



Response to Consultation

Local Loop Unbundling; responses to consultations on operating costs, equipment costs and network design parameters.

Responses to consultation papers 04/21 and 04/31.

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1 Executive Summary

Since the introduction of Local Loop Unbundling (LLU) in 2000 there has been an ongoing process to set prices based on Long Run Incremental Costs (LRIC) for these services. In February and March of this year ComReg issued two related consultation papers: 04/21 “Local Loop Unbundling Costing Consultation: Direct and Indirect Operating Expenditure Econometric Modelling” and 04/31 “Local Loop Unbundling Costing Consultation: Access Network Design Parameters and Costs of Certain Access Network Elements”. These two consultations set out the views of ComReg on a number of methodological and technical issues relating to the appropriate estimation of LRIC costs, and sought the views of interested industry parties.

This paper contains summaries of the responses received to the two consultations along with ComReg’s final position, having taken into consideration the valuable information and argument provided by the respondents, on these issues. This paper, taken together with the two consultation papers, sets out in a transparent manner the reasoning behind directions issued to eircom.

Since the introduction of LLU services in Ireland the take up has been disappointing. This is especially worrying given the potential importance of LLU in the development of a competitive and innovative broadband market, which would bring great benefits to consumers, businesses, and the competitiveness of Ireland.

Currently the price for the monthly rental for LLU services is based on the fully distributed historic costs of eircom’s access network, including whatever legacy inefficiencies may be inherent in that. ComReg believes and eircom accepts that prices for these services should be based on the forward looking LRIC costs. The success of competition in this market, and hence the maximum benefit to consumers, will depend upon having cost estimates and prices for unbundled loops as close to efficient economic cost as possible. Prices based on LRIC estimate the sum of minimised costs paid for all inputs required to supply LLU services. Using an accurate estimate of LRIC as the basis for prices performs a number of functions which, in combination, guarantee economic efficiency, i.e. it sends out the right signals to wholesale customers in making purchase decisions, it directs production to the most efficient suppliers, and it gives the appropriate signal to firms with regard to investment decisions.

Under the provisions of the Framework Regulations ComReg has undertaken an analysis of the market for unbundled local loops, and has designated eircom as having significant market power (SMP) in this market. As a part of the analysis process ComReg concluded that wholesale price controls were necessary, and that prices should be set on the basis of LRIC. Both the designation of eircom’s SMP and the obligation under the Access Regulations to offer cost oriented rates on the basis of LRIC were notified to the European Commission and set out in decision notice D08/04. While D08/04 imposes the obligation to set prices using LRIC, there remain a large number of complex issues of implementation that need to be appropriately resolved if the obligation is to achieve its objectives.

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In order to assist ComReg in determining the appropriate LRIC costs of LLU in Ireland in the most transparent manner possible ComReg established an industry advisory group (IAG2) consisting of representatives of eircom, other authorised operators (OAOs), and ComReg, under the independent chairmanship of Professor Bill Melody. To facilitate the workings of that group it was agreed that it would focus its discussions around a bottom up model of the local access network previously produced by eircom and its advisors. During the IAG2 process considerable progress was achieved and consensus between the parties was reached on many key modelling, engineering, and economic issues. However, at the conclusion of the IAG2 process, when Professor Melody issued ComReg with a final report documenting what had been achieved and making recommendations for further work, a number of important issues remained unresolved.

The most important unresolved issues related to the appropriate estimate of operating costs, the appropriate input costs of certain of equipment and infrastructure, and certain network design parameters. Subsequent to the end of the IAG2 process ComReg and its external advisors continued to work on these issues, and in May 2003 ComReg published Decision Notice D12/03 directing eircom to amend its prices for LLU services. This Decision Notice was subsequently challenged by way of Judicial Review by eircom; the grounds for appeal included a challenge to the decisions taken by ComReg in relation to those issues unresolved by IAG 2. The Judicial Review was settled before the case came to court, and it was agreed between the parties that ComReg would initiate a new process for the purposes of agreeing with eircom new LLU prices or in default of such agreement, making a new decision fixing LLU prices.

In order to resolve the issues in dispute in an open and transparent manner ComReg issued two Consultations, 04/21 and 04/31, which respectively addressed the issues of the appropriate operating costs and the appropriate network design parameters and the costs of certain network elements. These two consultations set out in detail ComReg's views on the best way to proceed in resolving these issues, and sought the views of respondents on the proposals set out. In response to the consultations ComReg received three submissions.

With regard to operating costs, ComReg believes that it is wholly inappropriate to use eircom's current costs as the basis for setting prices. The network modelled in the LRIC exercise is significantly different to that which eircom currently uses, and is valued in the model at several times the value identified in eircom's separated accounts. Consequently if one were to use eircom's actual operating costs as a basis for pricing then OAOs would be doubly penalised; they would be charged for both the capital costs associated with transforming eircom's current mixed vintage network to a brand new efficient network, while simultaneously being charged for the costs associated with eircom operating its current network with all its inherent inefficiencies. In view of the paucity of the information available on operating costs across European countries, ComReg proposes instead to estimate operating costs by reference to US data suitably adjusted by the use of econometric modelling to take account of differences between the US networks and the modelled network in Ireland.

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In the responses from industry one respondent states that it believes only eircom's current costs, adjusted for planned efficiency gains, can form a reliable estimate of costs for use in the LRIC modelling exercise, and goes on to state that differences in operating environments between the US and Ireland make any use of US data inappropriate. This respondent also makes a number of detailed and technical criticisms of the econometric modelling exercise. The other two respondents were supportive of the approach proposed by ComReg, although one noted that as ComReg was basing its estimates on a complete sample of US Local Exchange Carriers (LECs) rather than a subset of only efficient LECs the cost estimate should be very much regarded as an upper bound.

Having carefully considered the responses, ComReg is still of the opinion that the US data, suitably adjusted to allow for differences between the US and Ireland provides the most robust estimate available. However, as a result of the responses ComReg has reconsidered and amended a number of technical points in its analysis.

With regard to the unit costs of certain items of equipment, ComReg's concern relates not so much to the underlying materials costs, on which there is broad agreement, but to the capitalised labour costs associated with installing these items. In its consultation paper ComReg carefully broke down the sub-elements of the costs of these items, so that the responses from different parties could be compared on a like for like basis, and to identify the detailed causes of differences. In the interests of transparency ComReg set out broad ranges of costs that it believed would be appropriate.

ComReg received two detailed responses to this consultation, which have greatly assisted in its understanding of these issues. Unfortunately, given the detailed and proprietary nature of the information provided the responses are necessarily confidential, and therefore ComReg is constrained in the amount of information it can release in this document. After careful consideration of the responses a number of ComReg's concerns were allayed, or on the basis of the information provided ComReg has revaluated its views on appropriate costs. However, ComReg is of the view that eircom must amend the costs it uses in its LRIC modelling for the following items: underground cable cost; overhead cable cost; pole cost; PCP cabinet costs; MDF costs.

With regard to network design parameters, ComReg was concerned that the LRIC model was not reflecting the principle of efficient network design to the degree that no allowance was being made for the sharing of routes between the main and distribution portions of the access network. In the consultation ComReg put forward its view of what level of sharing could be expected of a newly built efficient network.

ComReg received two detailed responses to this issue. Due to the confidential nature of the submission received from the respondent, it is not appropriate to set out in detail the information supplied.

Having carefully considered the information provided, ComReg is still of the view that the LRIC estimate of costs should make an allowance for route sharing between

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the main and distribution portions of the network, as not to would not reflect the principles of efficient network design. However, in light of new information ComReg has revised its view of the proportion of routes that would be shared.

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2 Introduction

2.1 Local Loop Unbundling

The “local loop” is the copper pair connecting an individual telephone subscriber to the nearest point of interconnection with the main telephone network at the local exchange. This “last mile” of network is accepted to be the most difficult for new entrants to replicate. “Local Loop Unbundling” (LLU) implies that the network owner is required to provide access to this copper pair, so that new entrants can offer their services across the local loop. This allows new entrants to provide a full range of services directly to the customer. In particular, new entrants can offer the new range of broadband services (such as high-speed Internet access) even if the incumbent operator has not chosen to offer such services. As a result, local loop unbundling has the potential to increase the range of competing services available to businesses and consumers.

The Regulation on Unbundled Access to the Local Loop of 18 December 2000 defined the local loop as “the physical twisted metallic pair circuit connecting the network termination point at the subscriber’s premises to the main distribution frame or equivalent facility in the fixed public telephone network”. The access network is wider than local loops and includes line cards. Line cards are the pieces of electronic equipment that connect customers to the core network and manage the individual lines. These are provided by new entrants themselves when they purchase Unbundled Local Loops from the incumbent. Other access technologies such as fibre and wireless are also by convention excluded from the local loop network. What is of interest for this consultation paper is the cost of the local loop component of the access network, denoted as the local loop network.

The widespread take-up of broadband services remains of critical importance to Irish businesses and consumers. Since the year 2000, Ireland has lagged significantly behind most OECD countries. Competition has not developed at the rate anticipated, and the take-up of LLU by Other Authorised Operators (OAOs) has been disappointing. Among the possible reasons for this is the level of eircom’s charges to OAOs for local loop unbundling.¹

In addition, to the extent that wholesale line rental is regulated with reference to its underlying costs, the cost of the access network as calculated for LLU, is an important input.

While prices should clearly be set at levels that promote competition and enhance consumer welfare, they must also allow eircom an appropriate return on investment so as to encourage continued investment in the network or, in time, in alternatives.

¹ A recent study by the OECD noted: “It is difficult to undertake appropriate monthly pricing benchmarks for LLU from this comparative study due to the limited available information. However, in some countries, such as Denmark and Sweden, relatively low monthly charges facilitated LLU implementation, *whereas other countries, such as Ireland and the UK, have made slow progress due to relatively high charges for unbundled loops.*” (OECD DSTI/ICCP/TISP (2002) FINAL 10 September 2003 “Developments in local loop unbundling”.) Emphasis added.

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Unduly low prices might encourage entry of new suppliers into the market for services using the local loop, but fail to provide sufficient incentive for continued investment in the network. The balancing of these objectives is a complex matter.

2.2 Legal basis

Some legal background is provided in Appendix A.

2.3 FL - LRIC as the basis for charging

As set out in the Decision Notice D8/04 Long Run Incremental Cost (LRIC) provides the appropriate basis for the computation of cost oriented LLU prices.² This approach has also been followed by other telecommunication sector regulators, including those in the UK, Denmark and in the USA, and it has received support from the EC in the context of interconnection charges. This is in contrast with some other sectors, in which regulators have sometimes based price limits on the costs of maintaining the existing networks.³

Under the forward-looking LRIC approach estimates are made of the costs that would be incurred by an efficient new entrant and therefore reflect the present social cost of resources. In principle, charges based on LRIC costs should, therefore, prevent customers being over-charged while allowing an efficient operator to earn normal profit margins, and so provide a sound basis for the development of competition.

A modern, efficient copper local loop network would naturally comprise different assets than those currently in use, some of which might not be needed at all, while others would be replaced by modern equivalent assets.⁴ An efficient new entrant would also provide an amount of spare capacity (e.g. through “over-sizing” when laying new connections) that is likely to minimise the future costs of adaptations and expansions.

It is of course possible that either increases or reductions may be needed in an incumbent’s present charges and cost levels to bring them into line with LRIC estimates. It is also worth highlighting that the results under LRIC are likely to be different to those achieved under historic cost accounting.

² ComReg 04/70 of 15 June 2004 – Decision Notice D8/04 – Market Analysis: Wholesale Unbundled Access (including Shared Access) to Metallic Loops and Sub-Loops.

³ The difference arises because (as a broad proposition) technology is changing rapidly in telecommunications, with prices of equivalent equipment tending to fall, and the nature of services improving, so that a backward - looking approach would not reflect the outcome of a competitive market. This is less true in some other cases, such as for example water or gas networks, in which a reasonable assumption might be that the existing network will last indefinitely if enough is spent on renewals and maintenance; and that the most reasonable basis for charging for the use of the networks is an estimate of the amount of maintenance and renewals expense required.

⁴ The need for such an adjustment to operating costs being applied to eircom is acknowledged in Section 6.3.4 of eircom’s Accounting Documents: Current Cost and Long run Incremental Cost Statements for Year ended 31 March 2003.

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For example, if eircom has already recovered from customers (most of) the capital costs of duct and of laying copper, then its historic cost accounts will not need to include a capital charge for these large items. On the other hand, it may well be incurring significant operating costs in renewals and maintenance that would not be required if it were using a modern network. Whether cost increases permitted on the swings will outweigh costs disallowed on the roundabouts is an empirical question.

It is clear however that there must be consistency in the estimates. Thus the allowances for operating costs used in a price determination based on LRIC should be the costs of operating an efficient network in an efficient manner, including a reasonable rate of return and depreciation charges reflecting *inter alia* the likely rate of technological change. If cost estimates for the capital required to provide modern ducts and cables based on LRIC principles were to be added to estimates for the costs that are currently incurred by eircom in operating the existing mixed-vintage network, this could lead to serious over-charging.

2.4 Estimating LLU Costs

In order for eircom to demonstrate its compliance with the obligation to offer prices for LLU services on the basis of LRIC, eircom developed a bottom up model of a hypothetical network in Ireland (i.e. the network is not eircom's actual network but a re-dimensioned and optimised network design costed on the basis of using all new assets valued at current prices). While LRIC provides a methodological framework for the computation of appropriate costs, there are many contentious issues to be resolved on the implementation of the LRIC methodology.

