3

Maintaining and improving our assets

Our approach to prioritisation, solution development, capital maintenance, breakdown of the plan by theme and SP, and our approach to capital efficiency.





At a glance

Purpose of the chapter

This chapter sets out NI Water's proposed PC28 capital investment programme and describes how statutory, regulatory and service requirements have been identified, assessed and prioritised to create a deliverable and affordable investment plan. It explains the process used to translate established needs into a practical programme of work that aligns with the Utility Regulator's principles of efficiency, deliverability and value for money.

Investment requirement and priorities

The chapter presents NI Water's £3.02 billion Capital Investment Plan for PC28, endorsed by the Board and Executive Committee, and explains how over £13.5 billion of established needs have been prioritised into five strategic investment areas and fourteen outcome-based themes. It demonstrates how robust asset planning, engineering assurance, cost benchmarking and programme optimisation have been used to focus investment on the highest-priority requirements for customers, the environment and the wider economy.

Funding constraints and consequences

The chapter highlights the significant gap between identified investment needs and anticipated funding for PC28. It explains how investment has been prioritised to protect the most critical statutory and operational requirements and sets out the severe consequences of underinvestment, including increased risks to public health, deterioration in drinking water quality, worsening environmental pollution, growing constraints on housing and economic development, and reduced resilience of Northern Ireland's water and wastewater infrastructure. Collectively, these impacts represent a strategic national risk.

Overall, the chapter demonstrates that the £3.02 billion PC28 Capital Investment Plan represents the minimum level of investment that NI Water can support for PC28. It provides the funding required to maintain safe and reliable services, meet statutory and regulatory obligations, protect public health and the environment, and sustain the long-term resilience and development of Northern Ireland's water and wastewater infrastructure.

3 Introduction

This chapter sets out the capital investment required to maintain and improve Northern Ireland's water and wastewater infrastructure during PC28. It explains how more than £13.5 billion of established need has been assessed and prioritised into a deliverable Capital Investment Plan (NIAMP6) of £3.02 billion (2025/26 prices), focused on meeting statutory obligations, protecting essential services and the environment, supporting sustainable growth and delivering value for money. It also describes the consequences of funding below this level and the risks this would create for customers, communities and the wider economy.

The chapter is structured as follows:

- Section 3.1 provides an overview of the PC28 investment profile
- Section 3.2 summarises the regulatory sub-programmes
- Section 3.3 explains how we defined the size and shape of our plan
- Sections 3.4 & 3.5 set out our approach to assessing base maintenance and capital efficiency
- Sections 3.6- 3.10 describes our five PC28 investment priorities
- Section 3.11 explains the implications of funding constraints
- Section 3.12 identifies key risks associated with Capital Investment Requirements
- Section 3.13 examines a comparison between PC21 and PC28 investment
- Section 3.14 looks at long term capital investment projections

3.1 Overview of PC28 Capital Investment Plan

In developing the PC28 capital programme, NI Water considered the minimum acceptable level of investment NI Water considers necessary to deliver the critical outcomes proposed for PC28. The figure below represents the minimum acceptable capital investment across PC28 required to meet the UR's regulatory principles described within their approach documents and has been endorsed by NI Water Board and Executive Committee.

The five-year investment requirement of £3.02 billion, in 2025/26 prices (pre-efficiency), enables the resolution of the highest-priority established needs while ensuring value for money, practical deliverability and affordability for customers from a tariff perspective.

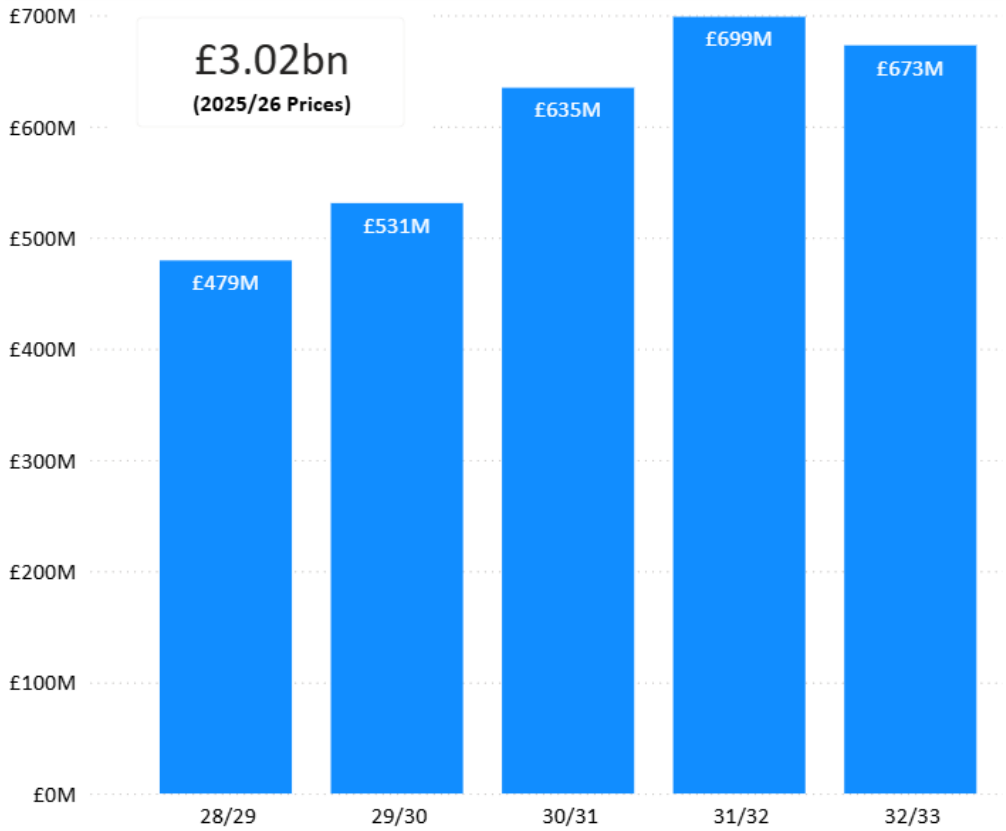


Figure 3.1 – Capital Investment Plan for PC28

3.2 Regulatory Sub-Programmes

To support clarity and ease of understanding, the NIAMP6 capital plan is organised into three broad areas: **Water Provision**, **Wastewater Provision**, and **Other Provisions**. Each area contains established sub-programmes that have been used across previous price controls, providing a consistent framework to articulate current needs and benchmark them against historic investment levels.

The Utility Regulator has established regulatory sub-programmes to provide the structure and clarity needed to plan, justify, and deliver a complex capital investment programme in a transparent and accountable way. By grouping investment into clear, purpose-driven categories, we can demonstrate how funding aligns with statutory obligations, service resilience, environmental protection, and customer outcomes. This ensures that each area of investment is evidence-based, auditable, and proportionate, giving our regulators confidence that resources are being directed to the right priorities while enabling consistent reporting, benchmarking, and long-term strategic planning. The figure below illustrates how the £3.02bn capital investment is constructed from its constituent regulatory sub-programmes:

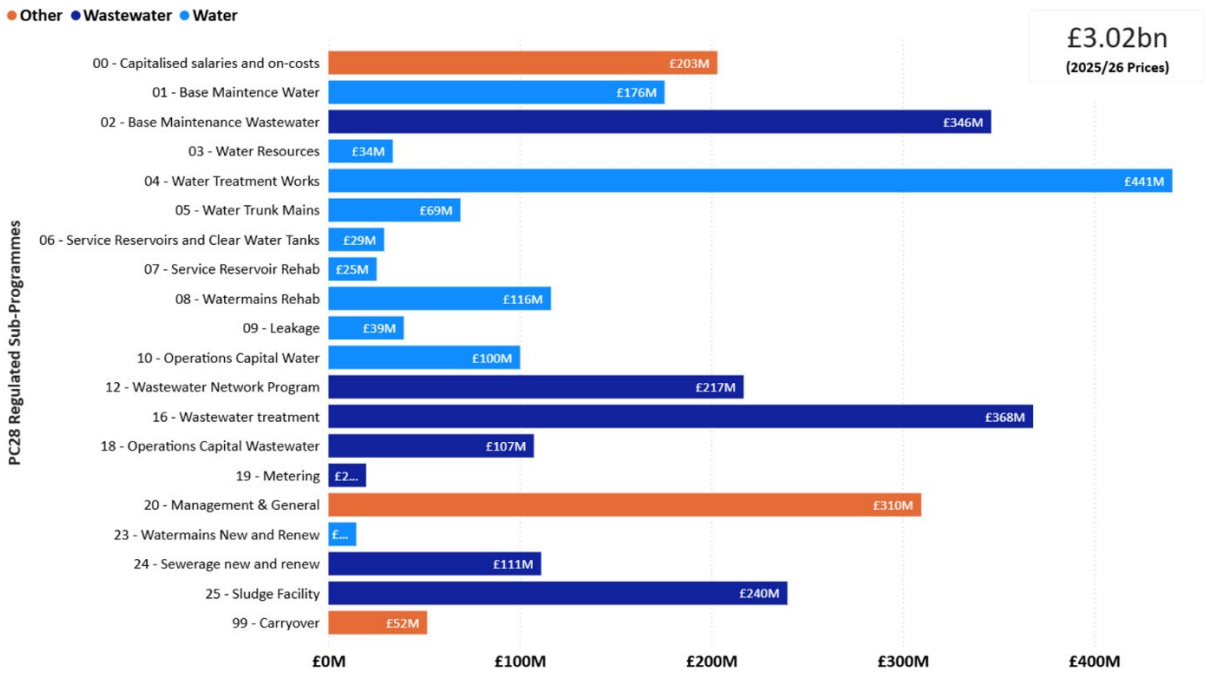


Figure 3.2 – Proposed PC28 Investment for Regulatory Sub-Programmes

3.2.1 Water Provision

Water provision is our most essential service, fundamental to public health, economic prosperity, and environmental protection. Established needs have been identified to ensure the delivery of clean, safe drinking water to more than 930,000 premises across Northern Ireland every day. The average total drinking water supplied each day is circa 613 million litres, with peak demands rising to around 740 million litres per day during periods of hot weather or high seasonal use. This investment supports resilience to drought and peak summer demand; enhancements to water quality, including colour, taste and odour; improvements to pressure and unplanned interruptions; targeted programmes to reduce leakage; and the rollout of innovative metering for business customers.

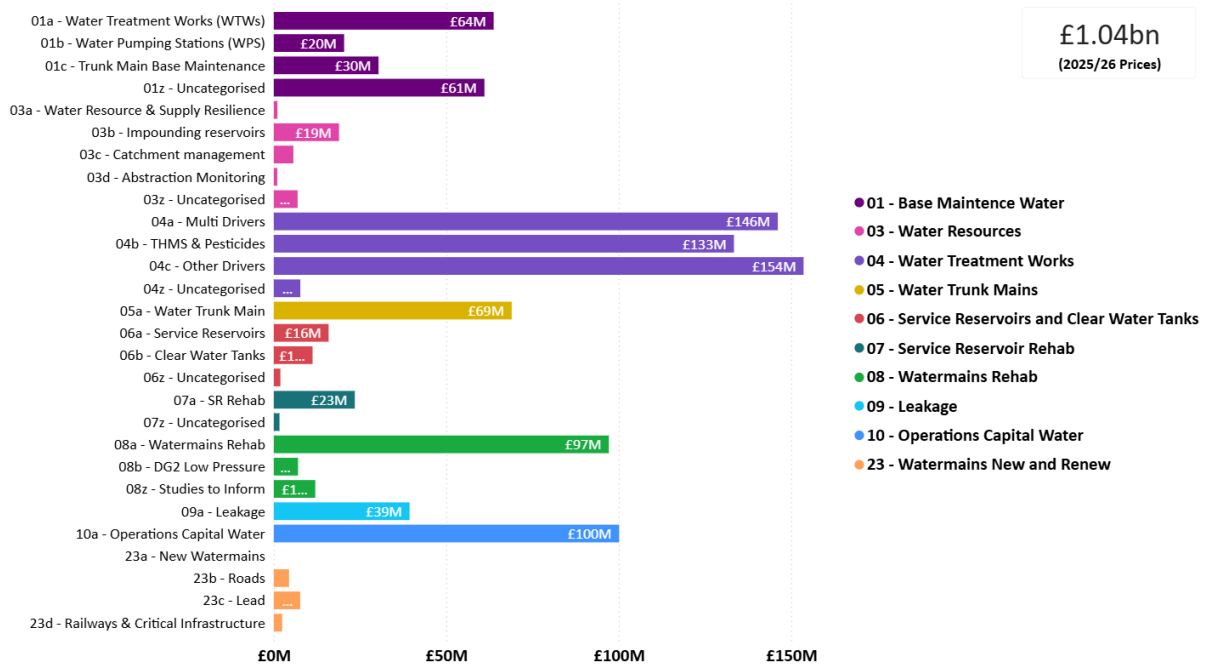


Figure 3.3 – Water Sub-Programmes and Portfolios

Within **Water Provision** there are 10 regulatory subprogrammes containing 28 distinct portfolios to fully describe investment requirements. Full details down to project level summaries are contained within Appendix 3.1

3.2.2 Wastewater Provision

Northern Ireland's wastewater system is a vast, ageing and increasingly stressed asset base that underpins public health, environmental protection and sustainable economic growth. The scale of the challenge facing NI Water is enormous with over £9bn of established need requiring investment to maintain compliance, support development and protect the environment.

The wastewater system operates under intense strain and is comprised of:

- 1,026 wastewater treatment works (WWTWs)
- 2,440 storm overflows at WWTWs, pumping stations or in our network
- 17,000 km of public sewers

Much of this infrastructure is operating at or beyond capacity. Historic underinvestment has created a backlog of need, particularly in urban centres such as Belfast, Lisburn, Newtownards, Newry and parts of the Northwest. Without intervention, service deterioration is inevitable.

Over 100 towns and settlements across Northern Ireland currently face development constraints due to insufficient wastewater capacity. These constraints limit housing delivery, deter economic investment and undermine regional planning objectives. Tackling the underlying wastewater capacity issues is therefore essential to unlock sustainable growth, enable local council plans and allow the wider Northern Ireland economy to realise their long-term ambitions.

