8

ACCESS AND INTERCONNECTION

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8.1 INTRODUCTION

For the purposes of this chapter, and under the European Union's Access Directive,[2] the term 'access' encompasses all kinds of contractual (private law) arrangements under which an operator or service provider acquires services from another operator in order to enable it to deliver services to its own customers. The issues discussed in this chapter relate to the regulated (public law) rights of operators to access each others' networks and services at a wholesale level, not the rights of end users to access telecommunications services, at a retail level.

The primary rationale in mandating different kinds of access in a liberalizing market is to reduce barriers to market entry, so a new operator will not have to replicate every network element that the incumbent has before being able to offer a competing end-to-end service. Once liberalized, however, there will generally

[1] This chapter was originally written for the 2nd edition by Emma McCormack.

[2] Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities, OJ L 108/7, 24 April 2002 (the 'Access Directive'). The definition of 'access' is in Art 2(a).

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continue to be a need to mandate access from those market players that control facilities and services that a competitor cannot feasibly, economically or technically, duplicate. In a networked industry like telecommunications, competitors are usually also your customers; creating so-called 'frienemies'. Access rights are also a means of reducing the environmental impact of competition by, for example, reducing the need for road works or the installation of masts. Access rights which are commonly regulated include network access (eg access to the 'local loop'[3]), the provision of wholesale products for resale (eg access to wholesale DSL products), and access to services and infrastructure necessary for the provision of a service (eg access to co-location or number translation services). Broadly speaking, access services can be distinguished into 'active' and 'passive' elements; the former including any access to the operator's transmission network and associated operational systems, while the latter would include access to ducts and poles.

'Interconnection' is a type of access right.[4] At its most basic level, interconnection involves the physical means of linking two different networks for the exchange of traffic, so that users on one network may communicate with users on the other. Typically, interconnection arrangements provide for two networks to be joined together at a 'point of interconnection' and require each operator to carry messages received from the other operator at the point of interconnection across their network and to either 'terminate' them with the relevant user or pass the messages onto another network operator.

There are obvious incentives for operators to enter into interconnection arrangements with operators in other territories. Incumbent operators will have had interconnection arrangements with incumbent operators in other countries, in order that its users could make and receive calls from users in the other country.[5] Interconnection means the ability to extend an operator's reach and provide a wider range of (sometimes high-cost and very profitable) services to users.

There is, however, little commercial incentive for an incumbent operator to interconnect with an operator who wants to compete in the same geographic market. Incumbent operators with a large number of customers may well determine, in the absence of appropriate regulation, that they bear little commercial risk if their users cannot contact the (initially very small number of) users on a new competitor's network. The new entrant, however, cannot survive without

[3] The 'local loop' is sometimes referred to as the 'local access network' and refers to the part of a telecommunications network that connects end-users premises with the nearest telecommunications exchange.

[4] Access Directive. The definition of 'interconnection' is in Art 2(b).

[5] International interconnection arrangements are examined further in Chapter 16, at Section 16.3.5.

interconnection with the incumbent. Its network will be virtually useless to users unless they can contact users on the incumbent's network. An incumbent operator's refusal to interconnect, or the imposition of unfairly onerous terms in relation to interconnection, could therefore allow market entry to be obstructed, or even prevented altogether.

It is for this reason that interconnection has become a key regulatory issue and is recognized as being essential for creating and maintaining effective competition and any-to-any connectivity. Most jurisdictions recognize that interconnection is so vital to the development of competition that specific *ex ante* regulatory controls over access and interconnection are necessary and proportionate. New Zealand tried relying exclusively on *ex post* competition law, but the courts proved unable to resolve key issues of dispute concerning interconnection arrangements.[6]

As electronic communications markets have matured, and as communications services have grown in sophistication, demand for other types of access has escalated. Some of these demands were initially dealt with by regulators in the EU under existing interconnection regulation, whereas in other cases access obligations were developed and imposed outside of the interconnection regime. The Access Directive consolidated many of these obligations and gave national regulatory authorities (NRAs) enhanced powers to mandate access.

Access issues present regulators with significant challenges. If new entrants are given insufficient rights to acquire interconnection and access from incumbents, effectively competitive markets are unlikely to develop. Markets that are not effectively competitive are less likely to yield lower prices and high levels of innovation. However, over-regulation can act as a strong disincentive to investment and innovation if incumbents fear that they will be made to give their competitors access to their network without those competitors bearing any of the investment risk or cost involved. Getting this balance right is particularly relevant at the current time, as governments seek to facilitate economic development through the roll-out of Next Generation Networks (NGNs).

This chapter will review the regulatory regime impacting on access and interconnection, and discuss some of the contractual issues that arise when negotiating some different types of access agreements.[7]

[6] See *Telecom Corporation of NZ Ltd v Clear Communications Ltd* (1992) 4 NZBLC. Such issues are now subject to an *ex ante* access regime under the Telecommunications Act 2001, implemented by the Commerce Commission of New Zealand.

[7] See also Chapter 11.

