CONSULTING

Report for Chorus

Documentation of demand and revenue model for the Chorus BBM IAV model

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Contents

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1 Introduction

This document contains documentation of the modelling of Chorus' demand and revenue forecasts built for Chorus by Analysys Mason in Excel.

This version corresponds to:

CONF Chorus Integrated Demand Revenue Model_v4.97 Commission Only ACTUAL.xlsm.

The remainder of this document is laid out as follows:

- Section 2 explains the purpose of each sheet in the model
- Section 3 describes the process taken to generate the outputs

The report includes an annex containing a glossary of terms used in this document.

1.1 Purpose of model

The integrated Demand and Revenue model takes as its input revenues (for the period) and End-of-Period (EoP) Line counts by Service. These are recorded under a specific general ledger ("GL") code, for both

- actuals (from FY12 for revenue and from immediately before the start of FY12 for demand) to 2021H2

- and as currently forecast by Chorus in the approved 5YP (FY21-FY25).

It creates as its outputs demand (i.e. numbers of connections at end of period) and revenue (NZD in period) values under various service categories and in the geo-type areas used by the BBM IAV model.

All periods (except 2021H2 and 2022H1) are Chorus FY, ending June 30. In version 4.97, unlike the version used in the Commission's draft decision model, FY22 is explicitly split into two periods in the model; 2021H2 (from 01 July 2021 to 31 Dec 2021) and 2022H1 (from 01 Jan 2022 to 30 June 2022). Also, FY12 is from 1 Dec 2011 to 30 June 2012 and is therefore not 12 months in length.

Certain revenue-related calculations (e.g. regarding revenue per line) use average over period demand values (AOP).

These outputs are used by the BBM IAV model and the related Opex model:

Grouping into service categories

The following service categories are used:

- Contracted FFLAS
- Voluntary FFLAS
- Non-FFLAS Fibre
- Copper and other non-fibre

As part of this process, revenues which are classified by the Commission as "Capital contributions" are separated out such that they do not form part of the other service category revenues in the output such as "Contracted FFLAS" revenues.

Geography

The demand and revenue model reports actual and forecast demand and revenues using a specific set of geographies (or "geotypes"):

- Chorus UFB ("UFB"): based on lines in UFB areas serviced by Chorus
- LFC UFB ("LFC"): based on lines in UFB areas serviced by non-Chorus LFCs
- RONZ: rest of New Zealand not covered by UFB

Within the BBM IAV model, a different definition is used for geographies based on the Exchange Service Area ("ESA"); in this view:

- all ESA in which Chorus is the primary provider of UFB are considered to be "Won",
- all[1] ESA in which a non-Chorus LFC is the primary provider of UFB services are "Lost"
- all ESA where there is no UFB are "Non".

It is therefore necessary to transform some of the Demand and Revenue geographic outputs so as to take into account these different views of geography. This required transformation is discussed further in section 3.5.

The Demand & Revenue model also creates forecast results beyond the timescale of the Chorus Five Year Plan (5YP) out to FY39, based on a forecast of connections.

As noted above, the model also separates out revenue streams considered by the Commerce Commission as being 'Capital Contributions', which are excluded from the revenue inputs used by the BBM IAV model and are netted off the BBM capex elsewhere in the BBM IAV model.

[1] This is an approximation: there are a small number of "partially won" ESA where both Chorus and another LFC are active. In this demand and revenue model we map all the demand and revenue to Won/Lost/Non; in the BBM IAV model all assets are mapped to one of these three or a "National" geography.

2 List of sheets in the demand and revenue model, and their purpose

This section of the documentation outlines what each sheet is used for in the model.

