Report for the Australian Competition & Consumer Commission

Assessment on the efficiency and prudency of Telstra's expenditure forecasts

Public Version

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Executive Summary

1. The Australian Competition & Consumer Commission (ACCC) has commissioned WIK-Consult end of December 2014 to provide advice on the assessment of the efficiency and prudency of expenditure forecast contained in Telstra's submissions as part of the Final Access Determinations (FAD) for the fixed line services which are due to be published in June 2015. We have been requested to assess whether or not the forecast expenditures proposed by Telstra for its fixed line services are both prudent and efficient.

2. We have conducted our consultancy work in January and February 2015. Over a period of three weeks in January, we have had the opportunity to conduct fact finding during an onsite visit in Melbourne. This included intensive discussions with the ACCC project team. It also included the attendance at two meetings of the ACCC staff with Telstra's regulatory experts. These meetings were intended to clarify many open issues regarding Telstra's modelling approach. Subject of these meetings were comprehensive questionnaires addressed to Telstra to which we contributed. Telstra provided answers to some of these questions on January 30 which we also took into consideration. We did not take any information provided after that date into account.

3. Our analysis is framed by the Building Block Model which the ACCC adopted in 2011 for setting declared fixed line prices. In this context we took note of the fixed principles provisions.

4. The starting point of our analysis is Telstra's expenditure Forecast Model. However, Telstra's Forecast Model fails to relate historic data on expenditure and the allocation of expenditure to asset categories to the quantities of network assets deployed (in fact, the Forecast Model avoids almost any statement on concrete quantities of network plant). Therefore we have drafted templates with concrete information requests to Telstra. Requested information concerned asset quantities by type of asset, the allocation of CAPEX and OPEX to distinct types of assets according to cost driver volumes. This information was intended to be used to "remodel" areas where the Forecast Model lacks transparency. However, Telstra did not provide the requested information. As a consequence, it was not possible to us to calculate the quantitative impact of certain changes or corrections which we recommended on the revenue requirements of the FLSM and following the level of price change of the declared fixed line services.

5. The Forecast Model relies on a NBN roll-out base case scenario which Telstra has derived from the NBN Co's Strategic Review from December 2013. We do not have reservations about the approach and the assumptions which Telstra has made to forecast the premises passed by NBN. Nevertheless, we recommend to

the ACCC to base its upcoming decision on the most recent NBN roll-out plans which cover the transition to a MTM-based NBN roll-out.

6. Telstra's assumptions concerning the migration of users to the NBN are based on experience from the recent past. Telstra itself has questioned whether these observations from the past will be representative for the upcoming migration trends. Migration may accelerate in the (near) future due to the roll-out and service policy of NBN Co, the use of HFC and FTTN technologies and more incentives for retail service providers (RSPs) to migrate fast(er). We recommend to the ACCC to assume a faster migration than presented in the current base case for the later years of the regulatory period.

7. In the Forecast Model Telstra does not only forecast demand for declared fixed line services. Telstra also forecasts demand for access to distinct facilities, namely access to duct and plant buildings (the latter measured in terms of rack usage). [c-i-c starts] [redacted] [c-i-c ends]

8. Telstra's forecasts on the usage of exchange space are highly implausible to us. Not only third parties but also Telstra will need less building/rack capacity due to its migration of customers/services to the NBN. Therefore we do not subscribe to Telstra's forecast assumption of its own building space use. Telstra seems to allocate all the overcapacity of building space emerging from the transition to the NBN to fixed line services. This allocation of overcapacity is not appropriate.

9. We fully support the principles the ACCC has developed in its position statement of October 2014 on how to consider and to treat the NBN-related migration payments. In our report we will develop a concrete analysis and assessment how these principles should be implemented and applied for certain CAPEX and OPEX categories.

10. It is the ACCC's task and responsibility to assess the efficiency and prudency of Telstra's expenditure forecast to derive justified revenue requirements for the regulated firm and prices for the declared fixed line services. In pursuing this task the ACCC should be aware that the regulated firm has incentives (and possibilities) to distort its expenditure forecasts compared to values which are

prudent and efficient. This does not represent misbehaviour but rational behaviour of the regulated firm which intends to optimize its shareholders' interest. We break down these incentives to possible distortions of the expenditure forecasts.

11. Our detailed analysis of the expenditure forecast always follows the same framework: Firstly, we describe how the Forecast Model works. Secondly, we present our recommendations to the ACCC regarding the particular expenditure category. Thirdly, we provide the economic analysis supporting our conclusions and recommendations.

Is an expense CAPEX or OPEX?

12. Although PROPEX is accounted like OPEX in the Forecast Model, PROPEX is actually expenditure that occurs in the course of investing in assets. This expenditure should be capitalized. It has to be made sure that expenses on asset remediation are not accounted twice, once as OPEX and once as CAPEX.

13. The model should provide separate figures for expenses on asset replacement and operational support, because both expenditure categories have different drivers.

Forecasting methodology

14. There should be separate forecasts of the OPEX associated with the maintenance of the various types of assets considered in the model. Types of assets should be defined in such manner that the quantities of assets of the same type can be aggregated. An input to the forecast should be unit prices per hour of maintenance work. The second input to the forecast should be the quantity of maintenance work per asset. The third input to the forecast should be the quantity of the assets deployed.

15. Major repairs typically increase the economic life of an asset. Therefore they should be capitalized. OPEX for each type of assets should be more transparently be identified and presented.

16. The OPEX category "CSD Other" represents a relevant amount of expense but is not transparently structured. This OPEX must be related to the consumption of concrete resources (such as electricity or floorspace in plant buildings) or to concrete activities.

17. OPEX spent on maintenance, buildings and electricity should be structured in much more detail.

18. Distinct TSO activities should constitute distinct cost centres which are clearly identifiable in the Forecast Model. In particular it has to be clear whether a TSO cost centre is a secondary cost centre or a tertiary cost centre. Costs directly attributable to a secondary cost centre are indirectly driven by service volumes, while costs attributable to a tertiary cost centre are neither directly nor indirectly driven by service volumes.

19. [c-i-c starts] [redacted] [c-i-c ends]

20. The activities that are associated with PROPEX are – firstly – the commissioning of new assets and – secondly – the extension of asset lifetimes. There should be separate forecasts on the expenses associated with the commissioning of new assets and the expenses on the extension of asset lifetimes. These forecasts have to be done separately for each type of assets considered in the model. The forecasts have to be based on forecasts on the asset quantities deployed during the forecast period.

21. The Forecast Model presents sequences of expenditure and demand. However, the Forecast Model does not tie expenditure to demand on the basis of CVR or AVR. The Forecast Model does not provide AVR that would allow deriving from demand forecasts the forecasts on required asset quantities and related CAPEX. The Forecast Model does not provide CVR that would allow deriving from demand forecasts the forecasts on OPEX. On the basis of these CVR/AVR it could be traced how a change of demand for communications services during the forecast period would impact the forecasted amounts of expenditure. To overcome these shortcomings a list of hierarchically organized primary, secondary and tertiary cost centres should be defined. The stepwise allocation of costs allows for a much better attribution of costs according to actual cost drivers and to develop AVR and CVRs.

Allocation of expenditure to services

22. The Forecast Model does not allocate expenditure to services. The purpose of the Forecast Model is to allocate expenditure to asset categories. However, the Forecast Model fails to distinguish between expenditure that is related to regulated FLS, non-regulated FLS, NBN and other services. We propose a format for a more detailed allocation scheme which allows for cost-based allocation of expenditure to services.

Expenditure by IMC code

23. [c-i-c starts] [redacted] [c-i-c ends]

NBN-related expenditure

24. The amount of CAPEX attributed to all services includes NBN-related CAPEX. FLS access seekers must not be charged for any expenditure (and related costs) that is caused by the migration of customers to the NBN. That expenditure should be regarded as incremental to the NBN. These recommendations imply that NBN-related CAPEX should be treated as incremental to the NBN. That CAPEX must not be allocated to FLS. The same consequence should be taken for any PROPEX related to those CAPEX.

Transmission

25. [c-i-c starts] [redacted] [c-i-c ends] However, demand for regulated FLS is more than unlikely to be the driver for Telstra's investment in additional transmission equipment.

Asset disposal

26. Telstra proposes that any asset included in the RAB that is transferred to NBN Co and which is no longer contributing to the supply of fixed line services should be treated as an asset disposal. However, Telstra seems to apply this policy [c-i-c starts] [redacted] [c-i-c ends]. Telstra's classification of assets to be transferred to NBN Co raises several questions of completeness. The migration of customers and services from Telstra's copper network to the NBN makes more of Telstra's assets obsolete [c-i-c starts] [redacted] [c-i-c ends]. For instance, Telstra will need less rack space and building capacity if its customers migrate.

Implications of our findings on FLS pricing

27. Some of our findings can be quantified and therefore directly transposed into the FLSM as corrections of certain elements of the model. The mechanics of the FLSM then allows to calculate revised revenue requirements and a revised pricing structure and pricing level. Some other findings which we presented (only) give reason to doubt the efficiency and prudency of Telstra's expenditure forecast. Telstra's expenditure forecast model did not allow us in these cases to translate our identification of faults and deficiencies into concrete corrections of the FLSM model. The forecast model does not provide the level of disaggregation of calculations which allows for that.

28. We have concluded that PROPEX should not be expensed in the period it occurs but over the lifetime of the assets it is related to. Moving PROPEX from OPEX to CAPEX reduces revenue requirements by [c-i-c starts] [redacted] [c-i-c ends].

29. We have shown that the NBN-related CAPEX associated with remediation of duct infrastructure are caused by the NBN and not by fixed line services. Removing NBN-related CAPEX will reduce the RAB by [c-i-c starts] [redacted] [c-i-c ends] million. Given that PROPEX is directly related to CAPEX programs the reduction of NBN-related CAPEX will also reduce the PROPEX by [c-i-c starts] [redacted] [c-i-c ends].

30. A variety of other faults and deficiencies which we identified would also lead to a reduction of CAPEX and OPEX and to a reduction of expenditure allocated to the fixed line services. The combined effect of the quantitative implications of our proposed changes to the expenditure forecast and the allocation of costs to the declared fixed line services would lead to a price decrease of the declared fixed line services and not a price increase.

31. Our findings regarding the prudency and efficiency of Telstra's forecast expenditure are less compatible with a price increase but more with a price

decrease, without being able to quantify the exact amount of a necessary price decrease. We therefore propose to the ACCC to keep the declared fixed line prices at their current level and structure for the next two years. The ACCC should combine this pricing decision with the obligation on Telstra to provide the forecast information in a form as specified in our report, Such obligation would make the assessment of the prudency and efficiency of the forecasts much more reliable than under the current structure of the provided documentation and information.

1 Consultancy tasks for this study

32. The Australian Competition & Consumer Commission (ACCC) has commissioned WIK-Consult end of December 2014 to provide advice for the provision of assessment on the efficiency and prudency of expenditure forecast contained in Telstra's submissions as part of the Final Access Determinations (FAD) for the fixed line services which are due to be published in June 2015.

33. We have been requested to assess whether or not the forecast expenditures proposed by Telstra for its fixed line services are both prudent and efficient. The following issues have been identified by the ACCC to be most important and in the forefront for our assessment.

A: Capital Expenditure (capex)

1. *Assess whether Telstra's capital expenditure for NBN remediation is incremental to the NBN and avoidable for the fixed line services, and assess the changing proportion of capex to FLSM asset classes over the forecast period.*

2. *Assess the reasonableness of proposed capex forecast driven by demand, in particular the capex forecast for Transmission Equipment asset category.*

3. *Assess whether the capital expenditure forecast in the top 10 IMC codes are directly related to the fixed line services, and direct allocations are applied when using a bottom up approach to allocate the capital expenditure forecast according to the FLSM asset classes.*

4. *Assess the reasonableness of long run capex trend proposed by Telstra, in particular the trade-off between capex and opex.*

5. *Assess any other relevant and material matter relating to the prudency and efficiency of Telstra's capital expenditures.*

B: Operating Expenditure (opex)

1. *Assess whether operating expenditures are unambiguously incremental to NBN and determine if re-based operating expenditures reflect the costs of operations relevant to those asset classes.*

2. *Assess the efficiency of the responsiveness of Telstra's fixed line operating expenditure to NBN migration.*

3. *Assess the appropriateness of Telstra's use of indexes to forecast input cost pressures over the forecast period.*

4. *Assess the efficiency of Telstra's expensing-capitalisation approach for operating expenditure.*

5. *Assess any other relevant and material matter relating to the prudency and efficiency of T*elstra's operating expenditures.

34. Our mandate had been to focus on the items mentioned in para. 2 but has not been limited to those.

35. As the FAD, our work is focussing on the primary prices of the following access services provided on Telstra's public switched telephone (PSTN) and asymmetric digital subscriber line (ADSL) networks:

- unconditioned local loop service (ULLS),
- line sharing service (LSS),
- fixed originating access service (FOAS – previously PSTN originating service (PSTN OA),
- fixed terminating access service (FTAS) – previously PSTN terminating service (PSTN OA),
- wholesale line rental (WLR),
- local carriage service (LCS),
- wholesale service (wholesale ADSL).

All services are provided over the legacy copper network infrastructure of Telstra.

36. Our consultancy work has been conducted over the months of January and February 2015. Over a period of three weeks in January, we had the opportunity to conduct fact finding during an onsite visit in Melbourne. This included intensive discussions with the ACCC project team. It also included the attendance at two meetings of the ACCC staff with Telstra's regulatory experts. These meetings intended to clarify many open issues regarding Telstra's modelling approach. These meetings have been prepared by comprehensive questionnaires addressed to Telstra to which we contributed.

2 Assessment framework

2.1 The FAD process

37. The ACCC uses a Building Block Model (BBM) pricing methodology for determining prices for the fixed line services. This approach was introduced and for the first time applied in the fixed line services FADs in 2011[1] and in 2013 for the Wholesale ADSL FADs[2]. To implement and apply its BBM and to determine the prices for the declared fixed line services, the ACCC makes use of a Fixed Line Services Model (FLSM). To effectively implement and to apply the FLSM, the ACCC requires forecast and actual data from Telstra relating to operating expenditure, capital expenditure, depreciation and demand over the regulatory period. To ensure that it has the relevant and necessary information to populate the pricing model, the ACCC requires Telstra to apply a record keeping rule (BBM RKR) that it has devised for the purpose.

38. The ACCC initiated the current FAD process by commencing an inquiry in July 2013. In September 2013, the ACCC approached Telstra with a written request to provide the relevant forecast information for the five year (intended regulatory) period from 2014/15 to 2018/19 and other information specified under the BBM RKR. On 25 November 2013, Telstra provided forecasts for capital expenditure, operating expenditure and demand for 2013/14 and the following five year forecast period. On 17 January 2014, the ACCC requested Telstra to provide further information which has been provided by Telstra on 10 February 2014. On 16 April 2014, the ACCC extended the current FADs for the fixed line services (original expiry date: 30 June 2014) until the new FADs come into force. The main reason given for this extension is the uncertainty on account of the National Broadband Network (NBN) regarding the demand forecasts. On 2 July 2014, the ACCC extended the inquiry period for making the FAD for the fixed line services until 11 January 2015. On 24 July 2014, the ACCC released a discussion paper on primary price terms for consultation by stakeholders.[3] In the discussion paper the ACCC sought stakeholder views on options to pursuing to address the consequences of uncertainty regarding the NBN to determine fixed line prices.

39. As part of its submission Telstra has provided a revised approach to forecasting operating expenditure and capital expenditure for each of the fiscal years 2015 to

1 See ACCC (2011a, 2011b).
2 See ACCC (2013).
3 See ACCC (2014a).

2019 in October 2014 which substantially deviates from the previous forecasts provided by Telstra methodologically as well as in its results.[4]

2.2 Relevant documentation

40. For conducting our analysis and preparing our report, we had access to the relevant decisions of the ACCC regarding the previous FADs in their public and confidential versions, ACCC (2011b), ACCC (2013).

41. A major document for our analysis has been the ACCC's discussion paper of July 2014 (ACCC, 2014a) and the submission of stakeholders to this discussion paper. Of particular importance has been the confidential version of Telstra's submission (Telstra, 2014a).

42. A major source of our analysis and assessment has been Telstra's forecast model version 1.05 (dated October 2014) and the model guide (see Telstra, 2014b).

43. We had access to the ACCC's BBM RKR and Telstra's BBM RKR response.

44. On January 14 and 15 the ACCC addressed a set of questions to Telstra for clarification of its expenditure forecast. Telstra provided answers to some of these questions on January 30 which we also took into consideration. We did not regard any information provided after that date.

2.3 Wholesale pricing in the FLSM framework

45. Prior to adopting the BBM pricing methodology for setting fixed line prices, the ACCC used Total Service Long Run Incremental Cost (TSLRIC+) and Retail-Minus-Retail-Cost methodologies for setting indicative prices. This system was reified in 2011 by a BBM approach.

46. Under the BBM approach, first of all the regulated business's regulatory asset base (RAB) is established. Once the initial value of the RAB is established, it is "locked-in" and rolled forward from one year to the next.

47. Prices in the 2011 FAD were determined on the basis of revenue requirements for each service. For that purpose the revenue requirement for each asset class is determined. This consists of its capital costs (based on the allocated RAB value) composed of a return on capital and a return of capital (depreciation), operating expenditure attributable to that asset class and an allocation of tax liabilities. A

4 See Telstra (2014a).

share of asset specific revenue requirements then is allocated to each declared service utilising that asset class. Adding up the relevant allocated asset specific revenue requirements determines the revenue requirements of a particular service. These service-specific revenue requirements are then divided by forecast volumes of demand to determine the price of the service.

2.4 The fixed principle provisions

48. The principal advantage of adopting a BBM approach is supposed to be its provision of certainty for both the access provider and the access seekers relative to the TSLRIC+ approach. One constitutional element of this certainty are the fixed principles provisions for the declared fixed line services which have been made by the ACCC in its decision on 20 July 2011.[5]

49. The fixed principles "*provisions lock in the value of Telstra's assets and the framework for setting prices beyond the expiry of the FADs*".[6] The provisions shall provide and promote certainty and predictability in an environment of regulatory and major market changes. With them the ACCC aims to avoid regulatory shocks and to promote price stability.

50. The fixed principles provisions[7] specify that the opening RAB value and an opening tax asset value have been determined at 1 July 2011. This RAB is "locked in" and rolled forward each year to reflect forecast capital expenditure, depreciation and asset disposals. More specifically: the closing RAB value for each year is calculated by taking that year's opening RAB and adding the forecast for capital expenditure incurred that year and subtracting depreciation and asset disposals for the year. When being rolled forward RAB values in nominal terms, they are indexed by the actual Consumer Price Index (CPI).

51. The fixed principles provisions also specify the building blocks for revenue requirements and price setting. Annual revenue requirements will comprise

- a return on the RAB calculated by multiplying the WACC by the opening RAB for that regulatory year
- a return of the RAB, that is regulatory depreciation, for that regulatory year
- operating expenditure forecast to be incurred in that regulatory year, and
- an allowance for tax liabilities.

5 See ACCC (2011b).
6 See ACCC (2011b), p. 9.
7 See ACCC (2011b), p. 130ff.

52. The fixed principles provision will apply for a ten year period with a termination date of 30 June 2021. Under certain specified circumstances, the ACCC reserves the right to modify or remove a fixed principles provision.[8]

53. The fixed principles provisions represent a commitment by the ACCC to a particular regulatory policy or approach over a longer period than the usual regulatory decision period. There remains room for some discretion and judgment in the price setting despite the mechanical nature of the BBM approach. These are mainly related to assessing the prudency and efficiency of the expenditure forecasts and the determination of the WACC.

2.5 Telstra's expenditure forecast model

54. In response to the consultation initiated by the ACCC with its discussion paper of July 2014, Telstra has provided a (new) forecast model "*to provide greater clarity and transparency with respect to operating expenditure and capital expenditure (and the drivers of this expenditure) and to enable the dynamic updating of these forecasts in response to changes in the external environment*"[9]. This forecast model and the forecasts themselves are an update and at the same time a substitute for the previously provided forecasts in response to the 2013 BBM RKR information collection and disclosure notice of the ACCC.

55. The material changes which necessitated a review of the forecasts have been a change in the planned architecture of the NBN, from a predominantly fibre-to-the-premise (FTTP) architecture to one of a "multi-technology mix" (MTM). This has impacted the expected timeframes for NGN roll-out, the timeframe of the migration of customers and the use of assets of the copper access network.

56. Telstra not only has changed the forecasts themselves but also the forecasting methodology. The forecast model now includes the flexibility of accounting for the impact of NBN migration under a range of roll-out scenarios. Telstra's expenditure forecasts themselves are based on a roll-out base case scenario derived from information contained within the NBN Co Strategic Review.

57. In addition to providing the forecast model, Telstra has re-based its forecasts using actual demand and expenditure data for FY 2014.