8.2 BASIC CONCEPTS AND TERMINOLOGY

An understanding of some of the terminology used to describe access and interconnection arrangements greatly assists an understanding of the regulatory regime. This section will explain some of the key concepts.

8.2.1 Packet-switched and circuit-switched networks

There are some key differences between the interconnection arrangements for 'circuit-switched' networks and for 'packet-switched' networks. Circuit-switched networks are networks which establish an end-to-end transmission path in order for a communication to be transmitted from one end to the other. Telephone networks have traditionally used circuit-switched technology. When a call is made, a dedicated channel is established over which the communication travels.

Packet-switched networks, by contrast, divide the data that comprises a communication into small packets. The packets are sent separately and reassembled at the destination. The internet is made up of interconnected or linked packet-switched networks. Packet-switched technologies are increasingly being used to carry voice, as well as data, and operators are using packet-switched architectures when modernizing their backbone and access network to NGNs.

8.2.2 Interconnection of circuit-switched networks—key concepts

8.2.2.1 *Call origination, call termination, and termination charges*

When a call is made between two interconnected circuit-switched networks, the operators must work out how the cost of carrying that call is to be divided between them. If the call is made within the same country, usually a wholesale charge known as a termination charge will apply. It is important to understand how this charge works.

This is most easily explained by thinking about a typical telephone call between different networks, like a call from a fixed line network (such as BT) to a mobile network (such as Vodafone). In this scenario the call is said to 'originate' on the fixed-line network where the user initiates the call by dialing the mobile telephone number. The call is carried over the fixed network to a point of interconnection with the mobile network. The mobile network operator will carry the call over their network from the point of interconnection to the relevant mobile user. When the call is connected, it is said to 'terminate' on the mobile network. The concepts of origination and termination are relevant to the charges that flow between the fixed network operator and the mobile network operator.

Telecommunications operators obviously charge us to make calls on their networks. Generally, the user who initiates a call will pay for that call. This is known as the 'calling party pays' (CPP) principle, and is the charging model most widely used by operators at a retail level, which is then reflected in the charging arrangements for interconnection. The terminating operator, in our example Vodafone, would charge the originating operator, BT, for the termination of the call onto the mobile network; known as a 'termination charge'. The termination charge will usually be a charge per minute (although there are variations), and may vary depending on the time of day, ie congestion pricing. The level at which termination charges are set can be a controversial issue, and is addressed by regulators in a number of ways, as will be discussed later in this chapter.[8] The two main alternatives to CPP are a 'receiving party pays' (RPP) regime, as operated in the US mobile sector and in the UK for Premium Rate Services,[9] and a 'Bill and Keep' (BaK) arrangement, as commonly adopted for internet interconnection (see later discussion).

8.2.2.2 *Transit*

The basic scenario described above, where the two networks are directly interconnected, could be varied in a number of ways. For example, it may not be efficient for a small fixed-line operator to establish direct interconnection with every other operator. Instead, a small operator may rely on a third operator, often a large incumbent operator, to transit traffic across that other operator's network to the terminating operator's network. Provided that both the originating operator and the terminating operator are interconnected with that third party and the third party has agreed to transit calls across its network, the calls will be connected even though the parties have not established direct interconnection arrangements. Much more complex arrangements have evolved. In the case of international calls or the exchange of internet traffic (discussed further in Section 8.2.3), messages or data may pass through many telecommunications networks.

8.2.3 Interconnection of packet-switched networks—key concepts

The interconnection of packet-switched networks is often referred to as 'IP interconnection', which describes the connection of networks that support packet-based communications controlled by a particular suite of software protocols known as transmission control protocol/internet protocol (TCP/IP). The TCP/IP protocols define how packets of data are addressed, transmitted, tracked, and reassembled by the receiving computers. TCP/IP is used by all computer networks

[8] See also Chapter 2, at Section 2.13 and Chapter 16 at Section 16.3.5.

[9] See further Chapter 15.

which constitute the internet. IP interconnection arrangements, therefore, are in place largely for the purpose of exchanging internet traffic between networks.

To understand how the contractual arrangements governing IP interconnection work, it is necessary to understand, at a basic level, the structure of the internet carriage industry and the typical payment arrangements that operators adopt. At a retail level, customers seeking access to the internet will enter into a contract with an internet service provider (ISP), like Plusnet or TalkTalk. A diverse range of retail pricing models have been adopted by ISPs for internet access services, including volume and/or time-based charges, flat-rate charges for unlimited access, and combinations of these models. Many ISPs also often offer web-hosting services to their users, allowing them to put content onto the internet. In other cases internet content is hosted by specialist networks who do not themselves provide internet access, for example eBay and Facebook.

In order that the users of an ISP can communicate with users on other networks, and access content (such as websites) hosted on other networks, ISPs must enter into IP interconnection arrangements with other IP networks. Sometimes direct interconnection is established, especially between networks which are close to each other geographically. However, it would obviously be both inefficient and virtually impossible from a practical point of view for every ISP to enter into direct IP interconnection arrangements with every other ISP and content provider around the world.