Figure 2.1: List of sheets in model and their purpose [Source: Analysys Mason, 2022]

Sheet name	Purpose of sheet
modelling sheets - ->	A placeholder sheet to demarcate the group of modelling sheets.
Output	Output sheet for BBM model and BBM Opex model to link to, showing FY11-FY39 EoP line volumes, and FY12-FY39 revenues, by above mentioned combinations of service category and geography (geo-type).
Flags	This sheet includes various parameters that are used to configure the model. The purpose of these parameters is explained below: 1. "*fix.bug.in.mobile.access.volumes*"; determines whether (or not) the model corrects a specific bug in mobile access volumes 2. "*use.actuals.FY21.and.Dec-21*"; determines whether the model uses actual inputs or forecasts (based on the 5YR Plan) for the periods FY21 and 2021H2 3. "*base.forecasts.on.FY20.rather.than.latest.available.date*"; determines whether forecasts beyond 2021H2 are set based on the corresponding FY20 or 2021H2 value 4. "*align.exactly.with.decision.model*"; determines whether (or not) the calculations of certain value are modified such that outputs for the model align exactly with the "decision model" version (Note: in order to get results that align exactly with the "decision model" version, the parameters "*fix.bug.in.mobile.access.volumes*" and "*use.actuals.FY21.and.Dec-21*" also need to be set to FALSE)
Revenue forecast	This sheet is the main revenue modelling sheet for attributing/allocating past and 5YP forecasted GL revenue streams, and for the creation of long-term revenue forecasts for FY26-FY39 based on a long-term connections forecast and ARPUs forecast.
Specific Part_FFLAS Rev Alloc	This sheet contains the data used for specific allocation of those part-FFLAS revenue streams for which relevant data is available to allow direct allocation.
Demand forecast	This sheet is the main demand modelling sheet for allocating long-term lines forecast from Chorus' 5YP forecast (FY21-FY25) and long-term market forecast for FY26-FY39.
Demand Aggregation	This sheet is the main demand modelling sheet for attributing past and 5YP forecast line volumes, aggregating data from several input sheets.
input sheets - - >	A placeholder sheet separating modelling and input data sheets.
Lists	Contains 2 tables: 1. List of UFB candidate areas, showing which are "Chorus_UFB" or which are "LFC_UFB", and 2. List of GL revenue streams that are considered by Commerce Commission definition as 'Capital Contributions'. The table includes toggles to treat these revenue streams as Capital Contributions or not.

