



# **Narrowband Access Retail Price Control**

A REPORT PREPARED FOR THE COMMISSION FOR COMMUNICATIONS  
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# Narrowband Access Retail Price Control

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## Executive summary

This report sets out the results of an analysis of the cost of provision of narrowband access services conducted by Frontier Analysis on behalf of ComReg. The report also summarises the conclusions on the appropriate scope and structure of a retail price control applied to narrowband access services in Ireland based on the analysis. The cost analysis is in addition to the wider market analysis conducted by ComReg.

Our key recommendations and conclusions are as follows:

1. CPI-X price caps to be applied covering both higher level (ISDN Primary Rate Access and Fractional Rate Access) and lower level (analogue lines and ISDN Basic Rate Access) narrowband access services, including both line rental and connection charges;
2. Separate price caps for higher level services and lower level services;
3. A price control duration of three years for both sets of controls;
4. For the lower level services, a CPI-CPI price cap for the first year of the control, taking account of the announced price increases<sup>1</sup> in eircom's analogue exchange line and ISDN-Basic Rate Access subscription services effective 30<sup>th</sup> July 2007, followed by a CPI-0 cap for following years implying prices to rise no more than the rate of inflation;
5. For the higher level services a "safeguard" cap recognising that the greater competition in this market should constrain eircom's pricing. This cap would be CPI-CPI for the first year of the control, taking account of the announced price increases in eircom's Fractional and Primary Rate Access subscription services, followed by a CPI-0 cap for following years implying prices to rise no more than the rate of inflation;

The remainder of this document is structured as follows:

- Section 1 sets out the methodology used to assess the appropriate level of retail prices;
- Section 2 sets out the results of the analysis of the cost base;
- Section 3 discusses the overall framework of the price control;
- Section 4 outlines the financial analysis underlying the estimation of the appropriate X factor and conclusions of this analysis.

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<sup>1</sup> The prices announced by eircom result in 4.9% increases in subscription charges for analogue exchange lines and ISDN services, with connection charges remaining unchanged.



# 1 Costing Narrowband Access Services

## 1.1 METHODOLOGY FOR SETTING THE PRICE CONTROL

The objectives of CPI-X type retail price controls is to ensure both that prices for retail customers are at an efficient level and that the regulated operator has incentives to deliver services as efficiently as possible. In order to meet these objectives the level of X is set such that prices at the end of the price control period reflect the level of costs for an efficient operator. Thus in order to set the price control we need to produce a forecast of the efficient level of costs for the included services at the end of the price control period.

We can break down the process of arriving at a cost forecast into three steps:

- Identify the relevant costs to be included for each service or group of services;
- Estimate the efficient level of costs for these relevant costs;
- Forecasting the efficient level of costs.

Each of these steps is addressed in this report.

The financial analysis required may also provide useful information when setting the structure of the price control within the broad framework set out by the market analysis. The parameters of the price control may include the duration of the price control, the services to be included and the structure of the price control in terms of the number of caps and the inclusion of any sub caps.

Decision on the level and structure of the price control also need to take account of other criteria such as consistency with the overall regulatory framework, the costs of implementing the price control and the impact of the price control on consumers and Other Authorized Operators.

### 1.1.1 Relevant costs

eircom delivers a wide range of services at both a wholesale and retail level and incurs a wide variety of costs in supplying these services. The cost basis used for setting the price control should include all those costs that are relevant to delivering the narrowband access services, including both direct and indirect costs and a proportion of common costs.

The primary criterion for deciding whether a cost should be included is the principle of causality. If a cost has a causal relationship with narrowband access services, at least part of the cost can be attributed to narrowband access services. Conversely if there is no causal relationship then the cost should be excluded from the calculation.

For many costs the causal relationship is complex and the cost cannot be mapped to a single product. Costs may be joint, where the level of costs is dependent on the level of demand for more than one product, or fixed and common between two or more products, where a fixed cost is incurred when any

one of the products is delivered but the level of costs does not increase when additional products are delivered.

Where causality does not provide a unique answer in terms of cost attribution, the next criterion to be applied is consistency with previous regulatory decisions on cost attribution. This consistency should ensure that all costs are recovered, and that there is no over- or under-recovery of costs across regulated services. It should also minimise competitive distortions introduced by inconsistent decisions on cost recovery. In terms of narrowband access services, one of the key regulatory decisions is the split between the core network, the costs of which should be recovered from services such as calls and interconnection conveyance services, and the access network, the costs of which can in part be recovered from narrowband access services.

Finally, by basing the cost analysis on eircom's regulatory cost accounting system, the attribution of costs will be based on those decisions made by implicitly or explicitly by eircom in producing its regulatory cost accounting system. Again this should ensure consistency in cost recovery across regulated services.

### 1.1.2 Cost basis

Forward Looking Long Run Incremental Costs (FL-LRIC) are used as the objective for estimating the efficient level of costs. The use of FL-LRIC should provide the correct signals to market players and is consistent with other regulatory decisions by ComReg.

It is not feasible to directly estimate all costs on a FL-LRIC basis within the scope of the present work. For a number of cost components we will be reliant on the Fully Distributed Historic Cost (FDHC) information available from eircom's cost accounting system. Information on an FDHC basis will differ from costs on a FL-LRIC basis for a number of reasons including:

- the methodology used to calculate capital charges for fixed assets, with FDHC being based on the cost of assets at acquisition and FL-LRIC basing based on the current replacement cost of assets;
- the inclusion of costs in eircom's FDHC estimates which reflect the costs of operating eircom's actual network compared to the costs of operating an efficient forward looking network;
- inclusion of costs relating to any inefficiencies in past investments or current operations.

Where FDHC information is used as the basis for cost estimates, we will assess whether adjustments are required in order to better estimate the level of FL-LRIC costs.

