# Lecg

Top-down analysis of efficiency assumptions in the UK regulated sector

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### Lecg

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#### 1 Background

#### Introduction

- 1.1 Drawing upon the best practice of other economic regulators, the Northern Ireland Authority for Utility Regulation ("NIAUR") has established a work programme to review both the operating and capital efficiency of Northern Ireland Water ("NIW"). The purpose of this review, amongst other things, is to establish efficiency targets and future revenue requirements that will be applied under an RPI-X type price control from April 2010.
- 1.2 As an initial step, LECG has been asked to undertake a high-level top down review of the efficiency assumptions and price controls set by other regulators. We have been asked to consider how such targets might be applied to NIW to derive a cost allowance for the financial year 2008/09. We understand that NIAUR might use our analysis as one of the inputs into their considerations.
- 1.3 Given the time constraints faced on this project, we have adopted a high-level approach to our review. As such, our work is necessarily constrained though we believe the conclusions are directionally sound and well supported. We understand that NIAUR will be undertaking a more detailed review of NIW's efficiency projections in the spring of 2008. As part of this work, further top down analysis might be required.
- 1.4 In this section, we first provide an overview to the approach we have adopted. We then summarise NIW's efficiency forecasts. In the subsequent sections, we then benchmark these forecasts to a range of top down indicators. Finally, we provide our conclusions.

#### Approach

1.5 When assessing the appropriate assumptions to be made with respect to the efficiency improvements of a regulated company, it is common for regulators to employ a range of approaches. In general, these approaches can be categorised as "bottom-up" where individual cost components are analysed and benchmarked with a view to establishing an overall efficiency assumption, and "top-down" where the overall level of efficiency that might be expected is derived from overall efficiency assumptions made and efficiency improvements achieved elsewhere.

- 1.6 In the regulatory context, top-down analysis typically takes the form of comparisons with the aggregate cost data of other companies, either nationally or internationally. Top-down analysis is necessary in cost efficiency studies because not all of the mechanisms available to the company for raising efficiency, or reducing costs over a forward period can normally be foreseen at the start of that period. Looking at the sum of initiatives that can be identified at the outset of the price control period (which is the nature of the bottom-up analysis that needs to be performed) may therefore understate the actual scope for forward efficiency gains.
- 1.7 In our experience, bottom-up estimates of the scope for efficiency gains are more likely to provide a lower limit to the actual scope. Looking at the problem on a topdown basis provides an alternative estimate of the scope for actual forward efficiency gains with which bottom-up estimates can be compared. In principle, neither of the two approaches has, or needs to have, primacy, although by its nature the bottom-up analysis is generally more comprehensive.
- 1.8 The relationship between the two forms of analysis is shown graphically below:



Figure 1: Graphical representation of top-down and bottom-up approach

1.9 Although the top-down approach is represented above as producing a single trend estimate, we have in fact considered a range of different approaches each of which produces slightly different figures. We have used these to define the upper and lower limits of a range based on all of the available information and a judgement on what weighting should be attached to each methodology.

Source: LECG analysis

- 1.10 NIAUR has asked LECG to undertake a brief top-down analysis. In particular, we have been asked to review:
  - the efficiency assumptions that have been used by other regulators (including Ofwat and WICS);
  - the actual rates of efficiency that have been achieved across utilities that have been subjected to RPI-X type regulation; and
  - an analysis of prior studies into the effects of regulation, competition and privatisation on total factor productivity.
- 1.11 This document summarises, therefore, efficiency savings across a range of regulated sectors, focusing in particular on the water companies regulated by Ofwat and the Water Industry Commission for Scotland ("WICS").
- 1.12 It is important to note that efficiency targets can be expressed on a number of different bases (e.g. in relation to total accounting costs, controllable costs, total cash costs, etc). There is no accepted standard for calculating efficiency percentages. We have tried to ensure that the figures in this report are presented on a consistent basis. However, given the tight time constraints, it has not been possible to present data on a wholly consistent basis. That said, we believe there is a weight of evidence that can prudently be applied to NIW.

#### NIW's existing efficiency targets

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- 1.13 When set up as a Government Company ("GoCo"), NIW inherited a Strategic Business Plan ("SBP"), which summarised a profile of future efficiency savings. In its response to the Independent Water Review Panel ("IWRP") Strand 1 report, NIW states that these efficiency savings equated to "22% over the 3 years 2007/8 2009/10".<sup>1</sup> This would suggest savings of around 7% per annum, in compound terms.
- 1.14 It is not clear how this 22% over three years has been calculated. We have been unable to replicate the calculation. Of course, there are many ways of calculating efficiency percentages, so we are not challenging the numerical accuracy of the calculation rather, we are unclear about either the cost base this percentage should be applied to, or the period over which it is achieved.

Northern Ireland Water's response to Strand 1 report, page 3.

- 1.15 The quote above suggests that 22% of costs will be taken out of the business over a three-year period. The SBP shows cumulative annual saving of £44m in 2009/10<sup>2</sup> (cumulative from a 2003/04 base, expressed in 2006/07 prices).<sup>3</sup> Information contained in other NIW documents<sup>4</sup> suggests that the 22% is calculated by reference to the £44m, which suggests that the 22% refers to savings over a longer period (i.e. from 2003/04).
- 1.16 Information in the SBP seems to confirm this. Forecast savings over the period 2006/07 to 2009/10 are expected to be some £19.4m (i.e. £44m £24.6m). These numbers are sourced directly from the table at paragraph 6.4 of the SBP as follows.

| КРІ   | Actual<br>2005/6 | Target<br>2006/7 | 2007/8 | 2009/10 | 2013/14 |
|---|------------------|------------------|--------|---------|---------|
| Comparative operating cost efficiency expressed in £m from a 2003/04 base | 17.9             | 24.6             | 29.8   | 44.0    | 55.6    |

#### Table 1: SBP Operating cost efficiency

Source: NIW SBP, table at paragraph 6.4. Efficiencies expressed in 2006/07 prices. The table at paragraph 6.4 does not provide information on the missing years. In particular the year 2008/09 is not disclosed.

- 1.17 The table implies that £24.6 million of the £44 million efficiencies will have already been achieved by 2006/7, leaving only a further £19.4 million to be delivered "over the 3 years 2007/8 2009/10" claimed by NIW. This would suggest efficiency of only 3.2% per annum (assuming the same basis is followed for calculating the 22% cumulative savings).<sup>5</sup>
- 1.18 As we are unsure of NIW's calculations, we have used the data available to estimate savings on a basis that is comparable with other benchmarks. We understand from the SBP and further supporting material<sup>6</sup> that the savings in the SBP are intended to follow the profile in the table below:

<sup>5</sup> Calculated as 19.4 / 44 \* 22% = 9.7% over 3 years, which is equivalent to 3.2% per annum.

<sup>&</sup>lt;sup>2</sup> The table at paragraph 6.11 of the SBP.

<sup>&</sup>lt;sup>3</sup> SBP, pages 30 to 31.