IP interconnection arrangements have evolved to overcome this problem. The primary way of avoiding the need to directly interconnect is by entering into transit arrangements, similar in principle to transit arrangements for voice telephony. Large, high-speed networks have developed which aggregate and transit traffic between numerous smaller networks, such as small retail ISPs. The operators of these networks are sometimes referred to as 'internet access providers' or 'transit providers'. There is no strict definition of an internet access provider, but it is generally an operator who can transit traffic to and from any other network on the internet, through its own upstream transit agreements. The largest of these networks are often called 'backbone providers', or 'Tier 1 operators'. There are no strict criteria for defining a backbone provider, but they are usually the predominant IP infrastructure operator in a region, or one of a limited number of operators providing direct international internet connectivity.[10]

The structure described above may give the impression of a neat series of tiered steps, with retail ISPs at the bottom, internet access providers in the middle, and backbone operators, with international links, at the top. However, this would be an

[10] See European Commission decision in Case IV/M.1069 *WorldCom and MCI*, OJ L 116/1, 4 May 1999.

over-simplification. The prevalence of vertically integrated operators means that a large network may be both a retail ISP and a backbone provider. Furthermore, over-supply of international capacity, resulting in cheaper prices, has allowed some networks that would otherwise be described as ISPs or internet access providers to bypass backbone providers and obtain international connectivity directly. Nevertheless, the analysis is helpful in understanding the structure of the industry and the reasons behind the different methods of charging.

8.2.3.1 *Peering and paying transit*

There are two main types of payment arrangements adopted in IP interconnection agreements, which will be referred to in this chapter as 'peering' and 'paying transit'. The term 'peering' has often been used as a generic term to describe the interconnection of any two computer networks. However, the term is now generally understood to describe settlement-free IP interconnection arrangements; that is, arrangements where the interconnecting operators agree not to charge each other.[11] Peering arrangements are commonly adopted between networks where the traffic flowing in each direction can be expected to be roughly symmetrical.[12]

Where the parties enter into 'paying transit' IP interconnection arrangements, by contrast, charges will be levied for traffic passing through the point of interconnection. Paying transit arrangements are generally entered into where the traffic flow is asymmetrical between the two networks. Transit providers may charge for traffic flowing in one or both directions over the point of interconnection.

Whether parties enter into peering arrangements or paying transit arrangements will largely depend on their respective bargaining positions, based on factors such as size of subscriber base ('eyeballs') or content hosted. These issues, and some of the other considerations that arise in negotiating IP interconnection agreements, are considered at Section 8.7.

8.2.4 Other access arrangements

As noted in the introduction, the term 'access' encompasses a broad range of arrangements, of which interconnection is only one kind. These range from very intrusive arrangements involving physical access to another operator's facilities or network, to the mere provision of wholesale services. Many different kinds of arrangements lie in between these ends of the spectrum.

[11] They may also be referred to as 'Bill and Keep' arrangements.

[12] The peering agreement will sometimes indicate a ratio (eg 1:4) within which the relative volume of traffic flows between the networks may vary, but if they fall outside it can trigger an option to levy charges or renegotiate the agreement.

One of the most intrusive examples of network access lies in local loop access. The 'local loop' is defined in the following terms:

> the physical circuit connecting the network termination point to a distribution frame or equivalent facility in the fixed public electronic communications network.[13]

This 'last mile' of an incumbent's fixed network has generally been the last component of its network to be upgraded to enable high bandwidth transmission capacity. Where replacement with optical fibre has not occurred, it has been possible, through digital subscriber line (DSL)[14] technologies, to upgrade the traditional copper-based local loop to provide high speed, 'broadband' internet access services to users. By obtaining access to the local loop, operators obtain the right to locate equipment at a telephony operator's local exchange and to physically connect that equipment to end-users' local lines, in order to provide DSL-enabled broadband internet services to customers. Where access to the whole line is obtained, the broadband operator controls the provision of telephony services to the customer as well. Alternatively, 'shared access' is where the original operator continues to provide voice telephony services, with the alternative operator providing broadband services to the user.

Access arrangements may relate to facilities as well as network elements. An example of access to non-network facilities is the arrangement between the mobile operators O2 and T-Mobile to share mobile telephony masts and sites in Germany and the UK, as well as to provide reciprocal roaming services to each others' customers. These facility-sharing arrangements were achieved through commercial negotiations, and were subsequently cleared by the European Commission.[15]

The majority of access arrangements are not as intrusive as the ones described above, and are more like straightforward interconnection arrangements. An example is the provision of carrier pre-selection, which allow users who are customers of one network to select an alternative operator in advance for particular calls (eg all national calls) without dialling additional digits on their telephone. Unlike local loop access, carrier pre-selection only involves the interconnection of the two

[13] Access Directive, Art 2(e).

[14] There are many variants of DSL technology. The variant most commonly used for upgrading the local loop has been asymmetrical digital subscriber line (ADSL) technology. ADSL provides fast download speeds, but comparatively slower speeds for uploading data. To obtain higher speeds over copper, other protocols are deployed, such as VDSL or G.fast.

