

Irish Water

Interim Revenue Control 2017 - 2018

Executive Summary



Introduction

Irish Water (IW) assumed responsibility for drinking water and wastewater services on the 1st of January 2014. This involved taking charge of a large portfolio of fragmented and disjointed drinking water and wastewater assets (treatment plants, network pipes, etc.). IW's operations include several thousand water extraction points, treatment plants, pumping stations and wastewater discharge points, approximately 63,000kms of mapped water pipelines and an estimated 25,000kms of wastewater pipelines.

IW supplies drinking water to approximately 80% of the general public (3.3m people), with the remainder supplied by group water schemes and private wells. This is delivered through some 1,000 separate water supply areas (public water supply zones) and involves the abstraction, treatment and delivery of c.1,700 million litres of drinking water each day. IW also collects wastewater from over 1,000 separate communities connected to the wastewater network (wastewater zones known as "agglomerations") and treats c. 1,600 million litres of wastewater daily, before it discharges it back into our rivers, harbours and coastal areas.

The origins of the fragmented nature of the Irish water and wastewater networks can be traced back to the 19th Century and the early formation of public water supplies, based locally on individual urban council areas and river basins. With expansion and development, this remained fragmented given the sparse rural nature of a significant part of the Irish population and the development of water and wastewater services within individual Local Authority (LA) boundaries.

In 2014 Ireland's national water services were under severe stress and were simply not delivering to the standard required by a modern economy. Key shortcomings merit mention. At the start of 2014:

- 121 drinking water treatment plants, supplying over 900,000 people, required major upgrading to mitigate high risk of drinking water contamination;
- Up to 49% of all drinking water was lost before it reached our taps;
- 23,000 people were on Boil Water Notices;
- An estimated 140,000 properties were at risk of not meeting the EU guideline on the maximum levels of lead in drinking water;
- Over two-thirds of the sewer network used to transport the country's wastewater was in need of major repair;
- Untreated sewage was being discharged into our rivers and seas at 44 different locations across Ireland, including 7 large towns (Arklow, Cobh for example); and
- In our largest cities (Dublin, Cork), the wastewater plants were not capable of meeting the full requirements of EU Directives.

This poor state of water services was as the result of decades of underinvestment combined with a highly fragmented industry structure. As with all Government dependent funding, historically, water services experienced constrained and variable year on year funding. In addition, in the past, water services were managed by 34 (now 31) separate LAs. This

structure resulted in duplication and significant inefficiencies and inconsistencies in the planning, construction, operation and maintenance of our water and wastewater networks. Without a single national utility structure, Ireland had suffered from the lack of a comprehensive database of water and wastewater assets and associated performance and compliance data.

IW has been working hard to begin to address many of these issues over the first Interim Revenue Control Period (IRC1¹).

The setting up of IW, to take responsibility for fixing our water services, was a massive and complex project of national importance. During this first revenue control period, and in subsequent ones, IW is progressing three key goals in parallel:

1. Establishing the new national utility, building out the resources, systems and processes required to deliver infrastructure and services to an acceptable standard for our customers - and ultimately to best practice over time.
2. Getting to grips with the scale of the problems, prioritising investment and remedial actions and delivering on agreed action/investment plans.
3. Transforming how services are delivered, moving away from the 31 LA model to a leaner, more efficient national utility model. The transformed model will deliver; economies of scale, standard operating practices, standard maintenance practices and will reduce costs significantly while meeting best practice performance metrics over time.

The scale and challenge involved is enormous and needs to be reflected in the targets, plans and timescales that all stakeholders commit to.

The establishment of IW and the commitment to move to a national utility model has delivered real progress on the most critical requirements that urgently needed to be addressed. By the end of the IRC1 period, we will have already invested c. €1.8bn in Ireland's water and wastewater asset base. This investment is delivering clear benefits to our customers:

- 17,000 people are no longer subject to a Boil Water Notice;
- Over 32 megalitres per day of drinking water is being saved through our Water Conservation and First Fix schemes;
- €70m of core asset operational expenditure savings since 2014;
- A reduction of 28 water treatment plants from the EPA's Remedial Action List (RAL);
- Over 800,000 domestic meters have been installed nationwide;

¹ Previously referred to as Interim Price Control 1 (IPC1).