<sup>&</sup>lt;sup>4</sup> NIW Response\_IFM queries\_300807.zip

<sup>&</sup>lt;sup>6</sup> The spreadsheet "SBP Opex tables.xls" sent from NIW to NIAUR on 7 January 2008.

|                          | To<br>05/06<br>(£m) | 06/07<br>(£m) | 07/08<br>(£m) | 08/09<br>(£m) | 09/10<br>(£m) | 10/11<br>(£m) | 11/12<br>(£m) | 12/13<br>(£m) | 13/14<br>(£m) |
|--------------------------|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Cumulative<br>efficiency | 17.9                | 24.6          | 29.8          | 35.3          | 44.0          | 47.3          | 50.1          | 52.9          | 55.6          |
| Incremental efficiency   | 17.9                | 6.7           | 5.2           | 5.5           | 8.7           | 3.3           | 2.8           | 2.8           | 2.7           |

Table 2: Operating savings implied by the NIW SBP

Source: SBP, SBP Opex tables.xls and LECG analysis. Note: We understand the SBP figures to be in 2006/7 prices

- 1.19 When undertaking a top down benchmarking exercise, it is important that there is consistency between the quoted efficiency and the benchmarks used. There appears to be at least two different definitions of the cost base in the SBP.<sup>7</sup> There is "baseline" operating costs, which excludes one-off transition costs and GoCo costs, and "Total Opex", which includes these costs from 2007/8 onwards. We understand that GoCo activities did not exist in 2006/7 (either in part or in whole). There is a structural break, therefore, in the time series. As such, one must be careful in interpreting costs trends given that the cost base changes. For consistency, one should either exclude GoCo costs in all years or include GoCo costs in prior years when these activities did not exist. This would help to ensure consistency across the period.
- 1.20 On balance, we believe that it is appropriate to consider efficiency targets in relation to total operating costs; including GoCo costs (especially as going forward these costs are included in the cost base). Many regulators express targets in relation to total operating costs, though some do express them in relation to controllable operating costs. It is also the case that the activities covered by the ongoing GoCo costs (e.g. customer billing, banking costs etc) are normally contained in the cost bases of comparator companies. Hence including these costs into the calculation improves consistency. Our analysis of the information provided by NIW seems to suggest that the 22% is based on total costs, including GoCo.<sup>8</sup>
- 1.21 For consistency with the comparator data we have derived the total Opex in real terms from the SBP data, excluding one off costs (e.g. Voluntary Employee

<sup>&</sup>lt;sup>7</sup> Neither basis appears to reconcile with the Opex reported in the June Return data for NIW.

<sup>&</sup>lt;sup>8</sup> NIW Response\_IFM queries\_300807.zip

Redundancy ("VER") costs and GoGo transformation costs), but including ongoing GoCo costs. We have made an estimate of the GoCo costs that would have applied in 2006/7 had these additional activities been undertaken. Our estimate of efficiency on this basis is contained in the table below:

| £m   | 06/07 | 07/08 | 08/09 | 09/10 | 10/11 | 11/12 | 12/13 | 13/14 |
|--|-------|-------|-------|-------|-------|-------|-------|-------|
| Opex<br>efficiency per<br>annum (see<br>table above) | 6.7   | 5.2   | 5.5   | 8.7   | 3.3   | 2.8   | 2.8   | 2.7   |
| Opex (see<br>notes below)                            | 179.8 | 174.6 | 174.4 | 167.0 | 162.5 | 165.6 | 163.7 | 162.9 |
| Efficiency as a proportion of total Opex             |       | 2.9%  | 3.2%  | 5.0%  | 2.0%  | 1.7%  | 1.7%  | 1.6%  |

Table 3: Percentage annual efficiency savings implied by the NIW SBP

Source: SBP, the SBP Opex tables.xls spreadsheet and LECG analysis. Note 1: Row 2 - Opex is derived from the total Opex, less an inflation adjustment, less VER and transition costs. Figures are in 2006/7 prices. There are minor differences between the SBP and the SBP Opex tables spreadsheet. Note 2: It is difficult to express 06/07 on a completely consistent basis with 07/08 (i.e. including GoCo costs) – as these costs did not exist. To estimate the efficiency achieved in 07/08 (which is normally expressed as a saving based on the prior years costs) we have estimated costs in 06/07 on an equivalent basis by taking total costs in 07/08 and adding back efficiencies achieved in 07/08. This is of course a best estimate – different approaches would not materially affect the resulting efficiency, and we only make the adjustment to try to achieve a degree of consistency.

1.22 Over the three years to 2009/10, it appears to us that NIW are forecasting total cumulative efficiencies of around 10.7%. We do not think this particularly stretching – as our findings show in this report. In particular, this target is not as stretching as the efficiency targets set for Scottish Water by WICS in the 2001/2 to 2005/6 regulatory period, which required Scottish Water to achieve an 16.8% improvement in opex efficiency in the *first* year of its price control, even excluding merger benefits.

#### Structure of this document

1.23 The remainder of this document is structured as follows. In Section 2, we set out the efficiency assumptions used by economic regulators in the UK, including assumptions made by the water sector regulators, Ofwat and WICS.<sup>9</sup> We also set out the actual price control RPI-X targets for gas, electricity, telecoms and water and sewerage services.

<sup>&</sup>lt;sup>9</sup> Previously known as the Water Industry Commissioner for Scotland.

- 1.24 In Section 3, we set out the efficiency improvements actually achieved in UK regulated sector, including, in particular the gains made by Scottish Water in the period from 2002 to 2006.
- 1.25 In Section 4, we examine total factor productivity improvements that have been made since energy and water utilities have become subject to economic regulation.
- 1.26 In Section 5, we set out our conclusions.

#### 2 Efficiency assumptions set by UK regulators

#### Introduction

- 2.1 Comparisons with other regulated companies are commonly used to provide highlevel indications of the scale of potential future efficiency savings. In this section, we summarise the efficiency targets set by UK sector regulators. These efficiency targets are then compared to outturn efficiency savings in the next section.
- 2.2 We provide a summary of the efficiency assumptions that have been used in different UK price controls below. For sectors containing more than one regulated company (e.g. water), the average target has been provided.

| Company                 | Duration  | Real reduction per annum | Cost Category                     |
|-------------------------|-----------|--------------------------|-----------------------------------|
| BAA                     | 1992-1997 | 3.3%                     | Employees/passengers - average    |
| BAA                     | 1997-2002 | 4.0%                     | Employees/passengers - average    |
| BAA                     | 2003-2008 | 1.7%                     | Average operating costs/passenger |
| British Gas             | 1992-1997 | 2.5%                     | Total non-gas costs               |
| BG Transco              | 1997-2002 | 3.1%                     | Operating expenditure             |
| BG Transco              | 2002-2007 | 2.5%                     | Real operating expenditure        |
| BGT                     | 1997-2000 | 4.0%                     | Unit supply costs                 |
| ВТ                      | 1993-1997 | 3.0%                     | Unit costs                        |
| ВТ                      | 1997-2001 | 3.5%                     | Unit operating costs – average    |
| Manchester Airport      | 1998-2003 | 4.6%                     | Staff cost/passenger              |
| Manchester Airport      | 2003-2008 | 3.75%                    | Staff cost/passenger              |
| NATS                    | 2001-2005 | 2% - 5%                  | Operating expenditure             |
| NATS                    | 2006-2010 | 2% - 3%                  | Operating expenditure             |
| NIE distribution        | 1997-2002 | 3.0%                     | Operating costs (MMC)             |
| NIE distribution        | 2002-2007 | 3.0%                     | Operating costs (Ofreg)           |
| NIE supply              | 1997-2001 | 1.5%                     | Operating costs (MMC)             |
| NGC                     | 1993-1997 | 5.0%                     | Operating costs                   |
| NGC                     | 1997-2001 | 2.5%                     | Operating expenditure             |
| NGC asset owner         | 2001-2006 | 3.5%                     | Controllable operating costs      |
| Royal Mail              | 2002-2006 | 5.4%                     | Operating expenditure             |
| REC distribution        | 1995–2000 | 2.0%                     | Unit operating costs              |
| <b>REC</b> distribution | 2000-2005 | 2.3%                     | Operating costs                   |
| REC distribution        | 2005-2010 | 1.5%                     | Operating expenditure             |
| REC supply              | 1994-1998 | 2.0%                     | Unit operating costs              |
| REC supply              | 1998-2000 | 2.0%                     | Operating costs                   |
| Railtrack               | 2001-2006 | 3.1%                     | Total 'steady-state' spend        |