58. In effect, the revision of forecasts has led to a downward revision of demand and expenditure for the fixed line network. Telstra assumes that the change in the NBN roll-out plan is expected to increase the speed of customer migration from

8 See ACCC (2011b). p. 129.
9 Telstra (2014b), p. 4.

Telstra's fixed line network to the NBN. This has the consequence of leading to lower expenditure requirements (at least in absolute terms) than previously anticipated. Nevertheless, the forecast model foresees a decline in expenditure requirements that is lower than the decline in demand. We have reservations about this assumption and will refer to it and assess it in Section 5 of our report.

59. The forecast model is designed to work in conjunction with the FLSM model of the ACCC. This should ensure a consistent estimation of the revenue requirements and the allocation of costs and price terms.

60. The forecast model consists of the following building blocks

- NBN roll-out assumptions,
- Demand forecast,
- Operating expenditure forecast,
- Capital expenditure forecast.

These building blocks are each represented in worksheets of a single MS Excel workbook. The forecasts provided by Telstra relate to a specified roll-out scenario. The user of the model may modify these assumptions and derive different outcomes for the expenditures. The demand forecast module calculates "post NBN" forecasts for regulated and non-regulated fixed line services. Operating expenditure forecasts are based on outputs of the demand forecast. The operating expenditure forecast is conducted separately for each business unit and lines of business. The capital expenditure forecasts are based on the NBN roll-out scenario. Capital expenditures are provided separately for each of the following "funding types":

- Demand,
- Asset replacement / operational support (AROS),
- Discretionary,
- NBN-related.

2.6 Templates with request for additional information

61. In the course of assessing the Forecast Model, WIK drafted templates with concrete information requests to Telstra. These templates addressed the following issues:

1. Asset quantities by type of asset.

2. Capital employed and CAPEX by type of asset.

3. The allocation of OPEX to types of assets according to cost drivers (e.g. allocation of expenses to network assets according to man-hours of maintenance work)

62. The templates pursued the following purposes:

- Comprehending the hard-coded historic CAPEX and OPEX figures which are the input to Telstra's expenditure forecasts.

- Comprehending the allocation of CAPEX and OPEX to asset categories.

63. Telstra's Forecast Model fails to relate historic data on expenditure and the allocation of expenditure to asset categories to the quantities of network assets deployed (in fact, the Forecast Model avoids almost any statement on concrete quantities of network plant).

64. The information specified in WIK's templates could have been used to "remodel" areas where the Forecast Model lacks transparency and to quantify necessary adjustments with regard to prudency and efficiency of expenditure forecasts. In this way, the templates provided Telstra with an opportunity to demonstrate that historic expenditure and the allocation of expenditure to asset categories are substantiated. However, Telstra did not provide the information requested in the templates. It also did not provide information in another format that would have been suitable to "remodel" historic expenditure or the allocation of certain kinds of expenditure to concrete asset types.

65. As a consequence, it was not possible to us to calculate the quantitative impact of certain changes or corrections which we recommended on the revenue requirements of the FLSM and following the level of price change of the declared fixed line services.

3 Basic starting points and principles of our analysis

3.1 Basic starting points

3.1.1 The NBN roll-out scenario

66. The forecast model relies on a NBN roll-out base case scenario which Telstra has derived from the NBN Co's Strategic Review from December 2013.[10] More specifically Telstra takes as a starting point the numbers of the optimised multi-technology-mix roll-out which NBN Co has presented for end of calendar years 2016 and 2020. [c-i-c starts] [redacted] [c-i-c ends]

Table 3-1: Brownfield premises passed by NBN, NBN roll-out base case scenario FY 2015 to FY 2019 [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra (2014b), p. 9

67. We do not have reservations about the approach and the assumptions which Telstra has made to forecast the premises passed by NBN, given that also Telstra had to make its best guess on the basis of the available information on the revised MTM-based NBN roll-out in autumn 2014. However, we assume it to be plausible that in the meantime the roll-out plans of NGN Co should be more broken down in detail. In particular, we would assume that the revised Definitive Agreement between NBN Co and Telstra should be based on the most recent NBN roll-out assumptions. Therefore, we recommend to the ACCC to base its upcoming decision on these most recent NGN roll-out plans.

10 See NBN Co, Strategic Review, 12 December 2013.

68. In any case our analysis and assessment in this report relies on the NBN roll-out assumptions as presented above.

69. The impact of the NBN on demand for fixed line services relates to both, the number of premises passed by the NBN and the rate at which end-users migrate to the NBN. If a fibre service area is declared Ready For Service (RFS) by NBN Co premises have to migrate services to the NBN within 18 months. Then the copper service is disconnected.

70. [c-i-c starts] [redacted] [c-i-c ends]

71. Telstra itself has questioned whether these observations from the past will be representative for the upcoming migration trends.[12] Migration may accelerate in the (near) future due to the roll-out and service policy of NBN Co, the use of HFC and FTTN technologies and more incentives for retail service providers (RSPs) to migrate fast(er).

72. We share these reservations of Telstra and regard the reason for a faster migration path in the (near) future as plausible. We therefore recommend to the ACCC to assume a faster migration rate than presented in the current base case for the later years of the regulatory period.

73. Assuming a uniform migration rate for each technology does not seem plausible to us. For instance, once HFC is part of the NBN, the change in service characteristics for end-users is less than the switch to a FTTP connection. Therefore, we would expect a faster migration for HFC based NBN connections. We would expect similar effects for FTTN-based NBN connections. We therefore recommend to the ACCC to assume faster and higher migration rates for FTTN and HFC than for FTTP.

74. Nevertheless, despite these recommendations to change the migration assumptions in the model, our quantitative analysis and assessment is based on the migration assumptions as fixed in the base case of the expenditure forecast model.

11 See Telstra (2014a), p. 10.
12 See Telstra (2014a), p. 10.

3.1.2 Migration of customers and demand

75. Demand forecasting consists of two basic building blocks: (1) Change of volumes for the relevant services over the forecast period without impacts from the NBN (the "pre-NBN" forecast), and (2) Impact of the NBN on these "autonomous" market trends ("post-NBN" forecast).

76. This overall structure of demand forecast modelling seems to us to be plausible and appropriate.

77. We did neither analyse and assess Telstra's pre-NBN nor Telstra's post-NBN demand forecast. Instead we took Telstra's fixed line service forecast as given for our detailed expenditure forecast assessment.

Table 3-2: Forecast demand for declared fixed line services – NBN roll-out base case scenario [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra (2014b), p. 22

78. In the forecast model, Telstra not only forecasts demand for declared fixed line services with the outcome as presented in Table 3-2. Telstra also forecasts demand for facilities access which is duct usage and network building usage measured as rack usage. These forecasts for infrastructural network elements and assets are required for use in the Cost Allocation Framework (CAF) model so as to share these costs among all network users.

79. [c-i-c starts] [redacted] [c-i-c ends] Because Telstra

provides no detailed breakdown of duct usage and the drivers for (its own) duct usage it is difficult to assess these forecast assumptions. Nevertheless, Telstra's forecast of the relative duct usage between fixed line services and other services (including NBN, HFC and other third party services) indicates some features to us that lack plausibility.

80. Table 3-3 summarizes Telstra's forecast duct usage shares. [c-i-c starts] [redacted] [c-i-c ends]

Table 3-3: Forecast duct usage shares [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra (2014b), p. 24

81. On the basis of the available information we cannot prove this contention, but it is highly plausible to us that forecast and allocations have not properly reflected the higher duct usage efficiency of fibre cables compared to copper cables. Copper cables need significantly more duct space than fibre cables. [c-i-c starts] [redacted] [c-i-c ends]

82. The particular way in which Telstra calculates duct usage for fixed line services[13] indicates that Telstra allocates duct overcapacity to fixed line users. Forecast duct usage of fixed line services is calculated as residual duct usage after usage by NBN Co, HFC networks and other third party networks is accounted for. What Telstra should have done is to treat duct capacity no longer needed due to the migration of NGN as asset disposal.

83. The specific alignment of the end point usage assumption which Telstra applies for NBN Co's duct usage[14] is not in line with cost causation and appropriate allocation of duct costs between NBN Co and other users of the networks. [c-i-c starts] [redacted] [c-i-c ends]

13 See Telstra (2014b), p. 24.
14 See Telstra (2014a), p. 23.
15 Figures in the Telstra's model documentation do not match with the figures in the model. [c-i-c starts] [redacted] [c-i-c ends] See Telstra (2014b), p. 24f.

Table 3-4: Rack count by band [c-i-c starts]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

85. These assumptions lead to forecast exchange space usage between fixed line services and other services (including NBN and other third party services) as documented in Table 3-5.

Table 3-5: Forecast exchange space usage shares [c-i-c starts]

[c-i-c ends]

Source: Telstra (2014b), p. 26

86. These forecast results are highly implausible to us. Not only third parties but also Telstra will need less building/rack capacity due to its migration of customers/services to the NBN. Therefore we do not subscribe to Telstra's forecast assumption of its own building space use. [c-i-c starts] [redacted] [c-i-c ends]

87. This allocation of overcapacity is not appropriate. To a relevant degree Telstra has the option to sell unutilised building space, e.g. by downsizing of the corresponding buildings. Or Telstra has the option to use this capacity for non-telecommunications purposes. In both cases these buildings and/or their corresponding capacity would have to be treated as asset disposal.

88. An alternative use of buildings or building capacity might not be feasible in each case. The efficient allocation of this overcapacity has to be treated as incremental to the NBN. The transition to NBN is the causal factor of the overcapacity and therefore the corresponding cost should be allocated to NBN and not to the remaining fixed line service users of the capacities.

3.1.3 Migration arrangements between Telstra and NBN Co

89. The NBN will replace Telstra's fixed line network as the infrastructure to provide fixed line services. The transition from Telstra's fixed line network to the NBN occurs under arrangements between Telstra and NBN Co. The original agreements, called the "Definitive Agreements", were originally fixed in June 2011. These agreements have been revised on 14 December 2014 to enable and govern the roll-out of the multi-technology model of the NBN.[16] The main change to the original agreements relates to Telstra's copper and HFC networks. Under the revised agreements, Telstra will progressively transfer ownership and the operational and maintenance responsibilities for the relevant copper and HFC assets to NBN Co.

90. These agreements define the migration of customers to the NBN and how NBN Co leases and acquires certain infrastructure elements and assets from Telstra. These arrangements have significant impacts on the use of Telstra's assets and the distribution and allocation of relevant costs between commonly used network assets between NBN Co and Telstra's fixed line services. Therefore, there are relevant implications on determining prices for declared services.

16 See letter of Telstra's chairman and CEO to Telstra's shareholders dated 15 December 2014.

91. The Definitive Agreements provide for migration payments for end-users which migrate to NBN and for ongoing and one-off infrastructure payments for the lease of certain infrastructure elements. NBN Co pays Telstra a one-off migration payment for each end-user disconnected from its copper network and migrated to the NBN. Furthermore, NBN Co will pay Telstra infrastructure payments for the lease of ducts, rack space in exchange buildings and dark fibre. One-off payments will be made for each lead-in conduit that is transferred to NBN Co. Under the revised agreement, infrastructure ownership payments for transferring relevant copper and HFC assets are included. Furthermore, [c-i-c starts] [redacted] [c-i-c ends] [17]

92. The estimated net present value (NPV) of these payments under the revised agreements are expected to be the same as under the original agreements. The total amount of payment adds up to $ 11.0 billion on a 2010 post-tax NPV basis. In its communications to shareholders[18], Telstra splits the payments to be received into the following categories:

- $ 4.0 billion as disconnection and infrastructure ownership payments,
- $ 5.0 billion as infrastructure access, transit network and exchange rack payments,
- $ 2.0 billion for Government policy commitments.

93. There has been a long and intense debate on the nature of these payments.[19] The major question controversially discussed has been whether to treat the payment as regulated or non-regulated revenue. Access seekers requested that the payments be considered when fixed line prices are determined to avoid major distortions of competition. Telstra argued, that the payments from NBN Co are not relevant for the ACCC to consider because they do not impact on the cost of supplying the fixed line services. "*The amount of these payments does not reflect a cost of supplying the fixed line services, nor does it reflect the amount by which the cost of supply changes at the time of migration. These payments are part of a commercial agreement between Telstra and NBN Co covering a range of matters.*"[20]

17 See Telstra (2014a), p. 44.
18 See footnote 16.
19 See ACCC (2014a) and the subsequent submissions of stakeholders.
20 See Telstra (2014a), p. 41.

94. Telstra's view on these payments helps to get a proper understanding of the economic nature of the payments. Telstra points out that the payments are not only a compensation for ownership transfer of assets and recurring service provision to NBN Co, [c-i-c starts] [redacted] [c-i-c ends]

This statement allows for an economic interpretation of what is included in the payment. A rationally acting operator would co-operate with NBN if it would (at least) be fully compensated for any economic loss due to the economic presence of the NBN. This operator would request to be compensated for any costs of stranded assets (which could also be an overcapacity) due to the migration to NBN. Insofar as Telstra is facing fixed costs, the migration of customers to the NBN does not decrease costs to the same extent as demand is decreasing. The degree of fixed asset utilisation decreases due to migration. For stranded assets and occurring overcapacities the legacy network owner would (in a competitive market) no longer get compensation from other users. These stranded assets and the value of overcapacities would not occur if the NBN had not emerged. Insofar they are incremental to the NBN. The rationally acting legacy network operator would allocate those costs to the option of co-operating with NBN Co. Otherwise he would compete to avoid (or reduce) stranded assets and overcapacities and would seek economic compensation from fixed line users (at the retail and wholesale level). This understanding of the economic nature of these payments is independent of the structure of the payments. The intentions are decisive.

95. In a position statement from October 2014[22], the ACCC has fixed its understanding and treatment of the NBN Co payments to Telstra in relation to fixed line service prices. As a general principle, the ACCC considers the impacts of the Telstra – NBN Co arrangement by using regulatory values of assets and

21 See Telstra (2014a), p. 44.
22 See ACCC (2014b).

costs and not the respective payments from NBN Co to Telstra as some stakeholders requested. According to this general principle, assets sold to NBN Co should be treated as asset disposal and removed from the RAB. This asset disposal should be based on the regulatory value of those assets within the FLSM and not based on the value of payments received from NBN Co.

96. Assets which are jointly used by NBN Co and the (declared) fixed line services should be appropriately allocated in the cost allocation framework of the FLSM.

97. Also the impact of customer migration from Telstra's fixed line network to the NBN should be taken into consideration. Affected assets should either be decommissioned or if utilised to a lesser extent partially be removed from the regulated cost base.

98. We fully support these principles and will develop a concrete analysis and assessment how these principles should be implemented and applied for certain capital and operational expenditure categories in the following sections.

3.2 Principles

3.2.1 Efficiency and prudency of Telstra's expenditure forecast

99. While the forecast annual capital expenditure is rolled into the RAB each year and forms a component for the revenue requirement, forecast operating expenditure for each year becomes directly a component of the revenue requirement for that particular year. The ACCC does not make adjustments for 'unders or overs' in actual expenditure compared to forecast expenditure during the regulatory period. This creates incentives on Telstra's side to overstate expenditure.[23] Given these incentives the ACCC cannot simply accept the forecast expenditure claimed by Telstra. The ACCC has to check Telstra's expenditure forecast on their prudency and efficiency and whether they have to be corrected before they can generate a revenue requirement.

100. The fixed principles provisions provide certain guidelines for Telstra to conduct the expenditure forecast and for the ACCC to check the prudency and efficiency of the resulting costs. Regarding capital expenditure forecast, the fixed principles require that the ACCC will take into account:

> "*(a) the access provider's level of capital expenditure in the previous regulatory period;*

23 For a more detailed analysis of these incentives see Section 3.2.4.

(a) reasons for proposed changes to capital expenditure from one regulatory period to the next regulatory period;

(b) whether the access provider's asset management and planning framework reflects the best practice;

(c) any relevant regulatory obligations, or changes to such obligations, applicable to providing the relevant declared fixed line services; and

(d) *any other matters relevant to whether forecast capital expenditures reflect prudent and efficient costs.*"[24]

For assessing the reasonableness of Telstra's operating expenditure forecasts the fixed principles provisions specify that the ACCC will take into account:

"*(a) the access provider's level of operating expenditure in the previous regulatory period;*

(a) reasons for proposed changes to operating expenditure from one regulatory period to the next regulatory period;

(b) any relevant regulatory obligations, or changes to such obligations applicable to providing the relevant declared fixed line services; and

(c) *any other matters relevant to whether forecast operating expenditures reflect prudent and efficient costs.*"[25]

101. These criteria to assess prudency and efficiency of costs are by themselves rather plausible but also rather general. The principles give a relevant weight to the corresponding expenditure (categories) in the previous regulatory period. Prudency and efficiency, however, requires that forecasts cannot only reflect a prolongation of trends of the past. They also have to reflect the volume effects of decreasing demand on both capital expenditure and operating expenditure. Prudent and efficient costs in the regulatory period can only emerge if in particular operating expenditure reflect the relevant volume of service in the regulatory period. If demand decreases prudent and efficient operating expenditure have to reflect that in a way which is described and required by the relevant cost volume relationships. That does not necessarily mean that forecast operating expenditure have to decrease at the same rate as demand decreases. There can for instance be efficient capital expenditure and operating expenditure trade-offs to be taken into account.

24 ACCC (2011b), Appendix C, p. 7, clause 6.10.
25 ACCC (2011b), Appendix C, p. 7, clause 6.9.

102. To make its assessment of the prudency and efficiency of costs, the ACCC needs a proper standard and criterion to be applied when making its judgement on individual expenditure or expenditure categories. We propose to use the competitive standard. Expenditures forecasts should be assessed according to the expenditure behaviour of a profit maximising firm which is constrained by competition in a contestable market and works under the relevant regulatory conditions ruling in Australia.

103. The ACCC itself has broken down the criteria of the efficient use of and investment in infrastructure such that it must have regard to:

"
- *whether it is, or is likely to become, technically feasible for the services to be supplied and charged for, having regard to:*
  - *the technology that is in use, available or likely to become available*
  - *whether the costs involved in supplying and charging for, the services are reasonable or likely to become reasonable, and*
  - *the effects or likely effects that supplying and charging for the services would have on the operation or performance of telecommunications networks*
- *the legitimate commercial interests of the supplier or suppliers of the services, including the ability of the supplier or suppliers to exploit economies of scale and scope*
- *incentives for investment in the infrastructure by which services are supplied; and any other infrastructure (for example, the NBN) by which services are, or are likely to become, capable of being supplied and*
- *the risks involved in making the investment.*[26]"[27]

104. In case of decreasing demand and migration to a new network infrastructure, there is a high barrier to justifying new capital expenditure into the legacy network infrastructure. A profit maximising firm would only invest in the requirements arising from new demand, e.g. by population growth or relocation of people. The firm would even try to avoid replacement investment into network assets even if their economic lives are ended and they are already fully depreciated. Instead, the efficiently operating firm would try to extend the economic lifetime of assets to their technical or physical lifetime if that is feasible. The firm would follow this

26 *Subsections 152AB(6) and (7A) of the CCA.*
27 See ACCC (2011b), p. 20.

strategy even though that might be at the expense of increasing operating expenditure. This trade-off would need to be fairly and efficiently calculated.

105. The general criterion for prudent and efficient capital expenditure in this environment is that the firm would only invest if that is required to meet the needs of (partially) growing demand and the need of maintaining the mandatory service level standards, and insofar as these needs cannot be met by extending the economic lifetimes of available assets and/or by substituting capital expenditure against operating expenditure. In the particular environment of the migration to the NBN, it should be unlikely that Telstra needs to undertake significant discretionary investments in the fixed line network due to the planned roll-out of the NBN.

106. Telstra claims that it "*faces very strong incentives to ensure that all its capital expenditure is prudent and efficient, and that mandated reliability standards and service levels are met at least cost*".[28] We can subscribe to this statement if it describes the incentives which Telstra has once the regulatory decisions on fixed line prices for the upcoming regulatory period have been taken. Under the ACCC's efficiency benefit sharing scheme, no adjustments would be made for 'unders or overs' in actual expenditure.[29] "*This means that Telstra effectively keeps the benefits of any efficiency gains that it makes, and bears the cost of any inefficient or imprudent spending. In short, Telstra has no incentive to 'gold plate' or spend inefficiently.*"[30] We fully agree on these efficiency incentives which Telstra has. It is only that the fixed line users would only benefit from these incentives if the ACCC used proper controls on prudency and efficiency regarding the costs allocated to these services in the first round.

3.2.2 No double recovery of costs

107. Any regulatory costing approach has to take care that the same costs are not recovered twice (or even three or four times). Otherwise, the regulated entity becomes overcompensated, access seekers (and retail customers) as a consequence would pay too high a price for the relevant service. Double-recovery of costs is not compatible with prudent and efficient costing.

