
Bottom-up fixed network cost model for BIPT: list of model components – public version

23 December 2011 • 17915-516

1 Introduction

Analysys Mason was commissioned to provide BIPT with a bottom-up fixed network cost model. This document lists the contents of the four files (in Microsoft Excel format) from the model which are available to the industry players. The files are:

- Module 0 - Market
- Modules 1 + 2 + 3 + 4 + 6 - Core
- Modules 5 + 7 - Access
- Module 20 + 21 + 22 + 23 - Service costing.

Within each file are a number of spread sheets, referred to as ‘Sheet’ in the tables below. Some of these spreadsheets have one or more sections, indicated by numbered horizontal grey bars in the Excel files and called ‘Section’ in the tables below. For each spreadsheet/section we list the inputs and calculations or outputs.

In the grey boxes we provide a statement of the confidentiality status by file for the draft model version.

2 Module 0 - Market

<i>Confidentiality status</i>	This file contains detailed BIPT market information and Belgacom demand information. The public and Belgacom versions only contain total demand for the modelled operator. The public version contains rounded values for the modelled operator.
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Sheet	Section	Inputs	Calculations and outputs
C, V, S	-	-	Contents, version control, styles
Lists	-	Names of services, years, etc.	-
Data provided by BIPT	1	Population, households, business sites	-
	2	Fixed, mobile, broadband, TV and leased lines	-
	3	Fixed telephony traffic, mobile telephony traffic, leased line by technology	-
	4	Wholesale fixed origination and transit, wholesale termination, wholesale broadband lines	-
Consolidated data	1	Wholesale access lines before 2005	Collation of fixed connections data
Market demand	1	-	Population, household and business forecasts
	2	Connection forecast parameters, leased line migrations	Connections by type over time
	3	Voice, broadband, IPTV and data traffic forecast parameters	Traffic by type over time
	4	-	Total market summary
Data provided by Belgacom	1	Copper access	-
	2	Forecasts	-
Operator	1	-	Total market summary
	2	Market share of connections and traffic, traffic type projections, IPTV projections	History and forecast market share, and connection for the modelled operator
	3	-	Operator service and connection demand
Output	1	-	Operator services and connection demand
Charts	-	-	Various chart information

The table below summarises the inputs amended for the public version and inputs that remain unchanged for the public version.

Inputs removed from public version	Populations, households, business sites Fixed, mobile, broadband, TV and leased lines Fixed telephony traffic, mobile telephony traffic, leased line by technology Wholesale fixed origination and transit, wholesale termination, wholesale broadband lines Wholesale access lines before 2005 Voice, broadband, IPTV and data traffic forecast parameters Connection forecast parameters, leased line migrations Market share of connections and traffic, traffic type projections, IPTV projections Copper access
Inputs not modified for public version	Dark fibre connections
Inputs modified for public version	International, mobile, fixed and non-geographic retail and wholesale traffic DSL data traffic Linear IPTV traffic VoD traffic Business Data Connectivity traffic PTSN/ISDN subscriptions DSL subscriptions Linear IPTV subscriptions VoD subscriptions Leased lines subscriptions

3 Modules 1 + 2 + 3 + 4 + 6 - Core

<i>Confidentiality status</i>	This file contains information confidential to Belgacom relating to network deployment, technical parameters or equipment costs. The public version contains rounded values for the modelled operator.
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Sheet	Section	Inputs	Calculations and outputs
C, V, S	-	-	Contents, version control, styles
Lists	-	Definitions of years, services, geotypes, etc.	-
LinkedIn (Linked Inputs)	1	-	Linked scenario inputs
	2	-	Linked connections for the operator
	3	-	Linked traffic for the operator
InputsSummary		-	Summary of capex inputs
AssetIn (Assets Inputs)	1	Inputs defined for categories of network assets	-
	2	Network asset names, categories, costs, trends, lifetimes, unit capex	-
Cov	1	Deployment dates	-
	2	Distributions of lines	Line distributions

