Revenue model

Instructions

30 June 2017

Quality drinking water

Reliable supply

Affordable pricing

Customer service

Environmental sustainability

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1 Overview

Icon Water's revenue model (Icon Water model) estimates each of the building blocks required to calculate the net revenue requirement and resulting prices for the 2018 to 2023 regulatory period.

The Icon Water model is based on the 2015 Industry Panel model (Panel model) with the exception of the following deviations.

- The Icon Water model incorporates the RFM into the same model as the RAB and MAR. The Panel had a separate model for the RFM which required manually updating the RAB for any changes made in the RFM. This model is completely stand-alone, requiring no manual updates or linkages to other workbooks.

- The Panel model had a single asset category for existing assets for water (excluding water security assets) and sewerage. For water security assets and new capex, the Panel's model had separate asset categories for each asset. The Icon Water model uses the same approach, although aggregates assets to the level of driver and asset life.

  The Panel model also had a separate line item for every year of capex spend. So if a new asset had expenditure spanning each of the 5 years of the regulatory period then that asset would appear in the Panel model RAB as 5 separate line items. The Panel used this approach to calculate separate asset lives for each year of capital expenditure. The Icon model takes a different approach with only one line item per asset category. For assets where expenditure spans more than one year a weighted average asset life is calculated, where the weights are based on the share of the total asset value.

- The Icon Water model contains a number of cosmetic changes compared with the Panel model, namely condensing the calculation of multiple notional CSOs into a single calculation and condensing the calculation of the MAR and prices into a single worksheet.

The Icon Water model is structured such that all inputs and assumptions are contained in separate sheets to calculations and outputs. To make this distinction, all tabs containing inputs and assumptions are coloured green while all tabs containing calculations and/or outputs are coloured red. There are no hard-coded numbers contained in red tabs. There are also three blue tabs at the end of the model which replicate the Industry Panel analysis of bill impacts and financial viability.

The remainder of this document describes the purpose of each sheet or tab in the Icon Water model. The section numbers correspond to the tab numbers in the Icon Water model. A reference to a tab within the model is made in *italics*.

2 Revenue model tabs

1.   Summary of results

This *Summary of Results* sheet summarises the results of the model, including estimates of each of the building blocks, net capex, the value of the WACC (post-tax nominal vanilla terms) and the P0 adjustment and X-factors that would be required to recover the net revenue requirement over the regulatory control period.   The *Summary of Results* sheet also reproduces the two net revenue requirement tables from the Industry Panel Substituted Price Direction (tables 8.1 and 8.2).

2.   Inputs and assumptions

The *Inputs and Assumptions* sheets contains key financial and demand assumptions that feed into other sheets in the model. Each of the inputs and assumptions is discussed below.

Mid-year capex and disposals – This assumption is set at 50% in line with the Industry Panel model. The assumption is used to determine the proportion of capex and/or disposals that are captured in the calculation of depreciation. The assumption of 50% implies that the timing of capex and disposals for a given year occurs equally throughout the year.

Inflation – This contains actual inflation up to 2016/17, however, for the purposes of Icon Water's June submission, the June quarter inflation data was not available so it has been held constant at the March value and will be updated when June data is available. Inflation is calculated as CPI All Groups (weighted average of eight capital cities) as published by the Australian Bureau of Statistics, 4 quarters on 4 quarters. This is identical to the approach adopted by the Industry Panel. For 2017/18, inflation has been set at forecast inflation and the difference between actual and forecast inflation will be captured in the true-up in the next regulatory period. Forecast inflation for the previous regulatory period is taken from the Panel's model while forecast inflation for the 2018-23 regulatory period has been estimated in accordance with Icon Water's regulatory submission. The starting values for the inflation indices are taken from the Panel's model and the subsequent values are calculated.

WACC – This contains the parameter estimates and the calculation of the post-tax nominal WACC and assumptions for the corporate tax rate and gamma.

Demand – The model requires demand inputs in order to calculate prices.

Actual charges 2017/18 – Actual charges for 2017/18 are required to calculate prices for 2018/19, as these are calculated as a percentage change with respect to 2017/18 prices.

Tariff reform – As discussed in Icon Water's submission, the water supply charge and the tier 2 water usage charge are set exogenously to the model to achieve a measured and balanced approach to tariff reform.

