

Agenda

Advancing economics in business

Ducting the issue: what role might duct access play in an NGA environment?

Local-loop unbundling has been a key driver of innovation in the delivery of broadband services, but new solutions are likely to be required following a move to next-generation access networks. The European Commission's preferred option is duct access, but what are the regulatory challenges involved, and do the economics support widespread adoption?

The UK government recently published a report on 'Digital Britain', which seeks to 'develop a comprehensive plan to further our digital economy and society'.¹ It emphasises the importance that the government places on next-generation access (NGA) networks to promote economic growth and support the country's competitive position.

At least at a high level, this view appears to be shared by regulators and governments across the world, and indeed the report comes on the back of a number of other initiatives to promote NGA, not least of which is the draft recommendation on NGA regulation issued by the European Commission in September 2008.²

In recent years, local-loop unbundling (LLU) has been a key driver of innovation and competition in the UK, and is an important component of EU telecoms regulation.³ However, the current form of LLU does not fit well in the topography of next-generation networks, and so alternative solutions are likely to be required in the future. As discussed in the box below, there is a wide range of alternatives that vary in their economic characteristics, as well as in their ability to allow entrants to differentiate their consumer proposition through innovation.

This variation is important because, according to Ofcom, the UK regulator, 'in the past effective competition—including innovation and differentiation—has only really been possible with ownership of the local loop'.⁴ Indeed, Ofcom expresses a preference for developing passive remedies into the future, and the Commission's NGA draft recommendation of September 2008 places significant emphasis on the benefits of duct access. While the Commission's recommendations were broadly welcomed by the European Regulators Group (ERG), the ERG expressed concern about the lack of attention

to alternative measures and a lack of flexibility to allow for regional differences:

the current text could be interpreted as implying that duct access seems to be 'the' regulatory panacea. ERG considers that depending on national circumstances duct sharing could be an efficient remedy to stimulate infrastructure competition, as is the case in France and Portugal. However this might not be sufficient in itself and may have to be complemented by other remedies. Again, in other countries it may not be applicable at all.⁵

A discussion on the merits and disadvantages of the different types of access to all NGA network topologies is beyond the scope of this article, so the focus is on the regulatory challenges and economic issues associated with duct access. In Europe, the deployment of duct access is most developed in France and Portugal; the evidence in this article therefore reflects on the experience of these countries to illustrate some of the issues that regulators are likely to face in implementing the remedy, and the potential scope for entrants to utilise it.

Regulating the remedy

Duct access gives rise to a number of practical regulatory challenges:

- the existence (or otherwise) of ducts;
- the definition of ducts and assessment of dominance;
- designing a mechanism to grant duct access in a non-discriminatory manner;
- determining the optimal duct access price.

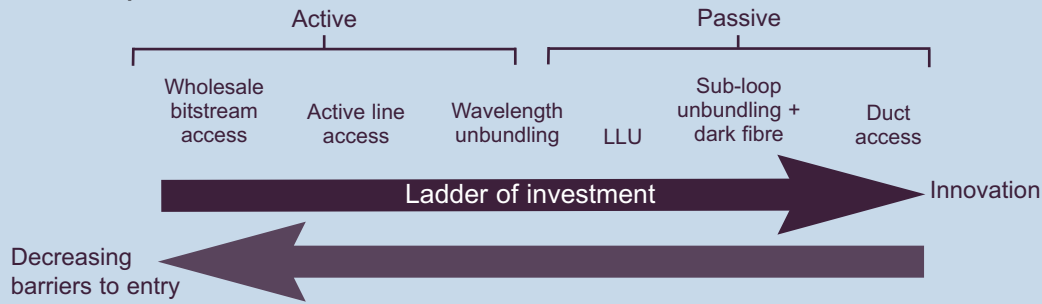
Addressing each of these points in turn, there are clearly limitations to the requirement for duct access in those countries where the incumbent operators do not utilise

Issues in NGA investment by entrants

Regulators wishing to promote competition in the provision of retail services have a variety of potentially complementary tools at their disposal. At a very high level, these tools typically have an inverse relationship between the cost of deployment and the control they allow entrants over the technical differentiation of their services, which in turn influences the ability of entrants to innovate in their provision. This relationship is often used to

classify access options, such that so-called ‘active’ remedies tend to exhibit lower entry costs but also offer lower levels of differentiation than ‘passive’ remedies, where entrants will tend to own (and thereby control) a higher proportion of the infrastructure that they are utilising. Figure 1 illustrates a range of access remedies, which are available on NGAs, old-generation access (OGA) networks, or both.