Table 4: Efficiency assumptions in previous price control reviews

| Network Rail                                | 2004-2009 | 7.0%                  | Renewals and controllable apex |
|---|-----------|-----------------------|--------------------------------|
| Scottish Hydro                              | 1995-2000 | 2.0%                  | Operating costs (MMC)          |
| Scottish Transmission                       | 1994-2000 | 2.0%                  | Controllable operating costs   |
| Scottish Transmission 2000-2005 1.0% - 2.0% |           | Total operating costs |                                |
| Ofwat WaSCs                                 | 1995-2000 | 2.0%                  | Operating expenditure          |
| Ofwat WoCs                                  | 2005-2010 | 1.4%                  | Operating expenditure          |

Source: "Transco Price Control Review for 2002-7 – Report for Ofgem", Mazars Neville Russell, September 2001 (Appendix D). 'Future Efficient Costs of Royal Mail's Regulated Activities', August 2005, LECG (page 74). LECG updated.

- 2.3 The efficiency assumptions in the table above are based on a variety of different measures of efficiency. Most use some definition of total operating or controllable costs. Efficiency targets have ranged from 1.4% to 7.0% and the straight average of the figures above gives an average efficiency assumption of approximately 3% per annum in real terms.<sup>10</sup> For the first price control for each company as stated in this table, the efficiency targets range from 2.0% to 5.4% with a straight average of 3.1%.
- 2.4 We have undertaken further analysis to identify the disaggregated efficiency assumptions for each Water Only Company ("WoC") and Water and Sewerage Company ("WaSC") made by Ofwat. We have reviewed the years 2000 to 2005, as this is the earliest data that appears to be readily available in electronic form for each individual water company.<sup>11</sup>
- 2.5 Information for the water and sewerage companies is set out in the table below.

 Table 5:
 Efficiency assumptions in Ofwat 2000-2005 price control review

<sup>&</sup>lt;sup>10</sup> Care must be taken when interpreting this average, as we recognise it is based on a number of different cost measures.

<sup>&</sup>lt;sup>11</sup> Given greater time, we could probably source information from earlier reviews, from Ofwat's library.

| Southern Water  | 1.4% | 3.7% |
|-----------------|------|------|
| Thames Water    | 1.7% | 2.3% |
| Wessex Water    | 2.3% | 1.4% |
| Yorkshire Water | 1.7% | 2.3% |
| Average         | 2.3% | 3.2% |

Source: Pages 35-59, Ofwat, Future Water and Sewerage Charges 2000-2005 and LECG analysis.

2.6 Information for the water only companies is set out in the table below.

| Table 6: | Efficiency assumptions in Ofwat 2000-2005 price control review |
|----------|--|
|          | (Water only companies)   |

| Company                            | Average annual Total Operating Expenditure<br>efficiency improvements |
|------------------------------------|---|
| Bournemouth & West Hampshire Water | 2.3%  |
| Bristol Water                      | 3.7%  |
| Cambridge Water                    | 1.7%  |
| Cholderton and District Water      | 1.4%  |
| Dee Valley Water                   | 1.7%  |
| Essex & Suffolk Water              | 2.3%  |
| Folkestone & Dover Water           | 4.4%  |
| Mid Kent Water                     | 4.4%  |
| North Surrey Water                 | 1.7%  |
| Portsmouth Water                   | 1.4%  |
| South East Water                   | 4.8%  |
| South Staffordshire Water          | 3.0%  |
| Sutton & East Surrey Water         | 2.3%  |
| Tendring Hundred Water             | 3.7%  |
| Three Valleys Water                | 2.3%  |
| York Waterworks                    | 2.3%  |
| Average                            | 2.7%  |

Source: Pages 35-59, Ofwat, Future Water and Sewerage Charges 2000-2005

2.7 It can be seen from these tables that for the 2000-2005 price control, Ofwat set efficiency assumptions that ranged from 1.4% per annum to 4.8% per annum, averaging around 2.8%. These assumptions are broadly similar to the efficiency assumptions in previous regulatory reviews listed in Table 4 above. However, it is the case that water companies that were deemed most inefficient were set targets of 4% or more. It is also important to remember that this was not the first review –

and the companies had been set efficiency targets in earlier periods. Hence the scope for catch-up efficiencies where presumably reduced.

- 2.8 In its 2002-2006 price control, WICS set an efficiency assumption equal to an average of approximately 9.2% per annum, in compound terms over 4 years.<sup>12</sup> The WICS efficiency assumption is relatively large in comparison to the other regulators and water companies. This reflected the easy win efficiencies that were available at that time, originating from the greater incentives for efficient performance under the regulatory regime and the merger savings that resulted from combining three separate water companies. The large target also reflects the poor cost efficiency of Scottish Water at that time. WICS noted, "*If the Scottish industry achieves this target, the industry would still be less efficient in 2005-06 than Welsh Water was in 2000-01*".<sup>13</sup>
- 2.9 Excluding the merger benefits, however, reduces the cumulative annual efficiency saving by just under £30m, equating to an annual average of 7.6%. This is still significantly higher than the target implicit in the SBP for NIW. These calculations of efficiency are disclosed in more detail in the next section.
- 2.10 WICS provided justification as to why it felt these targets were realistic. Within its COLS analysis, WICS used, comparator companies that, while being good performers were not at the efficiency frontier. We understand that WICS used the same comparators as Ofwat. WICS also argued that Scottish Water had the advantage of learning from the regulated companies in England and Wales and that certain service requirements for leakage targets and the metering of homes do not apply in Scotland, hence giving Scottish Water a comparative advantage. WICS indicated that alternative benchmarking techniques suggested that the efficiency targets should have been higher than it finally assumed.<sup>14</sup>
- 2.11 NIW also has the opportunity to learn from Scottish Water, as well as from the regulated companies in England and Wales. In addition, we understand that, like Scottish Water, NIW is anticipating a far lower level of metering activity (e.g. installation, meter reading and meter maintenance) than the English and Welsh

<sup>&</sup>lt;sup>12</sup> 9.2% is based on Baseline costs (i.e. base costs plus new costs) and the required savings (i.e. efficiency savings plus merger savings) relative to total costs in 2001/02. Source: WICS, Costs and Performance Report 2003-06, Assessment of Scottish Water's costs and performance page 6.

