INSTITUT BELGE DES SERVICES POSTAUX ET DES TÉLÉCOMMUNICATIONS

COMMUNICATION DU CONSEIL DE L'IBPT

DU 7 JUILLET 2008 CONCERNANT

L'IMPACT DE LA FERMETURE DES CENTRAUX

SUR LES MARCHÉS D'ACCES À LARGE BANDE

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CONTEXTE

Belgacom a déclaré au cours de sa réunion générale du 9 avril 2008 que dans le cadre de la modernisation de son réseau et du passage à la technologie Ethernet dans son réseau core et de l'utilisation de VDSL2 pour le réseau d'accès, elle souhaitait fermer environ 10% à 15% de ses centraux.

Le 13 juin 2008, Belgacom a présenté ses plans à l'IBPT et quelques jours plus tard, elle les a communiqués au secteur. L'IBPT ne disposait de la liste concrète des 65 centraux identifiés pour fermeture qu'un jour après la communication.

En fermant une série de points d'accès à la boucle locale ou à la sous-boucle locale, Belgacom fait en sorte qu'il ne soit plus possible de récupérer les investissements réalisés par les opérateurs alternatifs dans le cadre du développement d'un réseau propre.

L'impact de la fermeture de 65 centraux est considérable. Bien qu'il s'agisse seulement de 10 à 15% du nombre de centraux, cela aura un impact sur 40% des lignes BRUO et 14% des lignes BROBA et un espace de colocalisation est présent dans 52 de ces centraux. Il est également important de remarquer que cette fermeture peut également avoir des implications sur les points d'interconnexion des services vocaux et du backhaul mobile.

Un certain nombre de centraux figurent également sur la liste, pour lesquels un nouvel espace de colocalisation a été prévu dans les mois à venir. Il y a de fortes chances pour que ces investissements n'aient pas lieu si l'Institut ne donne pas rapidement plus de transparence sur ce qu'il adviendra de ces fermetures prévues. La disparition de ces investissements supplémentaires peut avoir de lourdes conséquences pour la concurrence sur le marché belge de la large bande.

Les premiers centraux doivent être vidés pour le 1er janvier 2003, par conséquent les opérateurs alternatifs doivent quitter ces centraux au cours de la période 2011-2012.

Il s'agit ici de circonstances exceptionnelles qui nécessitent des mesures spécifiques. Par le passé, des espaces de colocalisation ont déjà été fermés mais il existait toujours la possibilité d'obtenir un accès dégroupé aux mêmes utilisateurs finals via un autre emplacement, ce qui permettait de poursuivre la fourniture du service.

Belgacom reconnaît également cela en stipulant clairement dans sa présentation du 14 juin 2008 que la fermeture prévue de 02NOR n'a rien à voir avec les projets "Move-to-All-IP" de Belgacom. L'accès MDF pour 02NOR reste maintenu et l'opérateur alternatif peut fournir une ligne BRUO aux mêmes utilisateurs finals par le biais d'une colocalisation dans 02MAR alors qu'avec les 65 LEX annoncés qui sont menacés de fermeture, un accès dégroupé ne sera plus possible à ce niveau.

LA VIABILITÉ DU DÉGROUPAGE DE LA SOUS-BOUCLE LOCALE

La disparition du dégroupage au niveau des centraux (LEX) contraint les opérateurs à investir dans le dégroupage de la sous-boucle locale au niveau des cabines de rue (SC).

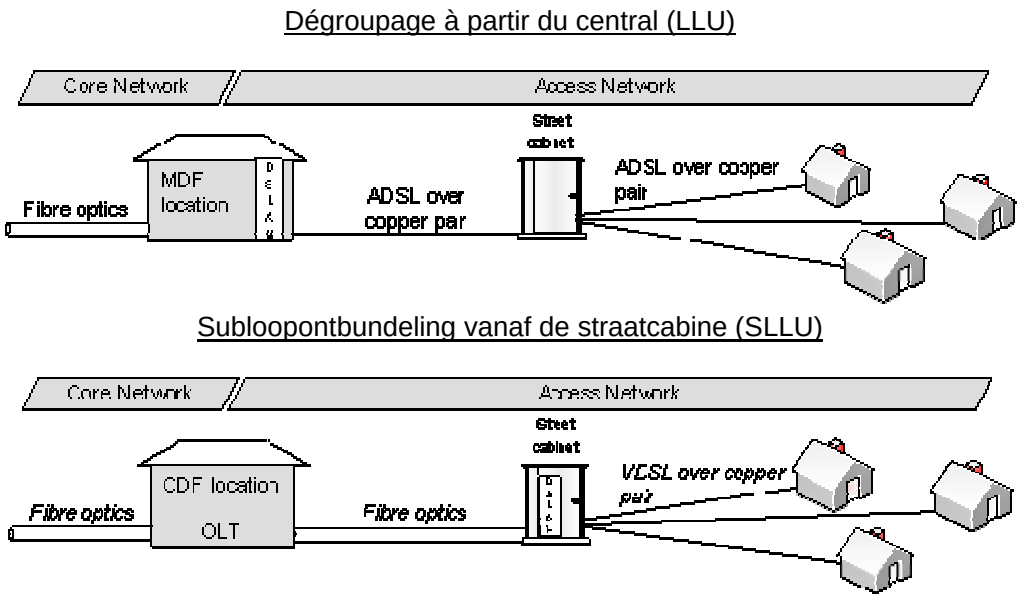

Figure 1. Aperçu de l'évolution du réseau d'accès (Source: Cullen, 2007)

La volonté et les possibilités d'un opérateur d'investir dans la poursuite du déploiement d'un réseau vers le SC dépendent du nombre de clients qu'il sait atteindre avec cette offre et des coûts liés à cet investissement.

Les économies d'échelle et de gamme gagnent plus en importance que pour le dégroupage de la boucle locale car la masse critique pour que certains projets commerciaux restent viable est plus facilement présente au niveau de la cabine de rue qu'au niveau LEX, Cela restreint les options pour les opérateurs alternatifs.

L'étude Analysys Mason (voir annexe) montre que le dégroupage de la sous-boucle locale n'est viable que dans une mesure restreinte. Le déploiement de VDSL2 dans certaines cabines de rue n'est intéressant que si un opérateur alternatif possède une part de marché suffisante (bénéficie d'économies de gamme), des revenus supplémentaires peuvent être générés par client en offrant des services innovateurs, la connexion backhaul peut se faire de manière payante et s'il peut être fait usage des remote optical platforms existantes.