- Significant upgrading at numerous wastewater treatment plants including Swords, Naas (Osberstown), Leixlip, Galway, Clifden, Dunmore East, Ardmore, Clonakilty and Carrigtwohill;
- Replacement of over 500kms of the worst performing watermains in terms of burst history;
- A best practice national Customer Service function has been established; and
- Our incident management capabilities have allowed the containment and mitigation of serious impact to customers from a number of national flood events.

IW is committed to building on these successes in the second Interim Revenue Control period (IRC2). Much work remains to be done, the deficiencies in our water and wastewater infrastructure have accumulated over decades and rectifying these will require investment over several revenue control periods.

In addition to investing in our assets, IW also needs to deliver an ambitious transformation programme for the water services sector. This is a fundamental requirement in order to secure sustainable efficiency and service benefits for our customers.

IW recently set out its Business Plan to 2021 with the overriding objective of delivering a quality service to customers. The strong progress made in IRC1 represented the start of this journey. IRC2, which runs for the two year period from 2017 to 2018, is the next important step towards full transformation of water and wastewater services in Ireland. IW is committed to delivering this transformation but stakeholder commitment and adequate funding is necessary.

This document provides a summary overview of our submission to the Commission for Energy Regulation (CER) on our capital investment plans, required operating expenditure and weighted average cost of capital in the IRC2 period.

IRC2 Capital Investment Programme

A long term investment perspective is required in order to strategically address the many deficiencies in IW's asset base.

The repair and upgrading of our water treatment plants, wastewater treatment plants and water and sewerage networks will require a multi-billion euro investment programme over several investment cycles. IW's long term investment planning strategy has been set out in our 25 year Water Services Strategic Plan (WSSP) which was subject to public consultation and approved by the Minister for the Environment, Community and Local Government in 2015.

In preparing the Investment Plan, IW has identified a minimum total capital requirement of c. €13bn to address the known deficits. It is clear that there will not be sufficient funding available to deliver everything that is needed in the near term. IW must optimise investment decisions to ensure that we utilise scarce capital by making investments that deliver the best possible service improvements, while maximising value-for-money. The WSSP provides the overall framework to allow for investment planning.

IRC2 covers a two year period, 2017 and 2018. As this is too short a time horizon for optimal investment planning, IW has developed an Investment Plan² based on a five year investment planning horizon, 2017 to 2021, which aligns to our WSSP and our seven year Business Plan, 2014-2021. The first two years of this Investment Plan constitute our capital infrastructure submission for IRC2.

A significant part of the Investment Plan for IRC1 was the completion of projects which the LAs had committed to under the Water Services Investment Programme (WSIP) governed by the Department of the Environment, Community and Local Government (DECLG). In IRC2, IW as a single national utility is taking a strategic, nationwide approach to asset planning and investment, and meeting customer requirements.

IW's primary function is to provide clean drinking water to customers and to treat and return wastewater safely to the environment. In providing these services we play a central role in enabling economic growth, protecting both the environment and the health and safety of our customers and the public. Consequently we must take a number of policy considerations into account when weighing up the relative merits of investment needs.

To develop this Investment Plan we have applied a best practice approach, listened to the views of our customers and stakeholders and accounted for external constraints.

With a deficient asset base, IW has had to select its investment portfolio in consideration of a wide range of competing priorities. To ensure both rigour and transparency, IW has developed a robust, evidence based asset investment planning process, based on leading industry practice, i.e. the UK Water Industry Research (UKWIR) Common Framework for Expenditure Decision-Making.

² Under Section 34 of the Water Services (No. 2) Act 2013 (the 2013 Act), IW is required to prepare an Investment Plan for a period determined by the CER.

This approach uses an Investment Planning Framework to assess each investment option based on its cost, benefits, and contribution to specific targets and needs. This allows the best combination of solutions to be identified based on legislative, business and financial constraints.

A key element of the approach has been meaningful consultation and engagement with our stakeholders and customers, both domestic and non-domestic. We published the Emerging Investment Plan (EIP) for consultation with stakeholders in January 2016. We also undertook a focused research study by speaking directly with 1,100 customers to examine satisfaction with the current levels of service and preferences for different service improvements. Through this research, we have been able to identify our customers' priorities for investment and to incorporate these into our portfolio assessment. We recognise in particular the importance which our customers place on drinking water quality, and on the resolution of leakage and lead issues.