<sup>&</sup>lt;sup>13</sup> Source: WICS Strategic Review of Charges 2002/2006, page 191.

companies regulated by Ofwat. This may suggest that NIW may have a similar scope for efficiency as Scottish Water.

#### **Regulatory price control targets**

2.12

Past price control targets also act as a proxy for anticipated efficiency gains. The table below provides a cross-sector summary of past price control determinations. For each sector, the price changes are presented on a year-by-year basis and are expressed as an average annual rate of change relative to RPI. Thus, a change of zero implies that prices would keep pace with RPI. Negative values in the table imply that prices fell relative to the RPI.<sup>15</sup>

|         | British Gas/<br>BT Transco | NGC   | RECs<br>Average | WaSCs<br>Average | WICS | BT <sup>16</sup><br>Network |
|---------|----------------------------|-------|-----------------|------------------|------|-----------------------------|
| 1984/85 |                            |       |                 |                  |      | -3.0                        |
| 1985/86 |                            |       |                 |                  |      | -3.0                        |
| 1986/87 | -2.0                       |       |                 |                  |      | -3.0                        |
| 1987/88 | -2.0                       |       |                 |                  |      | -3.0                        |
| 1988/89 | -2.0                       |       |                 |                  |      | -3.0                        |
| 1989/90 | -2.0                       |       |                 |                  |      | -4.5                        |
| 1990/91 | -2.0                       | 0.0   | 1.3             | 5.4              |      | -4.5                        |
| 1991/92 | -2.0                       | 0.0   | 1.3             | 5.4              |      | -6.5                        |
| 1992/93 | -4.0                       | 0.0   | 1.3             | 5.9              |      | -7.5                        |
| 1993/94 | -4.0                       | -3.0  | 1.3             | 4.5              |      | -7.5                        |
| 1994/95 | -4.0                       | -3.0  | 1.3             | 5.0              |      | -7.5                        |
| 1995/96 | -4.0                       | -3.0  | -14.0           | 1.8              |      | -7.5                        |
| 1996/97 | -4.0                       | -3.0  | -11.5           | 1.5              |      | -7.5                        |
| 1997/98 | -23.0                      | -20.0 | -3.0            | 1.4              |      | -4.5                        |
| 1998/99 | -2.0                       | -4.0  | -3.0            | 1.6              |      | -4.5                        |
| 1999/00 | -2.0                       | -4.0  | -3.0            | 1.5              |      | -4.5                        |
| 2000/01 | -2.0                       | -4.0  | -24.5           | -12.7            |      | -4.5                        |
| 2001/02 | -2.0                       | 0.0   | -3.0            | -0.4             |      | -10.2                       |
| 2002/03 | -4.0                       | -1.5  | -3.0            | 0.3              | 7.5  | -10.2                       |
| 2003/04 | -2.0                       | -1.5  | -3.0            | 1.4              | 7.8  | -10.2                       |
| 2004/05 | -2.0                       | -1.5  | -3.0            | 1.8              | 4.6  | -10.2                       |
| Average | -2.9 to -4.9 <sup>17</sup> | -3.2  | -4.3            | 1.6              | 6.6  | -6.0                        |

#### Table 7: Price control targets for selected UK utilities to 2004/05

Source: Impact of Liberalisation on Efficiency: A Survey, Frontier Economics, January 2002, Table 2. WICS Strategic Review of Charges, 2002-2006, page 2, LECG update. Figures rounded to one decimal place. Colour coding indicates separate price control periods.

<sup>&</sup>lt;sup>14</sup> Source: WICS Strategic Review of Charges 2002/2006, page 191.

<sup>&</sup>lt;sup>15</sup> Whilst the X factor might be a proxy for efficiency, it does only reflect the efficiency target. It also provides allowances for capital costs, changes in demand, etc.

<sup>&</sup>lt;sup>16</sup> The 2001 Oftel Review of Network Charge Controls introduced six separate control baskets, the controls ranged from -7.5 to -13%. The figure of -10.2% represents the median.

<sup>&</sup>lt;sup>17</sup> From 1997/98, the reviews relate to BG Transco.

- 2.13 The price control targets for the water and sewerage companies are affected by the substantial costs of quality enhancements required by legislation, which enter the price control set by Ofwat through a so-called 'K-factor'. Thus, even when substantial operating efficiency improvements are required to baseline Opex, it can still be the case that retail prices rise in real terms in order to allow companies to fund additional environmental and other quality obligations. When these high levels of investment are taken into account, productivity growth also exceeds the economy wide average. For example, in the current price control period, Ofwat is proposing an average X of +4.2%, with the price rises being justified based on a £16.8 billion capital expenditure programme.<sup>18</sup>
- 2.14 Excluding water and sewerage, the price control factors above suggest annual price reductions of between 2.9% and 6.0% in real terms.
- 2.15 When setting price controls, regulators typically consider a one off price change in the first year of the control (an adjustment to P<sub>0</sub>) followed by an annual price change relative to inflation (RPI-X). Whilst most annual price reductions are of the order of 3% to 5% in real terms, in several occasions, regulators have found it necessary to make a substantial cut in year on year prices. This happened to British Gas / BG Transco and NGC in 1997/8, with cuts of 23% and 20% respectively, and to both water companies and regional electricity companies. Ofwat also cut prices by 12.7% in 2000/1. These adjustments were necessary for a variety of reasons. First, the companies may have exceeded the regulators' efficiency targets by a considerable margin, leading to profits that were substantially in excess of those required to fund their cost of capital. Second, improved cost transparency may have lead to one-off base year adjustments (e.g. for non-cash costs). Alternatively, more sophisticated benchmarking techniques may have identified that the scope for higher levels of inefficiency where possible.
- 2.16 The table above also shows that, in most cases, the second price controls were tougher. This might be for a number of reasons but an important reason is that companies managed to out perform the targets they had been set (i.e. they have managed to exceed their efficiency targets). In our experience, regulated companies tend to understate the scope for efficiency, and claim that they cannot possibly meet the targets that have been set. However, the evidence suggests

<sup>&</sup>lt;sup>18</sup> Ofwat periodic review 2004, Future water and sewerage charges 2005-10, Final determinations, pages 10 and 11.

this is rarely the case – and the targets are met and often exceeded – as the next section shows.

## 3 Efficiency improvements achieved by regulated utilities in the UK

#### Introduction

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- 3.1 In the previous section, we summarised the efficiency assumptions made by UK regulators. In this section, we summarise the extent to which these efficiency targets were achieved in practice. In particular, we consider whether companies typically outperform or under perform relative to the regulator's assumptions.
- 3.2 Efficiency is reviewed frequently by economic regulators, often on an annual basis, and the results of aggregate savings achieved by regulated utilities are published in a number of price control and other efficiency reports. We have reviewed a number of these and extracted the data on a broadly comparable basis. We have used the real unit operating expense ("RUOE") measure to compare the trend efficiency improvement across other regulated sectors, as this is most readily indicator available.<sup>19</sup>
- 3.3 Two good sources for this work are the work undertaken for a Transco price control review, and work done by the CAA. These both report RUOE, but for slightly different periods. In addition to these, we have reviewed the RUOE trends achieved by Scottish Water.
- 3.4 The table below summarises the compound annual rate of changes in RUOE for a number of regulated UK industry sectors and companies since privatisation.