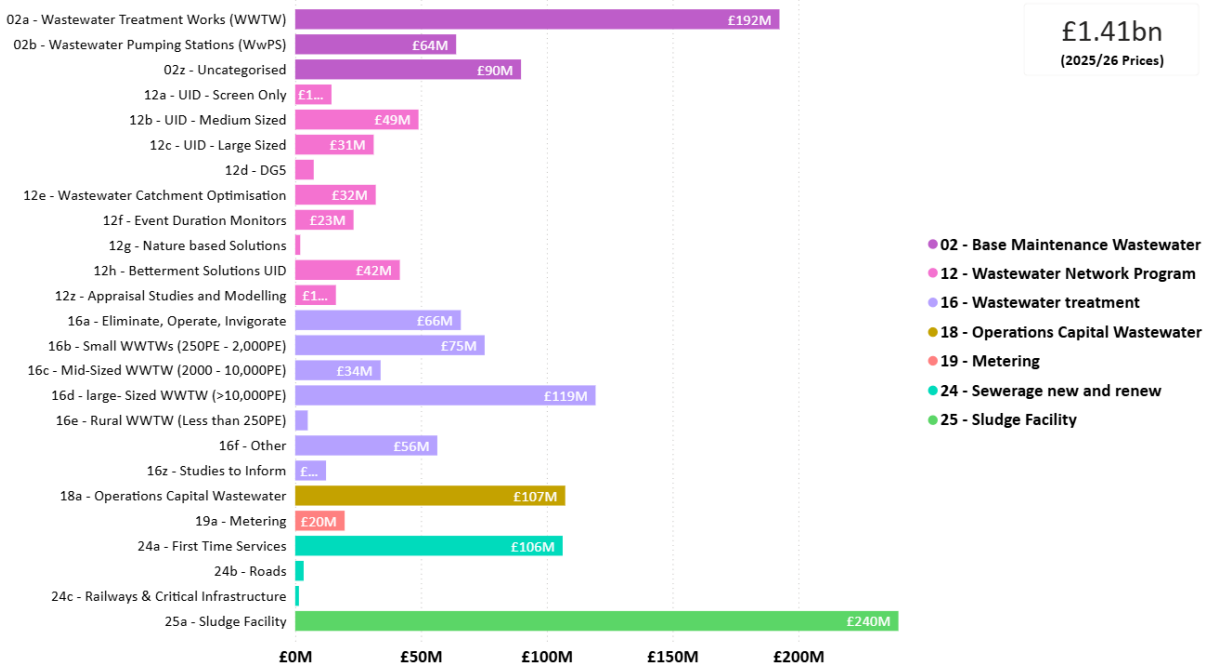


Figure 3.4 – Wastewater Sub-Programmes

Within **Wastewater Provision** there are 7 regulatory subprogrammes containing 25 distinct portfolios to fully describe investment requirements. Full details down to project level summaries are contained within Appendix 3.2

3.2.3 Other Provisions (Management & General, Cap Sals & Carryover)

Within **Other Provision** there are three regulatory subprogrammes containing 7 distinct portfolios to fully describe investment requirements. Full details down to project level summaries are contained within Appendix 3.3.

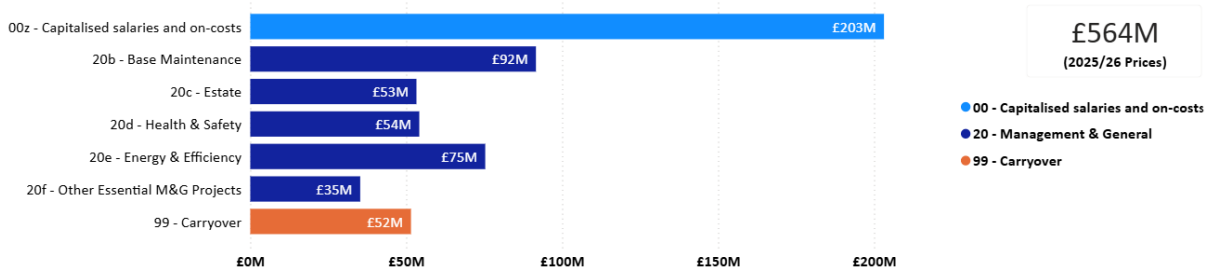


Figure 3.5 – Management & General Sub-Programmes

NI Water's **Management & General (M&G)** portfolio provides for the corporate, technical and enabling functions that support delivery of NI Water's capital programme and essential services. This includes investment in ICT, cyber security, fleet, depots, accommodation, resilience planning, workforce capability and organisational development. The portfolio also provides the governance, assurance and oversight needed to drive efficiency, manage risk and ensure the effective, value-for-money delivery of the PC28 programme.

Capitalised salaries and overheads reflect the costs of NI Water employees whose work directly supports the delivery of capital projects. Salary costs are allocated based on time deployed on capital activities, providing a transparent and auditable basis for capitalisation. Associated overheads, including accommodation, IT, travel, training, OSNI and NISRAN access, and statutory Roads-related charges, are apportioned accordingly.

To support the significantly expanded PC28 capital programme, NI Water estimates that up to 156 additional staff will be required, primarily within the Infrastructure Delivery Directorate. This assessment has been benchmarked against other UK water companies and ensures sufficient programme management, engineering, commercial and technical capability to deliver the increased scale and complexity of the proposed investment programme.

Carryover Construction represents enhancement projects that span across regulatory periods due to their scale, complexity, or delivery requirements. This includes approximately £52 million of PC21 enhancement schemes that continue into the PC28 period. A further £238 million of major water treatment works enhancement projects are not expected to achieve full construction completion and operational handover until the PC33 period. These longer-duration schemes are primarily focused on addressing taste and odour issues associated with raw water from Lough Neagh requiring significant treatment process upgrades and complex construction programmes that extend beyond a single regulatory cycle.

3.2.4 Transformation and Making Investment Go Further

Alongside essential infrastructure investment, PC28 will place greater emphasis on investment in innovation, technology and whole-system approaches to improve outcomes and maximise the value delivered from available investment.

This will be particularly important in complex wastewater catchments. Enhanced monitoring, data, modelling and analytics will help us better understand how networks and treatment works are performing, identify the root causes of capacity and environmental constraints, and target interventions more effectively.

Our approach will include reducing the volume of unwanted water entering sewer networks, optimising the performance and capacity of existing assets before progressing larger conventional solutions, and working with partners to address pressures such as stormwater and trade effluent at source. Importantly, these interventions will be considered within the context of the wider catchment to ensure that actions taken in one part of the system do not inadvertently transfer risk or environmental pressures elsewhere. This reflects the increasingly collaborative approach being developed with stakeholders, including DfI Rivers, to better understand and manage catchments as integrated systems.

New approaches will be tested and evaluated, with successful interventions incorporated into wider delivery where evidence demonstrates that they are effective, provide value for money, and deliver sustainable benefits across the catchment.

The objective over the course of PC28 is to determine where these approaches can accelerate environmental improvement, make better use of existing wastewater capacity, reduce flood and pollution risks, and enable development sooner, while maintaining regulatory compliance and delivering long-term resilience.

Transformation and innovation complement, rather than replace, the sustained investment required in essential infrastructure. The opportunity is to use better information, technology, operational interventions and partnership working to target investment more effectively, deliver benefits sooner, and reduce longer-term pressure on public finances while supporting better outcomes across the wider water environment.

3.3 Defining the Size and Shape of the Capital Programme

The PC28 capital programme has been developed in accordance with the Utility Regulator's regulatory principles and NI Water's statutory obligations, as set out in Sections 2.2.1 and 2.2.2. These provide the foundation for determining what investment is required, while the principles of established need, efficiency, deliverability and tariff affordability provide the framework for determining the size and shape of the PC28 programme.

The following sections explain how these requirements have been translated into established needs and, through assessment and prioritisation, into the proposed PC28 capital programme.

3.3.1 Established Needs

Established Needs represent the agreed technical interpretation of NI Water's statutory obligations, developed and tested through the PC28 stakeholder governance arrangements described in Section 2.4. This included engagement through the relevant regulatory working groups, particularly the Environmental Quality and Drinking Water Quality Working Groups, to identify and prioritise the requirements to be addressed through PC28. While legislation sets the overarching requirements, established needs define the specific outcomes that must be achieved. For example,

- the obligation to reduce leakage is translated into making incremental progress towards the Sustainable Economic Level of Leakage, rather than eliminating all leakage, and
- wastewater flooding obligations focus on removing properties at risk of internal flooding from severe hydraulic overloads occurring more frequently than once every five years where intervention is cost-effective rather than eliminating all flooding.

When these technical interpretations are applied across all statutory obligations, they result in **£13.5 billion of established needs** across NI Water's services.

We expect our understanding of all established need to grow significantly over the PC28 period as our technical investigations, surveys, modelling and engineering studies mature and improve our understanding of our statutory obligations under water and environmental legislation.

In general, the highest priority, deliverable and best value capital solutions arising from the full extent of established needs are promoted into the fully endorsed, capital plan for PC28.

3.3.2 Outcome Based – Established Need Theme Areas

The £13.5 billion of established needs has been structured into five priority investment areas and fourteen outcome-based themes to provide a clearer view of the scale, purpose and distribution of future investment requirements.

This outcome-led approach groups individual projects and programmes according to the benefits they deliver, helping stakeholders understand where investment is required across the portfolio and how proposed expenditure aligns to strategic, regulatory and customer priorities. By organising needs into a manageable set of themes and outcomes, the methodology provides a coherent framework for prioritisation, investment planning and performance tracking, while illustrating the relative scale of expenditure required across areas.

Figure 3.6 below enables a more transparent assessment of investment drivers and supports informed decision-making across a portfolio that extends well beyond a single regulatory period.

Priority	Theme Area	Outcome Based Themes	Description	Est. Needs	PC28
1	Inescapable Projects		1. Carry Over Construction 2. Killyhevlin WTW 3. Ballynacor Biosolids Facility	£438m	£438m
2	Maintain Our Assets		4. Critical Maintenance Water 5. Critical Maintenance Wastewater 6. Critical Maintenance M&G	£2,822m	£1,430m
3	Protect Our Water		7. Clean Safe Drinking Water 8. Taste and Odour Lough Neagh 9. Water on Demand	£835m	£415m
4	Start to Address Wastewater		10. WWRR Monitoring Programme 11. Pollution Lough Neagh 12. Pollution Belfast Lough 13. Enabling Dev. & Reducing Pollution	£9,292m	£669m
5	Delivering Efficiency		14. Achieving More, Faster, Greener	£115m	£65m
TOTAL				**£13,502m**	**£3,017m**

Figure 3.6 – Established Needs by Outcome Theme Area

3.3.3 Efficiency and Value for Money

The PC28 capital programme has been developed through a robust, standardised and evidence-based methodology designed to ensure that every project and programme represents the most efficient solution to an identified need. The full capital methodology is described in Appendix 3.12. Efficiency and Value for Money is maximised through the following processes, applied as appropriate to the nature and type of investment.

1. **Standardised Needs Assessment** - Investment requirements are first established through structured asset needs assessments, engineering investigations, scientific analysis and operational evidence, ensuring that proposed interventions are driven by verified statutory, regulatory, service or resilience requirements rather than isolated symptoms. The use of the

Asset Needs Analyser (ANA) provides a consistent framework for identifying, assessing and prioritising needs across the entire portfolio.

2. **Root Cause Assessment -** Once a need has been identified, projects progress through detailed root cause assessment, modelling and optioneering processes to ensure that the underlying driver of the issue is fully understood and addressed. A range of analytical tools, hydraulic models, environmental assessments and operational reviews are employed to test potential solutions. The methodology ensures lower-cost, lower-carbon and operational interventions are considered before capital solutions, ensuring that investment is targeted only where evidence demonstrates that construction activity is required to deliver the desired outcome.

3. **Engineering Quality Process** - All schemes are then subject to NI Water's comprehensive Engineering Quality Process and NIAMP6 Quality Assurance Framework, which incorporates formal verification, validation and multidisciplinary challenge at key decision points. Regulatory business cases are developed using a consistent methodology covering need identification, root cause confirmation, option development, cost review, risk assessment and technical approval. This governance framework provides confidence that proposed investments are technically justified, deliverable, proportionate and aligned with whole-life value objectives.

4. **Cost assurance** - is further strengthened through the Investment Planning and Costing (IPAC) system and Cost Model Library, which contain more than 700 standardised cost models derived from historical project performance, framework rates, supplier quotations and independent industry benchmarks. Project costs are subject to consistent allowances for risk, uncertainty and overheads, while independent benchmarking has confirmed that NI Water's estimated costs compare favourably with industry averages. This ensures that investment requirements are both realistic and externally validated.

5. **Capital Efficiency Target** - In addition, all projects within the PC28 programme incorporate capital efficiency expectations from the outset. Each scheme is assigned a capital efficiency target, supported by value tracking, performance monitoring, benchmarking and regular governance reviews.

Building on lessons learned during PC21, NI Water will continue to drive efficiencies through standardisation, digital tools, collaborative delivery models, improved procurement practices and enhanced asset data analytics. As a result, the PC28 investment plan reflects not only what is required to meet statutory and customer obligations, but also how efficiency and value for money are embedded across the programme.

3.3.4 Deliverable Projects

Deliverability is a key requirement of the Utility Regulator's assessment framework and ensures that proposed investment can be realistically developed, procured, constructed and commissioned within the relevant price control period. To demonstrate this, NI Water has undertaken a detailed review of the anticipated delivery profile of every project across PC28, mapping individual projects and programmes within Primavera P6 to identify critical dependencies, design activities, land acquisition requirements, planning approvals, environmental assessments, procurement milestones and construction sequencing.

This approach provides a clear view of project predecessors and delivery constraints, allowing investment to be phased in a manner that reflects achievable delivery timelines rather than simply prioritising need.

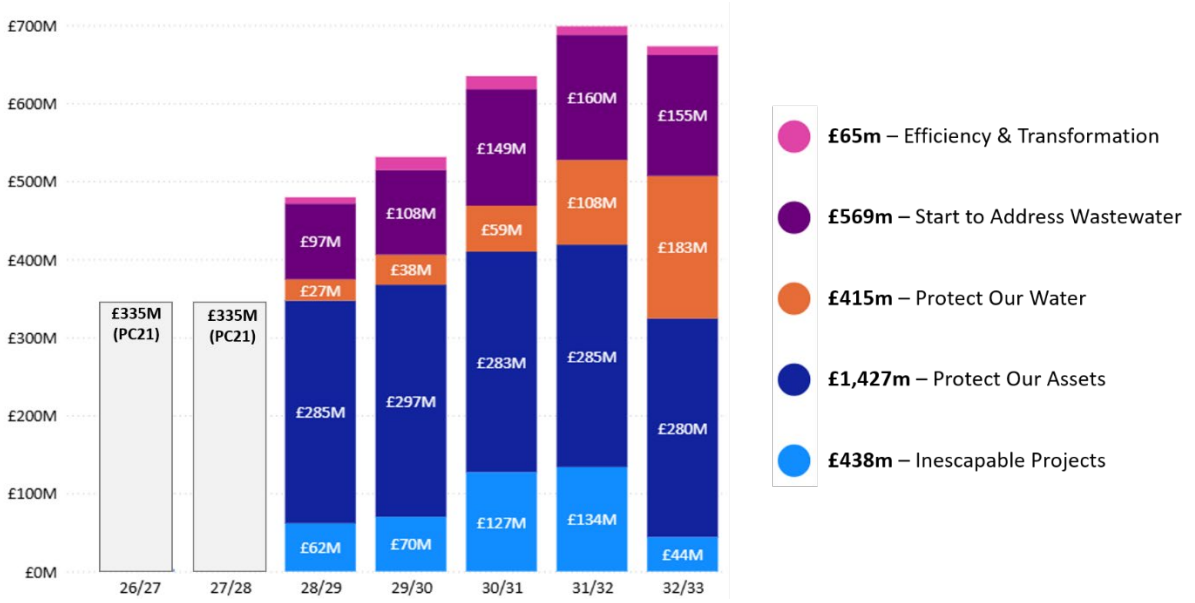


Figure 3.7 – Fully Programmed, Deliverable Projects

A key consideration in this assessment has been NI Water's anticipated delivery capacity and the industry's ability to absorb a significant increase in investment – more on this in Chapter 7.

As illustrated by the investment flight path above, annual capital expenditure is planned to increase from a baseline of approximately £335 million per annum in the final years of PC21 to between £480 million and £700 million per annum during PC28. Although identified investment need is substantially higher, the programme cannot move immediately from the current baseline to maximum delivery capacity. The rate at which expenditure can increase is constrained by the time needed to mobilise additional internal and supply-chain resources, secure statutory approvals, access specialist engineering capability and develop projects to a construction-ready stage. The achievable pace of this ramp-up was therefore a key constraint on the size and profile of the PC28 investment plan.

To ensure that the Business Plan is both achievable and stretching, we assessed two related constraints: the maximum annual level of investment that NI Water and the market could support, and the maximum pace at which delivery could credibly ramp up from the current baseline.

