Final Report for ComReg

The business case for sub-loop unbundling in Dublin

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1 Executive summary

1.1 Background

Analysys has been commissioned by ComReg to investigate the business case for sub-loop unbundling (SLU) in Dublin.

Sub-loop unbundling is a form of unbundling where the line is handed over from an incumbent operator to an other authorised operator (OAOs) at a point closer to the end user than in local loop unbundling (LLU): the hand-over in SLU typically occurs at a street cabinet.

At present there are no commercial deployments of SLU in Europe, although interest is starting to increase as incumbent operators begin to deploy VDSL. The incumbents in the Netherlands and Germany both have extensive VDSL plans. In the former case, OPTA has already considered the competitive implications of SLU, though in Germany the situation is more complex due to Deutsche Telkom's stance on unbundling. In the UK, the first deployment of VDSL is expected to be in South Yorkshire, in an initiative supported by public funds. It is anticipated that SLU will be used in this initiative, and it may therefore be an important learning ground for operators and Ofcom alike. At this point, however, the timing of any roll-out is not clear.

The lessons from LLU in Ireland, the UK and other markets, suggests that the introduction of new regulated products, and the establishment of the necessary supporting processes, takes time to get right. With interest in SLU just starting in some parts of Europe now, it is a suitable time for ComReg to review SLU for its own market.

1.2 Approach

The aims of this study were to (a) carry out a series of interviews with OAOs in Ireland in order to establish whether they are interested in deploying SLU, and (b) determine whether the business case for SLU is likely to be commercially attractive when compared with LLU. In our business modelling, we have considered the deployment of SLU compared to LLU. To do this, we have calculated the network costs downstream of the local exchange that are associated with each of the two delivery options. We have then included the incremental revenue achieved when using SLU to represent the potential difference in retail revenues between the two services. The extent of this additional revenue is a key input to the business case. It has also been necessary to estimate some of the costs associated with SLU, such as co-location and backhaul. As these services are not currently included in the reference offer from eircom,[1] our estimates for these costs have been guided by the reference offer from KPN in the Netherlands.

[1] Adjacent co-location is included within eircom's reference offer, but not co-location within eircom's street cabinet.

1.3 Key findings

Our modelling exercise showed that under our base case – which we believe represents the most likely market scenario – SLU is not as commercially attractive as LLU. This is also the case if OAOs were to focus their roll-out on the larger cabinets (those with more than 300 lines per cabinet). This is shown in Figure 1.1 below.

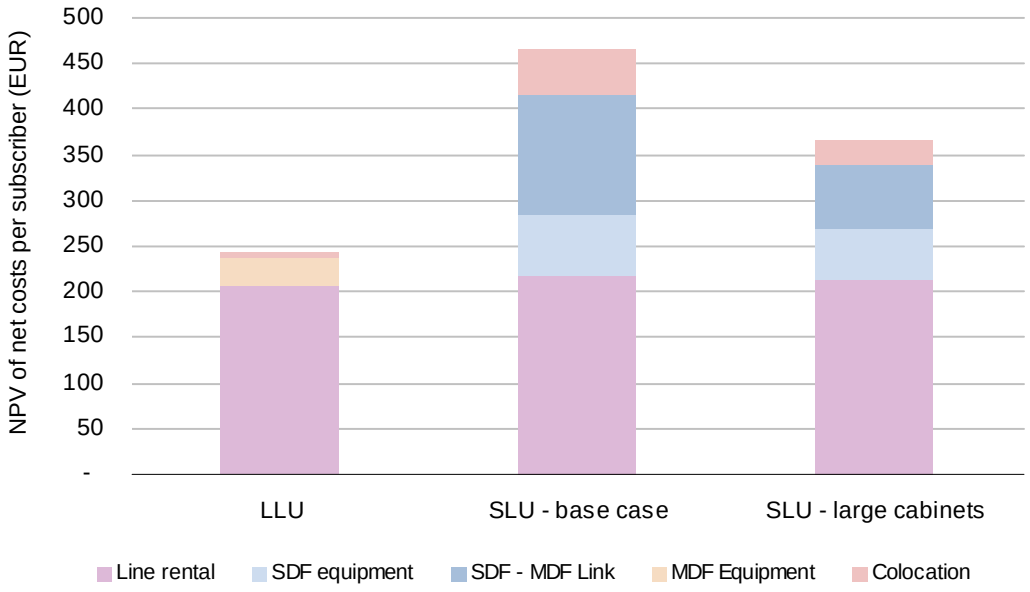

Figure 1.1: Relative net costs for LLU, SLU, and SLU targeted at large cabinets only [Source: Analysys]

The costs in the base case above, referred to as the 'NPV of net costs per subscriber', are equal to the NPV of costs, minus the NPV of additional revenue, divided by the NPV of subscribers, and represent an average cost per line.[2] The additional revenue for SLU has been allocated across the other cost categories in proportion. The base case makes the following key assumptions:

- the modelled operator offers voice and broadband services
- the penetration of broadband in Ireland reaches 65% by 2017
- compared to LLU, the OAO achieves an increase in average revenue per line (ARPL) of EUR5 per month (after VAT) by 2014
- the operator rolls out SLU to all street cabinets in the Dublin area
- it gains a 30% share of the broadband market in the areas where it rolls out services[3]
- backhaul links to the MDFs are rented from eircom
- the OAO is co-located with eircom at each cabinet.

[2] For an explanation of this methodology for comparing costs, see page 27 below.

[3] In our base case, we have assumed that the modelled operator has a 30% market share in the areas in which it is rolling out. This relatively high market share, significantly higher than that of any OAO in Ireland today, has been assumed in order to test whether a third operator (in addition to eircom and UPC) could be successful in the market.

However, it is possible that an OAO might take a more optimistic view of the business case for SLU. Under this Optimistic scenario the business for SLU becomes more commercially attractive when compared to LLU. The key assumptions for this scenario are detailed below, and their impacts are illustrated in Figure 1.2:

- the OAO achieves an increase in ARPL of around EUR10 per month (after VAT) by 2014, and the penetration of broadband in Ireland reaches 75% by 2017
- cheap backhaul is available (50% less than in the base case)
- SLU charges are reduced by 10% for recurring charges
- the OAO only deploys SLU in large cabinets (over 300 lines).

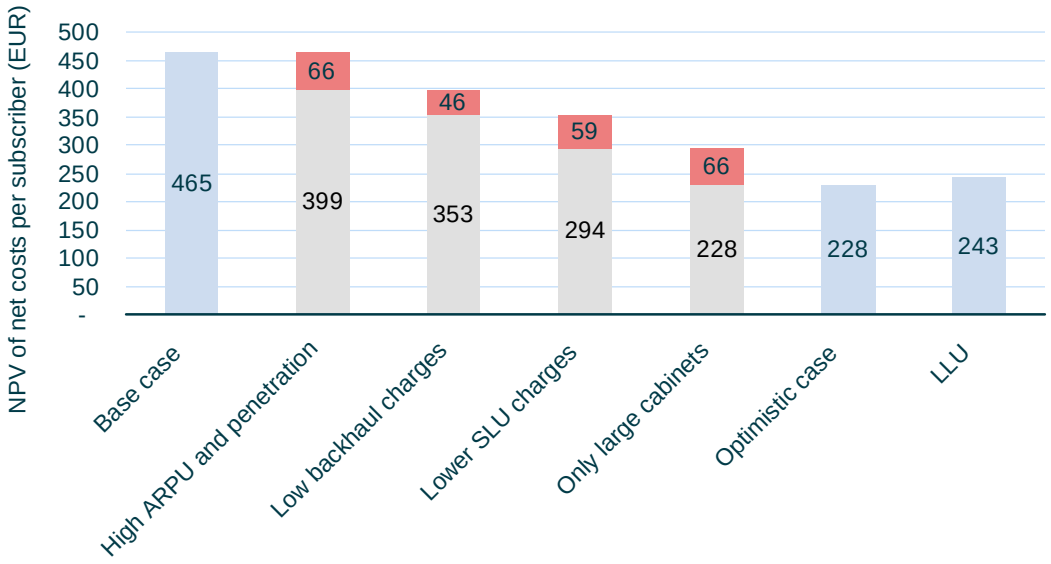

Figure 1.2: Impact of changes in assumptions between the base case and the Optimistic scenario [Source: Analysys]

In addition to the results summarised above, the study has also shown the following:

- SLU is subject to very strong economies of scale, which are much more significant than for LLU (see Figure 1.3 below). This contributes towards the difficulty of the business case for OAOs, who are likely to have a lower market share than eircom.

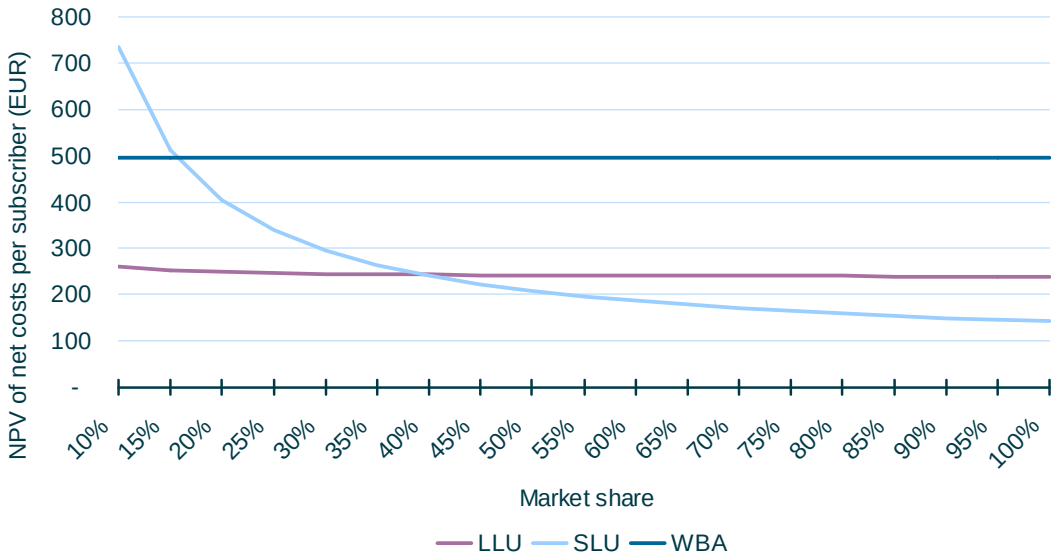

Figure 1.3: Impact of market share upon costs per subscriber for SLU and wholesale broadband access (WBA) compared to LLU [Source: Analysys]

- The largest costs faced by OAOs in deploying SLU are the charges for line rental, co-location at the street cabinet and the backhaul link to the MDF. In all three cases, it seems unlikely that competition will provide lower prices than those available from eircom. Therefore, the possibility of obtaining a fair price from eircom for these services will be important if OAOs are to be encouraged to deploy SLU.

- Though eircom already offers adjacent co-location at its street cabinets to unbundlers, OAOs may struggle to get planning permission to deploy new street cabinets. Therefore it is important that provisions are made for them to gain access to eircom's street cabinets and fibre backhaul at a reasonable rate. If access to this infrastructure is not ensured from the start, it may be difficult to introduce this in retrospect due to practical and cost issues.

On balance, therefore, we believe that an OAO can construct a positive business case for SLU in the Dublin area, but only under the following conditions:

- there are significant reductions in the costs of SLU
- OAOs are optimistic regarding the incremental revenue from SLU over LLU
- OAOs only deploy to large cabinets (over 300 lines), and possibly medium-sized ones (150–299 lines).

Given that the business case for SLU in the Dublin area is challenging, we believe that the business case will be difficult in other areas of Ireland, where the line density per cabinet is likely to be lower and the backhaul costs greater.

We have explored the business case for eircom deploying VDSL, and our analysis shows that the associated costs are less than those for LLU at a market share of around 40% – which is less than eircom's current retail market share of 47%.

1.4 Recommendations

Our study shows that OAOs can construct a commercially attractive business case for SLU under certain conditions. To ensure that they would be able to implement this in the future, it is important that any potential future VDSL roll-out by eircom does not have a significantly detrimental impact on competition, and we have the following recommendations:

- Given ComReg's responsibility to promote competition, it should now be considering how best to remove potential barriers (including supporting processes) to a successful deployment of SLU.
- The component prices for SLU should be reviewed, both in absolute terms and relative to LLU.
- It will be important for there to be a flexible and competitively priced wholesale bitstream product in addition to SLU.
- Though eircom is planning to offer unbundlers adjacent co-location at its street cabinets, it will be important for OAOs to have access to eircom's cabinets, since the installation of duplicate cabinets is likely to be uneconomic and/or suffer from other constraints such as local planning. ComReg should consider ensuring that eircom offers co-location space in its street cabinets. Further work should be carried out to establish the magnitude of the cost to eircom of deploying cabinets large enough to accommodate unbundlers' equipment.
- It will be important for OAOs to have access to an affordable, fibre-based, backhaul product from eircom as it would uneconomical in most cases for OAOs to replicate this infrastructure. Options for such a product include duct access, dark fibre or Ethernet products.

2 Introduction

As part of its development of a next-generation network (NGN), eircom has stated that it plans to deploy fibre-to-the-cabinet (FTTC) in Dublin, and in this context ComReg wishes to assess the business case for OAOs using sub-loop unbundling in the Dublin area. ComReg has therefore commissioned Analysys Consulting Ltd to undertake a study to understand the viability of providers using SLU. The present document is the final report from that study. Our approach has been twofold:

- We have carried out a programme of interviews with stakeholders including eircom and a number of OAOs, in order to learn the intentions of these organisation regarding SLU, and to understand any issues or concerns that they might have.

- We have also developed a model of the business case for an OAO using SLU under a number of possible scenarios.

This report summarises the approach used, and outlines the results of the modelling exercise. The report is laid out as follows:

- Section 3 provides an overview of the Irish fixed telecoms market, eircom's plans for FTTC deployment, the status of SLU in other European markets, and the service delivery options for OAOs
- Section 4 describes the interview programme (details of the responses are confidential)
- Section 5 outlines the methodology used in our model and describes the assumptions in the base case
- Section 6 describes the results of the modelling exercise
- Section 7 presents the conclusions of the study.

3 Market context

By the end of June 2007, the number of broadband connections in Ireland had reached over 650 000, representing a penetration of around 41% of households. At this point, DSL accounted for 72% of broadband lines in Ireland, cable accounted for 11%, and fixed wireless access (FWA) accounted for 16%. This situation is illustrated in Figure 3.1.