108. Double-recovery of cost can have many reasons and sources. It can be based on a blurred definition of services, costs and cost categories. It can follow from certain cost allocation rules applied. It can also relate to the approach of how the relevant cost are identified. Some methods of determining costs are more vulnerable to double-recovery than others. Furthermore, the method of

28 See Telstra (2014a), p. 71.
29 See ACCC (2011b), p. 53.
30 See Telstra (2014a), p. 71.

expenditure forecast can also be a risk factor for or a source of double-recovery of costs.

109. Telstra's expenditure forecast methodology significantly relies on the base year expenditure. Any double-recovery of expenditure in the base year due to blurred definitions of expenditure categories then impacts the expenditure forecast for the regulatory period and extends the problem over the upcoming regulatory period.

110. The current FAD is related to primary or monthly recurring prices. In particular, operating expenditure emerging in certain cost centres are related to both primary services and transaction services. The risk of double-recovery of costs for both type of services is high if there is not a rigorous cost allocation approach towards these services.

3.2.3 Relevant costs for legacy Fixed Line Services

111. The overriding criterion for determining the relevant costs for legacy Fixed Line Services (FLS) is that they are due to the use of resources that are truly caused by these services. Given the multiproduct nature of telecommunications network operators, identifying the costs of individual services according to this criterion is a challenge under any circumstances. It is a particular challenge in the current situation in Australia where a massive transfer of resources is taking place from Telstra to the new NBN Co along with an equally massive migration of subscribers from the first to the second company. This means in particular that the FLS that continue to be provided by the legacy network during the regulatory period must be identified under conditions where a simultaneous transfer of resources and a steady process of migration is taking place.

112. There are several features associated with this transfer of resources and this migration of subscribers that need particular attention to assure that costs are allocated to the FLS that are actually caused by them. Below we list a number of these features:

- Before the advent of NBN, a certain degree of economies of scale had been reached from which Telstra and presumably subscribers benefitted through cost and prices that are lower than they would have been if those economies of scale had not been reached. Through progressively turning connections over to NBN Co, the remaining connections would suffer from a decrease in the economies of density which, however, is not caused by a change in the demand for these connections but is due to the fact of resource transfer and migration. In the sequel, several instances will be shown where this particular circumstance must be paid attention to in order to assure proper allocation of cost to the FLS. The resolution of the

issues relating duct usage through NBN Co, on the one hand, and legacy services, on the other hand, discussed in Section 3.1.2, are also a case in point.

- Another aspect is that as a consequence of the use of ducts by NBN Co a remediation of these ducts is taking place. The cost of such remediation is incremental to NBN and none of it should be charged to the FLS. Only the share of costs proportional to the number of connections remaining and incurred as if there had been no resource transfer and migration is allowed to be allocated to the FLS.

- In many instances, categories of costs will be allocated to the different demand categories according to allocation factors that are supposed to reflect cost causation. A necessary condition is that the values of these factors are transparently derived on the basis of the underlying intensities of use of the resources by the different services. This would assure that the consequent allocation of cost reflects cost causation. It will be seen that this requirement will not always be met.

- There will be other individual cases of decisions as to how costs are to be allocated, which in each case require careful attention to the underlying causes to avoid that particular cost components are unduly allocated to the FLS. We will in each case deal with these aspects.

113. Above discussion applies for the case that the total forecast cost during the regulatory period has been determined prudently and efficiently. This applies both to the capital cost derived from the regulatory base having been rolled forward from its initial level taking forecast CAPEX into account, and to OPEX that for each cost category has been forecast to occur during the regulatory period. In Section 3.2.1 we discussed the criteria under which a profit maximizing firm in the current environment of declining demand would incur new prudent and efficient capital expenditure for the provision of the FLS. From the discussion there, it necessarily follows that the cost of such forecast expenditure, both for CAPEX and OPEX, can only be allocated to the FLS, provided they have been incurred on the basis of these criteria. In Section 5 of this report, it will be shown that this requirement is far from being met by Telstra's forecasting methodology. As will be shown there, this methodology is a crude application of trends of preceding years prolonging them into the regulatory period. By their very nature they cannot take into consideration any of the criteria that we discussed in Section 3.2.1.

3.2.4 Incentives to distort expenditure allocations

114. It is the ACCC's task and responsibility to assess the efficiency and prudency od Telstra's expenditure forecast to derive justified revenue requirements for the regulated firm and prices for the declared fixed line services. In applying the statutory criteria for price determination the efficient prices balance the economic interest of the regulated firm and the access seekers such that as a result the overall social welfare outcome is optimized.

115. The regulated firm should be assumed to act and operate as a profit maximising firm which intends to optimize its shareholders' interest. This presumption not only holds in the competitive process and the firm's interaction with customers, competitors and access seekers. It also holds in the regulatory process. In pursuing its interest in high FLS wholesale prices the regulated firm has incentives to structure its expenditure forecasts such that they generate high revenue requirements. This can mean that forecasts on expenditure allocations may be distorted compared to values which are prudent and efficient. This does not represent a misbehaviour but a rational behaviour of the regulated firm and can be pursued within the limits set by the ACCC. Because the ACCC has not pre-structured the way and methods in which Telstra has to present its expenditure forecasts, there is a significant degree of discretion for Telstra how to conduct and to present its expenditure forecasts. The ACCC should be aware of such incentives and should take them into consideration when assessing Telstra's expenditure forecast. For this reason we want to specify in the following paragraphs how such incentives might work and how they might distort "true" values.

116. There is first of all the incentive not to be "too" transparent in structuring the forecast model. The broader asset and expenditure categories are the more difficult it becomes to relate the outcome of the forecasts to relevant cost drivers and to assess prudency and efficiency. The more assets and expenditures are treated as non-attributable to services the more they can be distorted through arbitrarily chosen allocation keys. Changing the forecast tool from period to period makes it most difficult for the regulator to trace changes, the reasons for change, and the consistency of forecasts. Unclear definitions of categories invite for overlapping expenditure categories and the double-counting of costs.

117. Generally, Telstra has an incentive to overstate expenditure. This incentive follows from the ACCC's principle provision not to make adjustments for 'unders and overs' in actual expenditure compared to forecast expenditure during the regulatory period. This provision has the nice economic implication that Telstra has strong incentives to operate cost efficiently in the regulatory period. This efficiency incentives are the other side of the coin of being incentivized for

overstating expenditure forecast in the first round (and at the expense of access seekers).

118. There is the incentive to declare more expenses as OPEX than as CAPEX than would be justified from the economic nature of the expense. Depending on the economic lifetime of the capitalized expense such behaviour generates significant increases in cost in the period in which the expense is being made.

119. The regulated firm has the incentive not to show all possible productivity gains in its forecast which can be materialized by the firm within the regulatory period. This holds in particular for OPEX. Profits in the regulatory period become higher if the firm can achieve a higher level of productivity as anticipated in its forecast.

120. The firm has an incentive to ignore asset volume and cost volume relationships and to treat costs as fixed and not responsive to volume declines or to a lesser degree than actually characterised in its production process. Insofar as costs can be treated as fixed, they do not react to a volume decline and ceteris paribus unit costs go up.

121. The firm has no incentives to attribute CAPEX and OPEX directly to individual services or to regulated (or unregulated) services even if that were possible under relevant cost causation principles. Treating expenditure and costs as big building blocks which are only allocated to services via allocation keys enables the (partial) allocation of costs to declared services although such expenditure and cost are caused by unregulated services and could be directly attributed to those.

122. The firm has an incentive to inflate base year expenditures, to the extent possible, beyond the level actually incurred. Insofar as the forecasting methodology derives forecast values from base year(s) values inflated base year values also inflate the expenditure forecasts above the level of intended expenditure.

123. The firm has an incentive not to dispose assets from the RAB although assets are only used marginally or at all. This generates revenues and economic compensation for assets which are no longer used and economically useless. This incentive also hinders the search for efficient alternatives to cope with declining volumes in the production process like outsourcing of certain activities to keep the inefficient use of underutilized assets.

124. The firm has an incentive of double-counting of the same expenditure and cost. Double-counting automatically inflates revenue requirements. Double-counting can be caused by blurred categorization of expenditure categories which overlap. Double-counting can also occur if the same expense is accounted once as OPEX and once as CAPEX.

125. The firm has an incentive to include CAPEX dedicated for and caused by the NGN into the asset base to be allocated to FLS provided over the legacy infrastructure. This improves the competitive basis in the market for unregulated services at the expense of access seekers and fixed line service users.

126. In assessing such distortions the ACCC should of course take note of the fact that also Telstra faces a relevant degree of uncertainty in its forecast. Certain parameters of its forecast are determined by the roll-out program of NBN Co. On the other hand, major parameters of the forecast simply reflect management decisions of Telstra and can be changed (to a certain degree) within the regulatory period. This underlines that there are fundamental information asymmetries between the regulated firm and the regulator which are common in the regulatory process. This underlines the need to be aware of the distortive incentives mentioned above.

3.3 Specificities of the Australian situation and their implications

127. All regulators around the world face two specific challenges in determining access prices for wholesale services provided over the legacy copper network infrastructure. First, the legacy infrastructure is facing declining volumes due to migration of demand to next generation network services. This makes the use of traditional TSLRIC pricing (and costing) models problematic and perhaps even inappropriate because the use of TSLRIC pricing is conceptually based on an expanding market where additional capacity has to be installed. The notion of TSLRIC pricing based on seemingly optimal replacement cost of relevant assets becomes critical when nobody is replacing the legacy infrastructure anymore. The mechanical application of traditional cost models would signal increasing costs in case of declining demand. On the other hand, increasing prices for a legacy infrastructure is not in line with the economic value of the infrastructure which is not increasing but decreasing due to technological change.

128. The second challenge which regulators are facing in determining access prices for the legacy infrastructure is how to set prices such that efficient incentives to invest in the new next generation access infrastructure for both the incumbent and for access seekers become socially optimal. Where NGA infrastructures are available, regulators in addition face the challenge of determining access prices such that the incentives to migrate to the new infrastructure are optimized.

129. There is no uniform regulatory approach developed yet but a variety of approaches exist that aim at solving these complex and conflicting challenges towards access pricing. Australia has developed an institutional framework for

building the NBN which has made the pricing decision framework and challenge much easier to solve for the ACCC than for other regulators.

130. Pricing decisions for the legacy copper network infrastructure do not have any immediate impact on the investment decisions regarding the NBN and the incentives for such investments. The NBN investments are conducted by NBN Co, a governmentally owned and funded entity under an ongoing, predefined and incentivised roll-out plan.

131. Australia also has solved the problem as to how the new NBN infrastructure will be used effectively and how penetration of and migration to the new infrastructure is managed such that high penetration rates are achieved. The NBN will substitute the legacy copper infrastructure to provide fixed line services where it is deployed. On the basis of an agreed migration plan Telstra will migrate its customers and services from the legacy copper network to the NGN. Shortly after completion of migration, the copper network will be switched-off. Therefore access pricing is not burdened with the request to incentivize this migration process artificially.

132. Pricing of declared wholesale fixed line services in Australia is therefore not (over-)burdened with managing conflicting incentive structures. Pricing can focus on how to make best use of the legacy infrastructure as long as it is in place and to compensate Telstra for the actual cost of those parts of the legacy copper network infrastructure which is still used to provide the declared fixed line services. This is a much easier task to solve than the task which would follow from other institutional and competitive arrangements to build the NGA/NBN infrastructure. Telstra is economically compensated for those stranded assets and capacity which are no longer used due to the migration to NBN. Furthermore, there are rules assuring that pricing for declared services show predictability and stability to smooth the path of migration of access seekers to NBN.

4 Is an expense CAPEX or OPEX?

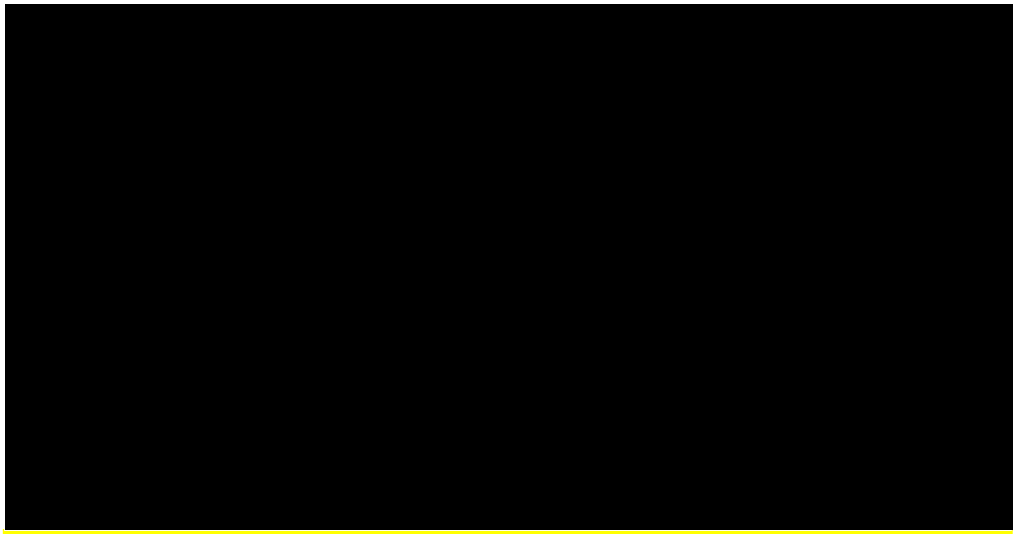
4.1 PROPEX

4.1.1 How the Forecast Model works

133. PROPEX is expenditure that occurs in the course of investing in assets. PROPEX is accounted for like OPEX.

134. PROPEX by asset class for the years [c-i-c starts] [redacted] [c-i-c ends] input to the FLSM. The FLSM itself does not provide information on the quantities and types of assets on which PROPEX has been spent.

Table 4-1: PROPEX in relation to other CAPEX-categories [c-i-c starts]



[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

135. Accounting for PROPEX like for OPEX implies: Each additional dollar of PROPEX translates 1:1 into an increase of the costs allocated to Telstra's service portfolio. If PROPEX was accounted for as CAPEX, its impact on the FLS cost base would be much smaller. For illustrative purposes, assume that an asset has got a lifetime of five years, and that the WACC rate is 5%. Capitalizing the expenditure related to the investment would translate to a depreciation of 1$/5 = 0.2 $ per $ spent, plus additional cost of capital of 1$· 5% = 0.05 $ per $ spent (these figures are only approximations, intended to give a direction). By accounting for the

expenditure as OPEX instead of capitalizing it, costs get inflated by 1$ - 0.2 $ - 0.05 $ = 0.75 $ per $ spent in the period in which it is spent.

4.1.2 Recommendations

136. Whether an expense is CAPEX or OPEX can be tested as follows:

- If an expense can be saved by stopping to operate a current asset, that expense is OPEX.
- If an expense can be saved by refraining from commissioning the asset in the first place, the expense is CAPEX.
- If the expense serves to extend the economic lifetime of an asset ("asset remediation"), the expense is CAPEX.

137. Double-counting of costs has to be avoided. In particular, it has to be made sure that expenses on asset remediation are not accounted twice (once as OPEX, once as CAPEX).

4.1.3 Economic assessment of the Forecast Model

138. The expenditure to which Telstra refers as "PROPEX" is in fact CAPEX. The mere fact that expenditure on the planning of investment and the commissioning of assets is labour-related does not qualify the PROPEX as OPEX.

139. The bulk of the expense for the commissioning of new assets and the extension of asset lifetimes is labour-related. However, that does not qualify these expenses as OPEX. PROPEX is in fact CAPEX and it has to be treated like it. By investing in a new asset – and that investment would also include that labour-related expenses spent on the commissioning of the asset – Telstra creates a resource. That resource is consumed in a period after the period of the expenditure. In other words, in the case of CAPEX, the expenditure occurs before the actual consumption of the resource takes place. Consumption of resources is a synonym for costs, and in the case of CAPEX, the consumption of the resource is measured by depreciation and the cost of capital invested into the resource. In the case of OPEX, the expenditure and the consumption of resources occur simultaneously.

4.2 AROS

4.2.1 How the Forecast Model works

140. AROS is one out of four sub-categories of CAPEX. AROS is an abbreviation for "asset replacement and operational support". The FLSM provides AROS by asset category, but it does not split up AROS into its components "asset replacement" and "operational support".

141. [c-i-c starts] [redacted] [c-i-c ends]

4.2.2 Recommendations

142. 1. The model should provide separate figures for expenses on asset replacement and operational support.

143. 2. Operational support has to be defined unambiguously. This definition should provide an implicit explanation why in the context of AROS, "operational support" was CAPEX rather than OPEX.

144. 3. It has to be made sure that the same expenditure does not get accounted for, on the one hand, as OPEX and, on the other hand, as "operational support" as part of AROS.

4.2.3 Economic assessment of the Forecast Model

145. The Forecast Model lacks transparency on the composition of the expenditure for asset replacements. It would have to be known which types of assets are replaced, how many assets are replaced and what amount is spent on average on the replacement of an asset.

146. However, documentation of the composition of the expenditure is not sufficient. Also the plausibility of the claimed expenditure has to be checked. Accordingly, the Forecast Model should provide information on the vintage structure of the asset base and projected average lifetimes by type of asset. Furthermore, the Forecast Model should state Asset Volume Relationships (AVR). AVR differ by type of asset; they relate service volumes to the quantities of assets deployed. The issue of AVR is discussed in further detail in Section 5.8 of this report.

147. Asset replacement follows a different economic logic than (new) investment in operational support. The drivers for both types of investment are different.

Integrating both types of CAPEX in one category makes it impossible to assess the reasonableness of such CAPEX. Therefore, Telstra should provide separate figures for these expenses.

5 Forecasting methodology

5.1 OPEX Maintenance

5.1.1 How the Forecast Model works

148. The Forecast Model inflates base year expenditure associated with plant maintenance according to an expenditure index which is derived from a quantity index and a price index. The model distinguishes between Internal Labour and Contract Labour. On these components of Proactive Maintenance different quantity indices are applied. The rationale behind the hard-coded quantity index used for inflating "Internal Labour" (see left column in Table 5-1-1) is not clear.

Table 5-1-1: Inputs to the calculation of the expenditure index applied on "OPEX CSD – Proactive Maintenance, Internal Labour" [c-i-c starts]

[redacted]

[c-i-c ends]

Source: WIK-Consult

Table 5-1-2: Inputs to the calculation of the expenditure index applied on "OPEX CSD – Proactive Maintenance, Contract Labour" [c-i-c starts]

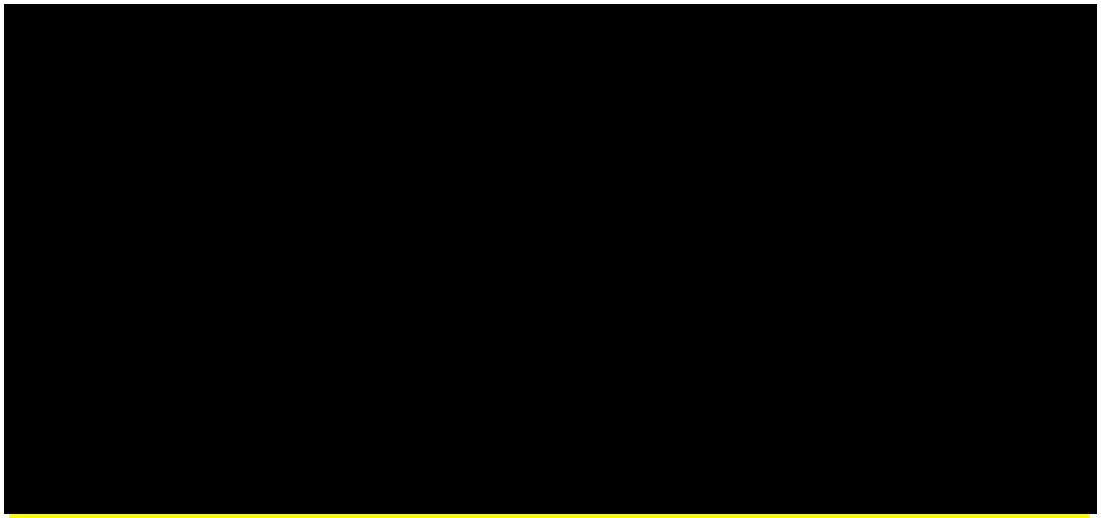
[redacted]

[c-i-c ends]

Source: WIK-Consult

149. With base year expenditure on Internal Labour amounting to $ [c-i-c starts] [redacted] [c-i-c ends] million (a hard-coded input to the Forecast Model) and base year expenditure on Contract Labour amounting to $ [c-i-c starts] [redacted] [c-i-c ends] million, the driver of the bulk of OPEX spent on Proactive Maintenance is the quantity of CAN SIO.