Finally, the overall portfolio was considered from a funding, operability and deliverability perspective. We need to ensure that we can fund the investment, maintain existing service during implementation, and that IW has the capacity to deliver such a portfolio.

The Investment Portfolio outlined in this paper for CER approval reflects a combination of these inputs; the Investment Planning Framework, engagement with our stakeholders and customers and wider constraints, such as funding limitations.

IW has set very challenging targets for the Investment Plan to 2021.

IW recognise that many decades of under-investment has led to a legacy of deficiencies in our drinking water and waste water treatment plants and networks. This has been exacerbated by a lack of planned asset management and maintenance programmes. We have developed service level targets to 2021 which will begin to address these deficiencies. These targets draw on our WSSP, Business Plan, and the outcomes of our customer and stakeholder engagement process.

They include:

- The number of Boil Water Notices in place for greater than 200 days being reduced from c. 4,057 to zero;
- The number of schemes on EPA's Remedial Action List being reduced from 75 to zero;
- Compliance with the parameters for Lead in Drinking Water being increased from 85% to 98%;
- Network leakage rates being reduced from 47% to 38%;
- Rationalisation of the number of Water Treatment Works from 856 to 780;
- The Population Equivalent (PE) served by Wastewater Treatment Works compliant with the Urban Wastewater Treatment Directive increasing from 45% to 90%; and

- Reducing the number of public wastewater agglomerations with no-treatment from 40 to zero.

In seeking to deliver these targets we are constrained by a number of factors, including financeability.

The expenditure required to meet all our objectives is significant.

By the end of the first IW investment period (IP1 2014-2016) we expect to have invested approximately €1.85bn in the water services network. The next Investment Period 2017-2021 (IP2) requires increased levels of expenditure to improve service delivery to our customers and meet our targets.

The IP2 Investment Planning Framework represents a major shift from the legacy model where expenditure was exclusively on new LA projects, focused within county boundaries, with very limited capital maintenance provision. IW has estimated that a €4.8bn investment over the period 2017-2021 is required to deliver all of the Investment Plan targets. The below table outlines the categories of spend within this €4.8bn investment. We refer to this portfolio as the Draft Investment Portfolio.

Category	Target Spend €m ³ 2017-2021
National Programmes⁴	1,377
Drinking Water National Programmes	909
Wastewater National Programmes	402
Other Infrastructure National Programmes – National Labs, Inventory Management, Depots etc.	66
Capital Maintenance - Water Services Above Ground (WSAG), Water Services Below Ground (WSBG), Wastewater Above Ground (WWAG), Wastewater Below Ground (WWBG)	813
Projects⁵	2,614
Drinking Water Projects	1,103
Wastewater Projects	1,511
Total	4,804

Table E.1 – Draft Investment Portfolio 2017 – 2021 (2015 monies rounded)

³ All monetary figures in this paper are rounded to the nearest million 2015 monies unless otherwise stated.

⁴ National Programmes refer to drinking water, wastewater and other programmes to bring asset performance to acceptable levels of compliance and capacity nationally e.g. Metering Programme, Resilience Programme etc.

⁵ Projects relate to investment in specific assets e.g. Cork Lower Harbour WWTP and networks and Ringsend Wastewater Treatment Plant.

Our Investment Plan is constrained by a number of factors.

The €4.8bn draft portfolio is unconstrained, i.e. it does not take into account any limitations in relation to funding or supply chain capacity. We have reviewed the €4.8bn draft portfolio to determine if it was (a) financeable, (b) deliverable, (c) operable and (d) meets the needs of our stakeholders and customers.

Our constrained funding has been assessed as c. €3.6 billion over the period 2017-2021. Our IP2 investment portfolio, detailed in the table below, reflects this funding limit and other constraints considered in our review.

We refer to this portfolio as the **Final IP2 Investment Portfolio**.