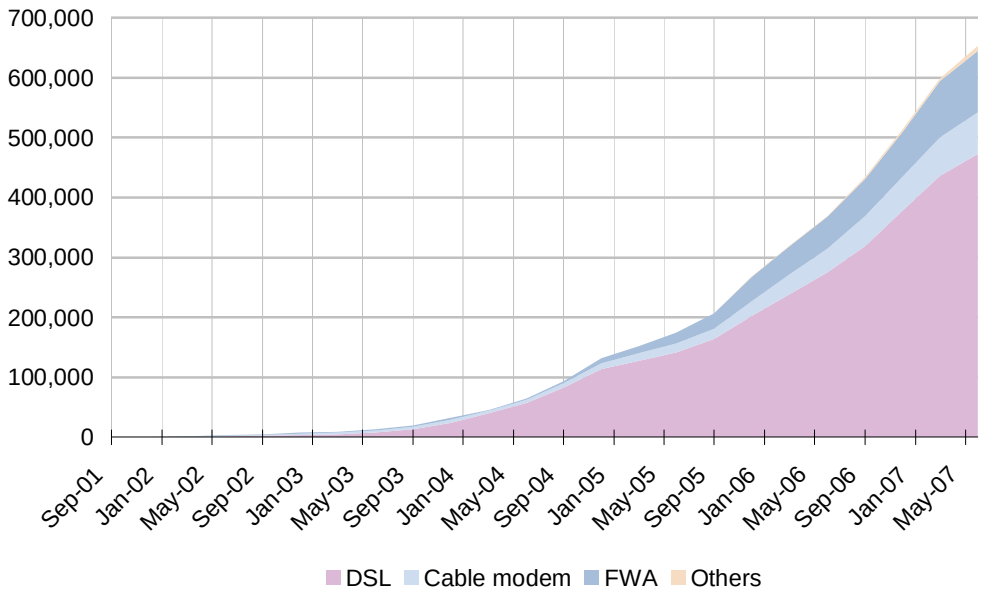

Figure 3.1: Number of broadband connections in Ireland, 2001–2007 [Source: Analysys Research, ComReg]

Within the wholesale DSL market, eircom currently has over 95% market share. The take-up of local loop unbundling (LLU) is low in Ireland. The main LLU operator in the market is BT. It is estimated that eircom have a 47% of the retail broadband market.

3.1 eircom's proposed NGN plans

In November 2006, eircom announced that it would spend EUR1 billion on network improvements over the following three years. These improvements will include developing a next-generation network, a development that falls into two parts:

- eircom has already announced contracts for the building of a new NGN IP core network to replace its Frame Relay and ATM networks. This will enable the operator to quadruple its Ethernet presence to 240 locations countrywide and to future-proof its core network by ensuring that it supports broadband speeds of 8Mbit/s minimum.

- eircom will roll out FTTC using VDSL2 technology, which will enable it to potentially offer speeds of up to 50Mbit/s, allowing it to compete with the cable operator, UPC, in markets such as high definition TV (HDTV) and video-on-demand. eircom is planning to conduct an FTTC trial in Dublin in the fourth quarter of 2007, involving 50 cabinets in two local exchanges areas (Dundrum and Priory Park). Subject to the success of this trial, by the end of 2008 it plans to roll out FTTC to 37 local exchange areas in the Dublin area, covering 1747 cabinets and 337 750 customer lines.

This study concerns the second of these points, which potentially raises more competition issues given that the local access network represents an enduring economic bottleneck.

Sub-loop unbundling is an important product for competition reasons. When eircom has completed its VDSL roll-out there are only likely to be two ways in which OAOs will be able to compete with products using VDSL. The first of these is by using a wholesale bitstream offer, and the second is to use SLU and then deploy their own equipment in street cabinets alongside eircom's equipment. This second option is similar to local loop unbundling, except that the OAO interconnects with eircom closer to the customer. Experience from other markets suggests that competition via LLU has been beneficial. In a next generation access network, competition at the sub-loop level may be a key factor in ensuring a competitive retail market.

Our modelling work focuses on the 37 exchanges in the Dublin area, since it is reasonable to assume that if the business case for SLU is not commercially attractive in Dublin, then it is unlikely to stand up for other parts of Ireland.

A typical FTTC/VDSL architecture is shown in Figure 3.2 below. As can be seen, the part of the local loop between the street cabinet and the local exchange (which is the point of interconnection with the incumbent's core network) is switched over to fibre. eircom is currently planning to maintain its local exchanges, unlike for example KPN in the Netherlands which ultimately plans to close down its local exchanges altogether.

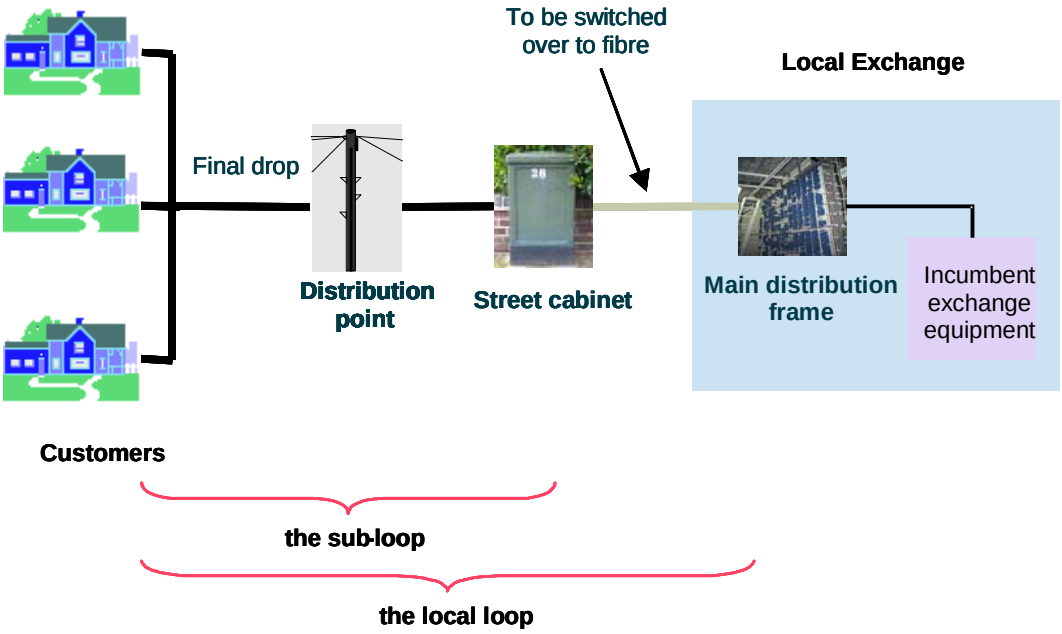

Figure 3.2: Typical FTTC/VDSL network architecture [Source: Analysys]

eircom has been designated as having significant market power (SMP) in the relevant market for metallic paths, and ComReg has imposed a remedy which obliges eircom to offer unbundled access at (a) the MDF level (i.e. local loop unbundling – LLU), and at (b) the sub-loop level (i.e. sub-loop unbundling – SLU). However, at the moment OAOs are only purchasing access at the MDF level, since the capabilities of such wholesale products are currently sufficient to meet demand. Furthermore, the SLU option may not be commercially attractive to OAOs. This study investigates this in detail.

3.2 Sub-loop unbundling in other European markets

At present there are no commercial deployments of SLU in Europe, although as incumbent operators begin to deploy VDSL, interest is starting to increase. KPN in the Netherlands and Deutsche Telekom in Germany both have extensive VDSL plans. In the former case, OPTA has already considered the competitive implications of SLU.[4] In the latter case, the situation is more complex due to DT's stance on unbundling.

The first deployment of VDSL in the UK is expected to be in South Yorkshire (an Objective 1 region), in an initiative supported by public funds. It is anticipated that SLU will be used in this initiative, and may therefore be an important learning ground for operators and Ofcom alike. At this point however the timing of any roll-out is not clear.

[4] See Analysys's report for OPTA, "The business case for sub-loop unbundling in the Netherlands", available at http://www.opta.nl/asp/en/newsandpublications/research/document.asp?id=2119

3.3 Service delivery options for alternative providers

We have considered a number of service delivery options for OAOs, with respect to:

- services offered
- extent of coverage
- use of SLU, LLU or wholesale broadband access (WBA)
- co-location and backhaul options.

Each of these is discussed in turn below.

3.3.1 Services offered

The services that an OAO chooses to offer will have an impact on the equipment that it deploys and the revenues that it can gain from customers. It is currently possible for OAOs to offer both voice and DSL services using existing wholesale products from eircom, and for some customers it is already possible to offer a triple-play service combining voice, broadband and TV services using ADSL2+ technology. Once VDSL is available, this will increase the ease with which TV services may be offered.

It is feasible to provide voice services and broadband services of up to 24Mbit/s using LLU and ADSL2+, although the speed of service that can be delivered varies according to the length of copper loop involved, as illustrated in Figure 3.3, below. The longer the copper loop, the lower the data rates that can be delivered.

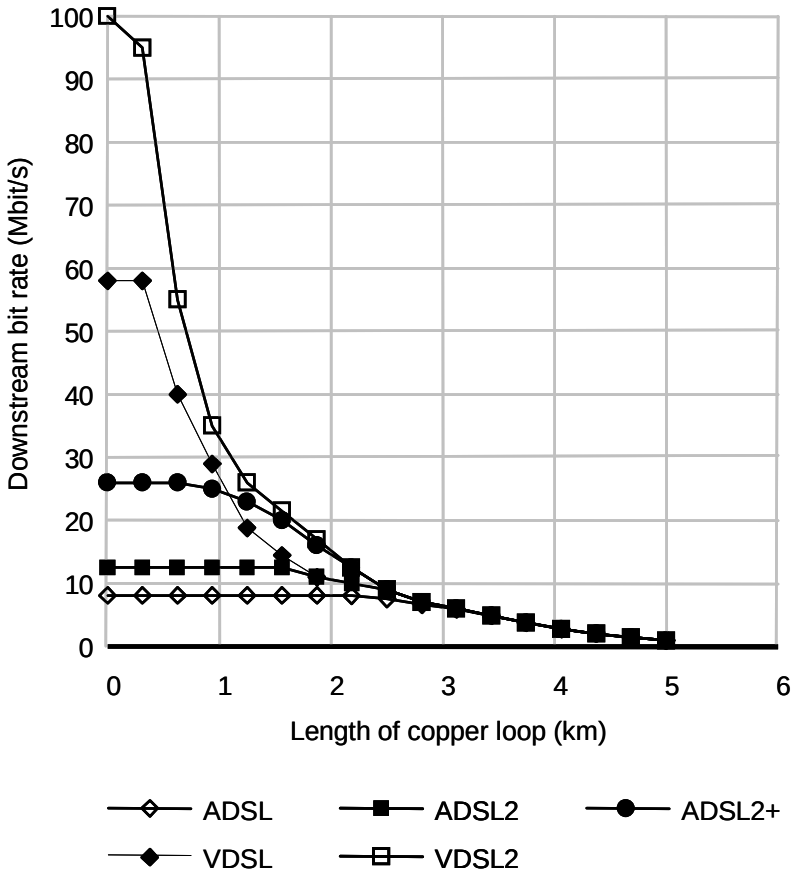

Figure 3.3: Variations in theoretical DSL downstream data rates versus length of copper loop [Source: Analysys Research, 2006]

The deployment of eircom's FTTC/VDSL network to street cabinets will significantly reduce the length of copper loop required to reach customers, enabling higher downstream bandwidths of 50Mbit/s and above to be offered to many customers. VDSL also offers major improvements over ADSL2+ in the upstream direction, with up to 25Mbit/s being possible under ideal conditions.

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. VDSL will increase the ease with which TV services may be offered, though it should be noted that this opportunity is limited by the existing use of cable and satellite TV.

3.3.2 Geographies covered

If OAOs were to choose to use SLU, they are likely to target their roll-out to the most commercially attractive areas. This can be achieved either by (a) targeting specific *exchanges* and deploying to all cabinets served by them, or (b) only targeting the more attractive *cabinets* within a given set of exchange areas. The feasibility of these options will depend on factors such as the local population density, the number of lines per cabinet, and whether residential or business customers are being targeted (business lines are likely to be concentrated at particular street cabinets, notably in business parks and town centres). The feasibility of the roll-out options will also depend on the availability of cheap backhaul for individual street cabinets.

3.3.3 Use of SLU, LLU and WBA

Currently, OAOs mainly use wholesale broadband access to deliver broadband services to the majority of broadband customers. We have modelled OAOs using other options, including LLU and SLU.

3.3.4 Co-location and backhaul options if using SLU

An OAO deploying SLU has two main options for the provision of street cabinets:

- build a second cabinet adjacent to the incumbent's, which could also be shared with other OAOs
- co-locate within the incumbent's street cabinet.

In Ireland, OAOs using LLU currently purchase backhaul connectivity from the MDF site to eircom's core network. If they migrated to SLU, they would need to extend this backhaul to the cabinet. The backhaul could be provided in the following ways:

- own build
- leased dark fibre from a third-party provider
- leased dark fibre from eircom
- duct access from eircom or other operators
- wholesale Ethernet-based products.

In our modelling, we have considered the first three options in detail – see Section 5.4.2.

4 Stakeholder interviews

As part of the study we consulted with stakeholders in order to gain an external perspective on the prospects for SLU in Ireland. We interviewed contacts from five organisations, selected to give a reasonable representation of the various types of players in the Irish market. The aim of the interviews was threefold:

- To understand each organisation's plans for the provision of high speed broadband access, and whether these plans involve the use of SLU.
- In the case that operators are planning to use SLU, to determine:
  - whether they plan to build their own street cabinets or to co-locate within eircom's
  - what options they are considering for backhaul from the cabinet to the local exchange
  - any other issues they might have regarding SLU.
- To confirm with eircom our assumptions about its FTTC roll-out plans.

The details of the responses are confidential, but they were used to provide inputs to the modelling, to verify the model results, and also to provide information for ComReg to support further work regarding SLU.

eircom supplied Analysys with a set of data for the study, and provided additional information on its FTTC/VDSL plans to clarify our understanding.

5 Model methodology

In order to assess the business case for SLU, we have developed a cashflow model for an OAO offering voice and data services using an SLU, LLU or WBA solution. In this section, we describe the methodology adopted in our modelling and provide details of the assumptions used in the base case and alternative market scenarios.

5.1 Overview of the model

The cashflow model considers the business case of an OAO (over a ten-year period) of deploying SLU compared to LLU or WBA. To do this we calculate the network costs downstream of the local exchange associated with each delivery option. As the model does not include all of the network costs, it is not possible to compare the standalone business cases for LLU or SLU in terms of total costs and revenues. For this reason it is not appropriate to consider all of the revenues for a service – only the *differences* in revenues between different options. In the modelling we have chosen to consider the *incremental retail revenue* for SLU or WBA, when compared to LLU.

The extent of this incremental revenue will depend on the relative consumer demand (and willingness to pay) for VDSL-speed services versus ADSL-speed services. The relative demand may vary across segments, with some segments being content with ADSL-speed services (e.g. email, web-browsing), whilst other segments may view VDSL-speed services (e.g. multi-channel HD IPTV, on-line gaming) at critical. Furthermore, at this point in time concurrent VDSL and ADSL services have not been experienced elsewhere. Hence, it is difficult to forecast the extent of this additional revenue. Therefore, in our approach we have run a number of sensitivities to this input in order to understand how it impacts the business case for SLU. We have also run sensitivities on each of the other key inputs.