- **Maximum annual capacity**: Market analysis indicates that NI Water and its supply chain could support annual capital delivery of approximately £700 million during PC28 once fully mobilised – see Chapter 7 for more detail.
- **Maximum pace of ramp-up:** The pace at which investment can increase, rather than NI Water's ultimate delivery capacity, constrains how quickly the programme can reach full scale. Increasing delivery requires sufficient lead time to develop business cases, secure statutory and planning approvals, acquire land, complete design and scope definition, procure works and long-lead items, and mobilise the necessary internal and supply-chain resources. These are normal requirements for a large capital programme, but NI Water's funding uncertainty compounds the constraint by limiting the confidence of the supply chain to invest in people, skills and capacity before work is confirmed. The proposed PC28 ramp-up therefore reflects both these practical lead times and evidence from previous price controls summarised below.
  - During PC21, annual investment increased from the PC15 baseline by an average of approximately £90 million per year over four years before reaching the assessed maximum PC21 delivery capacity of around £600 million per year.

- Following notification of reduced funding from Year 3 of PC21, we undertook detailed annual programme reviews to identify the maximum deliverable stretch for each funding request. These reviews supported requests for an additional £149 million in Year 4, including the Living with Water Programme, £84 million in Year 5 and £91 million in Year 6.

Based on this evidence, we assessed the maximum deliverable capital investment in Year 1 of PC28 at £479 million (2025/26 prices), including £52 million for projects carried over from PC21. This represents an increase of £149 million above the assumed PC21 baseline.

3.3.5 Tariff Affordability

Tariff Affordability is one of the Utility Regulator's key assessment principles and is intended to ensure that customers are not subject to unreasonable bill increases.

For PC28, NI Water's projected tariff increase is approximately 3.0% above inflation in real terms, which is significantly below the average increase allowed by Ofwat following its PR24 determinations. This is examined in more detail in Chapter 6.

As a result, tariff affordability is not considered a constraining factor in the development of the PC28 investment programme. Instead, the principal limitations on investment levels relate to deliverability considerations, including programme development timescales, resource availability, supply chain capacity and the ability to successfully deliver projects within the regulatory period.

3.3.6 Prioritisation Framework

The PC28 programme has been developed through a structured prioritisation process which aligns investment to **five strategic theme areas** and **fourteen outcome-based investment areas**. The framework first prioritises inescapable commitments, including carryover construction and projects already underway, before addressing the investment required to maintain existing assets, protect drinking water quality, address wastewater and environmental obligations, and enable future service resilience and growth. This ensures that PC28 investment is directed towards the areas that deliver the greatest regulatory, environmental and customer benefits.

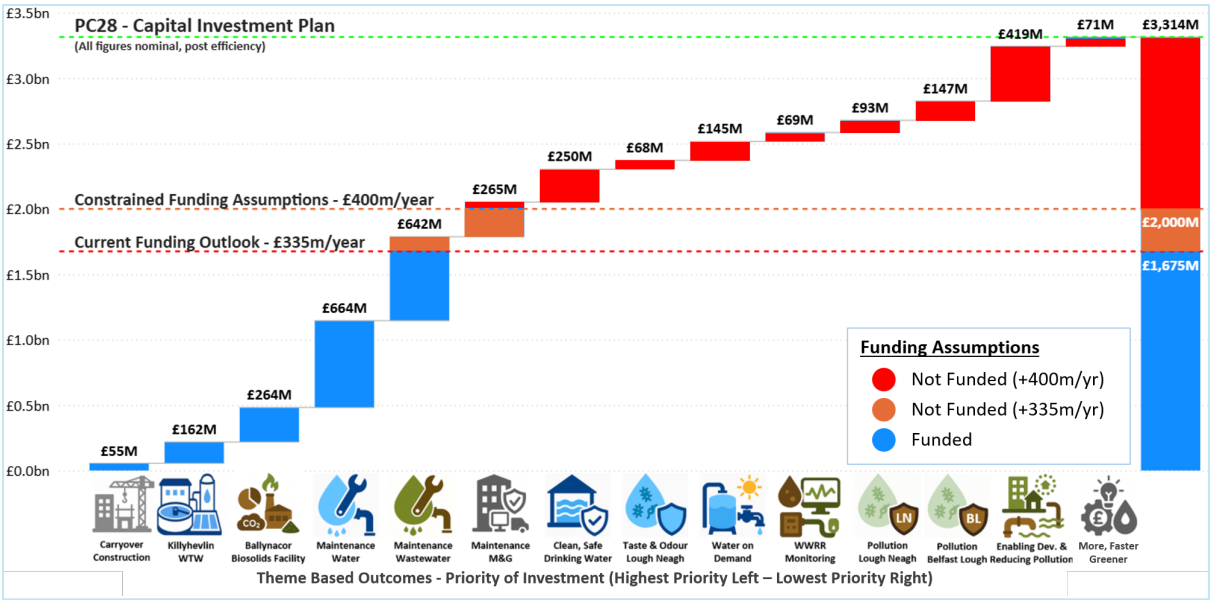


Figure 3.8 – Capital Programme by Theme Priority

The chart above demonstrates how NI Water's highest priority established needs have been assessed and prioritised to arrive at a proposed capital investment plan of £3.3 billion (nominal post efficiency),

equivalent to £3.02 billion in 2025/26 prices (pre-efficiency), for PC28. This represents the lowest level of investment that NI Water considers capable of maintaining essential services, meeting statutory and regulatory obligations, managing key risks and delivering critical improvements for customers and the environment.

The prioritised investment includes maintaining water and wastewater assets, improving drinking water quality, addressing Lough Neagh-related water quality challenges, reducing wastewater pollution, supporting economic growth and delivering operational efficiencies.

Importantly, the £3.02 billion capital investment plan is not an aspirational position but the **minimum investable threshold that NI Water can support and endorse**. Any funding settlement below this level would require the deferral or omission of essential investment, resulting in increased operational, environmental, regulatory and customer service risks. Consequently, NI Water does not consider investment levels below the proposed capital investment plan levels to be consistent with the sustainable delivery of water and wastewater services across Northern Ireland during PC28.

3.4 Our Approach to Base Maintenance

Base Maintenance is the investment required to maintain the long-term capability, condition and performance of NI Water's existing asset base. It supports the continued provision of safe, reliable and resilient water and wastewater services and is focused on sustaining current levels of service, compliance and operational performance. It includes the renewal, refurbishment and replacement of assets that have reached, or are approaching, the end of their economic life, together with the systems and resources required to continue operating and maintaining those assets.

Base Maintenance differs from Enhancement investment, which is undertaken to provide a new or improved level of service through activities such as increasing capacity, supporting growth, improving resilience or meeting new regulatory requirements. While Enhancement projects can also provide opportunities to replace existing assets, these maintenance benefits are classified as Incidental Base and form part of the overall Base Maintenance requirement. Together, Base Maintenance and Enhancement investment comprise the total PC28 capital programme.

The objective of the PC28 Base Maintenance Programme is to achieve no net deterioration in asset health throughout the PC28 period, whilst maintaining current levels of serviceability, compliance and operational resilience.

3.4.1 Developing the PC28 Base Maintenance Requirement

NI Water is proposing a Base Maintenance Programme of £1.31 billion during PC28, equivalent to approximately £264 million per annum. This represents the investment required to maintain the health, performance and resilience of an ageing asset base while continuing to provide safe and reliable services to customers and protect the environment.

The programme has been developed using a range of recognised asset management methodologies supported by asset inventories, engineering assessments, operational experience, historical expenditure analysis, asset condition information and specific asset maintenance plans. Different assessment techniques have been applied across different asset groups to reflect the nature of the assets being assessed and the quality of information available. No single methodology has therefore been relied upon across the programme. The approach applied reflects the most appropriate evidence available for each asset class and investment area.

The resulting programme has then been reviewed and challenged through NI Water's governance, assurance and business planning processes to ensure that the proposed requirement is proportionate,

evidence-based and aligned with the objective of maintaining asset health and serviceability through PC28.

3.4.2 Validation of the Requirement

The resulting programme was subsequently tested and validated using a range of complementary evidence sources. Figure 3.9 summarises the principal evidence streams used to assess the reasonableness of the proposed PC28 Base Maintenance requirement.

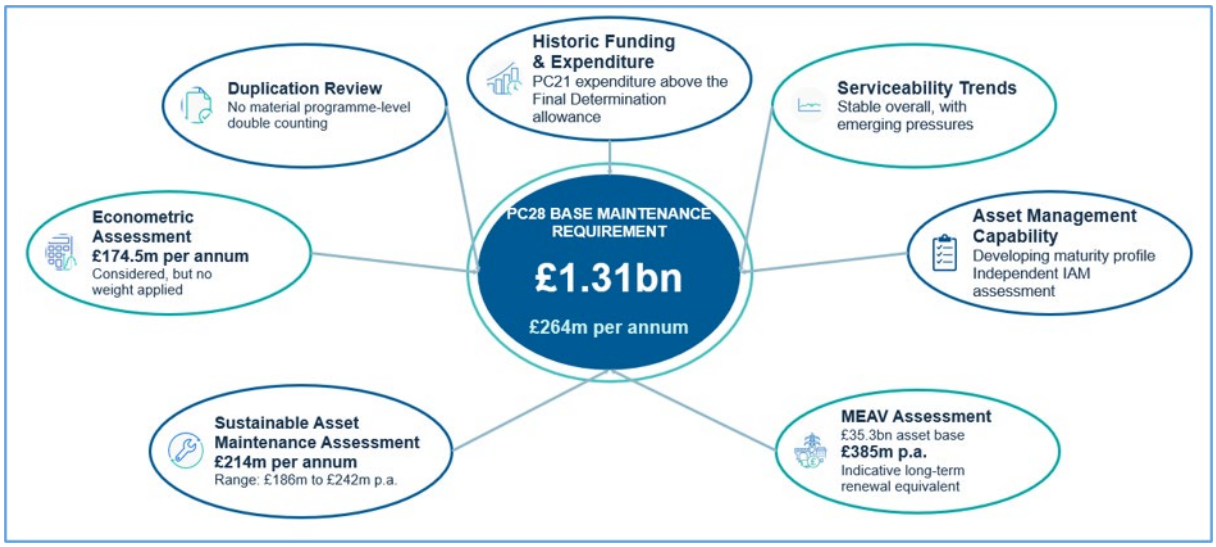


Figure 3.9 - Validation of the PC28 Base Maintenance Requirement

No single methodology has been relied upon in isolation. The proposed Base Maintenance requirement has been validated using a range of complementary evidence sources, including historic funding and expenditure trends, serviceability assessments, econometric assessment, Modern Equivalent Asset Valuation (MEAV), the Sustainable Asset Maintenance Assessment and a review of potential duplication between Base Maintenance and Enhancement investment programmes. These provide different perspectives on the scale and reasonableness of the proposed requirement and have been considered collectively rather than as individual determinants of the required level of investment.

Taken together, these assessments provide a consistent picture of increasing maintenance requirements across NI Water's ageing asset base. They demonstrate that maintaining current levels of service is becoming increasingly dependent on continued investment in the condition, reliability and performance of existing assets. The evidence also supports NI Water's conclusion that the proposed programme represents a reasonable and proportionate level of investment to achieve a position of no net deterioration in asset health throughout PC28.

Further detail on the assessment methodologies, validation exercises and supporting evidence is provided in Appendix 3.4 - Base Maintenance Technical Appendix.

3.5 Assessing the Scope for Capital Efficiency

Cumming Group was commissioned by NI Water to undertake an assessment of both the effectiveness of PC21 capital efficiency initiatives and the key opportunities for delivering further capital efficiencies over the PC28 period. A PC28 total capital efficiency target is proposed that represents both catchup efficiency and frontier shift efficiency.

The exercise included a comprehensive review of water industry capital efficiency initiatives and NI Water stakeholder interviews, to establish a list of new initiatives available for PC28. 10 initiatives were identified to be implemented within the PC28 period having the following predicted impact.

The results are expressed for each year of PC28 in terms of efficiency savings in £m and percentage reductions. The expected efficiency across the whole programme is 2.00% which equates to total efficiency savings of £59m.

Table 3.1 – Total capital efficiency savings (by initiative)

Ref	Efficiency Initiative	Pre-Efficiency Total (£m)	Post Efficiency Total (£m)	Efficiency Saving (£m)
1	Digital maturity	151	148	3.02
2	Improved consultancy scope definition and benchmarking	151	148	3.02
3	In-house Cost Intelligence	161	158	3.22
4	CPMO evolution	302	295	6.03
5	EIOB approach	643	630	12.86
6	Improved reporting and management of capital efficiency	402	394	8.04
7	Improved and longer term visibility of work	402	394	8.04
8	Operational-to-capital rebalancing	251	246	5.03
9	Renewable energy and energy-efficiency investments	201	197	4.02
10	Catchment management replacing treatment upgrades	302	295	6.03
Total		**2,965**	**2,906**	**59.30**
			Capital Efficiency Percentage	**2.00%**

The biggest savings are expected because of improvement in EIOB Approach (£12.86m) and Improved reporting and management of capital efficiency and improved and longer-term visibility of work respectively, both (£8.04m). The detailed approach and quantification methodology is attached in Appendix 3.8, with the methodology used to assess Capital Real Price Effects provided in Annex 3.8.1.

3.6 Priority 1 – Inescapable Projects

Inescapable Projects are investments that cannot be deferred beyond PC28 without creating significant operational, legal, environmental, contractual or service risks. Collectively, these projects are driven by unavoidable operational requirements, contractual commitments and national resilience needs, making them non-discretionary elements of the PC28 programme.

3.6.1 Carryover Construction

Carryover construction represents enhancement projects that span across regulatory periods due to their scale, complexity, or delivery requirements. This includes approximately £52 million of PC21 enhancement schemes that continue into the PC28 period.

3.6.2 Killyhevlin WTW

Killyhevlin WTW **(image right)** is a unique project arising because the Sirofloc process relies on an obsolete product (magnetite) that was refined to an acceptable quality and used in the water treatment process. Enough processed magnetite (to the specific refined grade) has been stockpiled to enable the current operation for a further 7 years up to 2032 and to enable the replacement of this facility.

If this national project could be funded from a different government source this would significantly relieve pressure on the public expenditure outlook enabling an additional £150m of capital projects to proceed in PC28.





3.6.3 Ballynacor Biosolids Facility

A new Sludge Disposal Facility is required to address 50% of the nation's wastewater sludges due to the expiry of the PPP Incinerators in 2032 **(Image left).** This facility is critical as there are currently no other ways of disposing of this sludge within Northern Ireland.

The replacement will also result in a 10% reduction in NI Water's entire operational carbon emissions and additionally create a valuable biochar for circular reuse.

If this national project could be funded from a different government source this would significantly relieve pressure on the public expenditure outlook enabling an additional £250m of capital projects to proceed in PC28.

3.7 Priority 2 – Protecting Our Assets

Capital Maintenance is the next highest investment area because it protects the essential assets that keep water and wastewater services safe, reliable and resilient. When these assets are not maintained, the consequences can be severe and far reaching. The risks are not theoretical. They are well understood, evidenced and independently assured.

If our assets are not maintained they can fail leading to serious impacts such as:

- Water shortages that disrupt homes, businesses and critical services
- Water quality incidents that undermine public confidence and regulatory compliance
- Severe watercourse pollution that damages the environment and risks enforcement action
- Property flooding incidents that cause distress, financial loss and reputational harm
- Health and safety incidents affecting staff, supply chain partners and the public
- IT and cyber breakdowns or shutdowns that compromise operational control and service continuity

These risks highlight why capital maintenance is not discretionary. It is the foundation that keeps the system functioning and protects customers, communities and the environment. Furthermore, insufficient maintenance which leads ultimately to breakdown and impact on customers is potentially grounds for management failure which could lead to prosecutions against the company.

