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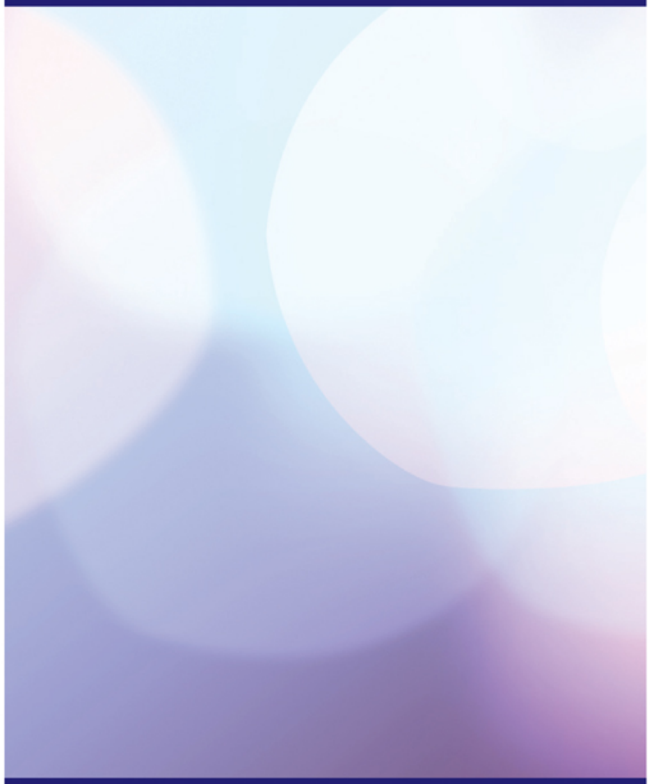

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Report for Nkom

Modelling the costs of copper networks in the Norwegian context

15 December 2017

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Ref: 2003395-402

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1 Introduction

This report provides relevant background and material in relation to Nkom's decision to use the latest version of the LRIC model of access networks for its pricing of the copper local loop unbundling (LLU) wholesale access service. This model was first developed in 2009–2012 and updated in 2015–2017. The current version is the vAcc2.2 model.

The copper LLU wholesale service falls within the definition of Market 3a from the latest European Commission (EC) Recommendation on relevant markets.[1] This market has been similarly defined by the European Free Trade Association Surveillance Authority (EFTA Surveillance Authority, or ESA).[2] The three relevant markets for this model are:

- Market 3a (wholesale local access provided at a fixed location)
- Market 3b (wholesale central access provided at a fixed location for mass-market products)
- Market 4 (wholesale high-quality access provided at a fixed location).

Two other documents published by the EC are of relevance. The first, published in September 2010, is a Recommendation on regulated access to next-generation access (NGA) networks (the '2010 Recommendation').[3] The second, published in September 2013, is a Recommendation on consistent non-discrimination obligations and costing methodologies (the '2013 Recommendation').[4] This document covers a wide range of issues including the valuation of re-used assets and the technologies to cost in relation to services relevant to broadband access.

In this report, we:

- Describe the background of copper LLU pricing in Norway (Section 2)
- Provide a comparison of historical and current costing approaches (Section 3)
- Set out the motivation for the modelling approach taken (Section 4)
- Provide an overview of the approach taken in the vAcc2.2 model (Section 5)
- Indicate how the vAcc2.2 model reflects the 2013 Recommendation and why the model is appropriate to the specific Norwegian context (Section 6).

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1 For the EC definition, see COMMISSION RECOMMENDATION C(2014) 7174 of 09.10.2014 on relevant markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC. See http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?action=display&doc_id=7045

2 See http://www.eftasurv.int/media/decisions/College-decision---Revision-of-ESA-Recommendation-on-Relevant-Markets-susceptible-to-ex-a.pdf

3 Recommendation C(2010) 6223 of 20 September 2010, see http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2010/c_2010_6223_en.pdf

4 Recommendation C(2013) 5761 of 11 September 2013, see http://ec.europa.eu/digital-agenda/en/news/commission-recommendation-consistent-non-discrimination-obligations-and-costing-methodologies

2 Background to copper LLU pricing in Norway

Regulatory accounting rules applied to Telenor originate in a decision taken in April 1995.[5] Our understanding is that this decision requires the use of historical cost accounting (HCA) principles. These rules have been revisited on several occasions. For several years in the early 2000s, Telenor presented the costs of LLU according to both HCA principles and replacement cost principles, although only the former has been used from 2005 onwards. Therefore, for the majority of its past (and including periods prior to the existence of the LLU service), Telenor's regulatory accounting has been based on HCA principles.

Telenor launched LLU in April 2000. According to Telenor's prospectus for its initial public offering in late 2000, the pricing of LLU was initially calculated on the basis of current cost, limited by end-user prices (other services were priced based on historical costs).[6] We understand from Nkom that these current costs were annualised using a standard (flat) annuity to derive prices for LLU, with an assumed asset lifetime of 15 years or less (depending on the asset).