RUOE stands for real unit operating expenditure (excluding capital expenditure or depreciation). We have expressed NIW's target on a comparable basis (i.e. excluding capital expenditure and depreciation), though we have done this in total cost, not unit cost, terms.

| Regulated Company                 | Start point<br>for trend | RUOE reductions<br>(constant volume terms) |
|-----------------------------------|--------------------------|--|
| BT (Oftel / Ofcom)                | 1984                     | 3.7%                                       |
| BAA (CAA)                         | 1987                     | 1.6%                                       |
| Electricity Distribution (Ofgem)  | 1990                     | 5.6%                                       |
| Electricity Transmission (Ofgem)  | 1991                     | 6.7%                                       |
| Gas Transportation & Distribution | 1990                     | 8.8%                                       |
| Railtrack 1 (ORR)                 | 1996                     | 7.3%                                       |
| Railtrack 2 (ORR) <sup>20</sup>   | 1996                     | 1.8%                                       |
| Water and Sewerage (Ofwat)        | 1993                     | 2.9%                                       |
| Average                           |                          | 4.8%                                       |

### Table 8: Compound RUOE reductions from Transco price review, not volume-adjusted

Sources: Transco Price Control Review for 2002-7 – Report for Ofgem, Mazars, Neville, Russell, September 2001 (Appendix D).

3.5

The CAA<sup>21</sup> presents similar figures to those above, although in constant volume terms.

| Regulated Company        | Period          | RUOE reductions |
|--------------------------|-----------------|-----------------|
| Water                    | 1992/93-2001/02 | 2.5% to 2.6%    |
| Sewerage                 | 1992/93-2001/02 | 0.1% to 0.9%    |
| Electricity distribution | 1990/91-2000/01 | 3.4% to 4.1%    |
| NGC                      | 1990/91-2001/02 | 4.9% to 6.0%    |
| NIE                      | 1992/93-1999/00 | 4.4%            |
| BT (exchange lines)      | 1995/96-2000/01 | 3.5%            |
| Average                  |                 | 3.4%            |

#### Table 9: Compound annual RUOE reductions derived by CAA and WICS

Sources: "Supporting paper 4: Top-down efficiency analysis", CAA, November 2004, Table 5.

3.6

The average compound reduction of the whole sample is 4.8% in RUOE terms using the Transco data. The results are 3.4% using the CAA data. The CAA's

<sup>&</sup>lt;sup>20</sup> The ORR provides two different estimates for Railtrack based on two alternative measures of output

<sup>&</sup>lt;sup>21</sup> Supporting paper 4: Top-down efficiency analysis, CAA, November 2004

figures exclude data for the gas transportation and distribution industry and use different start and end dates.<sup>22</sup>

- 3.7 The results are consistent with a recent study conducted for Ofwat by Europe Economics.<sup>23</sup> They conclude that "the evidence from analysis of UK regulated firms suggest that savings of the order of 3 per cent to 5 per cent per annum in real operating expenditure have been achieved since privatisation".
- 3.8 This view is also supported by Frontier Economics in its report on the impact of liberalisation on efficiency.<sup>24</sup> It concludes, "when capital inputs are taken into account, real unit cost reductions are generally lower. This is consistent with the view that some degree of substitution of capital for labour inputs has occurred in these sectors over the period since privatisation. Nevertheless, substantial average annual cost reductions have been made. On balance we believe that this evidence is consistent with medium-term unit reductions relative to RPI of between 2% and 7% per year, for a constant level of service quality cost (and including capital inputs)".
- 3.9 WICS presents the operating cost efficiency improvements delivered by Scottish Water as shown in the diagram below, which compares the actual cost savings achieved by Scottish Water with the efficiency targets set.<sup>25</sup> This shows that in 2002-03 actual performance was lower than expected performance. However, by 2005-06, Scottish Water had exceeded its cumulative efficiency targets by 2% overall.

<sup>&</sup>lt;sup>22</sup> Water and sewerage companies have been excluded for reasons set out above. Including gas and distribution would increase the average

<sup>&</sup>lt;sup>23</sup> Scope for Efficiency Improvement in the Water and Sewerage Industries, Final Report, Europe Economics, March 2003

<sup>&</sup>lt;sup>24</sup> The Impact of Liberalisation on Efficiency, Frontier Economics, prepared for Postcomm January 2002, page 30.

<sup>&</sup>lt;sup>25</sup> The operating expenditure targets here are based on baseline costs equaling both old and new costs and savings including merger savings as well as savings deriving from an efficiency target.



#### Figure 1: WICS presentation of Scottish Water opex efficiency

Source: "Costs and performance report 2003-06" from WICS, 14 November 2006, Figure 5.

#### 3.10 We understand that WICS calculates these percentages as follows:

|  | 2002/03 | 2003/04 | 2004/05 | 2005/06 |
|--|---------|---------|---------|---------|
| Cumulative opex efficiency target before merger savings £m | 63.0    | 96.9    | 115.9   | 128.8   |
| Cumulative merger savings target £m                        | 20.0    | 25.0    | 29.3    | 29.3    |
| Cumulative total efficiency target<br>£m                   | 83.0    | 121.9   | 145.2   | 158.1   |
| Opex £m  | 387.3   | 399.1   | 411.1   | 423.4   |
| Efficiency including merger savings (note 1)               | 21%     | 31%     | 35%     | 37%     |
| Efficiency excluding merger savings (note 1)               | 16%     | 24%     | 28%     | 30%     |

#### Table 10: Efficiency targets set for Scottish Water by WICS

Source: WICS Costs and Performance Report 2003-06 pages 6 and 8, WICS Strategic Review of Charges 2002/2006, page 303. Note 1: To calculate OPEX efficiencies WICS takes the Cumulative OPEX efficiency adds Cumulative merger savings and divides by total Opex in the given year.

3.11 On an annual basis this implies the following percentage savings, *including* merger savings:

| £m  | 2001/02 | 2002/03 | 2003/04 | 2004/05 | 2005/06 |
|---|---------|---------|---------|---------|---------|
| Cumulative Opex efficiency<br>target (including merger<br>savings)  |         | 83.0    | 121.9   | 145.2   | 158.1   |
| Opex efficiency per annum   |         | 83.0    | 38.9    | 23.3    | 12.9    |
| Total operating costs   | 375.9   | 387.3   | 399.1   | 411.1   | 423.4   |
| Efficiency as a proportion of total Opex (including merger savings) |         | 22.1%   | 10.0%   | 5.8%    | 3.1%    |

### Table 11: Efficiency targets set for Scottish Water by WICS recalculated by LECG (including merger savings)

Source: WICS Costs and Performance Report 2003-06 pages 6 and 8, WICS Strategic Review of Charges 2002/2006, page 303. Note 1: We have calculated efficiency as a proportion of Opex using the Opex of the previous year as the denominator.