Figure 5.1 below illustrates the calculation flow used in the model.

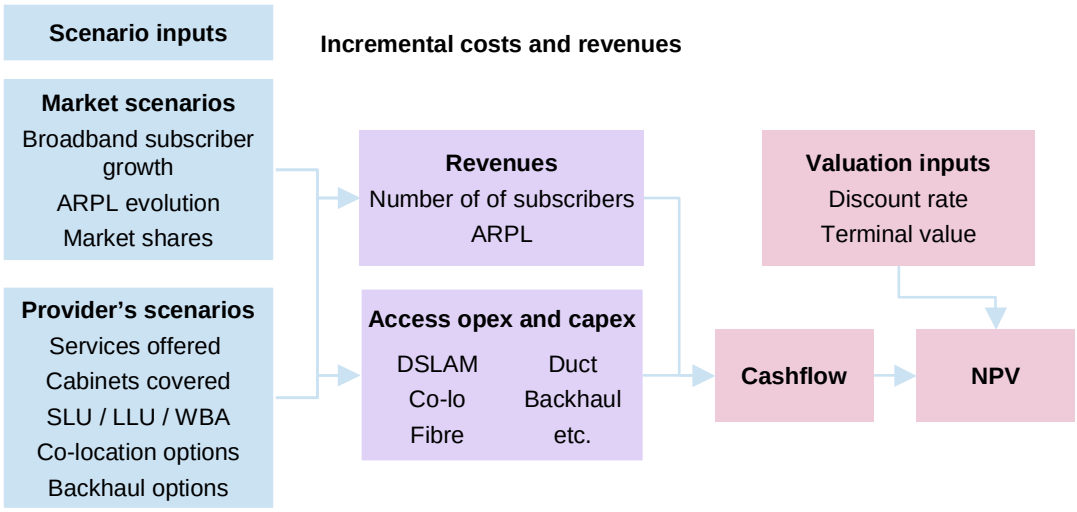

Figure 5.1: Overview of model methodology [Source: Analysys]

As mentioned above, the model contains a number of inputs which can be modified by the user to test specific scenarios and sensitivities. We list below the major dimensions that can be changed, with more detail on the specific inputs being provided later in this section.

Market scenarios

- *Average revenue per line (ARPL)*: the model provides three options for the size of the incremental increase in ARPL for VDSL service compared to ADSL services: High, Medium and Zero.
- *Number of broadband subscribers*: three options are available, assuming Low, Medium and High forecasts for the total number of broadband subscribers in Ireland over the next ten years.
- *Market share*: the user can set the market share for the OAO in 2007 and in 2017, for the areas which the operator is serving. The model assumes a linear interpolation of market share between these two points.
- *User churn*: the rate of churn can be set within the model, though in this study we have assumed a churn rate of 10% per annum for all scenarios.

Provider's scenarios

- *Services offered:* the OAOs are assumed to offer voice and data services. The model allows for possible additional revenues from video services, but no explicit video costs are considered.
- *Cabinets covered*: the user can select which size of cabinet are served by SLU (Small, Medium or Large).
- *Co-location options*: the user can choose whether the model assumes the OAO builds its own cabinets, or rents space from eircom. In the case of the former, it is also possible to vary the number of other operators sharing the cost of building new cabinets; in the latter case, it is possible to vary the number of other operators co-locating within eircom's cabinets.
- *Backhaul options*: three options are modelled, either 'Build own' in which the OAO builds a complete network, 'Rent from third party' in which backhaul is purchased from a third party, or 'Rent from eircom' in which dark fibre is purchased from eircom.

Network design algorithms are used to calculate the number of assets required in the network based on these scenarios. Total costs are then calculated by multiplying unit costs by the number of each asset required.

Incremental revenue in each year is calculated by multiplying the average number of subscribers in that year by the incremental ARPL in the year.

In addition to calculating the in-year incremental cashflows over the ten-year period, the model also calculates a net present value (NPV) on the basis of a discount rate of 12%. It also includes a terminal value which is calculated based on a simple multiplier of the final year cashflows and, for assets with a short lifetime such as DSLAMs and other electronics, an annualised replacement cost.

Results are presented either as the *total* cashflows, or as the costs and *incremental* revenues relative to a business case based on LLU.

5.2 Number of exchanges, cabinets and lines

The 37 exchange areas in which eircom will deploy FTTC/VDSL contain 1747 street cabinets. As part of this study we obtained from eircom current[5] data on the locations of these cabinets, and the number of working lines connected to all these exchanges and street cabinets. There are a total of 479 600 connected lines (PSTN and ISDN), of which 141 850 are directly connected to the MDF, i.e. do not pass through a street cabinet. The remaining 337 750 lines could be subject to SLU. We would expect the directly connected lines to have VDSL deployed at the MDF, which should still deliver high speed services as the lines are likely to be relatively short. The number of lines per street cabinet varies significantly. To reflect the different costs, and to enable us to asses the likely economies of scale, we therefore split the street cabinets into three groups: Large (>300 lines), Medium (150–300) and Small (<150).

The locations of the exchanges and street cabinets at which FTTC/VDSL will be deployed are show in Figure 5.2 below.

[5] Beginning of September 2007

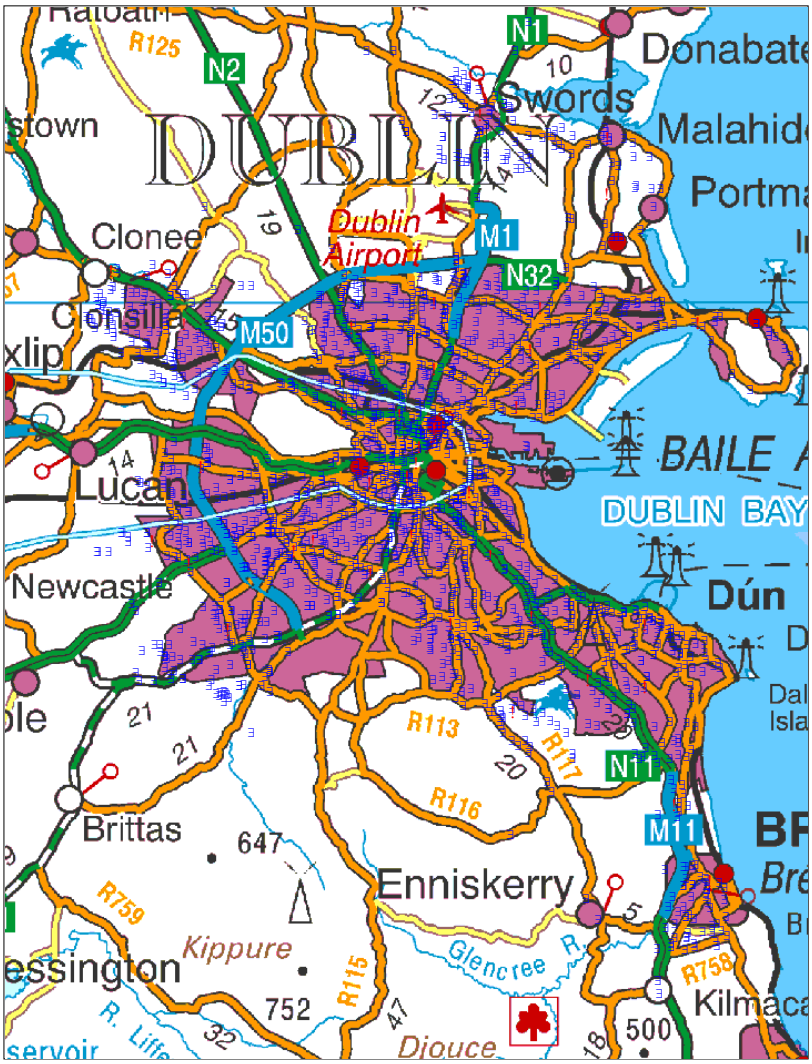

Figure 5.2: Location of eircom street cabinets and exchanges at which FTTC/VDSL will be deployed (cabinets are shown as blue stars, exchanges as red squares) [Source: Analysys, eircom]

The backhaul modelling requires an estimate of the distance from the street cabinet to the MDF and between nearby street cabinets to construct backhaul rings. To estimate these distances we have used the data from eircom on the locations of its exchanges and street cabinets, along with public information on the total amount of fibre that eircom expects to install as part of the FTTC roll-out.[6]

To construct a backhaul ring for the street cabinets, an efficient approach would be to link them to their closest neighbours. However, this would not create a configuration in which all cabinets are connected to a single network. We have estimated the total distance required to construct a backhaul network by calculating the average distance to the three closest street cabinets. Using ideal straight-line distances, this methodology implies 479km of new fibre. Public information from eircom states that 612km of fibre will be required, 27% more than our idealised methodology suggests. We have therefore increased our straight-line distances for the backhaul distance for each cabinet by 27% to correct for non-linear backhaul routes and other approximations.

[6] Source: http://www.comreg.ie/_fileupload/publications/PDanon.pdf

For backhaul options using a star topology back to the MDF we have calculated the straight-line distance from the street cabinet back to the parent MDF, and then applied the 27% uplift factor.

5.3 Demand

We have developed three forecasts (High, Medium and Low) of the total number of broadband subscribers in Ireland over the ten-year period, based on our view of how the market is likely to evolve. These forecasts are illustrated in Figure 5.3 below. Although historical data shows there has been a higher penetration of broadband in Dublin than the rest of Ireland, we believe that the recent growth in the broadband market has significantly reduced this differential. We have therefore assumed the same penetration in Dublin as the rest of Ireland.

In the base case we assume a Medium broadband penetration, reaching 65% of lines by 2017. The Low scenario assumes 55% penetration by 2017, and the High scenario 75%.

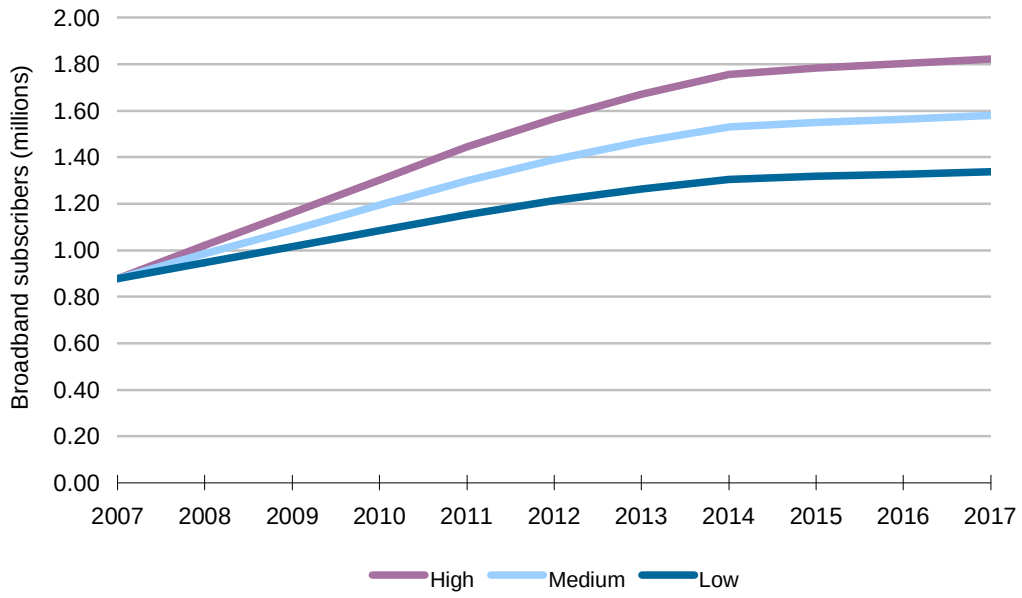

Figure 5.3: Forecasts for evolution of broadband subscribers in Ireland [Source: Analysys]

In addition, the EIU predicts that the population of Ireland will increase by an average of 0.7% per annum over the model period. We have therefore assumed that the total number of lines and cabinets will increase by 0.7% each year.

In our base case, we have assumed that the modelled operator has a 30% market share in the areas in which it is rolling out. This relatively high market share, significantly higher than that of any OAO in Ireland today, has been assumed in order to test whether a third operator (in addition to eircom and UPC) could be successful in the market.

5.4 SLU-related costs

5.4.1 Co-location at the street cabinet

At present, eircom's standard offer for SLU does not include specific prices for co-location, as these will be determined on a case-by-case basis based upon eircom's costs. In this study we have therefore estimated the one-off and ongoing costs for co-location at an eircom street cabinet using a range of sources including the reference offers from KPN in the Netherlands, and eircom's current ongoing charges for LLU (e.g. charges for power).

For the base case, with a single OAO co-locating with eircom at a street cabinet, the model assumes the following costs:

Cabinet size (total lines)	*One-off charge (EUR)*	*Recurring annual charge (EUR)*
Large (>300 lines)	20 000	250
Medium (>150 lines)	17 700	221
Small	15 000	188

Table 5.1: Co-location charges [Source: Analysys]

5.4.2 Backhaul

The model considers three different options for the provision of backhaul from the street cabinet:

- dark fibre rented from eircom
- dark fibre from an alternative wholesale provider
- fibre newly built by the OAO itself.

At present, no reference offer for dark fibre or duct access is available from eircom. In the absence of a reference offer, we have estimated likely charges from eircom and from an alternative wholesale provider, using benchmarks from the Netherlands. However, it should be noted that pricing for dark fibre and duct access can vary significantly between markets. The key costs for the three backhaul options are outlined in Table 5.2.

Backhaul provider	*One-off charges*	*Recurring annual charges*
Dark fibre rented from eircom	EUR997 per cabinet	EUR3 576 per cabinet and EUR0.72 per metre
Dark fibre from an alternative wholesale provider	EUR9 per metre	EUR4.5 per metre
Newly built fibre by the OAO	EUR101 per metre	EUR0.50 per metre

Table 5.2: Base case backhaul cost assumptions [Source: Analysys]

The three backhaul options have been considered in our modelling, the results of which are presented in Section 6.2.

5.4.3 Line rental

The model assumes a line rental equal to the charges in eircom's current reference offer. It also includes connection and disconnection charges, assuming a 10% annual churn rate.

The costs to OAOs of sub-loop access are shown in Figure 5.4 and Figure 5.5 below. From these it can be seen that the connection charges for SLU in Ireland are similar to those in the UK, but significantly higher than those in the Netherlands. The charges for monthly rental are high in Ireland for both LLU and SLU. The differential between full LLU and full SLU are greater in Ireland than other markets, which improves the business case for SLU relative to LLU. However, we recommend caution when drawing conclusions from these comparisons, as SLU pricing has so far not been subject to stringent review by regulators. This is due to there being very little demand for SLU (there are currently no commercial deployments in Europe).