Category	2017	2018	2019	2020	2021	Total €m 2017-2021
Wastewater Projects	192	266	286	261	166	1,171
Water Projects	152	217	229	214	150	961
National Water Programmes	78	59	86	131	252	607
National Wastewater Programmes	31	27	46	60	81	244
National Water and Wastewater Programmes	9	28	6	7	7	57
Capital Maintenance - WSAG	10	11	15	26	39	101
Capital Maintenance - WSBG	35	35	71	73	86	300
Capital Maintenance - WWAG	4	8	15	17	27	71
Capital Maintenance - WWBG	4	8	17	17	27	75
Total	516	660	772	806	835	3,588

Table E.2 – Final IP2 Investment Portfolio 2017 – 2021 (2015 monies rounded)

This Final IP2 Investment Portfolio is subject to approval by the CER.

The IRC2 period runs from January 2017 to end December 2018 – the first two years of the IP2 five year investment plan. Within this two year period we are seeking infrastructure capital investment of €1.175bn (rounded), as per the table above.

IW has prepared this Investment Plan in accordance with section 34 of the Water Services (No.2) 2013 Act (“the 2013 Act”). It is being submitted to the CER as part of its wider IRC2 review. This document, including the Final IP2 Investment Portfolio and associated proposed expenditure, is subject to the CER’s approval.

IW will update this IP2 Final Investment Portfolio to reflect the CER determination on IRC2.

Investment in non-network capex and industry transformation is needed to continue the drive for efficiency.

IW must continue to invest in critical Non-Network capital in order to ensure that the necessary systems and processes are in place to support the efficient operation of the business. Detailed breakdowns of all projects and capital expenditure in these areas are included in IW’s comprehensive IRC2 Non-Network Capital Investment submission.

Non-Network Capital	2017 €m	2018 €m	IRC2 €m
Totals	59	53	112

Table E.3 – Non-Network Capital Investment in IRC2 – (2015 monies rounded).

In its first three years, IW will deliver c. €1.8bn of capital investment and save c. €150m in capital efficiencies. Yet the challenges facing IW in rolling out its capital investment programme for IRC2 should not be under-estimated. We continue to encounter historic underinvestment issues which must be addressed, while we must also ensure that we allocate sufficient funds towards planning and investing for the future. An adequate level of efficient capital investment is fundamental to enabling IW to reach the performance levels demanded of us by our customers, regulators and other stakeholders.

IRC2 Operating Expenditure

IW manages and operates a very large, complex and disperse set of national assets.

IW's portfolio of operational assets is extensive. It includes approximately:

- 63,000kms of mapped water pipelines;
- 25,000kms of wastewater pipelines;
- 918 water treatment plants;
- 1,102 wastewater treatment plants;
- 1,610 water storage reservoirs and towers;
- 1,060 water pumping stations; and
- 1,163 wastewater pumping stations.

IW is responsible for the provision of public drinking water supplies from source to consumption. This includes the operation and management of abstraction, treatment, storage and distribution of drinking water. IW is also responsible for the collection, treatment and disposal of wastewater. These activities are delivered in partnership with third parties (including LAs through Service Level Agreements and Annual Service Plans).

Our opex projection for IRC2 is necessary to deliver these critical water and wastewater services on a national scale.

IW delivered significant savings and real improvement in priority areas in IRC1.

The establishment of IW as a national utility has delivered real progress on the most critical operational requirements that needed to be addressed in IRC1. Key achievements include:

- Delivering c. €70m savings in core asset opex through targeted initiatives such as procurement optimisation; spend rationalisation and process improvement;
- Establishment of a Customer Operations function to provide best in class service to customers, including processing of over 1.7m calls to date through our contact centres;
- The completion of over 120,000 work orders following deployment of a new Work and Asset Management system (Maximo) to 26 of the 31 LAs. This includes c. 700 hand held devices providing a platform for real-time work management and the capability to view asset data through a GIS platform;
- Implementing governance and control of LA operational expenditure so that this is now tracked by scheme with over 90% of Purchase Orders coming through IW systems;

- The development of a national Telemetry strategy including the definition of a target architecture;
- The roll-out of a Plant and Network Performance initiative which has already resulted in 500 high priority recommendations at implementation stage;
- Energy management initiatives, including the delivery of fixed pricing through a national electricity contract, and the roll-out of an energy reporting system across the country;
- Development of c. 20 Standard Operating Procedures (SOPs) and 68 Site Specific Operating Procedures (SSOPs) to introduce a standardised approach to compliance;
- 70% reduction in the average time to handle customer complaints – from 11 days in 2014 to just over 3 days in 2015;
- The development of a new incident reporting application, to track and manage the high volume of information associated with incident management and reporting to the EPA;
- Establishment of a National Operations Management Centre to enable real time visibility of national asset performance across 27 systems and 1,800 different assets; and
- Operational Management of a number of serious flood and storm events nationwide, controlling and minimising the impact on IW customers.