Sheet	Section	Inputs	Calculations and outputs
	3	LEX numbers, line allocations	Line distributions
	4	LDC numbers, line allocations	Line distributions
	5	Street cabinet line allocations	Line distributions
	6	ROP and AGW deployments, line allocations	Deployment profiles, line distributions
DmdSubCalc (Demand and Subscriber Calculations)	1	-	Traffic on the NGN
	2	-	Busy hour voice traffic
	3	Traffic region parameters, traffic routeing, traffic aggregations	Network traffic by service
NwDesIn (Network Design Inputs)	1	Throughput calculations, traffic loading inputs, technical inputs for network asset equipment capacities, transmission parameters, cluster definitions, core rings, trench and cable, trench sharing, dark-fibre, etc.	-
NwDes (Network Design)	1	-	Traffic volumes
	2	-	Access ROPs, SB-REM, AGW, transmission
	3	-	LEX and LDC sites, aggregators and ports, IP-DSLAM and ports, AGW and ports, Ethernet switches and ports, DWDM and cards, ports, wavelengths,
	4	-	Transponders and ADMs on clusters. fibre and trenches, ODF
	5	-	Call servers, LAN switches and ports, service routers and ports, SBC and ports, peering routers and cards/ports, transit gateway, BRAS, DNS, Radius, NMS, etc.
	6	-	Transponder and ADM on core express, fibre and trenches, ODF
	7	-	Voice subscribers
FullNw (Full Network)	1	-	Calculated network elements
NwDeploy (Network Deployment)	1	-	Network elements needed
	2	-	Network elements needed taking into account retirement of assets if demand is in decline
	3	-	Assets activated with periodic replacement

Sheet	Section	Inputs	Calculations and outputs
	4	-	Assets purchased taking into account period between purchase and activation
ServiceDemand	1	-	Service demand volumes
RF (Routing Factors)	1	Service routeing factors for some network elements	-
NwEleOut (Network Element Output)	1	-	Service demand volumes
	2	-	Routeing factor table
	3	-	Profile defining years in which recovery starts / ends
	4	-	Binary recovery profile
	5	-	Network element output
CostTrends	1	-	Inflation
	2	Real terms capex trends	Nominal capex trends by asset, capex indices
	3	-	Nominal opex trends by asset, opex indices
UnitCapex	1	-	Unit capex by network asset
TotalCapex	1	-	Total capex by network asset
	2	-	Capex and cumulative capex by category
UnitOpex	1	-	HMC values
	2	Maintenance inputs per network asset	Total maintenance opex per network asset
	3	Floorspace, power, aircon, supplier support per network asset	Opex per network asset
	4	-	Total opex per network element
	5	-	Weighted average cost trend for opex
TotalOpex	1	Working capital allowance	-
	2	-	Total opex by network asset
	3	-	Total opex by category
ED (Economic Depreciation)	1	-	Economic cost per unit of output due to capex
	2	-	Economic cost per unit output due to opex
	3	-	Total economic cost per unit of output
	4	-	Cost per service based on fully allocating all economic costs by network asset
	5	-	Total economic costs
	6	-	Total cost recovery

Sheet	Section	Inputs	Calculations and outputs
Erlang	-	Erlang table	-

The table below summarises inputs amended for the public version and inputs that remain unchanged for the public version – for sheets where changes have been made only.

Inputs removed from public version	AssetIn	Unit material costs (links to pre-existing models containing confidential data)
Inputs not modified for public version	LinkedIn	Network traffic
	AssetIn	Network asset names, categories, trends, lifetimes
	Cov	Deployment dates
Inputs modified for public version	NwDesIn	Throughput traffic rates and conversion factors Loading inputs, e.g. call attempts per successful call, data contention ratio IP network elements, except BRAS and RADIUS NGN network elements Voice interconnect network elements Transmission network elements Fibre elements
	LinkedIn	Linked network connections (automatically done by links to modified Module 0 – Market)
	AssetIn	Asset unit capex
Inputs modified for public version	Cov	Share of active lines by node type LEX/LDC line distributions and street cabinet allocations Street cabinet line distributions xDSL and business locations connected at the ROP level
	NwDesIn	Voice traffic peak hour percentage Average call durations BRAS capacity RADIUS capacity Fibre road distance by cluster, core rings and express rings Incremental road trench distance by cluster, core rings and express rings Nodes passed before amplification
	UnitOpex	HMC costs, working hours per year, breaks Cost per sq.m

4 Modules 5 + 7 - Access

<i>Confidentiality</i>	This file contains information confidential to Belgacom such as Belgacom's fixed asset register, which is removed in the public version, as well as
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status information relating to asset volumes and unit prices for network elements.
The industry version contains rounded values for the modelled operator.