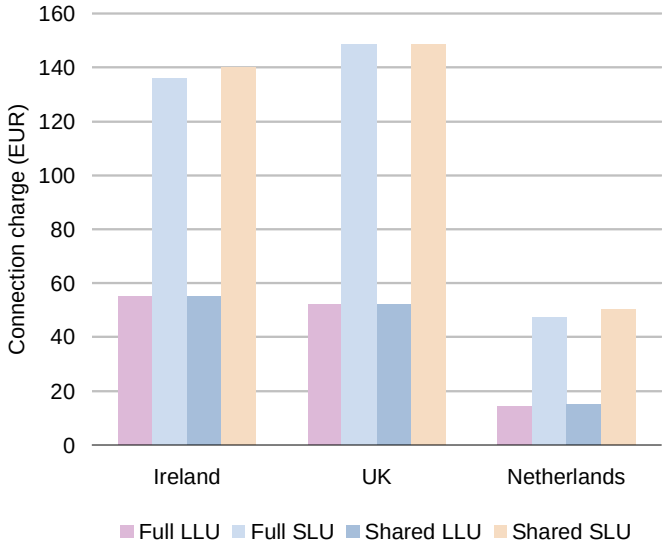

Figure 5.4: LLU and SLU connection charges [Source: eircom, BT, KPN]

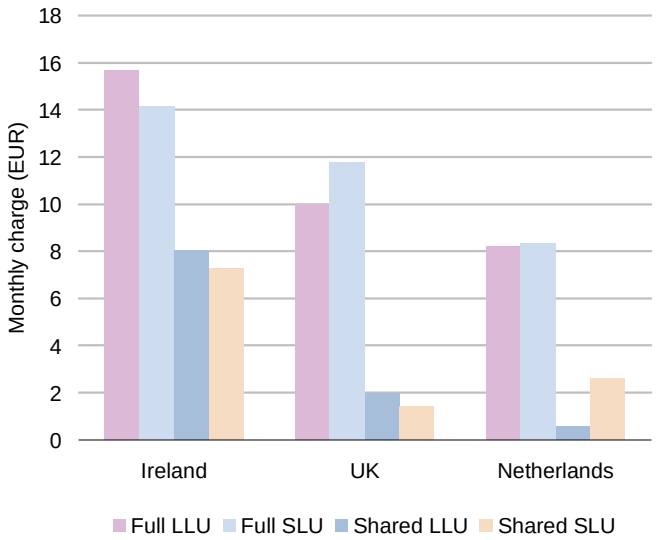

Figure 5.5: LLU and SLU monthly charges [Source: eircom, BT, KPN]

5.5 Network costs

In this section, we discuss the network costs associated with each of the service delivery options. For all options we have excluded the cost of the core network beyond the MDF: this allows for a fair comparison between the different technology options.

5.5.1 Network costs for LLU

The network architecture modelled for LLU is illustrated below. It includes rental of local loops from eircom, co-location space and associated services, and equipment installed at the MDF site.

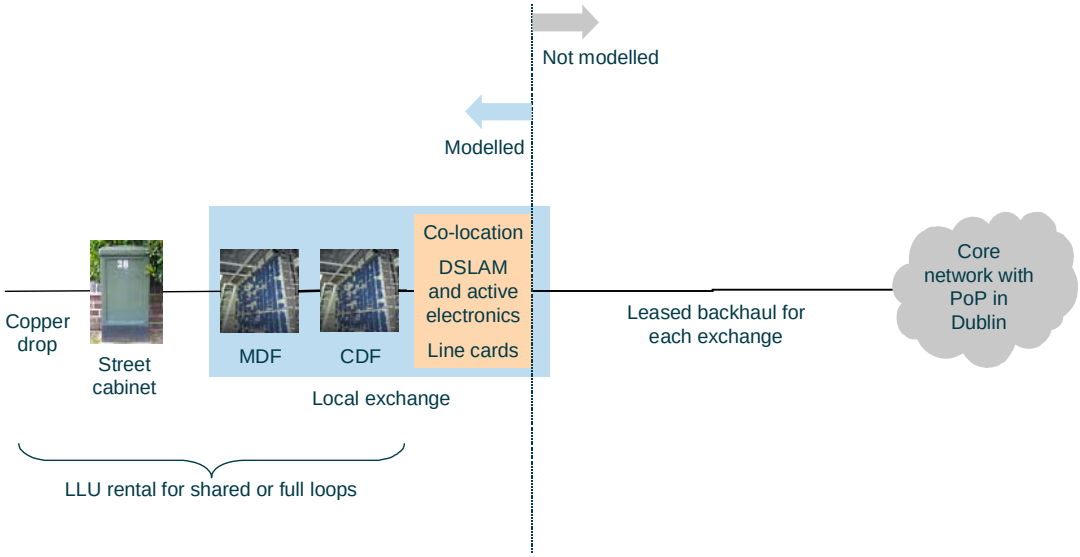

Figure 5.6: Network architecture modelled for LLU [Source: Analysys]

The current charges for the setup of full and shared LLU, line rental and disconnection as specified in eircom's co-location offer have been included in the model. The co-location costs have been estimated by Analysys using an expected demand for rack space and power. Our estimate for the average setup charge for the covered exchanges is EUR28 493, with an ongoing charge of EUR7106 per annum.

We have made use of Analysys estimates for the cost of DSLAMs and line cards, and assume a reduction in cost of 2% each year. The annual maintenance of these electronics is estimated to be 15% of the initial capex.

5.5.2 Network costs for SLU

We have modelled SLU using two possible network architectures, depending on who provides the backhaul between the street cabinet and the MDF. The first option is new build by the OAO or

leasing from a third-party wholesale provider. The second option is using dark fibre leased from eircom. These two options are described below.

SLU using own-built backhaul, or backhaul leased from a wholesale provider

If the OAO builds backhaul itself or leases it from a wholesale provider, then we assume the network architecture illustrated in Figure 5.7 below. It is not clear that such a third-party provider actually exists, as we believe that UPC does not have the required coverage. However, we still believe it is useful to consider this theoretical view point. It includes rental of sub-loops from eircom; either rental of co-location space and associated services or self-build of a street cabinet; provision of equipment installed at the SDF site; and a ring between the street cabinets.

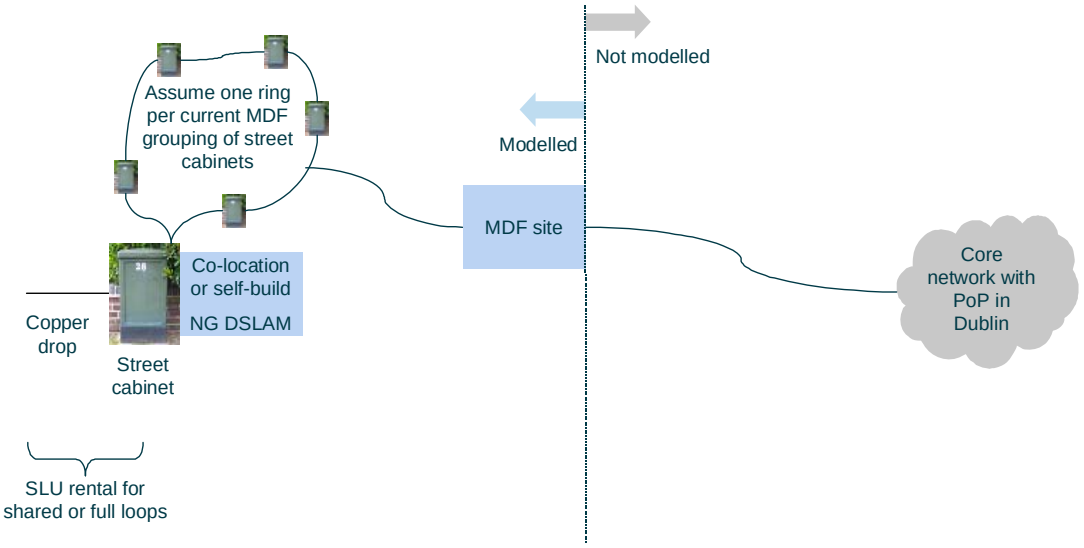

Figure 5.7: Network architecture modelled for SLU at MDF using new build for backhaul links [Source: Analysys]

When the OAO is building its own backhaul link, we have assumed the following costs:

- EUR100 per metre for new trenches and ducts (civil works)
- EUR1 per metre for fibre (materials)
- EUR5 per metre for upgrading ducting and installing additional fibre if using an existing duct.

We have assumed that these prices do not change over time and that there are yearly maintenance costs equal to 0.5% of initial capex.

Values for the SLU line rental and co-location charges have been taken from eircom's reference offer, and we have assumed that these prices do not change over the modelled period. We have conducted a sensitivity with a lower set of charges for SLU.

We have used Analysys estimates for the prices of street cabinet equipment such as next-generation DSLAMs and battery support prices. We have also estimated appropriate price trends.

Inputs for the costs of building and maintaining cabinets have come largely come from Analysys's previous study for OPTA on the same topic. We have assumed that these costs do not change over time.

SLU using dark fibre leased from eircom

If the OAO relies on eircom for its backhaul links to the MDF, then we assume the network architecture illustrated in Figure 5.8 below. This is similar to the configuration discussed above, except that, rather than there being a ring between the street cabinets, point-to-point links are purchased from each street cabinet to eircom's MDF site.

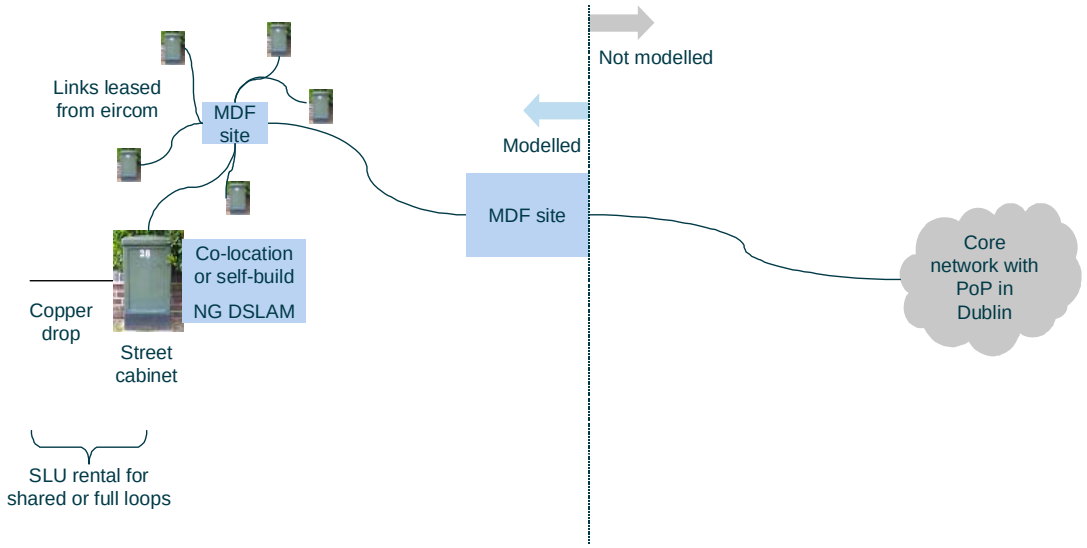

Figure 5.8: Network architecture modelled for SLU at MDF using eircom for backhaul links [Source: Analysys]

Under this option, the model assumes the used prices outlined in Section 5.4.2 above, namely one-off charges of EUR997 per cabinet and recurring annual charges of EUR3 576 per cabinet and EUR0.72 per metre. We have assumed that these prices do not change over time.

All other unit costs are the same as in the previous option, 'SLU using own build backhaul, or backhaul leased from a wholesale provider'.

5.5.3 Network costs for WBA

The network architecture modelled for WBA VDSL services is illustrated below.

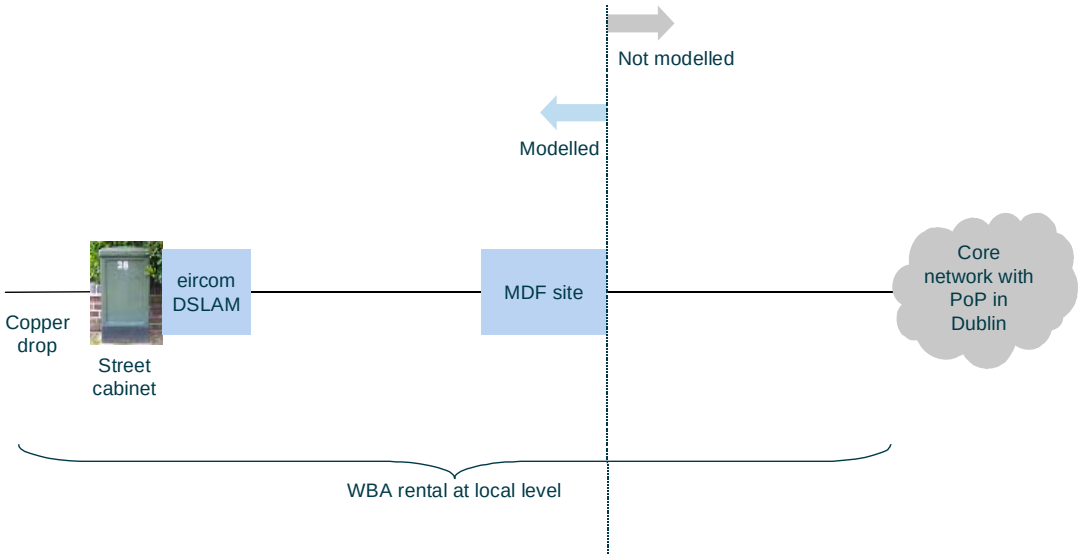

Figure 5.9: Network architecture modelled for WBA [Source: Analysys]

eircom currently does not provide a reference offer for VDSL-based WBA, so we have estimated the likely costs based upon products within the existing WBA offer:

- wholesale line rental for voice services (10% discount on retail prices)
- 3Mbit/s WBA product

We have then applied a discount for interconnecting at the local exchange instead of at a central POP. This is assumed to be equal to EUR5.80, based upon our estimate for the cost of connecting exchanges together using the backhaul product that would also be used for SLU.

5.6 Incremental revenues

The model considers only the *incremental* revenues generated by new services over SLU or WBA, relative to the revenues from offering services using LLU alone. In considering the business case for an SLU deployment, an OAO is likely take into account incremental revenue. This is because higher-speed VDSL services (via SLU) are likely to command higher prices and therefore yield higher ARPUs than ADSL services (via LLU), as illustrated in Figure 5.10. These incremental revenues are likely to arise either from higher monthly charges for a higher-speed Internet connection, or from additional revenues from new services such as television and video on demand.

