



**Factors to be considered when determining the
appropriate size of the next capital programme for
Scottish Water**

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1 Key findings

- 1.1 A number of factors influence the size of the capital programme Scottish Water can deliver efficiently between 2010 and 2014. These factors all indicate that a mid-sized programme, averaging approximately £400-£450 million per year, is to be preferred over a larger programme. This is significantly smaller than Scottish Water's current capital programme, which averages over £600 million per year.

2 Introduction

- 2.1 Relative to its size, Scottish Water's current capital programme (between 2006 and 2010) is one of the very largest undertaken by the UK water industry. The most recent forecast suggests that it is set to cost almost £2.5 billion. Given its size, it is important that Scottish Water's capital investment programme for the 2010 to 2014 period is no larger than can be delivered efficiently.
- 2.2 Establishing the appropriate size of the programme requires the identification and evaluation of current and future factors that could affect efficient delivery. This paper sets out our findings in respect of these factors. Consideration also needs to be given to issues such as affordability and customers' willingness to pay.
- 2.3 Importantly, the impact of larger capital enhancement programmes on prices depends on the availability of additional public borrowing. For example, if the current capital programme had been £100m per year higher, water and sewerage prices would have increased by an additional 1.3% per year in order to maintain the financial position of Scottish Water, assuming the availability of public borrowing. Without extra public borrowing, prices would have needed to rise by an additional 6% per year.
- 2.4 We recognise that the majority of available statistical data on capital programmes in the water and sewerage industry relate to England and Wales. However, our conclusions need to be robust for Scotland. We designed our analysis, therefore, to ensure that the results were meaningful in the Scottish context. We have drawn our data from a broad range of sources and we have tested many different definitions of programme size.

2.5 We investigated seven potential factors that may constrain the size of capital programmes. In each case, our analysis confirmed that a “medium” size capital programme would be more likely to be delivered efficiently within the required timescales than a large programme. Our analysis covered the following factors:

- efficiency of capital expenditure;
- project completion rates;
- contracting industry capacity;
- inflationary impacts;
- third party constraints, including SEPA and planning authorities;
- disruption to customers; and
- safety.

2.6 Our findings are summarised below.

3 Efficiency of capital expenditure

3.1 We investigated whether there is any relationship between the relative size of capital programmes set for water and sewerage companies¹ in England and Wales and the efficiency of capital programme delivery² using data collected by Ofwat.

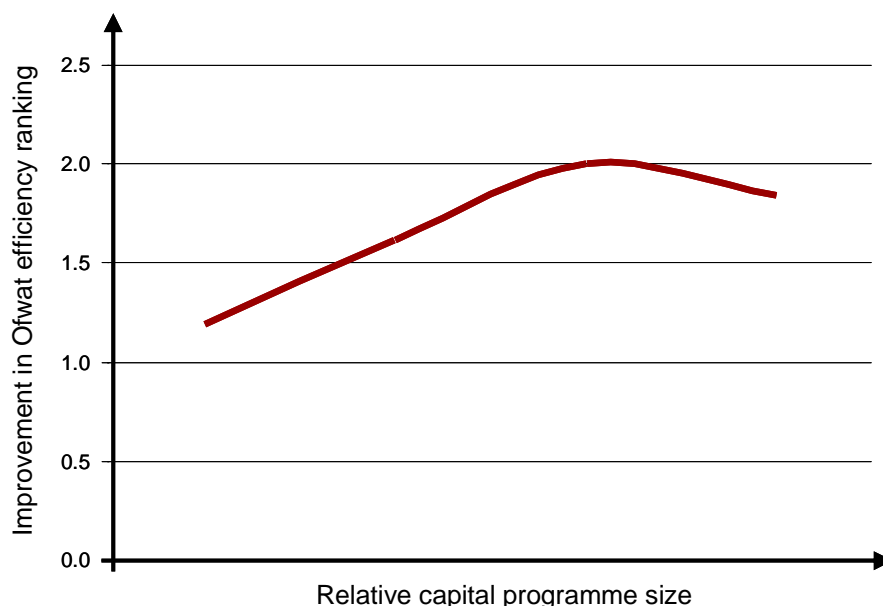
3.2 Although a range of factors impact on efficiency, we identified that companies regarded by Ofwat as being the most efficient at capital delivery were those with medium sized capital programmes relative to company size. In general, companies with the very largest and smallest capital programmes relative to their size were not ranked by Ofwat as being in the most efficient category. An explanation for this might be that companies given particularly large capital programmes necessarily divert management resources to delivering the programme, at the expense of investigating, deriving and implementing improvements in the efficiency of delivery.