IW met the regulatory allowances in IRC1, however some trade-offs were necessary.

The CER's efficiency challenge for IRC1 (7% year on year in 2015 and 2016) was predicated on high level benchmarking against international comparators. The asset data available at that time was very limited and it was acknowledged that this resulted in some limitations in the analysis. With the benefit of additional data gathered over the past two years, IW has undertaken a revised benchmarking analysis against peers in England & Wales, Scotland, and Northern Ireland. This indicates that IW is closer to the UK average efficiency line than previously understood.

IW did achieve substantial savings in opex in IRC1, c. €70m in core asset opex. This was not an easy task given the need to improve operational performance from the outset. While the 7% year on year efficiency target was achieved, in doing so we had to defer some activities in order to meet the allowance. IW had to focus available expenditure on the most critical areas for improvement and this has resulted in trade-offs. A number of examples are set out below;

- Sampling - IW does not have sufficient data on drinking water and wastewater quality. Our testing activities in this area have been limited to those which meet regulatory requirements. To obtain a better understanding of source waters, plant performance, network issues, and hence investment need; IW requires samples to be taken and analysed at more frequent intervals.

- Out-of-Hours Services - IW needs to improve the existing out-of-hours services for drinking water and wastewater services. The current structure needs to be improved and standardised and this will have to be addressed in order to give an acceptable and consistent service to customers.
- Resourcing - Areas which are currently under-resourced include environmental licensing and control of trade discharges to sewers, engagement with LA planning functions (including strategic planning policy), and interfaces with the private water services sector.
- Standard Operating Procedures (SOPs) – These are focused on reducing the risk of non compliance and are critical to maximising effectiveness. A project has been established to develop and implement c. 20 SOPs by the end of the IRC1 period. Additional SOPs are required, but have had to be deferred to the next revenue control period, due to insufficient resources.

We have achieved all the immediate savings attainable in IRC1. Greater efficiencies are possible, but delivery requires investment in full transformation of the operating model.

Efficiencies in IRC1 were secured through leveraging our purchasing power, rationalising our cost base and reducing resources (e.g. through managing a reduction in headcount). Early economies of scale were enabled by the co-ordination of disparate services into a single utility. A deeper, sustainable level of operating efficiency is possible but in order to achieve this, while continuing to improve performance levels, we must invest in a full transformation of the operating model.

The evidence supporting this ‘invest to save’ approach can be found in comparator companies in the UK, where regulators allowed investment in major programmes to tackle latent inefficiency, with the target of securing long term sustainable efficiency.

IW is committed to delivering this transformation and to securing service improvements for our customers and efficiency savings of €1.1bn by 2021. Sufficient regulatory allowances for IRC2 will be critical to ensuring that we have the necessary resources to deliver on our commitments to our customers and stakeholders. Our initial assessment of the investment required in transformation in IRC2 is c. €40m to €50m.

While we have delivered real savings and priority improvements in IRC1, there are increasing demands on IW. These will impact our cost base in IRC2.

Within the short duration of IRC1, IW has developed a better understanding of our opex cost base. It is clear that in order to effectively operate and maintain a disparate and stressed asset base, a greater level of activity is required than previously estimated. While we have reduced core asset opex costs substantially in IRC1 (by €70m) and are targeting further annual reductions in IRC2, our like-for-like operating costs are increasing due to a number of key factors:

- With increasing asset data, we have uncovered additional asset maintenance requirements. For example, at the beginning of IRC1, the network leakage estimate was 41%. We now know that this was closer to 49%. Equally, our 2014 estimate of the water network was 58,000kms and, with better asset data, we now know this to be currently 63,000kms. IW is rolling out an extensive asset survey programme and we anticipate that this will continue to add to our knowledge of the asset stock and consequently our operating cost estimates.
- The compliance standards which IW is required to meet have continued to rise, placing increased pressure on already stretched resources. For example, EPA licensing activity increased significantly during 2014 to 2015, with more than 200 additional licences issued within this two year timeframe. These licenses specify increasingly stringent service standards and reporting requirements to ensure compliance. DECLG is also introducing a Water Abstraction Licensing regime which will need to be implemented by IW over the course of IRC2.
- The roll-out of our capital investment programme is increasing the size of the asset base which must be operated effectively. While asset investment does lead to a reduction in the costs of maintaining failing plant, there will be a net increase in the overall operating costs due to the larger and more complex asset base (e.g. more complex treatment processes). In addition to plant and network maintenance, in IRC2 IW will also need to focus on maintaining our metering stock, in particular non-domestic meters which are in urgent need of maintenance investment. This requirement was not included in IRC1 operating costs.
- With a better understanding of operational requirements, we now know that we need to provide for additional capabilities in IW's Target Operating Model. For example, resource gaps were identified in relation to the licensing of wastewater plants, trade waste source control, and engagement with local and national planning authorities. Temporary resourcing was used to fill some of these gaps in IRC1 and while this provided short term flexibility, it is not an efficient long term solution. An appropriate level of resourcing is critical to the achievement of service and quality improvements for our customers.
- Ireland's economic and population growth continues to gather momentum leading to increasing pressure on water production to keep pace with demand. This has a direct impact on IW's operating costs due to increasing requirement for key inputs such as energy and chemicals.
- In order to meet the regulatory allowances, some activities had to be deferred in IRC1. Examples include the roll-out of a full sampling programme and the upskilling of LA staff to optimise plant performance. Extending the deferral of such activities beyond 2016 would result in deteriorating asset performance, an adverse impact on customer service levels, and a failure to improve operational efficiency.
- In addition to the above, we are committed to ensuring that our service levels to customers continue to improve. We must continue to optimise both plant and network performance to reduce planned and unplanned interruptions to supply. We also need to improve the out-of-hours services for drinking water and wastewater

services. The current system needs to be improved to provide a level of service that meets the needs of our customers. There are many other issues which, from our research, we know are of particular concern to customers, including Drinking Water Quality, Leakage and Lead. In order to make improvements in these areas, there is a clear need for additional operating expenditure above the current baseline.

Together, these elements represent a significant overall cost growth component (on a like-for-like basis) and necessitate a step change in our operating cost base for IRC2. Our growth projections are set out in detail in our IRC2 Operating Expenditure submissions. There is already an unacceptable level of risk in IW operations due to deficient funding over previous decades. Failure to adequately address these emerging issues will compound the existing difficulties and negatively impact our efforts to improve service and performance.

Opex requirement for IRC2

The table below sets out our requirement for opex for 2017 and 2018. The total IRC2 requirement of €1,523m is inclusive of our annual efficiency target and our opex growth forecast over the period.

Opex Categories	2017 €m	2018 €m	IRC2 €m
Operations and Maintenance	546	547	1,093
Targeting Operating Model	153	152	305
Shared Services	21	21	42
Group Centre	15	16	31
Non-Controllable Costs	24	29	52
Totals	759	764	1,523

Table E.4 – IRC2 Operational Expenditure requirement - (2015 monies rounded).

Detailed breakdowns of all opex categories are provided separately in our IRC2 Opex submission. This opex requirement is in line with our commitments to customers and underpins the continued improvement of services, the transformation of our operating model, and the delivery of €1.1bn reduction in opex costs by the end of 2021.

IRC2 Weighted Average Cost of Capital (WACC)

In its IRC1 decision the CER relied on the WACC determination and estimates used for ESB Networks (ESBN) at its mid-term review. The CER concluded that the risks faced by investors in IW are the same as the risks faced by ESBN investors. A similar approach was applied for the cost of debt – CER concluded that the cost of debt allowed for an ESBN-like Irish utility was sufficient to cover IW’s cost of debt over the following two years. IW did not agree with that conclusion and expressed that opinion. In 2015, IW again wrote to CER reiterating that the allowed WACC was not sufficient to fund its business in an efficient and sustainable manner.