L'IBPT estime que Belgacom est actuellement le seul opérateur qui, de par ses économies d'échelle et de gamme, est en mesure de déployer le VDSL2 en offrant une couverture nationale.

Pour maintenir la concurrence en Belgique, il est nécessaire d'une part que les opérateurs alternatifs aient la possibilité d'investir dans le dégroupage de la sous-boucle locale s'ils entrevoient un business case positif pour certaines cabines de rue. Pour cela, il faut que l'IBPT ajoute des services de support supplémentaires à l'offre de référence.

D'autre part, l'étude de faisabilité montre que pour la plupart des cabines de rue, le dégroupage de la sous-boucle locale n'est pas une option et qu'une offre bitstream à part entière est nécessaire pour maintenir la concurrence.

PROJETS DE L'IBPT CONCERNANT LA FERMETURE DES POINTS D'ACCÈS À LA BOUCLE LOCALE

FIXER DES CONDITIONS

Plusieurs obligations d'accès s'appliquent à Belgacom en tant qu'opérateur PSM. Selon la décision concernant l'analyse de marché du 11 janvier 2008, il est interdit à Belgacom de retirer l'accès sans que l'IBPT ou le tribunal ait donné son autorisation explicite:

> *Conformément à l'article 61, §1er, alinéa 3, de la loi relative aux communications électroniques, Belgacom ne devra pas, sans l'autorisation de l'IBPT ou d'un tribunal, interrompre une prestation d'accès dégroupé lorsque cela causerait un préjudice à l'opérateur ayant souscrit à ce service. Les conséquences d'une interruption de service sont tellement graves pour l'utilisateur final et l'opérateur alternatif, que cette interruption ne devra pas intervenir sans l'autorisation préalable de l'IBPT ou d'un tribunal.*
>
> *De plus, Belgacom ne retirera pas de prestations de son Offre de Référence sans l'accord préalable de l'IBPT. Belgacom a pour obligation de préserver l'acquis des Offres de Références adoptées antérieurement, à moins qu'une de ces obligations soit contraire aux objectifs de la loi relative aux communications électroniques.*

L'Institut est donc compétent pour établir les conditions que Belgacom doit remplir avant de retirer l'accès des opérateurs alternatifs suite à la fermeture des centraux.

L'Institut est d'avis que les mesures suivantes sont nécessaires avant de pouvoir procéder à la fermeture des centraux:

- Si Belgacom décide de fermer un site pour l'accès à la boucle locale ou à la sous-boucle locale, elle doit laisser ce central ouvert pendant une période déterminée encore après l'annonce à l'Institut et le maintenir ouvert aux bénéficiaires de l'offre BRUO comme si une offre de dégroupage était achetée à cet emplacement. Il est important que les opérateurs qui investissent reçoive un retour suffisant car dans le cas contraire, ils auront tendance à ne plus vouloir investir en Belgique, ce qui pourrait avoir de lourdes conséquences pour la dynamique future du marché et pourrait porter gravement préjudice à la concurrence.

- Etant donné que le dégroupage de la sous-boucle locale VDSL s'avère une option onéreuse, il est proportionnel de maintenir le réseau actuel parallèlement à l'établissement de VDSL par Belgacom aux endroits où Belgacom ne ferme que partiellement les LEX et que la colocalisation y reste possible en déménageant les équipements.

- Avant de mettre fin au service de gros, Belgacom doit prévoir la migration vers une alternative à part entière pour les services actuels auxquels il est mis fin par la fermeture des centraux. Cette offre doit prévoir suffisamment de possibilités de diversification sur le plan de la qualité et du fonctionnement pour qu'un large éventail de services puisse être offert aux utilisateurs finals.

LE PROCESSUS DÉCISIONNEL

Le 10 janvier 2008, l'IBPT a pris une décision concernant l'analyse des marchés d'accès à large bande 11/2003 et 12/2003.[1] Belgacom y a été désignée comme un opérateur avec une position dominante sur les marchés de l'accès dégroupé et l'accès bitstream.

A la page 200 de la décision susmentionnée, il était déjà prévu que l'IBPT lancerait une consultation concernant les NGN (Next Generation Networks) et le NGA (Next Generation Access) qui adapterait la décision concernant l'analyse de marché.

> *Le développement technologique vers les NGN (Next Generation Networks) et le NGA (Next Generation Access) entraînera le remplacement du réseau actuel ATM-/xDSL de Belgacom par un réseau dont les caractéristiques ne sont pas encore connues et qui fera l'objet d'une consultation distincte de l'IBPT dans le courtant du quatrième trimestre de 2007.*

L'IBPT a lancé la consultation[2] concernant les NGN du 3 janvier au 29 février 2008 inclus. L'Institut a reçu des réactions de Belgacom, de la Plate-forme, de Mobistar et de Telenet.

Après avoir traité les réactions et en tenant compte des éléments nouveaux, l'Institut transmettra successivement le projet de décision au Conseil de la concurrence, aux régulateurs communautaires et à la Commission européenne.

M. VAN BELLINGHEN
Membre du Conseil

G. DENEF
Membre du Conseil

C. RUTTEN
Membre du Conseil

E. VAN HEESVELDE
Président du Conseil

ANNEXE: ETUDE CONCERNANT LE DÉGROUPAGE DE LA SOUS-BOUCLE LOCALE

[1] Depuis la nouvelle Recommandation CE de décembre 2007, les marchés 11/2003 et 12/2003 ont été renommés marchés 4 et 5.
[2] http://ibpt.be/ShowDoc.aspx?objectID=2593

1 Background

Analysys Mason has been commissioned by the Belgian Institute for Postal services and Communications (BIPT) to investigate the business case for sub-loop unbundling (SLU) for alternative operators in Belgium.

With local loop unbundling (LLU), the line is handed over from the incumbent operator to other alternative operators (OAOs) at the Main Distribution Frame (MDF).[1] In contrast, with sub-loop unbundling (SLU) the line is handed over at the street cabinet, which is much closer to the end user than the MDF. The deployment of fibre-to-the-cabinet (FTTC) and the use of the *sub-loop* from the street cabinet (utilising VDSL technology) significantly reduces the length of copper loop required to reach customers, enabling high downstream bandwidths of several tens of Mbit/s to be offered to many customers, as well as important improvements in upstream speed compared to ADSL2+ technology. This development is likely to be attractive to business customers, and will also help providers to offer IPTV and video streaming services to the mass market, therefore representing a means to increase the range of services offered and the revenue per client achieved. However, such a deployment requires significant investment as the number of street cabinets (around 30 000 in Belgium) is much higher than the number of MDFs (around 1000).