3.12

On an annual basis this implies the following percentage savings *excluding* merger savings:

| £m  | 2001/02 | 2002/03 | 2003/04 | 2004/05 | 2005/06 |
|---|---------|---------|---------|---------|---------|
| Cumulative Opex efficiency (excluding merger savings)               |         | 63.0    | 96.9    | 115.9   | 128.8   |
| Opex efficiency per annum   |         | 63.0    | 33.9    | 19.0    | 12.9    |
| Total operating costs   | 375.9   | 387.3   | 399.1   | 411.1   | 423.4   |
| Efficiency as a proportion of total Opex (excluding merger savings) |         | 16.8%   | 8.8%    | 4.8%    | 3.1%    |

 Table 12:
 Efficiency targets set for Scottish Water by WICS recalculated by LECG (excluding merger savings)

Source: WICS Costs and Performance Report 2003-06 pages 6 and 8, WICS Strategic Review of Charges 2002/2006, page 303. Note 1: We have calculated efficiency as a proportion of Opex using the Opex of the previous year as the denominator.

- 3.13 In its 2002-2006 price control, WICS set an efficiency assumption equal to an average of approximately 9.2% per annum, in compound terms over 4 years.<sup>26</sup> Excluding the merger benefits, however, reduces the cumulative annual efficiency saving by just under £30m, equating to an annual average of 7.6%.
- 3.14 The above tables provide an indication of the cost reductions achieved by regulated utilities after the introduction of extensive and independent regulation.

<sup>&</sup>lt;sup>26</sup> 9.2% is based on total operating costs (i.e. base costs plus new costs) and the required savings (i.e. efficiency savings plus merger savings) relative to total costs in 2001/02.

Over the medium term, the efficiency gains actually achieved by regulated companies match closely and often exceed the efficiency targets that the economic regulators set them.

#### Short term gains

- 3.15 In some cases, regulators have required companies that were perceived to be particularly inefficient to make greater progress in the early years of a given price control period. One example of this is the first price control that WICS set for Scottish Water. As can be seen from the diagram above, Scottish Water was expected to achieve 21% of the cumulative 37% savings target in the first year.<sup>27</sup>
- 3.16 We noted in Section 2 above, that in all the regulated sectors in Table 7, the utility companies in question exceeded the efficiency targets that they have been set for the first price control period, leading the regulators to reduce prices more sharply (or at least not allow prices to increase so fast) in the subsequent price control. Typically, companies also outperformed this second set of targets, leading to even greater price reductions subsequently.

#### Table 13: Tightening price controls following out-performance

|  | Gas        | NGC        | RECs        | Ofwat<br>WaSCs | вт            |
|--|------------|------------|-------------|----------------|---------------|
| Last year of initial<br>price control        | RPI – 2.0% | RPI – 0.0% | RPI + 1.3%  | RPI + 5.0%     | RPI –<br>3.0% |
| First year of<br>subsequent price<br>control | RPI – 4.0% | RPI – 3.0% | RPI – 14.0% | RPI + 1.8%     | RPI –<br>4.5% |

Source: LECG analysis of data presented by Frontier economics.

27

Figures based on WICS calculations, not LECG's preferred method of relating efficiencies to the prior year.

## 4 The impact of economic regulation on TFP growth in utilities

#### Introduction

4.1 There are two components underlying the reductions set out in the previous section. One derives from the achievement of long-term efficiency gains, similar to companies in non-regulated sectors, and the other relates to the effects of a range of factors, including privatisation, the introduction of effective regulation and competition, which generally provide increased opportunities to make cost savings. We discuss each of these effects in the sub-sections below.

#### Long-term gains

4.2 The table below provides a summary of efficiency gains for the UK economy.

|  | Table 14: | UK economy TF | P growth rates | (volume-adjusted) |
|--|-----------|---------------|----------------|-------------------|
|--|-----------|---------------|----------------|-------------------|

| Period                             | Total factor productivity<br>(annual growth) |
|------------------------------------|--|
| UK 1974-1999                       | 1.36%  |
| UK 1995-1999 (down cycle period)   | 0.67%  |
| UK Economy CEPA forecast 2005-2010 | 1.30%  |

Source: "Productivity Improvements in Distribution Network Operators", Cambridge Economic Policy Associates, November 2003, pages 24 to 26. Underlying data is the NISEC02 data set from NIESR.

4.3 Alternative estimates by industry are provided in the table below.

| Sector                                   | 1974-1999 | 1990-1999 |
|--|-----------|-----------|
| Coal & petroleum products                | 1.7%      | 3.3%      |
| Chemicals & allied products              | 1.9%      | 1.3%      |
| Basic metals & fabricated metal products | 2.1%      | 0.7%      |
| Tool machinery equipment                 | 2.0%      | 1.8%      |
| Textiles, clothing & leather             | 1.8%      | 1.0%      |
| Food, drink & tobacco                    | 1.0%      | 0.5%      |
| Other manufacturing                      | 1.8%      | -0.2%     |
| Agriculture, forestry & fishing          | 1.9%      | 0.7%      |
| Mining & extraction                      | 0.3%      | 4.6%      |
| Electricity, gas & water                 | 2.0%      | 3.2%      |
| Manufacturing                            | 2.1%      | 1.3%      |
| Construction                             | 1.7%      | 1.2%      |
| Transport & communications               | 2.1%      | 3.8%      |
| Distributive trades                      | 0.4%      | 0.6%      |
| Financial & business services            | 0.2%      | 0.9%      |
| Miscellaneous                            | 0.1%      | 0.5%      |
| Non-market services                      | 0.6%      | 2.3%      |
| Total economy                            | 1.1%      | 1.2%      |

Table 15: Annual sector TFP trend growth estimates, volume-adjusted

Source: "Productivity Improvements in Distribution Network Operators", Cambridge Economic Policy Associates, November 2003, page 48.

4.4 CEPA's forecast of a long-run trend in UK TFP is 1.3% a year. However, the data suggests the electricity, gas and water sectors have experienced a higher rate of TFP growth compared to other sectors.

#### **Catch-up gains**

- 4.5 There is a considerable debate around translating estimates such as those in the table above into the "X" of the RPI-X framework in part, because they reflect the future long-term efficiency gains of companies that are *already* close to the efficiency frontier as they generally operate in well-established competitive markets.<sup>28</sup>
- 4.6 This approach to setting X is only appropriate when company costs have converged to an efficiency frontier. Where companies are not at the efficient frontier, X should be based on the scope for further cost reductions (i.e. catch up

<sup>&</sup>lt;sup>28</sup> Technically, we are interested in out-performance and not raw levels of TFP growth.

efficiency gains) as well as on the scope for underlying long run efficiency gains. Such comparators can then be seen as representing the minimum bound for appropriate X factors.<sup>29</sup> In the long term, CEPA's forecast suggests that companies should be able to achieve savings, in TFP terms, of at least 1.3% a year.