To aid ComReg in its understanding of these issues an Industry Advisory Group (IAG 2) under the independent chairmanship of Professor William Melody was established. Its aim was to expedite the introduction of LRIC based charges for services provided by LLU in Ireland by advising ComReg on the development of a bottom-up LRIC model of the access network. IAG 2 included representatives of eircom, OAOs, and ODTR/ComReg and the group met many times between 22nd May 2002 and 5th December 2002. The chairman's advice to ComReg was that it was preferable to use the existing eircom model as a basis for the work rather than creating a new model from scratch. After discussions with eircom, agreement was reached that the eircom model could be used in the IAG 2 forum. After a series of discussions, the participants in IAG 2, including eircom and ComReg, agreed that the model was structurally sound. The participants reached consensus on a large number of complex cost and technical issues regarding the implementation of LRIC. In some areas, it was impossible to achieve consensus and eircom was critical of some aspects of the work of the IAG 2 forum.

ComReg sees little merit and many disadvantages in revisiting those issues where consensus was reached but believes that the bottom up model developed by eircom and discussed in the IAG 2 is a good basis for the analysis of appropriate costs. ComReg is in agreement with eircom on the great majority of the assumptions and inputs used in that model. However, there remain a small number of important

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inputs and assumptions where there is a significant difference of principle between ComReg and eircom. It is with these issues that this paper deals.

2.5 Purpose of this Response to Consultation Document

On 28 May 2003, ComReg published Decision Notice D12/03 directing eircom to amend its prices for LLU services published in its Access Reference Offer (ARO). This Decision Notice was subsequently challenged by way of Judicial Review by eircom; the grounds for appeal included a challenge to the decisions taken by ComReg in relation to those issues unresolved by IAG 2. The Judicial Review was settled before the case came to court. It was agreed between the parties that ComReg will initiate new process for the purposes of agreeing with eircom new LLU prices to be effective from 1 April 2004, or in default of such agreement, making a new decision fixing LLU prices to be effective from that date.

ComReg has continued its analysis of the issues taking account of both the recommendations of the IAG 2 chairman and the legitimate concerns raised during the process by both eircom and the OAOs. As a result of the further analysis undertaken, ComReg issued two consultation papers sharing its current thinking with regard to LLU. The first consultation paper related to ComReg's views on the appropriate levels of direct and indirect operating expenditure as inputs to a LRIC price for LLU. The second consultation paper asked a number of questions in relation to network design parameters and the costs for certain pieces of equipment.

The views expressed in these consultations were not final conclusions. They were approaches that ComReg might use in a review of eircom's LLU pricing submission in order to take a view on the appropriate level of both direct and indirect operating expenditure, as well as its views on the costs and design of certain network elements, giving regard to the other assumptions being made in such a submission.

These consultations did not re-open issues on which agreement had already been reached. Rather they concentrated on the appropriate values to use within the LRIC costing exercise relating to both direct operating expenses and indirect operating expenses and the costs of certain network elements and design parameters, these issues being amongst those upon which little agreement has hitherto been reached between the IAG2 participants.

ComReg sought reasoned comments on the proposals in these two consultations and was particularly interested in attaining supporting evidence to which it may not otherwise have access from the industry.

This document accumulates the responses received in both these consultation papers into one document. It aims to provide details of the industry responses, where such responses have not been indicated as commercially sensitive. It also details ComReg's conclusions as a result of these consultations and sets out ComReg's reasoning for draft directions issued to eircom with respect to LLU pricing.

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3 Response to Consultation Document 04/21: Local Loop Unbundling Costing Consultation: Direct and Indirect Operating Expenditure Econometric Modelling

3.1 Summary of consultation document

This consultation explained the different kinds of operating costs required in providing the unbundled local loop. It also considered whether there are *a priori* grounds for expecting those costs to be significantly different in Ireland than in other countries.

ComReg presented several broad categories of operating costs, as explained below. Individual operators may use different classifications. Certain kinds of operating expenses are excluded here, notably depreciation (which is calculated as part of the LRIC model of asset costs) and, for this wholesale service, costs relating to customer services.

Direct Operating Costs

Direct operating costs are so called because they are directly associated with the operation of particular types of asset. The assets required to provide a local loop service are categorised as Network Assets, and Non-Network assets.

Direct network operating costs are the costs directly associated with the operation of network assets, such as those listed below, that are used mainly in the provision of the local loops to the customers' premises. The principal activities to which network direct operating costs refer are fault repairs and preventive maintenance. The main cost categories involved are therefore manpower (wages) and other costs directly associated with these activities (e.g. tools, insurance etc.).

Network Assets are those assets that make up the physical infrastructure used in the provision of the local loops to the customers' premises. These assets include, but are not necessarily limited to:

- a. Underground and overhead (on poles) drop cable;
- b. Underground and overhead (on poles) distribution and feeder cable;
- c. Poles;
- d. Duct and Manholes; and
- e. Joint boxes

If a separate charge is made for repairs, as is eircom's current practice, the costs involved will need to be separated from those of maintenance.

Direct non-network operating costs are the costs of operating and maintaining assets that are required to support the operation of the network assets described above. The requirement for non-network assets is determined by the extent and nature of the network assets. Unlike the use of network assets, the use of non-network assets is not directly determined by underlying customer cost drivers such as the number of lines or the extent of calls. Many of these non-network assets are

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also useful for the provision of other wholesale products, e.g. interconnection services.

Non-Network Assets include, but are not limited to:

- a. **Buildings.** The corresponding operating cost category refers to the costs of operating the buildings, (security guards, electricity etc), but might also include the costs of renting building space, (this depends on the specific accounting rules deployed by the operator in question; rents could also be capitalised and accounted as capital cost).
- b. **General Purpose computers.** The corresponding operating cost category refers to the wages of the IT department staff.
- c. **Vehicles.**

The distinction between direct network operating costs and direct non-network operating costs is important because direct network operating costs can largely be attributed to the LLU products, whereas direct non-network operating costs have to be allocated between providing the local loop and other services.

This category also includes **other operating costs** that result from activities such as:

- a. **Testing.** This cost category usually includes the costs incurred in testing telecommunications facilities to determine the condition of plant; receiving, recording and analyzing trouble reports; testing to determine the nature and location of reported trouble condition.
- b. **Plant operation general administration expenses.** This includes supervising plant operations; planning, co-ordinating and monitoring plant operations.
- c. **Engineering.** This cost category usually includes those costs incurred in the general engineering of the telecommunications plant which are not directly chargeable to an undertaking or project.

Indirect Operating Costs

Indirect operating costs contrast with direct operating costs in so far as they are incurred to run the business of a telecommunications operator as a whole and not just the access or local loop part of its network; moreover, they do not refer to the costs incurred in running assets, they are rather expenses associated with the administration of the business. The chairman's salary is the classic example for this cost category.

Indirect operating costs include, but are not limited to, the following cost categories:

- a. Executive.
- b. Accounting and finance.

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- c. Human Resources.
- d. External Relations.

These are likely to be mainly wage and salary costs.

The LRIC costing exercise for the unbundled local loop must include this type of costs to the extent that they are efficiently incurred and can appropriately be attributed to the local loop network.

3.2 Summary of ComReg position in the consultation paper

ComReg has decided to base allowable ULL charges on its best estimate of the long run incremental cost (LRIC) of the provision of such services, by an efficient operator. This estimate approximates to what in principle would be the outcome were it feasible to have a competitive market in such services. As the consultation paper made clear, ComReg has the objective of obtaining the best possible estimate of operating costs consistent with the LRIC estimate of the capital costs of providing ULL in Ireland.

In consultation document 04/21, ComReg set out and examined the strengths and weaknesses of a number of methods for estimating operating costs in the context of calculating FL-LRIC costs. ComReg considered adjusting eircom's actual costs, bottom up modelling of operating costs, benchmarking against other European operators, benchmarking against US operators and econometric modelling using US data. In this consultation, ComReg indicated that its preference was the use of econometric modelling based on US data. Annexed to this consultation was a detailed document prepared for ComReg by the consultants Europe Economics setting out how such an exercise has been performed for the purposes of this process and ComReg sought the views of respondents on the appropriateness of this econometric model.

3.3 Overview of responses

ComReg received three responses in relation to this consultation document, namely ESAT-BT, eircom and Smart Telecom.

One respondent has submitted a response, the points in which would, if accepted by ComReg, have the effect of increasing the allowance for operating costs to be included in ULL charges. On the other hand, responses from other operators make a number of points that would tend to reduce these charges.

One respondent claims that eircom's actual operating costs are the best guide to the costs that should be allowed in ULL charges, acknowledging that a reduction should be made to reflect likely future efficiency improvements. It argues that the differences between conditions in the US and Ireland are so great that no safe conclusions can be drawn from a study of US Local Exchange Carriers' (LEC) costs. Technical appendices argue with specific aspects of the ComReg's / Europe Economics' methodology.

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A second respondent generally supports the approach proposed by ComReg, and believes that the operating cost of an efficient operator would be below those currently incurred by eircom in operating and maintaining its present mixed vintage network.

A third respondent points out that the costs estimated by LECs include the costs of repairs, so that the estimate should be used to help determine the sum of eircom's monthly and *ad hoc* repair charges. This respondent also points out that since the LECs are of mixed efficiency, and use network assets of mixed vintage, their costs should be seen as a guide to the upper bound of what would be incurred by an efficient operator of the new and efficient network assumed for LRIC calculations.

This respondent would like more consideration to be given to the possibility of a bottom-up estimate, and to drawing more information both from experience of other European operators, and from further statistical analysis of LEC data relating to categories of operating costs not directly related to network assets.

3.4 ComReg Position

ComReg would like to take this opportunity to thank the respondents for their detailed and thoughtful submissions which have helped to clarify these complex issues.

In the following section, Section 4 ComReg reviews in detail the consultation questions, and the responses that were received.

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4 Detailed responses to the consultation questions

In consultation 04/21, ComReg first set out a discussion of potential factors that one might expect a priori to influence the level of operating costs in Ireland relative to other countries. ComReg sought the views of respondents on whether additional variables should be considered.

Subsequently in the document, ComReg set out the strengths and weaknesses of five alternative ways of estimating operating costs namely:

- a) adjusting eircom's actual costs;
- b) bottom up modelling of operating costs;
- c) benchmarking against other European operators;
- d) benchmarking against US operators; and
- e) econometric modelling using US data.

After that analysis, ComReg sought the views of the respondents on seven other questions namely:

- a) Are there any other variables (other than those discussed in the consultation paper) that might make operating costs of the local loop network materially different in Ireland from those costs in other countries with which comparisons might reasonably be made and that are not discussed above? If so, what are they and what effects would you expect them to have?
- b) Do you believe that eircom's actual operating costs of its local loop network cannot be used alongside the capital costs on a new network, as estimated under the LRIC approach?
- c) Are there grounds for believing that any of the operating costs forming part of an efficient entrant's LRIC local loop network would be higher than eircom's actual operating costs? If so, what might they be?
- d) Does the above discussion explain fairly the strengths and limitations of the different ways of estimating efficient operating costs for the LRIC unbundled local loop network? If not, in what ways is it incomplete or deficient?
- e) Do you agree that it is appropriate for ComReg to use evidence from US data in determining the efficient level of operating costs for the local loop network in Ireland? If not, please indicate what you think would be a superior approach and why.
- f) Do you agree that the explanatory model for differences in LECs' direct network operating costs set out in ComReg 04/21a⁵ has been selected using appropriate criteria and that it captures the important influences from plant, demographic and meteorological variables in a satisfactory way? If not, how should the modelling strategy be improved? and

⁵ ComReg 04/21a – Appendix C: Operating Costs for the Access Network In Ireland: An Econometric Model.

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- g) Do you agree with the allocation criteria set out for allocating a portion of direct non-network and indirect costs to the unbundled local loop should be based on eircom's Separated Accounts? If not, please indicate what you think would be a superior approach and why.

The remainder of this section considers the responses to these questions in turn. Section 5 will explain in detail how the proposed methodology for determining appropriate operating costs, as presented in the consultation document 04/21 (and in particular 04/21a), has been modified as a result of the responses received.

4.1 Reasons why operating costs might be different in Ireland from other countries with which comparisons might reasonably be made.

4.1.1 Introduction

Consultation paper 04/21 explained a number of factors that should be taken into account in drawing implications from experience of other countries for the appropriate level of operating costs to be recoverable through ULL charges in Ireland, and sought views on whether other significant factors should be considered.

As detailed in the consultation paper, the level of operating costs per line faced by an efficient operator could be affected by a number of different factors.