The evolution of LLU prices in Norway since 2000 is shown below in Figure 2.1.

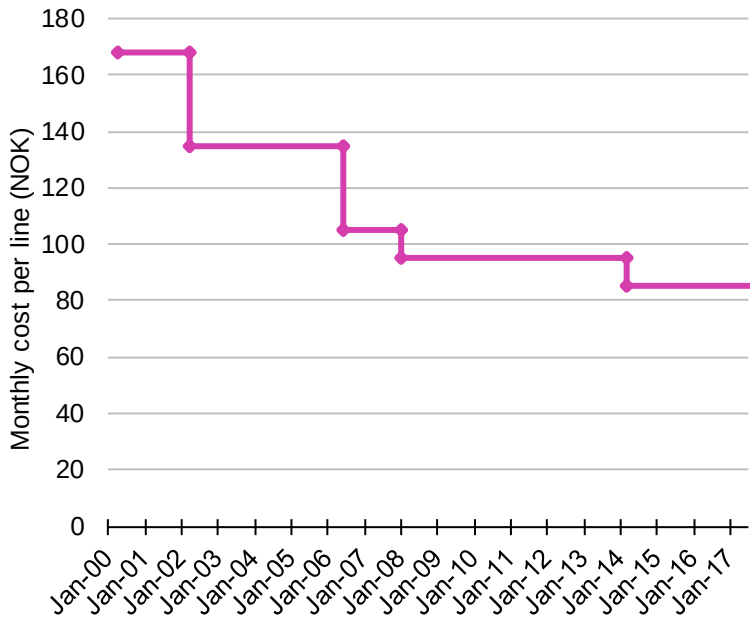


Figure 2.1: Evolution of LLU pricing since 2000 [Source: Nkom, 2017]

This flat annuity approach would lead to a higher annualised charge than HCA depreciation, given the shorter asset lifetime, the use of a replacement cost of the access network that will be higher than its historical cost (due to positive cost trends), and the use of a higher nominal WACC than in our calculation. Therefore, for the period of time where these annualised replacement costs were used to

5 See http://www.nkom.no/marked/markedsregulering-smp/%C3%B8konomisk-regulering/kostnadsregnskap/_attachment/1793?_download=true&_ts=1390f94458c, page 5

6 See https://www.telenor.com/wp-content/uploads/2014/08/telenor_ipo_prospectus_2000.pdf, page 175

price LLU, we believe that Telenor's in-year cost recovery would have been higher than if using a HCA approach.

In the two-year period when the monthly LLU price of NOK168 was applied, we understand that this price was not simply the result of the annuitised current costs but was reduced (to comply with the "limited by end-user prices" element noted above). These adjustments *may* have led to unit costs that were lower than the cost calculated using HCA principles (this cannot be established with certainty in the absence of the relevant data).[7] In any case, as this period is short, the overall impact of these prices on the overall cost recovery by Telenor would have been small. For the rest of the period, the price has been at or above the level implied by the application of HCA principles.

Norway is an example of a country that, as of 2017, still uses a HCA cost base for regulatory accounting in relation to copper LLU (Market 3a). According to BEREC's 2016 "Regulatory Accounting in Practice" report, four European Union (EU) countries still use HCA as their cost base for Market 3a as of late 2016.[8]

7 However, in its decision for Market 11 of February 2006, NPT concluded, with reference to Telenor's regulatory accounts in the years following the launch of LLU, that Telenor had over-recovered its costs from LLU. See paragraph 143 of http://www.nkom.no/marked/markedsregulering-smp/marked/marked-4-og-5/_attachment/1648?_ts=13899e2f6cd

8 See http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/6479-berec-report-regulatory-accounting-in-practice-2016, Figure 18

3 Comparison of HCA and CCA FCM costing methodologies

Although many regulators in the EU have chosen to use CCA FCM (current cost accounting financial capital maintenance) for regulatory accounting, HCA remains a potentially valid approach and is still used elsewhere in the EU. As described above, as of late 2016 four EU Member States still use only a HCA cost base for the purposes of regulating Market 3a.

HCA is also used in a number of EU Member States for related purposes. For example, Eir in Ireland is also still obliged to produce separated accounts on a HCA basis.[9]

The UK has also used HCA principles to value BT's duct assets deployed prior to 1997, with assets deployed on or after 1997 valued using CCA FCM principles.

Both HCA and CCA FCM result in the same total cost recovery by a regulated party in terms of net present value (NPV), but with a different path of cost recovery. Both lead to the full recovery of the actual costs incurred, taking into account the cost of money. We illustrate this property of HCA and CCA FCM in an example of a long-lived asset with a positive asset cost trend (such as trench deployments). The calculations illustrated below are for the cost recovery of a hypothetical trench deployment reflecting:

- Telenor's deployment profile over time
- a nominal capex cost trend of approximately +6% over time
- a similar 2015 trench unit cost per metre to that in the vAcc2.2 model
- regulatory/economic lifetimes of 30 and 50 years respectively, as in the vAcc2.2 model
- a nominal WACC, as calculated by Professor Thore Johnsen, of 8.0%.