### 1.1.3 Cost forecasting

When forecasting the future level of costs from the existing cost base we need to take account of a number of factors that will affect the efficient level of costs going forward including:



- Changes resulting from changes in the level of demand for narrowband access products;
- Changes to the unit cost of inputs;
- Changes in the efficiency with which inputs are used (total factor productivity).

In many cases it will not be possible to disaggregate changes in costs into these factors, but instead a forecast will be made at an aggregate level bearing in mind these three factors.

Costs for each service are modelled independently, with a common methodology. The results are then aggregated into the two relevant markets: Higher Level Access; and Lower Level Access.

#### 1.1.4 Cost of capital

The cost of capital was estimated by applying a Weighted Average Cost of Capital (WACC) to the mean capital employed in a period.

The WACC used was the 11.5% determined by ComReg for the fixed business of eircom<sup>2</sup> (the appropriate level of WACC for eircom is currently under review by ComReg). In the case of the local loop this cost of capital was used to set the wholesale charge used as the cost input as set out below.

## 1.2 DATA SOURCES

The data sources used as inputs to the financial modelling included:

- Eircom's determined wholesale prices for the local loop;
- Information supplied by eircom showing the costs allocated to narrowband services in eircom's regulatory cost accounting system;
- Operational data and unit cost data supplied by eircom;
- Operational and financial benchmarks from other jurisdictions.

The data sources are detailed below.

### 1.2.1 Wholesale local loop prices

As part of the Local Loop Unbundling (LLU) process, eircom determined prices for the local loop on a Forward Looking Long Run Incremental Cost (FL-LRIC) basis using a bottom up model. The use of a LRIC basis should ensure that the cost estimates reflect the costs that would be incurred by an efficient operator building a network now.

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<sup>2</sup> Decision D3/03 - Review of the Price Cap on Certain Telecommunications Services

### 1.2.2 Information from eircom's regulatory cost account system

Eircom produces regulatory financial statements for the core conveyance network on a Current Cost Accounting (CCA) basis, that is assets are valued based on the replacement costs of the assets today. The regulatory financial statements for the fixed business as a whole are on a Historic Cost Accounting basis, that is based on the costs at which assets were purchased. A CCA basis is preferred for setting regulated prices as it reflects the costs borne by new entrants. As, by definition, the costs of the core conveyance network are not recovered through narrowband access services, the information relevant to setting the price control is only available on a HCA basis.

The information published in eircom's regulatory accounts includes costs related to narrowband access services in two Businesses:

- The Access Network business;
- The Retail Access business.

Both of these businesses also include costs relating to other access services, including broadband access services and leased lines. In addition the Access Network business includes the cost of provision of wholesale access services to other operators.

eircom was required to supply additional information separating out costs relating to the provision of retail narrowband access services based on the information underlying the published regulatory financial statements. eircom were also required to show the allocation of these costs to individual services. The costs supplied were broken down further into the underlying activities generating these costs. The data was supplied for five reporting years up until the year ended 31<sup>st</sup> March 2006

eircom argued that an allocation of costs between "rental" and "connection" services was artificial as costs were recovered from one or other of these services over the lifetime of a customer. This observation has been taken into account in the analysis of the information supplied. We note that in some cases there is clear causality between a given cost category and either "connection" or "rental" services, for example, provisioning costs driven by requests for connection services by customers. However in other areas causality may be more complex and that causality alone may not be an appropriate basis for setting cost recovery.

### 1.2.3 Other operational and unit cost data from eircom

In addition to the dis-aggregated cost accounting data, eircom also supplied data on the volume of retail narrowband access services supplied in each of the previous 5 reporting years. For subscriptions, the opening and closing subscriber base was supplied and for connections the total number of connections during the year, including reconnections.

Eircom also provided information on the number of line cards in the network and the replacement cost of these cards.

### **1.2.4 Benchmark data**

Benchmark data can be used to assess whether the level of costs reported byeircom are efficiently incurred.

Benchmarking against operators in other jurisdictions requires finding operators who have similar operating environments and who have comparable information available. Given that we are benchmarking individual cost components rather than aggregates such as Total Factor Productivity for the firm as a whole, the choice of comparator operators will be largely dictated by the public availability of cost information or other information on a disaggregated basis. Where data are available account needs to be taken of any differences in the operating environment which may impact on the comparability of the data.



## 2 Cost Base by Element

### 2.1 LOCAL NETWORK COSTS

In order to ensure consistency with other regulatory decisions in terms of cost allocation and cost recovery, the definition of the network costs to be recovered from narrowband access services is drawn from the accounting separation framework.

In the ODTR’s decision D7/01<sup>3</sup>, for accounting separation purposes the Local Access Network was defined as follows:

*“The Local Access Network provides connections to the Core Network. The accounts for the Local Access Network business will include the costs and capital employed associated with providing and maintaining these connections.*

*For accounting separation, the Local Access Network business will include all the customer dedicated components of the network including, for example, the line cards and ports located at concentrators and/or exchanges.*

*The Core Network business will include all other network components. Customer line rental will be a service provided by the Retail business. The revenue from line rental provided to end users will therefore be recorded in the Retail accounts. The cost of providing customer lines will be recorded against the Local Access Network business and there will be a transfer charge of costs to the Retail business in order to match revenues with their associated costs. The costs transferred to Retail should be net of any possible local access revenue.”*

Furthermore the boundary between the access network and the core network was defined:

*“The access network boundary shall remain at the switch side of the line card.”*

As well as costs related to narrowband access services, the Local Access Network will also include costs related to the provision of other access services, primarily leased lines and broadband (ADSL) services. Apart for the local loop, the components, activities and hence costs for narrowband services can be distinguished from those costs related to other services.

