

Draft Financial Model v2.0

1) Introduction

It is intended that the financial model should allow WICS and Scottish Water to have important common ground on financial calculations during the process of assessing appropriate financial assumptions that underpin possible charge caps. We have indicated in our methodology consultation that we will be able to provide feedback to Scottish Water on its financial assumptions provided that our model is used.

The model is currently in draft form, and we intend to have the model independently reviewed. However, we have tested the model using data from the previous strategic review and the 1st Draft Business Plan, without material differences to the modelling results.

2) New attributes incorporated into the financial model

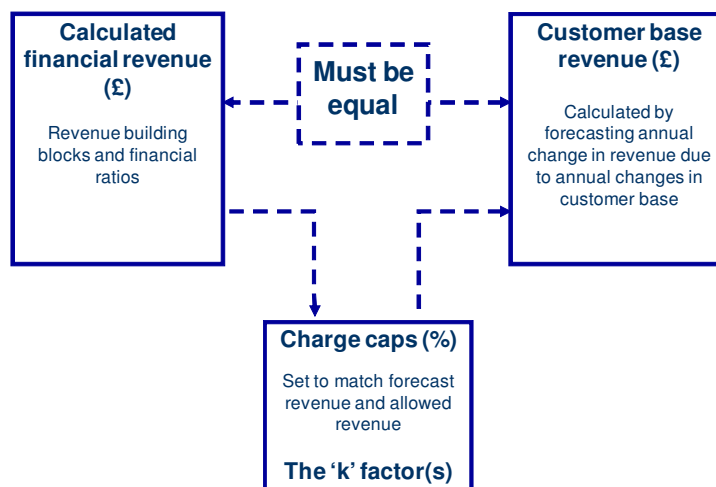
Compared with the financial model issued for the 1st Draft Business Plan, the model incorporates the following changes:

- Financial ratios approach: for this version of the financial model a financial ratios approach for price setting has been incorporated (discussed further below). This approach allows a user to target a specific final year FFO/debt ratio.
- Tariff basket basis: the model now calculates charge caps on a tariff basket basis and revenue rebalancing on a revenue basis. This allows a closer link between the calculations in the model and the outputs.
- “Phasing” sheet: The financial model calculates unrounded charge caps for each tariff basket for each year. We recognise that Scottish Water may wish to present a price profile that is different to this precise calculation and that doing so may involve trade-offs against other desirable features for price limits. We have included a sheet that both improves the user interface and makes this adjustment more specific
- Credit note provision: credit note provision inputs have been incorporated in line with Scottish Water’s 1st Draft Business Plan.

3) Setting charge caps

Charge caps are calculated by matching the calculated financial revenue and the implied revenue from tariff baskets (see figure 1). In the previous strategic review of charges, this process was carried out using two different models, the financial model and the tariff basket model respectively. The updated financial model now combines financial information as well as customer base information. This will allow the user to calculate charge caps easily as well as preventing errors by keeping all information in one single file.

Figure 1: Process for calculating charge caps



Although the financial model will calculate automatic charge caps, it also allows the user to alter manually the resultant charge to accommodate any desired ‘smoothed’ charges.

Another key attribute of the model is the allowance for unwinding cross subsidies among main customer groups. As such, the user should determine how the calculated ‘financial’ revenue should be allocated throughout the revenue groups (the composition of the revenue groups is explained in detail on the Commission’s guidance for completing Section 8 of the First Draft Business Plan)

4) Approaches to setting revenue

The financial model includes two approaches to establishing required revenue in the financial model:

- a building-blocks approach; and
- a financial ratios approach.

Building blocks approach

In its methodology, the Commission outlined a “building blocks” approach to establishing revenue requirements. This has been included in the financial model. The revenue building blocks are as follows:

Operating Costs
 +
 PPP costs
 +
 Depreciation
 +
 Working capital adjustments
 +
 Allowed return on RCV
 +
 Tax

These building blocks are calculated from the assumptions input in the model. This calculation resembles Ofwat’s approach for setting prices during its Periodic Review

2004. However, it is worth noting the specific adjustments made to the 'Allowed return on RCV' building block to adapt it to the Scottish context.

In the previous strategic review, the financial model forecast Scottish Water's financial accounts as a vertically integrated company. As such, the calculated initial Regulatory Capital Value also contained a portion for the value of the retail business. Given the full separation of the non-household retail business from 2008, the allowed return on RCV would need to be adjusted accordingly in order to identify the portion that would belong to the allowed return of licensed retailers. As such, the model calculates an assumed return for the licensed retail industry and subtracts it from the main calculated 'vertically integrated' return on RCV.