- 4.7 The catch-up element combines the impact on firms of privatisation, the introduction of regulatory price pressures, and/or exposure to competition. Economists have found it is difficult to disentangle the effects of a change in ownership from the effects of regulatory price pressure and/or increased competition, as these changes have typically affected regulated sectors over the same period. In the literature, many commentators refer to this catch-up as a 'privatisation effect', though this is potentially misleading in nature, as it includes all of the stated effects.
- 4.8 The regulatory literature shows that catch-up efficiency gains by regulated companies in the first five to ten years post privatisation and/or the introduction of regulatory price pressure, and/or the exposure to competition, is significant. Europe Economics<sup>30</sup> has found that "*privatised infrastructure companies have reduced unit-operating expenditure by some 1.25% to 3.5% per annum more than might have been expected in the absence of a privatisation effect. The privatisation effect arises from a catch-up of whole industries towards greater efficiency following privatisation and the introduction of incentive regulation."*
- 4.9 To the extent that economists have been able to disentangle the various elements of the "privatisation effect", there is widespread agreement that exposure to price pressure through effective regulation is a key driver of the efficiency performance in regulated industries. This is particularly relevant to water and sewerage companies such as NIW and Scottish Water that are being subject to economic regulation rather than privatisation.
- 4.10 Regardless of the relative importance of the effects of privatisation, introduction of regulatory price pressure, and/ or exposure to competition, it is clear that firms that have been in public ownership and not subjected to effective competition or regulation are typically some distance from their efficient cost frontier. A number

<sup>&</sup>lt;sup>29</sup> Productivity improvements in Distribution Network Operators, CEPA, November 2003.

<sup>&</sup>lt;sup>30</sup> Scope for Efficiency Improvement in the Water and Sewerage Industries, Final Report.

of studies perform a robust quantification of these privatisation, regulation and competition effects. The findings of these studies tend to be expressed either in TFP terms, or in RUOE/RUOC terms.

- 4.11 Europe Economics' study for Ofwat in March 2003 is perhaps one of the most comprehensive. Europe Economics performed a review of the literature relating to privatisation, regulation and competition effects in regulated industries in the UK. It concluded that privatisation leads to efficiency gains once regulation has become effective, but that the impact can be mixed across different firms. In the absence of sufficient pre-existing evidence, Europe Economics performed its own analysis to determine the privatisation effect on real unit operating costs in the water and sewerage industry.
- 4.12 Europe Economics calculated medium-term (roughly 10-year) volume-adjusted RUOE trends for firms in the water industry, and in privatised industries with similar network infrastructures to the water industry these were found in the electricity, sewerage, rail and telecoms industries. Europe Economics observed "*a central range of 3 to 5 per cent per annum RUOE reduction is a fair interpretation of the data*".<sup>31</sup> It concluded that UK regulated infrastructure firms had achieved savings of this magnitude since privatisation. Europe Economics then calculated a long run RUOE trend for the water and sewerage industries of 1.5% to 1.75% a year (using a nature of work comparison), and inferred that the residual RUOE productivity growth of 1.25% to 3.5% a year was attributable to the privatisation and liberalisation effects across their entire sample of regulated firms.<sup>32</sup> In total, this suggests savings of around 2.75% to 5.25% could be possible in the water sector.
- 4.13 Europe Economics concluded that this range was not directly applicable to RUOE in the water and sewerage industries for the years following 2003. This is because it was likely to pick up 'easy win' productivity gains and exceptionally high rates of capital substitution available to firms in the first few years following privatisation/ deregulation which were unlikely to be available to the water or sewerage industries after 2003. This argument would not seem to apply to NIW.

Europe Economics, March 2003, page 1

<sup>&</sup>lt;sup>31</sup> Europe Economics, March 2003, page 44

<sup>&</sup>lt;sup>32</sup> Europe Economics, March 2003, page 87

- 4.14 Europe Economics identified, therefore, a low-end estimate for RUOE after 2003 by arguing that there is at least some scope for minimal catch-up of efficiency in the water industry over the 10 years following 2003, which it estimated at 0.5% a year. Europe Economics identified an upper bound of 2.5% a year for the water industry by arguing that the 3.5% upper bound of historic observed privatisation effects is likely to be inflated by two effects, and should be adjusted downwards:
  - the first effect reflects a number of cases of 'easy wins' in newly privatised industries. Given that the water industry was privatised in 1989, these 'easy wins' are no longer likely to be available to the water industry; and
  - the second effect relates to high levels of capital substitution in the industries used to derive the 3.5% figure. Europe Economics did not believe such high rates of capital substitution would be available to firms in the water and sewerage industries.
- 4.15 We believe that NIW is in the early stages of making the transition from an inefficient, publicly owned organisation. Consequently, there should be a number of 'easy wins' available to NIW. Based on this form of analysis we think the range of 2.75% to 5.25% is a viable comparable.
- 4.16 Other utility regulators have also suggested large productivity gains immediately after the introduction of effective regulation. A report by Frontier Economics<sup>33</sup> suggested that a reasonable productivity path for Royal Mail, based on the thenimpending introduction of price control regulation, would be a 15% improvement in efficiency in 'the first 18 months' (to July 2003). It then concluded 4% a year efficiency gains for 5 years following that (to July 2008), and reversion to an underlying trend of 2% a year thereafter. Frontier Economics is not explicit whether these savings relate to RUOE, RUOC or TFP, however the implication of the context in which they are derived is that these savings relate to RUOE.

#### Summary

4.17 Based on the TFP analysis above – we think that following evidence can be applied to NIW:

<sup>&</sup>lt;sup>33</sup> The impact of liberalisation on efficiency: a survey, Frontier Economics, January 2002, page ii

| Study                 | Estimate                   | Comments  |
|-----------------------|----------------------------|---|
| Europe<br>Economics   | 2.75% to<br>5.25%          | RUOE. Applies to firms with 'easy win'<br>productivity opportunities and potentially high<br>levels of capital substitution. Includes both<br>catch-up and long term elements |
| Frontier<br>Economics | 10.0%                      | RUOE. Estimate for Royal Mail for first<br>18 months was 15%. Annualising this suggests<br>a saving of at least 10%.  |
| Europe<br>Economics   | 1.0% to 2.0% <sup>34</sup> | TFP. Relates to UK water and electricity industries in 2003, 14 years post-privatisation  |

| Table Io: Catch-up effect |
|---------------------------|
|---------------------------|

Source: Europe Economics, Frontier Economics, CAA and LECG.

4.18 We think the Royal Mail estimate is particularly interesting, as it remains in public ownership and over the period, it was expected to face limited competition.

<sup>&</sup>lt;sup>34</sup> Europe Economics, Office of Water Services PR04 – Scope for Efficiency Improvement dated 24 November 2003, page 6.

#### 5 Conclusions

#### Summary

- 5.1 Comparisons with other regulated companies are commonly used by regulators to inform decisions on efficiency assumptions and price controls. Such comparisons provide high-level indications of the scale of future efficiency savings. This approach can be used as an input into NIAUR's consideration of efficiency improvements that can reasonably be expected from NIW.
- 5.2 NIW, in its SBP, suggests that is able to make the following efficiency gains (from table presented in the first section:

| £m                                       | 07/08 | 08/09 | 09/10 |
|--|-------|-------|-------|
| Efficiency as a proportion of total Opex | 2.9%  | 3.2%  | 5.0%  |

Table 17: Percentage annual efficiency savings implied by the NIW SBP

Source: SBP, the SBP Opex tables.xls spreadsheet and LECG analysis.

5.3 Over the three years to 2009/10, it appears to us that NIW are forecasting total cumulative efficiencies of around 10.7%. We do not think this particularly stretching – as our findings show in this report.