Figure 1 Active and passive remedies



Source: Ofcom (2007), ‘Future Broadband: Policy Approach to Next Generation Access’, consultation, September.

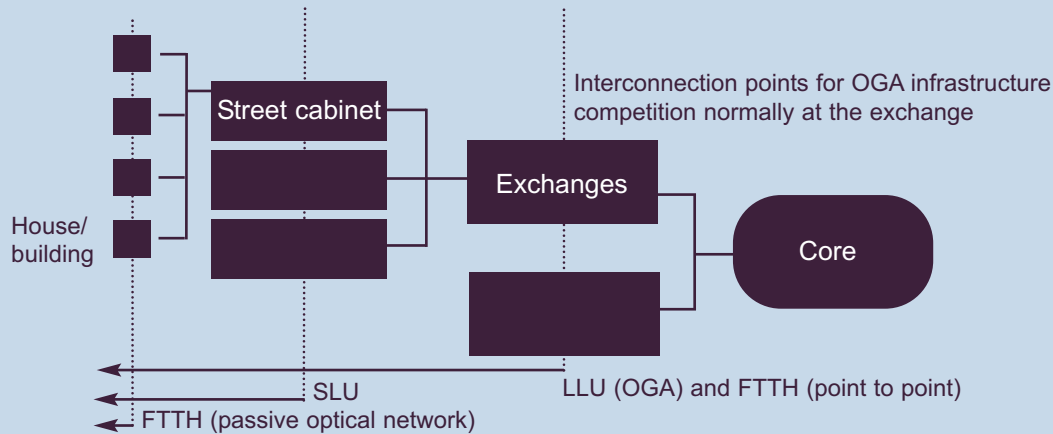
On OGA networks, potential competitors could, in very general terms, utilise the incumbent’s access network using bitstream or other similar wholesale products, or unbundle the local loop, involving renting space in the incumbent’s exchanges and installing third-party equipment. By altering the technology in the exchange it has been possible for LLU operators to influence the quality of service offered, such as the speed to connection. While duct access is technically feasible under OGA, it is not considered here because the economics would make it unlikely that an entrant could profitably install a second copper loop.

example, the NGA deployment involves a roll-out of fibre from the exchange to the cabinet, sub-loop unbundling (SLU) is the main passive remedy available to entrants. This is roughly equivalent to current LLU on a fibre network, but is carried out at the level of the street cabinet rather than the exchange. Alternative options would be available in fibre-to-the-home (FTTH) networks, and again would be sensitive to the particular technologies, with some combination of duct access, dark fibre or bitstream used to connect the unbundled cabinet to the entrant’s core network.

Entrants wishing to engage in NGA-based competition would have to utilise different technology than that of OGA networks, and the specifics of that technology and the feasible points of interconnection are sensitive to the network topology implemented by the incumbent. If, for

Many of these points of interconnection will be closer to the house/building than under OGA, contributing to a general increase in the cost of deployment for entrants. Consequently, the scope for entrants to deploy their own access infrastructure may be more limited in NGA than in OGA, increasing the importance of active remedies.

Figure 2 The impact of NGA on potential points of interconnection



Source: Oxera.

ducts. In the case of Belgium and the Netherlands, for example, the incumbent operators have typically buried the copper cables directly in the ground rather than utilise ducts, rendering access to legacy ducts an impractical regulatory tool.⁶

In those countries and areas where duct access is feasible, a first challenge for effective implementation lies in the definition of a relevant market. The principal tasks in this regard include determining the appropriate definition of a duct (66% of France Telecom's lines utilise aerial posts rather than ducts, for example⁷), and determining the degree of substitution that is possible with other utility infrastructure (eg, electricity posts and underground cables, sewerage, gas, urban heating and public lighting network).

In its market analysis, ARCEP, the French regulator, concluded that sewerage and other utility infrastructure was unlikely to provide an alternative for telecoms infrastructure.⁸ In its view, only public municipalities' ducts,⁹ other operators' passive fibre infrastructure, and the copper local loop (including its civil works) could be considered substitutes for France Telecom's engineering infrastructure.

These issues are not necessarily insurmountable, but they do indicate that there may be some practical difficulties with the determination of the particular relevant economic market and a subsequent assessment of market power.

In addition, regulators that consider mandating duct access are likely to face significant challenges in designing a regime to address non-price discrimination. Such a regime would need to address potential information asymmetries regarding the existence and availability of ducts and the provision of access to the ducts, including the allocation of space where demand exceeds supply. As the discussion below highlights, it would also normally need to ensure that the price of access is both non-discriminatory and, where necessary, provides the operator(s) with efficient price signals for the construction of new ducts.