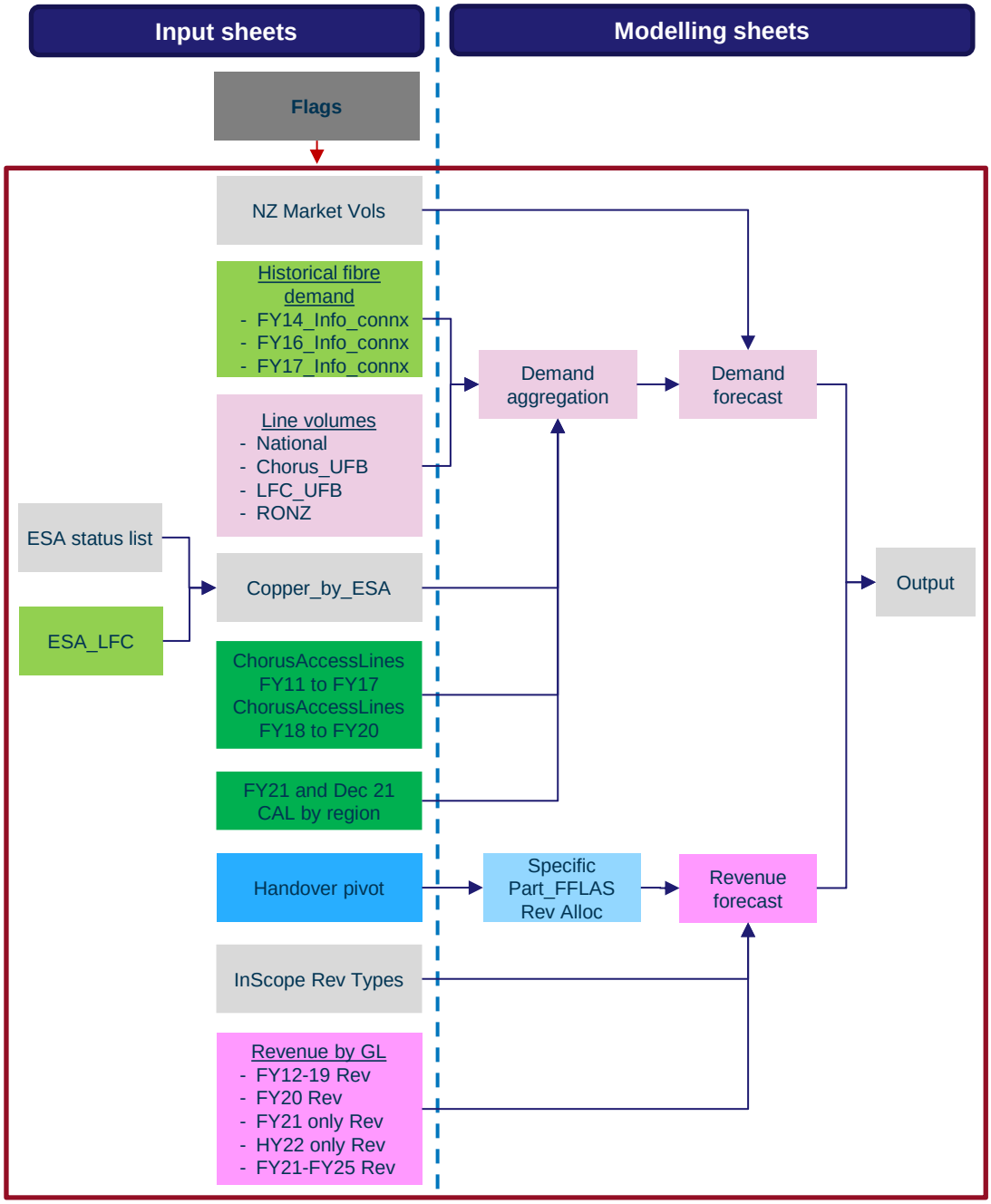
Sheet name	Purpose of sheet
	If treated as Capital Contributions, the relevant revenue is excluded from BBM Revenue.
InScope Rev Types	List of GL revenue streams and their attribution as being Non-FFLAS, part-FFLAS ("part" or potentially "Yes-Split") or FFLAS as per Chorus' Aug'19 Sec98 response to the Commerce Commission, refined by more recent data (Nov 2020) and in response to the financial loss asset IM decision. Revenues considered part-FFLAS are handled in two ways: • If there is no GL-line specific split provided then they are apportioned by pro-rating to service categories' fully attributed revenues. • If there is a GL-specific split provided, then they are apportioned by a ratio based on input data in each period
Handover pivot	Handover link input data, for allocating Handover link revenue (GL 60110) between Non-FFLAS and FFLAS in the "Specific Part_FFLAS Rev Alloc" sheet, and thence "Revenue Forecast" sheet.
FY12-19 Rev FY20 Rev FY21 only Rev HY22 only Rev FY21-FY25 Rev	These sheets contain input revenue data by GL; FY12-FY19 actuals, FY20 actuals, FY21 actuals, 2021H2 actuals, and forecasted FY21-FY25 as per Chorus approved 5YP.
National, Chorus_UFB, LFC_UFB, RONZ	Input actual past line volume (i.e. number of connections) data for FY17-FY20 plus as forecasted in approved FY21-FY25 5YP, national totals plus forecasts by geography (as per name of each sheet). Added to the bottom of the "National" sheet is a split of E1/E3 lines as per Chorus' lines report.
FY14_Info_connx	Input past fibre demand Information Disclosure ("ID") (number of connections) data by candidate area for FY13 and FY14.
FY16_Info_connx	Input past fibre demand ID (number of connections) data by candidate area for FY15 and FY16.
FY17_Info_connx	Input past fibre demand ID (number of connections) data by candidate area for FY17.
ChorusAccessLines FY11 to FY17 ChorusAccessLines FY18 to FY20	Input past Nov 2011 to June 2017 and July 2017 to June 2020 total national lines demand, including CRT and ICABS, plus legacy connections (E1's, E3's and STM1/STM4's).