[15] See *O2 UK Limited/T-Mobile UK Limited (UK network sharing agreement)* (2003) OJ L 200/59, 7 August 2003 and *T-Mobile Deutschland GmbH/Viag Interkom GmbH (Germany network sharing agreement)* (2003) OJ L 75/32, 12 March 2004.

networks; it does not involve the alternative carrier taking physical control of the incumbent's network infrastructure.[16]

Some access arrangements are even less intrusive than the ones described above. For example, the provision of wholesale line rental requires the operator who owns a local access line to provide that line on a wholesale basis to another operator. This product is particularly useful for operators who have obtained carrier pre-selection, as it allows them to bill their customers for both calls and for line rental. In this case, the incumbent operator will continue to service the customer's line, although the customer's contract will be with the other operator.

8.3 ACCESS AND INTERCONNECTION REGULATION

8.3.1 Introduction

The interests of new entrants in the telecommunications sector may be said to be protected by two distinct tiers of regulation in the EU. Firstly, general competition law prohibits certain anti-competitive agreements and the abuse of a dominant position.[17] Secondly, sector-specific *ex ante* measures under the Access Directive. Operators are required to comply with both competition law and the sector-specific rules.

Most legislators and regulators recognize that general competition law rules are inadequate for fostering the emergence of competition in telecommunications markets. This is because the telecommunications sector may be said to have special characteristics which justify a more interventionist approach than is involved where general competition law is applied. These characteristics include the prevalence of previously state-owned and state-funded operators who have historically enjoyed a legal monopoly. These operators have often maintained very high market shares, even many years after the introduction of competition. Secondly, operators who wish to enter the market by building competing infrastructure face very high barriers to market entry; it may not be possible economically, for example, to build out an entire competing communications network. Thirdly, the fact that cooperation among competitors, in the form of access and interconnection arrangements, is essential for the successful operation of competitive communications markets. In this sector, your competitor is also your customer.

[16] Carrier pre-selection was required of all SMP operators under the Universal Services Directive, Article 19, but this was deleted by the 2009 Reforms and under the Access Directive, NRAs may now require an SMP operator to give access to any network elements or facilities that allow carrier selection or pre-selection (Art 12(1)(a)).

[17] See further Chapter 10.

The aim of sector-specific legislation is to foster competition. Therefore, as competition emerges, the arguments in favour of maintaining sector-specific rules lose their force. In the EU the sector-specific rules have already become more aligned with general competition law over time. It is mostly accepted, however, that sector specific rules in the telecommunications sector are unlikely ever to disappear altogether due to certain innate features of the telecommunications market.

8.3.2 Regulation in the UK prior to the adoption of the Interconnection Directive[18]

Until the implementation of the Interconnection Directive in the Member States, there was no harmonized access and interconnection policy in the EU, and each Member State took a different approach. Because demand for interconnection at a local level only arises when competition is first introduced in a jurisdiction, the sector-specific legislation has developed largely in parallel with the history of liberalization of telecommunications markets.

When Mercury Communications became licensed in the UK to provide fixed line telephony in competition with BT in 1981, BT was not required to interconnect with it and in some instances refused to do so, arguing that Mercury customers should install an additional line (with an additional telephone) for making and receiving calls from other Mercury customers. Only with the commencement of the Telecommunications Act 1984 was the Director-General of Telecommunications (DGT)[19] empowered to mandate interconnection.[20] The first determination setting terms and conditions on which BT and Mercury were required to interconnect was made in October 1985.[21] This included a determination as to the charges which BT could levy, which were calculated on the basis of fully allocated costs, including a return on the capital invested.

A number of further Mercury/BT determinations were made in the following years, as well as determinations in 1991 for the interconnection arrangements between Mercury and Vodafone and between Mercury and BT Cellnet (the two mobile network operators at the time).

[18] Directive 97/33/EC of the European Parliament and of the Council on interconnection in telecommunications with regard to ensuring universal service and interoperability through the application of the principles of open network provision (ONP), OJ L 199/32, 26 July 1997 (the 'Interconnection Directive').

[19] The functions of the Director General of Telecommunications (DGT) now rest with Ofcom.

[20] Telecommunications Act 1984, s 7(5), (6).

[21] See Beesley, ME, and Laidlaw, B, 'The British Telecom/Mercury interconnect determination: an exposition and commentary', in Beesley, ME, *Privatisation, Regulation and Deregulation* (2nd edn.) (Routledge, 1997) pp 299–327.

Further demands for interconnection arose when the first post-duopoly PTO licences were issued in 1993, and when the first international facilities licences were issued in 1996.[22] The new licensees were required to show that they had relevant connectable system (RCS) status in order to be entitled to interconnection. In practice, RCS status was defined in such a way that most PTO licensees were entitled to interconnection.