- ***Plant variables*** might include characteristics of the assets of the network under consideration, in so far as different asset types and their configuration might affect the level of operating costs.
- ***Demographic variables*** might include demand features of the network under consideration. Customers in rural areas might give rise to more of these interventions than customers in metropolitan areas, or such interventions may be more costly due to greater travelling time.
- ***Meteorological influences*** might include forces of nature to which the network under consideration is subject; for example, more extreme environmental conditions might give rise to more faults than a network running in a milder environment. The prevalence of strong winds, of rain, of freezing temperatures, and of extreme heat may influence the interventions and hence affect efficient operating costs.
- ***Other factors*** resulting in differences in operating costs may include relative wages, and employers' labour tax contributions. Cost differences are also determined by a range of different kinds of regulation, such as regulation of employment and working conditions; any differences in the costs of possessions, (for example, if there are charges levied for blocking roads for

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repairs); and planning constraints on the location and layout of equipment that differ between jurisdictions.⁶

4.1.2 *Views of respondents to Question 1- [Are there any other variables (other than those discussed in the consultation paper) that might make operating costs of the local loop network materially different in Ireland from those costs in other countries with which comparisons might reasonably be made and that are not discussed above? If so, what are they and what effects would you expect them to have?]*

One respondent concentrates on comparisons between Ireland and the USA, suggesting that there are important differences with regard to wages and employment law, company size, population density and customer dispersion, inflation, energy costs and the exchange rate, taxes and operational costs, network rates, and in the regulatory and planning environment. This respondent also argues that wage costs tend to increase more rapidly in Ireland than in the USA, partly because of differences in general inflation and partly because of additional regulatory burdens emanating from the EC which tend over time to reduce the annual hours worked per employee.

Another respondent expresses broad agreement with the factors identified by the ComReg and its consultants, and is confident and satisfied that the addition of further factors across a minority of operators over a given time will not lead to any significant alteration in the result.

A third respondent emphasises the importance of distinguishing between differences that should be taken into account and those that should not, arguing that no allowance should be made for factors within management control, nor for present purposes for factors affecting capital but not operating costs. It points out that since overseas operators use networks that are to some extent sub-optimal, it is likely that operating costs reported will be somewhat higher than may apply under strict LRIC principles. This respondent also makes the point that some of the examples in the consultation document relate more to repairs than to costs currently recovered through the monthly rental charge.

4.1.3 *ComReg's position*

The understanding and selection of factors that would help explain the expected differences between operating costs in Ireland as opposed to other countries is

⁶ Comparing employment protection legislation between jurisdictions is not straightforward. However, considerable effort has gone into developing broad summary measures of the relative strictness of regulation. Published estimates using a methodology developed by the OECD and others suggested that Ireland, second only to the UK, had the least strict employment protection legislation in the EU in the late 1990s. Nevertheless, this legislation was stricter than that in the US.

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clearly an important issue. The respondents have made a large number of detailed suggestions and ComReg examines each of the main points in turn below.

One respondent raises a number of issues in relation to wage levels, and in particular it points towards possible differences between the US and the Irish jurisdiction with respect to pay-roll taxes. ComReg would like to make it clear that the figures used for the conversion of US and Irish wages from dollars to euros do include these costs (as explained in Annex 2 of 04/21a) and therefore no adjustment is required.

This respondent also points out that it incurs certain charges, such as building costs, which are specific to Ireland and which cannot be measured by way of comparison with US LECS. ComReg's view is that, for now, it is not possible to construct an index that will convert property related charges such as rent and rates from US levels to Irish levels. Notwithstanding that such charges as are actually incurred by eircom are not likely to be the most efficient possible and consistent with the LRIC environment, ComReg proposes to use eircom's actual charges for the time being.

This respondent also points out that the rate of inflation differed in Ireland and the US in the period from 2002 (to which the data used for the conversion from dollar to euro refer) and 2004 (the date to which the operating cost estimates refer to) making the use of 2002 figure less appropriate. ComReg accepts that this comment is relevant and therefore intends to modify the corresponding inputs. The details are given in section 5.1.

This respondent also makes more general points about prospects for inflation, and the possible greater volatility of costs related in particular to the price of energy. Even if ComReg were to agree with these comments, it would not be appropriate to include them in its estimate of allowable operating costs since the ULL charge is only concerned with the costs of the first year.

This respondent claims that the Europe Economics study has failed to establish the non-existence of scale factors for both direct and indirect operating costs, and that economies of scale are likely to exist for direct and, even more so, for indirect operating costs. However, no evidence is provided in support of this view. As part of the econometric modelling exercise, conducted by Europe Economics for ComReg, there was an analysis of the relationship between size of operator and operating costs per line. On the basis of the research carried out thus far, ComReg has not found it possible to establish with any degree of statistical confidence whether economies of scale do in fact play a part in explaining direct or indirect operating costs.

On the other hand, while the econometric analysis rejects the statistical significance of economies of scale for direct operating costs, it does not reject this assumption for non-network and indirect costs. The econometric study showed that it was not possible to develop a satisfactory model for these cost categories (even including the size of the company as a possible explanatory variable) and therefore a simple average was considered.

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On the basis of this respondent's comment, however, ComReg has considered the average cost per line, for all the categories but the direct operating costs, over different sub-samples of the original sample with varying threshold level of the company size (in terms of served lines). This exercise has shown that there is no consistent increase in costs per line as the company size is reduced. For example using only companies with less than 3m lines (8 companies), the final overall cost estimate, for the cost categories other than direct network operating cost, increases approximately by 14 per cent. However, using only companies with less than 2.2m lines (6 companies), the same cost *decreases* by 2 per cent.

This indicates that there is no firm evidence that, *ceteris paribus*, smaller companies experience higher costs. This is not only because the sample size is so small but also because one would not be able to control, given the available data, for all the other factors that might influence costs per line. One of the most important of these factors is likely to be the relative level of inefficiencies of the companies included in the sub-sample.

With regard to population density and customer dispersion, this respondent claims that this variable should have been taken into account since in any network industry costs are significantly affected by the population density in the market being served.

However, this respondent fails to produce any evidence, apart from some very general anecdotal evidence, that population density is a clear cost driver for operating and maintenance costs. Population density and customer dispersion are generally recognised in the industry as important cost drivers for the investment side of the business. Their relevance is demonstrated, for example, by the fact that costing models (of both a bottom-up and a top-down nature) generally distinguish access areas into geo-types (defined by line density, i.e. number of lines per square kilometres) to allow for a more accurate estimate of capital costs. As far as ComReg is aware, this is not the case for the estimate of operating costs and this respondent has failed to provide any evidence in this respect.

This respondent's more intangible claims about network rates (local government taxation) and the regulatory and planning environment are noted. This respondent's assertion that eircom is charged network rates by local authorities and that US LECs face no equivalent cost is rejected as US LECs are subject to a plethora of taxes, fees, and levies raised at state and municipal levels associated with infrastructure.

Turning to the points made by another respondent, the methods described in Consultation Paper 04/21 do aim to distinguish between exogenous and endogenous factors, and to concentrate only on factors relevant to operating costs, since other factors are either for consideration elsewhere, or can be attributed to differences in managerial efficiency.

ComReg agrees with this respondent that it is important to be clear about the relationship between *ad hoc* repair charges and monthly ULL access charges. The estimates based on LEC data relate to the total of these charges, and not solely to the present monthly charge.

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They also, as this respondent correctly identifies, relate to the LEC operator of average efficiency, and to one using a mixed - vintage network rather than the network whose costs are allowed through LRIC. These points, although hard to quantify, are clearly important and will be taken into account in this document (See Section 5.2).

ComReg notes the agreement with the suggested list of explanatory factors put forward in the consultation by the third respondent.

ComReg believes that the views put forward by the respondents are a useful contribution in the understanding of those factors that one should take into account when determining operating costs appropriate to an Irish context. The methodology that ComReg advocates attempts to control for the impact of these explanatory factors where ComReg believes these to be appropriate. Further details of the proposed methodology, including modifications made in light of the responses, is to be found in Section 5.

4.2 Can eircom's actual costs be used?

4.2.1 Introduction

The consultation paper explained in some detail the reasons why ComReg believes it inappropriate to base the maximum permissible LLU charge on a combination of the capital costs estimated on LRIC principles, and eircom's actual operating costs, even if a reduction were applied to reflect the amount by which these were thought to be below target levels of efficiency in operating the present network.

The consultation paper underlined a need for consistency. It explained that the costs of operating a local loop network are the costs of maintaining and managing that network. It is important to be clear why, if eircom's capital costs are to be estimated on the FL - LRIC assumption that they would be those of an efficient new entrant and valued at current costs, then ComReg could not accept eircom's actual operating costs as the basis for setting LLU charges. It is also relevant to explain how ComReg envisages interpreting data relating to eircom's actual operating costs.

Using eircom's actual operating costs for the purpose of setting the limit to charges for the unbundled local loop under a LRIC methodology would be to rely on eircom's efficiency in operating its actual network, which cannot simply be assumed.

Moreover, for estimates of operating costs of the local loop network to be consistent with the estimated FL-LRIC capital costs of the local loop network, they should refer to the LRIC network rather than to eircom's actual network.

These two principles imply that it is not possible to permit eircom simply to include its actual operating costs in LLU charges, even if as in a recent submission by eircom, they are then reduced by a few percent each year to allow for productivity improvements. That prices should fall over time to reflect productivity improvements is an important principle, but it is also necessary that the starting point be an appropriate one.

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It appears to ComReg that eircom's actual operating costs are associated with a different network than that estimated in the LRIC model. The value of trench and duct in the LRIC model network is much greater than its value in eircom's accounts, both because the cost of digging trench and laying duct is higher in current prices than it was in previous decades and because more lines are protected in duct. It would clearly be quite wrong to require users to pay both for the costs of a modern network, with assets valued at today's prices, and also to pay for the costs of operating eircom's actual assets, some of which require far more maintenance costs than would be needed for new assets providing a similar service.

Whatever method is used must include providing some assurance on the efficiency of the costs to be reflected in eircom's charges.

The specific assets for which costs are to be recoverable through LLU charges are those calculated according to the model prepared by eircom in the light of the work of IAG 2. As explained in section 1 and 2, this model is intended to provide estimates of the capital costs to an efficient entrant of running an access network providing the services currently provided by eircom's access network.

This LRIC model followed eircom's current design rules as a guide to current best practice, and these imply a network that is materially different from the actual one. The LRIC model network would use more pressurised duct in order to reduce the number of occasions on which flooding causes faults. It would use more underground duct, in place of the overhead poles currently seen even in urban locations, again with the economic justification including that less maintenance expenditure should be required. The LRIC model also includes significantly more spare capacity in the copper wires in place, in order that less trouble and operating expense is incurred when customers move, or requirements change for whatever reason. It assumes that the assets in use are new, and earn a return on their value at today's prices.

For each difference outlined in the paragraph above, the LRIC model of the local loop network would have lower operating costs than eircom's current network. Thus eircom's present levels of operating costs are likely to be significantly higher than the costs that should be recognised in a LRIC-based methodology for determining the costs of the local loop network. This would be true even if eircom were operating its existing network with perfect efficiency.

4.2.2 Views of respondents to Q2 [Do you believe that eircom's actual operating costs of its local loop network cannot be used alongside the capital costs on a new network, as estimated under the LRIC approach? Please provide detailed reasons for your views.]

One respondent reasserts its preference for using eircom's actual operating costs as "the best starting point", and cites in support a document from the US FCC (this point was developed in an appendix to the submission). (This respondent also makes a number of other points in the response to Q 2 that are more relevant to Q3 i.e. section 4.3.2; these will be discussed in Section 4.3).

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Another respondent is generally supportive of the approach proposed by ComReg.

A third respondent fully concurs with ComReg's description of the reasons why eircom's actual operating costs simply cannot be used in conjunction with the capital costs of a new network. It recognises that to do so would clearly contravene LRIC principles, resulting in inefficient levels of charges that would send wrong economic signals to the market.

4.2.3 ComReg's position

ComReg does not intend to use eircom's actual operating costs, as this would be inconsistent with allowing the capital costs of a new efficient network estimated under the LRIC approach.

It may be worth noting here that eircom might face lower overall costs were ComReg to require the annual capital charges for duct and other assets to be based on what eircom is currently paying for the use of these assets (a return to investors on the historic cost or, where assets have been fully amortised, nothing at all). If that approach had been followed, it would then in principle have been consistent to allow charges to recover eircom's actual operating costs, less any allowance for potential efficiency improvements.

In its response to Question 2, one respondent states:

Recent developments in the US suggest that the FCC accepts that, in obtaining the correct operating expense to add to the capital costs calculated using TELRIC (the US version of LRIC):

"An alternative method of calculating monthly expenses is to look at current operating expenses and make any adjustment to reflect anticipated experience in the period for which the projection is made, such as adjustments for productivity and inflation⁷"

It is clear that eircom's actual operating cost, adjusted for anticipated developments, should be used as the operating cost allowance. In fact, the use of the incumbent's actual costs, adjusted as appropriate, is proposed by the US regulator, the FCC.

ComReg believes that, in quoting the FCC, this respondent has not presented a clear and full picture of the FCC's published commentary on these issues.

The document under scrutiny is a Notice of Proposed Rule Making (NPRM), in which the FCC "begins its first comprehensive review of the rules applicable to the pricing of unbundled network elements (UNEs)". In other words, this document is a consultation exercise where different alternatives are presented and questions posed to the parties involved. In particular, the section on operating costs (paragraphs 109-113) of this document opens with:

⁷ FCC 15th Sept 2003 WC Docket 03-173

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In theory, the monthly operating cost should be calculated by estimating the total forward-looking operating expense associated with a particular network element (e.g., by conducting time and motion studies of likely maintenance activities) [...]

The merits of a “bottom-up” approach (as defined in ComReg’s consultation paper) are clearly acknowledged. However, it is also acknowledged that such an approach is difficult to implement in practice, and two different alternatives are proposed: the use of adjusted current operating costs being only one of them.