As presented by the BIPT in its Consultation document on NGN and NGA (February 2008), the incumbent operator Belgacom has already commenced a very aggressive FTTC/VDSL roll-out, with coverage reaching over 60% of population in spring 2008 and 80% forecasted in the long term. Moreover, Belgacom announced in June 2008 that, following its network upgrade, it plans to close 65 local exchange buildings during the period 2013-18 and as a result, wishes to cease providing services such as LLU that depend on those local exchanges (when these buildings are closed).

In this context, BIPT is currently considering additional measure to be imposed on the wholesale network infrastructure and broadband access markets (Markets 11 and 12 of the 2003 list of relevant markets[2]) so as to continue stimulating competition to the benefit of end users. Analysys Mason has already carried out analysis for the national regulators of Ireland (ComReg) and the Netherlands (OPTA) to assess the commercial attractiveness of SLU in these countries.[3] On the basis of this project experience, we have developed for BIPT an economic model that takes into account the specificities and characteristics of the Belgium market so as to assess the commercial attractiveness of SLU to alternative operators in Belgium. This work aims at contributing to BIPT's assessment of appropriate and justified remedies for Markets 11 and 12, by identifying the key levers to promote the development of competition in the Belgian market.

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1 Which can be located either in a local exchange (LEX) or in a local distribution centre (LDC), which is itself linked to a LEX by an optical fibre.

2 Markets 4 and 5 of the 2007 list of relevant markets

3 These reports can be found on http://www.odtr.ie/_fileupload/publications/ComReg0810a.pdf and http://www.opta.nl/download/Analysys+Final+Report.pdf

2 Approach

2.1 Methodology

Main principles

Our model examines the business case of an alternative operator in the Belgian market and compares the cost of LLU and SLU under different conditions of coverage, backhaul, co-location and market share. In order to do this, we calculate the relevant network costs downstream of each local exchange for LLU and for SLU, as presented in Figure 2.1 below.

- **For LLU**, we consider the relevant network costs within the LEX and all its attached LDC that are incurred by the alternative operator in order to provide double-play services (Internet access and telephony) by renting the (full) local loop of the incumbent.
- **For SLU**, we consider the relevant network costs from the LEX and all its attached LDC to and within street cabinets (SC), that are incurred in order to provide triple-play services (TV, Internet access and telephony) by renting the (sub) local loop of the incumbent.[4]

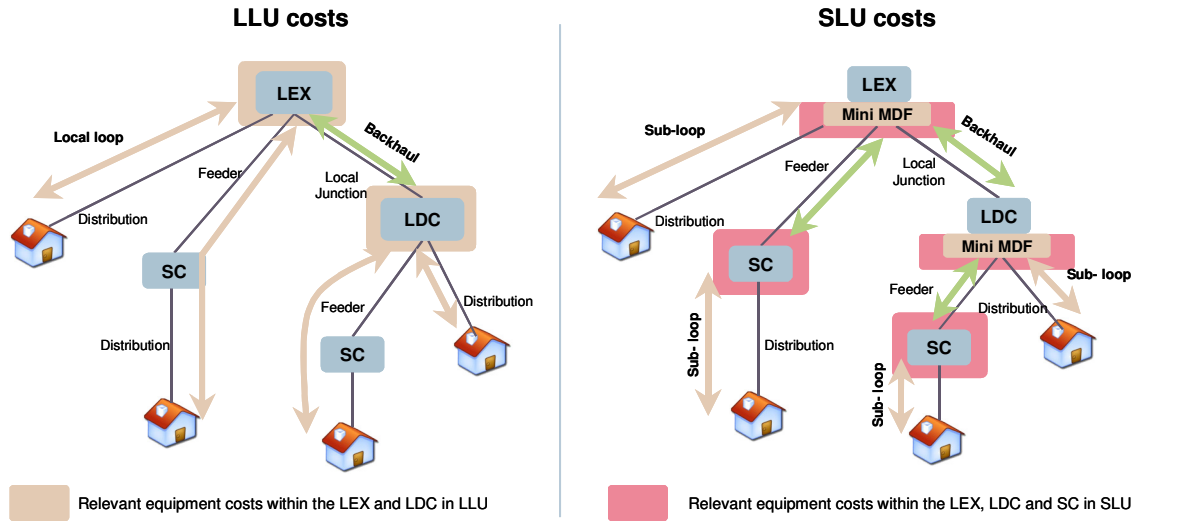

Figure 2.1: Schematic of LLU and SLU costs incurred by alternative operator [Source: Analysys Mason]

Triple-play services, in the context of SLU, are considered because it is commonly recognised by operators that FTTC/VDSL investment can only be justified in the context of additional revenues (over and above those achieved via LLU-based services) such as those offered by the triple-play approach.

4 In order to take all of the incremental costs for triple-play services into account, we also consider the costs of content rights and a video platform (which are located higher in the network hierarchy than the local exchange).

The main outputs of the cost model are:

- The NPV of the cost over a period of 10 years of providing services using the two delivery options (LLU and SLU), divided by the NPV of the number of customers. This calculation makes it possible to assess the average cost per subscriber per year taking into account the phasing of costs.

- The difference of the average cost (per subscriber per year) for these two delivery options, which represents the incremental ARPU[5] that would be necessary for the alternative operator to cover the cost difference calculated between SLU and LLU.

Network topology

Our model considers the same network inputs as the BIPT local loop cost model,[6] such as the number of LDC/SC/lines per LEX, the distance between the LEX/LDC/SC, and so on.

The share of lines per street cabinet that the modelled alternative operator will unbundle is an important input for the model. We have first estimated the total proportion of lines that will support services provided by all of the alternative operators, with a progression from the current 8% to around 20 % in 2018. We have then examined two possibilities:

- The modelled alternative operator has 50% of the total market share of all the alternative operators – this represents a "leading" DSL alternative operator.