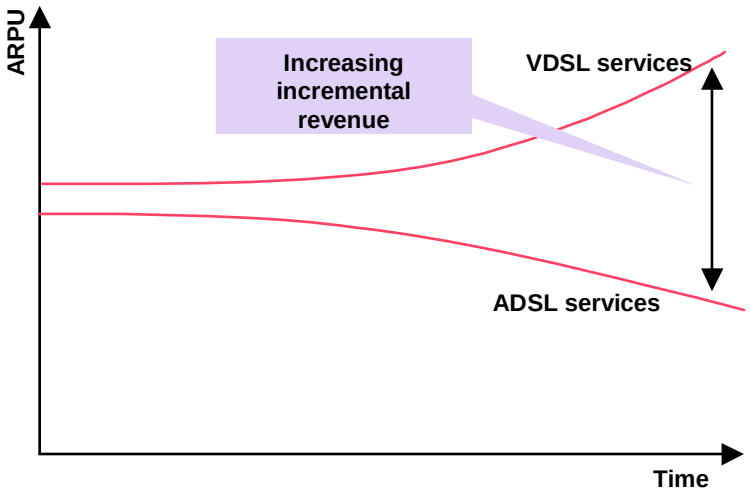

Figure 5.10: Explanation of basis for using incremental revenue [Source: Analysys]

The actual amount of incremental revenue that an operator could expect to gain from using SLU compared to using LLU is subject to considerable uncertainty: at this point in time, there are no instances of concurrent VDSL and ADSL services. Therefore, we have constructed a number of scenarios for the amount of incremental revenues assumed in the model, ranging from Very High to None, as shown below in Figure 5.11.

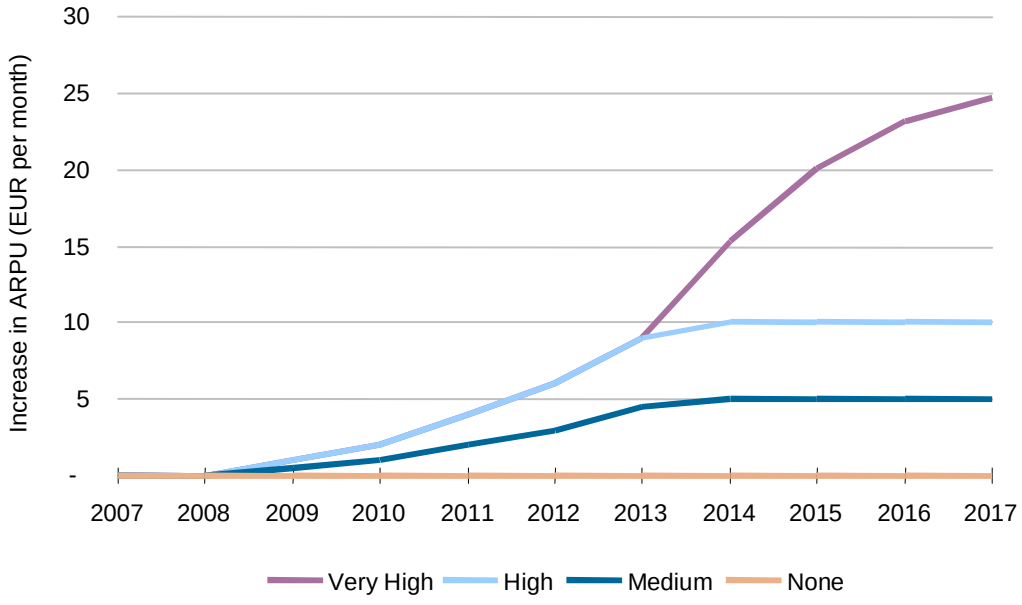

Figure 5.11: Different estimates for increases in ARPU (after VAT) in Ireland achieved by using SLU rather than LLU [Source: Analysys's estimate]

The Medium and High scenarios are designed to simulate a market where some consumers place a premium upon faster connections, but the services deployed over ADSL still have a place in the market. The Very High scenario assumes that the demand for services using ADSL drops off markedly and higher-speed VDSL connections become *de facto*. Under this scenario the

incremental revenues from using SLU tend towards the current retail revenues for a 3Mbit/s ADSL connection (EUR24.79 exc. VAT). The model also considers a scenario ('None') where there is no incremental revenue from SLU.

Our modelling does not consider the case where LLU rapidly collapses as a means of providing services to the market. We consider this case to be extreme since it would mean that LLU is effectively 'leap-frogged' by SLU as the *de minimis* technology for supporting broadband services: there is no precedent for such a development.

The model does not explicitly include revenues from corporate or SME customers. These revenues could be significantly higher per line than those from the consumer segment. We would expect the demand from corporate and SME sectors to be concentrated at specific cabinets, which are likely to be commercially attractive. However, as we do not know where these lines are we have not included additional revenues from these sectors in our modelling. It is also possible that some corporates are already served by fibre.

6 Model results

We have evaluated a number of different business cases for an OAO using SLU. In addition, for the base case we also provide a comparison with an estimate of the costs an operator would incur using a WBA product with interconnection at the local exchange. For each case we present net costs, taking into account any difference in revenue[7] compared to a situation in which the operator uses LLU.

We first present a high-level assessment for the base case scenario of the costs of serving customers in all of the Dublin area. We then discuss a series of sensitivities that explore how the base case is impacted by:

- market share
- targeting large cabinets only
- additional revenue
- broadband penetration
- costs from eircom.

After exploring these sensitivities, we consider the viability of services using SLU under a revised scenario that is based on more optimistic assumptions, and then explore the case for an individual exchange.

Finally, we describe a scenario to illustrate the business case for eircom, and examine its sensitivity to the additional costs associated with having to provide larger street cabinets in order to also accommodate co-locating OAOs.

6.1 Base case: high-level assessment

Base case

The assumptions in the base case have been described in detail in Section 5. The most important are the following:

- the modelled operator offers voice and broadband services
- the penetration of broadband in Ireland reaches 65% by 2017
- compared to LLU, the OAO achieves an increase in average revenue per line (ARPL) of EUR5 per month (after VAT) by 2014
- the operator rolls out SLU to all street cabinets in the Dublin area
- it gains a 30% share of the broadband market in the areas where it rolls out services
- backhaul links to the MDFs are rented from eircom
- the OAO is co-located with eircom at each cabinet.

[7] if there are any additional revenues, each category is reduced in proportion.

The results of this scenario for SLU are shown below in Figure 6.1. It can be seen that under this scenario the overall cost of deploying SLU to all of Dublin is EUR527 per subscriber in NPV terms. This has been calculated as the NPV of the costs, divided by the NPV of the subscribers. This method of calculating the average cost per subscriber per year takes into account the phasing of costs. It can then be seen that there is an additional EUR43 of revenue (when compared to deploying LLU), leaving a net cost of EUR465. In the remainder of this report the results are presented using this methodology, which is referred to as the *NPV of net costs per subscriber*.

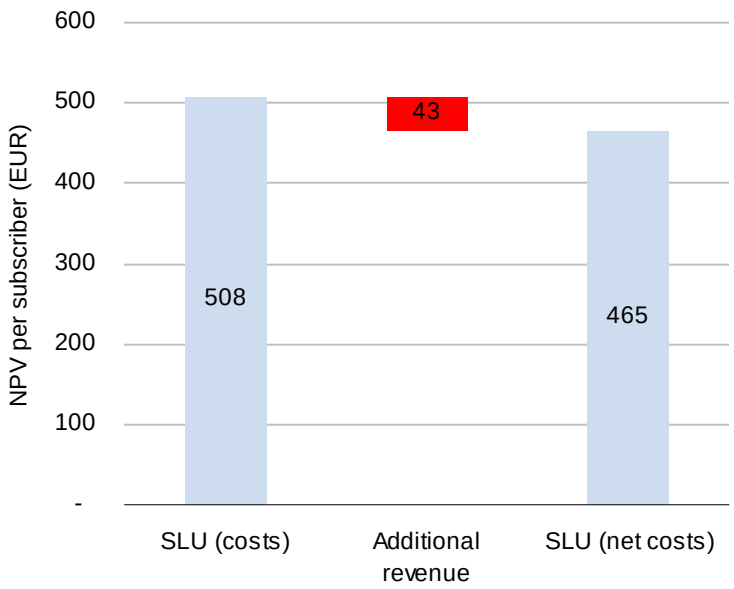

Figure 6.1: Results of the base case for SLU [Source: Analysys]

Figure 6.2 below shows the build-up of net costs for SLU, LLU and WBA under the base case, broken down by category (having allocated the additional revenue across all categories in proportion to their costs). In the case of WBA we have assumed wholesale line rental (WLR) based on the current ADSL-based infrastructure.

It can be seen that under the base case the net costs associated with SLU are 90% higher than if an operator was to use LLU, but 7% less than the current price for a 3Mbit/s WBA product from eircom. This suggests that under this scenario it would not be commercially attractive for an OAO to deploy SLU across Dublin, when compared to LLU. The analysis also suggests that the current WBA products for 3Mbit/s services are significantly less cost-effective than deploying LLU in the exchanges considered.

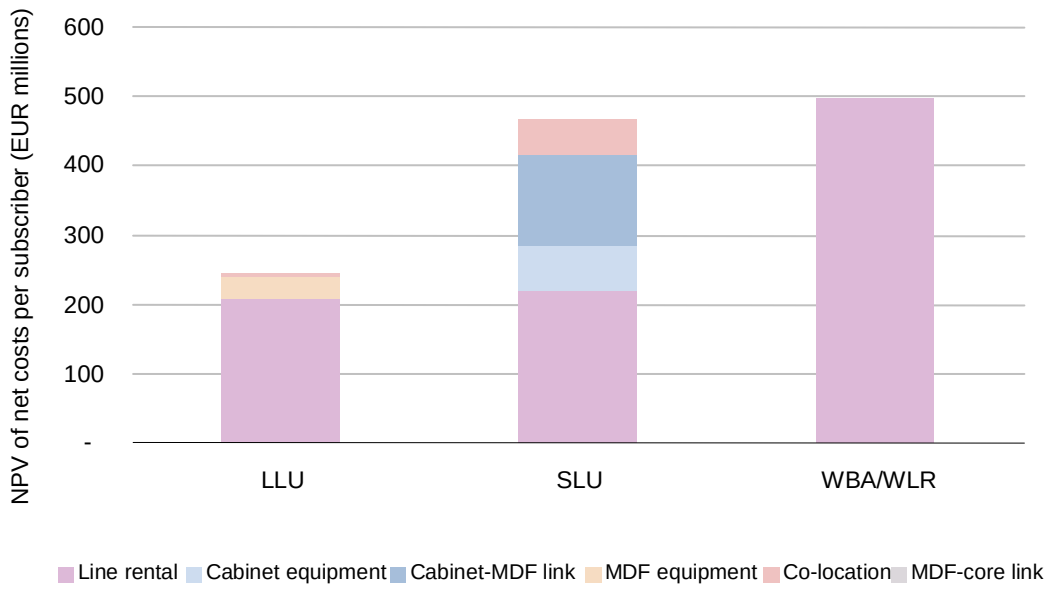

Figure 6.2: NPV cost stacks for different technology options using inputs from the base case [Source: Analysys]

The costs shown in Figure 6.2 are broken down into the following categories:

- *Line rental* – this includes line rental and charges for disconnection and connection (for LLU, SLU and WBA).
- *Cabinet equipment* – for SLU this includes the cost of next generation DSLAMs and line cards.
- *Cabinet–MDF link* – this includes charges for backhaul transport between the street cabinets and MDF sites.
- *MDF equipment* – for LLU this includes the cost of DSLAMs and line cards
- *Co-location* – this includes both recurring and non-recurring charges for co-location at the MDF level (for LLU) and at the street cabinet level (for SLU). In scenarios where the OAO builds its own cabinets, this cost is also included in this category.
- *MDF–Core link* – this includes charges for transport between the MDFs and the core network.

The impact of additional revenue has been allocated across the different cost categories in proportion to their costs.

The cashflows for the base case are shown below in Figure 6.3. This shows that both the initial investment required and the ongoing costs are higher for SLU than LLU.

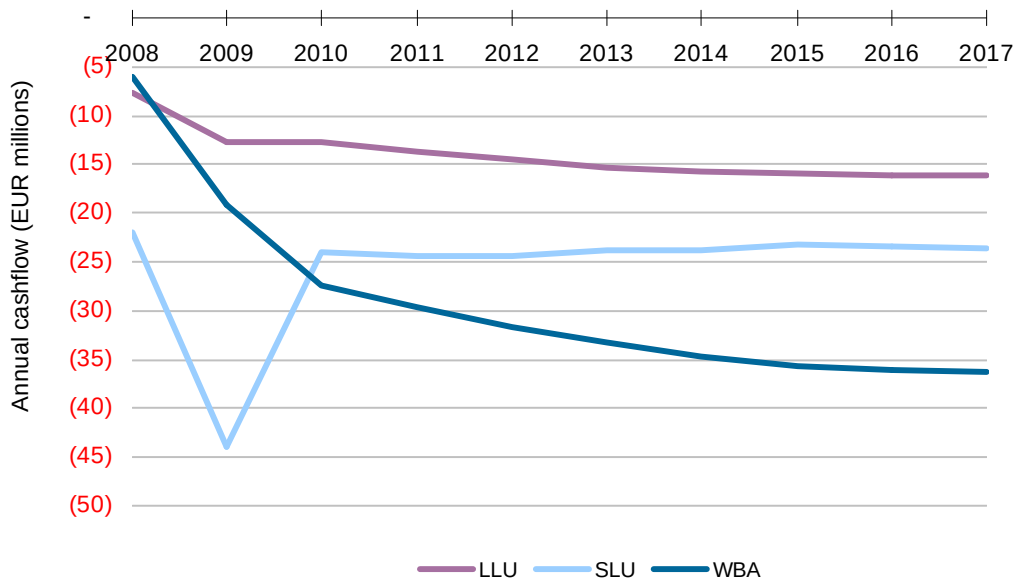

Figure 6.3: Cash-flows for the base case [Source: Analysys]

Analysis of costs by exchange

In order to examine how the costs of SLU vary by exchange, we have plotted the NPV of net costs per subscriber against the average number of lines per cabinet and the average distance between the street cabinet and the MDF. It can be seen from Figure 6.4 below that the cost of SLU is relatively dependent upon the average size of a street cabinet. It should also be noted that the cost per subscriber does not vary much between different exchanges when using LLU, and that even at the exchange with the largest cabinets, on average, LLU is still significantly cheaper than SLU. The blended average NPV of net costs across all street cabinets is EUR465.