Sheet name	Purpose of sheet
FY21 and Dec 21 CAL by region	Input past July 2020 to Dec 2022 total national lines demand, including CRT and ICABS, plus legacy connections (E1's, E3's and STM1/STM4's).
ESA_LFC	Input sheet with counts of addresses within ESAs that are served by Chorus UFB, Non-Chorus LFCs UFB or not covered by either Chorus or LFCs' UFB networks (designated as "RONZ"). The split provides the basis for splitting past total copper demand by Won/Lost/Non geo-types in the "Copper_by_ESA" sheet. This sheet includes two sets of inputs for counts of addresses within ESAs (by geography); one is for 2020 (which is relevant for all periods not affected by the TRUE-UP process) and the other is for 2022 (which is relevant for all periods affected by the TRUE-UP process).
ESA status list	The sheet lists ESAs by geography, indicating whether the ESA is in a geography won by Chorus UFB (designated as "Won"), partially won by Chorus UFB and partially won by LFCs (designated as "Partially Won"), lost to LFCs (designated as "Lost") or not included in UFB (designated as "Non"). This sheet includes two sets of lists for ESAs by geography; one is for 2020 (which is relevant for all periods not affected by the TRUE-UP process) and the other is for 2022 (which is relevant for all periods affected by the TRUE-UP process).
Copper_by_ESA	Input sheet containing past copper demand volumes by ESA. Uses the geo-type split for each ESA from the 'ESA_LFC' sheet to split the copper demand by geo-type. Used in "Demand Aggregation" sheet to split the past copper access demand given in the "ChorusAccessLines" sheets by geo-type area. It also uses the apportionment of uncovered addresses from the 'ESA LFC' sheet to apportion connections from RONZ to the "Won" "Lost" and "Non" geo-types used in BBM IAV model. This is used in the 'Output' sheet to allocate revenue and connections from RONZ to Won, Lost or Non geographies to align with the ESA geographies used in the BBM IAV model.

3 Outline of the model processing

This section of the documentation describes what data flows from the input sheets into the main modelling sheets, where the demand and revenue forecasts are generated. This data is then summarised in the 'Output' sheet. The model structure is shown in Figure 3.1:

Figure 3.1: Demand and revenue model overview [Source: Analysys Mason, 2022]



In the demand and revenue model, the following actions take place:

- **Geography ("geo-type") splits:** Splitting of connections into geographies. Two different sets of geographic splits are used in the model:
  - Geographies based on premises served by different networks ("Chorus UFB", "LFC UFB" and "RONZ"). The majority of the workbook uses these geographies.
  - Geographies based on the classification of the ESA areas into one of three types: "Won", "Lost", "Non". These are only used at the very last stage of the modelling, preparing the output for the BBM IAV model.
- **Service category splits**: Splitting of revenue into the following service categories:
  - Contracted FFLAS (e.g. UFB services offered by Chorus)
  - Voluntary FFLAS,
  - non-FFLAS fibre
  - non-fibre (further split into Copper and other non-Fibre)
  - Capital contributions
- **Transformations:** reorganisation of historical and forecast (e.g. 5YP) demand and revenue input data into five categories (Contracted FFLAS, Voluntary FFLAS, Non-FFLAS, Copper and other non-fibre, Capital contributions)
- **Forecasts:** projections of demand for connections by service category and geography, often using Excel GROWTH and TREND functions

The remainder of this document describes, for each of the four main modelling sheets, the above actions feeding into or being processed within the relevant sheets and then being pulled into the 'Output' sheet.

3.1 Demand Aggregation sheet

This sheet aggregates end of period (EoP) line volume data from several input sheets for the period End November 2011[2] to end of the current 5YP (currently FY25). The sheet consists of 4 main parts:

- Scaling copper demand by geographies for end November 2011- EoP FY16
- Aggregating fibre demand for FY11-FY16
- Aggregating copper and fibre demand for FY17-FY25
- Combining summarised FY11-FY16 and FY17-FY25 copper and fibre demand

Scaling copper demand data by ESA geographies for FY11-FY16

In rows 16:59 of this sheet, total copper demand from the 'ChorusAccessLines FY11 to FY17' sheet for November 2011 and FY12-FY17, 'Chorus Access Lines FY18 to FY20', and 'FY21 and Dec 21

2 As Chorus FY12 started 1 Dec 2011 and ended June 30 2012, the numbers for "End of period for FY11" are really for just before "Start of period FY12", ie 30 November 2011.