- The modelled alternative operator has 100% of the total market share of all the alternative operators – this represents either a leading alternative operator which has consolidated the other DSL alternative operators in the market, or an alternative operator that is providing wholesale services to all of the other DSL alternative operators.

We have derived the length of the backhaul needed on the basis of the topology and factors used in the BIPT local loop model, as well as on real data provided by Belgacom. We have considered four possible backhauling options:

- **Build own**, whereby the alternative operator builds its own backhaul (trenching, putting ducts, installing fibre) to connect its street cabinets from the LEX or LDC and, where applicable, connects its LDC to the LEX.

- **Duct sharing**, whereby the alternative operator rents the ducts from another operator and installs its own fibre.

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5 Assuming that fixed costs are the same in the two delivery options and therefore that this additional ARPU also represent additional margin

6 Described in the annex to the decision by BIPT board taken on 13 June 2007 regarding BRUO rental fee.

- **Fibre lease**, whereby the alternative operator leases dark fibre from another operator.
- **Ethernet backhaul**, whereby the alternative operator uses a bitstream type of service (comparable to a BROBA offer priced by user) to connect the street cabinet to the LEX.

It should be noted that in the absence of regulated services corresponding to the last three of these backhaul options, we have used estimates for these main cost drivers based on reference offers or current prices in other EU countries (including Netherlands, Ireland, France, etc.), or have used Analysys Mason estimates.

In modelling the installation of relevant equipment at street cabinet locations, we have considered three options:

- **Build own ROP** (Remote Optical Platform), whereby the alternative operator builds its own platform next to Belgacom's street cabinet, pays for a tie cable to get access to the sub-loop and installs its equipment in this platform.
- **Share ROP with one OLO**, whereby the alternative operator shares with another alternative operator the costs of building a shared platform close to Belgacom's street cabinet, with a tie cable to get access to the sub-loop. In this option, both alternative operators install their equipment in a single platform, so that the cost, although higher in total than for one operator, is shared between the two alternative operators.
- **Share ROP with incumbent**, whereby the alternative operator uses a potential regulated co-location offer in Belgacom's ROP. We have evaluated the price of this offer as the incremental cost for the incumbent operator for an extended platform that can accommodate two operators, compared to the cost of a platform for one operator alone.

Services provided

In our interviews with the main Belgium operators, it was their view that the main source of revenues in order to cover the additional cost of FTTC/VDSL compared to ADSL will be from TV services, currently not provided by alternative operators on the basis of ADSL services. For this reason, we have differentiated the services provided based on LLU and SLU as follows:

- services provided with LLU in our model are double-play services (Internet access and telephony)
- services provided with SLU are triple -play services (TV, Internet access and telephony).

Model structure and main cost elements

As presented in Figure 2.2 below, the model calculates for one local exchange at a time, and is populated by a file which contains data for all the LEXs ordered by decreasing number of lines.

Depending on the coverage selected, our model then calculates the total cost associated with that coverage. We have sorted the LEXs by decreasing number of lines in order to consider different coverage options, starting with the most densely populated regions where scale effects for SLU are more important.

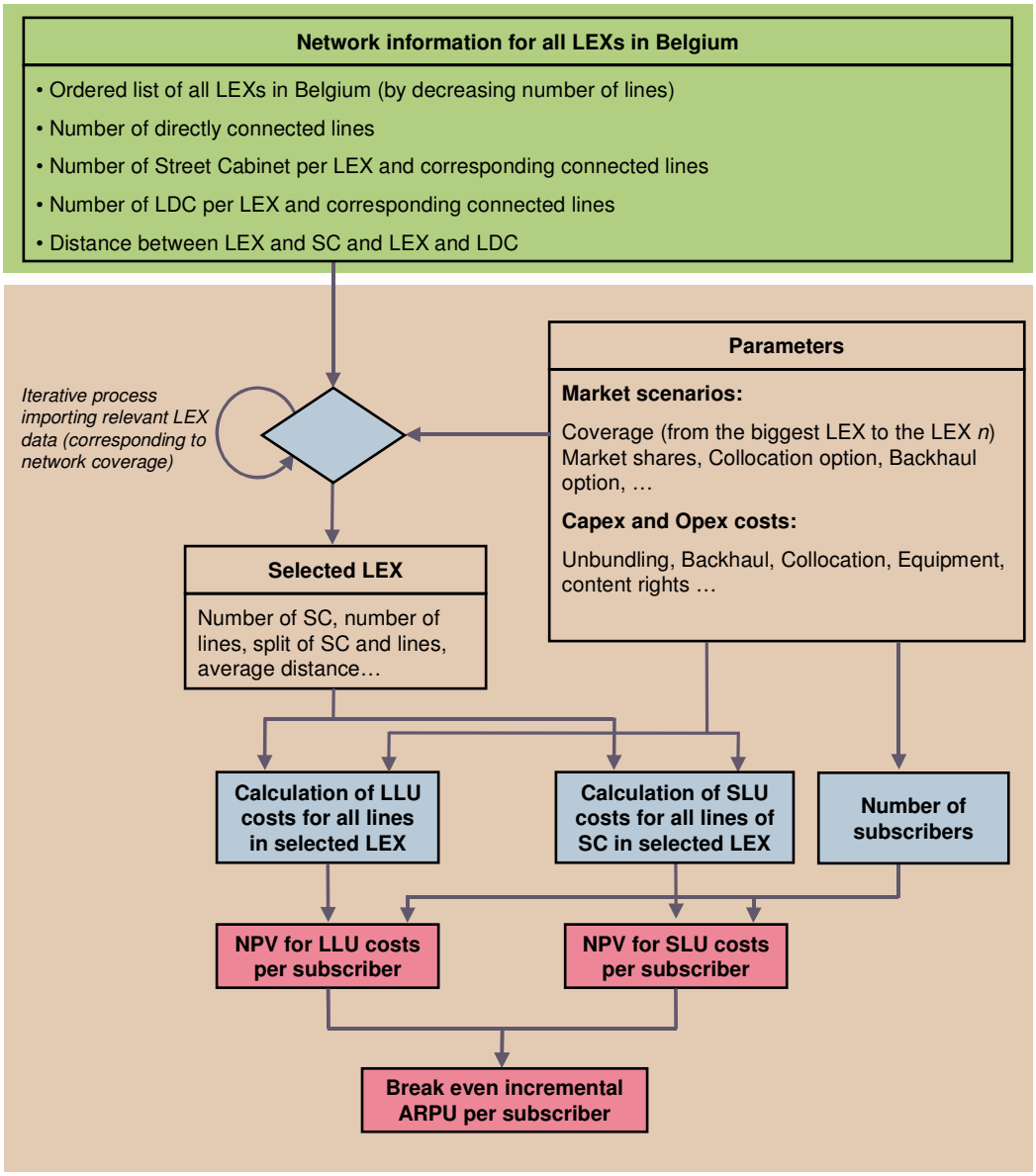

Figure 2.2: Overview of model methodology [Source: Analysys Mason]

The table below shows the main cost elements, by category, considered in both the LLU and SLU cases in the model.