In 1994, Oftel commenced a major review of interconnection pricing. The review was needed to take account of the growing level in sophistication of the interconnection products needed and a growing requirement on the part of operators to purchase disaggregated interconnection services. In 1996/97 Oftel required that BT's interconnection charges be based on the forward-looking incremental cost of replacing capital assets, rather than the historic cost of what the assets cost when originally purchased.[23] This type of cost modelling in respect of interconnection pricing was finally adopted in a Commission Recommendation in 1998.[24]

8.3.3 The Interconnection Directive

The Interconnection Directive brought about significant harmonization of interconnection policy in the EU. It introduced two different tiers of interconnection rights and obligations.

First, operators authorized to provide the public telecommunications networks and services set out in Annex I of the Interconnection Directive, or who enjoyed significant market power (SMP), were required to meet all reasonable requests for access to their networks (Article 4(2)). Three categories of networks/services were listed in Annex I: fixed telephone networks; mobile telephone networks; and leased line services. Member States were required to ensure the adequate and efficient interconnection of these networks to the extent necessary to ensure interoperability of these services for all users within the EC (Article 3(3)).

A rebuttable presumption of SMP arose where an operator had a 25 per cent market share. An operator with less than 25 per cent market share could be found to have SMP where the operator's ability to influence market conditions, its turnover relative to the size of the market, its control of the means of access to end-users, its access to financial resource, and its experience in providing products and services in the market were taken into account (Article 4(3)).

[22] See further Chapter 3.

[23] For further discussion on the costing of interconnection, see Chapter 2.

[24] Commission Recommendation 98/195/EC 'on Interconnection in a liberalized telecommunications market', OJ L 73/42, 12 March 1998.

SMP operators were also subject to a range of other obligations under the Interconnection Directive.[25] These included adherence to the principle of non-discrimination, and a requirement to make interconnection agreements available to the national regulatory authority and to interested parties. SMP operators providing fixed-line networks and leased lines (but not SMP operators providing mobile networks) were also required to set transparent and cost-orientated interconnection charges, and to publish a reference interconnection offer.

The second tier of regulation under the Interconnection Directive required all operators authorized to provide the public telecommunications networks and services set out in Annex II of the Directive to negotiate interconnection with each other on request (Article 4(1)). The categories in Annex II were:

(i) organizations which provided fixed and/or mobile public switched telecommunications networks and/or publicly available telecommunications services, and controlled the means of access to termination points identified by numbers in the national numbering plan;
(ii) organizations which provided leased lines into users' premises;
(iii) organizations which were authorized in a Member State to provide international telecommunications circuits between the Community and third countries, for which purpose they had special or exclusive rights; and
(iv) organizations which provided telecommunications services which were permitted to interconnect in accordance with relevant national licensing or authorization schemes.

Where commercial negotiations failed to bring about interconnection, NRAs had a range of powers to intervene to settle disputes, to require specified conditions to be observed, to specify issues to be covered in interconnection agreements, and to set time limits for the conclusion of negotiations.

8.3.4 UK implementation of the Interconnection Directive and the imposition of other access rights

The Interconnection Directive was implemented in the UK through the Telecommunications (Interconnection) Regulations 1997, SI 1997/2931 (Interconnection Regulations), and through amendments to operators' telecommunications licences (both individual licences and class licences) in accordance with the

[25] Such obligations may be found in Arts 6, 7, and 8 of the Interconnection Directive.

Licensing Directive.[26] The Regulations and licence conditions largely replicated the provisions in the Interconnection Directive. This section will examine only some specific, important aspects of the UK implementation.

8.3.4.1 *Determinations of SMP and requests for access*

Oftel determined that Kingston Communications (in respect of the Hull area) and BT (for the remainder of the UK) had SMP in the provision of fixed networks and services and leased lines, and that Cellnet and Vodafone had SMP in the market for mobile networks and services. These operators were therefore required to meet all reasonable requests for access to their network from Annex II operators. BT and Kingston Communications were also required to publish a reference interconnection offer and to provide access services at cost-orientated prices.

A range of interconnection products were requested by Annex II operators, particularly of BT. Some examples that have proved particularly important for competing operators include the following:

1. FRIACO interconnection—FRIACO stands for fixed-rate internet access call origination. In simple terms, FRIACO was a service whereby ISPs are charged a flat rate for calls from BT customers to telephone numbers which were dialled by users' modems to access the internet. When first requested by MCI in 1999, BT refused to provide such a service so the dispute was raised with the DGT. The DGT directed BT to provide a FRIACO product at its digital local exchanges.[27] Further directions relating to FRIACO required BT to provide FRIACO interconnection at other levels in its network.[28]
2. ATM interconnection—ATM interconnection refers to interconnection with BT's 'asynchronous transfer mode' network. Before BT provided ATM interconnection, operators wishing to purchase wholesale DSL products from BT were required to purchase an end-to-end service, consisting of DSL access, conveyance across BT's core network, and the connection between BT's network and their own network. ATM interconnection allows competing operators to use their own network for the conveyance of their customers' traffic wherever possible. This could allow operators to provide wholesale DSL products to other operators in competition with BT. BT was directed to

[26] Directive 97/13/EC on a common framework for general authorizations and individual licences in the field of telecommunications services; OJ L 117/15, 7 May 1997 (the Licensing Directive).