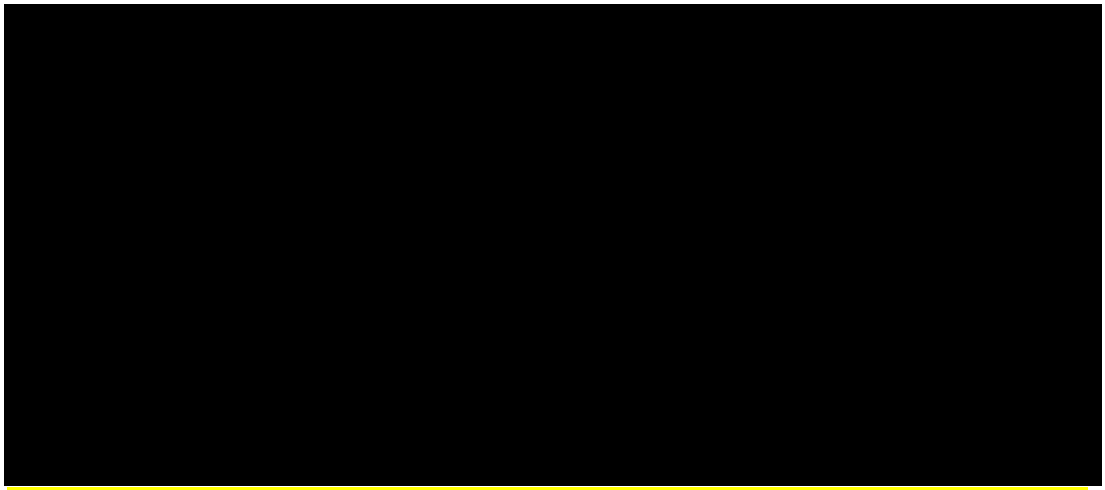
Table 5-1-3: OPEX CSD – Proactive Maintenance, Internal Labour. Own rebuilt of the Forecast Model. Inputs displayed in bold italics [c-i-c starts]



[c-i-c ends]

Source of inputs: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

Table 5-1-4: OPEX CSD – Proactive Maintenance, Contract Labour. Own rebuilt of the Forecast Model. Inputs displayed in bold italics [c-i-c starts]



[c-i-c ends]

Source of inputs: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

5.1.2 Recommendations

150. There should be separate forecasts of the OPEX associated with maintenance for the various types of assets considered in the model. Types of assets should be defined in such manner that the quantities of assets of the same type can be aggregated. It is possible that there is more than one asset type in a RAB asset category. To give an example: Asset type "SDH multiplexer" and asset type "WDM multiplexer" are both elements of asset category CO05 ("transmission equipment").

151. An input to the forecast should be unit prices per hour of maintenance work. These unit prices are unlikely to be identical for all types of assets. To derive a trajectory of unit prices for the duration of the forecast period, the base year value could be inflated according to a blend of Labour Price Index and CPI.

152. The second input to the forecast should be the quantity of maintenance work per asset (examples: annual maintenance work measured in man-hours per local switch, annual maintenance work measured in man-hours per SDH multiplexer). To derive a trajectory of the quantity of maintenance work per asset, the base year value could be inflated according to a productivity index.

153. The third input to the forecast should be the quantity of the assets deployed. The forecast model should state the driver for the quantity of assets deployed (examples: peak-hour bandwidth as a driver for the quantity of multiplexers). The trajectory of the asset quantities should be based of the trajectories of the drivers and an efficiency index.

5.1.3 Assessment of the Forecast Model

5.1.3.1 Base year values

154. Base year values for Internal Labour and Contract Labour ($ [c-i-c starts] [redacted] [c-i-c ends] million respectively $ [c-i-c starts] [redacted] [c-i-c ends] million, see Table 5-1-3 and Table 5-1-4) are hard-coded inputs to the model. It is not possible to assess whether these figures are prudent and efficient. However, due to the mechanics of the model, each percent of increase of the base year values will increase forecasted values in each subsequent year by the same percentage. Related to the base year 2014/15, the NPV of forecasted OPEX associated with Internal Labour and Contract Labour amounts to $ [c-i-c starts] [redacted] [c-i-c ends] million respectively to $ [c-i-c starts] [redacted] [c-i-c ends] million (values calculated at a discount rate of 5% p.a). Correspondingly, a simultaneous increase of base year values by just one percent will inflate the NPV of costs attributed to FLS by

0.01·($ [c-i-c starts] [redacted] [c-i-c ends] million + $ [c-i-c starts] [redacted] [c-i-c ends] million) = $ [c-i-c starts] [redacted] [c-i-c ends] million.

5.1.3.2 Allocation of expenditure to asset categories

155. The Forecast Model provides the allocation factors for OPEX CSD, inter alia those associated with plant maintenance. An allocation factor is the percentage of expenditure that gets allocated to a distinct RAB asset category. Provided that allocation factors are cost-oriented, Telstra knows which asset category is associated with which maintenance effort. At this background it is not clear why the Forecast Model does not relate maintenance to asset quantities as recommended in this report (see subsection above).

5.1.3.3 CAN SIO as driver of duct cost?

156. According to the Forecast Model, the quantity of CAN SIO is the key driver of the expenditure associated with maintenance. According to the Forecast Model [c-i-c starts] [redacted] [c-i-c ends] of the expenditure for maintenance gets allocated to asset category CA01 ("ducts and pipes"). The maintenance work to be spent on a piece of duct (assuming that a surface type such as pavement or trench is given) depends on the length of the duct and possibly also on the diameter of the duct, but it does not depend on the quantity of active wire pairs in the copper loops passing the duct.

5.1.3.4 Total length of active wire pairs as driver of copper cable cost

157. The forecast of "OPEX CSD – Proactive Maintenance" is based on the assumption that quantity of CSD maintenance work is primarily a function of the quantity of CAN SIO. Throughout the forecast period, [c-i-c starts] [redacted] [c-i-c ends] of "OPEX CSD – Proactive Maintenance" gets allocated to asset category CA02 ("copper cable"). This implies that the quantity of CAN SIO is the key driver of OPEX associated with copper loops.

158. However, it is not realistic that the quantity of CAN SIO (respectively the quantity of active wire pairs) is the only driver of the maintenance work spent on copper cable. The other driver is the length of the cable deployed. The overall length of copper cable declines as the NBN roll-out proceeds:

- In regions of migration (ROM) with FTTN deployment, copper feeder cable will be replaced for fibre cable, resulting in a reduction of the overall length of the copper cable deployed by Telstra. Furthermore, copper distribution cable will be either transferred to NBN Co or Telstra will operate the copper

distribution cable on behalf of NBN Co. In either case, the overall length of the copper cable accountable to FLS gets reduced by the length of the distribution cable.

- In ROM with FTTP/FTTB deployment, Telstra claims that fibre loops will be pulled through duct in addition to the copper cable already in place.[31] However, when no active wire pair in a copper cable is left (that is to say when the migration of customers in the ROM is completed), the copper cable can be removed from the duct, and the overall length of the copper cable declines.

159. As far as the copper cable used for the provision CAN SIO is concerned, it is plausible that the correlation between annual maintenance costs and the overall length of active wire pairs is stronger than the correlation between maintenance costs and the quantity of CAN SIO. The overall length of active wire pairs depends on the quantity of CAN SIO *and* the overall length of copper cable.

160. To forecast of "OPEX CSD Proactive Maintenance", the Forecast Model inflates base year expenditure by an expenditure index. That expenditure index is calculated from a quantity index and a price index. If the quantity index was calculated on the basis of the overall length of the active wire pairs rather than on the basis of CAN SIO, the forecasted amounts of "OPEX CSD Proactive Maintenance" would be presumably lower.

5.2 [c-i-c starts] [redacted]

[redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

31 Telstra (2014b), p. 23.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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32 Telstra, Framework and Guide to Forecast Assumptions, Forecast Model Version 1.05, October 2014, page 32

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

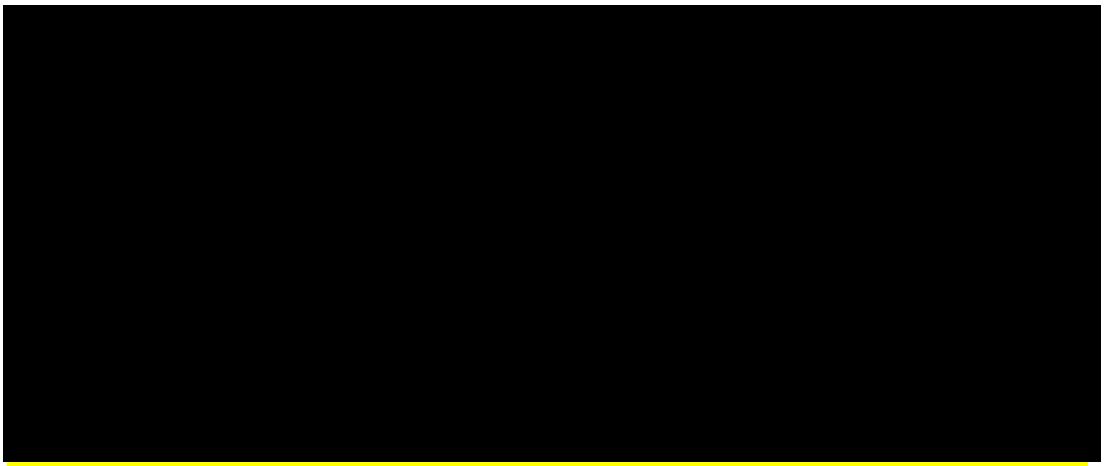
[redacted]

[redacted]

33 Typically accounting practices fix a threshold for the spent on a repair (i.e. x $) that determines whether or not the expense shall be capitalized.

[redacted]

[redacted]



[c-i-c ends]

Source of inputs: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

5.3 OPEX CSD Other

5.3.1 How the Forecast Model works

171. The methodology applied to forecast "OPEX CSD – Other" is analogue to the methodology applied to forecast "OPEX CSD – Proactive Maintenance" (see Section 5.1 of this report). The only differences are:

- In the context of "OPEX CSD – Other, Internal Labour", the quantity index for labour (see left column of Table 5-3-1) differs slightly from the quantity index applied in the analogue context of "OPEX CSD – Proactive Maintenance, Internal Labour" (compare Tables 5-1-3 and 5-3-3).
- All other quantity indices are derived from total SIOs (that is to say CAN SIO plus ADSL SIO) rather than from CAN SIO.

Table 5-3-1: Inputs to the calculation of the expenditure index applied on "OPEX CSD – Other, Internal Labour" [c-i-c starts]

[redacted]

[c-i-c ends]

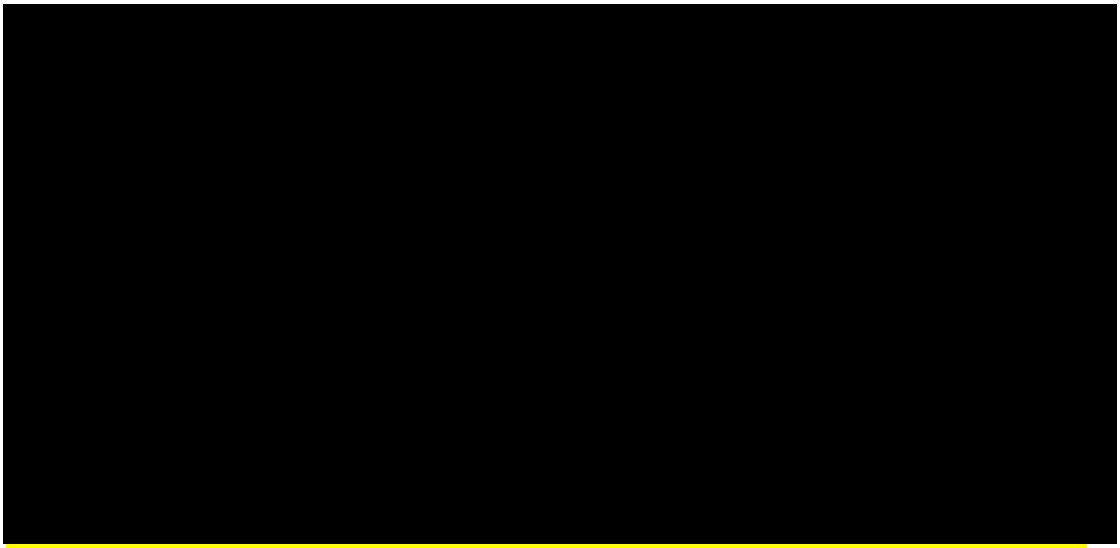
Source: WIK-Consult

Table 5-3-2: Inputs to the calculation of the expenditure index applied on "OPEX CSD – Other, Contract Labour" [c-i-c starts]

[c-i-c ends]

Source: WIK-Consult

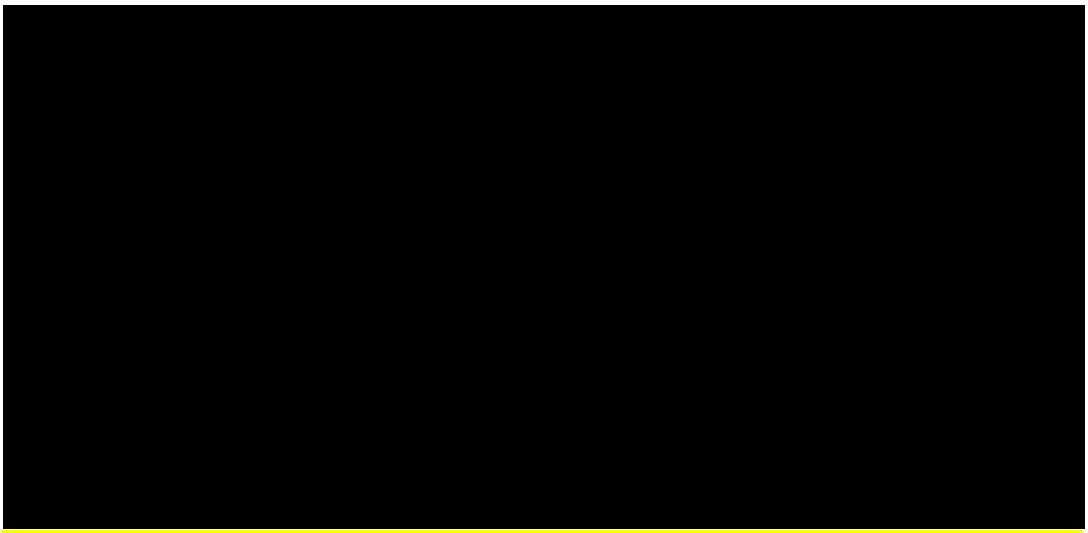
Table 5-3-3: OPEX CSD – Other, Internal Labour. Own rebuilt of the Forecast Model. Inputs displayed in bold italics. There is an error (apparently a typo) in Telstra's Excel spreadsheet: To derive the amounts shown in the Forecast Model, the sign of the CPI-change has to be reverted [c-i-c starts]



[c-i-c ends]

Source of inputs: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

Table 5-3-4: OPEX CSD – Other, Contract Labour. Own rebuilt of the Forecast Model. Inputs displayed in bold italics [c-i-c starts]



[c-i-c ends]

Source of inputs: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

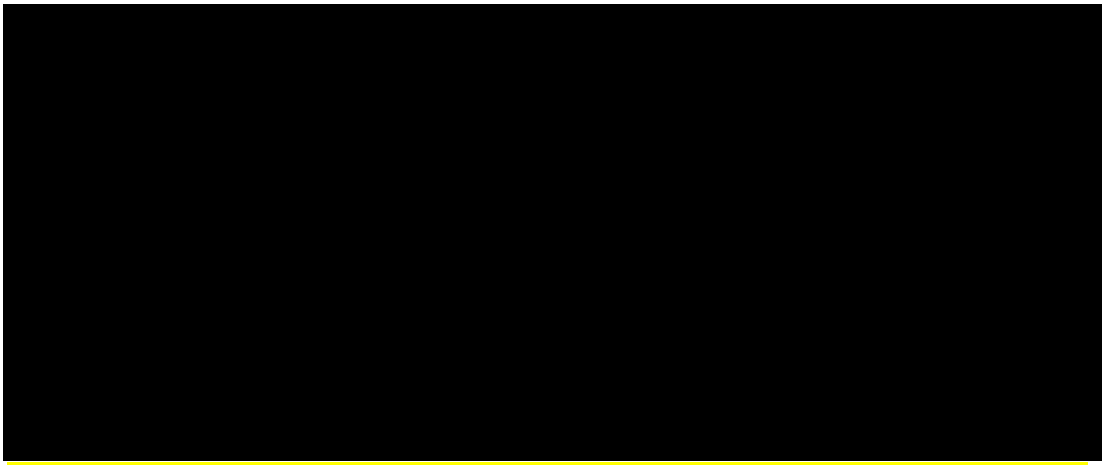
5.3.2 Recommendation

172. OPEX must be related to the consumption of concrete resources (such as electricity or floorspace in plant buildings) or to concrete activities.

5.3.3 Economic assessment of the Forecast Model

173. The Forecast Model does not provide a justification of the claimed amounts of OPEX CSD Other by relating the expenditure to concrete resources or activities. That is remarkable as the amount of "OPEX CSD – Other" even exceeds "OPEX CSD – Maintenance" (see Table 5-3-5).

Table 5-3-5: Components of OPEX CSD. Figures for "OPEX CSD – Other, Internal Labour" differ slightly from those in the Forecast Model. See Table 5-3-3 for explanation [c-i-c starts]



[c-i-c ends]

Source for "OPEX CSD – Other, Internal Labour": WIK-Consult. Source for all other data: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

5.4 OPEX Network

5.4.1 How the Forecast Model works

5.4.1.1 Maintenance - Contract Labour

174. OPEX spent on "OPEX Network – Maintenance – Contract Labour" is forecasted by deflating base year values at a constant rate of [c-i-c starts] [redacted] [c-i-c ends] % p.a. Hence the expenditure index for this OPEX subcategory is assumed to be identical with the price index. This implies that the quantity index does not change throughout the forecast period.

175. The price index differs from the price index used to inflate base year values of "OPEX CSD – Maintenance – Contract Labour" (see Section 5.1 of this report) is assumed to become more expensive,[34] while "OPEX Network – Maintenance – Contract Labour" is assumed to become cheaper.

34 The price indices relevant to "OPEX CSD – Maintenance – Contract Labour" are the CPI and the Labour Price Index.

Table 5-4-1: Forecast of "OPEX Network – Maintenance – Contract Labour" [c-i-c starts]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

5.4.1.2 Maintenance - Internal Labour

176. In contrast to "OPEX Network – Maintenance – Contract Labour", the quantity index of "OPEX Network – Maintenance – Internal Labour" is assumed to decline at a constant rate of [c-i-c starts] [c-i-c ends] %. The price index of "OPEX Network – Maintenance – Internal Labour" is assumed to be identical with the Labour Price Index. This implies that "OPEX Network – Maintenance – Internal Labour" is indeed only labour-cost driven, while "OPEX CSD – Maintenance – Internal Labour" is assumed to be a blend of labour and non-labour costs (see Section 5.1 of this report).

Table 5-4-2: Forecast of "OPEX Network – Maintenance – Internal Labour" [c-i-c starts]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

5.4.1.3 Buildings

177. The base year value for building rentals is inflated at a constant rate of [c-i-c starts] [redacted] [c-i-c ends] % p.a.

Table 5-4-3: Forecast of "OPEX Network – Building rentals" [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

178. "Building outgoings" are hard-coded input to the Forecast Model.

Table 5-4-4: Forecast of "OPEX Network – Building Outgoings" [c-i-c starts]

[redacted]

[c-i-c ends]

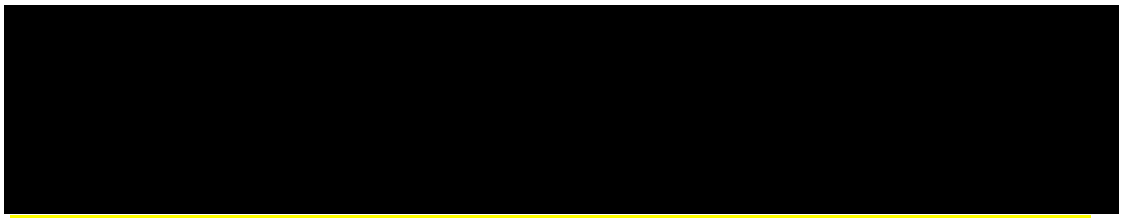
Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

179. Building costs are attributed to CAN and CORE according to the electricity consumed by CAN equipment (such as pair gain systems) and core equipment (such as switching and transmission equipment). This translates to attribution of [c-i-c starts] [redacted] [c-i-c ends] % of the building costs to CAN (asset class CA09) and to [c-i-c starts] [redacted] [c-i-c ends] % of the building costs to CORE (asset class CO09). These figures are hard-coded input to the Forecast Model, and they are constant throughout the forecast period.