Cost elements	*Capex*	*One-off opex*	*Recurring opex*
Video content rights (only relevant for SLU business model)			√
Backhaul (*build own backhaul, duct sharing, fibre lease, Ethernet backhaul*)	√	√	√
Unbundling (*local loop or sub-loop line rental, connection/ disconnection charges*)		√	√
Equipment and maintenance (*DSLAM, video platform*)	√		√
Co-location (*ROP costs, power, tie cables*)	√	√	√

Figure 2.3: Cost elements considered for LLU and SLU in the model [Source: Analysys Mason model]

The annex of this document details all the main unit costs considered in the model.

3 Key findings

We present below the key findings of our analysis.

3.1 Replicating Belgacom's business model is not realistic for an alternative operator

We have first assessed the commercial viability of an alternative operator that would theoretically try to replicate Belgacom's business model – that is, by:

- covering 80% of the population in Belgium
- using a "Build own" option for backhauling
- using a "Build own ROP" option for installing its equipment.

Under this scenario, we assumed that the alternative operator would have 50% of the total alternative operator market share (estimated to represent 10% of the copper lines within the coverage area by 2018).

As presented in Figure 3.1, under these assumptions, from the local exchange, the costs to provide LLU-based services amount to EUR326 per customer per year, and EUR2336 for SLU-based services. The incremental ARPU necessary to cover the additional costs between SLU and LLU is therefore EUR168 per month, which is clearly not realistic.

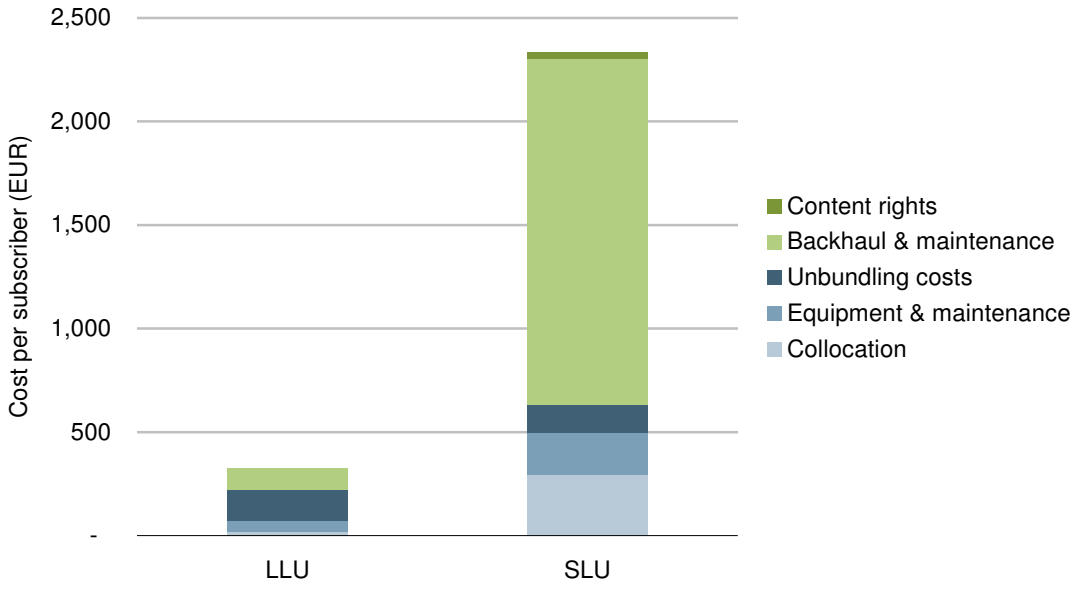

Figure 3.1: LLU and SLU annual costs per subscriber, assuming 80% coverage [Source: Analysys Mason]

It should be noted that that this figure does not represent the business case of the incumbent operator since :

- Belgacom can expect (and already achieves) a much higher market share than the one considered for the modelled alternative operator
- The incumbent can enjoy a lower cost of backhaul than the alternative operator (and these costs represent more than 70% of the cost per line in the SLU case). This is due to the mutualisation of the incumbent infrastructure with other services and potentially lower unit cost than the one we have considered in this study for alternative operators since Belgacom has the opportunity to roll out its backhaul network on an "opportunistic basis" (e.g while maintaining its network or when civil work is necessary)
- Belgacom could consider a longer investment perspective than the 10-year perspective that we have considered in this study for alternative operators.

3.2 Different levers can be identified to improve the SLU business model

In order to assess the commercial attractiveness of an SLU business model for an alternative operator, we have reviewed the following options :

- population coverage
- backhaul options
- co-location options
- market share.

3.2.1 Population coverage

Figure 3.2 below shows the impact of the number of LEXs covered, sorted by increasing number of lines, on the average annual cost per subscriber for LLU and SLU.