<p>Network Termination Point</p> <p>Underground and overhead (on poles) drop cable;</p> <p>Underground and overhead (on poles) distribution and feeder cable;</p> <p>Poles;</p> <p>Duct and Manholes; and</p>
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Table 1: Local network costs for narrowband access services

Source: Frontier Economics

<sup>3</sup> ODTR eircom’s Reference Interconnection Offer & Accounting Separation and Publication of Financial Information for Telecommunications Operators: Report on the Consultation & Decision Notice D7/01

Joint boxes  
MDF  
Line cards

### 2.1.1 Local loop costs

The cost of the local loop has been taken to be the cost of the local loop used to set the Unbundled Loop Metallic Path Charge in 2005<sup>4</sup>. This cost was determined to be €14.26 per loop per month, with the ULMP price set at €14.65 per loop per month to take account of €0.39 carrier billing and administration costs.

ComReg directed that eircom be allowed to increase the price by no more than the rate of consumer inflation by reference to the consumer price index ('CPI') in each year up to December 2007. eircom has increased the ULMP under this price cap as shown in the table below.

ULMP Monthly Rental	Applicability
€14.65	Applies from the 01/12/04 to the 09/12/05
€15.09	Applies from 10/12/05 to 30/11/06
€15.68	Applies from 01/12/06 to 01/12/07

Table 2: ULMP prices

Source: eircom RUO Price List

The price control allows eircom to increase the ULMP price on the 1<sup>st</sup> December 2007 in line with inflation. ComReg proposed that it would review the situation during 2007 and depending on market circumstances and cost data available at that time, might direct a new price any time after 1 December 2007.

We assume that the cost of the local loop component has increased in line with the overall ULMP price.

The local loop is required to deliver either narrowband or broadband services and the cost is independent of the combination of services delivered. Thus, for

<sup>4</sup> Review of eircom's ULMP Monthly Rental Charge. Decision No: D15/04 Document No: 04/110 Date: 5 November 2004

subscribers who take both narrowband and broadband services via ADSL, the cost of the local loop is common to both narrowband and broadband services. Under eircom's current product structure broadband services can only be purchased in conjunction with narrowband services. Hence the decision to purchase narrowband services, either alone or in conjunction with broadband services, can be argued to be the driver of local loop costs. For the purposes of the analysis we assume that the total cost of the local loop is recovered from narrowband services.

This assumption is inconsistent with the assumption used to set the price of the Line Share service for Local Loop Unbundling, for which it is assumed that where broadband services are delivered in addition to narrowband services, half of the costs of the local loop are allocated to broadband services. For these lines the cost of the line will be over-recovered, however the number of Line Share lines is very low.

### 2.1.2 Line cards

A bottom up model has been constructed to estimate the costs of line cards. This bottom up model has been based on a combination of data drawn from eircom and from benchmark data from other sources. The costs of analogue line cards, ISDN-BRA cards and ISN-FRA/PRA cards have been modelled separately.

The starting input for the calculation of costs is a time series of the number of (digital) narrowband subscribers, including both eircom retail subscribers and subscribers to OAOs using wholesale line rental to deliver narrowband access services. This is then used to estimate a time series of line cards required based on the number of subscribers per line card and a utilisation rate. The utilisation rate was based on information on the current utilisation of line cards supplied by eircom.

Over the years a number of differing types of line cards, from each of the two vendors used by eircom, have been installed by eircom. The calculation of the required number of line cards required uses the most recent type of line card from each of the two vendors for each service as the Modern Equivalent Asset.

The number of line cards installed in each year is calculated as the net increase in the number of cards over the previously installed base, plus a number of additional cards calculated as percentage of the existing base of cards. The additional cards take account of the need to replace cards that develop faults and the additions of new cards that are installed because of shifts in demand for example between exchange areas between areas that do not result in a net increase in the number of subscribers. This percentage applied has been set at 5%.

The current unit acquisition cost of line cards was supplied by eircom. This cost was benchmarked against assumptions about the unit costs of line cards taken from the Danish and Swedish LRIC models, and was found to be reasonable. This acquisition cost is projected forwards based on an assumption about the annual change in acquisition cost of line cards taken from the Danish LRIC

model (a 6% annual reduction). This is then multiplied by the number of cards installed in each year to give an estimate of Gross Book Value.

For each vintage of cards, the net book value and HCA depreciation charge in a year is calculated based on the accounting life applied by eircom (8 years). From these values, and the assumption about the rate of change in the unit acquisition charge of line cards, the corresponding items under Current Cost Accounting are calculated. The CCA variables being gross and net replacement cost, CCA depreciation and holding gains/losses. The weighted average cost of capital is then applied to the net replacement cost to calculate a cost of capital. The resulting charges for the year is summed across all vintages of line cards to give CCA depreciation, holding losses and the cost of capital for the line cards.

Direct operating costs for line cards are calculated as a percentage of Gross Replacement cost, with the percentage being based on the Danish LRIC model. Indirect costs are calculated by applying a mark up to the capital charges and direct costs.

The resulting total cost for line cards is then converted to a per line cost by dividing the cost by the number of subscribers, including OAO subscribers using wholesale line rental. The resulting unit cost forecast shows reduction in unit costs going forwards. This is a combination of the average age of line cards in the network increasing and reductions in unit replacement costs. The increase in the average age of the cards results lower net asset values and an increasing number of card being fully depreciated. The lower unit replacement costs feeds though as reductions in both capital charges and operating expenses.

### **2.1.3 MDF**

The costs of the elements of the MDF not included in the ULMP charge are estimated based on the pricing for MDF access in eircom's Reference Unbundling offer

### **2.1.4 Other network**

The Other Network category includes the costs of additional network elements, such as transmission equipment, related to providing higher rate services. These costs were taken directly from the cost information provided by eircom.