The other alternative, as reported by this respondent in its submission, corresponds to the application of an annual cost factor (ACF) to “the projected investment in the network” (thus underlying the link between operating costs and investment base).

Views from the parties are then sought by the FCC (“we seek comment on these approaches to estimate expenses.”) and a number of questions are then posed. A full list of these questions would show:

- a. how open the debate still is;
- b. the desirability that operating expenses be estimated in relation to the corresponding investment assets; and
- c. the possibility of using benchmark data from other companies.

Moreover, in paragraph 111, FCC “invite parties to provide empirical evidence that demonstrates the factors that most influence the level of expenses”. This approach is very much in line with ComReg’s exercise.

Based on this analysis of the FCC document, the conclusion drawn by this respondent, i.e. that the use of the operator actual cost (adjusted for anticipated developments) as an allowance for operating costs in these models is currently being proposed by the FCC, is flawed.

ComReg notes the support for not using eircom’s actual costs in the estimation of appropriate operating costs for the reasons set out 04/21.

4.3 Would any operating costs be higher for a new entrant with a network designed to give the services required at efficient LRIC?

4.3.1 Introduction

The consultation paper gave a number of examples of operating costs – e.g. those arising from the need to maintain and repair the network – that would be lower for an efficient LRIC network operator than for an operator using the present network. ComReg’s consultants were unable to suggest any examples of operating costs that might be higher for such an operator; question 3 was designed to confirm or alter this view.

4.3.2 Views of respondents to Q3 [Are there grounds for believing that any of the operating costs forming part of an efficient entrant’s LRIC local loop network

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would be higher than eircom's actual operating costs? If so, what might they be?]

One respondent suggests a number of reasons why the entrant's costs might indeed be higher. Firstly, it offers as circumstantial evidence the fact that there has been no apparent interest by competitors in building alternative copper networks in Ireland. In addition, this respondent comments that it does not agree with Europe Economics' finding that it could not find evidence of scale effects and refers to ComReg's recent consultation on Wholesale Unbundled Access to reinforce the point. Specific suggestions of possible higher costs for an entrant were made in this respondent's reply to the previous question, but are relevant here as follows:

- a) optimal capital expenditure might involve more operating costs than the present network;
- b) the introduction by local authorities of the Overhead cable levy will result in future costs exceeding past experience;
- c) a new network might face higher network rates because the asset valuations would be higher;
- d) new design specifications which avoid the use of pair gain systems may increase operating expenses;
- e) a new network may face higher labour costs because wage rates and payroll taxes are increasing rapidly;
- f) the price of copper and other materials used in maintenance may increase.

A second respondent does not believe that the operating costs of an efficient operator's LRIC network would be higher than those of eircom.

The third respondent believes that it is highly unlikely that any part of an efficient entrant's unit costs would be higher than eircom's actual unit costs. It is possible that an efficient entrant might put a higher proportion of its operating costs into preventive maintenance than reactive maintenance and repair, but this does not mean that the unit costs would be higher. In summary, this respondent believes that the LRIC estimates of operating cost are likely to be far lower than eircom's actual costs.

4.3.3 *ComReg's position*

One respondent's comment concerning the absence of new build proposals is not relevant here. Potential entrants have to consider capital as well as operating costs, as well as a number of other factors. Similarly Europe Economics' findings in relation to scale apply to operating costs only and are not relevant to total network costs.

This respondent's comment that an optimal network might have more or less capital assets than the existing network is accepted as a theoretical possibility, but no practical reason is offered to support it. In any case the issue is what operating costs are consistent with the LRIC model. ComReg notes that the amount of capital in the model is greatly higher than in eircom's separated accounts, and therefore if one were seeking the optimal balance between capital costs and operating costs it seems

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unlikely that this would be attained by having both higher capital and higher operating cost.

The next suggestions are to the effect that local government taxation may increase due to the introduction by local authorities of the Overhead cable levy. The model as presently proposed by eircom does not allow for such taxation based on the best information available. Should such taxes be levied in the future and place an unavoidable extra cost on eircom this issue would have to be considered at that time.

The point about pair gain systems is again unsubstantiated and ComReg can see no *a priori* reason why the addition of pair gain equipment would reduce operating costs compared to using copper loops without additional equipment. Indeed it is usually accepted that pair gain systems are used to increase network capacity whilst minimising capital expenditure at the expense of increased operating costs.

The last two points of this respondent's reply rest on a confusion; the likely rate of change of wages and materials cost in the future will affect both the incumbent and any new entrant. This kind of consideration would only be relevant if it were clear that the entrant would have a significantly different proportion of its costs in a particular category that was confidently predicted to change significantly relative to other factors. This has not been argued, and ComReg sees no reason to make such an assumption.

ComReg notes that another respondent does not believe that the operating costs of an efficient operator's LRIC network would be higher than those of eircom.

In conclusion, ComReg sees no reason to doubt that a realistic estimate of the operating costs to be allowed under a LRIC methodology will be significantly below those for an existing network.

4.4 Estimating the LRIC operating costs

4.4.1 Introduction

In the consultation document 04/21, having discussed the use of eircom's actual costs, and sought the views of the respondents of using these, ComReg went on to set out the strengths and weaknesses of a number of approaches for estimating costs. These other approaches are outlined below.

Bottom up modelling of operating costs

In a local loop, operating costs depend partly on "events" such as faults needing to be repaired, or customers needing new or different connections that in turn depend among other things on the types of assets employed and on the network layout. To estimate operating costs driven by events, two sets of assumptions are needed:

- a) Operating events (per year) per unit of equipment; and
- b) Unit costs for each of these events.

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The operating costs are those concerned with maintaining the network and providing or rearranging services to customers. Events might be defined to include both routine maintenance and monitoring, and also different kinds of failures and faults, and responding to different kinds of customer request.

The first step in this approach is to identify the major activities that give rise to operating costs. Some aggregation is desirable, but at the same time the operating costs of each identified activity should, as far as possible, be specified to depend on a single cost driver. The cost driver is required to explain the costs of that activity and should be easily quantifiable. The cost driver should be measurable in a way that enables it to be identified with individual products or services.

The next step is to identify the operating costs of each activity, and to ask what resources should that activity consume? If the activity is maintaining cables, the operating costs would include the wages of the engineer, the specialist equipment required by the engineer, transport costs and so on. Some of the costs are shared by more than one activity, in which case the costs should be apportioned.

Such modelling has been undertaken for Denmark.⁸ In Professor Melody's final report on IAG2, it was suggested that the Danish experience might give useful pointers for how such modelling might be undertaken for Ireland. In Denmark, such an approach was used to estimate the operating costs for copper cables and network termination points. The events used in the model were 25 events per 1,000 NTPs and 25 per 1,000 copper pairs. The cost per event for copper related events was based on the hourly wage rate of a technician and an assumption that each event took 4 hours to deal with (1.5 hours to organise and travel and 2.5 hours to repair and test).

A "bottom-up" approach to estimating the operating costs of some access assets seemed to work in Denmark. However, not all operating costs were estimated using such an approach. For example, mark-ups were used to estimate other direct operating costs such as those relating to duct or to building. A number of other relevant costs such as indirect operating costs were calculated through a mark-up based on an efficiency-adjusted view of the operator's actual costs.

As a result of this exercise, and including operating costs estimated using a mark up on capital expenditure, the estimate of operating cost per line in the Danish bottom up model amounts to some €1.70 per month. This estimate excludes an allowance for indirect costs, which were recognised through a mark-up.

The above discussion indicates the complexity of the task of generating a satisfactory bottom-up LRIC model of local loop network operating costs. In view of the length of time such an exercise would take, ComReg does not currently propose to establish an exercise to develop such a model.

Benchmarking against other European operators

⁸ Final Report on the Hybrid Model, available from www.itst.dk (in Danish only).

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The telecommunications industry has traditionally used summary ratios, such as operational cost per line or lines per employee, as broad indicators of a company's operational efficiency (before allowing for differences in networks or markets). Data from the accounts of other European operators can be used to make such comparisons.

However, for our present purposes, the data from European operators are currently very limited. Only in Ireland, the UK and Italy have regulatory accounts been published that allow the costs of the access or local loop network to be distinguished from other costs: statutory accounts available elsewhere do not provide this breakdown.

ComReg therefore concludes that simple ratio analysis from EU data cannot at this stage provide a useful guide to the appropriate level of operating costs of the access network. This position may change in time, as operators in more countries publish more detailed regulatory accounts.

Benchmarking against US operators

There is another data source from outside of Europe that can be used. Automated Reporting Management Information System, (ARMIS) is a database initiated in 1987 by the Federal Communications Commission (FCC), the US Telecommunications Regulator, with the aim of collecting financial and operational data from the largest US carriers (LECs).⁹ The ARMIS database consists of ten public reports. Within this information system, detailed data on access operating costs are available for all the 31 "Large Size" LECs, providing a valuable set of data for analysis.

The US LECs produce data for asset values on a Gross Book Value (GBV) historical basis, not on the Gross Replacement Cost (GRC) basis required by current cost accounting and LRIC costing. These data from the LECs are however generally considered to be of good quality and are presented in considerable detail, with the further advantage that the capital and associated operating costs for many individual categories of assets can be matched with those in eircom's regulatory accounts and in the LRIC model network.

ComReg therefore made an assessment of the ratios between different classes of asset and the associated LEC operating costs.

Average ratios between GBV and operating costs were applied to the same categories of assets as valued in the LRIC model, to provide estimates of different categories of operating costs for the Irish local loop. These estimated costs were substantially lower than eircom's current operating costs. As these were at the time

⁹ Additional ARMIS reports were added in 1991 to collect service quality and network infrastructure information from local exchange carriers subject to price cap regulations, in 1992 for the collection of statistical data formerly included in Form M, and in 1995 for monitoring video dial tone investment, expense and revenue data.

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the best available estimates, they were used, *inter alia* as the basis for ComReg's Decision Notice D12/03¹⁰.

However, the use of average ratios depends on historic asset valuations, and takes no account of differences between the circumstances in which different LECs operate, climate, population density, etc. ComReg has therefore been considering ways of taking account of other differences between the networks in a systematic manner.

Econometric modelling using US data

ComReg asked Europe Economics, an economics consultancy, to investigate further how fuller use could be made of the US LECs' data for estimating a feasible level of operating costs for the local loop network in Ireland.

The extent to which it is possible to control for differences in determinants of operating costs depends on the data that is available. For the US LECs, it is possible to obtain data on a number of the variables that might lead to differences in appropriate operating costs from those facing eircom. These series include variables relating to plant, to demographic and to meteorological variables.

The exercise starts by seeking to explain, in statistical terms, the differences between operating costs of different LEC operators and in different years (in technical terms this is a panel data set). Once a model has been developed, it can be used to produce estimates for what the operating costs would be expected to be of other companies not in the original set of companies, provided that data for the explanatory variables are available for those companies.

For a network outside the USA, some currency conversion will then be required, in this case from dollars to euros. Since most of operating costs comprise labour costs, this adjustment should be largely based on a ratio of hourly labour costs in the two countries, using non-wage as well as wage costs and approximating as closely as possible the kinds of labour whose wages comprise operating costs.

The starting point has been to calculate the average operating costs per line in the sample of LECs, distinguishing between the different types of operating cost. This provides estimates of a level of operating costs that has in practice been achieved by a large number of operators. The average does not show what costs the more efficient LECs incur. However, even if it was possible to identify, and only consider the costs of the more efficient LECs, these figures will reflect the operating costs of companies operating with assets of various ages, without the benefit of the hypothetical new network such as that of the LRIC model whose capital costs eircom would be allowed to recover in LLU charges.

It must also be acknowledged that an explanation can never account for all of the differences in determinants of costs. The crucial advantage of using the LECs for comparative purposes is that it provides a source of evidence on what operating cost

¹⁰ ComReg 03/55R of 28 May 2003 – Decision Notice – Local Loop Unbundling: Review of Charges

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other companies have been able to achieve and thus some evidence on what efficiency might mean.

The purpose of the econometric modelling is to establish, on a statistically significant basis, if there are any exogenous factors that can account for the variation in operating costs, other than the number of lines, observed in the data. Clearly when one can identify such factors it will be desirable to allow for these. Therefore, where explanatory factors are identified the average cost per line should be adjusted to account for the influence of the factor or factors. If on the other hand one is unable to identify, in a statistically significant manner, factors that account for the variation then the average cost per line is the most reasonable estimate available from the data.

The details of the econometric analysis performed by ComReg's consultant was set out in Appendix C to the consultation paper.¹¹ The detailed responses to aspects of that econometric analysis are set out in Section 4.6.

4.4.2 *Views of respondents to Q4 [Does the above discussion explain fairly the strengths and limitations of the different ways of estimating efficient operating costs for the LRIC unbundled local loop network? If not, in what ways is it incomplete or deficient? Please provide detailed reasoning.]*

One respondent expresses strong disagreement with the suggestion that the options have been fairly discussed. It again repeats its view that eircom's actual costs should be the starting point, and writes that the option of using a bottom – up approach has been rejected too quickly. It provides a technical appendix by its consultants who criticise a number of aspects of the methodology followed by ComReg's advisors and lead this respondent to the view that the econometric approach developed by and on behalf of ComReg has been described in too positive a manner.¹² These detailed criticisms are addressed in Section 4.6 below.