5.4.1.4 Electricity

180. Electricity is also forecasted by inflating a base year value.

Table 5-4-5: "OPEX Network – Electricity" before removal of DSLAM that become redundant in the course of the NBN roll-out [c-i-c starts]



[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

181. Table 5-4-5 is the forecast of the electricity bill in a scenario without the migration of customers to NBN Co. Telstra adjusts the figures from Table 5-4-5 to reflect the removal of DSLAMs in the course of the migration of customers to NBN Co. This adjustment is based on the following assumptions:

- DSLAMs consume about [c-i-c starts] [c-i-c ends] % of the electricity needed for switching and transmission equipment.
- The quantity of DSLAMs gets reduced at a constant rate of [c-i-c starts] [c-i-c ends] % p.a.
- Per kwh of electricity consumed by a DSLAM another [c-i-c starts] [c-i-c ends] kwh are consumed for air conditioning.

5.4.2 Recommendations

5.4.2.1 OPEX spent on maintenance

182. The recommendations discussed on the context of "OPEX CSD Maintenance" apply analogously (see Section 5.1 of this report).

5.4.2.2 OPEX spent on buildings

183. 1. Building types should be defined by size and geographical location of the building so that buildings of the same type can be reasonably aggregated.

184. 2. The floorspace requirements by type of switching and transmission equipment should be defined (in terms of m² per local PSTN switch, m² per SDH multiplexer etc.).

185. 3. For each type of building the following trajectories should be identified:

a) Average OPEX (building rentals, additional costs) per building.

b) Amount of buildings.

c) Average quantities of switching and transmission equipment accommodated.

d) Average floorspace occupied by emergency power supply equipment, rectifiers and air conditioning (AC).

e) Floorspace occupied by third parties (FLS access seekers, NBN Co).

f) Redundant floorspace (in terms of m^2).

5.4.2.3 OPEX spent on electricity

186. 1. For each type of building OPEX associated with emergency power supply (batteries, diesel generator etc.), rectifiers and AC should be identified. That OPEX would also include a share of building rentals according to the footprint occupied by emergency power supply, rectifiers and AC.

187. 2. For each type of active network asset (switching and transmission equipment) the following trajectories should be identified:

a) Annual average of the asset quantity.

b) Energy consumption of the network asset in in kwh p.a.

188. 3. The trajectory of the price per kwh of electricity should be identified.

189. 4. The OPEX associated with emergency power supply, rectifiers and air conditioning should be allocated to switching and transmission equipment on the basis of the annual amounts of electricity consumed by switching and transmission equipment.

5.4.3 Economic assessment of the Forecast Model

5.4.3.1 Maintenance costs – lack of transparency

190. To assess whether estimates of expenses for maintenance are reasonable, the underlying quantities of network assets would have to be known.

191. In so far the quantity index for maintenance is supposed to change during the forecast period, Telstra does not explain the reason for such change:

- Is there a decrease of the quantity index of maintenance because less network assets have to be maintained?
- Or is there is a decrease of the quantity index of maintenance because less units of maintenance work are needed to maintain the same quantity of network assets?[35]

5.4.3.2 Maintenance – Internal Labour: Usage of the term "efficiency gain"

192. Like other types of OPEX, "Maintenance – Internal Labour" is forecasted by inflating the base year expenditure on "Maintenance – Internal Labour" according to an expenditure index. An expenditure index is derived from a price index and a quantity index.

193. In the context of "Maintenance – Internal Labour", the price index is called by Telstra "labour rate index". The labour rate index (respectively the price index) is expected to increase at a constant rate [c-i-c starts] [c-i-c ends] % p.a. throughout the forecast period.

194. In the context of "Maintenance – Internal Labour", Telstra introduces the term "efficiency gain in engineering workforce". Telstra expects that "efficiency gain" to be [c-i-c starts] [c-i-c ends] % p.a. throughout the forecast period. As the price index is already defined, the "efficiency gain" has to be interpreted as a decrease of the quantity index. This means: The quantity index is expected to decrease at a constant rate of [c-i-c starts] [c-i-c ends] % p.a. According to this interpretation, the usage of the term "efficiency gain" indicates that the quantity of "internal labour" necessary to maintain the same amount of network assets is decreasing at [c-i-c starts] [c-i-c ends] % p.a. throughout the forecast period.

195. With the price index increasing at [c-i-c starts] [c-i-c ends] % p.a. and the quantity index decreasing at [c-i-c starts] [c-i-c ends]% p.a., the expenditure index applied on "Maintenance – Internal Labour" is decreasing at [c-i-c starts] [c-i-c ends] % p.a. throughout the forecast period (see table 5-4-2).

35 The latter explanation would be equivalent to an increase of productivity.

5.4.3.3 Maintenance – Contract Labour: Usage of the term "efficiency gain"

196. The forecast of the expenditure on "Maintenance – Contract Labour" is derived in the same principle manner as the forecast on the expenditure on "Maintenance – Internal Labour": Base year expenditure gets inflated according to an expenditure index. However, the Forecast Model provides no clear interpretation of the expenditure index applied on "Maintenance – Contract Labour".

197. In the context of deriving the expenditure index for "Maintenance – External Labour", the Forecast Model refers to an input called "efficiency gain in network maintenance contracts". That input is directly translated into a "Contract Price Index". This means: [c-i-c starts] [c-i-c ends] % of annual "efficiency gain in network maintenance contracts" is supposed to be equivalent to a decrease of the "Contract Price Index" by [c-i-c starts] [c-i-c ends] % p.a.. The expenditure on "Maintenance – External Labour" is supposed to decrease at that rate of [c-i-c starts] [c-i-c ends] % p.a. throughout the forecast period.

198. The equivalent usage of the terms "efficiency gain in network maintenance contracts" and "decrease of contract price index" in the Forecast Model provides contradictory interpretations of the decrease of the expenditure index applied on "Maintenance – Contract Labour":

- The price index for contract labour is supposed to decrease at a rate of [c-i-c starts] [c-i-c ends] % p.a., while the quantity index is supposed to remain constant. This interpretation is reflected by table 5-4-1.

- Alternatively, the quantity index for contract labour is supposed to decrease at a rate of [c-i-c starts] [c-i-c ends] % p.a., while the price index for contract labour is supposed to remain constant. According to this interpretation, the amount of contract labour needed to maintain the same amount of network assets is supposed to decline at [c-i-c starts] [c-i-c ends] % p.a..

5.4.3.4 "Maintenance – Contract Labour" and "Maintenance – Internal Labour": (In-) consistency of model inputs

199. While Telstra's terminology is ambiguous (see subsections above), no explanation is provided for the difference between inputs to the modelling of the expenditure indices applied on "Maintenance – Contract Labour" and "Maintenance – Internal Labour":

- If the decrease of the expenditure index for contract labour is to be interpreted as a decrease of the price index of contract labour, why would the price for contract labour decrease at a rate of [c-i-c starts] [c-i-c ends] %

p.a., while the price for internal labour is supposed to increase at a rate of [c-i-c starts] [redacted] [c-i-c ends] % p.a.?

- If the decrease of the expenditure index for contract labour is to be interpreted as a decrease of the quantity index of contract labour, why would the quantity index of contract labour decrease at just [c-i-c starts] [redacted] [c-i-c ends] % p.a., while the quantity index for internal labour is supposed to decrease at [c-i-c starts] [redacted] [c-i-c ends] % p.a.?

5.4.3.5 Electricity consumption as driver of building costs?

200. Rack space is used as a driver to allocate building floor space to third parties ('NBN' and 'TPA TEBA')[36] and FLS. The share of building costs attributed to FLS is then used to split to CAN and the CORE according to the share CAN and CORE equipment take in the annual consumption of power. However, the driver of building costs is hardly power consumption, but rather the footprint occupied by accommodated network plant.

5.5 OPEX TSO and OPEX ITS

5.5.1 How the Forecast Model works

5.5.1.1 OPEX TSO

5.5.1.1.1 Definition of OPEX TSO

201. The key activities of Telstra Service Operations (TSO) include "network monitoring", "assurance", "change management", "major incident management for fixed services" and "labour to operate IT systems" (Telstra 2014b, page 49).

202. The Forecast Model disaggregates TSO into four cost centres / activities, namely "Network Assurance Operations (NAO)", "Network Infrastructure Operations (NIO)", "Network Service & Facilities (NSF)" and "IT operations (ITO)". Expenditure for NAO, NIO, NSF and ITO are all broken down by cost types "IT - Professional Services", "Salary & Associated costs", "Info Tech costs", "Special Project", "Accommodation" and "Other".

Table 5-5-1: OPEX TSO (FLS and other services) [c-i-c starts]

36 TPA stands for Third Party Access. TEBA stands for Telstra Exchange Building Access.

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

203. The bulk of costs associated with NAO, NIO and NSF are "Salary & Associated costs".

Table 5-5-2: "Salary & Associated costs" as main cost type in OPEX TSO NAO, NIO and NSF [c-i-c starts]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

204. The bulk of costs associated with ITO are "IT - Professional Services".

Table 5-5-3: "IT – Professional Services" as main cost type in OPEX TSO ITO [c-i-c starts]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

5.5.1.1.2 Forecasting methodology

205. Expenditure forecasts are derived by inflating base year expenditure from 2013/14. That base year expenditure is hard-coded input to the model. The indices for the inflation of base year expenditure differ by cost type. In the context of "IT - Professional Services" the Forecast Model refers to an "efficiency gain index", and in the context of "Salary & Associated costs" it refers to an "internal

labour efficiency gain index". However, according to Telstra, OPEX TSO is supposed to be largely independent of the number of services being supplied over each of Telstra's networks, while the number of TSO staff required to support the provision of the fixed line services is not expected to change materially over time (Telstra 2014b, page 50).

5.5.1.1.3 Attribution to FLS

206. According to Telstra, the costs associated with NAO, NIO and NSF are allocated to FLS based on the number of staff allocated to supporting the provision of FLS, as a proportion of total staff (Telstra 2014b, page 50). However, the Forecast Model does not state the total amount of OPEX associated with NAO, NIO and NSF that is attributed specifically to FLS, the number of staff allocated to FLS, the number of total staff and the ratio "number of staff allocated to FLS : number of total staff".

207. The costs associated ITO are allocated to FLS according to the same allocation keys as OPEX ITS (see subsection on "OPEX ITS" below). However, the Forecast Model does not state the total amount of OPEX associated with ITO that is attributed specifically to FLS.

208. The Forecast Model just states the total amount of OPEX TSO (NAO, NIO, NSF and ITO) that gets attributed to FLS.

Table 5-5-4: Forecast on OPEX TSO expenditure attributable to FLS [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

5.5.1.1.4 Attribution to asset categories

209. The allocation of "OPEX TSO attributable to FLS" to RAB asset categories is also hard-coded input to the Forecast Model.

Table 5-5-5: Forecast on OPEX TSO expenditure attributable to FLS [c-i-c starts]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

5.5.1.2 OPEX ITS

210. The Forecast Model identifies numerous software projects (which are listed by their codenames) and allocates a small fraction of the costs ([c-i-c starts] [redacted] [c-i-c ends] m $ throughout the forecast period) associated with these projects to FLS. The subsequent allocation of the costs allocated to FLS to RAB cost categories is also hard-coded input to the model.

5.5.2 Recommendations

211. Distinct TSO activities should constitute distinct cost centres which are clearly identifiable in the Forecast Model. The definition of the cost centres should be compliant with the recommendations in Section 5.7 of this report. In particular it has to be clear whether a TSO cost centre is a secondary cost centre or a tertiary cost centre. Costs directly attributable to a secondary cost centre are indirectly driven by service volumes, while costs attributable to a tertiary cost centre are neither directly nor indirectly driven by service volumes.

5.5.3 Economic assessment of the Forecast Model

5.5.3.1 Constancy of OPEX during the forecast period

212. For the duration of the entire forecast period, the amounts of OPEX TSO and OPEX ITS allocated to FLS remain relatively constant. However, the FLS service volumes are expected to decline. At this background constancy of the OPEX TSO and OPEX ITS allocated to FLS is not reasonable. This finding is based on the recommendations outlined in Section 5.7 of this report.

5.5.3.1.1 Secondary cost centres

213. Some of the TSO activities seem to constitute secondary cost centres. The costs directly attributable to a secondary costs centre are by definition indirectly driven by service volumes.

214. "Network monitoring" and "major incident management for fixed services" are not precisely defined in the Forecast Model documentation, but it is plausible that these TSO activities are dependent on the size of the network: It is plausible that monitoring a small network requires less expense than monitoring a large network, and "major incidents" are also likely to happen the more frequently the larger the network is. The OPEX spent on "network monitoring" and "major incident management for fixed services" is thus indirectly dependent on the service volumes. In the course of migrating customers to the NBN, FLS volumes will shrink, and Telstra will operate less kilometres of duct, less kilometres of copper cable, a smaller amount of active wire pairs in these copper cables and less DSLAMs. That should result in a decline of the OPEX associated with "network monitoring" and "major incident management" in the course of the forecast period.

5.5.3.1.2 Tertiary cost centres

215. Costs attributable to a tertiary cost centre are by definition invariant to service volumes. The costs have to be attributed to secondary and primary cost centres in an arbitrary manner. This could be done by applying an Equal Proportionate Mark-up on

- the capital employed directly attributable to the recipient cost centres, or
- the OPEX directly attributable to the recipient cost centres, or
- the total costs directly attributable to the recipient cost centres.

The choice of the allocation key would depend on the nature of the tertiary cost centre in question. However, the capital employed, the OPEX and the total costs attributable to a recipient secondary and tertiary cost centre will ceteris paribus decline as the quantity of FLS declines. Hence every reduction of FLS should reduce the amount of OPEX TSO / OPEX ITS attributed to regulated FLS.

5.5.3.2 Allocation of OPEX to RAB asset categories

216. The allocation of OPEX TSO and OPEX ITS to RAB asset categories is hard-coded input to the Forecast Model. It is not transparent whether or not this allocation reflects the principle of cost causation.

217. If the recommendations from Section 5.7 of this report were applied, it could be traced how OPEX TSO / OPEX ITS gets forwarded to primary cost centres. The costs directly allocated to a primary cost centre are directly driven by service volumes. The bulk of primary cost centres are network components the dimensioning of which is directly driven by service volumes. These network components can be assigned to a RAB asset category. Accordingly implementation of the recommendations from Section 5.7 of this report would make sure that the allocation of OPEX TSO/ OPEX ITS is transparent and is reflecting cost causation.

5.6 Demand-driven CAPEX and AROS

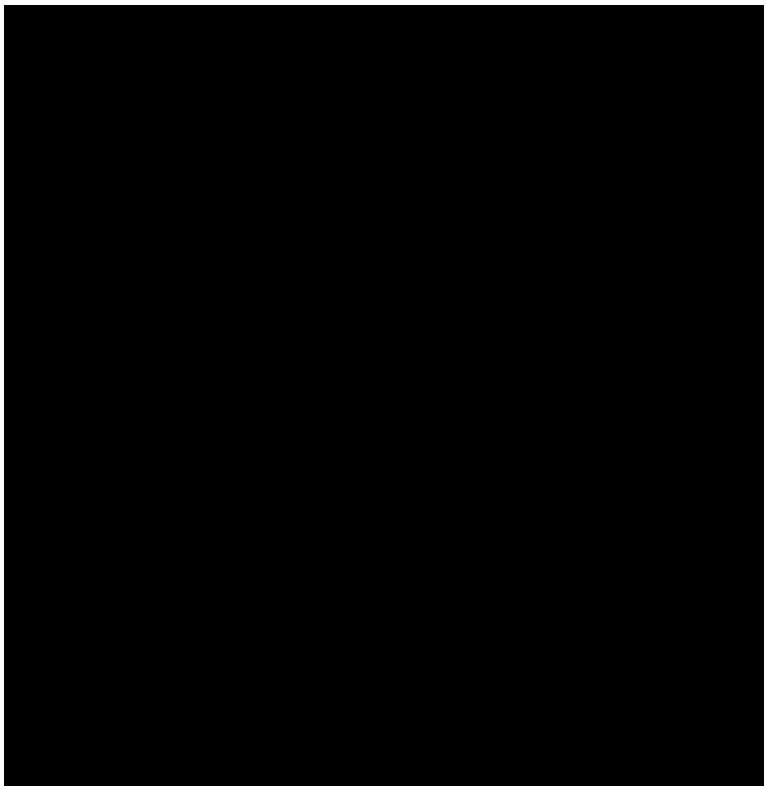
5.6.1 How the Forecast Model works

218. [c-i-c starts] [redacted] [c-i-c ends]

37 Telstra (2015): Fixed line services final access determination inquiry: ACCC request for information, Confidential Communication to ACCC, 30 January 2015, page 2.

Table 5-6-1: Mechanics of the Forecasts Model – Ceiling applied on the maximum growth rate of CAPEX by RAB asset category.

[c-i-c starts]



[c-i-c ends]

5.6.2 Recommendations

221. Forecasts of CAPEX should be based on underlying asset types and asset quantities rather than on trend analysis.

Table 5-6-2: Inputs to reasonable forecasts on CAPEX

	Related historic data	Related forecasts
Demand-driven CAPEX		• type and quantity of the assets on which CAPEX is spent • asset prices • demand for communications services
AROS	vintage strucutre of the current assets	type and quantity of the assets on which CAPEX is spent

Source: WIK-Consult

222. In analogy to OPEX forecasts (see Sections 5.1 – 5.4 of this report), reasonable CAPEX forecasts are based on asset volume relationships (AVR). An AVR describes the relationship between the quantity of an asset on the one hand and the demand for services on the other hand. An AVR is assigned to a distinct type of asset.[38] The quantities of assets of a given type can be reasonably aggregated (e.g. SDH multiplexer, PSTN switches etc.). An asset category (as defined in the RAB) can be composed of assets of different types. To give an example: Asset types "SDH multiplexer" and "WDM multiplexer" belong to asset category CO05 ("transmission equipment").

5.6.3 Economic assessment of the Forecast Model

5.6.3.1 [c-i-c starts] [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

38 For a more detailed discussion of the AVR we refer to Section 5.8 of this report.

[redacted]

[redacted]

[redacted]

[redacted]

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[redacted]

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[redacted]

[redacted]

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[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] [c-i-c ends]

5.7 PROPEX

232. The activities that are associated with PROPEX are – firstly – the commissioning of new assets and – secondly – the extension of asset lifetimes. As discussed in Section 4.1 of this report, that expenditure has to be capitalized. The following section deals only with the methodology which should be applied to forecast the expenditure associated with the commissioning of new assets and fault repair.

5.7.1 How the Forecast Model works

233. [c-i-c starts][redacted]

[redacted] [c-i-c ends]

5.7.2 Recommendations

234. 1. There should be separate forecasts on the expenses associated with the commissioning of new assets and the expenses on the extension of asset lifetimes.

235. 2. These forecasts have to be done separately for each type of asset considered in the model. (As previously discussed, a RAB asset category can comprise several types of assets).

236. 3. Forecasts on the expenses associated with the commissioning of new assets should be based on the quantities of newly commissioned assets.

237. 4. Forecasts on the expenses on the extension of asset lifetimes should be based on the on the quantities of existing assets.

5.7.3 Economic assessment of the Forecast Model

238. [c-i-c starts] [redacted]

[redacted]

[redacted]

[redacted]

39 See formula for PROPEX-forecasts in subsection "How the Forecast Model works". Division by zero is not defined.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

- [redacted]

- [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] [c-i-c ends]

5.8 No reference to AVR/CVR

5.8.1 Definition of terms

244. An Asset Volume Relationship (AVR) reflects the impact of a cost driver volume on the quantity of assets deployed by Telstra. There is an AVR for each type of asset. For instance, the AVR for the asset type "SDH multiplexers" would reflect the impact of change of bandwidth requirements on the quantity of SDH multiplexers deployed in the core network.

245. A Cost Volume Relationship (CVR) reflects the impact of a cost driver volume on the costs incurred by Telstra. There is a CVR for each type of costs. For instance, the annual expense spent of "proactive network maintenance" is driven by the amount of man-hours of maintenance work. This example relates to a direct CVR: A change of man-hours induces a change of the amount of OPEX. There are also indirect CVR. [c-i-c starts] [redacted] [c-i-c ends]

246. If asset volumes respectively costs are fixed with regard to some variable, that variable is no cost driver. The term "cost driver" implies: An increase of the cost driver induces in increase of costs. By definition, there is a causal relationship between a cost driver on the one hand and the asset quantity respectively the amount of costs incurred on the other hand.

5.8.2 How the Forecast Model works

247. The Forecast Model presents sequences of expenditure and demand. However, the Forecast Model does not tie expenditure to demand on the basis of CVR or AVR. This means:

- The Forecast Model does not provide AVR that would allow deriving from demand forecasts the forecasts on required asset quantities and related CAPEX. Instead, the Forecast Model tries to predict demand-driven CAPEX and network-related CAPEX for various RAB asset categories by deriving linear trend functions from historic CAPEX-figures from the four years prior to the forecast period.