CAL by region', are apportioned to geographies based on premises served by the different networks (Chorus UFB, LFC UFB, RONZ) by apportioning nationwide historical copper connections according to the geographic breakdown (UFB/LFC/RONZ) calculated in the 'Copper_by_ESA' sheet. Splits by geography in years prior to FY15 use the FY15 splits due to limitations in the available data.

Aggregating fibre demand data for FY11-FY16

In rows 146:403 of this sheet, fibre demand for FY11-FY16 for FFLAS and Non-FFLAS fibre services is compiled from a combination of the Chorus Access Lines reports[3] and the historical demand by UFB candidate area reports[4] for individual fibre services (HSNS premium access, Bandwidth fibre, Direct fibre, NGA/BoF).

For FFLAS fibre services, the historical demand is aggregated from UFB candidate area level to geographies (Chorus UFB, LFC UFB and RONZ) for FY13-16. For FY11 and FY12, total demand for each of the individual fibre services is derived from the Chorus Access Lines report and then pro-rated across geographies based on the FY13 split of connections by geography. Historical FY11-FY16 demand for STM1/STM4 and E3 connections, is derived from the Chorus Access Lines report.

For Other FFLAS including ICABS and the FFLAS fraction of CRT[5] nationwide demand is pro-rated across geographies in the following way:

- ICABS and the FFLAS portion of CRT are in the UFB area
- the remainder is pro-rated based on the split of connections by geography for point to point FFLAS services (i.e. HSNS premium access, Bandwidth fibre and Direct fibre).

Non-FFLAS fibre services consist of the non-FFLAS CRT which are derived from the Chorus Access Lines report (and apportioned by splits provided in the Specific Part_FFLAS Rev alloc sheet). Nationwide demand for Non-FFLAS fibre is pro-rated across geographies based on the split of connections by geography for point to point FFLAS services (i.e. HSNS premium access, Bandwidth fibre (BFAS) and Direct fibre (DFAS)).

Historical demand for individual FFLAS and non-FFLAS fibre services for FY11 to FY16 is also aggregated to a grouping by technology for further transformation in the 'Demand forecast' sheet:

- GPON FFLAS consists of NGA/BoF connections
- Point to point (PtP) FFLAS consists of HSNS premium access, Bandwidth fibre and Direct fibre connections
- Other FFLAS consists of STM1/STM4 and E3 connections, plus ICABS and the part of CRT that is FFLAS

[3] From input sheet: 'ChorusAccessLines FY11 to FY17'

[4] From input sheets: 'FY14_Info_connx' sheet, 'FY16_Info_connx' sheet, 'FY17_Info_connx' sheet

[5] Part of the CRT is considered FFLAS; the split is an input on the Specific Part_FFLAS Rev alloc sheet

- Non-FFLAS fibre includes the non-FFLAS fraction of CRT.

Lastly, historical demand for individual FFLAS and non-FFLAS fibre services for FY11 to FY17 is further aggregated to fibre service categories used in the BBM IAV model:

- **Contracted FFLAS** consists of HSNS premium access, Bandwidth fibre, Direct fibre and NGA/BoF connections in Chorus UFB areas. ICABS and the part of CRT that is FFLAS are also included. By definition, there are no Contracted FFLAS connections in LFC UFB and RONZ areas.

- **Voluntary FFLAS.** In Chorus UFB areas Voluntary FFLAS consists of STM1/STM4 and E3 connections. In LFC UFB areas, Voluntary FFLAS connections consist of STM1/STM4 and E3 connections plus the GPON and PtP connections from this area. Similarly, for RONZ, Voluntary FFLAS connections consist of STM1/STM4 and E3 connections plus GPON and PtP connections from this area.

- **Non-FFLAS fibre** consists of non-FFLAS CRT connections.

