



User guide for the ACCC

User guide to the wireless access model

5 May 2006

Analysys Consulting Limited
St Giles Court, 24 Castle Street
Cambridge, CB3 0AJ, UK
Tel: +44 (0)1223 460600
Fax: +44 (0)1223 460866
consulting@analysys.com
www.analysys.com

User guide to the wireless access model

User guide for the ACCC

Contents

1	Introduction	1
2	Worksheet guide	1
2.1	Summary	1
2.2	Cost and demand parameters	2
2.3	Demand forecast	2
2.4	Geodata	2
2.5	WiMAX	3
2.6	3G	3
2.7	Satellite	3
2.8	sc_1	3
2.9	Additional scenario sheets	6
2.10	Additional cost data	6
2.11	Lists	6
2.12	Various charts	7
3	Common questions	7
3.1	How can I make changes to unit costs?	7
3.2	How can I make changes to the service revenues?	7
3.3	How can I run pre-defined scenarios?	7
3.4	How can I create and run new scenarios?	8
3.5	Which sheets might I need to make modifications to?	8

1 Introduction

This document provides a brief overview of the wireless access model created for the ACCC by Analysys. It is complementary to our report: *Comparative Costing of Wireless Access Technologies* that describes in further detail the assumptions, results and conclusions that may be drawn from the modelling activities.

This document is structured as follows:

- Section 2 describes the function of the model and the changes that can be made to each of the sheets in the workbook
- Section 3 provides answers to a selection of potential questions that may arise.

2 Worksheet guide

2.1 Summary

This sheet contains a summary of the main results concerning costs and margins for each of the technologies in each geotype.

Results on the individual technology sheets are only concerned with one geotype at a time, whereas results are collated on this sheet to enable rapid analysis over all geotypes and of aggregates for each ULLS Band. The sheet uses an Excel table function that, depending on calculation settings in Excel, may not recalculate automatically after changes are made. As a result, it may be necessary to press the F9 key to force Excel to recalculate or to change the settings under *Options* from the *Tools* menu.

The sheet also addresses the problem of unreachable homes using either WiMAX, 3G or HSDPA, and also provides results if the operator is forced to address this demand using a satellite solution.

At the top of the sheet there are several switches to select the geotype, scenario and operator under consideration as well as choosing whether or not to consider satellite services to fill in these gaps in reachable homes using the alternative technologies.

2.2 Cost and demand parameters

This sheet contains no actual inputs of its own. It takes the inputs directly from the scenario sheet corresponding to whichever scenario is currently selected on the *Summary* sheet of the model. As such, the layout of this sheet is identical to each of the scenario sheets and must not be changed. The cost and demand parameters occupying this sheet are stored in a series of named ranges to be used in calculations elsewhere in the model.

2.3 Demand forecast

This sheet takes some demand parameters from the *Cost and demand parameters* sheet, and combines them with historical data to calculate demand forecasts for broadband services and outgoing minutes for voice services.

2.4 Geodata

This sheet contains data on the number of premises and exchanges, as well as the area of each geotype. These are used to calculate the number of households and businesses in each geotype using some basic assumptions. The 16 geotypes have been defined as any combination of the four bands (based on exchange size) and four zones (based on population of the exchange area) used by Telstra.

The input data is calculated offline based on the list of exchange areas with their corresponding bands, zones and areas provided to Analysys by the ACCC.

2.5 WiMAX

This sheet imports data from the *Cost and demand parameters* sheet, as well as subscriber numbers from the *Demand forecast* sheet and data on the number of exchanges, households, businesses and areas of the selected geotype from the *Geodata* sheet. A series of calculations are then performed to establish capacity requirements and hence the number of each type of asset required in each year. The capital and operating costs are then calculated on a year-on-year basis.

Using ARPU data from the *Cost and demand parameters* sheet, revenues are also calculated and these are combined with the costs to provide some financial summaries for the WiMAX solution. Data from this section is then sent to the *Summary* sheet.

2.6 3G

This sheet performs the same function as the *WiMAX* sheet, except that it uses the data for 3G/HSDPA and performs some different calculations accordingly.

2.7 Satellite

This sheet performs the same function as the *WiMAX and 3G* sheets, except that it uses the data for satellite and performs some different calculations accordingly.

2.8 sc_1

This sheet contains the basic inputs for cost, dimensioning and all other parameters in the base case of the model. These parameters are split into several sections, which are discussed in the following subsections.

General parameters

These are unlikely to vary too much between scenarios and include items such as exchange rates, cost of capital, termination rates and years to calculate NPVs over in the financial summary.

Revenues

This section contains 2006 subscription revenues and connection revenues per user, as well as price trends for these in each geotype and for each service.

Coverage

This section consists of the results of offline calculations to estimate the number of premises within 12 different 1km radii of the exchange building averaged over each geotype.

Other service details

This section contains details such as the downstream and upstream data rate definitions for each of the services modelled and the contention ratios that are applied.

Operator-specific parameters

This section contains parameters to calculate the overall market share of each operator (Telstra and a new entrant operator).

Churn

This section contains parameters for churn and the percentage of churners who go on to upgrade their service.

Broadband penetration parameters

This is the area for broadband saturation and take-up s-curve definition parameters, as well as the split of new demand between different speeds of service over time.