Accumulated losses for tax purposes – Accumulated losses at the close of 2017/18 are required for calculating accumulated losses for 2018/19. Accumulated losses are required for the calculation of tax.

Water Abstraction Charges – Water Abstraction Charges are included in the calculation of the annual revenue requirement.

Operating and Maintenance Expenses – Operating and maintenance expenses, including the Network Facilities Tax, are included in the calculation of the annual revenue requirement.

Other Income – Other income is deducted from the annual revenue requirement to determine the net revenue requirement.

CSO Opex – The operating expenses associated with CSOs are required to calculate the notional CSO amounts, which are deducted from the annual revenue requirement.

Disposals – These are the actual asset disposals included in the roll-forward model.

3.   Adjustment for 2012/13 capex

In rolling forward the asset base to determine the opening value for the new regulatory period, forecast net capex and disposals for the previous regulatory period is replaced with actual net capex and disposals. However, when regulatory decisions are made, the last year of actual net capex and disposals is usually not known and is based on forecasts. Therefore, in the subsequent regulatory period there is an adjustment for this final year of net capex and disposals to 'true-up' the difference between forecast and actuals.

In the Panel's Substituted Price Direction, the asset base was rolled forward from 2008/09 to 2012/13 to provide an opening asset base for 2013/14. Therefore, the Panel made an adjustment for capex in the last year of the prior regulatory period, 2007/08. The Icon Water model makes the same adjustment for 2012/13

Consistent with the Industry Panel methodology, the adjustment, which is applied to the RAB, is calculated as the sum of:

- the difference between forecast and actual net capex and disposals; and
- the rate of return on the difference between forecast and net actual capex and disposals.

4.   Actual capex

The *Actual Capex* tab contains:

- the opening value for existing water and sewerage assets at 2013/14. These asset values are taken from the Panel's model.
- the actual new net capex for each year of the 2013/14 to 2017/18 regulatory period;
- the economic and tax asset lives for existing water and sewerage assets and for actual new net capex;
- the remaining weighted average economic and tax asset lives which are calculated for each asset category using the opening value of the asset category and the new capex values as the relative weights. For example, if the opening value of the asset category in year t is $90 with a remaining average asset life in year t-1 of 6 years and new net capital expenditure on the asset category for year t is $10 with an asset life of 10 years then the weighted average remaining asset life for year t is calculated as $90/($90+$10) * (6-1) years + $10/($90+$10) * 10 years = 5.5 years;
- the forecast depreciation for water and sewerage which is taken from the Panel's model. Forecast depreciation is used to roll-forward the RAB in line with the Panel's approach; and
- the closing RAB and TAB asset values for the notional CSOs and corresponding remaining economic and tax asset lives. This information is required for calculating the notional CSO amounts.

5.   Forecast capex

The *Forecast Capex* tab contains:

- the opening value of existing assets for the beginning of the new regulatory period (2018/19). These values are read in from the RFMs. In line with the Panel's approach, existing assets are read in at the aggregate level with the exception of water security assets, which are read in at the asset category level.
- the forecast net capex for each year of the new regulatory period from 2018/19 to 2022/23.
- remaining asset lives for existing assets, which are read in from the RFMs and asset lives for new forecast net capex
- remaining weighted average economic and tax asset lives, which are calculated in the same way as in the actual capex tab.

6.   CSOs

The *CSOs* tab calculates the notional CSO value for Uriarra, the Discovery Trail and Gas Abatement in line with the approach adopted by the Panel.

A RAB, TAB, return on investment and tax calculation is undertaken for each item. The methodology used for each of these is the same as for total water and sewerage assets undertaken in separate sheets of the model.

The CSO value is then calculated as:

return on investment – other income + depreciation + operating and maintenance expenses + tax

7.   RFM water

The *RFM Water* tab rolls forward the regulatory asset base from the start of the last regulatory period to the beginning of the new regulatory period, that is, from 2013/14 to 2017/18. The closing asset base in 2017/18 provides the opening asset base for the new regulatory period starting from 2018/19. The roll-forward model involves replicating the Industry Panel's RAB from the last regulatory period but replacing forecast net capex with actual net capex and disposals and indexing the asset base with actual inflation.