The image below illustrates the many thousands of Water, Wastewater & M&G facilities that we are responsible for across the country.



Figure 3.10 - Water, Wastewater & M&G Facilities Across NI

The level of PC28 investment has been calculated to broadly maintain the current asset health of our Facilities and Networks. A reduction in this investment would cause deterioration in the health of these assets. We recommend that this investment is not deprioritised due to the consequences of asset failure that is likely to result.

3.7.1 Critical Maintenance – Water

Investment in Critical Maintenance – Water will keep the entire public drinking water system in good working order to prevent harm from poor water quality and avoid water shortages caused by outages. This includes controlling leakage without spending more than can be economically justified.

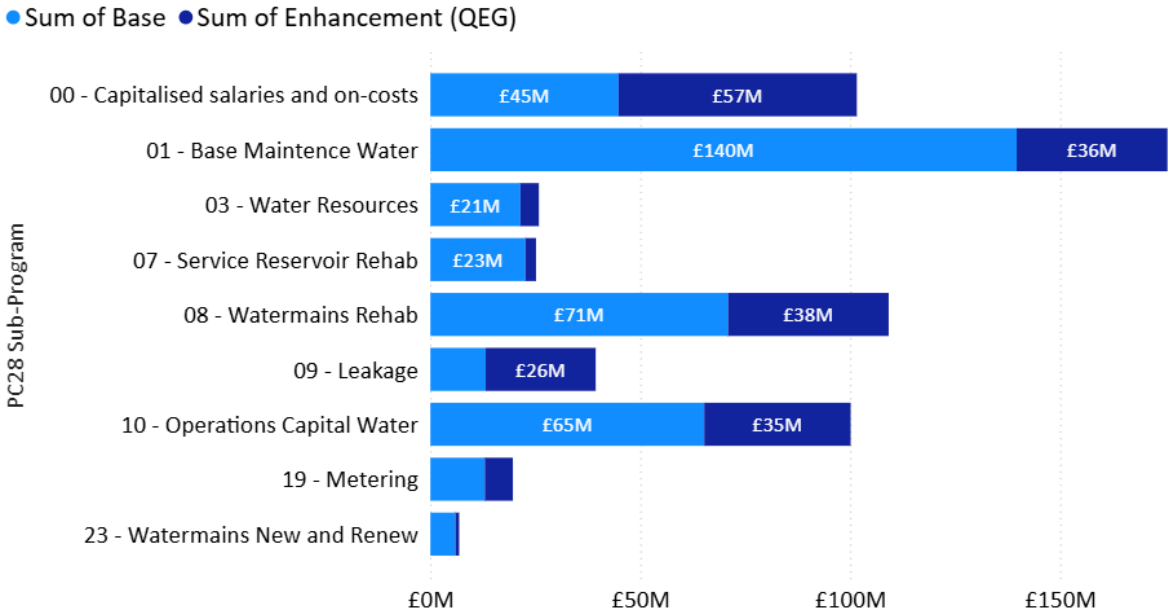


Figure 3.11 – Subprogrammes Containing Water maintenance themed projects

The **Water Maintenance** theme comprises several regulatory sub-programmes, each containing a different mix of base maintenance and enhancement investment. While the theme is presented as a single investment area within the prioritisation framework, it encompasses activities ranging from capitalised

salaries and operational capital investment to water resource resilience, reservoir rehabilitation, water mains renewal, leakage reduction and metering. The relative split between base and enhancement expenditure varies significantly across these programmes depending on the nature of the required intervention. Full transparency on this allocation is provided within the accompanying regulatory tables.

3.7.2 Critical Maintenance – Wastewater

Sustained spend on Critical Maintenance – Wastewater will protect a vast number of treatment works, pumping stations and sewers from deterioration and critical failure that would cause more pollution or flooding of properties and cost large amounts of money to repair if they go wrong.

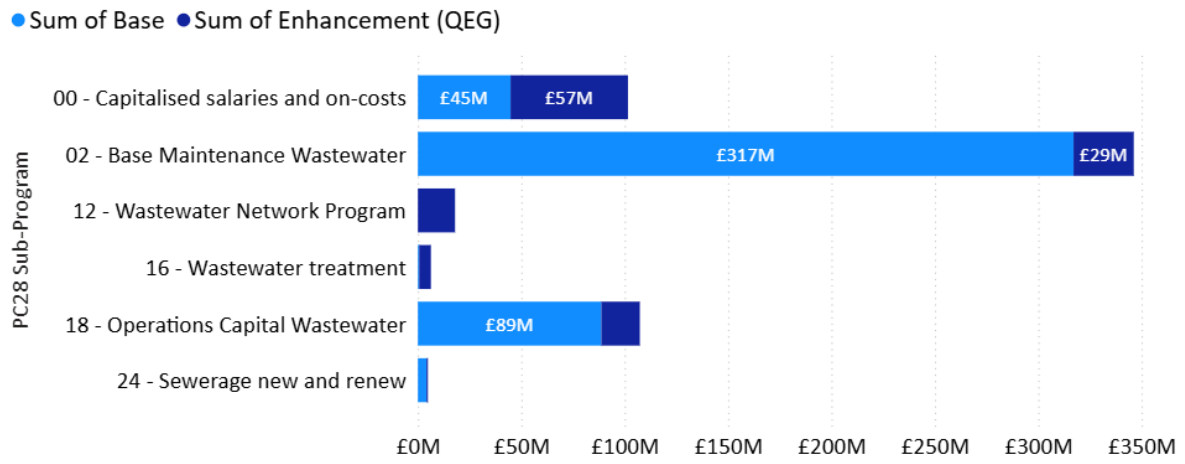


Figure 3.12 – Subprogrammes Containing Wastewater maintenance themed projects

Similarly, the **Wastewater Maintenance** theme focuses on sustaining the performance, reliability and resilience of NI Water's existing wastewater asset base, with the majority of investment directed towards proactive asset stewardship and long-term serviceability. The programme is predominantly comprised of Base Maintenance investment (£317m), reflecting the need to maintain ageing treatment works, pumping stations, sewer networks, mechanical and electrical equipment, and critical operational infrastructure. This investment is complemented by targeted enhancement activity across wastewater networks and treatment assets, ensuring that emerging operational, environmental and resilience risks are addressed before they impact customers or compliance performance. Together with operational capital expenditure and supporting capitalised resources, the Wastewater Maintenance theme provides a balanced and risk-based investment portfolio that protects essential public services, supports environmental performance and ensures assets continue to operate efficiently and effectively throughout PC28 and beyond.

3.7.3 Critical Maintenance – M&G

Investment in Critical Maintenance – M&G will be used to make sure our offices, ICT systems, labs, workshops, vehicles, land and depots are safe and secure, so people can work effectively whether they're in the office or out on site. It will also maintain and renew critical business and operational systems, including telecommunications, telemetry, SCADA, laboratory infrastructure, fleet and asset management systems. Investment in NI Water's estate and health and safety programmes will address ageing facilities and statutory compliance requirements, helping to maintain the organisational capability and resilience needed to support the delivery of essential water and wastewater services throughout PC28.

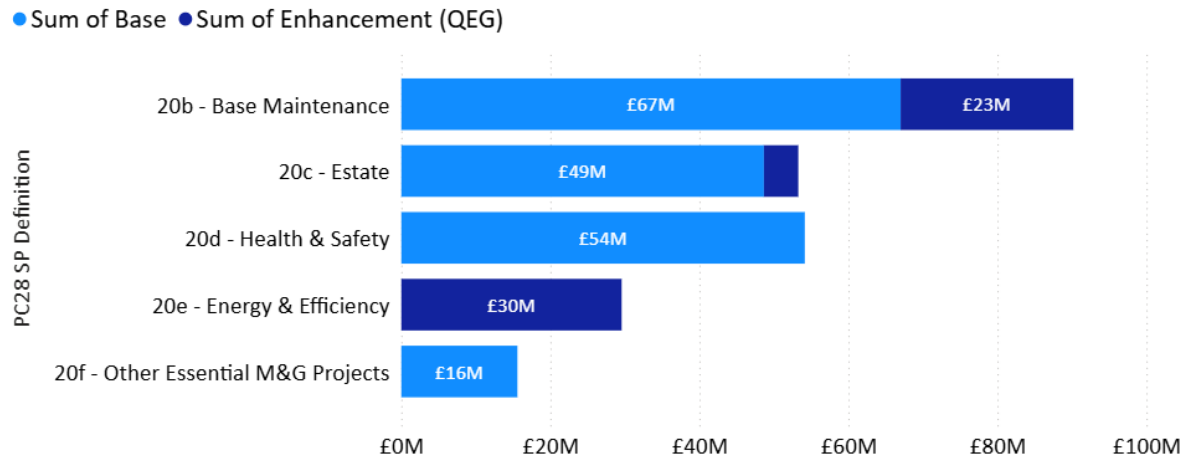


Figure 3.13 – Subprogrammes Containing M&G Maintenance themed projects

3.8 Priority 3 – Protect Our Water

Northern Ireland benefits from plentiful water resources, but reliable drinking water supplies cannot be taken for granted. Periods of hot, dry weather can increase demand by up to 40% within days. Changes in raw water quality, including the effects of blue-green algae, create additional challenges for the treatment and supply of drinking water. The investment programme, including major schemes with delivery extending into PC33, will:

- Increase drinking water production by 41 million litres per day.
- Add storage capacity equivalent to 6 Olympic swimming pools. Strengthen strategic water pipelines to move water around the region.
- Upgrade 9 treatment works to ensure potentially harmful substances are removed.
- Improve treatment resilience to blue-green algae affecting water supplies serving around 40% of the population.

These investments will help maintain water quality, strengthen the reliability of supplies and reduce the risk of future interruptions. They will also improve the flexibility of the water supply system, allowing NI Water to respond more effectively to changing demand, extreme weather and variations in raw water quality.

3.8.1 Clean Safe Drinking Water

Water treatment plants will be upgraded to meet stricter quality standards enforced by DWI. These upgrades will remove harmful pesticides and weed killers from untreated water as well as by-products from chlorine added to disinfect drinking water to kill harmful germs and bacteria. A significant proportion relate to drinking water quality and water safety and are expected to form part of DWI endorsed Annex A programmes. While DWI typically supports delivery through Annex A rather than moving immediately to formal enforcement, these projects remain mandatory compliance requirements.

3.8.2 Taste and Odour (Lough Neagh)

Investment in Taste and Odour projects will put in place protection against the effects of blue-green algae in Lough Neagh, which at times can release substances that if not removed will cause drinking water to have an unpleasant taste and smell that will cause concern for people. This will involve upgrading treatment processes at Moyola, Castor Bay and Dunore to be compliant to DWI standards.

3.8.3 Water on Demand

Investment in Water on Demand projects will help make the public water system more resilient so it can keep up with high demand during the hotter, longer summers we are now experiencing. This means boosting network pipe and pumping capacity and increasing the volume of drinking water we store so we can manage peaks of demand.

The projects within this category are associated with the production and transmission of more water across the country in line with the highest priority projects arising from the water resource and supply resilience strategy and because of modelled and verified hydraulic constraints. These projects are critical for customers to receive water during high demand periods during the summer. If these projects are not undertaken, we are likely to see more water shortages and hosepipe bans in the future.

3.9 Priority 4 – Start to Address Wastewater

Northern Ireland's wastewater system plays a vital role in protecting public health, safeguarding the environment and supporting economic growth. Many of the challenges it faces have developed over decades and will take time to resolve. Addressing all identified wastewater needs through conventional infrastructure solutions alone would require investment of several billion pounds and many years of sustained delivery.

PC28 represents an important first step in a much longer-term programme of improvement. It includes significant investment in wastewater infrastructure around Lough Neagh and Belfast, alongside enhanced spill monitoring and flow metering. These measures will improve transparency, strengthen environmental oversight and provide the evidence needed to target future investment towards the locations and interventions that can deliver the greatest benefit.

The plan will begin delivering measurable improvements during PC28 while creating the information, capability and foundations needed to accelerate progress over the longer term. Within the funding available, NI Water will prioritise solutions that deliver the greatest combined benefits for housing, the environment and the economy.

3.9.1 Wastewater Regulation Reform Monitoring

Investment in WWRRM projects will enable better understanding, communication and response to preventing and resolving pollution. We will deploy and maintain more monitoring equipment throughout the public wastewater system to comply with required regulatory standards.

The Wastewater Regulation Reform Programme, led by the Northern Ireland Environment Agency (NIEA), in consultation with NI Water, is designed to transform the current regulatory framework. These reforms will ensure a more holistic assessment of the performance of NI Water's wastewater assets, enhancing wastewater compliance visibility for regulators and customers and close the gap between perceived and actual performance.

The programme introduces an enhanced regulatory and operational framework built around six key reforms:

1. **Revised Quality Sampling Approach** – From January 2027, NI Water will move to a revised approach to the sampling of treated wastewater discharges under the Operator Self-Monitoring (OSM) scheme. This reflects changes in the regulatory approach and will support a more representative understanding of wastewater discharge performance. Responsibility for quality monitoring will remain with NI Water under the OSM scheme.

2. **Flow Compliance** - Introducing flow monitoring at more WwTWs and flow based assessments to better reflect actual environmental performance and identify where investment is most urgently required.
3. **Enhanced Monitoring of Priority Substances** - Expanding regulatory oversight to include additional priority substances that pose risks to ecosystems and human health.
4. **Collection System Compliance** – The introduction of regulatory compliance and reporting for collection systems including storm overflows and pumping stations. Making spill information more readily available for priority areas and enhancing levels of environmental protections arising from spills.
5. **Catchment-Based Outcomes** - Moving to a holistic, catchment-scale approach for wastewater management, supporting integrated solutions, including nature-based interventions.
6. **Support for Long-Term Funding and Capital Investment** - More holistic compliance evidence will clarify the scale of capital needed.

The Wastewater Regulation Reform Programme seeks to deliver improved environmental outcomes including enhanced protection of raw water quality for drinking water and of sensitive sites and support wider water quality objectives. It will bring holistic and transparent compliance reporting and create the evidence base required to secure long-term investment.

3.9.2 Pollution Lough Neagh

All projects associated with Lough Neagh and other major water bodies have been optimised though the development and use of state of the art integrated environmental models (IEMs). This enables the full understanding of pollutants arising from NI Water assets relative to other diffuse pollution.