We have calculated the fully depreciated assets by 2015 based on the regulatory lifetime and then determined the cost recovery of the non-fully depreciated assets according to both HCA and CCA FCM methods. The return of capital (depreciation) and cost of capital charges are derived separately. The costs recovered in each year based on these two methods are contrasted below.

9 See https://www.eir.ie/regulatoryinformation/separated-accounts/

Figure 3.1: Costs recovered over time using HCA [Source: Analysys Mason, 2017]

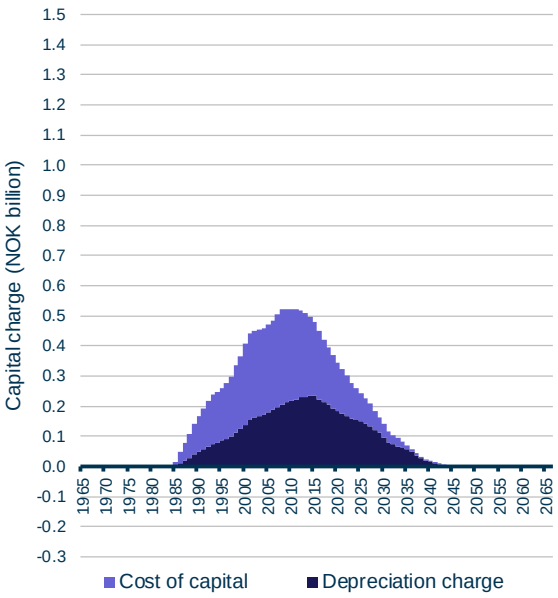
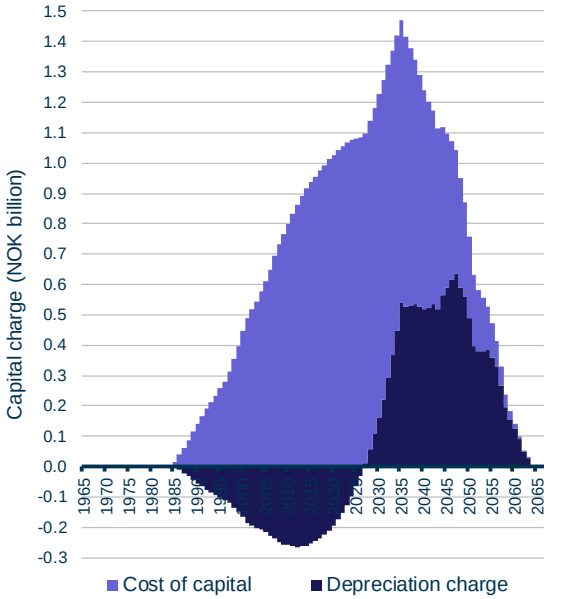


Figure 3.2: Costs recovered over time using CCA FCM [Source: Analysys Mason, 2017]



As can be seen above, the costs recovered in individual years vary considerably for the two methods. However, both methods obey two key principles. First, the total costs recovered in NPV terms using HCA and CCA FCM are the same, as shown by the two curves in Figure 3.3 below having the same endpoint.

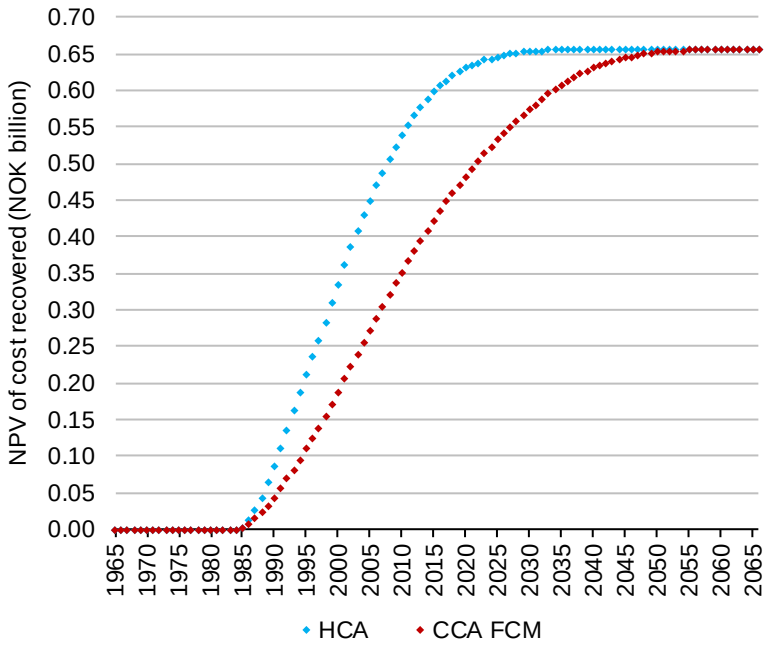


Figure 3.3: NPV of costs recovered over time under both methods [Source: Analysys Mason, 2017]

Second, in any given year, the net book value (NBV) of the existing assets is equal to the NPV (in that year) of all future cashflows. The profiles of NBV for HCA and CCA FCM are very different, as shown below in Figure 3.4 and Figure 3.5 respectively.