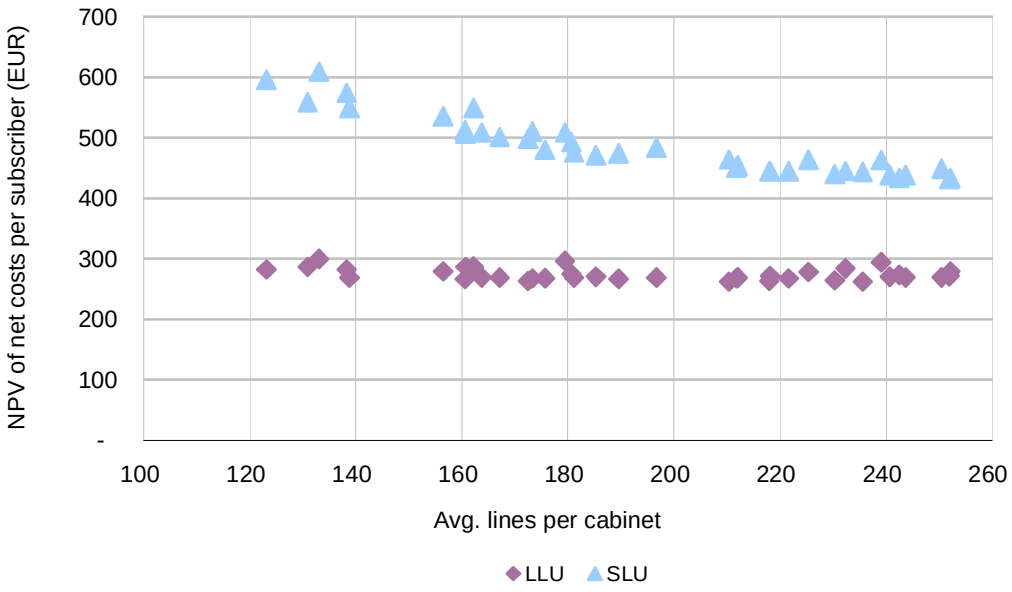

Figure 6.4: Average monthly cost per subscriber as lines per cabinet increases for the base case scenario [Source: Analysys]

From Figure 6.5 it can be seen that the length of the backhaul has little impact upon the costs per exchange under the base case. This is largely due to the tariff structure assumed, which is dominated by a per-link charge (due to the assumed pricing model from eircom, which would be different under the scenario where operators build their own backhaul). We believe this is reasonable as much of the cost is associated with connecting each end of the link.

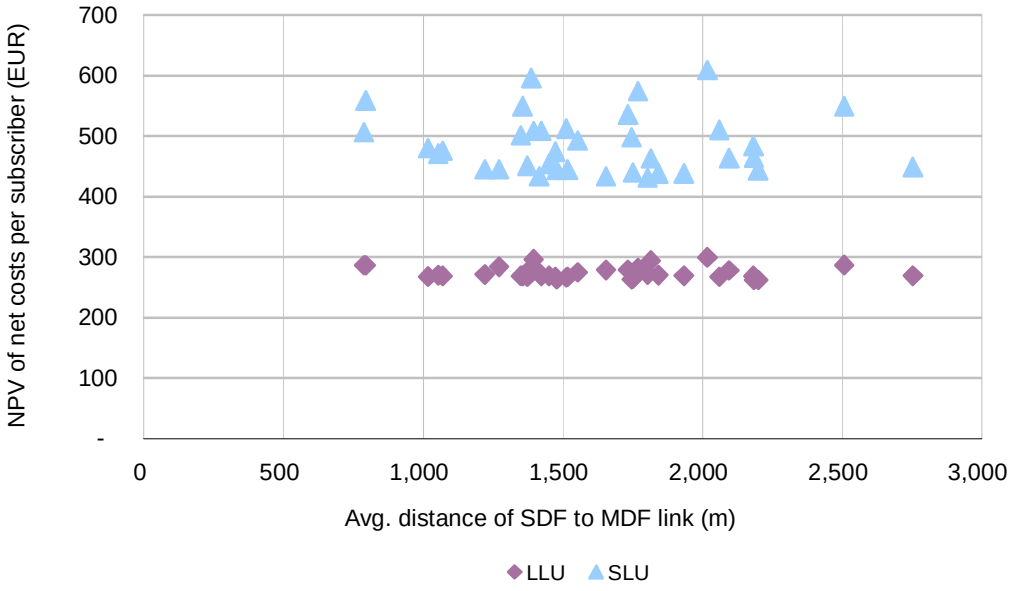

Figure 6.5: Average monthly cost per subscriber as the length of the backhaul link increases for the base case scenario [Source: Analysys]

6.2 Base case: sensitivities

In this section we examine a number of sensitivities to the base case in order to explore how the business case for an OAO deploying SLU is impacted by variations in key assumptions.

Impact of market share

We have considered the impact upon the base case of market share upon the costs for deploying SLU. It can be seen from Figure 6.6 that the costs for SLU are highly dependent upon the assumed market share of the operator. At a 30% market share an operator is beginning to benefit from the economies of scale, which continue to be significant even at very high market shares. In contrast to SLU the economies of scale associated with LLU are much less pronounced, with little cost advantage to be gained from a large market share. The lack of volume discounts for WBA means that it has no economies of scale, and becomes more expensive than SLU at a market share of around 30%.

Under the base case the business case relative to LLU does not become positive at any market share, and is significantly more challenging at lower market shares than the base case of 30%. However, this is not the case for eircom as discussed in section 6.5.

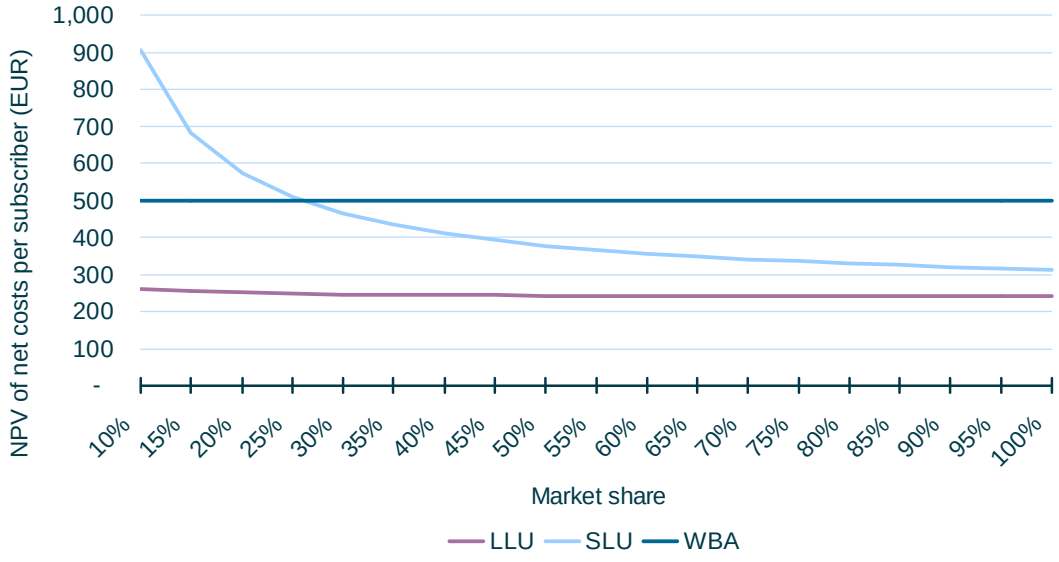

Figure 6.6: Impact of market share upon the costs per subscriber [Source: Analysys]

Targeted roll-out of SLU

Figure 6.4 showed how the cost of deploying SLU is also highly sensitive to the size of cabinet. The viability of targeting SLU roll-out to the most lucrative cabinets has been assessed by limiting the roll-out to different sizes of cabinets. However the analysis, presented in Figure 6.7, shows that even deploying to the largest cabinet type (over 300 lines per cabinet) is more expensive than deploying LLU.

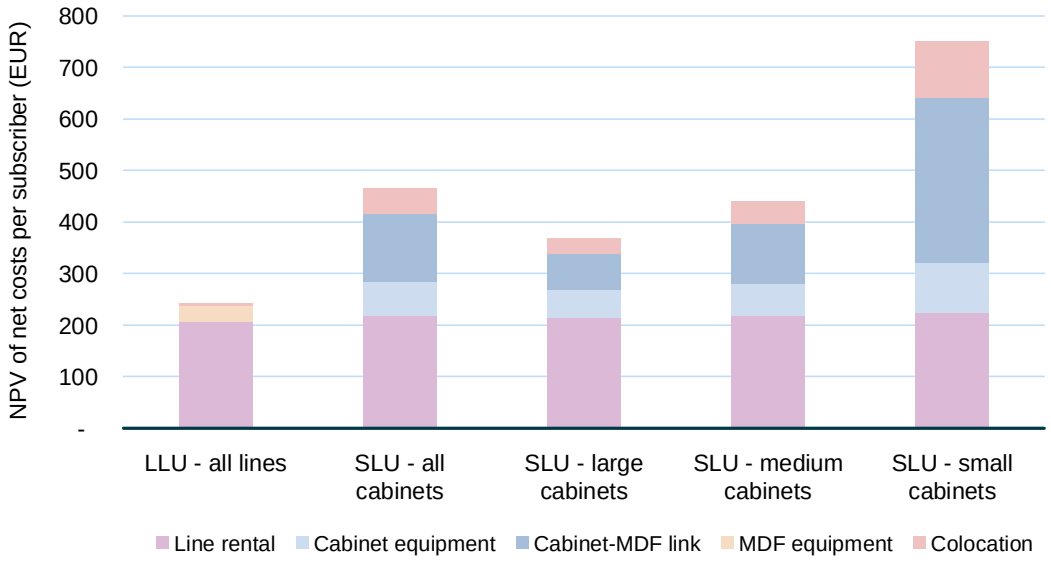

Figure 6.7: Variation of costs with cabinet size [Source: Analysys]

Alternative solutions for backhaul

The base case assumes that an OAO would use dark fibre rented from eircom for the backhaul from the street cabinet to the MDF. Other alternatives to this include building a new fibre backhaul network itself, or leasing fibre from another wholesale provider (the assumptions behind these solutions are discussed further in Sections 5.4.2 and 5.5.2). We have also considered the impact of a reduction in monthly charges from eircom of around 50%.

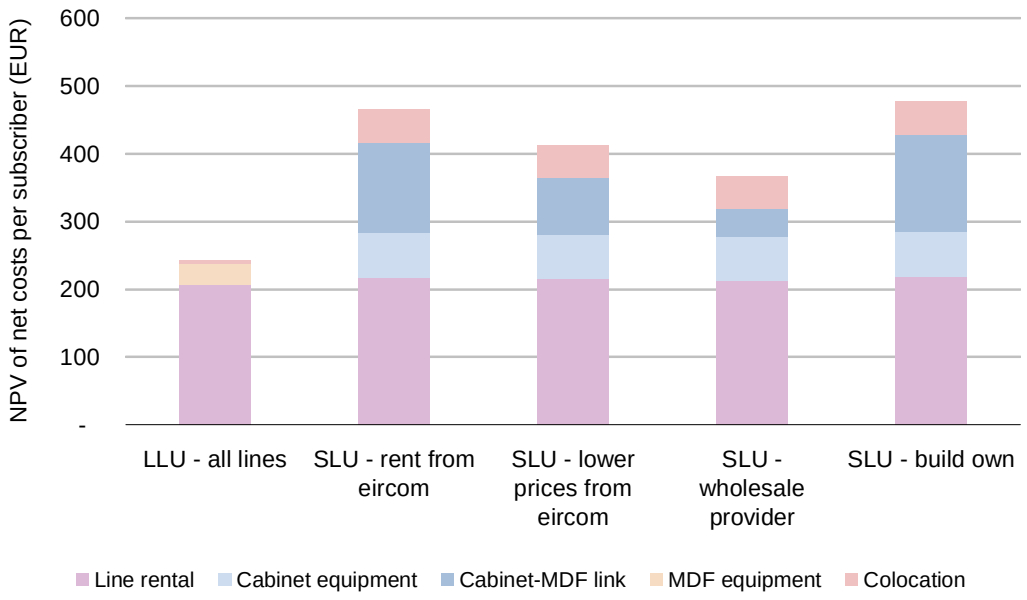

Figure 6.8: Impact of alternative backhaul solutions [Source: Analysys]

Figure 6.8 shows that it could be more cost effective to use backhaul from an alternative provider to eircom, if one was available. Despite the cost assumptions for the wholesale provider being slightly higher that those from eircom, the overall cost is reduced due to the ability to purchase shorter links from the street cabinet to the MDF by using a ring topology instead of a star topology. However, it should be noted that the availability of dark fibre to create such rings is likely to be limited, as we do not believe there is full coverage from other providers. For this reason this option has not been used in the base case.

As would be expected the costs for building a new backhaul network are greater than leasing from eircom. The impact of 42% reduction in eircom monthly charges for backhaul only has a minor impact of 9% on the total costs.

New-build solution for street cabinets

Figure 6.9 shows that the impact of different cabinet building strategies has a minimal impact upon the total costs. It should also be note that there could be significant planning issues if an OAO wanted to deploy its own cabinets next to eircom's cabinets, which would probably make this option unviable. The additional costs of gaining planning permission have not been included in this analysis.

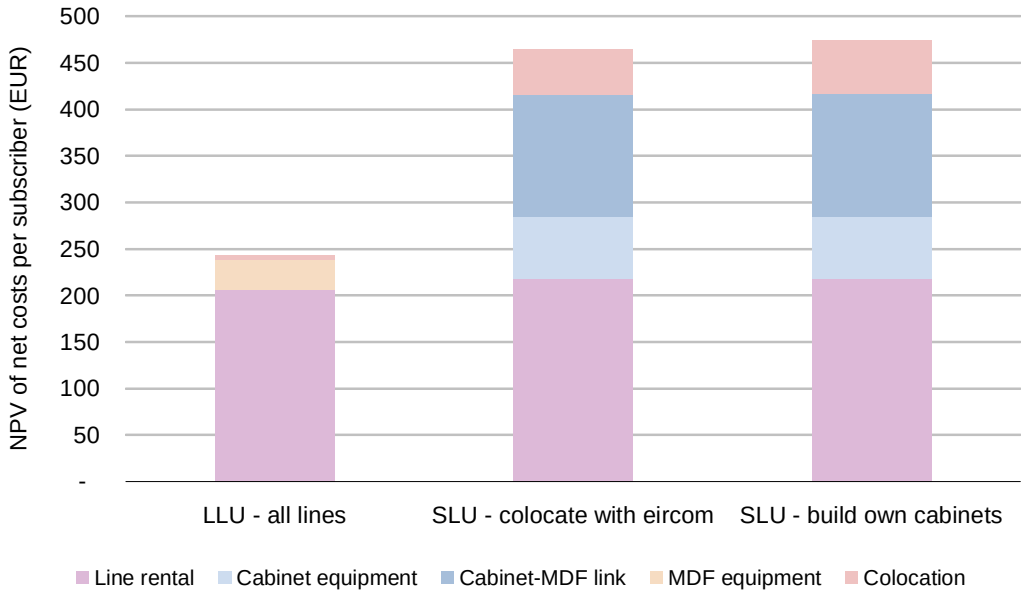

Figure 6.9: Impact of different cabinet building strategies [Source: Analysys]

Reduction in one-off and line rental charges for SLU

The potential impact of the following reductions in eircom's charges for SLU has been considered:

- A reduction in one-off connection and disconnection charges for SLU. These are currently significantly higher for SLU than LLU (connection to full SLU is EUR135.92, compared to EUR55 for full LLU).
- A 10% reduction in monthly line rental charges for SLU.