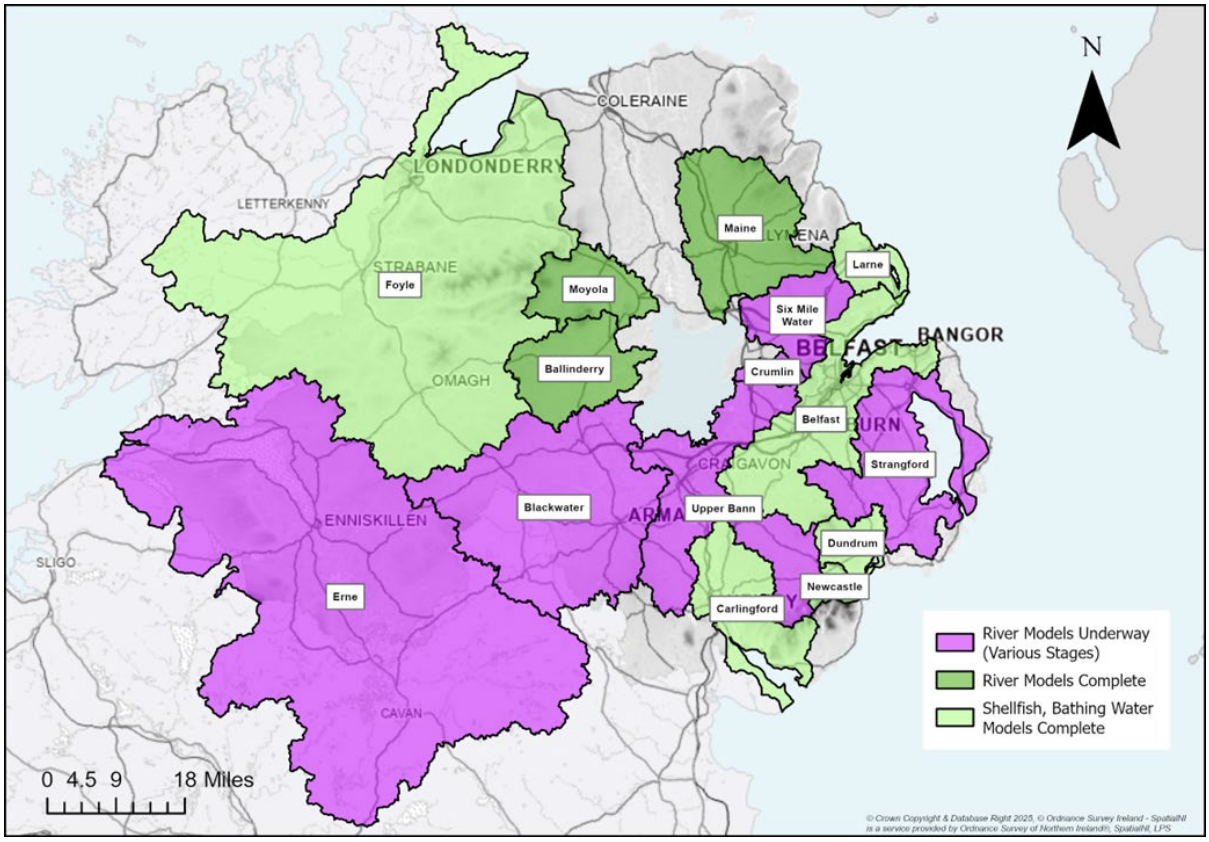


Figure 3.14 – Integrated Environmental Model Suite Status

Given the significant public, political and environmental focus on Lough Neagh, NI Water has included a targeted programme of catchment-related wastewater investments within PC28. While available evidence indicates that the majority of nutrient inputs to the lough originate from diffuse agricultural sources and private septic tanks, rather than NI Water assets, there remains a strong expectation that all sectors contribute to improving water quality. Consequently, the proposed investment programme goes beyond the minimum regulatory requirements currently specified by the Northern Ireland Environment Agency (NIEA), incorporating a range of wastewater treatment and environmental improvement projects aimed at reducing NI Water's impact on the catchment.

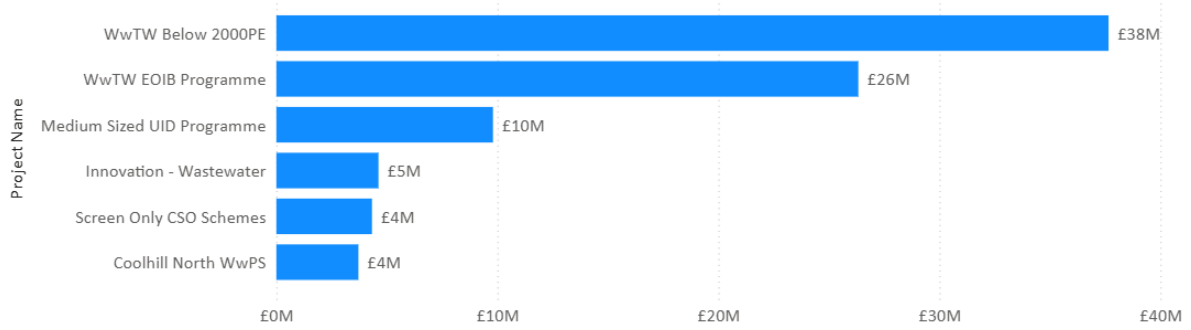


Figure 3.15 – Key Projects associated with Pollution in Lough Neagh

This reflects NI Water's commitment to playing its part in the wider recovery of Lough Neagh and responding proactively to stakeholder and public concerns regarding water quality and ecosystem health.

3.9.3 Pollution Belfast Lough

In PC21 the Living with Water Programme (LWWP) was the Department for Infrastructure's flagship, long-term plan to tackle Belfast's chronic drainage, wastewater and flooding problems through a single, integrated approach. It brought together DfI, NI Water, the Environment Agency, Belfast City Council and others to plan the city's drainage as one system, rather than as separate pipes, rivers and treatment works owned by different bodies.

The Living with Water Programme was mothballed in November 2024 because the Department for Infrastructure could not secure the multi-year capital funding required to move it from planning into delivery. Although the Executive endorsed the strategic plan for Belfast, the scale of investment needed to upgrade drainage, wastewater and flood-risk infrastructure far exceeded the budget allocated to DfI and NI Water. Without that funding, the Department was legally unable to commit to major construction contracts, forcing an indefinite deferral of the programme.

This decision reflected wider pressures on Northern Ireland's infrastructure budgets, with competing demands for investment from public bodies. For PC28 a drastically cut back version of this programme is recommended that focuses on the minimum investment required to ensure minimum legal compliance of the Belfast, Whitehouse and Kinnegar WWTWs. Full details are included in business cases within sub-programme 16d.

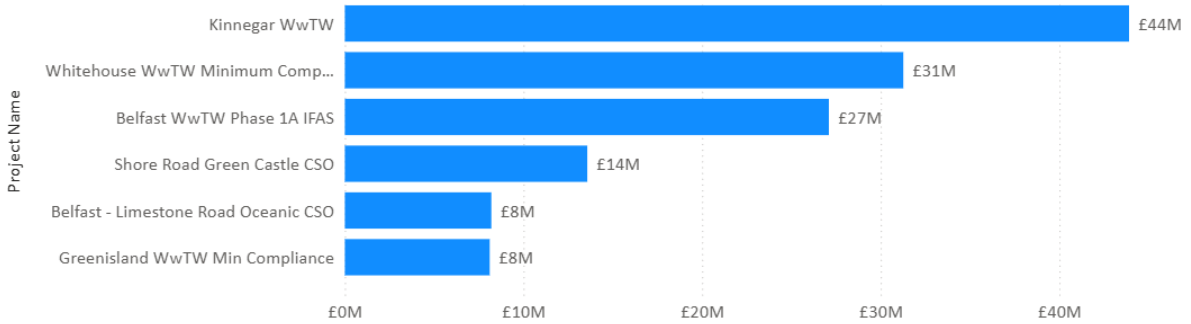


Figure 3.16 – Belfast Lough Projects

Over £3bn of established needs have been identified within the Belfast Lough Area. We are planning to invest £132m during the PC28 period which will result in the completion of approximately 5% of NI Water's elements of the LWWP Belfast Plan that DfI launched in 2021 – a plan that was originally intended to be complete at the end of the PC28 period.

3.9.4 Enabling Development and Reducing Pollution

Development constraints now represent one of the most significant challenges facing the wastewater system and are closely linked to underlying wastewater treatment and network capacity constraints that can also contribute to pollution risk. As a result of long-term underinvestment, ageing assets, and growing environmental obligations, many wastewater treatment works and associated sewer networks are operating at or beyond their design capacity. In these locations, the system cannot reliably accommodate additional hydraulic load without causing increased pollution risk, sewer flooding, or deterioration in receiving water quality.

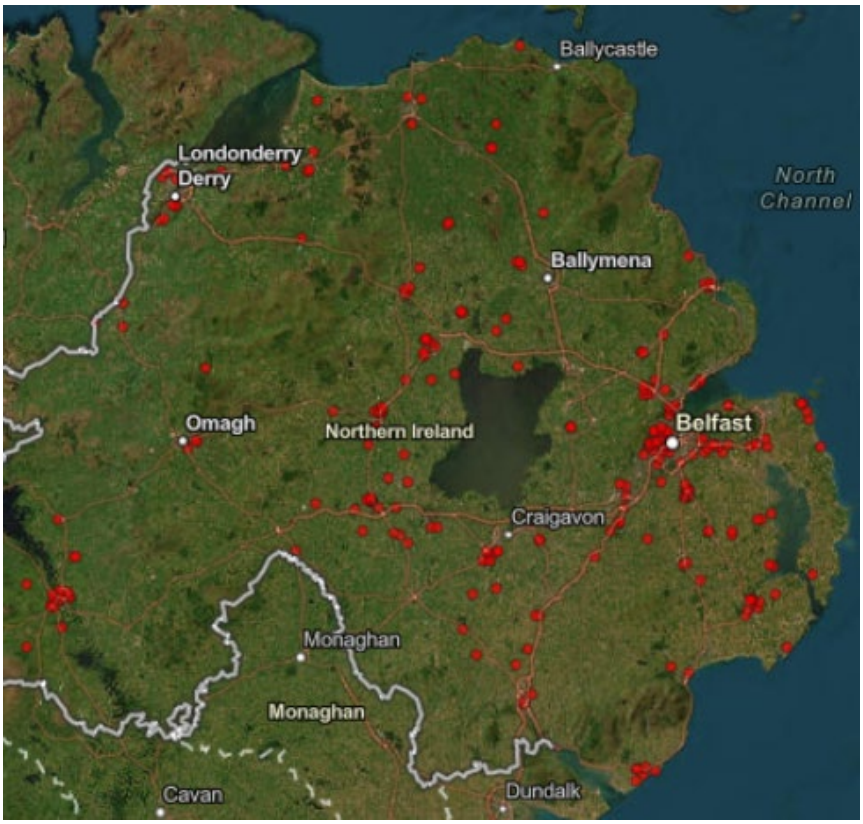


Figure 3.17 – Development Constraints across Northern Ireland

Across Northern Ireland, constraints affect a large number of towns and settlements of all sizes. These constraints limit the ability of new homes, commercial premises and strategic developments to connect to the wastewater network. In many locations, constraints arise from a combination of:

- Insufficient treatment headroom at local WwTW
- Hydraulic limitations in downstream sewer networks
- Unsatisfactory intermittent discharges (UIDs) with no remaining environmental allowance
- Pumping stations and rising mains that cannot convey increased flows
- Water quality sensitivities where even modest load increases would worsen ecological conditions
- Catchments with significant volumes of unwanted water, reducing capacity for growth

The status of development applications pending without permission to connect is shown below:

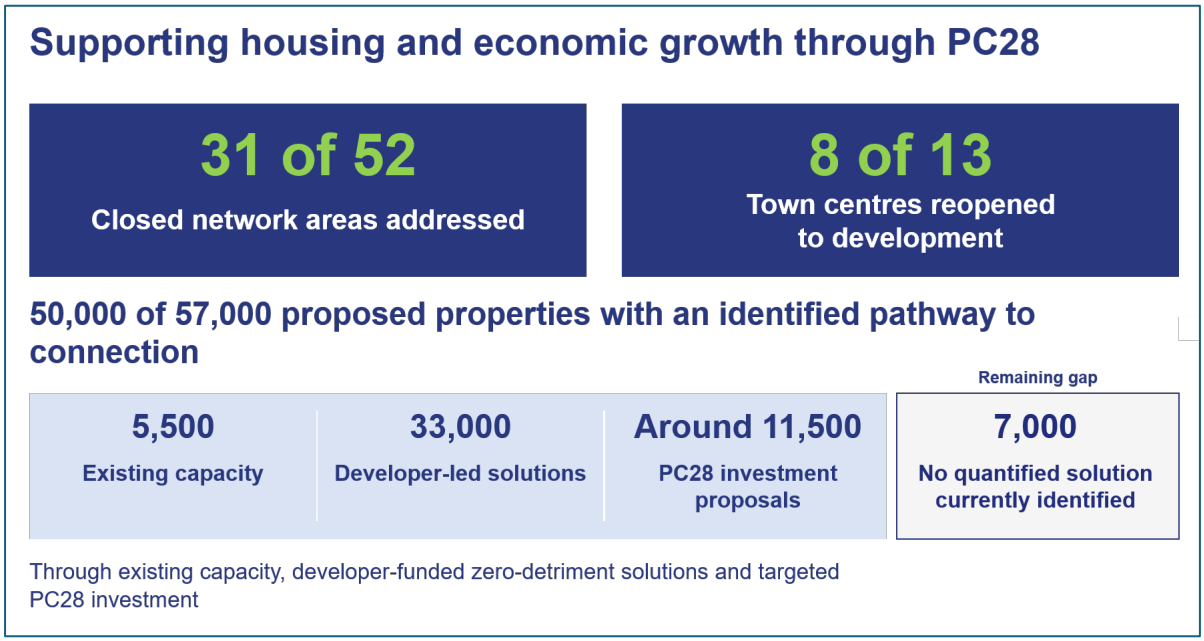


Figure 3.18 - PC28 Wastewater Capacity Outcomes for Housing and Economic Growth

As set out in the Enabling Development and Reducing Pollution theme, NI Water has identified a targeted programme of interventions in PC28 aimed at addressing the highest-priority constraints. This includes investment in treatment works upgrades, strategic network improvements, targeted UID schemes, Betterment Solutions in constrained catchments, and catchment optimisation activities to remove unwanted water and improve overall system performance.

Betterment Solutions provide localised storage or flow-attenuation measures that not only offset the hydraulic impact of new development but also deliver a proportionate improvement in the existing environmental performance of the receiving asset. Under this approach, storage equivalent to the development's impact is provided to ensure no deterioration, with additional storage added to secure a meaningful enhancement in asset performance. This enables controlled development to progress safely in areas that would otherwise remain fully constrained until long-term strategic upgrades can be funded and delivered.

The proposed PC28 investment programme includes interventions associated with enabling development for approximately 11,500 properties based on current best evidence, comprising:

- Betterment UID schemes associated with around 8,500 properties
- Strategic Site Development investment associated with around 3,000 properties

Wider wastewater investment will also contribute to increasing capacity and reducing development constraints through treatment works upgrades, network improvements, enhanced monitoring, catchment optimisation and unwanted-water removal. This wider investment will support the longer-term creation of capacity, including preparation of constrained catchments for interventions extending beyond PC28

While the proposed programme will not fully resolve all existing development constraints, it provides a focused, prioritised response within the Minimum Acceptable Investment Scenario. By combining strategic upgrades with Betterment Solutions that deliver both development capacity and incremental environmental improvement, PC28 will help create development capacity while supporting environmental improvement. This represents a critical first step toward restoring system capacity and supporting Northern Ireland's wider economic and housing ambitions. However, sustained strategic investment beyond PC28 will be required to address the wider infrastructure deficit and underpin Council Local Development Plan ambitions.

3.10 Priority 5 – Delivering Efficiency

Delivering efficiency is the lowest priority within the PC28 investment hierarchy, not because it is unimportant, but because investment must first be directed towards maintaining essential services, meeting statutory obligations and protecting public health and the environment.

However, ongoing investment in efficiency remains critical if NI Water is to keep pace with a rapidly evolving water industry and continue to perform in line with upper quartile water company standards for productivity and operational performance. These projects support the adoption of new technologies, digital solutions, process improvements and modern ways of working that drive both capital (capex) and operational (opex) efficiencies. Over time, these investments help reduce the overall cost of service delivery, improve asset performance and ensure NI Water can continue to meet increasingly challenging efficiency expectations from regulators while delivering better value for customers.