### **2.1.5 Provisioning**

When a customer has a line installed, eircom generally expenses the costs relating to the installation of this line. In the case of a new line these costs may include the cost of the drop wire from the distribution point to the customer premises and the provision of a Network Termination Point in the customer's premises. In cases where there is insufficient capacity in the local access network (for example if no copper pairs are available), this may include the costs of upgrading the access network to provide sufficient capacity.

In the regulatory accounts these costs are included as provisioning costs. However the cost of these network elements is included in local loop component of the ULMP charge used as the basis of the calculation of the cost of retail



narrowband access. Including the totality of the provisioning costs reported in the regulatory accounts in addition to the local loop element of the ULMP charge would double count the costs of these network elements.

The other element of costs included in the provisioning costs reported by eircom is the administrative costs of enabling a line. This cost will be incurred whether the line is a new line, a line which has been pre-provisioned with soft dial tone or and existing line which was disconnected. This cost is not included elsewhere in the cost calculation.

In order to prevent double counting of costs reported by eircom as provisioning costs only the proportion of the eircom reported provisioning costs related to the administrative costs were included. The cost of this element was estimated as 10% of the total provisioning costs reported by eircom, with the other 90% of costs reported by eircom being the costs of network elements already included in the cost of the local loop.

### 2.1.6 Repair

Repair costs will include both the cost of fault reporting and handling and the costs associated with any repairs result from reported faults or other identified faults. The majority of faults arise in the access network and are thus indirect costs of narrowband access. The fault rate (usually expressed as the number of faults per 100 lines per year) for an operator will to a large degree reflect the current state of the access network which will in turn reflect the past level of investment in the network. Given that the access network has been costed on the basis of the cost of a high quality state of the art network (the Modern Equivalent Asset principle), there may be an inconsistency between the repair costs reported by eircom and the forward looking basis on which the access network has been valued.

It is not feasible to construct a bottom up model of the level of faults, and hence repair costs, for an MEA network. However we can compare eircom’s fault rate with a sample of comparable operators.

Article 11 of the Universal Service Directive<sup>5</sup> requires designated universal service operators to publish information on a number of measures of quality of service including fault rate, with the definitions of the parameters and measurement methods being standardised<sup>6</sup>. The table below shows the data collected from Western European operators (despite the requirements of the directive data was not available from all operators).

Operator	Fault Rate (per 100 lines per year)
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Table 3: Reported fault rate

<sup>5</sup> DIRECTIVE 2002/22/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 7 March 2002

<sup>6</sup> ETSI EG 201 769-1

Telefónica de España	13.6	<i>Source: Operators (eircom data as reported to ComReg)</i>
France Télécom	8.3	
British Telecom	14.0 (weighted average of 15.5 residential and 10.7 business)	
Telecom Italia	13	
Portugal Telecom	11.2	
Swisscom Fixnet	20	
Telekom Austria	5.7	
Belgacom	5.6	
OTE	13.5	
Average	11.7	
Eircom (Q1 2006)	14.9	

As we can see from the table, the level of faults reported varies considerable between the operators with eircom's fault rate at the higher end of the range.

There is no obvious explanation in terms of operating environment for the differences in reported fault rates between operators. This suggests that the differences in part reflect differences in the quality of the access infrastructure. As eircom's costs are at the higher end of the range this supports the hypothesis that the fault rate and hence the current level of repair costs are above that for the efficient network modelled in order to set the ULMP charge.

In order to estimate the appropriate level of repair costs we have used as a base eircom's reported repair costs but then adjusted this cost by an efficiency factor to take account of the relatively high fault rate reported by eircom. Given the uncertainties involved in benchmarking we have taken a conservative view of the appropriate level of adjustment. The adjustment is based on the mean fault rate for the comparator countries, rather than setting the adjustment base on comparator countries with the lowest level of fault reports. The impact of this adjustment is to set the estimated efficient level of repair costs to 78% of the level reported by eircom.

While this adjustment takes account of the number of faults it takes no account of the efficiency of the costs incurred in dealing with faults. However, given the

incentives on eircom to operate efficiently we do not propose to make any further adjustments to the (implied) unit cost of dealing with reported faults.

## 2.2 RETAIL COSTS

We define retail costs to be those costs not related to the network, but which are required in order to deliver an end to end retail services to customers. The main costs included are detailed below:

Product Management
Marketing and Sales
Billing

Table 4: Retail costs

Source: eircom

While there is a well defined boundary between network costs to be recovered from narrowband access services and those to be recovered from call services, many retail costs are driven by the purchase of a bundle of services by an individual customer rather there being a causal link to any of the individual services within that bundle. These costs can be considered common and joint costs between the provision of narrowband access services and other services, such as calls and broadband services. For these costs there will not be a unique allocation of costs to narrowband access services based on causality alone. This could introduce an element of subjectivity into the cost allocation.

In order to ensure that the cost allocations used by eircom are reasonable we have inspected the methodology used by eircom to allocate costs to verify that it is soundly based and fairly allocates costs on the basis of cost accounting principles. As an additional check we have also analysed the resulting allocation of costs between narrowband access services and other services to ensure that the allocation is reasonable.

### 2.2.1 Product management

Product management consists of a number of activities such as product strategy, development of individual products, pricing and market research. While some of these activities will be causally related to a given product or group of products other, such as development of new products, will relate to a range of products.

eircom's cost accounting system allocates direct costs to product groups on the basis of headcount. This identifies separately those costs directly related to narrowband access ("PSTN/ISDN Non-traffic") which are then allocated across the products on the basis of revenues.

The allocation methodology used by eircom captures causality at the product group level, by allocating costs on the basis of the number of staff serving a particular product group. The use of revenue to allocate with product groups is reasonable on the basis of proportionality, although it could be argued that allocating costs equally to all products would better reflect causality.