A second respondent, on the other hand, is in broad agreement with the approach that has been recommended, and with the appraisal of alternatives. However, this respondent notes a concern that the assumptions made in the LRIC modelling about the network layout may lead to excessively high estimates of the costs that an efficient entrant would in fact need to incur.

A third respondent broadly agrees with ComReg's analysis, but offers some comments on the various approaches considered. It repeats its clear support for rejecting the use of eircom's actual costs, but suggests that it might be useful to make an assessment of eircom's efficiency levels, partly through further analysis of the LEC data. With regard to the possibility of a bottom-up exercise, this respondent favours further consideration although it agrees that this would require significant

¹¹ ComReg 04/21a – Appendix C: Operating Costs for the Access Network In Ireland: An Econometric Model.

¹² This respondent's economic consultants state that "Our report does not address Question 4, which relates to estimating efficient operating costs for the LRIC unbundled local loop network."

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data-gathering from eircom and that the exercise may be time-consuming. This respondent also expresses interest in learning more about the exercise in Denmark, and asks whether the Danish estimates can be used to cross-check the result of the econometric approach.

This respondent suggests that further analysis of the US LEC data may be productive, with regard to the relative levels of non-network costs to direct network costs, and indirect costs compared to non-network.

It also repeats that the US data should always be regarded as very much an “upper bound” of LRIC costs, since the LECs operate mixed-vintage assets and there is no guarantee that the networks are configured in a way that reflects LRIC principles. Taking account also of the fact that the LECs will be of mixed efficiency, they suggest that it might be appropriate to use data from all of the LECs to estimate the relevant relationships, but then to use a sub-set of the more efficient to guide as to the relevant levels of operating cost for a LRIC network operator.

This respondent also returns to the issue that the LECs cost cover services for which eircom currently levies a separate charge. It would therefore be inappropriate to use the results to provide information on the level of costs to be recovered through monthly charges, if a separate charge is to continue to be levied for repairs.

This respondent questions whether the present approach to estimating the direct non-network and indirect costs on a per-line average is the best that can be done, and asks that further consideration be given to the ratio between these costs and other operating cost categories or the assets they support.

4.4.3 *ComReg’s position*

One respondent reiterated their belief that eircom’s actual costs should be the starting point of any estimation of appropriate costs in the LRIC model. The reasons why ComReg does not believe it is appropriate to use eircom’s actual costs have already been explained.

ComReg agrees with the comment that, every other difference between the US and Ireland being taken into account, the US data should always be regarded as very much an “upper bound” of LRIC costs for the reasons indicated above. Section 5.2 explains why it is not appropriate to just consider a sub-set of the US LECs with lower costs per line, as suggested by this respondent, and how this point will be taken into account.

Two respondents favour further consideration being given to the possibility of a bottom-up assessment, and this was floated as a possibility in the consultation document 04/21. ComReg believes that there are considerable practical difficulties in successfully completing this kind of bottom-up modelling, and notes that other jurisdictions where this approach has been relied upon have required extensive use of mark-ups to capture all the costs. Furthermore, the data gathering requirement is onerous and time consuming and may be disproportionate in this context and,

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therefore ComReg does not propose to use this methodology at this time. However, considering the interest displayed in this methodology by two of the respondents, ComReg will continue to consider this matter and may at some point in the future issue a further consultation.

One respondent also expressed interest in comparing the results of the econometric exercise, applied to the LRIC model used to set charges in Denmark, and the results of the operating costs estimated in that model through a bottom-up approach. ComReg has used the publicly available information on the Danish model in order to apply the results of the econometric exercise to the LRIC model developed for Denmark. This was not straightforward and a number of assumptions were needed. However, the indicative results that have been obtained are in line with each other.

Having considered the responses outlined above, ComReg believes that at this time the best approach for estimating operating costs in a LRIC costing exercise is on the basis of econometric analysis using US LECs data. These costs are adjusted to account for services which are separately charged by eircom (eg fault repair) and Irish land and building related costs.

4.5 Use of US LEC benchmarks

4.5.1 Introduction

Before going on to discuss the details of the econometric analysis performed by Europe Economics on behalf of ComReg, it is worth considering potential difficulties in using data from the US in an Irish context.

4.5.2 Views of Respondents to Q5 [Do you agree that it is appropriate for ComReg to use evidence from US data in determining the efficient level of operating costs for the local loop network in Ireland? If not, please indicate what you think would be a superior approach and why.]

One respondent reiterated its view that eircom's own costs should be used, and that it does not agree that the LECs' data are relevant.

Another respondent agreed that the appropriate statistical analysis was completed in the analysis and transposition of the US data.

A third respondent regarded the US data as the most granular and extensive, and an econometric analysis of these data to be most likely to be able to predict with reasonable accuracy the level of costs in a country that lies outside the panel data set. However, this respondent thinks that a thorough bottom - up analysis would be at least as robust as the econometric analysis, while recognising the time scale and resource implications. It suggested a comparison with the results of a bottom - up exercise for Denmark.

This respondent believes that using US data should be acceptable provided that checks are carried out to establish that it does give materially lower estimates than eircom's actual operating costs. It argues that the results for the more efficient LECs should be used as the basis for the estimate.

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4.5.3 *ComReg's position*

One respondent raises the issue that operating conditions in Ireland and the US are likely to be different. While ComReg agrees that it would be inappropriate to simply assume that US operators face the same or very similar operating conditions as pertained in Ireland, ComReg rejects the assertion by this respondent that it is invalid to use US data because operating conditions are completely different between Ireland and the US. A crude benchmarking exercise using US data without analysing the potential impact of exogenous factors is likely to lead to a suboptimal outcome. The purpose of ComReg's preferred approach, an econometric analysis of the US data, is precisely to quantitatively examine the impact of differing operating conditions and to determine which are statistically significant. Having performed this analysis, it is possible to control for differences in conditions between the US and Ireland, and hence produce an appropriate estimate of costs.

4.6 Modelling strategy and critique of model used

4.6.1 *Introduction*

In the consultation paper 04/21, ComReg set out an econometric analysis performed by its consultants, Europe Economics, which is summarised below.

Direct network operating costs

This section describes the variables that were used to try to explain differences in direct network operating costs between the US LECs, and in different years.

As might be expected, the most obvious variable and a main determinant of operating costs is the number of lines in the local loop network. The model was estimated using costs per line as the dependent variable, with an additional test then being carried out for economies of scale using the number of lines as an explanatory variable.

Explanatory variables relating to the nature of the network included each operator's average cable length per line, trench length per line, the proportion of cable length strung along poles and the proportion of underground cable length that is put in duct, (as opposed to being simply buried). As a measure of quality, average repair intervals, (times for a repair to be carried out) were also included.

Explanatory variables relating to the demographics of the regions analysed included the proportions of lines in metropolitan areas and the proportion of lines to residential properties. A measure of wage levels was also included.

A number of variables were used to try to capture the effects of different meteorological conditions on local loop direct network operating costs. These included average temperatures in the State served by the LEC, the range of temperatures, the amount of rainfall and the number of freezing days, all of which may affect operating costs.

A time trend was also included in the model to allow both for inflation and for efficiency improvements over time.

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The appropriate level of these costs for Ireland will then need to be allocated between services because only part of the cost should properly lie with the local loop network. As US LECS data are not split between access network and other categories ComReg proposes to use the *ratio* of eircom's access network costs to total cost from the eircom Separated Accounts.

The model Europe Economics has constructed for direct network operating costs is a random-effects panel data model. This modelling approach allows the estimated parameters to be applied to out-of-sample data. This analysis represents the most thorough attempt ComReg is aware of to capture as many as possible of the influences on direct network operating costs that vary between networks.

A technical document, with an explanation of the approach and the reasoning behind choosing it in preference to other methods is included in 04/21a.

Direct non-network operating costs

Direct non-network operating costs mainly comprise the operating costs of land, buildings and of general purpose computers, as well as the costs of testing, engineering and network administration.

With regard to the direct non-network operating costs associated with land and buildings, ComReg has excluded these from the modelling exercise performed by their economists due to the difficulty in comparing these costs in Ireland and the US. As a result, ComReg has decided to use eircom's actual direct non network costs associated with land and buildings. This cost has been added to the indirect operating cost resulting from the modelling exercise to give the total indirect operating cost.

In the same way as for direct network operating costs, ComReg has explored the use of estimates based on LEC data for the categories of direct non-network operating costs concerned with general purpose computers, testing, engineering and network administration. However, it has not yet proved possible to develop satisfactory econometric models to explain differences between LECs' cost per line with regard to these particular costs. Thus the proposed approach to these categories of direct non-network operating costs is to use the average cost per line of the US LECs.

ComReg acknowledges that using an average of LEC costs per line does not develop any understanding of the determinants of differences other than the number of lines between networks in these costs that might help to understand influences on the costs likely to be involved in operating the LRIC network for Ireland. It may be that the differences are due to differences in efficiency, and other factors that are not directly measurable. Again as US LECs data are not split between access network and other categories ComReg proposes to use the *ratio* of eircom's access network costs to total cost from the eircom Separated Accounts (ComReg has taken into account some of the changes proposed by one of the respondents for the calculation of these allocation keys, see Section 4.7).

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Indirect operating costs

Indirect operating costs contrast with direct operating costs in so far as they are incurred to run the business of a telecommunications operator as a whole and not just the access or local loop part of its network; moreover, they do not refer to the costs incurred in running assets, they are rather expenses associated with the administration of the business. It has not proved possible to develop satisfactory econometric models to explain differences between LECs in the levels of indirect operating costs with regard to network variables, however this is hardly surprising given these particular costs have little in common with the design of a telecommunications network.

Again, the proposed approach with regard to the review of the eircom LLU pricing submission to these categories of indirect operating costs would be to use the average cost per line of the LECs. The appropriate level of these costs for Ireland will then need to be allocated between services; only part of the cost should properly lie with the local loop network.

Again as US LECs' data are not split between access network and other categories ComReg proposes to use the *ratio* of eircom's access network costs to total cost from the eircom Separated Accounts (see Section 4.7).

Conclusions on operating costs

ComReg considers that statistical or econometric studies of operating costs per line achieved by US LECs that adjust as far as possible for differences in the factors that determine costs can provide useful information on the appropriate level of operating costs for the unbundled local loop network in Ireland, as they show a level of operating costs per line that have been found practical by a number of companies. Those LECs whose costs are low indicate feasible levels of efficiency, using mixed-vintage assets.

Judgement will be required in applying the estimates, in particular in considering whether there are sound and demonstrable reasons why the level of operating costs in Ireland should differ from those in the LECs; if so, these can be taken into account in determining the appropriate charge.

ComReg also recognises the potential value of having a detailed bottom-up model of operating costs that would be incurred by an efficient operator of the LRIC model network; and of reconciling cost estimates derived in this way with the actual costs of the incumbent. However, such analyses would be time-consuming and involve difficult judgements.

ComReg therefore proposes to base its approach in the review of eircom's pricing submission for LLU and therefore in the setting of a maximum level of LLU charges from April 2004 on the econometric and statistical analysis described in consultation document 04/21, while also taking into account relevant information from all other available sources and some of the suggestions proposed by the respondents during the consultation exercise. Using eircom's actual costs would provide no information

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on efficiency, and would not be consistent with allowing eircom to charge the capital costs that would be required to remunerate an efficient new investor as modelled in the LRIC methodology.

ComReg’s proposed approach is summarised in Table 1 below.

It should be noted that because of the difficulty in constructing a cross border check to translate US property related costs into an Irish equivalent, ComReg has decided that it would be best for now to use eircom’s actual costs for land and buildings.

Table 1: Summary of Treatment of Cost Types

Operating Cost Category	Appropriate Treatment
Direct Access Network Operating Costs	Econometric model of LEC data
Direct Non-network Operating Costs	
<i>Of which testing, engineering and plant operations admin. expenses</i>	Average cost per line of LECs
<i>Of which land and buildings</i>	Use eircom’s actual costs
<i>Of which general purpose computers and other assets</i>	Average cost per line of LECs
Indirect operating costs	Average cost per line of LECs

4.6.2 *Views of Respondents to Q6 [Do you agree that the explanatory model for differences in LECs’ direct network operating costs set out in 04/21a has been selected using appropriate criteria and that it captures the important influences from plant, demographic and meteorological variables in a satisfactory way? If not, how should the modelling strategy be improved?]*

One respondent does not agree with the modelling strategy and does not think that its results should be relied upon because in its view and that of its consultants:

- a) The wrong objective test has been used and the basic methodology is flawed. This respondent argues that the out of sample forecast error is unacceptably high and that a properly specified model would give a lower error.
- b) Europe Economics should not have “collapsed” the data relating to LECs and operating more than one state.
- c) Europe Economics has failed to correct for the log-normal model.
- d) Simple averages should not have been used in estimating the operating costs in categories in which no econometric model had been established.
- e) The values used in the Europe Economics’ paper to apply the results of the econometric exercise to Ireland are wrong.

This respondent also submitted an alternative econometric model based on US LEC data prepared by its consultants.

A second respondent is happy with the model used.

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A third respondent notes with approval that a rigorous statistical approach appears to have been taken. Its key concern is to understand how the results of this analysis compare with alternative assessments of cost, in particular:

- a) the per line and total actual operating costs incurred by eircom;
- b) the original assessment of per line operating cost in the bottom - up model (2002); and
- c) the assumed level of per line operating costs implicit in the current LLU prices?