Figure 3.4: NPV of future cashflows (equal to NBV), calculated for each year, for HCA [Source: Analysys Mason, 2017]

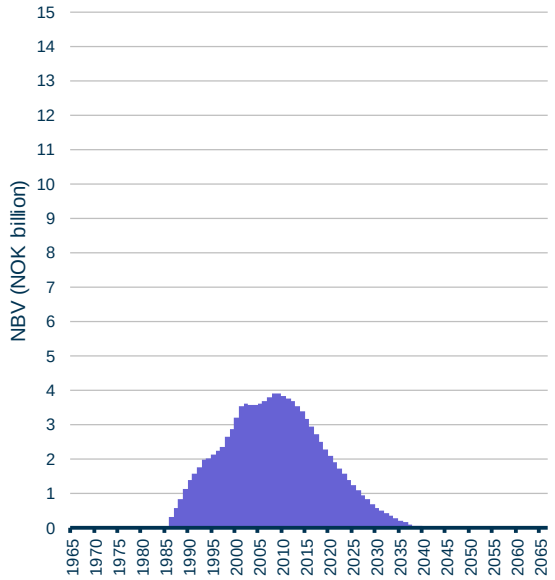
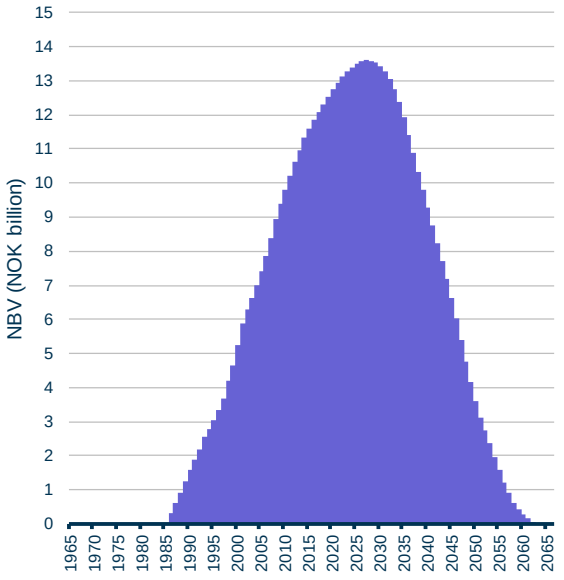


Figure 3.5: NPV of future cashflows (equal to NBV), calculated for each year, for CCA FCM [Source: Analysys Mason, 2017]



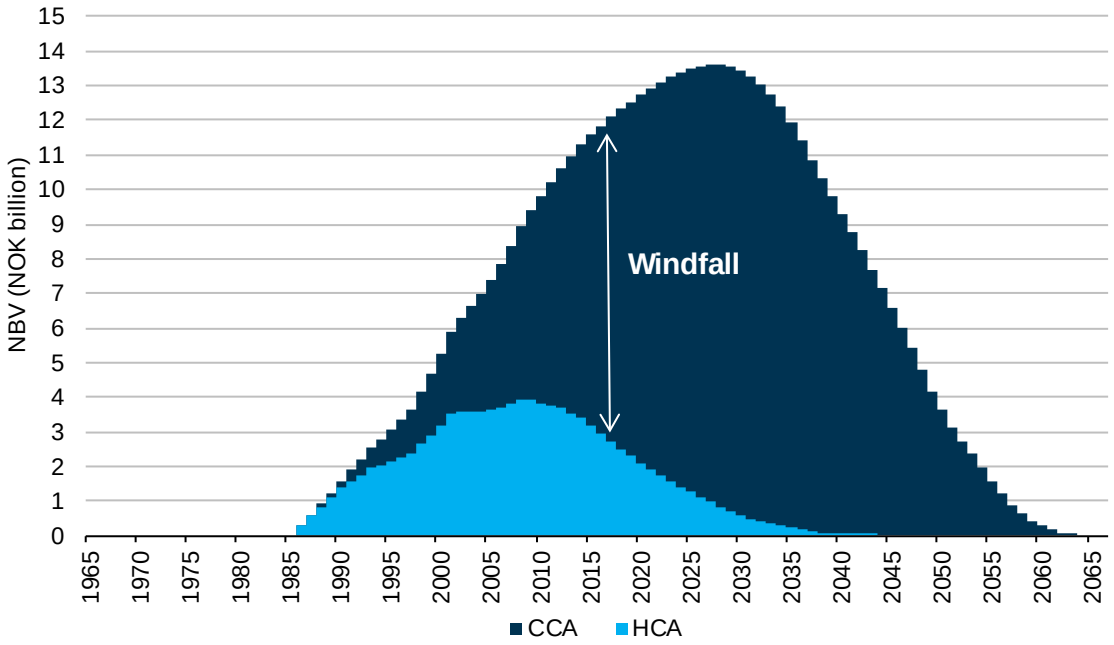
Changing the depreciation method during an asset's lifetime (such as from HCA to CCA FCM) can potentially lead to a windfall gain (or windfall loss). A windfall gain will occur when changing from HCA to CCA FCM if there is an increase in the NPV of future cashflows under CCA FCM compared with that expected under HCA. It can be shown that this quantity is the same as the change in the net book value (NBV) at that date i.e.