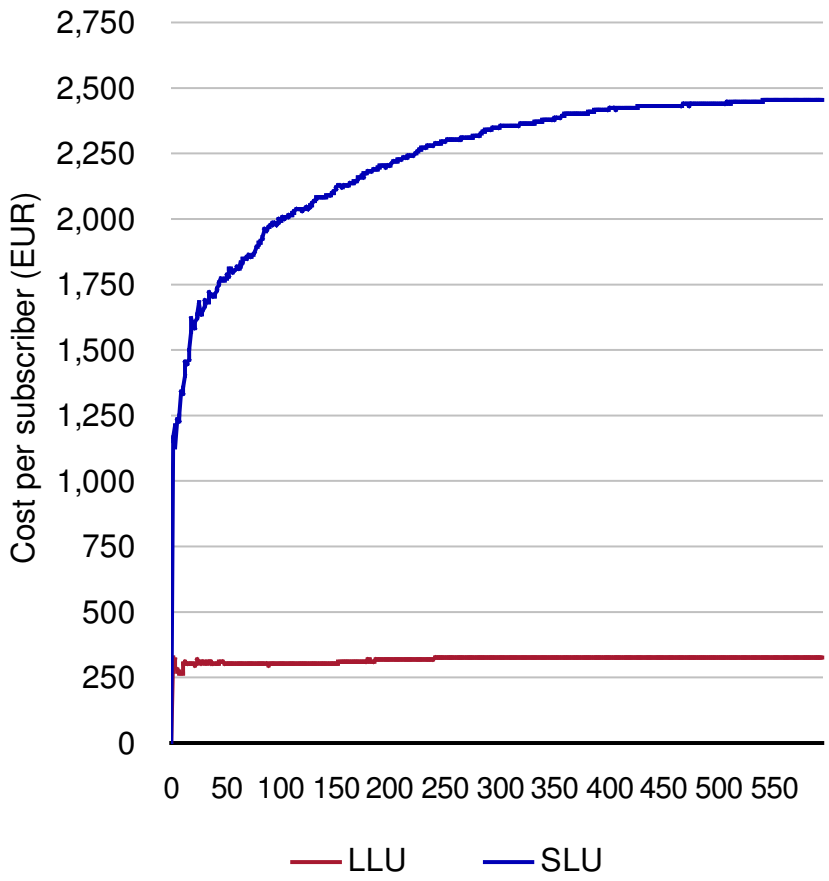

Figure 3.2: Impact of coverage on the average annual cost per subscriber for LLU and SLU [Source: Analysys Mason model]

As illustrated by the figure above, the SLU business case is more sensitive to scale effects than the LLU business case, so that reducing coverage has a bigger impact on SLU profitability than for LLU. In order to consider a realistic coverage scenario for an alternative operator, we assume that an alternative operator will not look to cover more than the 50 biggest LEXs (representing less than 10% of total LEXs in Belgium), in total covering around 30% of the population in Belgium.

As presented in Figure 3.3 below, under these assumptions[7] the additional costs of providing services with SLU compared to LLU total EUR1468 per customer per year. The incremental monthly ARPU necessary to cover these additional costs therefore represents EUR122 per month.

[7] Alternative operator covering 50 LEXs, building its own backhaul and its own ROP, with 50% of total alternative operator market share.

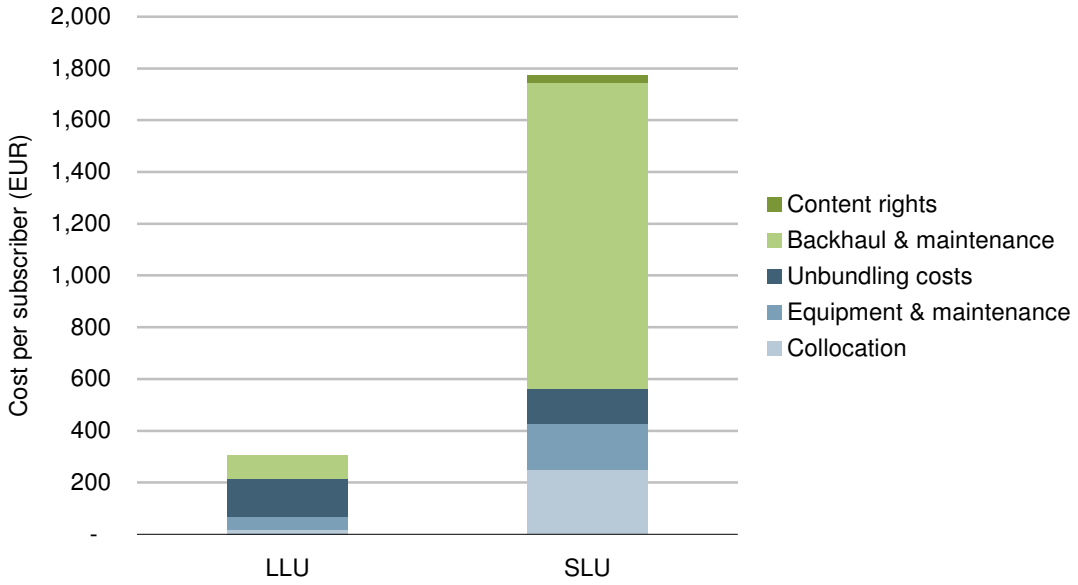

Figure 3.3: LLU and SLU costs per subscriber for the 50 biggest LEXs [Source: Analysys Mason]

3.2.2 Backhaul options

Figure 3.4 below shows the impact of the different backhaul options on the average cost per subscriber for SLU with all other parameters kept as in section 3.2.1 above, namely:

- 30% of the population covered
- using a "Build own ROP" option to install its equipment
- 50% of total alternative operator market share.

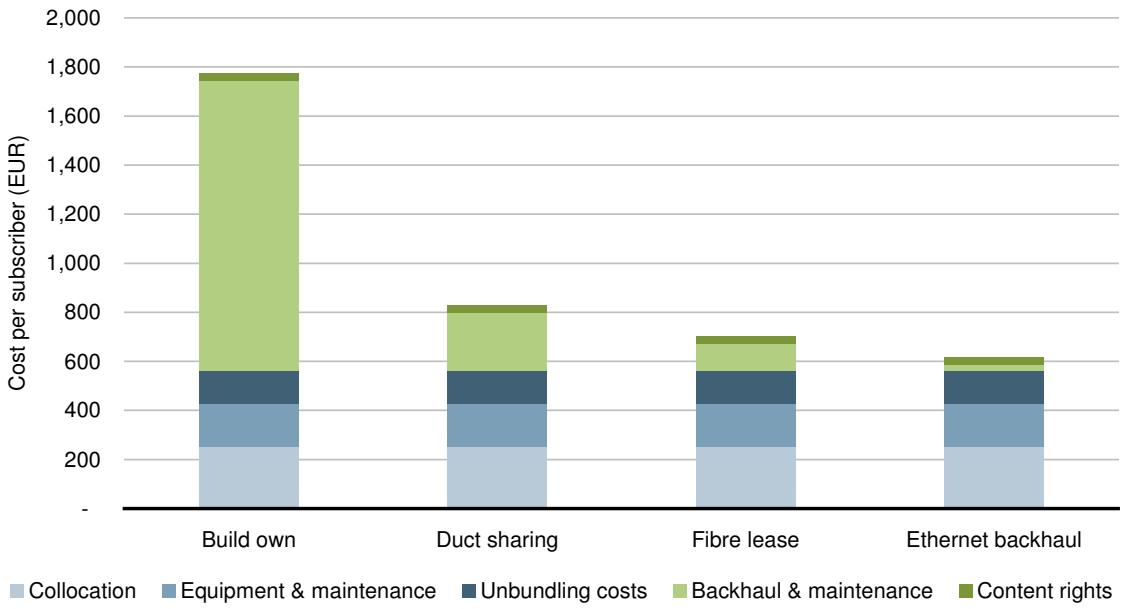

Figure 3.4: Impact of backhaul choice on SLU cost per subscriber for the 50 biggest LEXs [Source: Analysys Mason]