Aggregating copper and fibre demand data for FY17-FY25

This sheet also aggregates copper and fibre demand data for FY17-FY25 (rows 405 onwards) using data from 5 demand files which contain a breakdown of Chorus' demand for both copper and fibre services by GL account, covering actuals from FY17 to 2021H2 plus 5YP forecast for FY21-FY25:

- National total (see the highlighted areas in cols V:AE on rows 409:512)
- Chorus UFB (see the highlighted areas in cols V:AE on rows 526:629)
- LFC UFB (see the highlighted areas in cols V:AE on rows 639:742)
- RONZ (see the highlighted areas in cols V:AE on rows 752:855)

There are differences between the National connection totals and the sum of the connections by geographies. A check is made comparing the input National demands with the sum of the input demands for each geography (see rows 866:1073). The calculated difference is used to scale the connection forecasts for FY17-FY25 for the different geographies in the forecast summaries.

Each GL account is mapped to a technology service grouping defined by Chorus Subject Matter Experts based on Chorus' Section 98 response to the Commerce Commission (see "InScope Rev Types" input sheet). The classification is shown in columns J:P and is used to derive the revenues for the technology service groups.

Some GL accounts have related demand figures and are categorised as "Part FFLAS", notably E1/E3's, CRT, CNS Ethernet and Handover Links. The E1s/E3s are split between copper (E1's) and fibre (E3's) based on the individual volumes obtained from Chorus' Lines Report (see rows 521 and 522). E1 demand is then split between the geographies based on the ratio of other Copper & Non-Fibre demand in each of those areas (see rows 634, 747, and 860). E3 demand is split along with STM1/STM4 demand between the geographies on the basis of the ratio of other point-to-point (PtP)

demand across the 3 areas. Demand for CRT, CNS Ethernet and Handover Links is split between FFLAS and non-FFLAS using inputs from the "Specific Part_FFLAS Rev Alloc" sheet.

Combining summarised FY11-FY16 and FY17-FY25 copper and fibre demand data

This sheet then aggregates copper demand data for FY11-FY17 and combines it with above summarised Copper FY17-FY25 demand to produce one summarised FY11-FY25 Copper demand data set (rows 16:59). As mentioned above, the FY17-FY25 forecasts by geography for copper connections are scaled to align with the National total (rows 32:34).

Final FY17 volumes used are based on the FY17-FY25 data set. There is a very slight difference compared to the FY17 volumes based on the FY11-FY17 data set (in the order of 19 fibre connections and 1,911 copper connections).

This sheet also combines summarised FY11-FY16 and FY17-FY25 fibre demand data into one summarised FY11-FY25 Fibre demand data set (rows 60:144), providing two different breakdowns of demand:

- **Grouping of services into like categories based on architecture/technology:** GPON FFLAS, PtP FFLAS, Other FFLAS and Non-FFLAS fibre services
- **By service categories used in the BBM IAV model:** Contracted FFLAS, Voluntary FFLAS, Non-FFLAS fibre

As mentioned above, the FY17-FY25 connections for the services by technology groups for the geographies are scaled to align with the National total (rows 79:104).

3.2 Demand forecast sheet

This sheet is the main modelling sheet for forecasting connections demand. It uses Chorus' 5YP forecast for the FY21-FY25 period. A longer term forecast uses an Excel GROWTH function for each component line, which uses the FY23-FY25 forecast trend to forecast demand up to FY39.

Connections demand forecasts are re-classified from Chorus' internal groupings into the BBM service categories (Contracted FFLAS, etc) and UFB/LFC/RONZ geo-type combinations (from row 137 onwards). These are the demand forecast results included in the 'Output' sheet (before reallocation of a fraction of "RONZ" connections to ESA geographies – see section 3.5 for further details on this reallocation).