From Figure 6.10 it can be sent that a reduction in one-off charges for SLU would have a greater impact on total costs (9%) than a 10% reduction in line rental (4%).

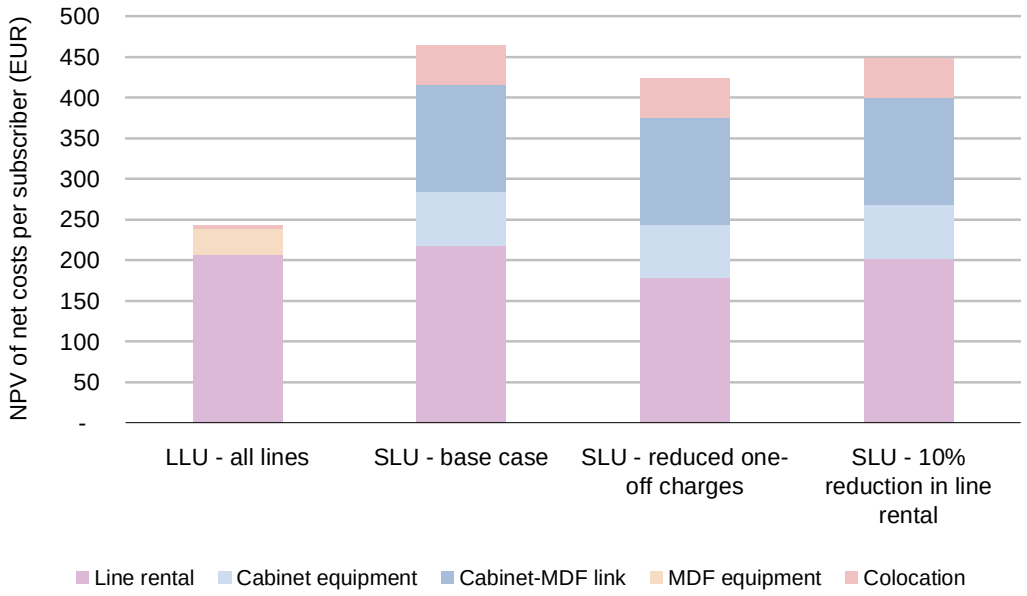

Figure 6.10: Impact of reduced one-off charges for SLU [Source: Analysys]

Additional revenue from SLU-based services

The base case assumes that an OAO would be able to gain additional revenues from SLU-based services. These additional revenues are assumed to ramp up to EUR5 per month (after VAT) by 2014. We have explored sensitivities in which (a) there are no additional revenues ('No Extra Revenue'), (b) the additional revenues amount to double those in the base case ('High Revenue'), or (c) over time all existing data revenues are considered incremental ('Very High Revenue'). The assumptions behind these sensitivities are detailed in Section 5.6, and their impact is shown in Figure 6.11 below.

In the High scenario, the inclusion of additional revenues has an impact of EUR43 per annum per subscriber in NPV terms, compared to the base case.

In the Very High scenario – which an OAO could assume if it took a very pessimistic view of the prospects for ADSL – all of its data-based revenues would be at risk over time. Under this scenario, SLU is still less commercially attractive than LLU, though the business case becomes more attractive in the later parts of the 10-year period, suggesting that under this scenario an OAO might eventually prefer SLU to LLU, if not in the short term.

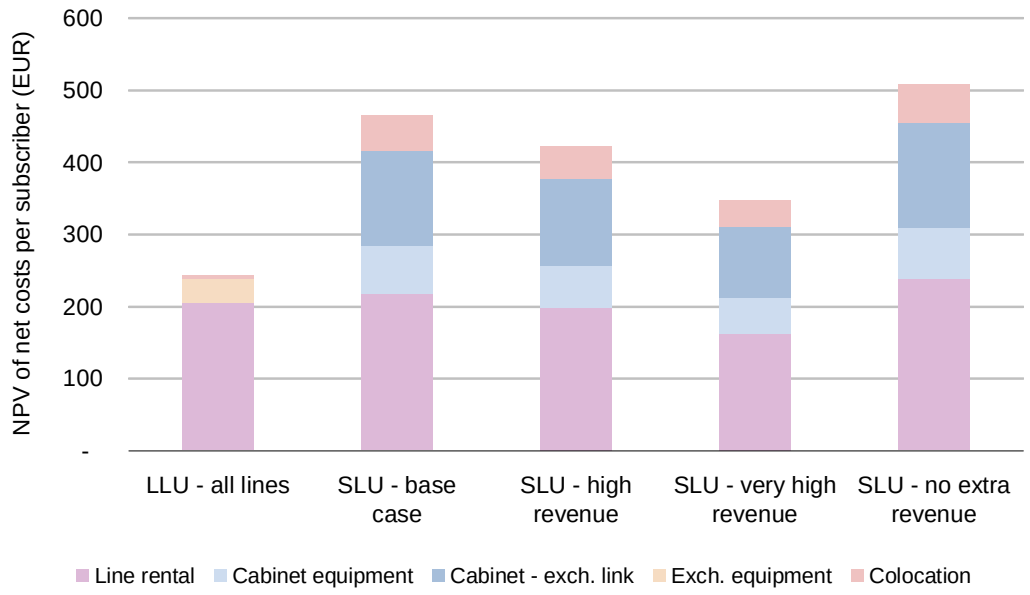

Figure 6.11: Impact of sensitivities regarding additional revenue [Source: Analysys]

Broadband penetration

In the base case we assume that broadband penetration will reach 65% of lines by 2017. The impact of assuming a Low broadband penetration (55% by 2017) or a High penetration (75%) are shown in Figure 6.12 below. It can be seen that a 10% variation in the broadband penetration equates to a change of around 5% in net costs per subscriber.

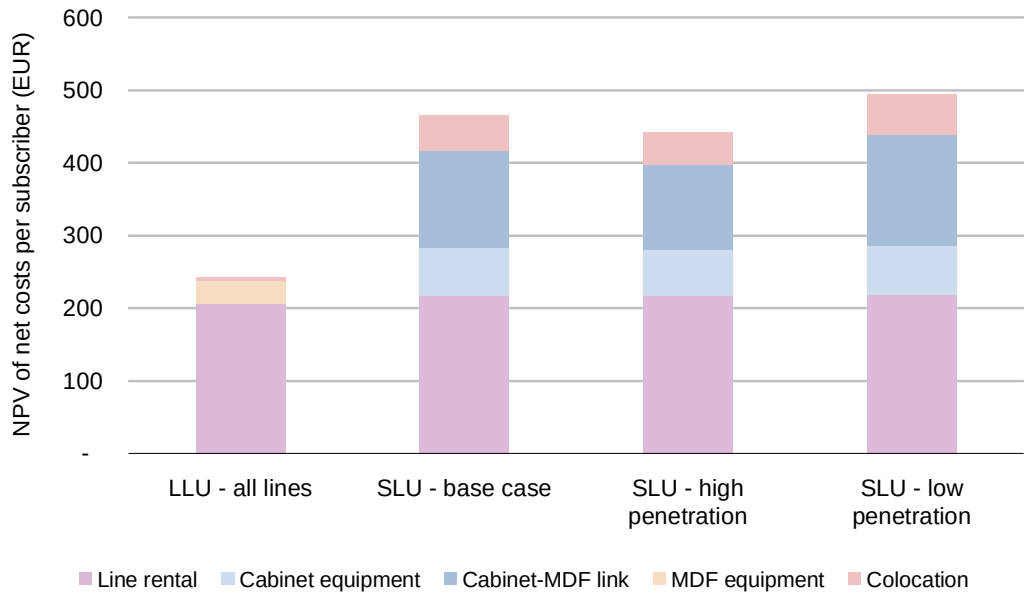

Figure 6.12: Impact of penetration assumptions [Source: Analysys]

6.3 Optimistic scenario

To complement the base case, a second scenario has been constructed that assumes a significantly more optimistic set of assumptions for the OAO. Figure 6.13 shows the impact of the following changes to the base case, which were explored individually in the previous section:

- the OAO achieves an increase in ARPL of around EUR10 per month (after VAT) by 2014, and the penetration of broadband in Ireland reaches 75% by 2017
- cheap backhaul is available (50% less than in the base case)
- SLU charges are reduced by 10% for recurring charges
- the OAO only deploys SLU in large cabinets (over 300 lines).

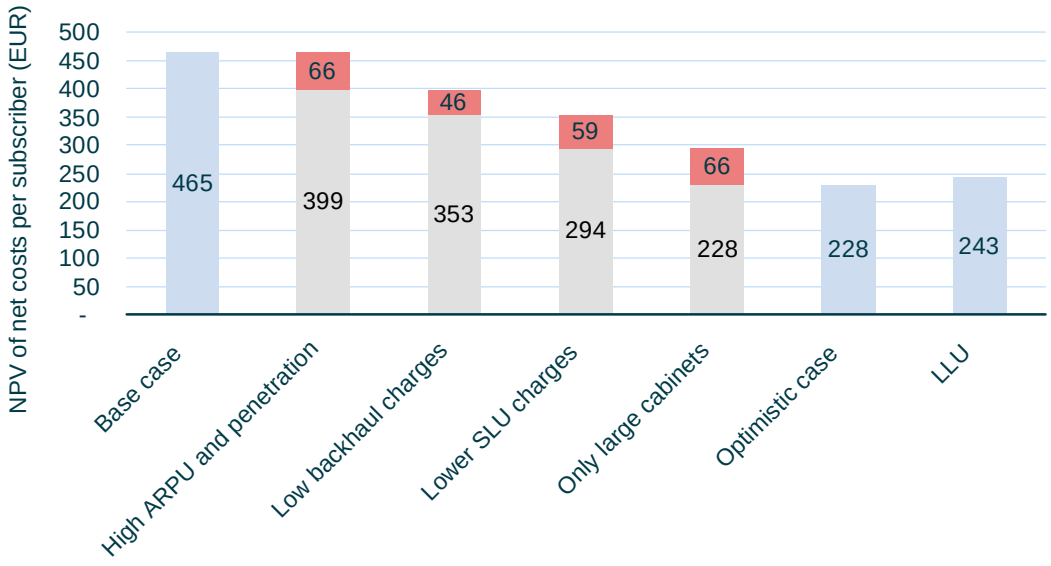

Figure 6.13: Impact of changes between the base case and the Optimistic scenario [Source: Analysys]

If only the first three of these changes are assumed – that is, if the OAO still deploys SLU to *all* street cabinets in the Dublin area – this still leads to a higher cost per line than using LLU (EUR294 compared to EUR243).

If the OAO were also to limit its roll-out to *large* street cabinets (312 of the 1747 in total), the cost per subscriber for SLU then becomes less than that for LLU by around EUR15 per annum. Under these conditions it could be commercially attractive for an OAO to deploy SLU, when compared to LLU.

This Optimistic scenario relies upon significant reductions in unit costs to the base case and would only see SLU services deployed to large street cabinets, which cover around 34% of the lines connected to street cabinets. However there would be significant marketing issues with a strategy of only deploying SLU to large cabinets: the availability of next generation services would vary from street cabinet to street cabinet, making it more difficult to ensure effective marketing. The likely coverage of such a targeted roll-out is illustrated by the map in Figure 6.14.

Figure 6.14: Location of large street cabinets (large cabinets are blue stars, other cabinets are grey stars, exchanges are red squares) [Source: Analysys, eircom]

6.4 Business case at individual exchanges

In order to obtain a picture of how the business case for SLU varies for different sizes of street cabinet, we have carried out this analysis for each of the individual exchanges in Dublin, comparing both the base case and the optimistic case with LLU.

The following three Figures present the NPV of net costs per subscriber for SLU rolled out to the large, medium and small cabinets in Dublin, broken down by exchange area. From Figure 6.15 it can be seen that the *large* cabinets (>300 lines) in almost all exchange areas are more commercially attractive than LLU under the optimistic case, whereas under the base case they are less attractive, with a net cost increase of over EUR100 per line per year. The commercial attractiveness of *medium* cabinets (150–300 lines) is borderline with respect to LLU in the optimistic case (see Figure 6.16). *Small* cabinets are less attractive under both cases (see Figure 6.17).

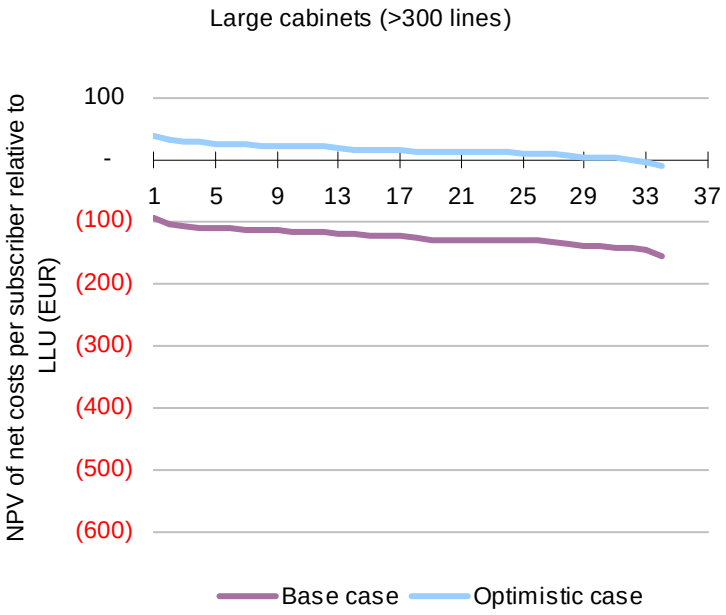

Figure 6.15: NPV of net costs per subscriber at large cabinets in Dublin by exchange [Source: Analysys]

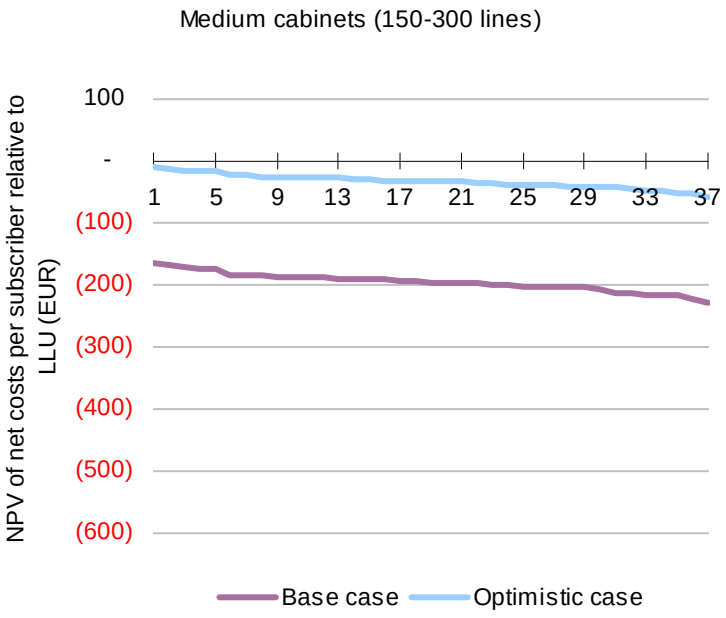

Figure 6.16: NPV of net costs per subscriber at medium cabinets in Dublin by exchange [Source: Analysys]