- **Information on duct availability.** Transparency and availability of information are likely to play a fundamental role in allowing entrants to make informed decisions about where to roll out their telecoms equipment. The French and Portuguese approaches allow access to information in quite different ways. While French operators must, at their own expense, run a survey on France Telecom's infrastructure, operators in Portugal can access an online database developed by Portugal Telecom at cost-oriented prices.¹⁰

A potential disadvantage of the French approach is that it may act as a barrier to entry by limiting the ability of entrants to benefit from economies of scale and scope when accessing information about the ducts.¹¹ The Portuguese approach mitigates this issue, but creates the risk that control of this information could afford incumbent operators a strategic advantage. One possible regulatory response to this concern is for regulators to undertake parallel surveys of ducts in order to confirm that the information contained in the database is accurate.

- **Non-discriminatory access to ducts.** As in the case of LLU, the granting of access to ducts may provide incumbent operators with significant scope for non-price discrimination, which could raise additional regulatory challenges. This may be particularly the case where there is limited duct space available, as regulators may have to devise a mechanism to allocate it between competing parties (both between incumbents and entrants, as well as, potentially, between competing entrants).

ICP-ANACOM, the Portuguese regulator, has addressed issues of this sort by introducing service-level agreements and a compensation mechanism;¹² however, whatever the merits of ICP-ANACOM's approach, these issues are likely to remain of significant regulatory interest.

Finally, NGA architecture may be rolled out across a combination of old and new ducts, which will need to be accounted for in the access pricing mechanism. Indeed, the European Commission's draft guidelines on NGA regulation considered the issue sufficiently significant to justify a differential pricing regime for old and new ducts.¹³ It is beyond the scope of this article to consider the Commission's proposition in detail, but it should be noted that groups such as the ERG have argued that pricing of ducts can be adequately addressed through the standard long-run incremental cost framework, without any such differentiation.

The economic case for duct access

Assuming that the challenges outlined above can be overcome, what scope do alternative providers have to utilise the duct access regulatory remedy?

A study commissioned by ARCEP indicated that 79% of households in Claremont-Ferrand, a French town with 67,000 inhabitants, could be covered by an entrant utilising existing ducts, compared with only 13% of households if the ducts had to be constructed.¹⁴

However, while this study indicates the significant cost savings that duct-sharing may engender, it focuses only

on one town, and therefore appears to provide relatively limited insight into the probability of widespread adoption of a duct access remedy.

Indeed, wider-ranging studies indicate significant regulatory challenges for entrants wishing to deploy NGA infrastructure generally, or utilise ducts in particular. For example, a study commissioned by the European Competitive Telecommunications Association concludes that 'the current degree of LLU based competition does not seem to be replicable [in a VDSL NGA environment],' and that 'there is only relatively low replicability of FTTH infrastructure'.¹⁵

Similarly, research conducted for OPTA, the Dutch regulator, concludes that SLU (see box) does not represent a viable alternative to LLU, except under certain conditions such as a high market share and a large incremental revenue. The limited viability of SLU indicates that the scope for entrants to utilise duct access must also be limited and, in this regard, the report notes that:¹⁶

unless very substantial revenue streams can be generated from services other than SLU backhaul, then it will not be possible for a third party to provide such backhaul at prices at the same level as, or below, the current offer from KPN.¹⁷

Any estimates made at such an early stage of the development of NGA technology and business cases are likely to be subject to a considerable degree of uncertainty. However, taken together, the studies point to a significant limitation on the ability of entrants to invest in alternative NGA infrastructure outside of particular locations and circumstances. By implication, their scope to utilise duct access will also be limited and so additional remedies are likely to be required for the delivery of a significant degree of NGA competition.

These alternatives include examining ways of reducing the cost of the infrastructure investment, possibly through the provision of government finance towards investments, or even direct government investment in infrastructure that could be leased back to private parties. However, any such public intervention would have to be consistent with EU state aid rules and competition law. Furthermore, the effect of this intervention would be to generate investments that would not normally be provided through the market mechanism. Therefore, the investment would need to be carefully targeted to ensure that it delivered competitive and/or societal benefits that offset any consequent loss of efficiency.

The most obvious alternatives to direct government intervention relate to active remedies, which are

lower-cost but may also limit the opportunities of entrants to innovate and differentiate themselves from their competitors.