### 2.2.2 Marketing and sales

Marketing and sales includes activities such as advertising, sales and account managements.

eircom differentiates between sales and customer service costs to serve mass market customers, both residential and businesses, and account management to serve larger customers. The costs of these two activities are allocated to product groups using a combination of “dashboards” (described by eircom as management tools used to track the focus of the corresponding teams) and management judgement. Costs are then allocated to revenues on the basis of revenues.

While this methodology seeks to identify causality, the use of management judgment as a source of allocation suggests there may be an element of subjectivity in the allocation.

Communications costs related to marketing campaigns are allocated on the basis of the products promoted by the campaigns. This should effectively identify causality.

### 2.2.3 Billing costs

Billing costs includes both the costs of billing customers and the collection costs associated with recovering revenues from customers.

Credit management, which includes both the costs of managing credit and bad debt provision are allocated to products based on the billed revenues of bad debt accounts, collected from a sample of bad debt accounts. Bad debt costs are thus directly allocated to products on the basis of causality.

Costs related to bill payment (fees paid to banks and other financial intermediaries) are allocated on the basis of billing occurrences, that is the number of connections of lines for non-traffic services.

Costs related to the billing systems are largely recovered from call services as the billing systems complexity is largely the result of the need to rate the large volume of calls rather than the cost of billing access services.

Costs related to the printing and dispatch of bills appear to be largely allocated to access services. Arguably this reflects causality as the provision of an access service such as line rental generates a bill irrespective of whether any additional services are purchased.

### 2.2.4 Overall allocation of retail costs

While turnover from narrowband access services constitutes 34% of eircom’s total retail turnover, 30% of the costs of retail activities are allocated to narrowband services. The lower proportion of costs that are allocated to narrowband access services reflect the maturity and relative simplicity of narrowband access services compared to services such as broadband services, which will require proportionately greater sales and marketing costs and call

services, which are more complex to bill. The overall allocation does not appear to be disproportionately weighted towards narrowband access services.

### **2.3 COMPARISON WITH EIRCOM'S REPORTED LEVEL OF COSTS**

It is natural to compare the resulting costs from the estimation exercise with the level of costs reported by eircom in its regulatory accounts, and provided on a more disaggregated basis to ComReg. However when making this comparison we should take account of differences in the basis under which costs have been calculated. Any differences in the overall level of costs may in part reflect these differences in basis.

The key differences in the basis in which the costs are calculated are the use of HCA in the regulatory accounts for the access network and the expensing of costs related to the installation of new lines in eircom's accounts. As both of these changes affect the time periods over which costs are recovered, the effect of these two differences in basis is complex, depending on distribution in expenditure over time.

A further difference in the two sets of data is the classification of network costs. As noted above the network costs included in the ULMP charge cover the costs of the network from the NTP to the line side MDF, which the corresponding costs in eircom's regulatory accounts are classified in part to "Subscriber Unit", "narrowband access network" and "provisioning".

The chart below shows a comparison between the overall costs reported by eircom for narrowband access services and our estimates of the efficient costs for delivery of these services.

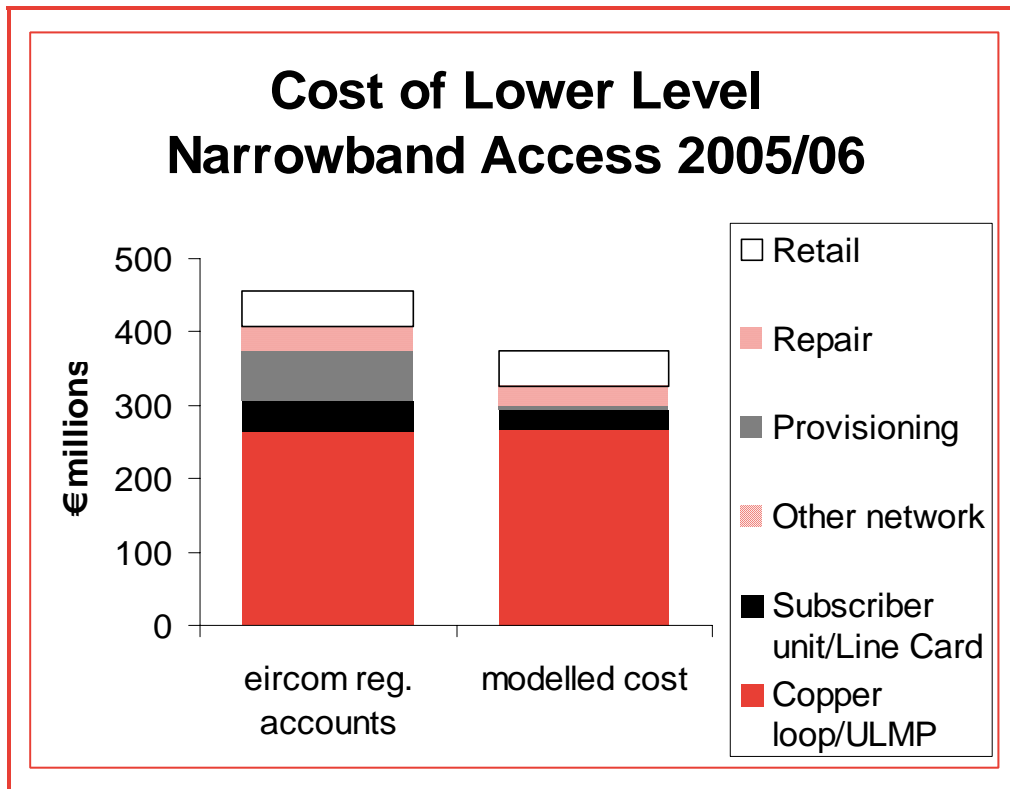


Figure 1: Comparison of cost bases

Source: eircom and Frontier Economics

The analysis shows that the cost basis used for the purposes of setting the price cap is significantly below that reported in the regulatory accounts. Most of the difference arises in the local loop, reflecting differences between the FL-LRIC model used to set the ULMP charge and the level of costs reported by eircom.