We believe that the points that we argued then remain robustly valid. Cambridge Economic Policy Associates (CEPA) has been commissioned by Ervia to review the approach to setting the cost of capital for Irish Water and to propose an estimate for the weighted average cost of capital (WACC) for IRC2. The full CEPA report is attached and fully outlines the findings discussed below.

Our primary focus remains the ‘asset beta’ used to calculate cost of equity, more specifically the relative risk of IW versus a low risk utility such as ESBN. There are many precedents of regulators acknowledging that companies may face different risks despite operating under the same regulatory regime. Regulators have not only acknowledged this, but have allowed uplifts to the cost of equity to remunerate investors for same.

Relative risk analysis compares the exposure of a business to a range of factors. The table below summarises the treatment of the key risks faced by IW versus those of ESBN.

Risk Category	IW	Direction of impact on IW beta	ESB
Key risk factors			
Capex to RAB ratio	Small RAB, large capex programme.	↑↑	Large RAB, proportionately small capex.
Operational gearing	Opex is a higher proportion of revenue, with return and depreciation allowances commensurately lower proportions. Increases exposure to opex risks (labour, energy costs, etc.).	↑↑	Return and depreciation allowance are larger proportions of revenue.
Slowing paying receivables	Domestic collection rate improving but has not yet normalised; domestic payment cap until 2019 prevents recovery of K-factors. No ability to disconnect for non-payment.	↑↑	Extremely low levels of non-payment, collateral provided by customers. Disconnection for non-payment.
Regime/ policy	Limited track record and details still evolving.	↑	Strong track record.

Table E.5 Key Relative Risk Analysis

Note: Risk assessed against ESBN - ↑↑ (substantially higher), ↑ (higher)

We believe that these four key risks are significantly different for IW and at the moment are not remunerated through other elements of the price control. We present the conclusions for each of them below.

Size of investment programme

Following a long period of underinvestment, IW must deliver a very significant capex programme over the next few years. At the same time, IW's asset base is small, relative to other regulated utilities. The chart below shows the capex-to-RAB ratios for IW versus its comparators, where we can see that it is more than double that of ESBN.

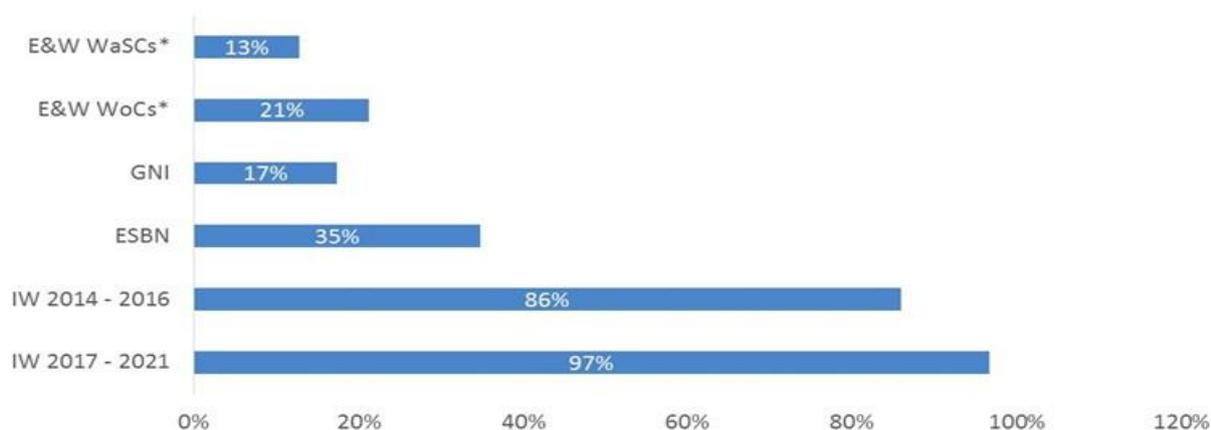


Figure 1: Capex: RAB

Source: CEPA calculation⁶

*In previous price control but levels are comparable

The relatively high size of the capex programme compared to existing assets leads to higher delivery and financing risk for Irish Water, relative to its peers. Ofgem and the Civil Aviation Authority (CAA) have both allowed for asset beta uplifts in the past to account for the extra risk that investors in companies with large and economically crucial investment programmes bear. We therefore believe that the same risk needs to be remunerated in IW's WACC allowance.