Sheet	Section	Inputs	Calculations and outputs
C, V, S	-	-	Contents, version control, styles
Lists	-	Definitions of asset groups, services, etc.	-
LinkedIn (Linked Inputs)	1	-	Scenario and control inputs
	2	-	SNA parameters
	3	Proportion of broadband lines that are PSTN, FTTO access connections	Household and line numbers
	4	-	Shared trench, ROP, AGW, LEX, line distributions
	5	-	Inflation
	6	-	Line distributions
	7	Asset groups	Confidential fixed asset register
	8	Numbers of assets required for the full network deployment, unit prices, cost trends, chronology	-
	9	Exceptional cost trend for copper	-
Assets	1	-	Households, lines and active lines, copper rollout and removal profiles
	2	Financial and replacement lifetime for network assets, deployment drivers, proportion of 'free' assets, output drivers,	Deployment drivers over time, number of units needed in network over time, annual asset purchase and replacement, total investments, gross replacement cost
Opex	1	-	HMC inputs
	2	Maintenance inputs per network asset	Total maintenance opex per network asset
	3	Floorspace, power, aircon, supplier support per network asset	Opex per network asset
	4	-	Total opex per network element
	5	-	Weighted average cost trend for opex
HCA	1	-	Discount and inflation factors
	2	-	Investment, accounting depreciation, book values, cost of capital employed, cost recovery, discounted cost recovery, remaining investment to be recovered, opex, remaining opex to be recovered

Sheet	Section	Inputs	Calculations and outputs
ED	1	-	Economic depreciation calculation over all time, output profiles, price trends, economic cost recovery for installation, materials and opex
	2	-	Economic depreciation calculation of residual accounting costs, output profiles, price trends, economic cost recovery for residual installation, materials and opex
Unit cost	1	-	Cost per unit output based on HCA, ED and HCA-ED cost recovery
Summary	1	-	Monthly cost per line, for each cost recovery method
Comparison book values	1	-	Calculation of TAM fixed asset values and comparison with model
	2	Previous BRUO model outputs	Comparison with previous model
Service costing	1	Service routeing factor matrix	-
	2	-	Cost per service over time

The table below summarises inputs amended for the public version and inputs that remain unchanged for the public version – for sheets where changes have been made only.

Inputs removed from public version	Comparison Book Values	Entire sheet
	LinkedIn	Links to Regulatory Accounts Confidential fixed asset register
Inputs not modified for public version	LinkedIn	Commercial WACC (nominal) Network elements from Modules 1+2+3+4+6 – Core Inflation rate Number of S0 ROP Estimates of copper cable cost trends
Inputs modified for public version	LinkedIn	Number of SNAs in each year Cost of SNAs
	UnitOpex	Linked network connections (update from modified Module 0 – Market) Civil works installation and material capex by asset Copper cable, trench and street cabinet deployment chronology Number of FTTO end user access connections HMC costs, working hours per year, breaks Cost per sq.m

5 Module 20 + 21 + 22 + 23 - Service costing

<i>Confidentiality status</i>	This file contains scenario inputs and service cost calculations, but no specific confidential inputs.
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Sheet	Section	Inputs	Calculations and outputs
C, V, S Control	-	- Main scenario choices and inputs	Contents, version control, styles
LinkedIn (for Linked Inputs)	-	-	Linked information from other model files
	7	Core network common cost proportions	-
DF (for Discount Factors)	1	Discount rate	Discount series and multipliers
	2	Inflation rate	Inflation series and multipliers
PureLRIC	-	-	Contains expenditures with and without termination, and calculations of pure LRIC of wholesale termination
LRAIC+	-	-	Calculates LRAIC unit costs and marked-up LRAIC costs
Services needed		Service build-up and service proportions	End wholesale service costs amalgamated from service components
Results	-	-	Summary of main results
Breakdown of LLU cost	-	-	Comparison of LLU with previous model