3.3 Specific Part_FFLAS Rev Alloc sheet

This sheet generates the split of various specific revenue time series based on a variety of input data. It is used only by specific GL codes:

- 54400 CRT

- 56090 CRT Install
- 54210 HSNS tail extension
- 60015 CNS Ethernet
- 60020 CNS SDH/PDH
- 60110 Handover Links

This sheet generates the split in the revenues between different service types in each year FY12-FY25:

- Copper access services
- Other non-Fibre services
- GPON FFLAS
- PtP FFLAS
- Other FFLAS
- Non-FFLAS Fibre services

These time series are from a variety of sources including input from Chorus Subject Matter Experts. For GL 60110, for years prior to FY19 where data is not available, we assume that the FY19 ratio is pro-rated based on in-year GPON connections relative to FY19.

3.4 Revenue forecast sheet

This sheet models both past and future revenues for specified service categories. FY12-2021H2 historical revenues and 5YP (FY21-FY25) forecast revenues from GL accounts are attributed to specified service categories based on classification by Chorus Subject Matter Experts (classification is provided in cells H136:M348) and used to derive the revenues for the different service categories.

Where revenues are shared between service categories and only partially related to FFLAS, and where a GL-code specific split has not been provided in the 'Specific Part_FFLAS Rev Alloc' sheet, the revenues are pro-rated to the service categories based on one of two options that can be selected via a toggle switch in cell H3:

- fully attributed revenues
- number of connections

If "Fully attributed revenues" is selected, revenues are apportioned to the relevant service categories based on the relative size of the fully attributed revenues (using the fully attributed revenues presented in rows 354:359). Alternatively, if "Connections" is selected, revenues are pro-rated based on number of connections of the different service categories.

The results of the apportionment of revenues to the different FFLAS service categories is presented in cell range JC$136:PV$348.

Note: In the case where revenues are pro-rated by connections, 'Other non-fibre' services need to be handled in a specific way as there are no connection volumes directly associated with these revenues.

Being 'Other non-fibre' it is considered appropriate to allocate these on the basis of copper connections, unless there is also part allocation of that GL to 'copper access services' in which case 'Other non-fibre' is allocated zero.

As noted above, the model also separates out revenue streams considered by the Commerce Commission as being 'Capital Contributions', which are excluded from the revenue inputs used by the BBM IAV model and netted off the BBM capex inputs elsewhere in the BBM IAV model.

Beyond the 5YP forecast period, the longer term revenue forecast for the different service categories is based on the ARPU forecasts (rows 120:125) and the demand forecasts derived in the 'Demand forecast' sheet. GPON FFLAS and Copper access services ARPU is projected to grow at a constant 2% annually, whereas ARPU for PtP FFLAS and Non-FFLAS is kept constant at the ARPU projected for FY25.

3.5 Output sheet

This sheet pulls the results from the 'Demand forecast' and 'Revenue forecast' sheets by service categories and geography into one sheet that the BBM and BBM Opex model can link to:

- Historical demand (End November 2011 to EoP 2021H2[6]) and demand forecast (EoP 2022H1 to EoP FY39) in rows 94-213
- Historical revenue (FY12 to 2021H2[7]) and revenue forecast (2022H1 to FY39) from row 214 onwards.

On this sheet, we allow for the fact that the geographies are defined differently within the demand and revenue forecasts and the BBM IAV model.

Within the demand and revenue forecasts, the geotype definitions are based on premises served by geographies defined by the different network coverage:

- Chorus UFB
- LFC UFB
- RONZ

As noted above, within the BBM IAV model, we use an ESA-based approach to the definition of geographies. The difference is that in this definition of geography there can be a small fraction of premises that are not served with UFB even within the Won areas.

Connections in Chorus UFB are 100% Won by definition. Connections in LFC UFB are 100% "Lost" by definition. RONZ connections are distributed across Won, Lost and Non.

6 Based on the configuration of the flag "*use.actuals.FY21.and.Dec-21*" the model can also be set to product historical demand/revenue till FY20 and demand/revenue forecast from EoP FY21 to EoP FY39

7 Based on the configuration of the flag "*use.actuals.FY21.and.Dec-21*" the model can also be set to product historical demand/revenue till FY20 and demand/revenue forecast from EoP FY21 to EoP FY39

This means that:

- the “Won” area in the BBM IAV model is a combination of all the connections forecast in the “Chorus UFB” area (Won/UFB) and a fraction of the connections forecast in the “RONZ” area (Won/RONZ);
- similarly, the “Lost” area in the BBM IAV model is a combination of all the connections forecast in the “LFC UFB” area (Lost/LFC UFB) and a fraction of the connections forecast in the “RONZ” area (Lost/RONZ);
- finally, the “Non” area in the BBM IAV model is only a fraction of the connections forecast in the “RONZ” area (Non/RONZ).