[27] DGT, *Determination of a dispute between BT and MCI Worldcom concerning the provision of a Flat Rate Internet Access Call Origination product* (2000).

[28] Such as at its tandem exchanges. See DGT, *Determination relating to a dispute between British Telecommunications and Worldcom concerning the provision of a Flat Rate Internet Access Call Origination product (FRIACO)* (2001).

provide ATM interconnection on a retail minus basis[29] in June 2002 following a dispute with Energis and Thus.[30]

3. PPCs—PPCs are 'partial private circuits'. In effect, PPCs are circuits providing capacity between an end-user's premises and a point of interconnection between two operators' networks. PPCs allow competing operators to provide leased line services to end-users even if the competing operator's network does not reach the end-user's premises. BT was directed to provide PPC interconnection products in a series of decisions over 2001 and 2002.[31]

Another direction made by the DGT under the Interconnection Regulations concerned what are known as radio base station (RBS) backhaul circuits. RBSs are the base stations that transmit signals to and from mobile handsets. RBS backhaul circuits are functionally identical to PPCs, but they are used to link RBSs with the main part of a mobile operator's network. A dispute arose between BT and Vodafone as to the provision of RBS backhaul circuits. In June 2003 the DGT, using its powers under the Interconnection Directive and the Interconnection Regulations, directed BT to provide RBS backhaul circuits to Vodafone on terms similar to those applying to PPCs.[32]

BT challenged the DGT's right to investigate the dispute on the basis that RBS backhaul circuits do not fall within the definition of 'interconnection' under the Interconnection Directive and the Interconnection Regulations. In May 2004, the Competition Appeals Tribunal (CAT) handed down a decision holding that RBS backhaul circuits are not interconnection products, and, accordingly, the DGT had no jurisdiction over the Vodafone/BT dispute.[33]

The principal reason for the Tribunal's decision was that RBS backhaul circuits are, in effect, used by Vodafone to construct its own network: they link a Vodafone RBS with the main part of Vodafone's network. RBS backhaul circuits do not

[29] Retail minus pricing does not involve setting an absolute level of charge; it allows the operator to set the level of charges according to its commercial judgment. However, the operator is required to ensure that a sufficient margin exists between the charge in question and the relevant downstream price so as to allow the necessary additional costs of providing the downstream product to be recovered. Setting prices on a retail minus basis should ensure that no discrimination takes place between the downstream arm of the operator providing the product and competing operators.

[30] DGT, *Direction to resolve a dispute between BT, Energis and Thus concerning xDSL interconnection at the ATM switch* (2002).

[31] DGT, *Direction under condition 45.2 of the public telecommunications operator licence granted to BT under Regulations 6(3) and 6(4) of the Telecommunications (Interconnection) Regulations 1997* (2001), DGT, *Phase 1 Direction to resolve a dispute concerning the provision of partial private circuits* (2002), DGT, *Partial private circuits, Phase 2—a Direction to resolve a dispute* (2002).

[32] DGT, *Direction to resolve a dispute between BT and Vodafone regarding wholesale connections between BT's and Vodafone's networks (radio base station backhaul circuits)* (2003).

[33] [2004] CAT 8. Although the DGT's determination was made before the Communications Act 2003 came into force, the appeal was made after that time, and so proceedings were brought before the CAT rather than the High Court.

ensure connectivity between Vodafone customers and BT customers, or between Vodafone customers and customers on any other network. Indeed, for such connectivity to be established, points of interconnection would be needed.

The Tribunal was required to determine the appeal on the basis of the law in force in June 2003, when the direction was made. As will be seen below, the law now permits broader access rights to be mandated. The provision of RBS backhaul circuits has since been mandated under the new regime.

8.3.4.2 *Licence conditions*

Obligations concerning interconnection, largely replicating the provisions of the Interconnection Directive and the Interconnection Regulations, were inserted into all telecommunications licences in 1999.[34] They included conditions requiring all Annex II operators to negotiate connection services, including co-location and facility sharing with each other, and for SMP operators to meet all reasonable requests for access, to not unduly discriminate, to publish a reference interconnection offer, and to charge cost-based prices for access services.

In addition, specific access conditions were at various times imposed on operators via their telecommunications licences. Some examples of these conditions are discussed.

8.3.4.3 *Wholesale line rental*

Following a review of the fixed telephony market which found that BT had market power in the provision of calls and access, BT's licence was modified in August 2002 to require it to provide line rental on a wholesale basis to other operators. This enabled operators who obtained both CPS interconnection and wholesale line rental from BT to offer their customers a single bill for calls and access, something that, previously, could only be done by those operators who owned the access line.[35]

8.3.4.4 *Access to the local loop*

In 2000, the European Council in Lisbon identified a pressing need to increase broadband internet use across the EU. The EU was lagging behind the US in terms of penetration of such services, and it was perceived that the EU may miss out on the growth and employment potential of the knowledge economy. It was also perceived that increased competition in DSL broadband services would lead to lower prices and thus stimulate demand. Member States were therefore encouraged to ensure that new entrants were entitled to access to incumbent operators' local

[34] Pursuant to the Telecommunications (Licence Modifications) (Standard Schedules) Regulations 1999, SI 1999/2450 and the Telecommunications (Licence Modification) (Mobile Public Telecommunications Operators) Regulations 1999, SI 1999/2453.