Change in NPV of expected future cashflows = CCA FCM NBV – HCA NBV

In other words, a windfall gain or loss can arise from the revaluation of the underlying assets. In particular, it is not the gross replacement cost, but the change in the NBV that matters. The same principle applies to fully depreciated assets (whose NBV is zero); an upward change to the NBV of these assets would inevitably result in a windfall gain.

When considering the example shown in Figure 3.4 and Figure 3.5 above, the windfall gains in 2018 can be seen as the difference in the two curves in 2018, as illustrated below.

Figure 3.6: The windfall gains in our illustrative example if a change in accounting principles were to occur in 2018 [Source: Analysys Mason, 2017]



It is possible to change depreciation method during an asset's lifetime without causing an over-recovery or under-recovery. This can be achieved by using the initial asset depreciation method and lifetime to derive the NBV at the point of the depreciation change. It is then this remaining NBV that is depreciated (and recovered) using the new depreciation method over the remaining assumed asset lifetime.

4 Motivation for the approach taken in the vAcc2.2 model

Many regulators (and also the European Commission) prefer the use of CCA FCM (which also uses economic lifetimes) because it reflects asset price changes over time and the economic lifetime of the assets. This preference was not made explicit by the EC in the 2013 Recommendation, but has been made explicit in subsequent documents. For example, the Lithuanian regulator (RRT) notified the EC in December 2015 that it intended to continue to use HCA as the cost base for Market 3a (Case LT/2015/1821 on CIRCABC). The EC responded to the RRT with the comment that:

> *In particular the choice of HCA for all assets in the cost model can potentially lead to very low access prices. An FDC HCA model is unlikely to send the appropriate build or buy signals, in particular when pricing access to legacy assets that may have been substantially depreciated, but which could be replicated in the competitive process, such as technical equipment or the transmission medium. The more common BU LRIC+ Current Cost Accounting (CCA) model used by other NRAs and recommended in the Commission in its Recommendation on Costing and Non-Discrimination is likely to meet that objective.*

Notwithstanding these comments, RRT then adopted the measures in January 2016, meaning that Market 3a pricing in Lithuania continues to use HCA depreciation.[10] RRT considered it would be disproportionate at this stage to adopt a CCA-based LRIC model, given that:

- the transition from copper to NGA has already largely taken place in Lithuania
- civil assets will not be replicated and should therefore not be valued at current costs
- RRT considers that copper prices will remain stable over the next period of review
- fibre-based retail products are cheaper than copper-based ones in Lithuania
- the migration of retail demand from copper-based products to fibre-based products was steady, which RRT believed was indicative of the incumbent's willingness to migrate its subscribers to NGA products.

It must be remembered that both HCA and CCA FCM recover the same NPV. Therefore, the choice between HCA and CCA FCM should have no effect on the investment incentives of the regulated party, although it may influence the "build versus buy" incentives faced by other market entrants.

There are two linked objectives to consider: avoiding over-recovery versus sending efficient market signals. These two objectives are not necessarily of equal importance in the context of copper wholesale access pricing. Even if they were of equal importance, Nkom still has to make a choice between them. In particular, if a move to CCA FCM modelling were to give efficient signals to the market, the effect of moving from a pricing approach that takes HCA regulatory accounts as an input would be to effectively generate a windfall gain for Telenor.

[10] See https://circabc.europa.eu/sd/a/9f798c49-5653-4891-ab6b-6a7fbb5a1852/4_M3a_letter_EC_LT_2015_1821_final_decision_20160113.pdf

As we have described in Section 3, changing depreciation method part way through the lifetime of an asset can lead to windfall gains (or losses). Put another way, the NPV of future cashflows will be increased (or decreased) by making this change. For example, Ofcom's "valuing copper access statement"[11] of 2005 says:

> *4.11 In terms of cost recovery, the total returns permitted will be equivalent (for any given asset), irrespective of whether an HCA or FCM CCA methodology is applied, provided that the methodology is applied consistently throughout the asset's life and that such returns are discounted at the operator's cost of capital. However, any change in methodology during the life of the asset could lead to an over- or under-recovery of cost. The analysis conducted by Ofcom has shown that the inconsistent application of CCA on some of BT's network assets has created the potential for a future over-recovery of costs against those assets.*
>
> *4.12 Although the use of CCA and HCA are equivalent in terms of cost recovery if applied consistently over time, a switch between the two conventions could potentially give rise to over- or under-recovery of costs depending upon the future replacement cost and the point during the asset lifecycle at which the switch took place. This is because, while the extent of cost recovery is equivalent between the two approaches, the path of cost recovery is not.*