Core costs (common to all access technologies)

This section contains parameters for all of the costs that are common to all three technologies. These include core network costs such as IP transit and IP switch capacity, as well as other opex such as customer acquisition, billing, bad debt and sales/marketing.

WiMAX

This section contains the dimensioning parameters for all of the WiMAX equipment and effective cell radii definitions. It also contains all of the costs (capex, opex and installation) associated with WiMAX equipment. Look-ahead periods (for network planning), equipment lifetimes and the number of kbit/s required for voice services are also stored here.

3G

This section contains the dimensioning parameters for all of the 3G equipment and effective cell radii definitions. It also contains all of the costs (capex, opex and installation) associated with 3G equipment. Look-ahead periods (for network planning), equipment lifetimes and the number of kbit/s required for voice services are also stored here.

Satellite

This section contains the dimensioning parameters for all of the satellite equipment and effective cell radii definitions. It also contains all of the costs (capex, opex and installation) associated with satellite equipment. Look-ahead periods (for network planning), equipment lifetimes and the number of kbit/s required for voice services are also stored here.

2.9 Additional scenario sheets

These sheets are labelled *sc_2*, *sc_3* etc. The sheets all have an identical layout, which is also the same as the *sc_1* sheet. This has been done so that all of the values on each sheet can be linked to those in the base case, which is held on the *sc_1* sheet. All of the green shaded cells represent the links to this sheet. The values in cells that are highlighted in yellow represent values that differ from the base case. This enables multiple different scenarios that vary individual parameters such as equipment unit costs or operator market share. It also allows rapid comparisons to be carried out with the base case.

The other difference from the base case sheet comes in cell B3, which contains the name of the scenario. This name appears in the *scenario_list* named range on the *Lists* sheet. When adding a new scenario sheet there are some important steps to observe, and details of these steps are provided in Section 3.4 below.

2.10 Additional cost data

This sheet contains additional data used to derive certain cost assumptions for base stations and CPE.

2.11 Lists

This sheet provides a collection of lists of scenarios, geotypes, operators and services available for use in the model. These lists all form Excel named ranges and if additions are made to the lists for any reason (e.g. adding a new scenario), these named ranges will need to be updated.

There are ten different services in the model, representing voice and four speeds of broadband access for both residential and business customers. There are also two operator choices (Telstra and a new entrant operator) and 16 geotypes.

2.12 Various charts

In addition to the sheets described above, there are also various charts generated from other worksheets, which are dependent on the scenario, geotype and operator selected. These charts cover residential and business demand for broadband services over time for the currently selected geotype, margin per subscriber and ULLS equivalent costs by geotype for each technology.

3 Common questions

3.1 How can I make changes to unit costs?

Any changes to unit costs should be made in the *sc_I* sheet. The section of the sheet depends on whether the cost is a core cost or whether it is specific to one of the technologies. This will adapt the costs in the base case and in all scenarios where they have not been modified already.

3.2 How can I make changes to the service revenues?

Again, service revenues should be modified in the *sc_I* sheet, but this time in the *Revenues* section. Changes can be made to the 2006 subscription or connection revenues or to the annual trends in either case.

3.3 How can I run pre-defined scenarios?

Pre-defined scenarios can be run by going to the *Summary* sheet and selecting the required scenario from the drop-down list in the area of cell C4. Depending on the calculation settings of the version of Excel being used, it may be necessary to press F9 to force the table to be recalculated to view the results in the *Summary* sheet. Selecting a particular geotype from the drop-down menu in cell C11 and the operator from cell C6 enables detailed results to be viewed on the individual technology costing sheets.

3.4 How can I create and run new scenarios?

We have provided a number of spare scenarios within the existing model.

New scenarios can be created and run by creating a copy of the *sc_2* sheet and naming it appropriately to follow the current sheet naming convention. For example, if *sc_25* is the highest numbered scenario sheet, then the new sheet should be named *sc_26*. A name for the scenario then needs to be typed into cell B3 of the new sheet and the formulae in columns B and C of the *Lists* sheet must be copied down a row. It is also necessary to rename the *scenario_list* name on the *Lists* sheet to include the latest addition.

Once this has been done, the new scenario, designated by the chosen name, will be added to the drop-down menu on the *Summary* sheet and results can be viewed. To arrive at some results that differ from those in the base case, it is also necessary to make some changes to the parameters on the new scenario sheet (*sc_26*). The green shaded cells linking to the base case, *sc_1* sheet can be overwritten with some new values. We recommend highlighting these cells in yellow, as has been done on the other scenario sheets. This will mean that it is clear in the future how this scenario differs from the base case.

3.5 Which sheets might I need to make modifications to?

The majority of sheets in the workbook should not require modification. In general, cells with blue borders are likely to be those that can be modified. It is likely that the majority of changes to be made will happen in the *sc_1* base case parameters sheet. Any of the blue-bordered cells in this sheet can be modified but the structure should not be changed otherwise links to the other scenario sheets and to the *Cost and demand parameters* sheet will be disrupted. Making changes in this sheet will, however, also have a knock-on effect to all other scenarios that have not overridden the particular value in question. In the same way, data on the other scenario sheets can also be edited, although in this circumstance it may be worth considering the option of creating a new scenario, as described in Section 3.4 above.