To align demand and revenues to BBM IAV model geographies, the historical and forecast demand and revenues are therefore adjusted by re-allocating a fraction of the “RONZ” demand and revenues between “Won”, “Lost” and “Non” based on data about the distribution of RONZ demand of different types across Won, Lost and Non.

In calculating these FFLAS geographic fractions (e.g. x% of voluntary FFLAS in the RONZ is in the Won) we have used data from the relevant financial year if possible. However, there are two exceptions:

- Voluntary FFLAS uses FY17 values for pre-FY17 years because the point to point FFLAS data is of higher quality in FY17 and later years.
- Non-FFLAS fibre uses FY19 data for years before FY19. Again, this is because the data quality is higher in FY19 and later years.

Reallocation to these ESA geographies for connections takes place in rows 132:213 and for revenues in rows 253:334.

We maintain this level of detail (Won/UFB, Won/RONZ, Lost/LFC, Lost/RONZ, Non/RONZ) in the output demand and revenues by geography, which are defined as a series of named ranges used as inputs by the BBM IAV model.

Annex A Glossary of terms

Figure A.1: Glossary of terms [Source: Analysys Mason, 2022]

Abbreviation or term	Definition
2021H2	Half-year from 01 July 2021 till 31 Dec 2021
2022H1	Half-year from 01 Jan 2022 till 30 June 2022
5YP	Chorus' 5-year plan
Chorus UFB	A geography covering premises in UFB candidate areas that are served by Chorus UFB. Note: Within this demand and revenue model and its inputs, the definition of this area is assumed to be static over time: if does not track the network deployment and "grow as the network grows".
Contracted FFLAS	The fibre fixed line access services Chorus has to provide under its contractual arrangement with the NZ government in the areas where Chorus is the local fibre company (LFC) under the UFB programme
EoP	End-of-period. All periods in this model are Chorus Financial Years. Note that Chorus FY12 starts 1 Dec 2011 and is only 7 months in duration.
FFLAS	Fibre Fixed Line Access Service
FY	(Chorus) Financial Year
Geography	A grouping of similar areas of New Zealand. Two different sets of geographies are used within this model: - A grouping of areas in which the premises are served by different networks (Chorus UFB ("UFB"), LFC UFB ("LFC") or RONZ) based on the assignment of UFB candidate areas to the LFCs - A grouping of ESA areas where Chorus is the main provider of UFB ("Won"), where there is a non-Chorus LFC ("Lost" and where there is no UFB ("Non")
GL	General Ledger
GROWTH function	A function in Excel. This is an exponential growth function for a given set of data. For a given new value of x, it returns the predicted value of y.
ID	Information Disclosure
LFC UFB ("LFC")	A geography covering premises in UFB candidate areas that are served by LFCs other than Chorus
Non-FFLAS fibre	Fibre services that are outside the scope of FFLAS
Non-fibre connections	Copper and other non-fibre connections e.g. VDSL
RONZ	Rest of New Zealand. A geography covering premises that are not included in UFB
Service category	Grouping of connections into service categories (used in the BBM IAV model): Contracted FFLAS, Voluntary FFLAS, non-FFLAS fibre, Copper, Capital contributions
Service grouping by technology	Grouping of individual services into the following groups: GPON FFLAS, PtP FFLAS, Other FFLAS and Non-FFLAS fibre services
TREND function	A function in Excel that computes the linear trend line based on the given set of data. It calculates values of Y for given array values of X and uses the least squares method based on the given two data series

Abbreviation or term	Definition
Voluntary FFLAS	The fibre fixed line access services offered by Chorus outside the UFB programme