Operational gearing

IW's revenues are highly exposed to opex fluctuations, driven by movements in labour, electricity, chemical costs, etc. In contrast, ESBN is much less exposed to such fluctuations as a higher proportion of its revenue is derived from the depreciation allowance and return on capital.

As a result, equity investors in IW are more exposed to operating risk than investors in ESBN. This is an issue that has been considered by regulators in the past. For example, the Competition and Markets Authority (CMA) in the UK has considered the impact of operational gearing on Bristol Water twice and has allowed an uplift to equalise investor exposure to that faced by investors in other companies on each occasion. Furthermore, the CER also acknowledged operational gearing as a risk for EirGrid at PR4. We believe that an uplift for this un-diversifiable risk, which arises from the transitional circumstances of IW, is appropriate.

⁶ CEPA have used the most recent price control allowances: IRC1 for IW; CP4 for ESB, PC3 for GNI. For the E&W companies, they have used the previous price control actuals.

Slow Paying Receivables

The recent introduction of domestic water charges will naturally take time to become fully accepted by customers and will result in payment rates being lower than optimal. This is a very different situation to that of ESNB, with a track-record of billing, collateral for certain payers, and the right to disconnect non-payers. IW has none of the above. This in turn will impact on revenue collected (through non-payment and delayed payment) and therefore the actual return to equity holders.

Regime/policy

We consider that the short track record of water economic regulation in Ireland will be perceived by investors as a higher risk. Furthermore, short price control periods of two years mean that a frequent resetting of the WACC creates more investor uncertainty and impacts the economics of the investment decision.

Cost of Equity Summary

Our estimate of the cost of equity is based on:

- A risk free rate of 1.9%;
- An equity risk premium of 4.75%;
- An asset beta for a mature utility of 0.4; and
- An asset beta uplift of 0.15 to reflect risks specific to IW.

Given these parameters, we can estimate a cost of equity (real, pre-tax) of 8.8%.

Cost of Debt

In setting the proposed cost of debt, we have taken the starting assumption that the overall framework to setting the cost of debt, and the characteristics of debt assumed for IW, is consistent with the recent CER ESNB PR4 determination and IRC1 for IW.

Central to setting the allowed cost of debt is the assumed credit rating. IW is, at present, a sub-investment grade (IG) entity. Using a debt premium based on peer utilities (typically IG rated entities) could significantly undercompensate IW for the expected debt costs it faces. Based on this uncertainty and risks faced by IW, we propose to adopt the upper end of the cost-of-debt range of peer utilities - a debt premium of 1.20%. Combined with a 1.90% risk-free rate, and an adjustment for loan transaction fees of 20bps gives a real cost of debt allowance of 3.30%.

WACC Summary

Based on combining our estimates for cost of equity with cost of debt, we arrive at a cost of capital (real, pre-tax) of 5.8%, after rounding. This is supported by the CEPA report which states that a WACC at the top end of a 5.5%-5.8% range is appropriate if the risks outlined are not addressed elsewhere in the IRC2 determination. Of course the mitigation of any of

the above risks could lower IW's asset beta and allow a lower target WACC. In particular an allowance for slow paying receivables could provide such a mitigation.

Conclusion

IW was established in 2014 to take on the challenge of reforming how Ireland's water and wastewater services are delivered. Over the course of IRC1, much progress has been made. We are delivering investment of over €1.8bn to begin the process of bringing our infrastructure up to an acceptable standard. We are making real savings in our cost base, bringing a national utility approach to efficiency improvements. And we are placing our customers' needs at the centre of everything we do; from actively seeking their views on our investment priorities, to implementing a best in class customer support function. We are committed to continuing this strong progress in IRC2.

To fully address all of the deficiencies in our asset base will take a multi-billion euro investment programme continued through several investment cycles. We have developed an ambitious Investment Plan to 2021 which will deliver real service improvements for our customers. This is based on a best in class approach to achieving maximum value for money in a constrained funding environment.

We know that more needs to be done, particularly in delivering long term sustainable efficiency levels which are in line with other comparable utilities. In order to achieve this, we need to invest in the transformation of our operating model. This is a fundamental requirement in order to achieve both the service commitments that we have made to our customers, as well as our target of €1.1bn in savings by the end of 2021.