Ofcom continues to use HCA for duct assets deployed by BT prior to 1997: it refers to this HCA treatment of specific assets as the regulatory asset valuation (RAV) adjustment. This adjustment (implemented within the final statement cited above) avoids a windfall gain resulting from a previous change from HCA to CCA FCM in the regulatory accounts as of 1997. Ofcom considered its approach to be consistent with article 40 of the 2013 Recommendation, namely the use of "an asset valuation method that considers certain civil infrastructure assets would not be replicated in the competitive process".[12]

In addition to the UK, other countries have considered and used mixed depreciation approaches (e.g. accounting approach before one date, economic approach after). Belgium is one example and France is another.[13] ComReg in Ireland has also proposed to use HCA principles to value reusable assets in its most recent decisions on Eir's wholesale access services.[14] ComReg concludes that where an infrastructure asset is non-replicable, it is reasonable to base regulatory pricing on historical costs, even though it uses a CCA FCM LRIC model.

Another relevant example is when ARCEP determined to modify the lifetimes of copper cable/duct assets in the annex to Decision 2012-0007.[15] In that annex, ARCEP state that, when changing

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11 Ofcom's final statement on "Valuing copper access", dated 11 August 2005. See http://web.archive.org/web/20131224223724/http://stakeholders.ofcom.org.uk/binaries/consultations/copper/statement/statement.pdf

12 See http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/statement-june-2014/volume2.pdf, paragraph 3.35

13 For Belgium, see http://www.bipt.be/public/files/en/805/3653_en_consultation_document_for_bipt_23-12-2011_.pdf, Section 2.2.3

14 See http://www.comreg.ie/_fileupload/publications/ComReg1567.pdf, paragraph 4.79

15 See https://www.arcep.fr/uploads/tx_gsavis/12-0007.pdf

assumptions during the depreciation cycle, it is natural to determine the net asset value and apply the depreciation formula to that value over the remaining life of the asset concerned.

A similar situation of capturing a mix of depreciation approaches is now being potentially faced in Norway, if considering CCA FCM for assets for which HCA has previously been used in the regulatory accounting (which has subsequently been an input to Nkom's regulatory price setting).

Adopting CCA FCM would likely lead to an increase in the NPV of Telenor's future cashflows, such that over the remaining lifetime of the assets Telenor would be allowed to over-recover on its copper network services. The theme of avoiding over-recovery can be found in recital 35 of the 2013 Recommendation itself, which states:

> *This approach sends efficient market entry signals for build or buy decisions and avoids the risk of a cost over-recovery for reusable legacy civil infrastructure.* ***An over-recovery of costs would not be justified*** *to ensure efficient entry and preserve the incentives to invest because the build option is not economically feasible for this asset category.*

5 Overview of the approach to modelling the copper network

The 2013 EC Recommendation gives emphasis to the depreciation methods used specifically for what it refers to as legacy *reusable civil engineering assets* (RCEA) compared with the methods of cost recovery used for other assets.

RCEA are assets that would be unlikely to be replicated in a modern network because they already exist and can be re-used in an NGA deployment, albeit possibly with some refurbishment. For an NGA network, RCEA would include poles, trenches with spare duct space and manholes.

The vAcc2.2 model includes two versions of a calculation that considers the residual value of RCEA.

The first, on the *A6ReUse* worksheet, is used to derive the residual capital value and residual economic lifetime for RCEA assumed to be used in a fibre-to-the-home (FTTH) NGA network. This worksheet is not relevant to the copper modelling.

The second is relevant to the copper modelling and can be found on the *A7ResidualValueCopper* worksheet. It is used to derive the residual capital value and economic lifetime for *all* assets in the copper network. These copper-related calculations can be used for two different purposes, namely:

- for all assets reused between the cabinet and the end user in a fibre-to-the-node (FTTN) network (what we would refer to as the secondary copper network assets)
- an estimation of the residual capital value/lifetime in the entire copper network.

The approach taken for the copper network modelling has been to consider the entire copper network as an infrastructure that cannot be replicated (an operator would not cost-efficiently deploy a national copper network in Norway today) and therefore apply our residual value calculation to all copper network assets in order to calculate the NBV using HCA principles.

A regulated asset base (RAB) for this capital value is then calculated and depreciated on an asset class basis over the average remaining lifetime of that asset class. We use tilted annuity depreciation to depreciate this RAB on a year-by-year basis. The RAB is also indexed using the Norwegian consumer price index (CPI). Assets that are found to be fully depreciated according to the regulatory lifetime are not included in the RAB.

We would note that, whilst RRT is continuing to use what the EC refers to as a "pure HCA standard" for its Market 3a copper access pricing, the Nkom vAcc2.2 model is not. Instead, it is using HCA to derive the residual value for the copper network. This residual value is then locked into a RAB and depreciated over the remaining economic asset lifetime using a tilted annuity.

