuring compliance with the Industrial Emissions Directive (IED), across our sludge asset base, in a timely manner. We sought endorsement of our approach from the Environment Agency (EA).

12.2.3. The EA wrote a letter in response in January 2021[24]. It was helpful in confirming that IED applies to the biological treatment of sewage sludge and the regulatory timeline for IED implementation, as detailed in Section 5.3. Working with the EA we will endeavour to ensure that all our facilities will hold IED permits by 2022, meeting the regulatory compliance date.

12.2.4. It confirmed that many of the BAT requirements will require improvements to procedures and the expectation that those procedural improvements would be made by August 2022. We have committed to make modifications to operational processes, for example updates to environmental management systems to manage environmental risk as soon as practicable.

12.2.5. It specifically recognised the need for some capital projects to deliver BAT improvements. The expectation was that companies would begin planning for large infrastructure projects, if necessary, in advance of receiving a permit. We are meeting that expectation as we have completed site assessments to identify any gaps between current operations and BAT and this proposal sets the capex and opex investment we will require across our asset base, in advance of the EA permit schedule.

12.2.6. The EA acknowledge that where there is a clear need to extend deadlines beyond August 2022 this can be done with improvement conditions, with the agreement of DEFRA. Considering the timescales for permitting sites runs right up to the August 2022 deadline, it is clear improvement conditions, particularly those requiring capital investment, will go beyond the August 2022 deadline.

12.2.7. The EA stated that they did not anticipate this process extending into AMP8. We have set out a pragmatic approach to setting timescales and securing the resources for enhancement investment to deliver capital related improvement conditions above. This is for the next publication of the WISER to explicitly include IED, any resulting investment requirements would be submitted into the next available price control process, in this case that would mean PR24, for investment to be delivered during AMP8. We do not see any other reasonable way of managing the delivery of change in requirements, other than as part of AMP8, or as part of Green Recovery.

[23] GR0005d - EA IED Letter 171220_FOR ISSUE

[24] GR0005b - 060121 UU Green Recovery and IED Response

12.2.8. The letter concluded that, *"the IED improvements you propose appear to align with the Green Recovery criteria. However all companies' proposals are being evaluated through a joint regulator process and it would be unhelpful to pre-empt the results of that exercise".*

12.2.9. We responded to the letter 28th January 2021[25] to make clear our position based on previous EA communications. We set out the key points about IED in a timeline and why we consider that the process would require extending into AMP8.

12.2.10. The following text reflects an extract from that correspondence:

> *"IED regulations came into UK law in 2013. The requirements for the industry to be compliant with IED are set out through site specific permits, which detail the specific standards each site must meet in order to comply.*
>
> *The EA "Industrial Emissions Directive – Waste Sector update" in 2014, deferred permitting requirements to allow time for further consideration of the regulations and the interpretation of the Urban Wastewater Treatment exclusion clause.*
>
> *The WISER describes itself as the strategic steer to water companies on the environment, resilience and flood risk for business planning purposes, which "sets out the action [the EA] would like to see from the water companies over the next several years to tackle these challenges".*
>
> *IED was not included or referenced in the WISER and so was not accounted for in our business plan for 2020-2025. Not including IED in the WISER was in line with IED permitting having been deferred when the WISER was published, and while the 2020-2025 business plans were being developed.*
>
> *The EA confirmed the end of the deferral position in July 2019, concluding that IED applies to the biological treatment of sewage sludge and that installation permits would be required.*
>
> *This was the first time that the IED regulations were formally confirmed to apply to the water industry's sludge treatment activities, and represented a new requirement to enhance our sites to comply with IED regulations. This has significant implications for the water industry, as before July 2019, it had not been confirmed whether or not compliance with IED regulations would be required.*
>
> *In July 2019 we had already submitted our business plan for 2020-2025 to Ofwat, and although this was before the final determination, there was insufficient evidence on the specific implementation requirements of the IED for us to add this new requirement to our plans for AMP7.*
>
> *We have worked with you to confirm the IED implementation requirements. We have 31 sites which fall under IED regulations, and they will now receive their permits for IED as part of the EA permitting schedule which runs between April 2021 and July 2022.*
>
> *These permits will set out the enhancements, known as "improvement conditions" that each site needs to deliver in order to become compliant with IED regulations. This addition of conditions to our permits is a new requirement, driven by the application of IED*

[25] GR0005a – 280121 Green Recovery and IED UU Response

Regulations to sewage sludges (as confirmed in the EA's letter, July 2019), and requires enhancement expenditure in order to achieve the new environmental standards.

There is a need for the deadline to deliver improvement conditions to be extended beyond August 2022 (the original date for EU Member States compliance with IED). This is because we will only know the site specific requirements for IED compliance when permits are issued (between April 2021 and July 2022), and will then require time to deliver these enhancements.

As IED regulations have now been confirmed to apply to the water industry, and requires the enhancement of our sites to meet the newly applied IED regulations, I would expect that IED compliance will be included in the next version of the WISER, which will be used to inform our business plans for 2025-2030.

Any enhancement investment required to achieve IED regulations compliance would then be submitted in the next price review process, to ensure that we have the sufficient resources to meet the requirements. That would mean inclusion in PR24, for investment to be delivered during AMP8."

12.2.11. Our response therefore explains that the Green Recovery criteria this proposal aligns to is, the acceleration of AMP8 enhancement investment into AMP7. That receiving Green Recovery funding in AMP7 to deliver these enhancements represents the best opportunity to achieve IED compliance, and deliver the associated environmental benefits, as swiftly as possible. We believe this explains the EA conclusion that the IED improvements we proposed appear to align with the Green Recovery criteria.

Technical Discussions

12.2.12. Notwithstanding the communications with the Environment Agency over the need for investment and timescales for implementation, as outlined above, we have also had extensive communication with the Environment Agency technical lead for IED.

12.2.13. Discussions with the Environment Agency technical lead have primarily focussed on determining the technical guidance against which the EA will assess compliance with the latest IED BAT standards. Some of the technical guidance has yet to be published and therefore United Utilities have worked collaboratively with the EA (through the Water UK Waste and Recycling Network) to identify these gaps and to define requirements.

12.2.14. Through the Water UK Waste and Recycling Network United Utilities have also supported the development of a permitting schedule. This has confirmed which facilities will require IED permits, how and when these permits will be processed. This was finalised and confirmed via email on 6th December 2020.

12.2.15. In developing our submission, ahead of starting the permitting process we have had to make a series of assumptions about the likely scope of works that will be required to demonstrate IED compliance. We documented our process and these assumptions ahead of a meeting with the Environment Agency technical lead for IED on 6th January 2021. This covered specific areas around covering tanks, odour control and secondary containment of assets.

12.2.16. At this meeting, and within follow up minutes, the EA endorsed the approach we have taken in developing a scope of works to deliver IED compliance. Particularly this endorsed the use of risk assessment to minimise the likely scope of works to be required to demonstrate compliance with IED BAT standards, rather than a blanket application of BAT measures to be retrofitted to existing sites.

12.2.17. At this meeting the EA further validated the specific technical assumptions we have made to develop the scope of works as part of our Green Recovery submission. The assumptions we have made were viewed as reasonable and based on the latest available technical guidance.

12.2.18. The EA confirmed the meeting minutes on 13th January 2021 by email, stating that *"It was a very useful discussion last week. I've reviewed the minutes and they're detailed and accurate so few comments or additions from me"*[26].

[26] GR0005f – Minutes from Meeting on 6th Jan; and GR0005g – Minutes IED rationale_20210106+CH