¹ We determined the relative size of the capital programmes of the English and Welsh undertakers by reference to both their assets and to the number of properties connected to their networks.

² We used Ofwat’s assessment of efficiency from “Future water and sewerage charges – Final Determinations”, Ofwat, 2004.

3.3 Our findings also show that there is a marked relationship between programme size³ and improvements in efficiency. The rate at which companies improve the efficiency with which they deliver capital programmes increases with the size of the programme up to a certain size. Beyond this, increasing the size of the programme reduces the rate of efficiency improvement. The best performing companies were able to increase their efficiency, by 8% more, on average, than those with the largest capital programmes.

Figure 1: Large capital programmes do not lead to the greatest improvements in efficiency⁴



Source: LECG analysis of Ofwat data

3.4 If Scottish Water is given a relatively large capital programme to deliver during the 2010 to 2014 period, our analysis of recent experience in England and Wales suggests that it may not be able to deliver the programme as efficiently or improve its efficiency of capital delivery as much as it could if the capital programme was relatively smaller.

³ Relative to modern equivalent asset value.

⁴ Ofwat ranked companies in one of five efficiency bands. The vertical scale shows the number of bands that companies moved up between reviews.

4 Project completion rates

- 4.1 As part of its last capital programme, each sewerage company in England and Wales was required to complete a specified list of projects to reduce undesirable discharges of sewage and effluent to the environment. Our analysis of the information relating to project completion rates shows that companies with larger capital programmes (i.e. relative to company size) tended to complete a smaller percentage of their projects than those with smaller programmes. In contrast to companies with relatively small programmes, no company with a capital programme in the top third by size completed all of its projects.
- 4.2 This implies that the larger the capital programme Scottish Water is required to deliver between 2010 and 2014, the greater the risk there will be uncompleted projects. This is consistent with recent experience in Scotland, which suggests that around £80 million of Scottish Water's current capital programme will not be delivered by April 2010.

5 Contracting industry capacity

- 5.1 The capacity of the civil engineering and contracting industry, particularly in Scotland, is a potential constraint on the size of capital programme that can be delivered efficiently by Scottish Water.
- 5.2 Information from a broad range of sources, including government reports and statistics, water and sewerage companies, contractors, and industry regulators shows a strong and consistent message - that there have consistently been, and are anticipated to be, shortages of specific skills that will delay or prevent the delivery of capital programmes across a range of industries. The following quotes from water and sewerage companies we contacted highlight this:

“skilled engineers of all [types] are generally in short supply... particularly those with real project experience that can lead complex projects”

“the resource pool is stretched further by other non water construction projects, such as the Olympics, rail industry etc.”

“the major skill that is in short supply is decent project management”

“...latest stories have been about a national shortage of civil engineers because of the proliferation of major construction projects and the up and coming demand for the Olympics”

“it is getting increasingly difficult to recruit experienced civil engineers”

“The size and structure of the design and construction industry itself may impose short term limitations and can certainly result in cost escalation when there is a shift from competitive tendering to reimbursable type work...”

5.3 In addition to the shortages of project management and civil engineering skills highlighted above, both Scottish Water and SEPA indicated that there was currently a shortage of hydrologists in Scotland.

5.4 The Office of Government Commerce commissioned a Construction Demand/ Capacity Study for the period 2005-2015.⁵ The conclusions of this report are consistent with the views expressed to us:

“as well as some skills gaps in certain trades, there are significant skills shortages in specific professional disciplines, particularly ... leadership; project management; and specific aspects of design (e.g. M&E design).”