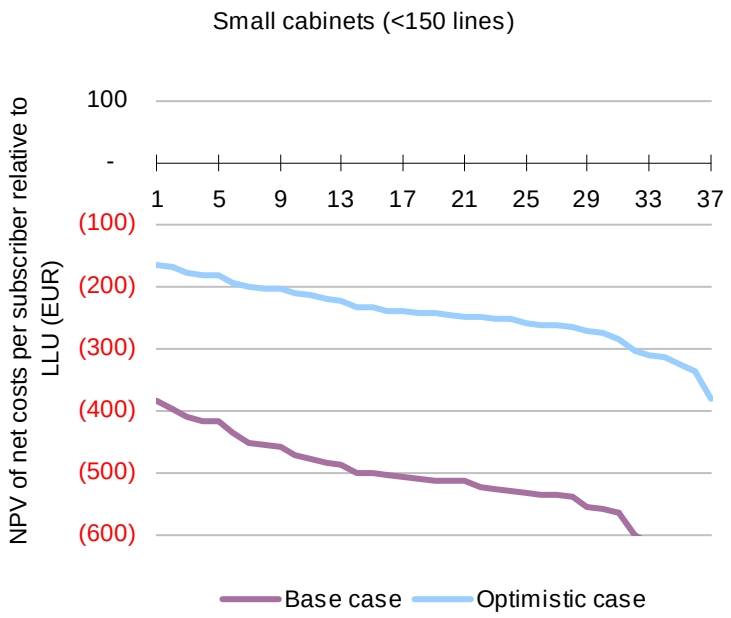

Figure 6.17: NPV of net costs per subscriber at small cabinets in Dublin by exchange [Source: Analysys]

In order to examine these results at the level of one particular exchange area, we chose Tallaght, which is the second largest in the Dublin area. When the results for Tallaght are isolated under the optimistic case, it is seen to be the 16th most attractive exchange area for large cabinets, 33rd for medium cabinets and 19th for small cabinets. Overall this makes Tallaght a reasonably representative sample of all exchanges in Dublin, as illustrated in Figure 6.18. This shows that the net costs for deploying SLU in Tallaght are close to the average in Dublin under most of the options considered. It should also be noted that the deployment to large and medium cabinets is EUR14 more expensive than LLU on average. However, this is a small differential, and it would suggest that the deployment of SLU to some of the medium cabinets may be more attractive based upon local conditions (e.g. higher market share, or higher spending customers). The small cabinets contain 11% of all lines in Tallaght.

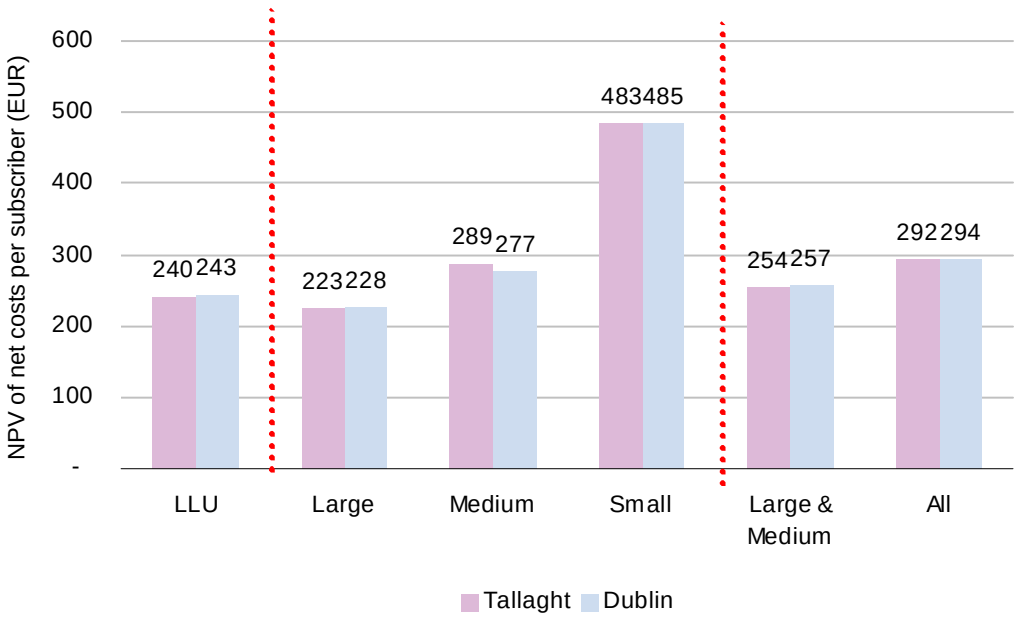

Figure 6.18: NPV of net costs for LLU and for SLU at different cabinet sizes in Dublin and Tallaght (Optimistic scenario) [Source: Analysys]

However, the distribution of street cabinets of different sizes within the Tallaght area does not show any pattern, and limiting roll-out to the large and medium cabinets would lead to uneven coverage. As discussed earlier in Section 6.3, this might cause marketing to be less effective.

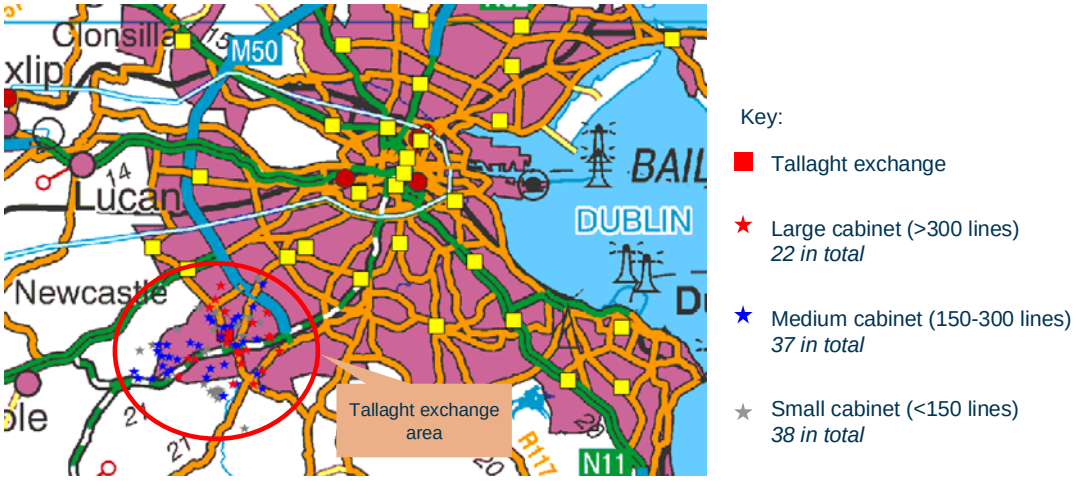

Figure 6.19: Tallaght exchange area and street cabinets [Source: eircom, Analysys]

6.5 Business case for eircom

The business case for eircom deploying VDSL has been explored by constructing a scenario to simulate its costs and likely incremental revenues. The changes to the base case required are summarised below:

- The 'High' increase in ARPL has been assumed, to reflect the greater brand strength and typically higher prices that incumbents can charge
- Street cabinets are assumed to be built new rather than leased
- Backhaul is provided using new-build fibre, but assuming 90% of ducts already exist and can be reused
- Lower one-off charges are assumed for eircom. This is assumed to be a proxy for eircom to maintain the local loop.

The NPV of net costs per subscriber as a function of eircom's market share is shown in Figure 6.20 below. This shows that the costs associated with the eircom deployment of VDSL would become cheaper than LLU at a market share of around 40%, which is less than eircom's current retail market share of 47%.

Assuming a 50% market share, the capital investment per line connected to street cabinets is EUR183 per line. This is in line with benchmarks from the KPN VDSL deployment, which average out at around EUR200 per line across all of the Netherlands.

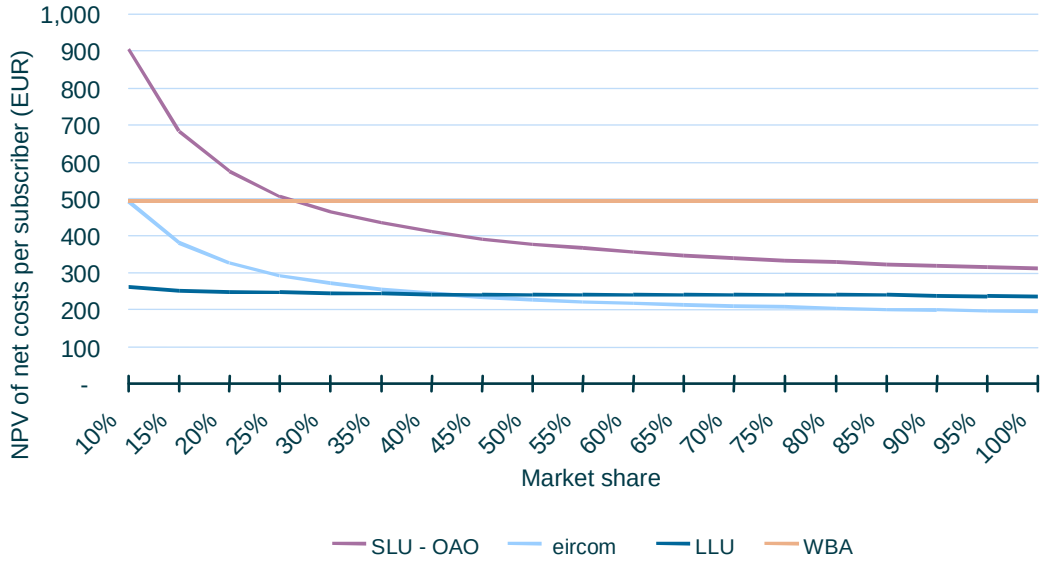

Figure 6.20: Scenario to assess eircom's likely costs compared to an OAO [Source: Analysys]

Potential impact of mandating larger cabinets

The deployment of VDSL by eircom will involve the construction of new street cabinets. At present we do not believe that eircom plans to provide additional space in these cabinets to accommodate other, co-locating operators. The provision of such additional space would lead to increased costs for eircom, but by using the latest technologies the incremental cost to eircom from providing additional space within its cabinets may be relatively small, partly due to the modular nature of modern 'pizza box' DSLAMs.

In our model of eircom's deployment of VDSL we assume that it would cost eircom EUR10 000 to deploy each street cabinet. Assuming a 50% market share, under the base case scenario this leads to a cost of EUR183 per subscriber, of which around EUR19 is for the construction of street cabinets.

It is assumed that the additional cost to eircom of constructing larger street cabinets able to accommodate an additional co-locating operator is EUR1000–3000 per cabinet (representing an additional EUR1.88–5.64 per line). We estimate that this is equivalent to a 1%–3% increase in the total costs for the VDSL roll-out. We would recommend that ComReg seek more information on the magnitude of these costs from eircom.

7 Conclusions and recommendations

7.1 Key findings

The potential eircom VDSL roll-out is still at a trial stage, and there is not yet a reference offer for some of the wholesale products that an OAO would need to use. However, we believe that this study is able to draw the following conclusions with a reasonable amount of certainty:

- Under our base case – which we believe represents the most likely scenario – SLU is not as commercially attractive as LLU. This is also the case if OAOs were to focus their roll-out on the larger cabinets (those with more than 300 lines per cabinet).

- However, it is possible that an OAO might take a more optimistic view of the business case for SLU. Under this Optimistic scenario the business for SLU becomes more commercially attractive when compared to LLU. The key assumptions for this scenario are as follows:

  - the OAO achieves an increase in ARPL of around EUR10 per month (after VAT) by 2014, and the penetration of broadband in Ireland reaches 75% by 2017
  - cheap backhaul is available (50% less than in the base case)
  - SLU charges are reduced by 10% for recurring charges
  - the OAO only deploys SLU in large cabinets (over 300 lines).

- SLU is subject to very strong economies of scale, which are much more significant than for LLU. This contributes towards the difficulty of the business case for OAOs, who are likely to have a lower market share than eircom.

- The largest costs faced by OAOs in deploying SLU are the charges for line rental, co-location at the street cabinet and the backhaul link to the MDF. In all three cases, it seems unlikely that competition will provide lower prices than those available from eircom. Therefore, the possibility of obtaining a fair price from eircom for these services will be important if OAOs are to be encouraged to deploy SLU.

- Though eircom already offers adjacent co-location at its street cabinets to unbundlers, OAOs may struggle to get planning permission to deploy new street cabinets. Therefore it is important that provisions are made for them to gain access to eircom's street cabinets and fibre backhaul at a reasonable rate. If access to this infrastructure is not ensured from the start, it may be difficult to introduce this in retrospect due to practical and cost issues.

On balance, therefore, we believe that an OAO can construct a positive business case for SLU in the Dublin area, but only under the following conditions:

  - there are significant reductions in the costs of SLU
  - OAOs are optimistic regarding the incremental revenue from SLU over LLU

  - OAOs only deploy to large cabinets (over 300 lines), and possibly medium-sized ones (150–299 lines).

- Given that the business case for SLU in the Dublin area is challenging, we believe that the business case will be difficult in other areas of Ireland, where the line density per cabinet is likely to be lower and the backhaul costs greater.

- Analysis of the business case for eircom deploying VDSL shows that the associated costs are less than those for LLU at a market share of around 40% – which is less than eircom's current retail market share of 47%.

7.2 Recommendations

Our study shows that OAOs can construct a commercially attractive business case for SLU under certain conditions. To ensure that they would be able to implement this in the future, it is important that any potential VDSL roll-out by eircom does not have significantly detrimental impact on competition, and we have the following recommendations:

- Given ComReg's responsibility to promote competition, it should now be considering how best to remove potential barriers (including supporting processes) to a successful deployment of SLU.

- The component prices for SLU should be reviewed, both in absolute terms and relative to LLU.

- It will be important for there to be a flexible and competitively priced wholesale bitstream product in addition to SLU.

- It will be important for OAOs to have access to cabinets, since the installation of duplicate cabinets in likely to be uneconomic and/or suffer from other constraints such as local planning. ComReg should consider ensuring that eircom offers co-location space in its street cabinets. Further work should be carried out to establish the magnitude of the cost to eircom of deploying cabinets large enough to accommodate unbundlers' equipment.

- It will be important for OAOs to have access to an affordable, fibre-based, backhaul product from eircom as it would uneconomical in most cases for OAOs to replicate this infrastructure. Options for such a product include duct access, dark fibre or Ethernet products.