## 2.4 ESTIMATES OF CURRENT LEVEL OF SERVICE PROFITABILITY

The profitability of each service for the year 2006/07 was estimated by comparing the revenues from each service to an efficient level of costs including the cost of capital.

Overall narrowband access services more than recovered their costs, i.e. prices were above a cost based level. The prices overall of lower level narrowband services were only slightly above costs, with prices for the higher level services significantly above costs.

While eircom have indicated that the attribution of costs between connection and rental is not reliable, the analysis showed that for lower level narrowband services both connection and rental prices were above attributed costs.

## 3 Price Control Characteristics

### 3.1 COVERAGE OF PRICE CONTROL

One of the options set out in the consultation document<sup>7</sup> was the possibility of forbearance either on all narrowband access services or on high level services only (maintaining a price control on lower level services).

eircom have increased narrowband access prices in real terms under the current retail price control, which includes both access services and calls in a broad basket. Overall prices for narrowband access services are above an efficient cost based level. In the longer term, in the absence of price control eircom may continue to set prices above an efficient level. Thus the financial analysis does not support forbearance on all narrowband access services.

A further option set out in the consultation was forbearance for pricing of higher level services, due to the greater degree of competition for these services. The analysis suggests that these services are currently priced significantly above an efficient cost level. This suggests that competitive pressures alone have not yet constrained prices to an efficient level. Thus again the financial analysis does not support forbearance on the higher level services.

### 3.2 PRICE CONTROL DURATION

Setting the duration of the price control is a decision that needs to balance the risk of forecast errors over a longer time period, with the need to provide some incentive for the operator to make efficiency gains. If the price control period is too long, then there is increased risk that by the end of the period prices will be significantly above or below the efficient level of costs due to forecast error. If the price control is too short, the operator will have less incentive to make efficiency gains. This is because any gains additional to those forecast by the regulator, while producing increased profitability in the current price control period, will lead to a tighter price cap in the following price control period. Thus efficiency gains tend to be concentrated in the early part of the price control period where they result in increased profitability for a longer period before being clawed back.

In the case of the price control of narrowband access services there are particular difficulties in forecasting in the medium term due to market evolution such as the potential introduction of next generation technology. On the other hand, even with a relatively short price cap, eircom still have strong incentives to make efficiency gains throughout the price control period due to competitive pressures in other markets.

On balance we believe that a relatively short price control of three years is appropriate.

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<sup>7</sup> Consultation on a Retail Price Cap as a Potential Remedy on Fixed Narrowband Access Markets - Part 1. Document No: 06/41

### 3.3 STRUCTURE OF PRICE CONTROL

#### 3.3.1 Separate baskets for higher and lower level services

The market analysis process identified two separate markets for higher level services and lower level services.

Even though separate markets have been identified, there would be an argument for grouping the two markets together if there was a high degree of common costs, as such a grouping would allow eircom a degree of flexibility in recovering such common costs across the services. However, the cost analysis shows that while there are some common costs between the two services the majority of the costs for the higher level services in the network are distinct from those for the lower level services. In addition some of the retail costs such as account management are distinct for large accounts which typically purchase the higher level services. Thus the level of common costs is relatively small.

In view of the lack of significant common costs between the higher level and lower level services we recommend separate controls for higher and lower level services.

#### 3.3.2 Single basket for connection and rental services

eircom believe that it is not appropriate to distinguish between costs that should be attributed to connection products and those that should be attributed to subscription products. While our analysis does attempt to distinguish these costs on the basis of causality, there are a number of potential reasons why costs which are incurred when a customer is first connected may be appropriately recovered from subscription services. The analysis indicates that currently prices broadly reflect the distribution of costs attributed on the basis of causality, although both connection services and rental services are priced above cost.

Placing both connection and rental products in the same basket gives eircom some limited flexibility to set the relative levels of connection and rental prices although with neither line rental nor connection services loss making there is no need to “rebalance” prices. Thus we would recommend a single basket including both rental and connection services separately for higher level services and lower level services.



## 4 Estimating the Appropriate Level of X

### 4.1 SETTING X

For each basket X should be set such that the revenues from the basket of services at the end of the price control period are equal to the costs of providing the basket of services.

We can break down the process into three steps:

- forecast the demand for services;
- forecast the cost of efficiently delivering the basket of services;
- estimate the real price reduction required to ensure that the revenues from the basket of services equal the costs.

#### 4.1.1 Effect of inflation

The financial modelling has been carried out in nominal terms, with forecast costs and prices expressed in terms of the value of the Euro in the respective periods, rather than the current purchasing power of the Euro. i.e. including price increases related to general inflation.

In the model it is assumed that general inflation over the forecast period, as measured by the CPI, will be 3 per cent. This is based on the OECD's forecast of consumer price inflation for Ireland for 2008 published in December 2006.

#### *Sensitivity to changes in assumptions*

CPI-X price controls are designed to be insensitive to differences between the forecast level of inflation and the actual level of inflation during the price control. Any changes in the level of general inflation that impact on the level of costs will directly feed through into retail prices and hence revenues through the CPI term in the CPI-X formulae. Hence the level of profitability will only be marginally affected by the level of inflation.

#### 4.1.2 Price control period

The price control is assumed to begin during September 2007 and run for three years. Thus the end date of the price control, where prices should be in line with costs, is in September 2010.

### 4.2 DEMAND FORECASTS

#### 4.2.1 Total market size

Demand forecasting for narrowband access services in the current environment is subject to a relatively high degree of uncertainty due to a number of factors.