However, while there is evidence that differentiation and innovation may be difficult to achieve with active remedies on OGA networks,¹⁸ there are indications that this may not hold in the future due to evolving technology facilitating a new generation of active products that allow entrants a greater degree of control over the underlying infrastructure. For example, Ofcom's recent consultation on NGA provision included a proposal for the introduction of Ethernet active line access (ALA), which is designed to allow greater scope for innovation than traditional services.¹⁹

Conclusions

Governments across the world consider NGA as playing an important role in promoting economic growth and competitiveness. However, securing the necessary investment gives rise to many challenges, from providing the incumbent firm with efficient signals to commit to NGA, through to the provision of an appropriate access regime to ensure the ongoing success of competition between providers.

While the European Commission recognises the need for a range of regulatory remedies, its preferred option appears to be the provision of duct access as a facilitator for investment. In principle, this is reasonable given that an estimated 68% of FTTH deployment relates to the construction of ducts, and that competition based on duct access is much closer to the infrastructure-based competition that the Electronic Communications Framework is designed to promote.²⁰

Furthermore, the experience of France and Portugal demonstrates that duct access can be utilised by entrants seeking to roll out their own infrastructure. Where this occurs, consumers may expect some combination of lower prices and innovative, higher-quality services.

However, duct access can lead to significant regulatory challenges and, even where these can be overcome, it is far from clear that entrants will be able to profitably utilise these ducts outside of a narrow range of locations and circumstances.

As such, duct access is not a regulatory panacea. To ensure that competition develops across as broad an area as possible, it is important that high-quality, flexible active products (such as ALA) are developed that provide competitors with the ability to differentiate their products by, for example, varying the quality of service they offer their customers. This will be required regardless of whether duct access is feasible across some parts of incumbents' networks.

- ¹ See Department for Culture, Media and Sport and Department for Business, Enterprise and Regulatory Reform (2008), 'The Digital Britain Report Steering Board: A Joint DCMS/BERR Press Release', 118/08, November 7th.
- ² European Commission (2008), 'Draft Commission Recommendation of [...] on Regulated Access to Next Generation Access Networks (NGA)', September.
- ³ See Ofcom (2008), 'Regulatory Alternatives to Fibre Loop Unbundling', June 17th.
- ⁴ *Ibid.*, slide 10.
- ⁵ European Regulators Group (2008), 'IRG/ERG Response to the Draft Recommendation on the Regulated Access to Next Generation Access Networks', ERG (08) 38 rev2, p. 3.
- ⁶ *Ibid.*
- ⁷ ARCEP (2007), 'Étude portant sur les modalités de déploiement d'une boucle locale fibre optique', June, report prepared by Avisem, June, p. 21.
- ⁸ ARCEP (2007), 'Étude portant sur les modalités de déploiement d'une boucle locale fibre optique', June, report prepared by Avisem, June.
- ⁹ Public municipalities' ducts refer to telecommunications civil engineering works owned by local public agencies.
- ¹⁰ See ICP-ANACOM (2008), 'Decision of ICP-ANACOM on the Price of Access to the Database on the Conduits of PT Comunicações', August; and France Telecom (2008), 'Offre d'accès aux installations de génie civil de France Télécom pour les reseaux FTTx', September 15th.
- ¹¹ These economies may arise both from differing entrants wishing to survey the same sets of ducts, and other interested parties wishing to establish the location of particular ducts (municipalities, for example).
- ¹² ICP-ANACOM (2008), 'Sentido provável da deliberação relativa à publicitação dos níveis de desempenho na qualidade de serviço das ofertas grossistas', October.
- ¹³ European Commission (2008), *op. cit.*, Annex I.
- ¹⁴ European Regulators Group (2007), 'Supplementary Document to the ERG Opinion on Regulatory Principles of NGA', 16rev2b, p. 52.
- ¹⁵ WIK-Consult (2008), 'The Economics of Next Generation Access: Final Report', study for the European Competitive Telecommunication Association, September 10th, p. XIX.
- ¹⁶ Duct access may be used both as a backhaul option for firms that unbundle the sub-loop, and for firms to run fibre all the way to the building or the home.
- ¹⁷ Analysys (2007), 'The Business Case for Sub-loop Unbundling in the Netherlands', January, p. 34.
- ¹⁸ Note that this point is distinct from the role that active remedies may play in allowing entrants to grow their market share such that they are able to utilise passive remedies.
- ¹⁹ Ofcom (2008), 'Ethernet Active Line Access: Technical Requirements', September 23rd.
- ²⁰ European Regulators Group (2007), 'Supplementary Document to the ERG Opinion on Regulatory Principles of NGA', 16rev2b, p. 55.

If you have any questions regarding the issues raised in this article, please contact the editor, Derek Holt: tel +44 (0) 1865 253 000 or email d_holt@oxera.com

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