3.10.1 Achieving More, Faster, Greener

This programme brings together a portfolio of targeted, high-value investments that can be delivered quickly to generate immediate environmental, operational and sustainability benefits. The programme is strongly focused on reducing energy consumption and carbon emissions, with major investment in behind-the-meter solar generation, energy efficiency measures and hydro-generation schemes, helping to improve energy resilience while reducing operating costs.

Complementing these investments are a range of innovation, digital transformation and asset management initiatives, including BIM and Common Data Environment capabilities, telemetry standardisation, improved asset information systems and the development of future engineering standards. Together, these projects support NI Water's climate change objectives, biodiversity commitments and broader organisational transformation agenda.

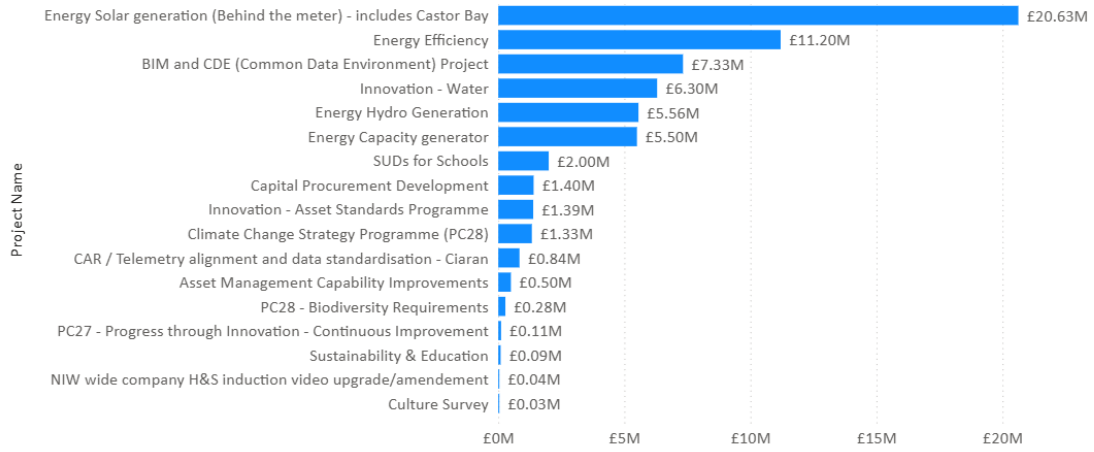


Figure 3.19 – Key Projects associated with delivering efficiency

By focusing on relatively low-cost, rapidly deliverable interventions, the Fast Green Projects programme accelerates progress towards net zero, improves operational efficiency and delivers early customer, environmental and financial benefits whilst creating the foundation for longer-term sustainable investment

3.11 Consequences of Funding Constraints

The £3.02 billion Capital Investment Plan represents the **minimum level** of investment required to maintain safe and reliable services, meet statutory and regulatory obligations, protect public health and the environment, and sustain the long-term resilience of Northern Ireland's water and wastewater infrastructure.

NI Water has also assessed an "unacceptable" reasonable worst-case funding scenario of approximately £400 million per year. This level of funding represents the absolute minimum investment required to deliver inescapable projects and maintain the integrity, safety and operability of the existing asset base. It is focused almost entirely on asset preservation and critical risk management and provides little or no capacity to deliver material improvements, environmental enhancement, growth-related investment or modernisation

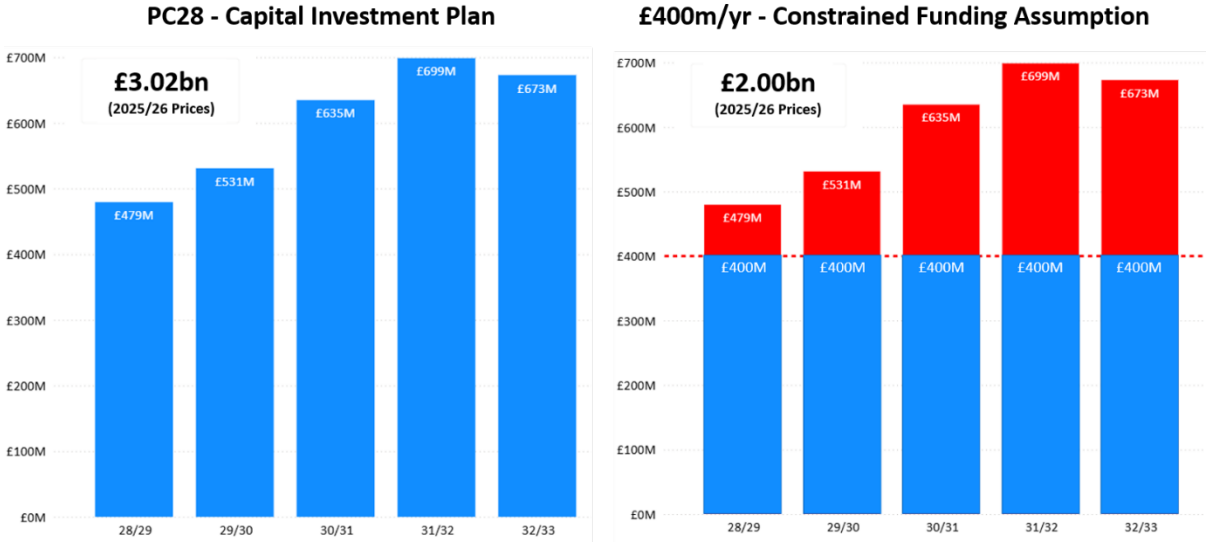


Figure 3.20 – Constrained Funding Assumption

A funding level closer to current expenditure levels of approximately £335 million per year would be insufficient to protect existing assets and would accelerate infrastructure deterioration. This would

increase the likelihood of asset failures, customer service interruptions, environmental pollution incidents, compliance failures, regulatory intervention and prosecutable public health and environmental events.

Insufficient investment would result in a progressive deterioration in the condition and performance of NI Water's assets. The consequences would extend beyond asset reliability, increasing risks to drinking water quality, wastewater compliance, environmental protection and service resilience. As infrastructure continues to age, the likelihood and frequency of asset failures would increase, placing greater pressure on operational teams and increasing costs to customers over the longer term.

Under these funding scenarios, investment would increasingly be directed towards maintaining the operability of ageing assets and managing critical risks. Opportunities to improve service performance, enhance environmental outcomes, increase resilience and support economic growth would be significantly reduced, resulting in a transition from improvement to the management of decline. Over time, a growing proportion of available funding would be absorbed by maintaining failing infrastructure rather than delivering benefits for customers and the environment.

In practical terms, constrained funding (£400m/year) would progressively reduce Northern Ireland's ability to protect public health, improve environmental quality, support housing growth and attract economic investment, transferring larger risks and costs to future generations.

- **Public Health and Service Risk** – Failure to invest in critical water treatment, distribution and wastewater assets would increase the risk of service disruption and reduce resilience to extreme weather, population growth and changing environmental requirements. Asset failures within water treatment and distribution systems could result in deterioration in drinking water quality, while failures within wastewater networks and treatment facilities could lead to pollution incidents, property flooding and impacts on public health.

- **Environmental and Economic Consequences** – Funding constraints would significantly limit NI Water's ability to improve environmental performance. In practice, much of the investment required to reduce storm overflows, improve river water quality, enhance wastewater treatment performance and support environmental compliance would be delayed or unable to proceed, substantially reducing NI Water's ability to deliver environmental improvements during the period. This would increase pressure on Northern Ireland's rivers, lakes and coastal waters and reduce progress towards meeting environmental obligations and societal expectations. Funding constraints would also increasingly restrict NI Water's ability to provide wastewater capacity for new housing and commercial development. Existing constraints would worsen over time, limiting economic growth and the delivery of local development plans.

- **Regulatory Compliance Risk** – As assets continue to deteriorate, NI Water would face an increasing risk of failing to meet statutory and regulatory obligations. Reduced asset performance could lead to increased compliance failures, enforcement action and prosecution risk, alongside reputational damage and a reduction in public confidence in essential water and wastewater services. **Funding constraints do not remove statutory duties. The legal obligations associated with drinking water quality, environmental protection and wastewater treatment remain in place irrespective of the funding available to meet them.**

- **Asset Sustainability** – Deferred investment does not remove the need for expenditure; it typically increases future costs. Continuing to postpone the renewal of ageing infrastructure would accelerate asset deterioration, increase maintenance requirements and ultimately require more extensive and costly interventions to restore serviceability and resilience in future regulatory periods.

- **Cannot support NI Executive Programmes** - would also mean that we are unable to deliver water and wastewater obligations within other NI Executive statutory programmes including, NI River Basin Management Plan, NI Climate Action Plan, NI Climate Adaptation Programme and the NI Flood Risk Management Plan.

The PC28 Capital Investment Plan therefore represents the lowest level of investment that can reasonably sustain essential water and wastewater services over the PC28 period. Funding below this level would result in progressively increasing service, environmental, regulatory and financial risks, with consequences extending well beyond the current regulatory period.

3.11.1 Shareholder Instructions from Draft S&EG (Clause 10)

The Department for Infrastructure (DfI) has asked through the draft social and environmental guidance to understand the implications of a constrained budget for PC28 without advising of a target for that constraint

> ***"NI Water's PC28 Business Plan Submission should clearly articulate the implications of a constrained budget, outlining what could be delivered within budget plans, when agreed by the Department, and provide analysis of how projects which may not be currently deliverable within the funding available could be delivered in phases should additional funding become available. NI Water's PC28 Business Plan should also articulate the implications of not funding the assessed capital requirements in the PC28 Outline Capital submission, including how this will impact on the service delivery for current and future customers." (S&EG Cl.10)***

NI Water Board and Executive has asked to understand the consequences of a Constrained Funding Assumption equating to £400m/year in (2025/26 prices). Plus, for the PC28 Plan to describe an adjustment mechanism for any other level of funding that might materialise within future budget plans from DFI.

3.11.2 Disconnect Between UR's Regulator Principles and DFI S&EG Clause 9

The PC28 Capital Investment Plan has been prepared on the basis of the UR's Regulatory Principles:

> ***"NI Water should prepare a Business Plan which sets out what is essential for the company to meet its statutory obligations. It should be an efficient and deliverable plan which meets established needs and is affordable from a tariff perspective..."***
>
> ***"…deliverability is not concerned with public funding availability"***

The DFI S&EG Clause 9 instructs:

> ***"All investment in water and sewerage services must be affordable and aligned to budget plans, when agreed. In this sense, the Department considers affordable means the level of actual investment that can be recovered from consumers within the period, at an affordable level. The Department expects that the Regulator shall have regard to the public expenditure outlook and the Department's capital budget allocation for NI Water, when agreed."***

The requirements set out by the Utility Regulator and the Department for Infrastructure present a significant planning challenge for NI Water. The Utility Regulator's principles require NI Water to identify the investment necessary to meet statutory obligations and customer needs irrespective of public expenditure constraints, whereas the draft DfI guidance places greater emphasis on affordability

within available public expenditure allocations. Figure 3.20 illustrates the scale of this gap, which is estimated at approximately £1.02 billion over the PC28 period.

The following sections describe the consequences of funding below the PC28 Minimum Acceptable Scenario.

3.11.3 Prioritisation Step Diagram

The PC28 programme has been developed through a structured prioritisation framework that aligns investment with five strategic theme areas and fourteen outcome-based investment areas. All projects and programmes within the PC28 plan have been assigned a primary outcome to ensure clear alignment between investment decisions and the benefits they are intended to deliver.

Where a project or programme contributes materially to multiple outcomes, the investment has been apportioned accordingly to reflect the full range of benefits delivered. This approach is also reflected within the project tables and supporting analysis presented throughout this chapter.

Further detail on the prioritisation framework, investment themes and associated project content is provided in Sections 3.6 to 3.10. This demonstrates how the PC28 programme has been developed to maximise delivery of customer, environmental, regulatory and operational outcomes within the funding available.

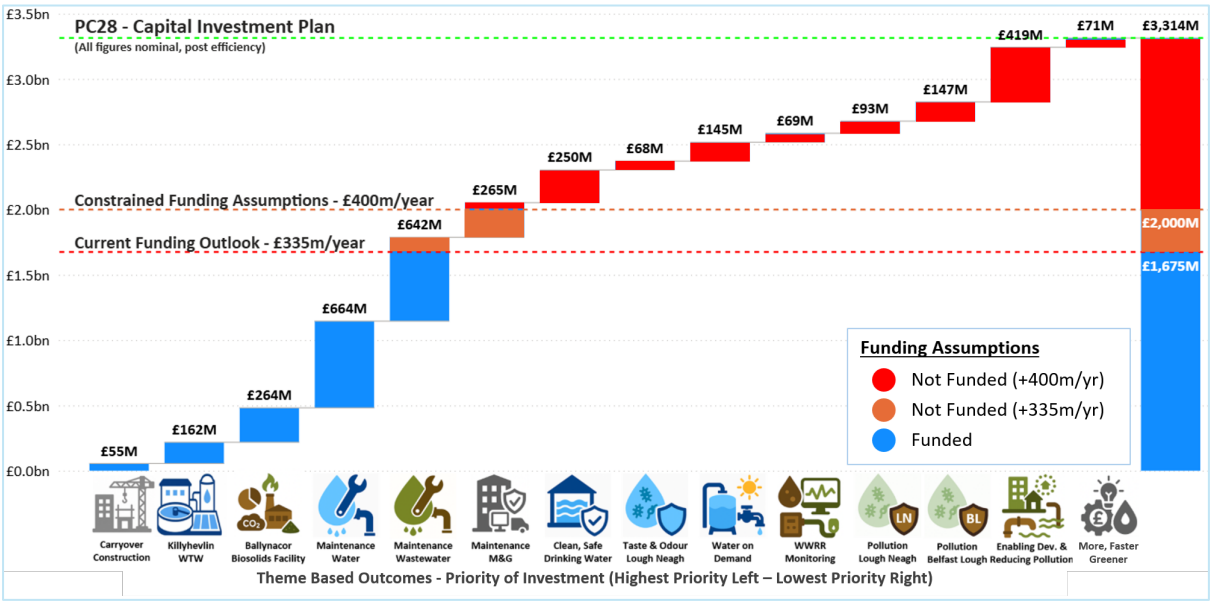


Figure 3.21 – Capital Programme by Theme Priority (Nominal Post Efficiency)

These themes enable us to group similar projects and programmes together, ensuring that investment is directed towards delivering the most important outcomes during the PC28 period. The Figure 3.21 above presents these outcomes from left to right, beginning with those of highest priority through to those of lower priority. If a project above the line was to be specifically funded, then:

1. NI Water would require more funding allocation to facilitate the project or
2. Need to swap the funding with a project below the line and not receive the benefits of that project.

The current funding outlook is also shown to illustrate the consequences should NI Water continue to be funded at current levels.

3.11.4 Projects without Funding in the £400m/yr Constrained Scenario

Similarly, when these outcomes are mapped against our delivery programme (Figure3.22) below it is clear to see that Water and Wastewater enhancement programmes and Efficiency and Transformation are severely under threat from insufficient funding.