The steps involved are as follows:

- Opening asset value for 2013/14 are read in from the *Actual Capex* tab;

- Actual new net capex and asset disposals for each year are read in from the *Actual Capex* tab;

- Indexation values are calculated as follows:

    (Opening value

    + new net capex * mid-year capex assumption

    + disposals * mid-year disposal assumption)

    * actual inflation

- Given the mis-match between asset categories in the Industry Panel model and the asset categories in the Icon Water model, it is not possible to match forecast depreciation from the Panel model with the asset categories in the Icon Water model. Therefore, actual depreciation is calculated for the asset categories in the Icon Water model and then the ratio of forecast to actual depreciation is calculated. Forecast depreciation is calculated by reading in forecast depreciation from the *Actual Capex* tab and multiplying this by the ratio of actual to forecast inflation (using the inflation indices in the *Inputs & Assumptions* tab). The ratio of forecast to actual depreciation is used to scale actual depreciation at the asset category level up or down to ensure that total depreciation is equal to forecast depreciation.[1]

- The closing asset value is calculated as:

    opening value + actual net capex – actual asset disposals + actual indexation – actual depreciation * forecast to actual depreciation ratio

    The closing value of assets for the first year (2013/14) becomes the opening value of assets for the second year (2014/15) and so on.

- The adjustment for 2012/13 capex is added to the closing value in the last year of the RFM calculation (2017/18) consistent with the Industry Panel model

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[1] The roll-forward in the Industry Panel model was done at the aggregate level and hence avoided this issue. However, to properly calculate the weighted average asset life for the RAB, the Icon model calculates the roll-forward at a more disaggregated level.

- Remaining asset lives are tracked for each year of the roll-forward. The RFM calculates the weighted average asset life, using the opening RAB values as the weights. The weighted average asset life is then an input to the RAB.

8. RFM sewerage

The *RFM Sewerage* tab undertakes the same calculations as the *RFM Water* tab but for sewerage assets.

9. RFM water tax

The *RFM Water Tax* tab undertakes the same calculations as the *RFM Water* tab with the following differences:

- The opening value for 2013/14 reads in the tax value of assets

- There is no indexation

- Depreciation is calculated as:

  (opening asset value

  + net capex * mid-year capex assumption

  + disposals * mid-year disposals assumption)

  / weighted average tax asset life

- The adjustment for 2012/13 net capex is added to the opening value in the first year of the RFM calculation.

10. RFM sewerage tax

The *RFM Sewerage Tax* tab undertakes the same calculations as the *RFM Water Tax* tab but for sewerage assets.

11. RAB water

The *RAB Water* tab calculates the value of the regulatory asset base for each year of the regulatory control period from 2018/19 to 2022/23.

The steps involved are as follows.

- The opening asset value for 2018/19 are read in from the *Forecast Capex* tab, which in turn takes this value from the *RFM Water* tab;

- Forecast capex is read in from the *Forecast Capex* tab;

- Indexation values are calculated as follows:

  (Opening value

  + net capex * mid-year capex assumption

  + disposals * mid-year disposal assumption)

  * forecast inflation

- Depreciation is calculated as:

  (opening asset value

  + net capex * mid-year capex assumption

  + disposals * mid-year disposals assumption

  + indexation)

/ weighted average asset life

- The closing asset value is calculated as:

opening value + net capex – asset disposals + indexation – depreciation

The closing value of assets for the first year (2018/19) becomes the opening value of assets for the second year (2019/20) and so on.

12. RAB sewerage

The *RAB Sewerage* tab undertakes the same calculations as the *RAB Water* tab but for sewerage assets.

13. TAB water

The *TAB Water* tab undertakes the same calculations as the *RAB Water* tab with the following differences:

- The opening value for 2018/19 reads in the tax value of assets
- There is no indexation
- Depreciation is calculated as:

(opening asset value

+ net capex * mid-year capex assumption

+ disposals * mid-year disposals assumption)

/ weighted average tax asset life

14. TAB sewerage

The *TAB Sewerage* tab undertakes the same calculations as the *TAB Water* tab but for sewerage assets.

15. MAR water

The calculation of the maximum average revenue follows the same approach as the Panel model. The calculations are circular and therefore require an iterative solution to be found. This is achieved using goal seek which is run via a macro when the "solve" button is selected.

There are four elements to the *MAR Water* worksheet.