6 How Nkom's copper modelling reflects the 2013 Recommendation

In the 2013 Recommendation, articles 30–37 are concerned with the recommended costing methodology. We quote each of these articles below and how Nkom's vAcc2.2 model meets these recommendations, or why there is a divergence.

Figure 6.1: Overview of the key articles in the 2013 Recommendation [Source: Analysys Mason, 2017]

No.	Summary of article	Summary of compliance
30	For the purposes of setting copper and NGA wholesale access prices where cost orientation is imposed as a remedy, where appropriate, proportionate and justified pursuant to Article 16(4) of Directive 2002/21/EC and Article 8(4) of Directive 2002/19/EC, NRAs should adopt a bottom-up long-run incremental costs-plus (BU LRIC+) costing methodology which includes a bottom up modelling approach using LRIC as the cost model and with the addition of a mark-up for the recovery of common costs.	The vAcc2.2 model of copper networks calculates asset requirements on a bottom-up basis. A mark-up is used to recover common costs. Using a RAB for all copper assets means that the approach is not a LRIC calculation for the copper network.
31	NRAs should adopt a BU LRIC+ costing methodology that estimates the current cost that a hypothetical efficient operator would incur to build a modern efficient network, which is an NGA network. This is without prejudice to whether an NGA network in the relevant geographic market is subject to an obligation of regulated wholesale access pricing, which is addressed in point 36 of Recommendation 2010/572/EU and points 48 and 49 of this Recommendation.	This article is not relevant to the copper modelling. However, for reference, for the modelling of the two FTTH architectures), the vAcc2.2 model calculates the current costs of the network using a BU LRIC+ approach. For the modelling of the FTTN/VDSL architecture, the vAcc2.2 model calculates the current costs of the primary network and models the secondary network as reusable copper assets. This is described below.
32	When modelling an NGA network, NRAs should define a hypothetical efficient NGA network, capable of delivering the Digital Agenda for Europe targets set out in terms of bandwidth, coverage and take-up, which consists wholly or partly of optical elements. When modelling an NGA network, NRAs should include any existing civil engineering assets that are generally also capable of hosting an NGA network as well as civil engineering assets that will have to be newly constructed to host an NGA network. Therefore, when building the BU LRIC+ model, NRAs should not assume the construction of an entirely new civil infrastructure network for deploying an NGA network.	This article is not relevant to the copper modelling. For reference, the vAcc2.2 model considers the modelling of NGA networks (FTTN/VDSL and two FTTH architectures). All three architectures assume some reuse of poles and ducted routes, though this is limited since a large proportion of the copper route network is not ducted (and therefore not reusable).

No.	Summary of article	Summary of compliance
33	NRAs should value all assets constituting the RAB of the modelled network on the basis of replacement costs, except for reusable legacy civil engineering assets.	The vAcc2.2 model of copper networks considers all the modelled assets to be "reusable". This is assumed because modelling the copper assets at current replacement cost in Norway would likely lead to a significant windfall gain for Telenor. This is because: • the replacement cost of the copper-related assets would be far higher than their original gross book value due to past positive cost trends • until now, these assets have been depreciated in the regulatory accounts using HCA, meaning a current cost revaluation would mean a change in depreciation method during the asset lifetime. The assets are heavily depreciated on an HCA basis.
34	NRAs should value reusable legacy civil engineering assets and their corresponding RAB on the basis of the indexation method. Specifically, NRAs should set the RAB for this type of assets at the regulatory accounting value net of the accumulated depreciation at the time of calculation, indexed by an appropriate price index, such as the retail price index. NRAs should examine the accounts of the SMP operator where available in order to determine whether they are sufficiently reliable as a basis to reconstruct the regulatory accounting value. They should otherwise conduct a valuation on the basis of a benchmark of best practices in comparable Member States. NRAs should not include reusable legacy civil engineering assets that are fully depreciated but still in use.	The RAB for the reusable assets is defined to begin at the start of 2018, at which point the residual capital value of the reusable assets is calculated. Specifically, this is our estimate of regulatory accounting value net of the accumulated depreciation as of the start of 2018. Since, in the Norwegian context, straight-line depreciation has been used, this residual capital value is the HCA NBV. The model inputs used to calculate historical capital costs (prior to 2010) were calibrated in the previous version of the model (v1.7), by comparison with Telenor's gross book value. The RAB is indexed using Norway's CPI. Copper assets that are modelled as being fully depreciated by the start of 2018 are not included in the RAB.
35	When applying the method for asset valuation set out in point 34, NRAs should lock in the RAB corresponding to the reusable legacy civil engineering assets and then roll it forward from one regulatory period to the next.	Having defined the RAB for the relevant assets as of the start of 2018, we index the remaining value within the RAB from year to year using CPI. Then, for a selected future year, we calculate the total capital charge for each asset in the RAB, using either CCA FCM depreciation or a tilted annuity (the user can choose between them, but the tilted annuity is used in the vAcc2.2 model). The return-of-capital (depreciation) part is subtracted from the remaining value of the RAB, meaning that the remaining RAB value of an asset is then recovered over its remaining lifetime. However, a difference is that this is applied to all copper assets, rather than just the reusable civil engineering assets.