As illustrated in the graph above, backhaul is a fixed cost that is difficult to cover with a limited number of customers served by street cabinet. Given the average size of a street cabinet (typically 150 lines in total) and the market share considered for alternative operators (typically 10% to 20%), the "Ethernet backhaul" option, with a flat cost per customer, provides the most efficient cost structure.

Under these assumptions, the additional costs to provides the services with SLU compared to LLU amount to EUR399 per customer per year. The incremental monthly ARPU necessary to cover these additional costs represents around EUR33.

3.2.3 Co-location options

Figure 3.5 below shows the impact of the different co-location options on the average cost per subscriber for SLU, with all other parameters kept as in section 3.2.2, namely:

- 30% of the population covered
- Ethernet backhaul option
- 50% of total alternative operator market share.

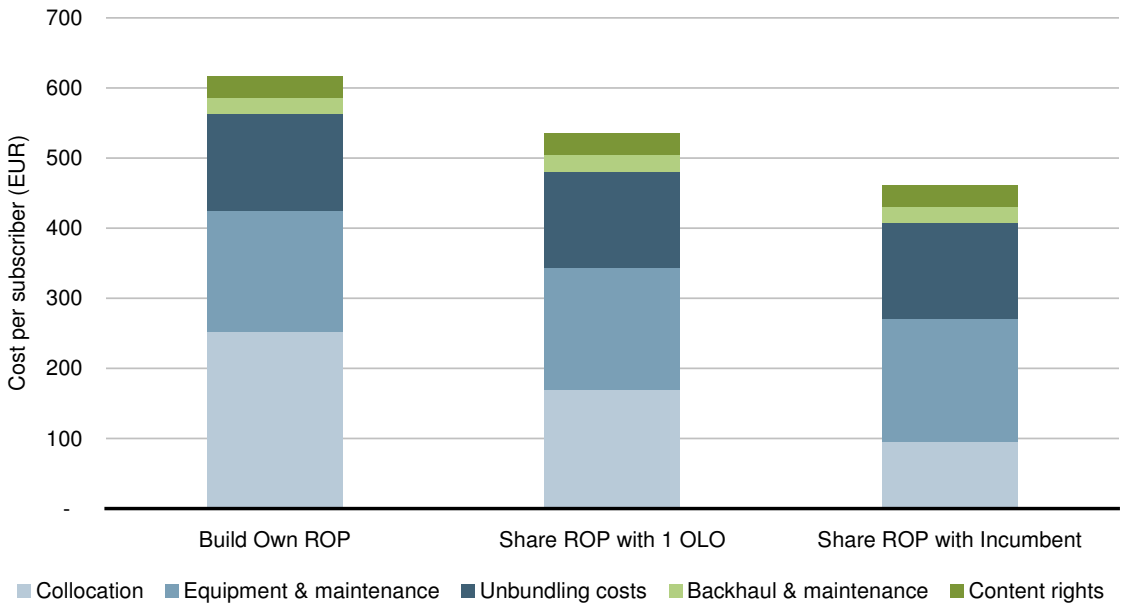

Figure 3.5: Impact of co-location choice on SLU cost per subscriber for the 50 biggest LEXs [Source: Analysys Mason]

The graph shows that, in a similar manner to the backhaul solutions discussed above, building a street cabinet represents a fixed cost that is difficult to cover with the limited number of customers that an alternative operator can serve using that street cabinet. The co-location option "Share ROP with incumbent" provides the best cost structure for the modelled alternative operator.

Under these assumptions, the additional costs to provides the services with SLU compared to LLU are EUR244 per customer per year. The incremental monthly ARPU necessary to cover these additional costs represents around EUR20.

3.2.4 Market share

Figure 3.6 below shows the impact of the market share (in terms of lines) reached by an alternative operator in 2018 on the average cost per subscriber for SLU, with all other parameters kept as in section 3.2.3, namely:

- 30% of the population covered
- "Ethernet backhaul" option
- "Share ROP with incumbent" co-location option.

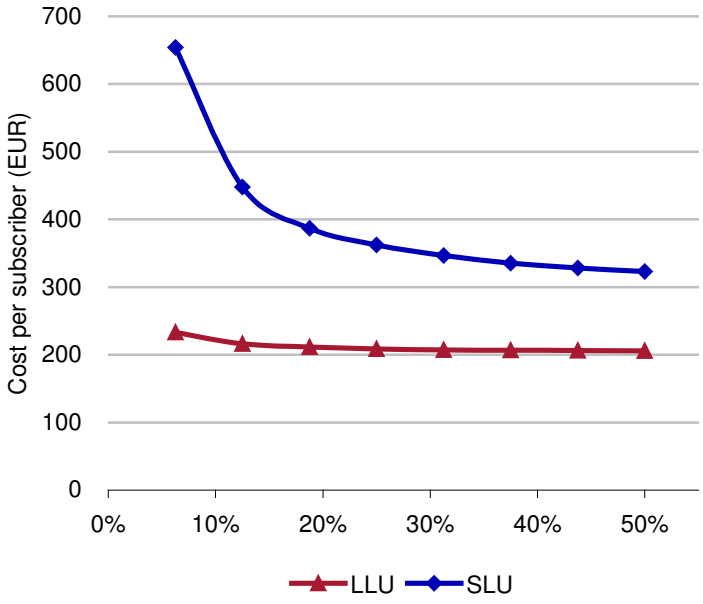

Figure 3.6: Sensitivity analysis on market share for the 50 biggest LEXs [Source: Analysys Mason]

As illustrated by the graph above, the market share of the alternative operator is a very important parameter that can significantly improve the SLU business model in comparison with LLU. For example, if an alternative operator can manage to unbundle around 20% of the lines in the area where it rolls out services (e.g. on the street cabinet to which it is connected)[8], the additional costs to provides the services with SLU compared to LLU are EUR154 per customer per year. The incremental monthly ARPU necessary to cover these additional costs represent EUR12.8.