[35] Oftel, *Wholesale line rental: Oftel's conclusions—statement* (2003).

loop networks. Local loop unbundling was seen as the shot in the arm necessary for stimulating the broadband market.

The Commission adopted a Recommendation[36] in May 2000 recommending that Member States should mandate access to the local loop by the end of that year. It became clear, however, that many Member States were unlikely to meet this target. The European Parliament and Council then adopted a Regulation[37] requiring 'notified operators' to meet reasonable requests for unbundled access to their local loop and related facilities under transparent, fair, and non-discriminatory conditions, and to publish a reference offer for such access. NRAs were given powers to intervene to ensure non-discrimination, fair competition, economic efficiency, and maximum benefit for users, and to settle disputes. The Local Loop Regulation was repealed as part of the 2009 Reform.

Under the Local Loop Regulation, 'notified operators' were those designated by NRAs as having significant market power in the provision of fixed public telephone networks and services under the Interconnection Directive. This meant that BT and Kingston were 'notified operators' in the UK, and, accordingly, licence conditions were imposed on them in August 2000.

In the months after the imposition of the licence condition a large number of operators expressed interest in obtaining access to BT's local access network. These operators signed confidentiality agreements with BT and joined an operator interest group established by Oftel to facilitate progress. However, the vast majority of these operators never obtained local loop access and withdrew their interest. This can be attributed to many factors, including financial strains on the telecommunications industry at the time. Some in the industry, however, criticized the DGT and Oftel for failing to take swift and appropriate action against BT when faced with complaints by operators seeking access. To address this concern, Ofcom established a Telecommunications Adjudication Scheme in 2004, operated under the auspices of a Telecommunications Adjudicator, to facilitate competitor access to BT's local loop (which has since become operated by Openreach[38]). Over recent years, the availability and take-up of broadband internet access has boomed, mainly through resale of wholesale DSL products obtained from BT.

8.3.4.5 *Conditional access and access control services*

Conditional access services and access control services are services provided to broadcasters and interactive service providers.[39] Conditional access services

[36] Recommendation 2000/417/EC of 25 May 2000 on unbundled access to the local loop, OJ L 156/44, 29 June 2000.

[37] Regulation 2887/2000 of the European Parliament and Council of 18 December 2000 on unbundled access to the local loop, OJ L 336/4, 30 December 2000 ('Local Loop Regulation').

[38] See further <http://www.offta.org.uk>.

[39] See further Chapter 14.

enable broadcasters to make access to their television or radio signals conditional upon prior authorization. Where conditional access is applied, users need a set top box and appropriately authorized access card to receive a broadcaster's channels in intelligible form. Access control refers to a range of services provided to broadcasters so that they can run interactive applications through a viewer's set top box.

Prior to the Access Directive, conditional access services were regulated by the Advanced Television Standards Directive.[40] The requirements in that Directive were implemented in the UK through the Advanced TV Services Regulations 1996, SI 1996/3151 and through the class licence for Conditional Access Services.[41] The licence required, amongst other things, that providers of conditional access services offered them on a fair, reasonable, and non-discriminatory basis.

Access control services were regulated in the UK under the class licence for Access Control services,[42] which required, amongst other things, that 'regulated suppliers' of such services offer them on fair, reasonable, and non-discriminatory terms. Sky Subscribers Services Limited was designated as a 'regulated supplier' for access control services supplied over its digital satellite platform.[43]

8.4 EU OBLIGATIONS IN RELATION TO ACCESS AND INTERCONNECTION

During the Commission's review of regulatory policy in the communications sector in 1999,[44] the focus of discussion and debate about access and interconnection surrounded two issues. The first concerned the widening of the scope of access rights: the Commission considered that a broader scope of access obligations should be provided for. Apart from fostering competitive markets, the reasoning for the new approach included other public interest reasons, including the promotion of the Single Market and the protection of the environment. The second issue of focus involved when, and how, an operator should be determined to have SMP, thereby being subject to access and interconnection obligations.

[40] Directive 95/47/EC on the use of standards for the transmission of television signals, OJ L 281/51, 23 November 1995.

[41] The Class Licence was issued under the Telecommunications Act 1984, s 7 in January 1997 and re-issued in August 2001.

[42] August 1999.

[43] DGT, *Decision as to the status of Sky Subscriber Services Limited as a regulated supplier in the market for access control services for digital interactive TV services* (2000).

[44] See Commission Communication, 'Towards a new framework for Electronic Communications infrastructure and associated services: The 1999 Communications Review', COM(1999) 539, 10 November 1999.