- Substitution of fixed access services provided by eircom by other access providers including those providers using eircom infrastructure to deliver services and at the margin mobile substitution of fixed lines;
- The growth of broadband access services which when purchased from eircom or from access providers using eircom's bitstream service, requires the customer purchase narrowband access services;
- Growth in the number of households due to a combination of reductions in mean household size and increases in population due to net immigration.

Given this uncertainty, rather than attempting a multivariate approach, attempting to forecast the impact of these factors, we have chosen to adopt a simple univariate approach to forecasting demand project forwards recent trends.

Demand is projected in terms of the number of access lines, with a PSTN line being a single access line, Basic Rate ISDN being two lines and Fractional/Primary Rate Access being up to 30 access lines.

The rate of growth in the number of access lines was falling towards zero in recent years. However in the year to March 2007, eircom reported a 4% increase in the number of retail and wholesale access lines it provides<sup>8</sup>. While it is not clear whether this trend will be maintained, it suggests there may be scope for continued increases in the number of access lines. Our forecast is that over the period of the price control, the number of market access lines will increase at 2% a year, approximately the average annual increase over the last five years.

In recent years an increasing proportion of access lines have been ISDN lines, and an increasing proportion of these have been Primary/Fractional rate lines. We forecast this trend to continue.

### *Sensitivity to assumptions*

There may be some economies of scale in the provision of narrowband access services, particularly in the local loop. Thus an increase in market growth above that forecast would be expected to lead to lower unit costs and hence a higher level of X, all other things being equal. However these economies of scale are not reflected in the local loop unit cost used in the model, which is independent of the market size. Hence, overall the level of X is not very sensitive to changes in the level of demand.

### **4.2.2 eircom market share**

In order to estimate the number of retail lines for eircom we need to forecast eircom's retail market share. Forecasting the level of market share is subject to a great deal of uncertainty. In addition different types of competition will result in different levels of change in market share for different levels of the network:

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<sup>8</sup> BCM Ireland Finance Limited Quarterly and twelve-months results announcement 31 March 2007

- Competition from alternative access providers will result in reduced number of subscribers in all parts of the network;
- Competition from access providers using full unbundling will result in reduce numbers of line cards, but no reduction in the number of loops in place;
- Competition from access providers using WLR, potentially in conjunction with shared access or bitstream services, will result in fewer retail customers, but no reduction in the number of customers using any part of eircom's narrowband access network (line cards and local loop);

For modelling purposes, Frontier has made the assumption the eircom's market share will move to the following as at March 2012, with market share over time changing at a constant rate:

Service	Market share as at March 2012
Analogue lines	65%
ISDN-BRA	65%
ISDN-PRA/FRA	65%

Table 5: Frontier's assumption for eircom's retail market share

Source: Frontier Economics

eircom's market share is currently lower for higher level services than the lower level services, the market share for higher level services has been relatively stable over time whereas that for the lower level services as reported by eircom has fallen in the year to March 2007, due to an increase in customers of OAOs using Wholesale Line Rental.

#### *Sensitivity to changes in assumptions*

While there is significant uncertainty on the future evolution of market share the forecast level of market share is not critical to the estimate of the level of X, as reductions in the number of eircom retail customers due to the use of WLR will have no impact on the total number of customers (wholesale and retail) using the eircom network and thus will have no impact on economies of scale in the network.

#### **4.2.3 Number of connections**

Forecasts of the number of connection were made based on forecasts of churn rates, both for the market as a whole and for eircom.

Forecast churn rates for the market as a whole (the proportion of the connected customer base which disconnects completely rather than move to another operator) were based on average churn rates over the last five years based on the information supplied by eircom to ComReg. Applying the forecast market churn rate to the subscriber base gives a forecast of the gross number of disconnections for the market. Adding the forecast net increase in subscribers in the year to the

forecast number of disconnections gives a forecast of the gross number of connections for the market.

Forecast churn rates for eircom (the proportion of the connection customer base who disconnect either to move to another operator or to leave the network) were based on the churn rate for 2005/06 as the eircom churn rate has been higher in recent years due to increased competition. Again applying the forecast eircom churn rate to the subscriber base gives a forecast of the gross number of disconnections for eircom. Adding the forecast net increase in subscribers in the year to the forecast number of disconnections gives a forecast of the gross number of connections for eircom.

### 4.3 COST FORECASTS BY COMPONENT

#### 4.3.1 Local loop

The determination of the ULMP charge based on FL-LRIC also set a mechanism for updating the price with the price being indexed from the base price. The price changes on the 1<sup>st</sup> December each year based on the change in inflation as measured by the CPI up until September of that year. The final indexation as set out under the decision will take place on 1 December 2007. After this date neither the level of the ULMP charge, nor a mechanism for setting the price has been determined.

We have not constructed an independent cost model of the local loop and thus are unable to determine how the cost of the local network may change going forwards. Instead we assume that the costs of the local loop after December 2007 will continue to rise in line with general inflation as measured by the CPI with successive price increases in December of each year. Thus we are assuming that the loop cost will rise by 3% each year.

#### *Sensitivity to assumptions*

The local loop is the largest single cost component of narrowband access, making up almost three quarters of the cost. Hence the level of X is highly dependent on the assumption that the cost attributed to narrowband services will move in line with the CPI (although assumptions on the level of the CPI itself will have little net impact on the level of X for the reasons set out in 4.1.1 above).

This assumption may be affected by any revaluation of the local loop and/or revisions to the operating costs associated to the local loop, or changes to the attribution of the costs of the local loop between narrowband and broadband services (for example to bring the attribution into line with that used for setting the Line Sharing charge under Local Loop Unbundling).

Any divergence between the assumptions used for setting retail prices, and hence Wholesale Line Rental through the retail minus formula, and the costs used to set the ULMP charge would also have an impact of competitive neutrality. This may need to be taken account of when reviewing future ULMP charges.

### 4.3.2 MDF and line card costs

The forward looking cost of line cards is forecast based on the bottom up model. The main drivers of the future unit costs going forwards are.