#### Assumptions made by other regulators

- 5.4 When other UK regulators have undertaken efficiency analyses of companies operating costs they have set targets in the range of 1.4% to 7.0% per annum. Within the water sector, WICS set an efficiency target for Scottish Water from 2002 to 2006 commensurate with an average of 7.6%<sup>35</sup> per annum improvement in efficiency (excluding merger savings), and Ofwat assumed for the 2000-2005 price control that an annual efficiency of up to 4.8% could be achieved.
- 5.5 Furthermore, in the case of Scottish Water, WICS front-loaded the efficiency profile, setting Scottish Water a target of achieving 22.1%<sup>36</sup> including merger

<sup>&</sup>lt;sup>35</sup> Calculated as total opex savings excluding merger savings, of £128.8m, as a proportion of 2001/2 opex (£375.9m), over 4 years.

<sup>&</sup>lt;sup>36</sup> See Table 11.

savings, or 16.8%<sup>37</sup> excluding merger savings in the first year of the price control period.

5.6 A summary of the available evidence is provided in the table below.

| Company  | Low   | Average | Тор   |
|--|-------|---------|-------|
| Average of regulators  | 1.4%  | 3.0%    | 7.0%  |
| Ofwat WaSCs (Water only)   | 1.4%  | 2.3%    | 4.8%  |
| Ofwat WaSCs (Sewerage only)  | 1.4%  | 3.2%    | 4.4%  |
| Ofwat water only companies   | 1.4%  | 2.7%    | 4.8%  |
| WICS – average annual efficiency<br>over 4 years excluding merger<br>savings | 7.6%  | 7.6%    | 7.6%  |
| WICS – average over 2 years excluding merger savings <sup>38</sup>           | 12.2% | 12.2%   | 12.2% |

 Table 18:
 The average and range of efficiency assumptions

Source: LECG analysis

- 5.7 It is up to NIAUR to select where in this range NIW might be most comparable. We note that in general, NIW is viewed as being inefficient. For example, the IWRP states, "*in relation to opex, we have concluded that there has been and still is enormous scope for improvement in NIW's efficiency*".<sup>39</sup> It further notes, "*a Relative Efficiency Analysis commissioned by DRD indicated that the Water Service was very inefficient…particularly in relation to opex*".<sup>40</sup> The IWRP recommended, "*NIW's operational cost efficiency target should be raised to 40% for the period ending 2009/10*".<sup>41</sup>
- 5.8 We understand that the Water Service commissioned ICS consulting to review the efficiencies required by DRD, and that ICS report confirmed the existence of

<sup>&</sup>lt;sup>37</sup> See Table 12.

<sup>&</sup>lt;sup>38</sup> Based on the cumulative opex savings target of £96.9m in 2003/4 and the 2001/2 opex of £375.9m. We have calculated the annual rate on a compound basis.

<sup>&</sup>lt;sup>39</sup> IWRP Strand One Report, paragraph 5.5.

<sup>&</sup>lt;sup>40</sup> IWRP Strand One Report, paragraph 5.10.

<sup>&</sup>lt;sup>41</sup> IWRP Strand One Report, paragraph 5.16.

large opex efficiency gaps.<sup>42</sup> In addition, the COLS analysis undertaken by NIAUR has indicated that there is a large opex efficiency gap relative to the English and Welsh undertakers.

5.9 Typically, where regulators are regulating inefficient companies, they set harder targets, so that greater and more rapid progress is achieved. Given that NIW is thought to be inefficient, it might be reasonable to expect NIW to achieve annual efficient improvements at the top end of the ranges set out in the table above. This might suggest a range of 5% to 7.5% per annum is achievable. The upper end of this target is broadly consistent with the target set by WICS, assuming a constant rate of efficiency. If efficiencies are front loaded – then a higher rate of efficiency might be achievable.

#### Performance relative to expectations

5.10 The improvements in operating efficiency actually observed in regulated UK utility companies generally exceeds the assumptions of efficiency improvements made by regulators. The Transco and CAA studies show average historical trends in RUOE improvements for privatised/regulated companies as high as 8.8% and 6.0% respectively. These figures are shown below – and are typically above those set by regulators.

| Study           | Low  | Average | High |
|-----------------|------|---------|------|
| Transco studies | 1.6% | 4.8%    | 8.8% |
| CAA studies     | 0.1% | 3.4%    | 6.0% |

Table 19: Achieved RUOE trends

Source: Transco Price Control Review for 2002-7 – Report for Ofgem, Mazars, Neville, Russell, September 2001 (Appendix D) and "Supporting paper 4: Top-down efficiency analysis", CAA, November 2004

5.11 Again, given the scale of the perceived efficiency gap, it might be appropriate for NIAUR to select figures towards the top end of the range. Again, we believe that a target of 5% to 7.5% per annum can be supported by the available data.

#### TFP Evidence and the impact of economic regulation

5.12 The TFP evidence indicates that the creation of NIW as a company, combined with the introduction of economic regulation, is likely to have the effect of

<sup>&</sup>lt;sup>42</sup> IWRP Strand One Report, paragraph 5.11.

increasing the rate at which it can improve its efficiency. All else being equal, it would be reasonable, therefore, to expect NIW to increase the rate at which it becomes more efficient.

5.13 We believe that NIW is in the early stages of making the transition from an inefficient, publicly owned organisation. Consequently, there should be a number of 'easy wins' available to NIW. Based on analysis performed in the water sector we think the range of 2.75% to 5.25% is a viable benchmark. Other utility regulators have also suggested large productivity gains are possible immediately after the introduction of effective regulation. For Royal Mail, the impact of incentive-based regulation was predicted to lead to a 15% improvement in efficiency in 'the first 18 months (or 10% on an annual basis).

#### Impact on costs in 2008/09

- 5.14 The top down analysis suggests that NIW should be able to deliver efficiency improvements of around 5% to 7.5% per annum. Potential gains of around 12% could be achieved if the WICS comparator was selected (i.e. front loaded actual targets excluding merger savings). Where NIAUR selects will be based on its interpretation of the data.
- 5.15 Given that we are part way through 2007/08, we assume that NIW achieves the costs set out in its SBP for 2007/08. In doing so, we are implicitly assuming that it does not outperform the efficiency target it has suggested for the current year. We have not been provided any information to verify current progress within 2007/08 and therefore cannot validate the appropriateness of our assumption.
- 5.16 The table below shows the additional efficiency savings that would be required if the SBP targets were increased to this range.

|   | 5%    | 7.5%  | 12%   |
|---|-------|-------|-------|
| 2007/08 Opex adjusted for VER & transition costs in 2006/07 | 174.6 | 174.6 | 174.6 |
| Implied efficiency using NIAUR<br>benchmark                 | 8.7   | 13.1  | 21.0  |
| NIW forecast  | 5.5   | 5.5   | 5.5   |
| Additional efficiencies required in 2008/09                 | 3.2   | 7.6   | 15.5  |

#### Table 20: Efficiency saving conclusions

Source: LECG analysis

- 5.17 Thus, assuming a 5% efficiency target for NIW for 2008/9 would require additional savings of £3.2 million relative to the SBP, and a 7.5% target would require additional savings of £7.6 million relative to its SPB both expressed in 2006/07 prices. If the WICS benchmarks were taken then additional savings of £15.5 million might be appropriate.
- 5.18 Concluding on a final figure is NIAUR's responsibility. In doing so, we understand that NIAUR will need to consider the significant management challenges facing NIW. We have not considered such challenges specifically in presenting the above estimates though we do note the figures are based on a prudent set of assumptions.