- The Forecast Model does not provide CVR that would allow deriving from demand forecasts the forecasts on OPEX. Instead, the Forecast Model tries to predict OPEX CSD and network-related OPEX by inflating base year figures from the year prior to the forecast period in accordance with expenditure indices. Expenditure indices are derived from quantity indices and price indices. However, the quantity indices provided in the Forecast Model are hard-coded input; the Forecast Model does not link quantity indices to demand forecasts. Also the base year values are not linked to demand.

5.8.3 Recommendations

248. The following recommendations summarize how CVR and AVR should be derived.[40] On the basis of these CVR/AVR it could be traced how a change of demand for communications services during the forecast period would impact the forecasted amounts of expenditure. On the basis of CVR/AVR it could be also traced how a change of a distinct type of expenditure (say the expense on proactive plant maintenance) would change the amount of expenditure allocated to individual RAB asset categories.

249. 1. A list of cost centres has to be prepared. Cost centres can be assets, activities and other resources. That list of cost centres has to be reasonably complete. This means:

- If the capital employed associated with a distinct type of asset exceeds a distinct threshold (*x* m $), that type of asset should constitute a cost centre of its own.
- If the expenditure associated with a distinct type of activity or resource exceeds a distinct threshold (*y* m $ p.a.), that type of activity of resource should constitute a cost centre of its own.

250. 2. Cost centres have to be hierarchically organized. Cost centres further down in the hierarchy can only (!) have supply relationships with cost centres further up in the hierarchy. Primary cost centres constitute the top layer of the hierarchy of cost centres.

Table 5-8-1: Hierarchy of cost centres

Type of cost centre by hierarchical layer	Relationship between demand and the amount of costs directly attributable to the cost centre
Primary cost centre	Direct relationship
Secondary cost centre	Indirect relationship
Tertiary cost centre	No relationship

Source: WIK-Consult

251. Typical primary cost centres include:

- Copper loop cable
- Main Distribution Frames

40 These recommendations have nothing to do with top-down TSLRIC modelling. It is true that CVR are also a key element of TSLRIC models as they are necessary to identify that partial amount of total costs which is incremental to distinct service categories. However, in this report CVR and AVR are only discussed as a means to derive correct forecasts on CAPEX and OPEX.

- DSLAM
- Transmission equipment
- Switching equipment
- Wholesale activities

252. Typical secondary cost centres include:

- Buildings
- Proactive plant maintenance and fault repair
- Energy supply (including emergency energy supply) and air condition.

253. Tertiary cost centres include general management, support activities such as HR, procurement and assets related to these activities (e.g. office buildings).

254. 3. The forwarding of costs from each originating cost centres to the corresponding set of recipient cost centres should be clearly documented. This means:

- For each originating cost centre the corresponding set of recipient cost centres should be identified.
- It should be documented on which allocation key has been used to forward costs from originating cost centres to recipient cost centres.
- It should be documented which partial amounts of the overall OPEX attributed to an originating cost centre get forwarded to distinct recipient cost centres.

255. 4. Expenditure attributed to tertiary cost centres has to be forwarded to secondary and primary cost centres allocated in a transparent and fair manner (forwarding according to the principle of cost causation is impossible by definition as the costs allocated to tertiary cost centres are by definition neither directly nor indirectly driven by the service volumes). This could be done (inter alia) by applying Equal Proportionate Mark-Ups on:

- the capital employed directly attributable to the recipient cost centres, or
- the OPEX directly attributable to the recipient cost centres, or
- the total cost directly attributable to the recipient cost centres.

256. 5. Expenditure attributed to secondary cost centres should get allocated to cost centres further up the hierarchy of cost centres according to the cost driver volumes attributable to the recipient cost centres. Examples:

- The floorspace required for the accommodation of network plant could be identified as the driver of building costs. Building rentals (originating cost centre "plant buildings") could be allocated to switching equipment, transmission equipment, Main Distribution Frames, DSLAM, air condition and emergency power supply and other recipient cost centres according to footprint.

- Electricity consumption could be identified as the driver of the costs associated with emergency power supply and air conditioning. Electricity consumption, air condition and emergency power supply (all accounted to an originating cost centre "power supply") could be allocated to switching equipment, transmission equipment, DSLAM and other recipient cost centres according to the annual amounts of electricity consumed (measured in kwh p.a.).

6 Allocation of expenditure to services

6.1 General remarks

6.1.1 How the Forecast Model works

257. The Forecast Model does not allocate expenditure to services. The Forecast Model just allocates expenditure to asset categories. The allocation of expenditure from the asset categories to services (respectively service categories) is subject of the FLSM.

258. However, the Forecast Model fails to distinguish between expenditure that is related to regulated FLS, non-regulated FLS, NBN and other services. All expenditure is just attributed to attributed to an asset category, irrespective of service category to which the expenditure relates. Therefore it cannot be made sure that the FLSM allocates to expenditure to services according to cost causation. Possibly the FLSM allocates of portion of the expenditure that relates to NBN and other services to FLS. In that case charges for regulated FLS would not be cost-based.

6.1.2 Recommendations

259. 1. The Forecast Model should allocate expenditure to the following asset subcategories:

- CX0Y1: attributed to regulated FLS
- CX0Y2: attributed to non-regulated FLS
- CX0Y3: attributed to NBN
- CX0Y4: attributed to the other services

260. While CX0Y denotes any asset category defined in the RAB, CX0Y1, CX0Y2, CX0Y3 and CX0Y4 are suggested subcategories of that asset category. The placeholder "X" can take the values "A" and "O" (CA indicates that the asset category relates to the access network, while CO indicates that the asset category relates to the core network). Y is the number of the asset category. Example: For the asset category CO05, asset subcategories CO051, CO052, CO053 and CO054 should be defined.

261. 2. The matrix below (Table 6-1) defines the format in which the Forecast Model should allocate expenditure to asset subcategories. The asset subcategories do not change the asset categories defined in the RAB. The asset subcategories should rather serve as an interim stage in the process of forwarding expenditure (CAPEX and OPEX) and capital employed from asset categories to services according to cost causation.

Table 6-1: Proposed format for the allocation of expenditure to asset subcategories

	Asset subcategory			
	CX0Y1 ("attributed to regulated FLS")	CX0Y2 ("attributed to non-regulated FLS")	CX0Y3 ("attributed to NBN")	CX0Y4 ("attributed to other services")
Capital employed	… $	… $	… $	… $
Category of OPEX	… $	… $	… $	… $
Fault repair	… $	… $	… $	… $
Proactive maintenance	… $	… $	… $	… $
Power supply	… $	… $	… $	… $
Building rentals	… $	… $	… $	… $
Others	… $	… $	… $	… $
Category of CAPEX				
Demand-driven	… $	… $	… $	… $
Asset replacement	… $	… $	… $	… $
Procurement (capitalized)	… $	… $	… $	… $
Extension of asset lifetime (capitalized)	… $	… $	… $	… $
Others	… $	… $	… $	… $

Source: WIK-Consult

262. According to Table 6-1, CAPEX should be structured differently than in the Forecast Model (see Table 6-1):

- CAPEX-categories "procurement" and "extension of asset lifetime" replace the concept of PROPEX (see Section 4.1 of this report) where we discuss the treatment of PROPEX as CAPEX.
- CAPEX-category "asset replacement" substitutes "AROS" as the latter mixes asset replacement with operational support (see Section 4.2 of this report) where we discuss this asset category in detail.

263. 3. CAPEX changes the capital employed, and the FLSM translates capital employed into depreciation and cost of capital. The same set of asset subcategories should be used for the allocation of expenditure by the Forecast Model and the allocation of capital employed by the FLSM.

6.1.3 Economic assessment of the Forecast Model

264. The output of the Forecast Model is CAPEX and OPEX by asset category. Different types of CAPEX and OPEX get allocated to an asset category. However, the Forecast Model does not separate for each type of CAPEX/OPEX that expenditure that is driven by FLS, NBN and other services. Therefore, it cannot be determined which portion of the *total* expenditure allocated to a RAB asset category is driven by FLS. Correspondingly, it cannot be assessed whether the portion of expenditure that the FLSM forwards from a RAB service category to FLS reflects cost causation.

6.2 OPEX

6.2.1 How the Forecast Model works

265. The Forecast Model determines OPEX forecasts by inflating base year expenditure according to expenditure indices. The allocation of the base year expenditure to RAB asset categories is hard-coded input to the model.

6.2.2 Recommendations

266. Whenever possible, OPEX should be attributed to asset categories and within each asset category to asset subcategories

- CX0Y1: attributed to regulated FLS,
- CX0Y2: attributed to non-regulated FLS,
- CX0Y3: attributed to NBN and
- CX0Y4: attributed to the other services.

according to cost causation (see section 6.1 of this report).

Example:

- Telstra spends wages on the remediation of ducts which Telstra leases to NBN Co. These wages are OPEX which can be directly attributed to asset category CA01 ("ducts and pipes"), and within that asset category to subcategory CA013 ("attributed to NBN"). This allocation is in accordance with cost causation. The partial allocation of the said wages to regulated FLS would not be in accordance with cost causation as the remediation of

duct is performed with regard to the substitution of legacy copper cable operated by Telstra for fibre cable operated by NBN Co. The fibre cable operated by NBN Co will not be used to provide regulated FLS to access seekers.

267. In so far as possible, any type of OPEX considered in the model should be associated with a cost driver. Two principle categories of OPEX can be defined by type of cost driver:

a) OPEX which is driven by a quantifiable activity.

b) OPEX which is driven by the quantifiable consumption of a resource.

Examples:

- Some wages can be attributed to activities such as standard maintenance of network plant. The amount of maintenance work can be measured in man-hours per year. Hence the wages associated with standard maintenance work are driven by a quantifiable activity.

- Rentals for plant buildings are also a type of OPEX. Plant buildings are a resource which is consumed by network plant (such as switches and transmission equipment). The consumption of the resource can be quantified by the footprint of accommodated assets. Hence the rentals are driven by the quantifiable consumption of a resource.

268. Whenever OPEX gets allocated to an asset subcategory CX0Y1 ("attributed to regulated FLS"), the volume of the relevant cost driver volume should be stated. This provides transparency regarding the average amount of OPEX per unit of the cost driver. The information helps the ACCC to assess whether the amount of OPEX to regulated FLS is prudent and efficient.

269. The definition of activities that are identified as drivers of OPEX should be as closely related to network assets as possible. The definition of an activity comprises the measure for the quantity of the activity performed.

Example:

- [c-i-c starts] [redacted]

[redacted]

[redacted]

[redacted]

[redacted] [c-i-c ends]

6.3 Expenditure by IMC Code

6.3.1 How the Forecast Model works

273. In 2013 Telstra submitted to the ACCC some information on its top-10 investment projects which reportedly represent about [c-i-c starts] [redacted] [c-i-c ends]of the CAPEX considered in the Forecast Model (Telstra 2013, page 22). In January 2015 Telstra provided an update (Telstra 2015). Each of these investment projects is assigned an identifier, the so-called IMC-code. The information provided by Telstra comprises a high-level description of the investment project and the investment volume.

274. The said list of investment projects is not related to the Forecast Model. It is not possible to determine whether the investment volumes by IMC code are consistent with the CAPEX claimed in the Forecast Model. The Forecast Model presents CAPEX by RAB asset category. The assignment of concrete IMC codes to RAB asset categories is not transparent.

Table 6-3-1: Capital expenditure on the top 10 IMCs (FY2015) [c-i-c starts]

[c-i-c ends]

Source: Telstra (2015), page 7

6.3.2 Recommendations

275. 1. The investment volume associated with a distinct IMC code should be disaggregated to

- the asset subcategories suggested in Section 6.1 of this report (CX0Y1 – "related to regulated FLS", CX0Y2 – "related to non-regulated FLS", CX0Y3 – "related NBN", CX0Y4 – "related to other services"), and
- the capex subcategories suggested in Section 6.1 of this report (demand-driven CAPEX, asset replacement, procurement (capitalized), extension of asset lifetime (capitalized)).

276. 2. The investment volume associated with distinct IMC codes should be disaggregated

- the investment that is directly attributable to distinct RAB asset categories
- the investment that is allocated to a RAB asset category on the basis of some allocation key.

277. 3. CAPEX forecasts should be substantiated with a forecast of investment volumes itemized by IMC code and year.

6.3.3 Economic assessment of the Forecast Model

278. It is not possible to determine whether the investment volumes by IMC code are consistent with historic CAPEX claimed in the Forecast Model. The reason is that Telstra's statement on CAPEX by IMC code (Telstra 2015, pages 7 – 8) does not distinguish between

- PROPEX (i.e. CAPEX that is spent on the commissioning of additional asset and the extension of asset lifetimes),
- demand-driven CAPEX (i.e. the CAPEX that is spent on enhancing the capacity of Telstra's networks), and
- asset replacement.

279. Telstra (Telstra 2015 and Telstra 2013) provides no information on which portions of the CAPEX associated with a distinct IMC code

- is directly attributed to RAB asset category as the CAPEX is directly spent on an asset from that asset category.
- is allocated to RAB asset categories on the basis of some allocation key.

Allocation keys are not documented either.

280. [c-i-c starts] [redacted] [c-i-c ends]

281. Telstra (Telstra 2013, page 22) provides just very brief descriptions of the investment projects by IMC code.[41] [c-i-c starts] [redacted] [c-i-c ends] The transparency of the Forecast Model could be improved by assigning investment projects to asset subcategories CX0Y1 - CX0Y4, which are discussed in detail in Section 6.1 of this report.

41 Telstra (2015) does not provide further clarification.

282. [c-i-c starts] [redacted]

[redacted]

42 DSLAM = DSL Access Multiplexer.

[redacted]

[redacted] [redacted]

[redacted] [redacted]

[redacted]

- [redacted]
- [redacted]

[redacted] [redacted] [c-i-c ends]

7 NBN-related expenditure

7.1 Relevance to FLS

7.1.1 How the Forecast Model works

286. The migration of customers from Telstra to NBN impacts the charges applied on FLS access seekers in various ways.

7.1.1.1 NBN-related CAPEX

287. The amount of CAPEX attributed to all services includes NBN-related CAPEX. "NBN-related CAPEX" is an explicit category of CAPEX included in the model. NBN-related CAPEX is primarily the expense for the [c-i-c starts] [redacted] [c-i-c ends]

7.1.1.2 Expenditure not explicitly related to NBN

288. The NBN roll-out also causes expenditure which the Forecast Model does not explicitly relate to NBN:

289. 1. [c-i-c starts] [redacted] [c-i-c ends]

290. 2. The Forecast Model does not provide detailed documentation on the activities that cause expenditure. However, some these activities are for sure induced by the NBN roll-out, for instance:

- The gradual removal of ADSL ports at DSLAM.
- The dismantling of DSLAMs once all ADSL ports got disconnected.
- The dismantling of MDF[44] from plant buildings.

43 CSD = customer service driven.
44 An MDF (Main Distribution Frame) is a rack at a plant building. It is used to sort copper loops so that ports at switches and DSLAMs can be assigned to concrete customers.

7.1.1.3 Allocation of expenditure to services

291. Once the annual amounts of expenditure have been forecasted, these amounts have to be allocated to services. Some network resources are subject to diseconomies of scale as the NBN roll-out progresses. These diseconomies of scale are not explicitly identified in the Forecast Model but accounted implicitly accounted to FLS. Concerned asset categories are [c-i-c starts] [redacted] [c-i-c ends] This is discussed in further detail in sections 7.2 – 7.4 of this report.

7.1.2 Recommendations

292. FLS access seekers must not be charged for any expenditure or cost that is caused by the migration of customers to the NBN. Those expenditure and cost should be regarded as incremental to the NBN. This implies:

a) FLS access seekers must not be charged for any CAPEX that is associated with the lease or sale of resources to NBN Co.

b) FLS access seekers must not be charged for the disposal of DSLAM or other plant that gets redundant for no other reason but the migration of customers to the NBN.

c) FLS access seekers must not be charged for any increase of OPEX associated with the maintenance of ducts or copper cable that is caused by the roll-out of fibre by NBN Co.

d) The amount of duct and cable costs attributed on average to a CAN SIO must not increase as the number of active wire pairs declines in the course of NBN roll-out (that is to say, FLS access seekers must not be charged for diseconomies of density caused by the NBN roll-out).

e) FLS access seekers must not be charged for floorspace that gets redundant as MDF can be removed when the NBN roll-out is completed in a region of migration.

f) FLS access seekers must not be charged for the commissioning of assets and asset life extension (Telstra-terminology: PROPEX) of NBN-related equipment.

These recommendations in particular imply that NBN-related CAPEX should be treated as incremental to the NBN and therefore be removed from the relevant

asset classes. The same consequence should be drawn with regard to any PROPEX associated with NBN-related CAPEX.

7.1.3 Economic assessment of the Forecast Model

7.1.3.1 Cost-orientation of regulated FLS rates

293. The concept of basing FLS-tariffs on costs implies that only those costs should be included in the cost base which are incremental to the provision FLS. That principle is fundamental. Any additional expenditure incurred by Telstra due to the NBN roll-out is not caused by the business of access seekers. The same applies on the increase of average costs by FLS service. For such kind of additional expenditure and diseconomies of scale Telstra might or might not receive sufficient financial compensation from NBN Co; the contractual terms agreed between Telstra and NBN Co. are beyond the influence of FLS access seekers and must have no impact on the tariffs for wholesale FLS.

7.1.3.2 NBN roll-out saves OPEX

294. Access seekers should not pay for any diseconomies of scale resulting from the migration of customers from Telstra to NBN Co. Telstra takes a different view and argues that FLS access seekers should be attributed a share of the expenses for the remediation of duct and other NBN-related expenses. This view implies that the NBN roll-out is an economic burden on Telstra. That thesis can be challenged on the grounds of the Forecast Model. Irrespective of these considerations, there must be no doubt that FLS access seekers must not be charged for any cost directly or indirectly caused by the NBN roll-out. That principle prevails no matter whether or not the deal between Telstra and NBN Co is economically advantageous for Telstra.

295. Telstra's forecast model assigns about [c-i-c starts] ■ [c-i-c ends] % of OPEX CSD to asset category CA02 ("copper cable"), and that asset category will be obsolete once the NBN roll-out is completed. Provided that the allocation of OPEX CSD to copper cable is cost-based, Telstra will save about [c-i-c starts] ■ [c-i-c ends] % of OPEX CSD once the NBN roll-out is completed. Just at the background prospective savings of OPEX CSD, NBN roll-out is profitable for Telstra: The NPV of NBN-related CAPEX is likely to be less than the NPV of prospective savings of OPEX CSD. This statement will be substantiated below.

296. According to the Forecast Model, the allocation factors[45] for OPEX CSD do not change throughout the forecast period. The allocation factors are hard-coded input to the model.

Table 7-1-1: Allocation factors for OPEX CSD [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra, Forecast Model, Version 1.05, October 2014

297. The OPEX CSD attributed to asset category [c-i-c starts] [redacted] [c-i-c ends] is derived by multiplying the OPEX CSD figures from Telstra's Forecast Model with the allocation factors stated in Table 7-1-1.

Table 7-1-2: OPEX CSD allocated to asset category [c-i-c starts] [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

stable. To derive a rough estimate what amount OPEX CSD would have incurred, the OPEX CSD figure from 2013/14 is inflated at the CPI see Table 7-1-3).[46]

Table 7-1-3: Inflation of base year OPEX CSD at the CPI [c-i-c starts]

[redacted]

[c-i-c ends]

Source for CPI: Telstra, Forecast Model, Version 1.05, October 2014

299. According to Table 7-1-3, Telstra saves about $ [c-i-c starts] [redacted] [c-i-c ends] m in 2018/19 as the quantity of SIO (and correspondingly the amount of OPEX CSD) is smaller than in the base year 2013/14. The amount of these OPEX will increase even further beyond the horizon of the forecast period: Once the migration of customers to NBN Co will be completed, Telstra will operate copper loops for the provision of CAN SIO, and consequently the amount of OPEX CSD attributable to copper loops will be zero.

300. The amounts of OPEX CSD saved due to the NBN roll-out can be compared with the amounts of NBN-related CAPEX stated in the Forecast Model.

Table 7-1-4: Forecast of NBN-related CAPEX [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra, Forecast Model, Version 1.05, October 2014

301. The NBN-related CAPEX will be terminated at some point in time, whereas the savings of OPEX CSD associated with copper cable are perpetual. Hence NBN-related CAPEX is likely to be an investment that will pay off for Telstra just from the OPEX saved on copper cable.

46 That approach is conservative in terms of the Forecast Model, as the Forecast Model inflates some distinct subcategories of OPEX CSD at the change of labour rate, and the change of the labour rate is assumed to exceed the change of the CPI.