4.6.3 *ComReg's position*

The first respondent had five main criticisms (as detailed above). This respondent's economic consultants' technical criticisms of the econometric methods used by Europe Economics have been reviewed in detail, but the main points are not accepted. Each of these five points is elaborated on below:

a) Methodology / Objective test criticism:

This respondent's consultants criticise the Europe Economics method of model selection and put forward an alternative model selection criterion as "the scientific standard".

This respondent's consultants propose two steps for model selection. They first consider all variables that are allegedly backed by economic reasoning to be significant, without testing for them explicitly. Then, the selection criterion between all the possible candidate models given by different linear combinations of these variables is the mean of the actual out-of-sample squared prediction errors (MSE), as derived by "leave one out cross validation". There would therefore be no need for testing the model further for internal consistency or examining the plausibility of the coefficients (e.g. that they concur with the economic theory suggesting the variable in the first place).

Standard econometrics textbooks, and evaluation of this respondent's consultants' reply, however show that this respondent's consultants claim of the appropriateness of their criteria, as presented in the reply, to be unsustainable. This view has also been supported by an independent academic advisor to ComReg.

There are three main reasons why the method is not appropriate for "forecasting" model selection, let alone *the* scientific standard (as claimed) for selecting such models.

First, there is a high probability of retaining irrelevant variables in the model. Europe Economics has used the conventional test level of 5 per cent to be the initial guide on this. However, this respondent's consultants' approach implies a test level of 32 per cent. In this method, the smallest MSE will be achieved by retaining irrelevant variables that happen to matter just a little more than 'average' from sampling fluctuations.

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Moreover, as a result of this selection criterion, the model could easily be internally inconsistent and the signs of the explanatory variables could be opposite to the sign implied by their theoretical framework.

Second, the MSE method does not correct for model size in relation to data availability. This leads to the following criticism: the MSE is not an asymptotically efficient selection method, which means that there is more than the optimal amount of uncertainty about the forecasted value.

Third, selecting by the minimum MSE does not lead to consistent selection. That is, it does not select the correct model even as the size of the data sample increases. Indeed, this respondent's consultants will over-select irrelevant variables with a high probability. This is an especially undesirable feature for models that are used in out-of-sample forecasts.

ComReg therefore finds this respondent's claim to have suggested the scientific standard for model selection unsustainable and has decided not to modify the selected model for the estimation of direct operating costs in the way suggested by this respondent.

Moreover, in light of the criticism made by the respondent's consultants and following independent academic advice, ComReg and its consultants have also evaluated the selected model against the alternative specifications proposed by the respondent's consultants through two different Selection Criteria (namely the Akaike and the Schwarz Information Criteria). The result of this was that the selected model performed better than the others and so no adjustment was made to the specification of the model.

b) "Collapsing" LECs data

This respondent's consultants assert that the raw US LEC data were wrongly "collapsed" into the 23 companies used by Europe Economics, and estimating the model on the un-collapsed data leads to a prediction of cost that is 18 per cent higher.

At the time of consultation, Europe Economics was not aware of the availability of the dependent variable at a State level from the ARMIS report 43-03. The aggregated data for operating costs, the dependent variable, were used from the beginning, which was the main practical reason for also "collapsing" the data for the explanatory variables.

However, in trying to replicate this respondent's consultants' results, the compilation of the "un-collapsed" dataset was found to be problematic. This respondent's consultants provide no description of the issues involved, or assumptions used, in compiling their un-collapsed dataset. Compiling the data set at operating company level from ARMIS data, on the other hand, required no assumptions and therefore ComReg believes that the demerits of working on the "collapsed" dataset (smaller

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sample) are less important than its merits (no need to make arbitrary assumptions to obtain the relevant values of the explanatory variables).

c) Log normal correction:

One of the respondents correctly pointed out that Europe Economics has failed to correct for the lognormal distribution when transforming the estimated logarithmic values into actual values for Ireland.

This is a valid comment and although the impact is small the estimates have been corrected for it. More details on these corrections are provided in Section 5.

d) Simple averages

This respondent fiercely criticized the use of simple averages for the estimate of the non-network and indirect operating costs. However, this respondent fails to recognise that Europe Economics' analysis indicates that the potential explanatory variables identified in this exercise have not been found reliable in explaining these categories of operating costs. In other words, despite thorough investigation, it has not been possible to find explanatory variables that improve on the simple average as a measure of the operating costs per line in those categories. (This is not really surprising, since the nature of the costs in question - operating costs associated with non - network assets and operating costs associated with running the companies as a whole as distinct from operating particular assets - are unlikely to be strongly associated with factors that can be directly measured, as opposed to random factors and differences in managerial competence.) Like Europe Economics, this respondent has not been able to propose any viable alternative methodology (model) aimed at estimating the operating cost categories in question, using the data in hand. The simple averages are thus currently the best measures available of the likely non - network and indirect operating cost per line.

e) Wrong values for Ireland

This respondent's consultants also claim that the values used in Europe Economics' paper in order to apply the results of the econometric exercise to Ireland are not correct since they do not refer to eircom's network. It is here important to stress once again that the aim of this exercise is to estimate a level of operating costs that is consistent with the assets already included in the LRIC model. This implies a major flaw in the application of the proposed alternative models: when applying the results of the econometric exercise to the Irish case, the characteristics of the network to be taken into consideration are the ones related to the LRIC model and not the ones of eircom's network as assumed by this respondent's consultants.

ComReg has therefore decided not to modify the values inserted in the econometric exercise, with the exception of taking into account intra-building cable, as suggested by this respondent, in the value of the variable *Ducted Share* (i.e. the proportion of underground cable that is put in ducts). This has now been put equal to 99.5 per cent (the original value was 100 per cent). The adjustments are detailed in Section 5 of this document.

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Another respondent suggests obtaining an estimate of indirect costs by applying the ratios of indirect costs over direct operating costs from the US LECs' accounts to ComReg's estimate of direct operating costs. ComReg believes that this is not a possible improvement to the use of simple averages, since it would imply that also these cost categories depend upon the explanatory variables identified as cost drivers for the direct operating costs. However, econometric analysis has indicated that this is not the case.

This respondent also suggests that these cost categories could be estimated by applying the ratios of indirect costs over asset values from the US LECs' accounts to ComReg's estimates of asset values, as they are derived from the LRIC model. ComReg believes that this would not be a suitable comparison since the valuation of the assets in the US LECs accounts refers to gross book values (a different standard than the one implied in the LRIC model).

4.7 Allocation criteria

4.7.1 Introduction

In Consultation Paper 04/21, ComReg noted that indirect operating costs need to be allocated between services and only the costs associated with the local loop should be included. ComReg proposed to use the ratio of eircom's access network costs to total costs from eircom's separated accounts as the basis of this allocation.

4.7.2 Views of Respondents to Q7 [Do you agree with the allocation criteria set out above for allocating a portion of direct non-network and indirect costs to the unbundled local loop should be based on eircom's separated accounts? If not, please indicate what you think would be a superior approach and why.]

Firstly one respondent questions the adequacy of the values used to allocate the costs of non-network and indirect costs to the unbundled local loop. The allocation keys used to allocate Direct Network and Non-network costs have been estimated on the basis of the access and core network operating costs, as these have been derived from *eircom's* accounts for 2002/2003. These operating costs include a depreciation charge, whereas those derived from the econometric exercise are purely maintenance costs.

This respondent points out that the services provided by the US LECs differ from the ones provided by eircom. This respondent is highlighting the fact that the allocation keys used to split the shared costs that have been estimated on the basis of the US LECs' network structure and services provided should be consistent with the LECs structure and services provided rather than with eircom's structure and services provided.

In its submission, this respondent suggests some adjustments to the figures originally included in the Separated Accounts (SA) to take these two factors separately into account.

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Secondly, this respondent questions the adequacy of using the allocation keys calculated on the basis of data that refer to one year only, given that the benchmark exercise covers a 12-year period.

Another respondent agreed with the allocation methodology proposed by ComReg in the consultation paper 04/21.

A third respondent questioned the origin of the allocation criteria. This respondent sought clarification on what figures from eircom's separated accounts were actually included in calculating the allocation percentages.

4.7.3 *ComReg's position*

ComReg accepts the suggestion from one respondent that it is better to allocate indirect costs on the basis of operating costs excluding depreciation, and has since the consultation obtained data on this basis from eircom. The detail of the allocation is set out in Section 5 below.

This respondent also suggests that there should be adjustments made to the information in the separated accounts to provide a more accurate basis for allocation. The analysis provided by the respondent of the impact of these adjustments is minimal and does not justify the resources required to verify the appropriateness of the suggested adjustment.

ComReg would like to point out that the aim of this exercise is to estimate operating costs for 2004. Since this has been done on the basis of a panel dataset and therefore using data stretching back to 1990, it would be desirable, for consistency, that the companies included in the sample would maintain the same structure and provide the same range of services during the period under consideration and across the board. However, ComReg believes that, given the considered cost categories, the relevance of this issue is minor and that trying to correct for these would create more problems than it would solve.

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5 Conclusions on operating costs for ULL charges

ComReg received three responses to the Consultation Paper 04/21 on operating costs for LLU charges. As a general point, these have helped clarify the complex issues under scrutiny and ComReg is glad of the detail and thoughtfulness of the responses received.

A number of specific comments/suggestions of modifications were brought forward by the respondents. In the main body of this Response to Consultation document ComReg, on one hand, rejects some of them but, on the other, considers a number of them as improvements to the analysis. Here follows a list of the modifications carried out on the model as a result of this consultation exercise and their impact on the estimate of the operating costs as part of the LLU charge. It is worth noting that the order in which these modifications were carried out does not affect the relative impact of each change (and, of course, the final result).

The starting point of the exercise is an allowance for total operating costs within the LLU charge equal to €3.22 per line per month, as indicated in Table 4.7 of Consultation Paper 04/21a. For clarity, this figure and all other figures referred to in the sections below are exclusive of adjustments for separately charged services and Irish land and building related costs.

5.1 Quantified modifications

5.1.1 *Adjustment for the lognormal distribution*

On this point, the reference to the main body of this paper is section 4.6.3.c).

One of the respondents correctly pointed out that Europe Economics has failed to correct for the lognormal distribution when transforming the estimated logarithmic values into actual values for Ireland. This is needed because the dependent variable of the estimated model for direct operating costs is a stochastic variable, and, given the assumptions underlying the model used, it is distributed according to the lognormal distribution. The expected value of the direct operating costs is therefore equal to the exponential of the sum of the mean and half the variance.

Therefore the variance of the regression was obtained and halved (approximately 0.0334), and then added to the predicted value before the exponential transformation into a dollar figure. The effect of this correction is to increase the estimated direct operating cost by 3.4 per cent, bringing the total operating cost to €3.24 per month per line.

5.1.2 *Adjustment for rate of changes of wages and inflation as between Ireland and the US*

On this point, the reference to the main body of this paper is section 4.1.3.

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Although productivity is essentially a matter on which management should take responsibility, differences in general price and wage levels between different countries are largely outside individual management control. Therefore, once having established an estimate of the averagely efficient LEC's operating costs (both direct and indirect) per line in \$, these costs are translated into € using a weighted average of hourly wage costs (including tax and national insurance paid by the employer) and the purchasing power parity exchange rate for non-wage costs. Thus allowance is made for differences in wage rates, including employment taxes incurred by the employer, and, through the use of a purchasing power parity (PPP) exchange rate, also in the estimated costs of materials purchased as part of operating expenditure.

However, for the purposes of the translation of the \$-denominated estimates into €, Europe Economics has used, for both wage costs and for the PPP exchange rate, 2002 figures since these were the latest data publicly available for both wages and the PPP. One respondent has pointed out that if inflation of the relevant costs between 2002 and 2004 was higher in Ireland than in the US, then slightly different results will be obtained once the later data are established. ComReg accepts this point as relevant and appropriate.

ComReg has therefore updated the wage figures with the latest available data and the PPP figure through the ratio of the GDP deflator growth in the two countries. The details of these adjustments are provided below.

5.1.2.1 Adjusting for wage inflation difference 2002 – 2004

To take into account the fact that inflation between the US and Ireland differed between 2002 and 2004, the Irish wage level for 2003 was obtained from ComReg. The latest figure for the relevant U.S. wage was available for the year 2001. This has been adjusted up to 2003 using the U.S. private industry employment cost index from the U.S. Bureau of Labour Statistics, as ComReg did in the Consultation document 04/21 up to 2002 (at the time this was the latest figure published). To bring both of the wage figures up to the year 2004 in a consistent manner, the OECD index of compensation per employee in business sector was used for both countries. These projections are from the Statistical Annex to the OECD Economic Outlook report No. 74.

The effect of this change is to increase the ratio of the wages in Ireland denominated in € to those in the US (in \$) from original 0.755 to 0.777, increasing the final cost estimate of total operating cost by 2.1 per cent, bringing it to €3.30 per month per line.

5.1.2.2 Adjusting the PPP figure

An up to date PPP figure was obtained from the OECD for 2003, which is the same 1.01 as in 2002. This was adjusted to 2004 using the ratio of price levels in Ireland and U.S. measured by the projected increase in GDP deflators in the two countries. The Statistical Annex to the OECD Economic Outlook No. 74 estimates a 4.2 per cent increase for Ireland, and a 1.2 percent increase for the U.S. from 2003 to 2004.