Figure 3.7 below details the types of costs for LLU and SLU under these assumptions.

8 Either by assuming a consolidation of the DSL alternative operators in the market, or by assuming that the modelled operator has an SLU business model that relies on providing wholesale offers to other alternative operators.

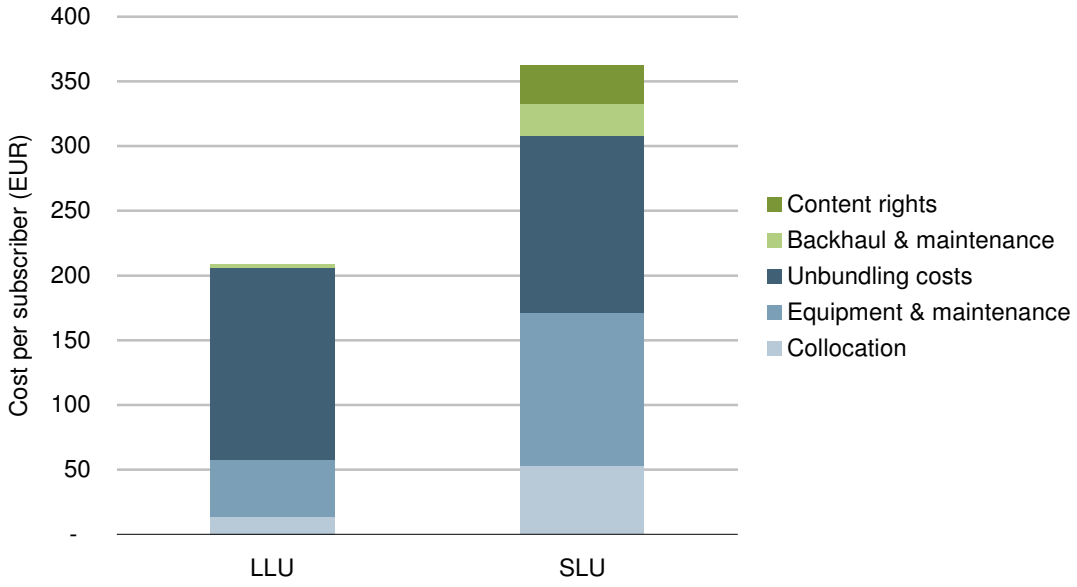

Figure 3.7: LLU and SLU costs per subscriber for the 50 biggest LEXs with around 20% market share in terms of lines [Source: Analysys Mason]

3.3 Conclusion

The results of our model show that, in the current market conditions, and especially without regulatory intervention regarding the conditions under which backhaul and co-location services are made available for SLU, the SLU business model is clearly not as commercially attractive as LLU for an alternative operator.

However, it seems that a viable case can be constructed provided a strict set of conditions are met, which we detail below:

- the alternative operator limits its SLU roll-out to the densest part of Belgium (typically the 50 biggest LEX representing the densest 30% of the Belgian population)
- backhaul links to the MDFs are rented from the incumbent
- the operator co-locates its equipment with the incumbent
- it gains a market share of around 20% (of copper lines) in the area where it rolls out services
- SLU allows the operator to provide triple-play services which enable it to achieve an increase in ARPU of around EUR13 per month compared to the double-play services that can be provided via LLU.

The figure below illustrates these key messages by showing, from an initial coverage of 80%, the relative impact of each of these factors of coverage, backhaul, co-location and market share on the

incremental monthly ARPU necessary to cover the additional costs represented by the SLU model over the LLU model.

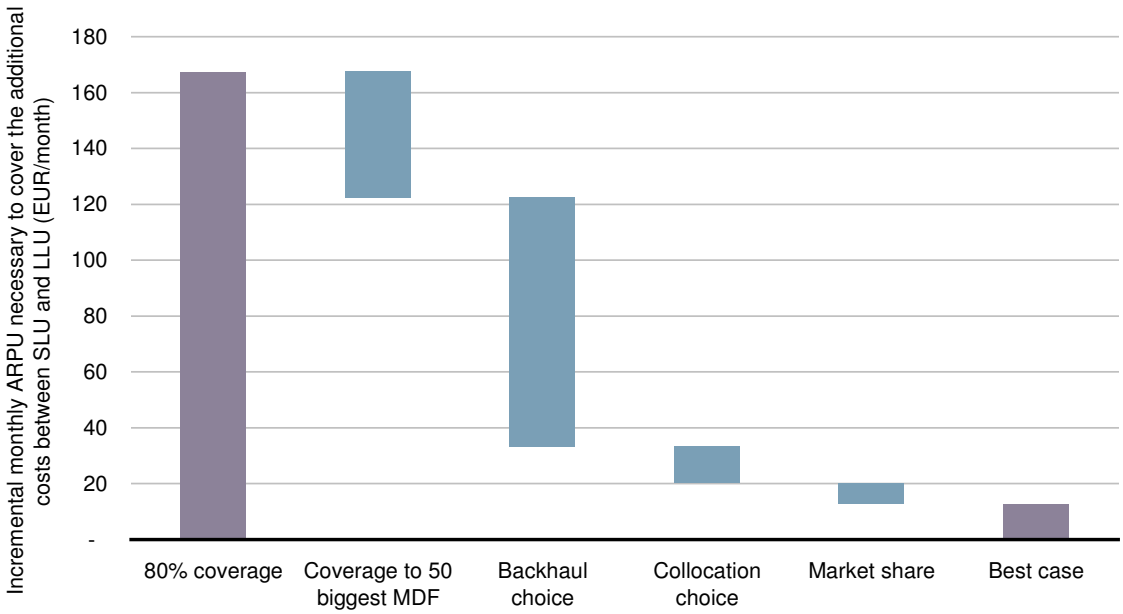

Figure 3.8: *Impact of the different network deployment choices and scenarios on the incremental ARPU necessary to cover the additional cost between SLU and LLU [Source: Analysys Mason]*