An additional adjustment made for the Scottish water industry is the adjustment for embedded debt. As in the last review, the financial model allows any difference between the cost of debt assumption used for cost of capital calculations and the actual weighted average interest rate paid on embedded debt. This adjustment is calculated on a real basis.

Finally, there is an adjustment for any dividends 'forgone' by the Scottish Government. This reduces the amount of calculated commercial allowed for cost of capital (one of the building blocks) for the return on equity that the Scottish Government is willing to forgo during the regulatory period. This is an assumption input to the model and is expressed as a percentage of the unleveraged portion of the RCV.

Financial ratios approach

In its Strategic Review of Charges 2006-10, the Commission made an assessment of financial strength part of assessment of the appropriate charge caps for Scottish Water. It targeted a specific value for a FFO/Debt ratio at the end of the price review period. Scottish Water continued this method into its first draft business plan. We recognise that assessments of financial strength may be an appropriate way to calculate revenue and have updated the model to include this approach.

There are two choices (prior to phasing) for a user in pursuing a financial ratios approach:

- input a P_0 , followed by calculated charge caps in each year; or
- allow the model to calculate price limits for each year.

Having selected an approach, the user inputs a target for the FFO/debt ratio for the end of the price review period. Because this is an end-of-review target and not a target for each year, there needs to be a rule for determining revenue in years leading up to this. The macro in the model uses equal changes in the weighted average price index as an approximation for a reasonably smooth change.

It should be noted that the FFO/debt ratio calculated is for the regulated part of Scottish Water. It may be worth considering whether this has any impact on the targeted value.

5) Structure of the model

The model contains seven main sections:

- Base Historic Data
- Assumptions
- Process Sheets
- Outputs
- Tariff Baskets
- Modelling
- Alternative inputs

There are two additional sections (Working Sheets, Others) but the user does not need to interact with these.

- **Base Historic Data**

The user should input in this section any 'historic' financial information. This implies inputs for years 2006-07 and 2007-08. Financial information is based on the Regulatory Accounting Rules (any deviations to these are explained in the First Draft Business Plan definitions for Section 7).

This section comprises seven worksheets:

- B1. Profit and Loss account
- B2. Balance Sheet
- B3. Cash Flow
- B4. Working Capital and other non-trade debtors/creditors
- B5. Tax
- B6. Maturity profile of closing (embedded) debt (as of 31 March 2008)
- B7. Depreciation and amortisation of closing assets

Although Tables B6 and B7 involve assumptions beyond 2007-08, these are related to closing assets to the 'base year' (2007-08). For instance, B6 inputs are related to the maturity profile of the closing debt as of 31 March 2008 and B7 inputs refer to the expected historic and current cost depreciation and amortisation of closing assets at 31 March 2008.

- **Assumptions**

This section contains inputs on variables that could affect revenue or charges for the period 2008-09 to 2017-18.

This section comprises seven worksheets:

- A1. Inflation
- A2. Financing
- A3. Capital expenditure
- A4. Asset Disposals
- A5. Non Fixed assets
- A6. Licensed Retail business
- A7. Tax

Worksheet A6 information has already been input by the Commission and comprises a high-level approach for calculating the licensed industry cost of capital.

- **Process sheets**

This section deals with all necessary calculations for calculating the revenue building blocks and well as the main inputs for the calculation of forecast financial information. The worksheets included in this section are:

- P1. Capital Expenditure
- P2. Depreciation
- P3. Book Value
- P4. Regulatory capital value
- P5. Interest income and interest expense
- P6. Capital allowances
- P7. Tax
- P8. Licensed retail industry
- P9. Cost of capital
- P10. Current Cost reserve adjustments
- P11. Revenue calculation formula

The calculations in this section form the basis for the 'key outputs' of the financial model.

- **Outputs**

This section contains the key outputs of the model. Worksheets in this section include:

- O1. Profit and Loss Account
- O2. Balance Sheet
- O3. Cash Flow
- O4. Financial ratios and debt calculations
- O5. Investment summary
- O6. Charge caps

The first three worksheets display the forecast financial account information for Scottish Water. These are expressed in Historic Cost as well as Current Cost accounting.

The fourth worksheet calculates referential ratios. These are the same as those used in the previous review and resemble those used by Ofwat in its Periodic Review 2004. The table also informs the user if the resultant modelled scenario complies with the reference range targets for the financial ratios.