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The effect of this change is to increase the PPP value from 1.01 in 2003 to 1.04 in 2004, increasing the final cost estimate of total operating cost by 0.9 per cent, bringing it to €3.33 per month per line.

5.1.3 *Adjustment of the value of the variable Ducted Share*

On this point, the reference to the main body of this paper is section 4.6.3 e).

One respondent included a comment that the appropriate value for the variable *Ducted Share* to be used in the forecasts for Ireland should take into consideration the amount of intra-building cable modelled in the LRIC exercise. This is a fair comment since the corresponding explanatory variable of the econometric exercise includes intra-building cable as part of underground cable (whose ducted share corresponds to the variable in question).

Allowing for intra-building cable brings the value to be used in this exercise from 1 (the value used in the Consultation paper 04/21) down to 0.995.

Making this adjustment increases the cost estimate of total operating cost to €3.34 per line per month, an increase by 0.1 per cent on total operating costs (as a result of an increase by 1 per cent of the direct operating costs).

5.1.4 *Adjustment the allocation keys*

On this point, the reference to the main body of this paper is section 4.7.2.

As explained in section 4.7.2, ComReg sees as appropriate the adjustment to exclude depreciation from the allocation keys suggested by one respondent. The data provided by eircom to take these adjustments into account (section 4.7.2) have been used in the final allocation keys.

This adjustment increases the LLU share of total operating costs by 2.5 per cent, bringing the final estimate to €3.42 per line per month.

5.2 Unquantifiable Modifications

Respondents have made two further comments that, although interesting, are very difficult to quantify. These are:

The result of the econometric exercise based on US data aimed at obtaining LRIC estimates for operating costs, should always be regarded as an “upper bound” (see Section 4.4.3).

Differences in local taxes, rates or charges and planning environment between the US and Ireland should be taken into account as an exogenous factor.

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By disregarding these, ComReg would underestimate operating costs in Ireland (see Section 4.1.3).

With regard to the first point, the respondent has suggested considering a sub-set of the US LECs with the lower costs per line. This, however, can only be, at best, a partial solution as it does not adjust for the fact that “new” assets (as in a LRIC model) usually require less maintenance than the assets of mixed-vintage for the US LECs.

Further, it is only an approximation of an efficient set of costs and does not take account of all of the factors that ComReg would expect to include in a comprehensive review of efficiency.

With regard to the second bullet point, ComReg notes that differences in network rates and the planning environments between different jurisdictions do play a role in the level of operating costs, but it does not have the necessary information to make a reasonable estimate of the effects.

ComReg believes that these two changes, which go in opposite directions, will to some extent balance each other out. It may be that further analysis of them would lead to a view that the reasons for reducing the estimates derived from the LECs outweigh the argument that local conditions in the US are more favourable, but for the purpose of the present discussion ComReg has decided to treat them as broadly offsetting, so that the amount to be allowed for total (direct and indirect) operating costs (including *ad-hoc* repairs) within the LLU charge will be € 3.42 per line per month.

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6 Response to Consultation Document 04/31¹³

6.1 Context of the consultation

Access network element costs and indeed some parameters of the access network design have been two of the areas of disagreement between ComReg, eircom and the Other Authorised Operators (OAOs). The design parameters and element cost ranges described within the Consultation paper 04/31, together with the responses received as a result of this publication, will form an important part of ComReg's review of eircom's pricing submission for the LLU products for the period from April 2004 to March 2005 and beyond.

The Consultation Paper 04/31 dealt specifically with two of the areas of disagreement between ComReg, eircom and the OAOs, namely the areas of access network design parameters and network element costs.

6.2 Purpose of the consultation

The consultation set out for public consultation how ComReg proposed to review inputs contained within eircom's LLU product pricing submission with regard to access element costs and design parameters with a view to settling these issues in considering the level of charge for LLU.

ComReg sought reasoned comments on the information put forward paper, and, in particular, was looking for supporting evidence to which it may not otherwise have access from the industry. Any information submitted to ComReg that the respondents consider to be confidential, submitted in confidence or commercially sensitive has been treated as such.

¹³ ComReg 04/31 dated 18 March 2004 – Local Loop Unbundling Costing Consultation: Access Network Design Parameters and Costs of Certain Access Network Elements

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7 General responses to Consultation

7.1 General views of the respondents

Two respondents stated that they felt public consultation was an inappropriate method of determining the cost of network elements. Both respondents claimed that only operators owning physical networks would have the information required to cost network elements.

One respondent stated that ComReg must use the actual costs in Ireland. A second respondent indicated that the actual costs should be benchmarked against other operators similar to the exercise carried out for the operating expenditure. One of the respondents also argued that the model and its underlying network assumptions were fixed.

A third respondent stressed that this consultation paper acted as a guide and stressed that the correct cost is that for an efficient operator and not necessarily the apparent actual cost of any existing operator.

7.2 ComReg's view

ComReg agrees that only operators and contractors building or intending to build physical networks in Ireland would be able to provide the required cost information. ComReg agrees that efficient operator costs are the appropriate costs for use in a LRIC model and noted this in Consultation Paper 04/31.

ComReg does not agree with the view that the LRIC model of the access network is fixed or rigid in nature. A model as extensive as eircom's bottom-up LRIC model of the access network will, by its nature, evolve over time and ComReg believes it is inappropriate to disallow refinements to the modelling which supports the LLU published price, if those refinements improve the quality of the modelling. The view which was advanced by one respondent that the current input to the LRIC model was agreed by IAG2 is misleading. Several items remained in debate at the conclusion of the IAG2 forum.

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8 Detailed responses to consultation questions

8.1 Pole Route

8.1.1 Introduction

During the consultation process, ComReg sought information regarding the cost of telephone poles, installed, with appropriate fittings (e.g. footrests, cable brackets). The cost should be the average cost, bearing in mind that some poles will require lateral supports/bracing. ComReg requested respondents to specify the proportion of such supported braced poles allowed. ComReg also requested them to specify the type of pole for which costs are supplied (e.g. diameter, length, material and finish treatments {if any}).

In Consultation Paper 04/31, ComReg provided its preliminary view that the cost of provisioning a single average pole within a large network build will probably be within the range of €230 to €280.

8.1.2 Views of the respondents to Q1 – *[Do you believe that the installed cost of a pole for an access network to be built in Ireland would lie within the range given above? Whether within or outside of this range, can you indicate precisely where you consider the cost lies? Please provide detailed information to support your view in any case.]*

Two respondents answered this question. Both respondents referred the costs incurred by the respondents and the various specifications used in Ireland. Due to the confidential nature of the two submissions received from the respondents, it is not appropriate to detail the sets of costs supplied to ComReg.

In addition to the above, one respondent expressed a failure to comprehend why ComReg decided to consult on this issue which they indicated had been resolved at IAG2. This respondent also highlighted that ComReg have not provided any evidence to backup the cost ranges put forward in the Consultation

8.1.3 ComReg's view

Having considered the cost submissions received ComReg has determined an appropriate cost to be used in the costing model based on a detailed confidential submission. This cost lies towards the upper end of the range indicated by ComReg.

8.2 Cabinets

8.2.1 Introduction

Cabinets are used for the primary cross-connect points (PCPs) in the access network. A typical cabinet would be expected to provide cross connect facilities for 900 pairs (400 E-side and 500 D-side). In Consultation Paper 04/31, the cost required was that for a pressed steel cabinet of suitable size (please state), mounted adjacent to a joint box and must include the cost of installing the cabinet roof, the ducts to the joint box,

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mounting the cabinet shell and all the internal fittings required to support the cross connect blocks, all cross connect blocks, the cost of terminating cables on both E-side and D-side and the cost of jumpering 80% of the E-side pairs.

ComReg provided its preliminary view in the consultation paper for the cost of provisioning an average PCP within a large network build would probably be within the range of €2,600 to €3,300.

8.2.2 Views of the respondents to Q2 – [*Do you believe that the installed cost of a PCP cabinet for an access network to be built in Ireland would lie within the range given above? Whether within or outside of this range, can you indicate precisely where you consider the cost lies? Please provide detailed information to support your view in any case.*]

Two respondents answered this question. Due to the confidential nature of the two submissions received from the respondents, it is not appropriate to detail the two sets of costs supplied to ComReg. However, both sets of costs and specifications have been valuable with regard to ComReg's review of eircom's LLU pricing submission.

In addition to the above, one respondent expressed deep concern with ComReg's approach regarding cabinets as it felt that ComReg was now digressing from the agreed approach of the IAG. This respondent also highlighted that the approach advocated by ComReg represents a material change from the components agreed during IAG2 as it excludes the attendant PCP joint box. According to this respondent, this exclusion results in an understatement of the actual cost of PCPs in the BU-LRIC model and does not allow for the cost recovery required.

8.2.3 ComReg's view

ComReg intentionally separated the cost of the PCP cabinet installation from the cost of the attendant joint box in order to ensure comparability between respondents' submissions. Opportunity was provided within the consultation for submissions on costs of joint boxes (see below). The elements required to provide PCP functionality were agreed within the IAG2 process and are not a subject of this consultation.

After consideration of the cost submissions received ComReg has determined an appropriate cost to be used in the costing model based on the detailed confidential submissions. This cost lies within the middle of the range indicated by ComReg.

8.3 Joint boxes

8.3.1 Introduction

Clearly joint boxes for the access network will not all be of the same size and specification – for example some will be turning boxes only, some will be for major cable joints and some will be distribution point boxes where the distribution system is buried. Since specifications of such boxes will vary between operators the joint box usage specified and the requirement is for the specification and cost of boxes for such usage.

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Therefore, ComReg proposed, in Consultation Paper 04/31, that joint boxes should be used in the model in the following way:

- Joint box (large – copper)
- Joint box (small – copper)
- Joint box (large – fibre)
- Joint box (small – fibre)
- Turning box (large)
- Turning box (small)
- Distribution point box

ComReg stated in the consultation paper that if a respondent considers that other types of joint box may be required then that should be explained within their submission.

ComReg appreciates that boxes for some of these uses may be of identical specification within some respondents' networks. Where this is the case it is only necessary to provide the specification and cost for each type of box which is used, together with a statement on the usages to which that specification of box is put. Where ancillary structures are included in the costs of joint boxes, e.g. cable bearers, these costs should be identified separately.

8.3.2 Views of respondents to Q3- [*What is your view on the appropriate costs and specifications for joint boxes in an access network to be built in Ireland? Please provide detailed information to support your view.*]

Two respondents answered this question providing detailed feedback of costs incurred by the respondents and the various specifications used in their own networks. Due to the confidential nature of the two submissions received from the respondents, it is not appropriate to detail the two sets of costs supplied to ComReg.

In addition to the above, one respondent claimed that eircom's costs for joint boxes would be lower than the costs it incurs due to the economies of scale enjoyed by it in Ireland. The other respondent expressed deep concern with ComReg's approach regarding joint boxes as it felt that ComReg was now digressing from the agreed approach of the IAG. This respondent claimed that, as it is the only operator to have built an extensive underground cable network in Ireland, its costs are the only appropriate costs to be used as inputs to a forward-looking LRIC model. This respondent also asserted that these costs could not be improved upon by any other operator in the Irish market tasked with building an access network as the costs reflected the respondent's purchasing power in the Irish market and its advanced procurement processes.

8.3.3 ComReg's view

As explained in Consultation Paper 04/31 specifications for joint boxes vary widely and accordingly ComReg was not in a position to provide ranges of costs. However, ComReg can now confirm that the average costs for joint boxes included within the LLU LRIC model are a reasonable reflection of those presently availing in the Irish market.

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8.4 Cable, cable pulling and jointing

8.4.1 Introduction

ComReg's preliminary view of the likely ranges within which the costs of underground cabling lie was provided in the Consultation Paper 04/31. During the consultation process, respondents were asked to provide their views as to whether these cost ranges are reasonable and, having indicated whether or not the ranges were considered reasonable, to indicate where, in precise terms, the actual cost should lie. The pressurised main network uses poly unit twin construction cable, whilst the non-pressurised cable is of jelly filled poly twin construction. All underground cables are installed within ducts. ComReg's understanding at the date of consultation was that much of the installation costs reflect the cost of jointing the cables (most particularly for the larger pressurised cables).

8.4.2 Views of respondents to Q4 – [*Do you believe that the underground cabling costs for an access network to be built in Ireland would lie within the ranges given in Consultation Paper 04/31? Whether within or outside of this range, can you indicate precisely where you consider the costs lie? Please provide detailed information to support your view.*]

Two respondents answered this question both with regard to the costs incurred by the respondents and the various specifications used in their own networks. Again, due to the confidential nature of the two submissions received from the respondents, it is not appropriate to detail the two sets of costs supplied to ComReg.

Additionally, one respondent asserted that as it was the only operator to have an extensive nationwide underground and overhead copper telecommunications copper access network in Ireland, then only its costs would be the most efficient available in the context of the Irish market. This respondent also asserts that the planning rules applied are international best practice.

This respondent then suggested that the ComReg ranges for underground cable are not credible as the prices are not based on the current bulk prices available on the London Metal Exchange and the respondent further suggested that there are inconsistencies with the copper content of the prices. In addition this Respondent believes that the costs of installation are not reflective of the costs currently available in the Irish market.