“There will undoubtedly still be capacity constraints impacting on some aspects of individual projects and programmes and in specific locations.”

“Moreover, constraints in the industry may occur if new major public sector projects and programmes are scheduled to occur simultaneously.”

5.5 Shortages of these specialised and technical skills limit the speed that projects can be delivered, and the number of projects that can be undertaken at any one time. It is unlikely that recruitment or bringing in appropriate experienced individuals from abroad will easily address any of these skill shortages. Even if more individuals were persuaded to join the civil engineering and construction industry or become

⁵ 2005 – 2015 Construction Demand/ Capacity Study, Full Report, OGC, June 2006.

hydrologists immediately, it would take time for them to acquire the required levels of knowledge and experience. Furthermore, different processes, quality standards and procedural frameworks mean that some of these technical skills are not directly transferable from other jurisdictions.

5.6 The construction industry in Scotland is currently experiencing high levels of demand. The Royal Institution of Chartered Surveyors' UK construction market survey for the second quarter of 2007 noted that for Scotland "*total workloads are now increasing at close to the fastest pace in [the] survey's history*" and Scottish "*workload expectations rose to the highest levels in seven years*".

5.7 Over the period 2010 to 2014 demand for civil engineering and construction industry resources will increase further due to a number of major programmes including:

- water and sewerage industry infrastructure projects (including, for example, the capital programmes for the English and Welsh companies, and the remedial work resulting from the severe flooding in Gloucestershire and elsewhere);
- infrastructure projects in Scotland (such as the Edinburgh tram system, a new Forth river crossing and the Glasgow 2014 Commonwealth Games); and
- infrastructure projects elsewhere in the UK (including the 2012 Olympics, Heathrow Terminals 1 and 2, the Argent Kings Cross Development, the Stratford City development, Crossrail, and a range of military infrastructure projects).

5.8 In the face of such high levels of demand in the construction and civil engineering sectors and the additional impact of new large infrastructure projects, the skill shortages identified above may in fact become more acute.

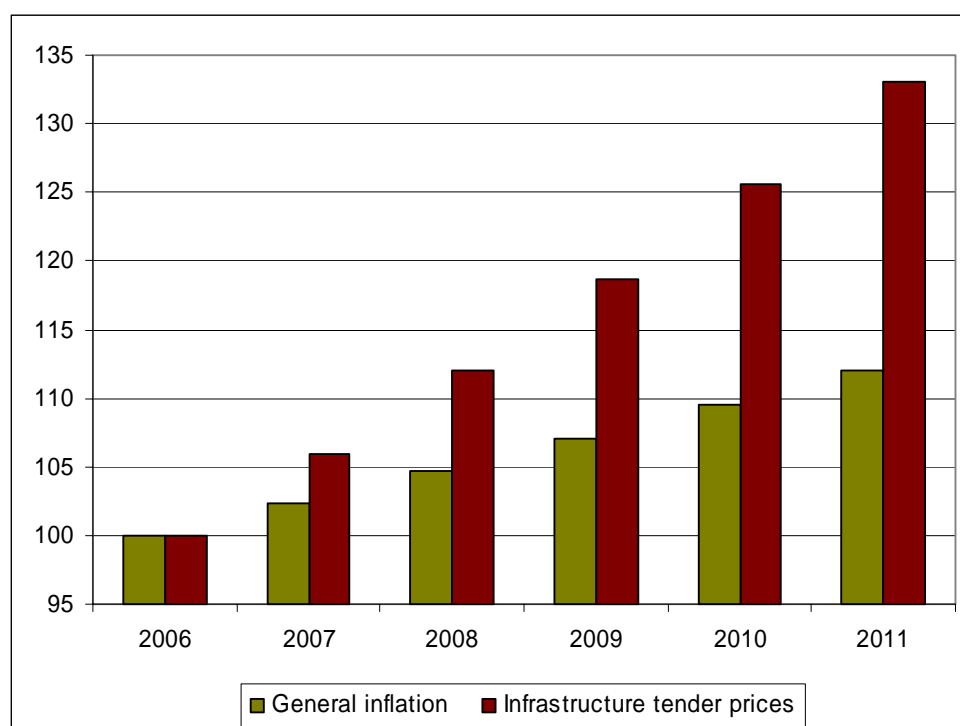
6 Inflationary impact

6.1 Tender price inflation is anticipated to rise significantly in the next few years. For example, the Building Cost Information Service of the Royal Institution of Chartered Surveyors, stated that:

“Tender prices are expected to rise by more than two-and-a-half times the rate of inflation over the next five years, rising by 33% against a background of 12% general inflation”⁶

6.2 Graphically, this can be illustrated as follows:

Figure 2: The cost of infrastructure projects is set to rise



Source: LECG analysis of BCIS/RICS data

6.3 We found that there is a direct causal link between changes in demand for engineering and construction projects⁷ and construction price inflation.⁸

6.4 The anticipated increase in tender prices shown above reflects the increased demand in the sector given the constraints on the supply of resources. Any increase in the capital programme that Scottish Water is asked to deliver will have an additional inflationary impact in general terms.

⁶ BCIS press release: 24 August 2006 BCIS five year forecast of tender prices to first quarter 2011.

⁷ DTI Construction Statistics Annual Report 2006.

⁸ DTI All-New Construction OPI, BCIS All-In OPI.

7 Third party constraints

- 7.1 Delivery of Scottish Water's capital programme requires input from a range of parties. These include SEPA providing appropriate environmental consents, local planning authorities granting planning permission for new works, and utility companies making connections to their electricity and telecommunications infrastructure.
- 7.2 Scottish Water and others highlighted to us that difficulties in obtaining planning permission, environmental consents and connections to utility infrastructure were some of the reasons why Scottish Water's current capital programme is behind schedule.
- 7.3 We understand from discussions with SEPA and local planning authorities that measures such as the Planning etc (Scotland) Act 2006 are intended to secure smoother running of these processes in the future.⁹ Amongst the planning authorities we contacted, there was, however, strong agreement that the need to obtain planning permission and environmental consents can constrain the size of any capital programme that can be delivered. Clearly, these constraints need to be taken into account when setting the size of Scottish Water's next capital programme.

8 Disruption to customers and the public

- 8.1 Delivery of utility infrastructure programmes inevitably results in some disruption to customers and to the public. In the case of Scottish Water, this can take the form of disruption to traffic caused by road works, the movement of machinery and materials, and temporary interruption to supply or water discolouration.
- 8.2 We commissioned market research in Scotland as part of our investigations. This showed that nearly half of the respondents believed that the level of disruption caused to traffic by utility companies such as Scottish Water was a problem. This is consistent with recent press reports expressing public concern over the level of traffic disruption in Scotland.

⁹ Many of the measures in the Planning etc (Scotland) Act 2006 come into effect in 2008.

- 8.3 There is a clear relationship between the level of road works and the level of disruption to journeys. At the levels of road works likely to occur in Scotland between 2010 and 2014, any increase (or decrease) in the number of road works has an exponential impact on disruption. Accordingly, any increase in Scottish Water's capital programme will increase the level of road works and cause a disproportionately larger increase in disrupted journeys. Typically, a 10% increase in the number of road works will cause a 15% increase in disrupted journeys with obvious adverse environmental impacts.

9 Safety

- 9.1 Our analysis of the data published by Ofwat indicates a link between the accident rates and the relative size of capital programmes. Water companies in England and Wales, with larger capital programmes relative to their size, suffer more accidents per employee and in total than those with relatively smaller capital programmes.

10 Conclusions

- 10.1 There are important factors that will influence the size of the capital programme that Scottish Water can expect to deliver efficiently over the next control period. The factors include, for example, contracting industry capacity, inflationary impacts, third party constraints, disruption to customers and safety. Our analysis indicates that a mid-sized programme, averaging approximately £400-£450 million per year, should be preferred to larger programmes. This is significantly smaller than Scottish Water's current capital programme, which averages over £600 million per year.