7.2 [c-i-c starts]

[redacted]

[redacted]

[redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] [redacted]

[redacted] [redacted]

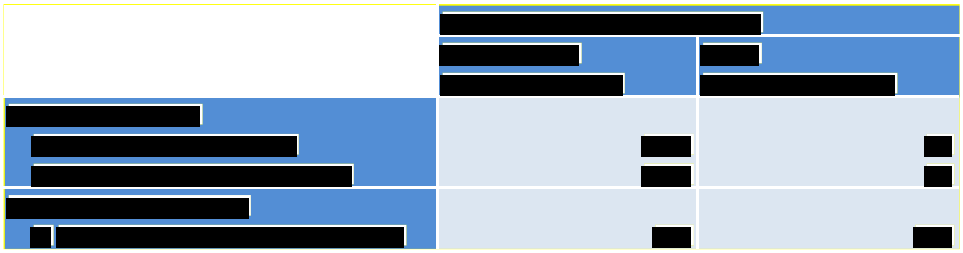
[redacted] [redacted]

[redacted]

[redacted]

[redacted]

[redacted]



[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[c-i-c ends]

7.3 Duct

7.3.1 How the Forecast Model works

313. The FLSM allocates duct costs to service categories "FLS", "NBN Co" and "others" by type of cable. Supposed there are three cables in a duct – a copper cable, a fibre cable operated by NBN Co and a co-axial cable for television – each of the three service categories "FLS", "NBN Co" and "others" will be attributed one third of the duct costs. Initially, the number of active wire pairs in the copper cable plays no role for the amount of duct costs attributed to FLS. However, in the course of migrating customers from Telstra to NBN Co in a ROM, the number of active wire pairs in the copper cables gets increasingly smaller. This means that

the remaining CAN SIOs have to bear on average an increasingly larger amount of duct costs.

Table 7-2: According to the FLSM, the number of CAN SIO per kilometre of duct attributed to the CAN is supposed to decline [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

7.3.2 Recommendations

314. Within the asset category CA01 ("ducts and pipes"), the following asset subcategories should be established:

- CA011 – duct attributed to regulated FLS
- CA012 – duct attributed to non-regulated FLS
- CA013 – duct attributed to NBN Co
- CA014 – duct attributed to other service categories (such as cable TV)

(This recommendation applies on all other asset categories; it is discussed in detail in Section 6.1 of this report.)

315. The portion of CAPEX, OPEX and capital to be allocated to subcategory CA011 from category CA01 shall be calculated as

$$\frac{X_{021}}{X_{021}+X_{022}+X_{023}} \cdot \frac{Y_{021\&022}}{Y_{021\&022}+Y_{023}+Y_{024}}$$

whereby

$Y_{021\&022}$ = average number of cables dedicated to FLS in a duct

Y_{023} = average number of cables dedicated to NBN Co in a duct

Y_{024} = average number of cables dedicated to other service categories in a duct

316. The portion of CAPEX, OPEX and capital to be allocated to subcategory CA012 from category CA01 shall be calculated as

$$\frac{X_{022}}{X_{021}+X_{022}+X_{023}} \cdot \frac{Y_{021\&022}}{Y_{021\&022}+Y_{023}+Y_{024}}$$

317. The portion of CAPEX, OPEX and capital to be allocated to subcategory CA013 from category CA01 shall be calculated as

$$\frac{X_{023}}{X_{021}+X_{022}+X_{023}} \cdot \frac{Y_{021\&022}}{Y_{021\&022}+Y_{023}+Y_{024}} + \frac{Y_{023}}{Y_{021\&022}+Y_{023}+Y_{024}}$$

318. The portion of CAPEX, OPEX and capital to be allocated to subcategory CA014 from category CA01 shall be calculated as

$$\frac{Y_{024}}{Y_{021\&022}+Y_{023}+Y_{024}}$$

7.3.3 Economic impact of recommendations

319. A numeric example is well suited to illustrate the difference between the accounting policies applied in the FLSM and the recommendations listed above:

- Subject to the example is a duct which bears 1 cable dedicated for NBN Co, 1 co-axial cable (TV), 1 copper cable for CAN SIO.
- In the ROM ("region of migration") where that duct is located, 40% of wire pairs are still loops operated by Telstra, while 60% of the access customers have been already migrated to the NBN.

Table 7-3: Illustrative example on the allocation of expenditure and capital employed from asset category CA02 ("copper cable") to suggested asset subcategories of that asset category

	Sub-categories of asset class CA01		
	CA011 + CA012 ("attributed to FLS")	CA013 ("attributed to NBN")	CA014 ("attributed to other services")
What the FLSM does			
Before the migration process	1/2	0%	1/2
During the entire migration process	1/3	1/3	1/3
What the FLSM should do			
At distinct stage of the migration process	40 % of 1/3	1/3 + 60 % of 1/3	1/3

Source: WIK-Consult

320. According to the accounting policies applied in the FLSM, a CAN SIO is attributed on average an increasingly larger amount of duct-related expenditure in the course of the transition period. In this way access seekers are made to pay for the diseconomies of density caused by the migration of customers to NBN Co. However, access seekers should not pay for diseconomies of density that they have not caused. Accordingly the average amount of duct-related expenditure per CAN SIO must not change in the course of the transition period. This is achieved by applying the accounting policies illustrated by the numerical example above.

7.4 Buildings

7.4.1 How the Forecast Model works

321. According to Telstra's documentation on the Forecast Model, building-related costs are attributed to FLS and other services according to the number of racks dedicated to Telstra's own use, NBN and other third parties. This "rack count" is done separately for buildings located all bands 1 – 4, and the corresponding ratio of "Telstra's own racks" and "other racks" is calculated. From the ratios derived for bands 1 – 4 a weighted average is calculated. This weighted average is presented in Table 7-4-1 below.

Table 7-4-1: Portion of building costs allocated to FLS and other services [c-i-c starts]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

7.4.2 Recommendations

322. 1. Within asset categories CA09 respectively CO09 ("network buildings/support"), the following asset subcategories should be established:

- CA091 respectively CO091 – attributed to regulated FLS
- CA092 respectively CO092 – attributed to non-regulated FLS
- CA093 respectively CO093 – attributed to NBN
- CA094 respectively CO094 – attributed to other services

(This recommendation applies on all other asset categories; it is discussed in detail in Section 6.1 of this report.)

323. 2. The Forecast Model should explicitly state the number of buildings (by band 1 – 4) which are still in use for the provision of FLS. A building in which all DSLAM and the MDF got redundant as the migration of customers to NBN Co is completed in the respective region of migration (ROM) is no longer relevant to the provision of access-related FLS. The costs associated with such building must not be attributed to asset subcategories CA091 respectively CA093.

324. 3. MDF-racks get redundant as the NBN roll-out proceeds in a ROM. The corresponding redundant floorspace must not be attributed to asset subcategories CA091 respectively CA093.

325. 4. Building-related costs should be attributed to asset subcategories according to floorspace rather than racks. Racks used by NBN Co or other third parties might be located in separate co-location chambers. For Telstra's own use racks are not in located in separate co-location chamber. Consequently the average floorspace attributable to one of Telstra's own racks is smaller than the average floorspace attributable to racks used by NBN Co and third parties.

326. 5. The building costs attributed to racks dedicated to Telstra's own usage (respectively the floorspace dedicated to these racks) should be split between FLS and non-FLS, depending on the nature of the services provided with the equipment installed in that rack.

7.4.3 Economic assessment of the Forecast Model

327. According to the Forecast Model, the number of racks dedicated to Telstra's own use is expected to remain constant throughout the entire forecast period (this applies in all bands 1 – 4). This suggests that the quantity of buildings attributed to the provision of FLS remains constant. This is not plausible as DSLAM and MDF can be removed from buildings located in ROM where the NBN roll-out is completed.

328. Furthermore, the Forecast Model suggests that any rack dedicated to Telstra's own usage can be entirely attributed to FLS. This is not plausible:

- Demand-driven CAPEX for transmission equipment cannot be explained on the grounds of increased demand for FLS (see Section 8 of this report).

That additional transmission equipment occupies racks, but the corresponding floorspace must not be attributed to FLS.

- Ethernet switches do not only process broadband traffic generated by ADSL-customers, but also broadband traffic generated by customers that have been migrated to the NBN. These Ethernet switches occupy racks, but the corresponding floorspace must not be entirely attributed to FLS.

8 Transmission

8.1 How the Forecast Model works

329. Almost all CAPEX that is allocated to asset category CO05 ("Transmission") is [c-i-c starts] [redacted] [c-i-c ends] According to the Forecast Model, a total of [c-i-c starts] [redacted] [c-i-c ends] m $ will be spent on additional transmission equipment during the forecast period.

Table 8-1: CAPEX allocated to asset category CO05 ("transmission equipment") [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra, Fixed Line Services Access Pricing Model FY2015-19 – update based on FLSM 1.2, 09 December 2014

330. The Forecast Model forecasts CAPEX spent on transmission equipment for 2015/16 - 2018/19 by deriving a linear trend function from the [c-i-c starts] [redacted] [c-i-c ends]. This forecasting methodology is discussed in further detail in Section 5.4.1 of this report. The total historic demand-driven CAPEX in [c-i-c starts] [redacted] [c-i-c ends], meaning that [c-i-c starts] [redacted] [c-i-c ends] have been spent in this period on additional transmission capacity.

331. The CAPEX forecasts can be mirrored against the share of the expenditure that is forwarded to FLS access seekers. These shares (or allocation factors) are hard-coded input to the model.

Table 8-2: Allocation of expenditure from asset category CO05 ("transmission equipment") to service categories[c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra, Fixed Line Services Access Pricing Model FY2015-19, Version FY2015 to FY2019 (update based on FLSM 1.2), 09 December 2014

During the forecast period, about [c-i-c starts] [redacted] [c-i-c ends] of the CAPEX gets charged to access seekers, [c-i-c starts] [redacted] [c-i-c ends] of the CAPEX allocated to transmission equipment is demand-driven. This implies that the FLSM attributes a share of demand-driven CAPEX to access seekers.

8.2 Recommendations

332. Within asset category CO05 ("transmission equipment"), the following sub-categories should be established:

- CO051 – attributed to regulated FLS
- CO052 – attributed to non-regulated FLS
- CO053 – attributed to NBN
- CO054 –attributed to other services

(This recommendation applies to all other asset categories, which will be discussed in further detail in Section 6.1 of this report.)

333. [c-i-c starts] [redacted] [c-i-c ends] Accordingly FLS access seekers should not be made to pay for demand-driven CAPEX[47] for transmission equipment. This implies: Demand-driven CAPEX and the related OPEX should not be attributed to asset subcategory CO051.

47 According to the terminology of the FSLM, "demand-driven CAPEX" is investment in additional capacity.

8.3 Economic assessment of the Forecast Model

8.3.1 Trend of demand-driven CAPEX

334. [c-i-c starts] [redacted] [c-i-c ends] That indicates that FLS is unlikely to be a driver for CAPEX spent on transmission.

As discussed in Section 5.6 of this report, demand-driven CAPEX is forecasted by means of linear trend analysis. Due to the mechanics of the Forecast Model, a simple rearrangement of historic CAPEX-figures in the time period 2011/12 – 2014/15 on the time axis (while leaving the total amount of CAPEX spent in this time period constant at [c-i-c starts] [redacted] [c-i-c ends] m $) would have changed the CAPEX-forecast for 2015/16 – 2018/19 dramatically.

335. PROPEX that is associated with the demand-driven CAPEX spent on transmission would also change if the distribution of CAPEX and/or the distribution of PROPEX in the time period 2011/12 – 2014/15 was changed.

8.3.2 Absolute level of demand-driven CAPEX

There is prima facie evidence that the **absolute level** of demand-driven CAPEX cannot be explained on the grounds of demand for regulated FLS. According to the Forecast Model, [c-i-c starts] [redacted] [c-i-c ends] m $ are supposed to be spent on **additional** transmission equipment in the forecast period. That figure has to be put in context with the expenditure on additional transmission equipment in the four years prior to the forecast period. The total expenditure on additional transmission equipment for 2011/12 – 2018/19 amounts to [c-i-c starts] [redacted] [c-i-c ends] m $.

336. According to the FLSM, FLS access seekers shall by charged for demand-driven CAPEX on transmission equipment. However, demand for regulated FLS is highly unlikely to be the reason for investment in additional transmission equipment.

337. The only regulated FLS that occupy transmission capacity in the core network are call origination and call termination (PSTN FOTAS), LCS[48] and the backhaul transmission services related to ADSL SIO.

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48 The LCS is a wholesale local call service that allows access seekers to resell local calls without deploying substantial alternative infrastructure. It involves the carriage of a telephone call from one end-user to another end-user in the same standard zone.

338. The Forecast Model predicts that demand for PTSN FOTAS and LCS will both be [c-i-c starts] [redacted] [c-i-c ends]. It is also unlikely that increased demand for ADSL-related backhaul services is the reason for investment in additional transmission capacity.

339. There is insufficient evidence that the demand-driven CAPEX spent on transmission has anything to do with the demand for regulated FLS.

Table 8-3: ADSL wholesale SIO [c-i-c starts]

[redacted]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

340. For example, suppose the overall amount of peak backhaul traffic generated by wholesale ADSL-SIO remained constant between 2013/14 and 2018/19, then the following equation would apply: [c-i-c starts]

[redacted]

[c-i-c ends]

Correspondingly, if the overall amount of peak backhaul traffic generated by wholesale ADSL-SIO remained constant between 2013/14 and 2018/19, [c-i-c starts] [redacted] .[c-i-c ends] Emphasis is to be put on the fact that it is just *peak* traffic – and not the overall traffic – that drives the transmission capacity requirements and ultimately the investment in transmission equipment.[49]

[49] Depending on the concrete shape of the peak load curve (that is to say the distribution of bandwidth requirements on the time axis) it might be well the case that overall traffic increases while peak traffic remains constant. A (hypothetical) forecast that *overall traffic* is supposed to increase by x % is fundamentally different from the forecast that *peak traffic* increases by x %.

341. To cope with an increase of peak traffic by more than [c-i-c starts] [redacted] [c-i-c ends] per average wholesale ADSL SIO, FLS access seekers would have to have more (!) backhaul capacity in place by the end of the forecast period than in 2013/14. This does not appear plausible for at least two reasons:

    1. FLS access seekers have an incentive to flatten their peak load curve ("traffic shaping"). For an FLS access seeker, more peak traffic means larger expenses on backhaul services provided by Telstra (cost-oriented charges for backhaul services are at least partly dependent on bandwidth). FLS access seekers are likely to have an incentive to prevent a very significant increase of average peak backhaul traffic per ADSL SIO.

    2. FLS access seekers will anticipate that the market for ADSL access shrinks in the course of the migration of customers to the NBN, and at that background it is unlikely that they will spend more money on purchasing backhaul capacity from Telstra.

    For a definitive assessment, Telstra would have to provide an authoritative prognosis on the backhaul capacity ordered by FLS access seekers for the realization of ADSL accesses. However, the Forecast Model does not provide a forecast on backhaul capacity.

342. As discussed above, it does not appear plausible that regulated FLS are the reason for Telstra's demand-driven CAPEX on transmission equipment. However, there are plausible other reasons (outside demand for FLS) for Telstra's investment in transmission equipment. It makes sense to believe that investment in transmission equipment is rational from Telstra's point of view. If regulated FLS are not the reason for the investment, there must be some other reason. Identifying plausible other reasons for investment in additional transmission equipment strengthens the argument that regulated FLS are not the reason for that investment. It is plausible that Telstra's investment in additional transmission capacity is motivated by the following reasons:

    - [c-i-c starts] [redacted] [c-i-c ends]

50 [c-i-c starts] [redacted] [c-i-c ends]

- Fibre loops can provide customers with more bandwidth than copper loops. This advantage can be only relevant if it there is complementary investment additional bandwidth on core network transmission links.

343. The overall conclusion to be drawn is that the investment in additional transmission equipment is highly unlikely to be driven by demand for regulated FLS.

8.3.3 Attribution of demand-driven CAPEX to asset sub-categories

344. The Forecast Model allocates substantial amounts of demand-driven CAPEX to the RAB asset category CO05 ("transmission"). However, demand for regulated FLS is highly unlikely to be the reason for investment in additional transmission equipment (see subsection above). Demand-driven CAPEX that is not related to regulated FLS should not be allocated to asset subcategory CO051 ("related to regulated FLS"). If that asset subcategory was implemented, FLS access seekers would not be charged for demand-driven CAPEX that is not related to regulated FLS.

345. The allocation of demand-driven CAPEX to other asset subcategories than CO051 – such as CO053 ("related to NBN") or CO054 ("related to other services") – would have further implications:

    1. Less expenditure on the commissioning of new assets (in Telstra's terminology: "PROPEX") would be attributable to regulated FLS.

    2. Less network-related OPEX would be attributable to regulated FLS. This concerns in particular the following types of network-related OPEX:

        - The OPEX spent on the maintenance of transmission equipment that is not related to regulated FLS.

        - The rentals for plant buildings which are attributed to transmission equipment that is not related to regulated FLS.

        - The OPEX spent on electricity, air conditioning and emergency power supply which are attributed to transmission equipment that is not related to regulated FLS.

    3. Some expenditure (CAPEX and OPEX) is neither directly nor indirectly driven by the demand for communications services. According to the terminology introduced in section 5.8 of this report, such expenditure is directly attributable to so-called "tertiary cost centres". Furthermore, according to the

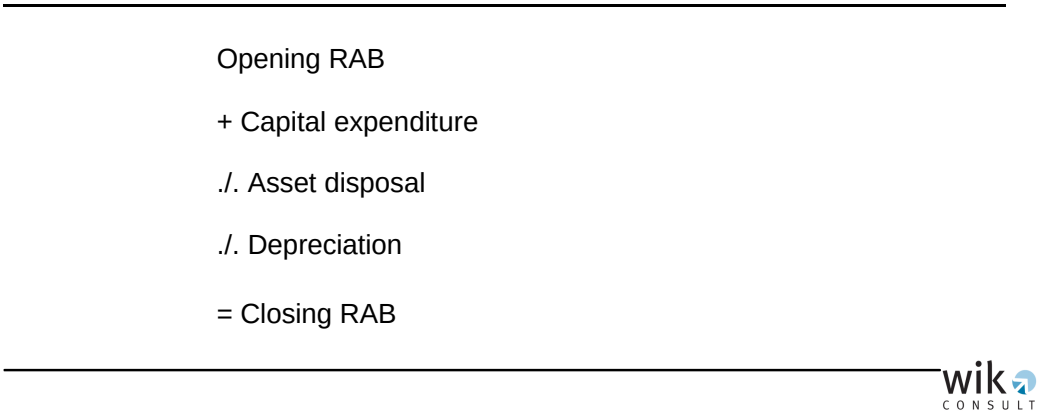
terminology introduced in section 5.8 of this report, "transmission" constitutes a primary cost centre, i.e. the costs that are directly attributable to transmission are directly driven by the demand for communications services. With the bulk of the expenditure (CAPEX and OPEX) directly allocated to the cost centre "transmission" being identified as irrelevant to regulated FLS, less expenditure from tertiary cost centres would be allocated to regulated FLS.

9 Some side findings

9.1 Forecast of asset disposal looks low

346. The forecast capital expenditure is one input into the RAB over the forecast period. In addition to forecasting capital expenditure it becomes also necessary to forecast the value of assets which will be decommissioned and removed from the RAB over the forecast period. Decommissioned assets are removed from the RAB for pricing purposes at the time of decommissioning. The remaining cost of disposed assets would also be removed from the cost base. This is demonstrated in Figure 9-1.

Figure 9-1: RAB roll-forward mechanism



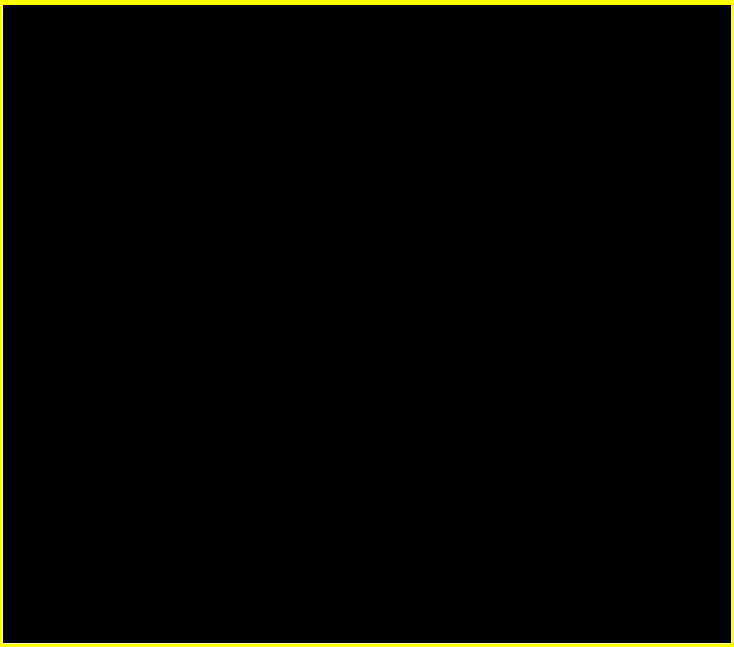
Source: WIK-Consult

347. Telstra proposes that any asset included in the RAB that is transferred to NBN Co and which is no longer contributing to the supply of fixed line services should be treated as an asset disposal.[51] According to Telstra's classification, this only seems to be the [c-i-c starts] [redacted] [c-i-c ends]. Figure 9-2 demonstrates the increase of this asset disposal to an accumulated value of $ **[c-i-c starts]** [redacted] **[c-i-c ends]** million over the forecast period.