8.4.3 ComReg's view

ComReg does not agree with the views put forward in regard to the particular efficiency of certain operators in respect of installation costs, nor does it believe that unsubstantiated assertions in regard to planning rules and jointing schedules are appropriate. Being in possession of the most extensive copper cable access network in Ireland does not necessarily provide evidence of ability to build such networks efficiently or cost effectively. The only costs appropriate as inputs to the hypothetical network LRIC model agreed within the IAG2 process are those for an efficient *builder* of copper access networks.

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ComReg has analysed the copper market over the last five years and accepts that cable prices are currently higher than it indicated in the Consultation Paper 04/31. It has also checked with each of the respondents to ensure that the cable prices submitted are comparable in time and copper base price. When corrected for timing of purchase in the market the cable prices submitted are within very close proximity with small variances in either direction.

Installation costs vary significantly between the respondents. ComReg has analysed the detailed submitted costs to ensure that the component elements costed by each respondent are comparable or can be adjusted to be comparable. After consideration of the cost submissions received ComReg has determined an appropriate set of costs for cables and cable installation to be used in the costing model. The set of installed cable costs lies considerably outside the higher end of the ranges suggested by ComReg – the main reason for this is the increase in cable prices because of recent significant rises in the cost of copper. The effect is particularly marked with high pair count, high copper content cables.

8.5 MDF termination

8.5.1 Introduction

During the consultation process, respondents were asked to provide their views on the cost of termination of main network cables (of the sizes provided above) to their associated MDFs.

8.5.2 Views of respondents to Q5 – [*What is an appropriate cost for termination of main network cables on an MDF? Please provide detailed information to support your view.*]

Two respondents answered this question both regard to feedback of costs incurred by the respondents and the various specifications used. Due to the confidential nature of the two submissions received from the respondents, it is not appropriate to detail the two sets of costs supplied to ComReg. However, both sets of costs and specifications have been valuable with regard to ComReg's review of eircom's LLU pricing submission.

In addition to this, one respondent claimed that ComReg is separating integral parts of the access network in an unreasonable manner. This respondent detailed that equipment and labour for main cables termination on the MDF are vital components of the installation activity of the main cable.

8.5.3 ComReg's position

Whilst varying slightly in their approach to the detailed work up of the costs involved in terminating main cables on MDFs both respondents provided broadly similar figures (particularly for smaller cables) in the overall context of costs within the LRIC model. ComReg continues to regard termination of main cables on an MDF as an integral part of the main network cable element, however it does not

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consider that it is appropriate to amalgamate this item (which occurs on a per cable and per pair basis) with e.g. cable pulling costs which are incurred on a distance basis only.

8.6 Pressurisation equipment

8.6.1 Introduction

At sites where the pressurised main cable network terminates pressurisation and remote pressure monitoring facilities are required. During the consultation process, respondents were asked to provide their views on the costs of such facilities and their application (MDF sizes where pressurisation facilities are required are in the 2,000 to 30,000 line range).

8.6.2 View of the respondents to Q6 – [What are the appropriate costs for pressurisation and monitoring facilities at MDF sites? Please provide detailed information to support your view.]

One respondent answered this question. Their response relates to both the costs incurred by the respondent and the various specifications used. Due to the confidential nature of the submission received from the respondent, it is not appropriate to detail the costs supplied to ComReg. However, the costs and specifications have been valuable with regard to ComReg's review of eircom's LLU pricing submission.

In addition to this a second respondent indicated that they were not able to obtain the required information within the time constraints of the Consultation. However, this Respondent indicated that they would pursue this information outside the consultation timelines if ComReg so requested.

8.6.3 ComReg's position

Having considered the responses to this consultation ComReg is now in a position to confirm that the costs of pressurisation equipment and associated telemetry systems included within eircom's LLU model reasonably reflect the costs availing in the present Irish telecommunications market.

8.7 Installed overhead cable

8.7.1 Introduction

ComReg's preliminary view of the likely ranges within which the costs of overhead cabling lie were provided in the Consultation Paper 04/31. During the consultation process, respondents were asked to provide their views as to whether these cost ranges are reasonable and, having indicated whether or not the ranges are considered reasonable, to indicate where, in precise terms, the actual cost should lie.

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8.7.2 *Views of respondents to Q7 – [Do you believe that the overhead cabling costs for an access network to be built in Ireland would lie within the ranges given in Table 3? Whether within or outside of this range, can you indicate precisely where you consider the cost lies? Please provide detailed information to support your view.]*

Two respondents answered this question with regard to the costs incurred by the respondent or with regard to costs incurred by a company in the same group. Again due to the confidential nature of the two submissions received from the respondents, it is not appropriate to detail the two sets of costs supplied to ComReg.

In addition, one respondent reiterated the issues it articulated with regard to underground cable in that the respondent asserted that as it was the only operator to have an extensive nationwide underground and overhead copper telecommunications copper access network in Ireland, then only its costs would be the most efficient available in the context of the Irish market. This respondent also asserts that the planning rules applied are international best practice.

The same respondent then again suggested that the ComReg ranges for overhead cable are not credible as the prices are not based on the current bulk prices available on the London Metal Exchange and this respondent further suggested that there are inconsistencies with the copper content of the prices. In addition this respondent believes that the costs of installation are not reflective of the costs currently available in the Irish market.

8.7.3 *ComReg's position*

ComReg does not agree with the views put forward in regard to the particular efficiency of certain operators in respect of installation costs, nor does it believe that unsubstantiated assertions in regard to planning rules and jointing schedules are appropriate. Being in possession of the most extensive copper cable access network in Ireland does not necessarily provide evidence of ability to build such networks efficiently or cost effectively. The only costs appropriate as inputs to the hypothetical network LRIC model agreed within the IAG2 process are those for an efficient *builder* of copper access networks.

Both respondents provided cable costs which were in excess of the ranges suggested by ComReg. ComReg has analysed the copper market over the last five years (see above with regard to underground cables) and accepts that cable prices are currently higher than it indicated in the Consultation Paper 04/31. It has also checked with each of the respondents to ensure that the cable prices submitted are comparable in time and copper base price. When corrected for timing of purchase in the market the cable prices submitted are within very close proximity with small variances in either direction.

Installation costs vary significantly between the respondents. ComReg has analysed the detailed submitted costs to ensure that the component elements costed by each respondent are comparable or can be adjusted to be comparable. After consideration of the cost submissions received ComReg has determined an appropriate set of costs

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for cables and cable installation to be used in the costing model. The set of installed cable costs transits from within the higher end of the ranges suggested by ComReg to well outside the higher end for higher pairage cables – the main reason for this is the increase in cable prices because of recent significant rises in the cost of copper (again – see 8.4 above re: underground cables).

8.8 Joint box distribution

8.8.1 Introduction

The issue of the costs of joint boxes is dealt with above in Section 7.7. Within the model the average cost of joint boxes per kilometre of the network is required. To this end, during the consultation process, ComReg requested respondents to provide the expected proportions of such boxes in an access network and an estimate of the overall number of boxes which will be required (e.g. average spacing 50m or similar).

8.8.2 Views of the respondents to Q8 – [What is your view on joint box distribution within an access network to be built in Ireland? Please provide detailed information to support your view.]

Two respondents answered this question. Both provided their general views on joint box distribution within the access network (on a joint boxes per metre basis) and provided support for these views. Only one respondent felt able to suggest a distribution of types of joint boxes required as a percentage of the overall requirement. Again due to the confidential nature of the two submissions received from the respondents, it is not appropriate to detail the two sets of costs supplied to ComReg.

In addition to this one respondent underlined the concern that ComReg was revisiting an issue that they felt had previously been agreed at IAG2. This concern was reinforced by this respondent's second concern that the agreed outputs of IAG2 are now being put to other parties for consultation in spite of the fact that such parties did not participate in IAG2.

8.8.3 ComReg's position

ComReg does not accept that this issue was agreed during the IAG2 process. Nonetheless it appears that there is broad consensus within the industry on the overall distribution of joint boxes within an access network (neither submitting party being able to provide other than a broad estimate of the number of joint boxes per kilometre which were, in engineering terms proximate).

ComReg is now content that the overall joint box distribution within the model is broadly correct and that the types and proportions of joint boxes included within the cost of the average joint box in the model are reasonable.

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8.9 Duct route sharing between the main network and the distribution network

8.9.1 Introduction

The distribution portion of the access network is clearly pervasive in order to provide access to all premises where it may be required. ComReg understands that some portions of the main network may run in routes where the access network may not exist, for example in short portions in the boundaries between service areas of a single MDF or where there are no premises to serve. Therefore, as part of the consultation process, respondents were asked to provide their views on what proportion of the main network will share its route with the distribution network.

ComReg's preliminary view, at the date of consultation, was that the proportion of the main network routes which would be expected to be coincident with the route of the distribution network should be of the order of 90%.

8.9.2 Views of the respondents to Q9 – [Do you agree that route sharing between the main and distribution cabling in an access network in Ireland should be of the order of 90%? Please provide your reasoning and any supporting information.]

Two respondents answered this question. One respondent provided information based on historic data derived from its GIS and accounting systems on the route sharing between the main and distribution cabling which it currently experienced. The other respondent provided data on newly designed networks within Ireland. Due to the confidential nature of the submission received from the respondent, it is not appropriate to detail the information supplied to ComReg.

8.9.3 ComReg's position

ComReg believes that a network evolving over a considerable time will exhibit duplication of trenches on routes where network reinforcement has been required. It does not believe that an analysis of the reality at any particular instant aids the understanding of the underlying sharing of routes between main and distribution cabling in a newly designed network.

The information provided on new access network designs, in Ireland, have enabled ComReg to make a more informed estimate of the appropriate level of sharing between main and distribution routes in a competitive access network such as that required as the basis for eircom's BU-LRIC model.

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9 Conclusions

9.1 Overall conclusions on 04/21

As detailed in Section 5 of this paper, after the consultation process and modifications to the original Europe Economics model as a result of the responses received from respondents, ComReg has a figure for direct and indirect operating expenditure.

9.2 Overall conclusions on 04/31

As already noted, ComReg is not in a position to disclose publicly many of the details of consultation responses. However ComReg has now received sufficient evidence from several operators to form a firm opinion as to the appropriate cost of the inputs consulted upon.

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Appendix A – Legal Background and Statutory Powers Relating to Local Loop Unbundling

A. Legal Background

Under the terms of the settlement of the judicial review proceedings¹⁴ (‘the Settlement’) between *eircom* Limited (‘*eircom*’) and the Commission for Communications Regulation (‘ComReg’) it was agreed and consented amongst other things, that ComReg would forthwith initiate a new process for the purpose of agreeing with *eircom* new LLU prices effective from 1 April 2004 or, in default of such agreement, making a new decision fixing LLU prices to be effective from 1 April 2004.

Having regard to the Settlement, ComReg published two consultation documents, to which *eircom* and industry responded (‘the Consultations’):-

1. *Loop Unbundling Costing Consultation Direct and Indirect Operating Expenditure Econometric Modelling Document No: 04/21 Date: 27 February 2004* and;
2. *Local Loop Unbundling Costing Consultation Access Network Design Parameters and Costs of Certain Access Network Elements (Document No: 04/31 Date: 18 March 2004).*

The purpose of the Consultations was to seek the views of *eircom* and industry in relation to the costs of an efficient operator, having regard to operating expenditure costs and the costs of certain access network elements.

In parallel to the Consultations arising from the Settlement, ComReg, as required by EU law, has also been engaged in the process of carrying out a detailed review of wholesale and retail markets for the provision of electronic communications services¹⁵. In the document entitled *Market Analysis: Wholesale unbundled access (including shared access) to metallic loops and sub-loops (Response to Consultation Document 03/146 and Draft Decision) Document No: 04/70 Date: 16 April 2004* (‘the SMP Decision’) *eircom* was designated with significant market power on the market for wholesale unbundled access (including shared access) to metallic loops and sub-loops for the purpose of providing broadband and voice services, under the provisions of Regulations 25, 26 and 27 of the Framework Regulations¹⁶. The SMP

¹⁴ The High Court, 2003 No. 6822P, *eircom* Limited, Applicant v The Commission for Communications Regulation, Respondent.

¹⁵ See Directive 2002/21/EC of the European Parliament and the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services.

¹⁶ S.I. No. 307 of 2003 the European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2003 which transposes Directive 2002/21/EC of the European Parliament and the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services.

Local Loop Unbundling; responses to consultations on operating costs, equipment costs and network design parameters.

Decision also imposed the *ex ante* regulatory obligations on *eircom* which are set out in Regulations 10, 11, 12, 13 and 14 of the Access Regulations¹⁷. The obligations imposed on *eircom* under Regulation 14 of the Access Regulations include obligations relating to cost recovery and price controls and the obligation for cost orientation of prices. ComReg may under Regulation 14 of the Access Regulations, require prices to be adjusted. Under Regulation 17 of the Access Regulations ComReg may issue directions to *eircom* to do or refrain from doing anything which ComReg specifies in the direction, for the purpose of further specifying requirements to be complied with by *eircom* relating to its obligations under the Access Regulations, including those under Regulation 14 thereof.

¹⁷ S.I. No. 305 of 2003 the European Communities (Electronic Communications Networks and Services) (Access) Regulations 2003 which transposes Directive 2002/19/EC of the European Parliament and the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities. These obligations are respectively transparency, non-discrimination, accounting separation, obligations of access to and use of specific network facilities and price control and cost accounting obligations.