No.	Summary of article	Summary of compliance
36	NRAs should set the lifetime of the civil engineering assets at a duration corresponding to the expected period of time, during which the asset is useful and to the demand profile. This is normally not less than 40 years in the case of ducts.	Within the model, civil engineering assets are assumed to have a lifetime of 50 years, based on the data received from Telenor regarding the average age of its existing assets.
37	In light of the principle of technological neutrality, NRAs should consider various approaches to modelling the hypothetical efficient NGA network depending on the access technology and network topology that best fit national circumstances. When determining the access prices of services that are entirely based on copper, NRAs should adjust the cost calculated for the modelled NGA network to reflect the different features of wholesale access services that are based entirely on copper. For this purpose, the NRAs should estimate the cost difference between an access product based on, for example, FTTC/FTTH and an access product based entirely on copper by replacing the optical elements with efficiently priced copper elements, where appropriate, in the NGA engineering model. Where appropriate, NRAs could otherwise obtain the copper cost by modelling an NGA overlay network, where two networks (copper and fibre, either FTTH or FTTC) share to an extent the same civil infrastructure.	The modelling of replacing optical elements with efficiently priced copper elements is not appropriate in the Norwegian context. This is because modelling the copper assets at replacement cost in Norway would lead to a windfall gain for Telenor, as already discussed above. The modelling of an NGA overlay network would not be appropriate in Norway, since operator data has established that only a small proportion of trenches could be reused by NGA (since a large proportion of existing trenches are not ducted in reality).

Whilst Article 31 recommends that where cost-orientation is imposed, copper wholesale access prices should be set using a bottom-up LRIC+ model, there are larger EU Member States that do not use this approach (i.e. it is not just smaller Member States such as Lithuania). For example:

- In ARCEP's most recent pricing decision regarding Markets 3a and 3b (Cases 2016–1832 and 2016–1833), the prices for copper access services are derived for 2016 and 2017 based on the forecasting of the incumbent's actual cost parameters (a top-down approach)[16]

- In Ofcom's consultation of March 2017 on proposed charge control designs for the Wholesale Local Access (WLA) market review, Ofcom proposed to price copper LLU using a top-down model based on BT's accounting data to calculate the cost of providing LLU services, with some adjustments made where appropriate in order to ensure consistency with their overall approach to modelling.[17]

16 See https://circabc.europa.eu/sd/a/bd83af85-4f8a-4e93-886f-64900863a6e6/FR-2016-1832-1833-1834%20ADOPTED_publication_EN.pdf

17 See https://www.ofcom.org.uk/__data/assets/pdf_file/0034/99637/Vol2-Charge-control.pdf, paragraph 2.56

- In ACM's most recent decision regarding Market 3a (Case NL 2016–1916), the price cap for existing LLU services was based on the previous price cap increased by the consumer price index only (i.e. kept constant in real terms).[18]

A key part of the 2013 Recommendation is article 34 (and its corresponding recital 35), which can be paraphrased as "By using methodology X, you achieve the aim of Y". In our specific context, "Y" is taking account of the costs already recovered by Telenor. We believe that, in the context of the 2013 Recommendation, achieving this desired aim of article 34 (i.e. identifying the cost already recovered by Telenor) is more important than the specific means (as indicated in the Recommendation) through which this could be achieved.

If a current costing approach such as CCA FCM were to be used in the Norwegian context, then we do not believe the aim of article 34 would be achieved. This is because Telenor has not recovered costs in the past under CCA FCM principles, since until now Nkom has set wholesale access line price caps (where required) using HCA-based accounts as a significant input.[19]

If the issue of past cost recovery was restricted to LLU lines, then the issue would be much smaller in magnitude since LLU has consistently been a small proportion of Telenor's subscriber base. However, implicitly, all products using the copper access network should have to use the same basis of cost recovery. This is not just a practical point; if the internal and external use of these assets were costed differently (e.g. if Telenor's retail products were charged less for the use of the asset), then this would be a significant breach of non-discrimination.

Therefore, we do not believe that moving to a CCA FCM-based approach with economic lifetimes and CCA FCM revaluation can achieve the intended aim of article 34 in the specific case of Norway, given the use of HCA principles in the regulatory accounting (which Nkom has since used as an input for regulatory price setting) until now.

Our recommended approach is instead to calculate the HCA NBV of all the copper assets and then depreciate these remaining capital costs over the remaining lifetime using a RAB and a tilted annuity.

18 See https://circabc.europa.eu/sd/a/7168cd23-8f19-46de-bb7e-58dec0341f19/NL-2016-1916%20ADOPTED_EN.pdf

19 We understand that, for a period, Telenor's local loop pricing was based on annualised replacement cost using a flat annuity. This may have led to over-recovery compared to HCA (the uncertainty is in relation to whether the price was in fact higher than implied by HCA in that period, as noted above. Correcting for any such over-recovery would lead to an even lower NBV (and therefore lower residual value).