51 See Telstra (2014a), p. 13.

Figure 9-2: Copper asset disposal

[c-i-c starts]



[c-i-c ends]

Source: Telstra (2014a), p. 14

348. Telstra's classification of assets to be transferred to NBN Co raises several questions of completeness. [c-i-c starts] [redacted] [c-i-c ends]

349. The migration of customers and services from Telstra's copper network to the NBN makes more of Telstra's assets obsolete than [c-i-c starts] [redacted]. [c-i-c ends] Telstra will need less rack space and building capacity if its customers migrate.[52] Even if these assets will not be transferred to NBN Co they

52 We have worked out this argument in more detail in Section 3.1.2.

will no longer be used by fixed line services and should be removed from the RAB. These assets are no longer needed to provide fixed line services and become obsolete due to the migration to NBN independent of whether the assets are transferred wholly or partly to NBN Co or not.

350. The need for further asset disposal beyond the limited amount of copper asset values as proposed in para. 347 is consistent with the principles which the ACCC has developed in its position statement from October 2014 (see ACCC (2014b)). The ACCC states in this context that assets which are either decommissioned or utilised to a lesser extent due to migration to NBN should be removed totally or an appropriate share of it from the regulated cost base. We fully share and support this principle.

9.2 Implications of our findings on FLS pricing

351. Although the task of this consultancy is primarily focussing on the efficiency and prudency of Telstra's expenditure forecast, we want to share with the ACCC some thoughts on the implications of our findings on pricing we have developed during the course of the project.

352. The findings on Telstra's expenditure forecast which we presented in the previous sections are of a different nature with regard to its potential transposition into the FLSM and the revenue requirements which are the basis for the FAD price determination. Some of our findings can be quantified and therefore directly transposed into the FLSM as corrections of certain elements of the model. The mechanics of the FLSM then allow to calculate revised revenue requirements and a revised pricing structure and pricing level. Some other findings which we presented (only) give reason to doubt the efficiency and prudency of Telstra's expenditure forecast. Telstra's expenditure forecast model did not allow us in these cases to translate our identification of faults and deficiencies into concrete corrections of the FLSM model. The forecast model does not provide the level of disaggregation of calculations which allows for that. As part of a set of questions which the ACCC addressed to Telstra on 14 January 2015 we developed a set of templates which inter alia included the request for detailed forecasts of physical asset quantities and network topology. Because Telstra did not feel in a position to fill these templates, we could not quantify some of our findings. As a consequence, we could only express our doubts on the appropriateness of certain expenditure forecasts and the reasons why these forecasts are not suitable to be used as input in the FLSM to determine the FAD primary prices.

353. In Section 4.1 we have shown that the expenditure category project operating expenditure (PROPEX) newly developed by Telstra should on grounds of

prudency and efficiency represent capital expenditure and not operational expenditure. For the years 2015 to 2019 real PROPEX amounts to $ **[c-i-c starts]** [redacted] **[c-i-c ends]** million and $ **[c-i-c starts]** [redacted] **[c-i-c ends]** million in nominal terms representing approximately **[c-i-c starts]** [redacted] **[c-i-c ends]** % of operating expenditure over the same period. PROPEX should not be expensed in the period it occurs but over the lifetime of the assets it is related to.

354. In Section 7 we have shown that the NBN-related CAPEX associated with remediation of duct infrastructure are caused by NBN Co and not by fixed line services. Service-specific CAPEX should generally not be part of the asset base which is shared by a variety of services. Removing NBN-related CAPEX will reduce the RAB by $ **[c-i-c starts]** [redacted] **[c-i-c ends]** million. Given that PROPEX is proportional to CAPEX, the reduction of NBN-related CAPEX will also reduce the PROPEX by $ **[c-i-c starts]** [redacted] **[c-i-c ends]** million.

Table 9-1: NBN-related CAPAEX and PROPEX **[c-i-c starts]**

[redacted]

[c-i-c ends]

Source: Telstra, Fixed Services Forecast Model, Version 1.05, October 2014

355. A variety of other faults and deficiencies which we discussed in Sections 4 to **Error! Reference source not found.** would also lead to a reduction of CAPEX and OPEX and to a reduction of expenditure allocated to the fixed line services.

356. The combined effect of the quantitative implications of our proposed changes to the expenditure forecast and the allocation of costs to the declared fixed line services would lead to a price decrease of the declared fixed line services and not a price increase.

357. The FLSM is not only generating the price level but also the price structure of the declared fixed line services. Once the revenue requirements have been allocated to the declared fixed line services, service prices can be calculated on the basis of forecast demand. This mechanical application of the FLSM would under Telstra's

uncorrected demand and expenditure forecast lead to price changes as demonstrated in Figure 9-3.

Figure 9-3: Potential price changes on the basis of Telstra's uncorrected forecast

[redacted] (2014a), p. 18

Individual prices would go up significantly, others would decrease significantly. The LSS would face a price increase of more than **[c-i-c starts]** [redacted] **[c-i-c ends]** %. Others would [c-i-c starts] [redacted] [c-i-c ends] or more. As a result, the relative prices between services would change radically.

358. The mechanical application of the FLSM on the basis of Telstra's forecast could have some disruptive effects to the market. Access seekers would have to respond to these changes of relative wholesale prices by shifting demand between services. This would have impacts on the asset requirements of Telstra and on the underlying projected cost structure which would no longer be stable. Disruptive implications on past and future investments of access seekers cannot be excluded. Also disruptive implications on Telstra's cost structure may be possible. The BBM was intended to generate certainty and predictability as well as stability to access seekers and to Telstra[53] to facilitate business and investment planning during the transition to the NBN. The presented outcome of the BBM would not be consistent with those principles. For us this outcome is to a

53 See ACCC (2011b).

relevant degree the result of faults and deficiencies of Telstra's expenditure forecasts which we have identified.

359. To overcome potential disruptive implications of structural price changes between different fixed line services, Telstra has presented a proposal which – as far as its general thrust is concerned – we find attractive for the ACCC to pursue. Telstra proposed to implement the required price increase (to meet the revenue requirements) as a once-off nominal and uniform adjustment to the prices of the declared fixed line services. This proposal would keep the price structure of the declared services unaffected but would adopt the price level in a one-time price change to the supposed revenue requirements. According to Telstra's forecast a **[c-i-c starts]** **[c-i-c ends]** % price increase would be required. We regard this proposal – again as far as its general thrust is concerned – as structurally attractive for the ACCC. It would much better meet the principles of predictability, stability and regulatory certainty than the price changes as presented in Figure 9-3, following from a mechanical application of the FLSM. Furthermore, access seekers would not be burdened with the deficiencies and unresolved allocation issues of Telstra's expenditure forecast and the allocations in the FLSM.

360. Our findings regarding the prudency and efficiency of Telstra's forecast expenditure, however, are less compatible with a price increase but more with a price decrease, without being able to quantify the exact amount of a necessary price decrease. We therefore propose to the ACCC to keep the declared fixed line prices at their current level and structure for the next two years. The ACCC should combine this pricing decision with the obligation to Telstra to provide the forecast information in a form proposed in Section 9.4 so as to make the assessment of the prudency and efficiency of the forecasts much more reliable than under the current structure of the provided documentation and information. To provide the proper incentives to Telstra we propose to decrease the declared fixed line service prices by 10% after two years for the remaining part of the regulatory period if Telstra fails to provide its forecast in a transparent form and according to the structure requested by the ACCC.

9.3 Welfare analysis of constant rates for wholesale FLS

361. The Forecast Model provides forecasts of CAPEX and OPEX. The FLSM translates these forecasts and the book values of legacy assets into a price increase for regulated FLS of more than **[c-i-c starts]** **[c-i-c ends]** %. Accordingly, Telstra claims that the costs of providing regulated FLS are increasing.

9.3.1 The scope of welfare analysis

362. The following analysis deals with the welfare effects of a denial of an increase of regulated FLS. It is plausible that the economic costs of providing FLS are decreasing rather than increasing. Economic costs are those costs that are relevant for measuring the producer surplus. If expected revenues are below economic costs, the concerned undertaking will have to leave the market. Only if expected revenues are at least recovering economic costs, there will be an incentive to invest in new assets. Economic costs are thus the costs that are relevant for measuring producer welfare and they are the costs that are relevant to decisions on market entry respectively market exit and to decisions on (re-) investment in assets.

363. It should be very clear that the following analysis is in no way meant to criticise the building block model (BBM) as form of public utility regulation. The valuation of assets in the BBM is given, and so is the way in which expenditure forecasts and the book values of assets in the BBM get translated into prices. The only intention of the following analysis is to demonstrate that if the ACCC denied an increase of rates for regulated FLS, it would not affect Telstra's investment decisions, while Telstra would still enjoy a positive producer surplus.

364. Historic costs and economic costs differ by the way in which assets get valued. In the case of economic costs, assets get valued by comparing the NPV of cash flows that can be generated with current assets with the NPV of cash flows that can be generated with so-called Modern Equivalent Assets (MEA). Current assets are attributed the value at which the operator would be indifferent between keeping the current asset and replacing it for the MEA.

365. As far as legacy core network assets are concerned, Telstra has the free choice between keeping its legacy assets and replacing them for MEA. Like other incumbents worldwide, Telstra reportedly replaces its legacy core networks for an Ethernet-based NGN.

366. As will be discussed below, fibre loops are the MEA of copper loops. As far as its legacy access network (CAN) assets are concerned, Telstra's current entrepreneurial choices are limited by legislation and contractual agreements with NBN Co. In particular, Telstra must not put own fibre loops into the ground. Furthermore, Telstra must migrate its customers to NBN Co. Keeping customers connected to copper loops is no longer an option to Telstra. Despite these facts, fibre loops are still the MEA that is relevant to the valuation of Telstra's remaining copper loops and related ducts. This statement is based on the following thesis: Compared to a hypothetical situation in which Telstra would be free to put its own fibre in the ground, the deal with NBN Co does not put Telstra in an economic

worse position. Maybe Telstra would be chosen a different scope and a different speed of fibre roll-out if there was no NBN Co, but at the time when Telstra concluded the deal with NBN Co, Telstra did not suffer an economic loss; otherwise Telstra would not have concluded the deal.

9.3.2 The concept of economic costs

367. The concept of economic costs is closely tied to the concept of the economic asset value. The economic value of a legacy asset is the hypothetical asset price at which Telstra would be indifferent between keeping the legacy asset and replacing it for the Modern Equivalent Asset (MEA). The economic costs are defined as the total of OPEX, the economic cost of capital (that is to say the economic value of the assets times the cost of capital rate) and the economic depreciation (that is to say the decline of the economic asset value). Economic costs are always independent from the vintage of the assets deployed; otherwise the value attributed to the legacy asset would be not the value at which Telstra would be indifferent between keeping the legacy asset and the MEA.

368. A firm can only stay continuously in the market if expected revenues are not below expected economic costs. If expected revenues are below economic costs, the firm will continue to operate its legacy assets as long as revenues exceed the OPEX associated with the legacy assets. However, the firm will not replace its legacy assets for new ones: When revenues are no longer sufficient to recover the OPEX associated with the legacy assets, the legacy assets will be disposed but they will not be replaced for new assets. In the long-run, the firm will leave the market. At this background, a regulator must not set prices that would not recover expected economic costs per unit of output.

9.3.3 The role of technical progress

369. In the course of time new assets emerge and get available to operators of legacy assets. These new assets permit to generate the same revenue as their predecessors at lower operating costs and lower up-front investment. In this scenario, the average costs per unit of output decline in the course of time. While economic costs are declining on the time axis, the economic costs incurring at any given point in time are still always independent from the asset vintage. A new asset might be associated with less OPEX than a legacy asset. However, in turn the legacy asset must be associated with a lower sum of economic depreciation and economic cost of capital. Hence there is a trade-off between OPEX on the one hand and CAPEX-related costs on the other hand. The overall economic costs associated with the new asset and the legacy asset have to be identical;

otherwise the legacy asset would not have been attributed the value at which the firm would be indifferent between keeping the legacy asset and substituting it for the Modern Equivalent Asset.

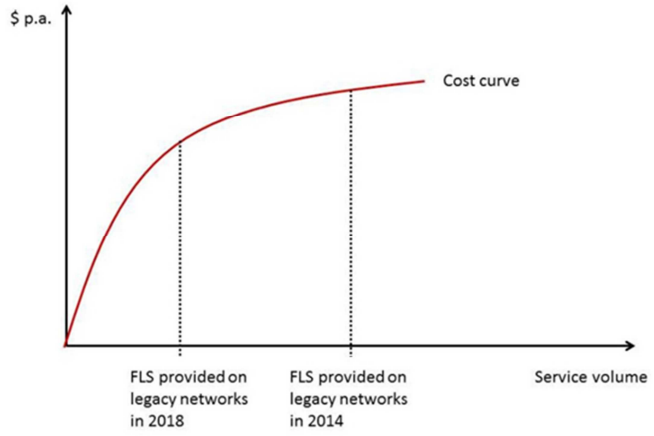
9.3.4 Increasing historic costs versus declining economic costs

370. Retail FLS provided on legacy networks can be compared to retail products that are provided on state of the art Ethernet-based NGN and fibre loops (NGA). A SSNIP-test would identify some of these latter products as substitutes for the retail FLS provided on legacy networks. It is thus fair to say that fibre loops are MEA in relation to copper loops, while the NGN is a MEA in relation to PSTN/ATM. The OPEX that is attributable to the substitutes of FLS is smaller than the OPEX of the legacy networks. Prove positive for that finding is that currently no network operator would replace its existing legacy infrastructure for the same technology. If replacement of legacy assets takes place, it will be for NGN/NGA. Hence the cost of serving the product market defined by retail FLS and its substitutes is declining in the course of time.

9.3.5 No misinterpretation of diseconomies of scale

371. Telstra's basic argument for requiring an increase of wholesale rates for FLS are diseconomies of scale: Telstra claims that regulated FLS are provided in legacy network components (copper cable), and that shrinking demand for FLS (regulated wholesale plus non-regulated retail) caused higher average costs per unit of output (see Figure 9-3-1). Though plausible at first glance, the "diseconomies of scale"-argument is flawed.

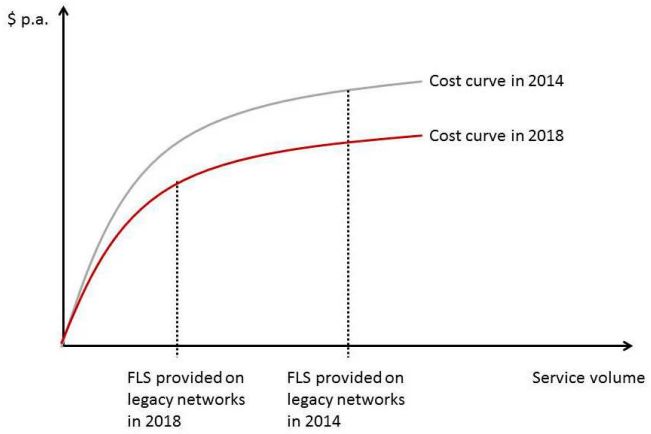
Figure 9-3-1: The basic "economies of scale"-argument



Source: WIK-Consult

372. The first flaw is the presumption that the cost curve – i.e. the functional relationship between costs and service volumes – does not change in the course of time. In reality, however, the cost curve ***does change***. The cost curve in 2018 will not be the same as the cost curve in 2014 (see Figure 9-3-2). That change of the cost curve is determined by technical progress. In this context, it is important to note that the shape of Telstra's economic cost curve ***does not depend*** on the technology that Telstra deploys in reality. In fact, that cost curve is independent from the vintage of the assets deployed. To determine the cost curve, the costs associated with Modern Equivalent Assets (MEA) have to be analysed. Claiming that legacy networks in 2018 would be associated with higher costs than the MEA just indicates the book value attributed to legacy assets is higher than the economic value of the legacy assets.

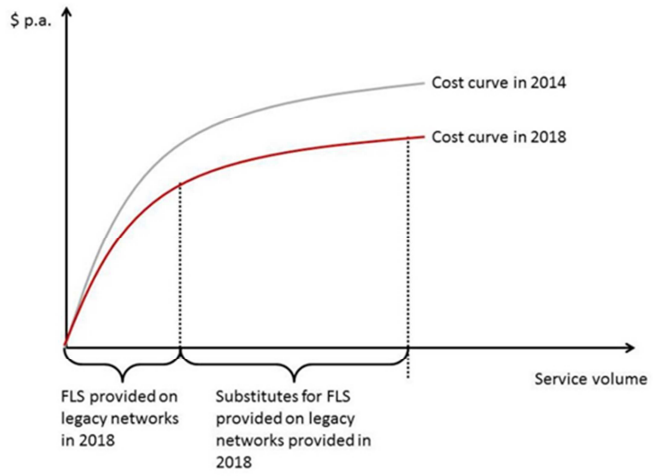
Figure 9-3-2: The impact of technical progress on the cost curve



Source: WIK-Consult

373. The second flaw of the "diseconomies of scale"-argument is that relevant service volumes are defined on the basis of distinct technology: Telstra interprets FLS as services provided on its legacy networks. However, it is not technology that defines relevant service volumes, but the substitutability of services according to the SSNIP-test. The substitutes for FLS that can be provided on NGN/NGA have to be taken into consideration when determining the average economic costs per unit of output (see Figure 9-3-3).

Figure 9-3-3: Substitutability of services determines relevant service volume



Source: WIK-Consult

9.3.6 The impact of denied price increases

374. In the subsections above it has been demonstrated that the average economic costs of providing FLS and its substitutes are declining in the course of time. At this background it can be concluded that keeping rates for regulated FLS constant would not do economic harm to Telstra. This means: If the ACCC denied an increase of rates for regulated FLS, it would not affect Telstra's investment decisions, while Telstra would still enjoy a positive producer surplus.

9.4 Recommendation on future regulatory assessment of Telstra's expenditure

375. As discussed in this report, the design of Telstra's Forecast Model is problematic. These problems relate to the following issues:

Issue 1: The categorization of expense as CAPEX respectively OPEX.

Issue 2: The methodology to derive forecasts on the annual expenditure, namely

- the inflation of hard-coded base year values to derive OPEX-forecasts

- the trend-extrapolation of [c-i-c starts] [redacted] [c-i-c ends] values to derive CAPEX-forecasts

Issue 3: The attribution of forecasted expenditure to FLS, NBN-related services and other services.

This report provides in Sections 4 – 8 various detailed recommendations for a more prudent design of the Forecast Model.

376. As a consequence of the experiences made with the Forecast Model analysed in this report, the ACCC might decide to reduce the scope for discretionary decisions by Telstra on the model design. The ACCC might consider translating the recommendations made in this report into a concrete scheme according to which forecasts have to be derived in the future. Such scheme would do the following:

1. It would define the types of model inputs.

2. It would automatically translate the model inputs into expenditure forecasts.

3. It would allocate forecasted expenditure automatically to relevant service categories.

377. Pre-determination of such scheme would go further than the definition of abstract guidelines for prudent forecasts. Abstract guidelines, no matter how carefully drafted, would always leave room for interpretation. With a concrete scheme for deriving forecasts being in place, Telstra's discretionary freedom would be limited to choosing the concrete values of the model inputs. Telstra would be largely deprived of the options

- to design the model algorithms in its favour, and

- to delay the ACCC's decision making process by submitting a sequence of "improved" versions the model algorithms.

378. Furthermore, Telstra's current Forecast Model is confidential. As model inputs and the model design are both embedded in Excel spreadsheets, the industry's insight in the model design is basically limited to the public version of Telstra's model documentation. If the ACCC decides to stipulate a concrete scheme for deriving forecasts, the transparency of model algorithms to the industry could be significantly improved.

10 Documents used in this report

ACCC (2014a): Public Inquiry into final access determinations for fixed line services – primary price terms, Discussion paper, July 2014

ACCC (2014b): Public Inquiry into final access determinations for fixed line services – primary price terms, Position statement on the treatment of the Telstra-NBN Co arrangements for regulated pricing, October 2014

ACCC (2013): wholesale ADSL FAD decision: http://www.accc.gov.au/regulated-infrastructure/communications/fixed-line-services/wholsale-adsl-final-access-determination-fad-2013

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Telstra (2014a): Public inquiry into final access determinations for fixed line services – primary prices, Response to Discussion Paper, Commercial in Confidence, 3 October 2014

Telstra (2014b): Forecast Model v 1.05, Framework and Guide to Forecast Assumptions, Commercial in Confidence, October 2014

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