- The age of line cards in the network will continue to increase over time. As the capital charge will fall over time as cumulative depreciation increases, this will result in lower unit capital charges going forwards;
- Decreases in unit acquisition costs over time will reduce the cost going forwards.

The costs of the MDF have been assumed to increase in line with general inflation as measured by the CPI.

### 4.3.3 Other OPEX

Information was provided by eircom on the level of costs at a disaggregated level for the last five years. In theory this time series could be used to estimate the rate at which unit costs have evolved over time which could be used to forecast potential unit cost changes. However analysis of the data showed a number of discontinuities. These discontinuities are artefacts, reflecting changes in the way costs have been allocated with eircom, rather than discontinuities in the level of underlying costs. Hence it has not been possible to extract any information on the rate of efficiency gains in the past.

With no data available from which to project forwards trends in costs or unit costs an independent forecast has to be made. Given the complexity of the activities included a “bottom up” approach is not feasible.

The future level of operating costs depends on a range of factors:

- Changes in unit input costs over time;
- Efficiency improvements due to the introduction of new technology and improved working practices;
- Changes in the level of demand over time.

Given the relatively stable forecast in demand at the wholesale level, changes in demand will not have a significant impact on the future level of unit costs for the network. For retail activities, the reduction in the volume of narrowband access services will be offset, to a degree, by increases in other services such as broadband services. Thus neither for network nor retail activities do we expect to see material changes in unit cost due to changes in demand.

In terms of trend in prices for inputs, weekly wages in Ireland have been increasing at a higher rate than the increase in the CPI. However this increase in unit costs for one input will be offset by reductions in other input costs, particularly reductions in the cost of information technology. In addition there should be continuing improvements in efficiency due to the introduction of new technology.

Given the lack of firm data on which to base the forecasts, an assumption was made that unit costs would increase in line with the CPI.

#### 4.4 DERIVING THE LEVEL OF X

The cost to eircom of delivering a basket of services at the end of the price control was calculated as the volume of the services in the basket multiplied by the unit cost run rate.

Separately, the revenues from this basket of services at current prices were calculated by multiplying the volume of services by the prices as at June 2007.

The percentage increase in prices needed to ensure that the total revenues equal costs was then calculated and converted to a compound annual growth rate to give the nominal annual price increase required. Subtracting the average inflation rate over the period gave the real annual price changes required.

Based on the assumptions above, the following values of X were derived for the two baskets:

Basket	Level of X
Lower level narrowband access services	0 to 2
Higher level narrowband access services	16 to 18

Table 6: Estimates of X

Source: Frontier Economics

This implies that the prices for the basket of lower level services would need to increase by the CPI less 0% to 2% (a price fall of between 0% and 2% in real terms) for prices overall to be in line with costs. The reduction in real terms prices reflects a combination of the level of prices currently being slightly above the level of costs for the lower level services, and forecast real terms reduction in the cost of some components (primarily line cards).

Prices for the basket of higher level services would need to decrease by the CPI less 16% to 18% for prices to be aligned with costs at the end of the price control period. This significant real terms price reduction almost entirely reflects the fact that the current level of prices for higher level services is significantly above cost.

#### 4.5 CONCLUSIONS FOR PRICE CONTROL

##### 4.5.1 Lower level services

The range of estimates for the value of X for a basket of the lower level services is 0 to 2, implying a prices being stable or falling slight in real terms. The range indicates that prices are currently broadly in line with costs and that there is limited scope for efficiency gains over the duration of the price control.

While there is a possibility that the out turn unit costs will be at the lower end of the forecast range due to efficiency gains in for example retail activities, the impact of such efficiency gains may be relatively small. On the other hand eircom argue that unit costs in the access network are increasing through a combination of higher input prices for both labour and raw materials and due to

the need to increase the coverage of the network to serve new residential properties, while the overall number of lines is relatively stable. Given that the majority of costs are due to the local loop, the impact here could be relatively large.

Given this balance of upside and downside risks, and the continued investment required in the access infrastructure by eircom to meet developing demand, we believe that it is appropriate to allow eircom the flexibility to increase prices at the top end of the forecast. Thus, we recommend setting the level of X at 0, thus allowing eircom to increase prices in line with inflation.

The level of X was based on the June 2007 prices, prior to the price changes due to be introduced by eircom on July 30<sup>th</sup> 2007.

The prices announced by eircom result in 4.9% increases in subscription charges for analogue exchange lines and ISDN services, with connection charges remaining unchanged. The annual change in the CPI for the year to June 2007 reported by the Central Statistics Office was also 4.9%. Thus the level of prices for the basket of lower level services from July 30<sup>th</sup> 2007 will be close to the level required under the proposed cap at the end of the first price control period. For simplicity we recommend that a CPI-CPI cap be applied for the first year, i.e. no increase in nominal terms from the level of prices at the beginning of the price control year.

#### 4.5.2 Higher level services

The range of estimates for the value of X for a basket of the higher level services is 16 to 18 implying significant annual reductions in prices in real terms. Such dramatic reductions in prices could have a negative effect on the sustainability of competition for this sector of the market, both for narrowband access services and other services, which in the longer term may not be in the interests of these customers.

The market analysis noted the greater prospective competition in this sector. While, for reasons set out above we do not believe that forbearance is appropriate, the level of the price cap can reflect the greater competitiveness of the market. Thus we recommend a safeguard cap of CPI-0 to be placed on higher level narrowband access services. A CPI-0 safeguard cap would ensure that prices for these customers would not increase in real terms overall.

Again the level of X was based on the June 2007 prices, prior to the price changes due to be introduced by eircom on July 30<sup>th</sup> 2007. Similarly to the lower level services we recommend that for the first year of the price control that a CPI-CPI cap be applied based on the opening prices.







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