- **Tariff Baskets**

As mentioned previously, tariff basket information has been added into the financial model in order to calculate charge caps directly. Tables T3 to T22 contain detailed information on tariff baskets. The structure of these tables resembles that of the Business Plan guidance section 8. Table T2 summarises the information of the former tables into tariff basket information and revenue group information and T1 summarises revenue information on a service level basis.

However, unlike the Business Plan tables, all tariffs that affect primary revenue have been put together in a single worksheet ("TA1"). This has been

done for the purpose of mapping tariffs with their respective tariff basket and customer revenue group.

Assumptions on changes in tariffs are also input on table TA1. Tariffs changes are input on a revenue group basis (i.e. Household water retail, wholesale water charges (measured) to licensed providers through charges scheme in respect of supply points consuming greater than 1,000MI/annum). This sheet also allows Scottish Water to input its credit note provision and income uncertainty provision assumptions.

- **Modelling:**

This section is made of four worksheets: “k solving”, “scenarios”, “phasing” and “allocations”.

The table “k solving” is the worksheet that contains the ‘macro’ that calculates charge caps. This is done by matching the revenue from the financial modelling worksheets and the revenue from the tariff basket worksheets. This worksheet also contains key outputs such as charge caps (expressed in real terms), financial ratios and the use of available public borrowing.

In this worksheet the user will also select if he/she wants the macro to use the ‘building blocks’ calculated revenue, financial ratio, targeted revenue or a manually input revenue profile. A third option is to select revenue from a desired tariff basket revenue assumption.

The “scenarios” worksheet allows the user to model different scenarios by selecting alternative inputs to those input in tables A1 to A7. Alternative inputs include capital expenditure, operating expenditure and cost of financing. Alternative assumptions are input in worksheets E1 to E7, but the model also allows to input ‘custom’ assumptions in this worksheet as well.

The “allocation” worksheet is also key for charge cap setting as it defines any unwinding of cross subsidies at a customer revenue group level. These revenue group allocations are used to calculate charge caps on a tariff basket basis. As such, before running the macro, the user should determine *how* the calculated financial revenue will be distributed among revenue groups throughout the regulatory period 2010-14. The model then assumes equivalent charge cap increases among tariff baskets. After all the tariff basket groups get their corresponding allocation, the macro will further determine the allocation for those revenue groups that are sub groups of tariff baskets, i.e. revenue groups 3, 4, 5, 6, 7, 8.

The user has been given three alternatives to solve the revenue allocation targets. Alternative 1 allows the user to input the 2013-14 targets and let the model assume a straight line apportionment between this breakdown and that calculated for 2009-10. Alternative 2 allows the user to input percentage targets to year 2010-11 and then let the model calculate a straight line until the 2013-14 targets. Alternative 3 allows to user to customise revenue allocation throughout the entire regulatory period. Whatever alternative is selected, the user will need to confirm his/her selection by selecting the relevant alternative number in worksheet “K solving” block “Revenue proportion allocation”.

The “phasing” worksheet (see below).

- **Alternative inputs:**

The model allows the user to input alternative assumptions to those included in some key variables throughout tables A1 to A7. Alternative assumptions can be input in the following tables:

- E1. Operating costs, PPP and inflation scenarios
- E2. Q&S3b: Capital enhancement (total investment and apportionments) scenarios
- E3. Q&S3b: Capital maintenance (total investment and apportionments) scenarios
- E4. Q&S3a: Capital enhancement (total investment and apportionments) scenarios
- E5. Cost of Capital, Financing Costs and Dividend Scenarios
- E6. Revenue Options

The first scenario for each variable is by default the ‘base case’ and is sourced from its related input in the tables A1 to A7. The user can then input 2 new pre-determined scenarios. Finally, a fourth (called ‘custom’) scenario is that input in the “scenario” worksheet should the user wish to manually insert an assumption without wishing to save it.

7) Solving K and smoothing the result

Using the financial model macro:

Currently, the financial model ‘K solving’ macro calculates the charge caps that exactly match the calculated revenue (or an alternative input revenue phasing) and the building blocks revenue. This macro works by applying the Microsoft Excel’s ‘goal seek’ function by iterating inputs in worksheet “TA1” block “Tariff increases per revenue group” so that they match the desired ‘revenue proportion’ target set in the worksheet “allocation”.

The macro does this calculation for all customer groups for all years until 2013-14. Beyond this year, the macro seeks for a single charge cap (applied to all groups) that would match the entire tariff basket revenue with the modelled revenue.