1. **Tax calculation** – the tax calculation calculates taxable profit as:

Forecast tariff revenue

Plus Other income

Less Tax depreciation

Less Interest

Less Operating and maintenance expenses

Less Previous year losses

Forecast tariff revenue is calculated based on prices and quantities (explained below). Tax depreciation is taken from the *TAB Water* tab. Interest is calculated by multiplying the asset value for the ROI calculation (see below) by the debt gearing ratio and then by the cost of debt. Operating and maintenance expenses are taken from the *Inputs and Assumptions* tab. Previous years losses are calculated by checking for accumulated losses. If they are zero then this value

is set to zero. If there are accumulated losses then the previous year losses value is calculated at the level of the losses that can be recovered by the net revenue for that year.

2. **Return on investment calculation** – the required return on investment from tariffs is calculated as:

Return on investment

Less capital gain on assets

Less imputation credits

The return on investment is calculated by multiplying the asset value for the ROI calculation by the WACC from the *Inputs and Assumptions* tab. The asset value for the ROI calculation is the sum of the opening value for water assets and the capex for that year multiplied by the midyear capex assumption. The capital gain on assets is the value of indexation taken from the *RAB Water* tab. Imputation credits are calculated by multiplying the result of the tax calculation by the value of imputation credits (gamma) from the *Inputs and Assumptions* tab.

3. **Target revenue calculation** – the target revenue is calculated as:

Return on investment

Less Other income

Less Notional CSO revenue

Plus Depreciation

Plus Operating and maintenance expenses

Plus Tax

The return on investment comes from the return on investment calculation. Other income comes from the *Inputs and Assumptions* tab. Notional CSO revenues comes from the CSO tab. Depreciation comes from the RAB water tab. Operating and maintenance expenses comes from the *Inputs and Assumptions* tab. Tax comes from the tax calculation.

4. **Price calculation** – the price section of the model finds the value of P0 (the year 1 adjustment) subject to the value chosen for X (the % change applied to prices in years 2 to 5 of the regulatory period) and the constraint that the total revenue from prices and the total MAR (in NPV terms) are equal. As prices for water supply and tier 2 usage are set exogenously, the model only solves for the tier 1 usage price.

To run the model, starting values for P0 and X need to be entered.

Price escalators – the price escalators are calculated as:

Year 1 = (1+forecast inflation) * (1+P0)

Years 2 – 5 = (1+forecast inflation) * (1+X)

Currently, X is the same in all years of the model but varying them by year is a simple model adjustment.

Prices – prices are calculated as:

Year 1 = Prices for 2017/18 * year 1 price escalator

Years 2 – 4 = Prices for t-1 * year t price escalator

Actual prices for 2017/18 are contained in the inputs and assumptions tab.

Forecast revenue – forecast revenue is calculated by multiplying prices by volumes, where volumes are contained in the inputs and assumptions tab.

The model runs by selecting the Solve button, which adjusts P0 so that the sum of forecast revenues across the regulatory period equal the sum of the target revenue across the regulatory period, both in NPV terms.

The model sets prices by:

- setting the X factor to below zero for prices from years 2 to 5 of the regulatory period to smooth pricing over the regulatory period; and

- finding the change in price required for year 1 of the regulatory period (P0 adjustment) which will equalise the total revenue from prices and the total MAR (in NPV terms).

16. Mar sewerage

The *MAR Sewerage* tab undertakes the same calculations as MAR Water, but using sewerage inputs.

17. Bill impacts – Res

The *Bill impacts – res* tab calculates the change in the annual water bill and combined bill by water usage levels based on the prices determined in *MAR Water* and *MAR sewerage* tabs. A customer distribution is included in this tab to assess the weighted average impact of the proposed price path.

18. Bill impacts – Comm

The *Bill impacts – comm* tab performs the same calculations as the *Bill impacts – res* tab but for commercial customers. It therefore takes into account the number of sewerage fixtures.

19. Financial viability

The *Financial viability* tab replicates the Industry Panel's financeability test with updated inputs.

Abbreviations and acronyms

ACT	Australian Capital Territory
AER	Australian Energy Regulator
CPI	Consumer Price Index
ESC	Essential Services Commission
ESCOSA	Essential Services Commission of South Australia
ICRC	Independent Competition and Regulatory Commission
RAB	regulatory asset base

References