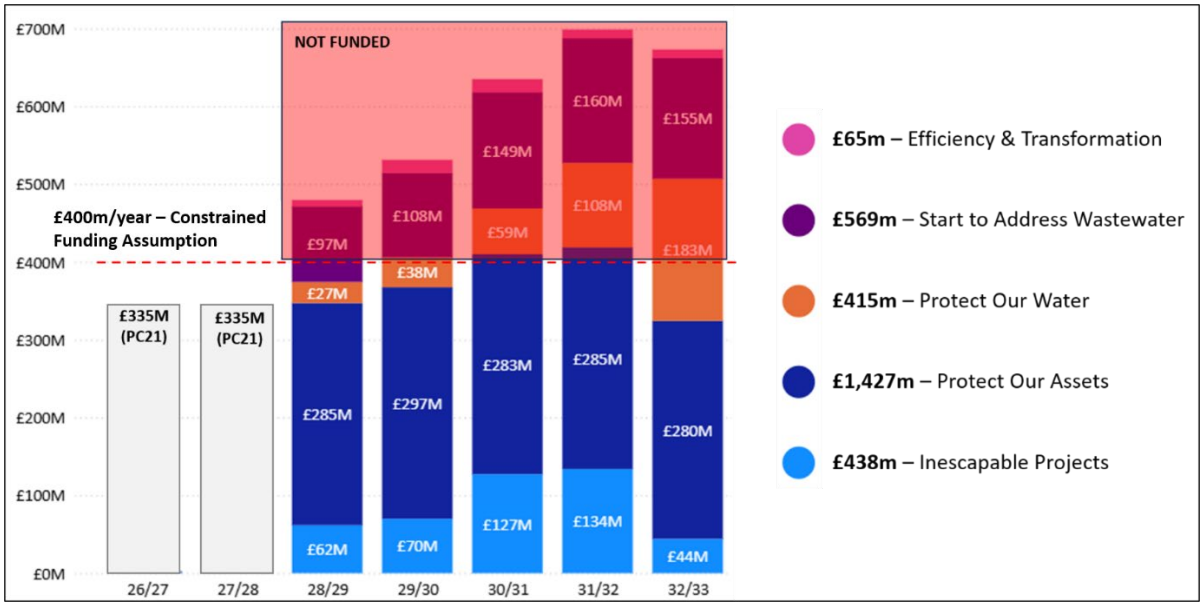


Figure 3.22 – Deliverability by Theme Priority

3.11.5 Impact on "Inescapable Projects" Portfolios

There are three wholly unavoidable projects within the £400m/year Constrained Funding Assumption that cannot be deferred, reduced in scope, or impacted by funding constraints under any circumstances: Construction Carryover, Killyhevlin WTW, and the Ballynacor Biosolids Facility. Failure to progress any of these projects are likely to result in immediate operational, environmental, regulatory, and public service consequences, presenting risks that would be unacceptable to the business and wider society.

- **Construction Carryover:** Interruption of projects already in construction would expose NI Water to significant contractual and financial liabilities, including compensation claims and penalty costs. It would also leave critical assets in partially completed states, creating substantial operational, health and safety, and service resilience risks while potentially wasting considerable sunk investment.
- **Killyhevlin WTW:** Failure to deliver this project would result in the effective loss of treated water production capability serving Enniskillen and a significant proportion of Co Fermanagh. The consequence would be widespread and prolonged loss of potable water supply to customers, with serious implications for public health, economic activity, and community wellbeing.
- **Ballynacor Biosolids Facility:** Without this facility, approximately 22,500 dry tonnes of sludge produced annually from wastewater treatment operations would have no compliant disposal route. Sludge stocks would rapidly accumulate across the wastewater network, creating an escalating environmental emergency, significant pollution risk, potential regulatory enforcement and prosecution, and the prospect of extremely substantial financial liabilities and reputational damage for the organisation.

These three projects represent a non-negotiable inescapable investment requirement. Any failure to fund and deliver them would lead to unacceptable consequences including loss of drinking water

supplies, major environmental incidents, regulatory intervention, significant financial penalties, and serious risks to public health and safety. As such, they are considered inescapable commitments and must proceed irrespective of funding constraints.

3.11.6 Impact on "Protecting Our Assets" Portfolios

Protecting Our Assets represents the next highest investment priority because it safeguards the critical infrastructure, systems, people and operational capabilities upon which the delivery of safe drinking water and wastewater services depends. Even within the £400m/year Constrained Funding Assumption, approximately 95% of this portfolio is protected, reflecting the catastrophic consequences that would arise if investment were reduced. These assets are not optional enhancements, they are fundamental to maintaining service continuity, regulatory compliance, public health protection and environmental stewardship.



Figure 3.23 – Elements of Protecting Our Assets Portfolios

Failure to maintain these assets and the skilled operational capabilities that support them would lead to a progressive deterioration in asset condition, reliability and resilience, ultimately resulting in increased asset failures, interruptions to water supply, wastewater service breakdowns, pollution incidents, regulatory non-compliance and escalating risks to public health and the environment. The consequences would not be isolated or short term; they would compound over time, increasing operational instability, recovery costs and the likelihood of major service failures across the network.

These risks are neither theoretical nor remote. They are well understood through operational experience, evidenced by asset performance data and independently assured through regulatory and governance processes. As asset deterioration accelerates, the organisation would face growing exposure to environmental enforcement action, financial penalties, legal challenge and significant reputational damage.

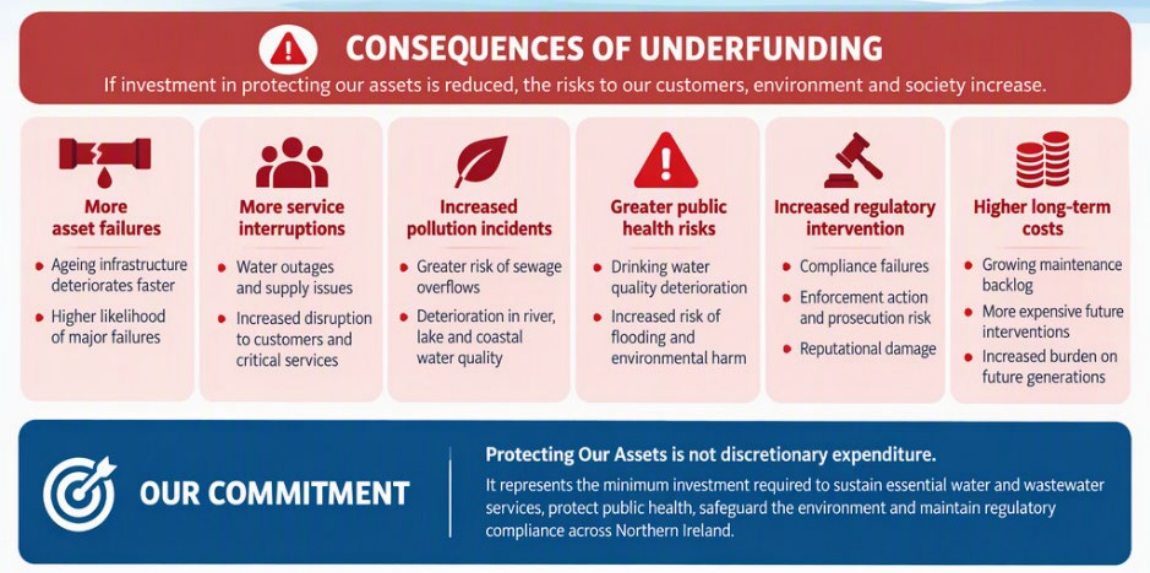


Figure 3.24 – Consequences of not funding the Protecting Our Assets Portfolios

This portfolio is therefore not discretionary expenditure. It represents the minimum level of investment required to preserve the safe and reliable operation of Northern Ireland's water and wastewater infrastructure. Failure to adequately maintain these assets would require acceptance of increasing levels of service failure, environmental harm and public health risk. Furthermore, where insufficient investment leads to foreseeable asset breakdown, pollution events or impacts on customers, there is potential for findings of management failure, exposing both the company and its officers to regulatory investigation, enforcement action and prosecution. The consequences of underinvesting in this portfolio are therefore severe, systemic and ultimately unacceptable.

3.11.7 Impact on "Protecting Our Water" Portfolios

The vast majority of critical projects within this category would be fully mothballed throughout PC28 under the £400m/year Constrained Funding Scenario until sufficient funding could be secured to complete our "Protecting Our Assets" commitments and "Inescapable Projects" portfolio.

This position is wholly unacceptable as it would expose Northern Ireland to increasing public health, environmental and economic risks. The implications extend far beyond service performance and represent a direct threat to public health, economic resilience and the security of Northern Ireland's drinking water system. Failure to invest in these nationally significant projects would knowingly expose the region to increasing risks of regulatory non-compliance, deterioration in drinking water quality, and an inability to meet customer demand during periods of peak stress. The consequences for the nation are severe and fall into three critical areas:

- **Failure to Meet DWI-Enforced Drinking Water Quality Standards** - Investment required to maintain and enhance compliance with Drinking Water Inspectorate (DWI) requirements would be deferred indefinitely. This would significantly increase the risk of asset failures, treatment deficiencies and regulatory non-compliance across the water supply system. The result would be

a growing threat to public health, increasing enforcement action, and the potential for widespread customer impacts arising from deterioration in drinking water quality.

- **Inability to Resolve Lough Neagh Taste and Odour Issues** - Critical interventions required to address the increasingly severe taste and odour challenges associated with raw water sourced from Lough Neagh would not proceed. Customers would continue to experience recurring water quality concerns, undermining confidence in public water supplies and leaving Northern Ireland increasingly exposed to the consequences of worsening source water conditions. Without intervention, these challenges are likely to become more frequent, more severe and more costly to manage.

- **Inability to Meet Water Demand During Hot Summers** - Essential investment in water production, storage and transmission infrastructure would be postponed, reducing system resilience at a time when demand pressures are rising and weather patterns are becoming increasingly extreme. During prolonged periods of hot, dry weather, Northern Ireland would face a growing risk of supply shortfalls, restrictions on water use and service interruptions as ageing infrastructure struggles to meet peak customer demand.

Collectively, these impacts constitute a strategic national risk. They would compromise drinking water quality, undermine public confidence in essential services, and weaken Northern Ireland's ability to provide a safe, reliable and resilient public water supply. In practical terms, this scenario would place the security of the nation's water system at risk and transfer an even greater financial, environmental and societal burden to future generations

3.11.8 Impact on "Starting to Address Wastewater" Portfolios

All projects in this category would be fully mothballed throughout PC28 under the £400m/year Constrained Funding Assumption until sufficient funding could be secured to complete our statutory and nationally critical commitments under "Protecting Our Water", "Protecting Our Assets", and our "Inescapable Projects" portfolio.

This position is fundamentally untenable as it would accelerate environmental degradation, increase constraints on economic growth and undermine long-term wastewater service resilience. It would represent a conscious acceptance of escalating environmental degradation, increasing constraints on economic growth, and the loss of a once-in-a-generation opportunity to modernise the wastewater regulatory framework.

Additionally, the consequences for Northern Ireland would be profound, long-lasting and increasingly difficult to reverse. They fall into three critical areas:

- **Development Constraints Would Intensify -** Existing wastewater capacity limitations would worsen significantly, preventing new housing developments, commercial investment and economic expansion across large parts of Northern Ireland. Growth ambitions set by government, local authorities and the private sector would be increasingly unattainable as infrastructure constraints become a binding limitation on the region's prosperity and competitiveness.

- **Pollution Would Increase** - Essential environmental improvements would be halted, leaving ageing infrastructure under increasing pressure and resulting in a growing risk of wastewater discharges, river deterioration and failure to meet environmental standards. The absence of investment would mean environmental performance would continue to decline, undermining public confidence and placing greater pressure on future generations to address a larger and more costly problem.

- **Northern Ireland Would Be Unable to Participate in Wastewater Regulation Reform** - The suspension of these projects would leave Northern Ireland unable to effectively implement or respond to emerging wastewater regulatory reforms. This would isolate the region from industry best practice, inhibit modernisation of the sector, and significantly reduce our ability to deliver the environmental, operational and customer benefits expected from a transformed regulatory framework.

Collectively, these consequences represent more than a programme delay or a reduction in service ambition. They constitute a material risk, constraining economic growth, accelerating environmental decline, and undermining Northern Ireland's ability to deliver resilient, sustainable wastewater services for future generations.

3.11.9 Impact on "Efficiency and Transformation" Portfolios

All projects in this category would be fully mothballed throughout PC28 under the £400m/year Constrained Funding Assumption until sufficient funding could be secured to complete our statutory and nationally critical commitments under "Start to Address Wastewater", "Protecting Our Water", "Protecting Our Assets", and our "Inescapable Projects" portfolios. Constrained funding would reduce NI Water's ability to modernise operations, improve productivity and maximise value from future investment programmes. The consequence would be higher operating costs, lower efficiency and reduced value for money from future public expenditure.

This scenario is wholly unacceptable as it would halt the transformation and modernisation needed to improve efficiency, affordability and long-term resilience. It would represent a decision to halt transformation projects at a time when efficiency, resilience and affordability are more critical than ever. The consequence would be a widening performance gap between Northern Ireland Water and leading UK water companies, increasing operational costs, reduced value for money for customers, and a growing inability to respond to future challenges. The impacts for the nation are severe and fall into three critical areas:

- **Failure to Deliver Operating Cost Efficiencies** - Without investment in modernisation, automation, digitisation and process improvement initiatives, Northern Ireland Water would be unable to deliver the operating cost efficiencies required to manage rising expenditure pressures. This would lock the organisation into higher-cost operating models, increasing the long-term funding burden on customers and government while reducing resources available for frontline service delivery and environmental improvements.

- **Failure to Deliver Capital Efficiency Targets** - The deferral of transformation and efficiency programmes would prevent the adoption of modern delivery methods, innovative construction techniques, and strategic asset management approaches designed to maximise value from every pound invested. As a consequence, future capital programmes would become increasingly expensive to deliver, reducing the amount of infrastructure that can be built within available funding and further exacerbating Northern Ireland's growing infrastructure deficit.

- **Failure to Transform and Keep Pace with the UK Water Sector** - Investment required to modernise the organisation and align with industry-leading performance would cease. While other water companies continue to adopt advanced digital technologies, data-driven asset management, automation, predictive maintenance and innovative customer services, Northern Ireland Water would fall progressively further behind. This would weaken operational resilience, reduce productivity, limit innovation and leave the organisation increasingly ill-equipped to meet emerging environmental, regulatory and customer expectations.

Collectively, these impacts would create a cycle of rising costs, declining relative performance and worsening affordability. Rather than progressing towards the standards achieved by the best-performing water companies in the UK, Northern Ireland would be left operating an increasingly outdated and inefficient water utility. The result would be a material strategic risk to the long-term sustainability, resilience and affordability of essential water and wastewater services, with the economic and societal consequences felt for decades to come.

3.11.10 Conclusion

The funding levels presented within this plan represent the minimum investment considered necessary to maintain essential water and wastewater services, protect public health, safeguard the environment and sustain the performance of Northern Ireland's critical water infrastructure. Funding below this level would not simply defer improvement. It would increase the likelihood of asset failure, environmental deterioration, regulatory intervention, development constraints and higher long-term costs.

The consequences would extend well beyond the PC28 period, transferring increasing costs, risks and liabilities to future generations. Funding below the Minimum Acceptable Scenario would not remove the need for investment, it would simply defer it, increase its cost and reduce the benefits that can be achieved.

3.12 Key Risks

NI Water operates within a continually evolving regulatory, environmental and operational landscape. The development of the PC28 has therefore been underpinned by a series of strategic risks and working assumptions that reflect current certainties while also recognising areas where external policy, regulatory guidance, technical evidence or environmental conditions may change over the price control period.

These risks and assumptions shape how investment needs have been identified, prioritised and costed, and they support the proportionality, deliverability and efficiency of the PC28 programme. While NI Water continues to strengthen the quality of its asset information, there remain instances, particularly for early-stage or scope-uncertain investments, where reasonable, evidence-based assumptions are required to progress appraisal and business case development.

To provide transparency and ensure a consistent basis for appraisal across all sub-programmes, NI Water has developed a consolidated set of strategic risks and assumptions. These include potential changes in regulatory standards, planning constraints, supply-chain conditions and climate-related impacts. The principal strategic risks and associated management measures are set out in Chapter 7, alongside NI Water's wider approach to programme delivery and risk management.