Worked Example:

Before running the macro, the model has the following data:

- Calculated revenue from building blocks: £100m
- Desired proportion of revenue to be allocated to Revenue Group 1: 25%
- Tariff for Revenue Group 1 (i.e. same as previous year): £1
- Number of customers in Revenue Group 1: £20m
- Implied tariff basket revenue from Revenue Group 1 with current inputs: £20m

Running the macro

Given that the difference in target revenue from the revenue group is £25m (£100m multiplied by 25%) and that of tariff basket worksheet, the macro will run the goal seek function and vary the revenue from the tariff basket worksheet by increasing/decreasing the tariff (s) for the revenue group. In this example, the tariff would need to increase in 25% in order to match the target revenue of £20m.

Shared tariffs:

Some tariffs are shared amongst revenue groups. In general, tariffs in revenue group 5 are a subset of tariffs in revenue group 6; tariffs in revenue group 4 are a subset of tariffs in revenue group 5 and tariffs in revenue group 3 are a subset of tariffs in revenue group 4. The model first solves revenue group 4, then 3, then 5 then 6 are equal to their target revenue.

However, the part of revenue group 3 that relates to assessed charges includes shared tariffs with revenue groups 4, 5 and 6. As such, the approach of 'ordering' changes can result in a different revenue from revenue group 3 than the target approach. This has been solved through iteration, with the macro running several times through the ordered solving such that the revenue equals target (to a high degree of accuracy).

Worked example:

We use the same assumptions as per the previous worked example, but in this example there is an additional revenue group with the following characteristics:

- Desired proportion of revenue to be allocated to Revenue Group 2: 60% (or £60m)
- Revenue group 2 is made of two subgroups of charges A and B. Charge A is equivalent to that in Revenue group 1 (i.e. £1). Charge B is £2.
- Tariff multipliers for Group A and B are 25m and 10m respectively.
- Current implied tariff basket revenue is £45m ($25m * 1 + 10m * 2$)

Running the macro

As indicated previously, the macro would first solve revenue for the group whose tariffs affect other groups (in this example, group 1). As such, the resultant tariff for revenue group one would be £1.25 (or an increase of 25%).

With this change, revenue group 2 would have been affected via Tariff A (as this is a shared tariff). As such revenue in group two is at this stage £51.25m ($25m * 1.25 + 10m * 2$). At this stage the macro would solve the tariff that is not shared (i.e. tariff B). As such, the resultant tariff for subgroup B is £2.875 (or an increase of 43.75%). After this adjustment, the final revenue for the group would be £60m ($25m * 1.25 + 10m * 2.875$).

It is worth noting that for the model, the overall cap for Revenue groups 1 and 2 is 25% and 33% respectively.

This is run several times.

8) Phasing:

The user may wish to 'smooth' the resultant 'macro' calculated charge caps from revenue approach option 1, 2 and 4 (fixed revenue approach, building block approach and financial ratios approach). The model does not have a mathematical approach for smoothing revenue, as there may be a wide range of criteria for 'smoothing' charge caps that the user might want to apply. As such, we have incorporated a 'phasing' sheet to help users to smooth revenue, the phasing sheet contains the key outputs from both financial section and tariff basket section, and thus users can monitor the implications whilst smoothing revenue. As indicated earlier, the 'phasing' sheet should be activated after running revenue approach options 1, 2 or 4, since the 'solving K' process identifies the allocations of those revenue groups that are within tariff baskets. Users also need to note that when you switch off the "phasing" sheet, the pre-activate price profile will be restored to the "TA1" sheet. Therefore, if users would like to keep a "phasing" work, they should use the "Save current profile" button to store the "phased" profile.

7) Ten steps for calculating charge caps

In order to calculate charge caps, it is suggested that the user follows the following steps:

- 1) Complete base historic information (worksheets 'B1' to 'B7').
- 2) Complete forecast assumptions information (worksheets 'A1' to 'A7').
- 3) Complete tariff multiplier information (worksheets 'T3' to 'T19').
- 4) Complete Schedule 3 and non-primary revenue forecast (worksheets 'T20' to 'T23').
- 5) Complete primary revenue tariff information (worksheet 'TA1').
- 6) Complete target revenue allocation in the relevant option table (worksheet 'Allocation').
- 7) Select 'revenue' input information (i.e. revenue building blocks, financial ratios approach) in worksheet "K solving" block "Revenue approach".
- 8) Confirm revenue allocation approach (that selected in step 6) by selecting the relevant option in worksheet "K solving" block "Revenue proportion allocation".
- 9) Click on 'Solve K' button in worksheet "K solving".
- 10) Smooth calculated charge caps by increasing/decreasing tariffs in worksheet 'TA1' block "Percentage change in tariffs per revenue group (net of Schedule 3 agreements)"