3.13 Comparison with PC21

3.13.1 Background Context

A direct comparison between PC21 and PC28 should be viewed within the context of a significantly changed operating environment. PC21 was developed before the unprecedented disruption caused by the COVID-19 pandemic and prior to the sustained period of high inflation that followed, ending decades of relative cost stability across the UK economy. Since then, construction costs, energy prices, supply chain pressures and labour market constraints have fundamentally altered the affordability and deliverability of infrastructure investment programmes.

At the same time, NI Water's understanding of asset condition, performance and investment requirements has improved significantly. Substantial enhancements in asset information, data quality, risk assessment methodologies and strategic planning processes have enabled the identification and quantification of a greater volume of established investment need than was possible during the development of PC21. Consequently, the long-term investment requirement is now understood with much greater confidence and clarity.

There has also been a fundamental shift in the strategic context underpinning investment planning. During PC21, investment planning was heavily influenced by the objective of maintaining tariff neutrality, resulting in a programme constrained primarily by affordability considerations. In contrast, the scale of historic underinvestment now means that the principal challenge is no longer identifying justified investment need but determining the maximum level of investment that can be delivered effectively. As a result, the development of the PC28 programme has been shaped primarily by considerations of deliverability, including organisational capacity, supply chain capability and customer affordability, rather than by tariff neutrality alone.

3.13.2 Analysis and Observations

The comparison between PC21 and PC28 demonstrates both the evolution of NI Water's understanding of investment requirements and the changing strategic challenges facing the organisation. In many areas, increases reflect improved asset information, enhanced bottom-up needs assessments and the identification of previously unquantified risks. Conversely, a number of investment areas show reductions when compared with assessed need, reflecting the practical constraints of programme deliverability, organisational capacity and supply chain capability. As a result, differences between PC21 and PC28 should not necessarily be interpreted as changes in underlying need, but rather as the outcome of a structured prioritisation process designed to maximise customer, environmental and regulatory outcomes within an achievable and affordable delivery programme.

To draw a similar comparison in table 3.2 below the following high-level assumptions have been used to calculate PC21 comparison investment figures:

- PC21 Mid-Term Review Capital agreement
- Uplifted by 15.3% in line with the UR Reporter recommendations
- Uplifted to 2025/26 Costs
- Scaled back by 5/6ths to reflect shortening of price control period to 5 years

Table 3.2 – PC21/PC28 Subprogramme Analysis

Sub-Programme	PC21	PC28	Increase	Comments
00 - Capitalised salaries and on-costs	£150m	£203m	36%	Increase is broadly proportional to the larger overall capital investment programme and the associated growth in programme development, delivery and assurance activities.
01 - Base Maintenance Water	£87m	£172m	97%	Reflects a significantly improved understanding of asset condition and risk through enhanced bottom-up asset management planning, resulting in a higher identified maintenance requirement.
02 - Base Maintenance Wastewater	£197m	£339m	72%	Increase driven by improved bottom-up assessment of asset needs together with the legacy impact of constrained enhancement investment during PC21, which resulted in greater reliance on reactive and minimum intervention maintenance activities.
03 - Water Resources	£28m	£33m	18%	Modest increase reflecting the expansion of inspection, monitoring and resilience assessment programmes required to support long-term water resource security.

Sub-Programme	PC21	PC28	Increase	Comments
04 - Water Treatment Works	£76m	£435m	475%	Significant increase arising from a substantially improved understanding of investment needs identified through engagement with the Drinking Water Inspectorate and the growing requirement to address water quality and resilience challenges, including those associated with source water deterioration.
05 - Water Trunk Mains	£68m	£67m	-1%	Small reduction reflects prioritisation decisions within the overall programme and the need to align investment with realistic delivery capacity over the PC28 period.
06 - Service Reservoirs and Clear Water Tanks	£12m	£28m	129%	Increase reflects additional investment requirements identified through asset condition assessments and discussions with the Drinking Water Inspectorate regarding resilience and compliance expectations.
07 - Service Reservoir Rehab	£24m	£25m	4%	Broadly consistent with PC21 investment levels, reflecting stable long-term requirements and no material change in underlying need.
08 - Watermains Rehab	£132m	£114m	-14%	Reduction supported by updated asset performance data and improved understanding of network condition, allowing investment to be targeted more effectively through mains conditioning
09 - Leakage	£45m	£39m	-13%	Reduction reflects difficult prioritisation decisions within a constrained programme, with investment focused on areas considered to deliver the greatest overall customer, environmental and regulatory benefit.
10 - Operations Capital Water	£73m	£100m	36%	Increase reflects the need to support operational resilience and service continuity where enhancement funding remains constrained.
12 - Wastewater Network Program	£461m	£209m	-55%	Reduced from the assessed level of need due to programme deliverability constraints and prioritisation of higher-risk investments elsewhere within the PC28 portfolio. Significant unmet need remains.
16 - Wastewater treatment	£636m	£354m	-44%	Reduced from the identified level of requirement due to deliverability considerations and programme prioritisation. The reduction should not be interpreted as a reduction in underlying wastewater treatment need.
17 - Rural WWTW Programme	£12m	-	-	Investment is included in SP16
18 - Operations Capital Wastewater	£97m	£107m	11%	Increase required to maintain operational resilience and compliance performance in areas where enhancement investment remains constrained.
19 - Metering	£17m	£20m	16%	Moderate increase reflecting the growing importance of metering in supporting water efficiency, demand management and customer service objectives.
20 - Management & General	£218m	£303m	39%	Increase largely driven by enhanced base maintenance requirements and health, safety, security and resilience-related investment across the estate.
23 - Watermains New and Renew	£37m	£14m	-62%	Decreased reflecting forecast demand growth, network reinforcement requirements and ongoing asset renewal needs.
24 - Sewerage new and renew	£51m	£107m	111%	Significant increase driven primarily by strategic developer-led growth schemes and the requirement to support economic development and new connections.
25 - Sludge Facility	-	£237m	-	New investment category reflecting the requirement to develop long-term biosolids treatment and disposal solutions, including replacement of ageing sludge processing infrastructure and future sludge strategy needs.

3.14 Long Term Capital Investment Requirements Beyond PC28

Analysis of identified asset and service needs indicates that NI Water has a substantial and enduring requirement for capital investment extending well beyond the PC28 period. Current assessments

identify over £13.5 billion of established investment need, providing a robust and sustainable pipeline of schemes for many decades to come.

3.14.1 Expected Funding Requirements (25 years)

The challenge is therefore not a shortage of investment requirements, but rather determining the optimum pace at which investment can be effectively and efficiently delivered. Based on current understanding of industry capability, organisational capacity, programme management maturity, and customer affordability considerations, NI Water considers that a sustained investment profile of approximately £700 million to £800 million per annum (expressed in 2025/26 prices and excluding inflation) represents a realistic upper limit for long-term delivery.

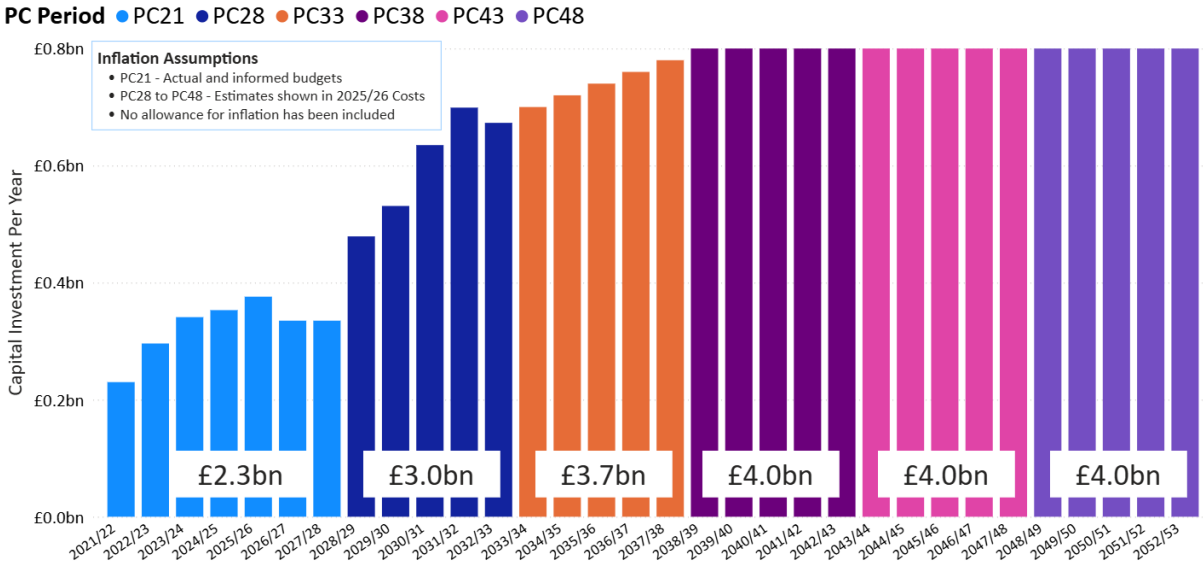


Figure 3.25 – Estimate of Long-Term Capital Investment Requirements

This assessment reflects several practical constraints, including:

- The capacity of the Northern Ireland construction, engineering and specialist supply chains to mobilise and deliver increasingly complex infrastructure programmes.
- The organisational capability required within NI Water and its delivery partners to develop, procure and manage a programme of this scale while maintaining safe and effective operations.
- The need to balance investment ambitions with the affordability of customer tariffs and the wider economic impact on households and businesses.

As illustrated in Figure 3.25, capital investment requirements continue at or above this level throughout the long-term planning horizon. This demonstrates that investment demand is expected to significantly exceed foreseeable delivery capacity for the duration of the planning period. Consequently, investment prioritisation will remain essential to ensure available funding is directed towards the areas of greatest risk reduction, regulatory compliance, service improvement and environmental benefit.

The analysis therefore supports transition towards a sustained long-term investment programme in the region of **£700-£800 million per annum**, representing a step-change from historic funding levels while remaining broadly achievable within current assumptions regarding delivery capability and customer affordability. This level of investment would still address only a proportion of the total identified need, confirming that there is no foreseeable risk of exhausting the pipeline of justified investment requirements.

3.14.2 Composition of Future Investment Need

While the overall requirement of approximately £13.5 billion demonstrates the scale of long-term investment needed beyond PC28, the underlying drivers of this requirement are diverse and reflect both historical underinvestment and emerging future challenges.

Priority	Theme Area	Outcome Based Themes	Description	Est. Needs	PC28
1	Inescapable Projects		1. Carry Over Construction 2. Killyhevlin WTW 3. Ballynacor Biosolids Facility	£438m	£438m
2	Maintain Our Assets		4. Critical Maintenance Water 5. Critical Maintenance Wastewater 6. Critical Maintenance M&G	£2,822m	£1,430m
3	Protect Our Water		7. Clean Safe Drinking Water 8. Taste and Odour Lough Neagh 9. Water on Demand	£835m	£415m
4	Start to Address Wastewater		10. WWRR Monitoring Programme 11. Pollution Lough Neagh 12. Pollution Belfast Lough 13. Enabling Dev. & Reducing Pollution	£9,292m	£669m
5	Delivering Efficiency		14. Achieving More, Faster, Greener	£115m	£65m
TOTAL				**£13,502m**	**£3,017m**

Figure 3.26 – Established Needs by Outcome Theme Area

Area 1: Completion of Existing Strategic Commitments

A significant proportion of investment requirements immediately beyond PC28 relate to the completion of major programmes already underway. This includes approximately £280 million of forecast carry-over expenditure from PC28, predominantly associated with water treatment improvements required to address taste and odour issues arising from the increasing prevalence of blue-green algae in Lough Neagh. These schemes represent critical resilience investments that will continue beyond the current regulatory period.

The period beyond PC28 will also require decisions regarding the future of sludge treatment and disposal infrastructure. In particular, the replacement of the existing second sludge incinerator, or the development of an alternative long-term biosolids management solution, will represent a major strategic investment requirement.

Area 2: Sustaining Existing Asset Health

The analysis assumes that expenditure on asset maintenance and renewal continues broadly at PC28 levels throughout the planning horizon. This investment does not address the historic backlog of asset deterioration but is primarily focused on maintaining current levels of asset health and serviceability. Consequently, substantial ongoing investment will be required simply to prevent further deterioration of water and wastewater infrastructure and to maintain existing levels of customer service and operational resilience.

Area 3: Water Supply Resilience and Quality

The need for investment in water quality and supply resilience is expected to grow significantly over future planning periods. Emerging requirements associated with the revised Drinking Water Directive, increasing expectations regarding water quality standards, and the impacts of climate change will all place additional demands on infrastructure.

Recent years have demonstrated the growing challenge posed by longer, hotter and drier summer periods. These conditions increase pressure on source water quality, treatment processes and network

capacity while simultaneously driving higher customer demand. Investment in treatment capability, storage, network resilience and alternative water resources is therefore expected to remain a major component of future programmes.

Area 4: Environmental Compliance and Wastewater Regulation

Environmental investment requirements represent one of the largest and fastest growing components of future need. Significant wastewater and environmental compliance backlogs already exist across the asset base, and there is a strong likelihood that future regulatory reform will increase these requirements further.

In particular, should Northern Ireland move towards regulatory arrangements similar to those currently operating in England and Wales, including enhanced monitoring and tighter controls on storm overflows and intermittent discharges, the level of investment required could increase substantially. This area therefore represents one of the greatest long-term investment uncertainties, although the direction of travel is clearly towards increased environmental performance expectations rather than reduced requirements.

Area 5: Innovation, Optimisation and Digital Transformation

Alongside traditional infrastructure investment, there is an increasing requirement for investment in technology, innovation and operational optimisation. Future service delivery will be increasingly dependent on the effective use of digital technologies, advanced analytics, automation and artificial intelligence.

These capabilities have the potential to improve operational efficiency, enhance asset performance, reduce whole-life costs and support better decision-making across the organisation. While representing a relatively small proportion of total capital requirement, investment in these areas is expected to deliver benefits across all other investment themes and will become increasingly important in enabling NI Water to manage a growing and more complex asset base efficiently.

Taken together, these five investment areas demonstrate that future capital requirements are driven not only by the need to maintain and replace existing assets, but also by emerging challenges associated with climate change, environmental regulation, population needs, resilience and technological advancement. The long-term investment profile therefore reflects a combination of sustaining current services, addressing historic deficits and preparing water and wastewater infrastructure for the demands of future generations.

3.15 Appendices and Annexes

The following appendices and annexes provide supporting information for this chapter.

Reference	Supporting Document
Appendix 3.1	Water Provision
Appendix 3.2	Wastewater Provision
Appendix 3.3	M&G and Capitalised Salaries
Appendix 3.4	Base Maintenance Technical Appendix
Annex 3.4.1	Independent Review of Updated Capital Maintenance Econometric Models
Annex 3.4.2	Sustainable Asset Maintenance Assessment
Appendix 3.5	Asset Inventory
Appendix 3.6	Asset Maintenance Capability Assessment
Appendix 3.7	Project Costing Methodology
Appendix 3.8	Approach to Capital Efficiency
Annex 3.8.1	PC28 Capital Real Price Effects Methodology

Appendix 3.9	NIAMP6 Project Quality Plan – Engineering
Appendix 3.10	PC21 Outturn report
Appendix 3.11	Changes since the Outline Capital Submission
Annex 3.11.1	Overview of Change in Costs since OCS
Annex 3.11.2	PC28 Post-Submission Cost Reconciliation
Appendix 3.12	Capital Methodology