The New Regulatory Framework of 2002 includes the Access Directive and the Framework Directive.[45] The Access Directive defines Member States' duties in relation to imposing access obligations. The Framework Directive is relevant in understanding these duties, in particular because it sets out the market analysis process which must be undertaken when imposing access obligations based on an undertaking's market power. Both Directives were subsequently amended in 2009, by Directive 09/140/EC.[46]

8.4.1 Framework Directive

The Framework Directive is relevant to the issue of access and interconnection for two reasons. First, as indicated above and discussed in the next section, the Framework Directive details a process whereby NRAs are required to identify markets susceptible to *ex ante* regulatory intervention; carry out a market analysis; designate any operator with significant market power; and impose those obligations designed to remedy any market failure. Second, it contains provisions on co-location and facility sharing, both important components of access.

Under the original 2002 measure, NRAs were called upon to encourage the sharing of facilities and property by those providing electronic communication networks that had been granted rights to install facilities on, over, or under public and private property, including through expropriation (Article 12). A process for the granting of such rights is provided for under the previous article (Article 11, *Rights of way*), which are widely referred to as Code Powers.[47] Such powers potentially enable an operator to substantially interfere in the property rights of others, therefore encouraging co-location and facility sharing was seen as an appropriate counter-balance to such rights. An NRA only had powers to mandate access where there was (a) no 'viable alternatives' and (b) there was a need to protect the environment, public health, public security, or town and country planning objectives. Before imposition, the NRA would have to carry out a public consultation.

Under the 2009 Reforms, these provisions were significantly enhanced. First, the role of the NRA was strengthened from that of 'encourage' to the ability to

[45] Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services, OJ L 108/33, 24 April 2002 ('Framework Directive').

[46] Directive 2009/140/EC amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorization of electronic communications networks and services, OJ L 337/37, 18 December 2009.

[47] See further Chapter 6, at Section 6.4.4.4.

'impose' in all situations where operators exercise Code Powers, subject only to the principle of proportionality (Article 12(1)). Second, the no 'viable alternative' threshold for intervention has been removed. Third, the persons who may be required to share has been broadened from operators with Code Powers to any owner of 'wiring inside buildings or up to the first concentration or distribution point where this is located outside the building', if such sharing can be justified 'on the grounds that duplication of such infrastructure would be economically inefficient or physically impracticable' (Article 12(3)). Fourth, a transparency obligation has been inserted whereby undertakings are required to provide, on request, information about the nature, availability and geographical location of any facilities referred to in the first subsection, to enable an NRA to establish an inventory of such facilities (Article 15(4)).

8.4.2 Access Directive

The Access Directive defines 'access' as:

> the making available of facilities and/or services to another undertaking, under defined conditions, on either an exclusive or nonexclusive basis, for the purpose of providing electronic communications services, including when they are used for the delivery of information society services or broadcast content services. It covers inter alia: access to network elements and associated facilities, which may involve the connection of equipment, by fixed or non-fixed means (in particular this includes access to the local loop and to facilities and services necessary to provide services over the local loop); access to physical infrastructure including buildings, ducts and masts; access to relevant software systems including operational support systems; access to information systems or databases for pre-ordering, provisioning, ordering, maintaining and repair requests, and billing; access to number translation or systems offering equivalent functionality; access to fixed and mobile networks, in particular for roaming; access to conditional access systems for digital television services and access to virtual network services. (Article 2(a))

Access has been defined in the very broadest term, catching not only network access but access to physical infrastructure such as ducts and masts, and to related facilities such as software. The inclusion of 'virtual network services' in the definition also seems to imply that access obligations can be imposed on those who do not own the underlying network, but have other rights to use it, such as Mobile Virtual Network Operators.[48]

[48] See further Chapter 11 at Section 11.2.5.

'Interconnection' is defined in the Access Directive as:

> the physical and logical linking of public communications networks used by the same or a different undertaking in order to allow the users of one undertaking to communicate with users of the same or another undertaking, or to access services provided by another undertaking. Services may be provided by the parties involved or other parties who have access to the network. Interconnection is a specific type of access implemented between public network operators. (Article 2(b))

There is no question, then, that interconnection is considered to be a category of access under the European regulatory regime.

8.4.2.1 *Overview of the access conditions under the Access Directive*

The Access Directive envisages that Member States will have the power to impose several different types of access obligations, which can be summarized as follows:

- Member States must impose a general obligation on all providers of public electronic communications networks to 'negotiate interconnection' with other such providers on request.
- NRAs are to encourage and ensure adequate access and interconnection, and the interoperability of services in a way that promotes efficiency, sustainable competition, and gives maximum benefit to end-users.
- NRAs may impose additional obligations on operators designated as having SMP on a specific market, from a list of remedies detailed in Articles 9 to 13a.
- NRAs must impose specific access obligations in relation to conditional access services.

These categories of obligations are explored in more detail in the following sections.

8.4.2.2 *General condition to negotiate interconnection: Article 4*

Article 4(1) of the Access Directive provides that 'operators of public communications networks' shall have a right, and, when requested by other such undertakings, an obligation, to negotiate interconnection with each other for the purpose of providing publicly available electronic communications services to ensure the provision and interoperability of services throughout the European Community. The category of operators with rights and obligation to interconnect was expanded under the Access Directive from those falling within one of the categories of Annex II under the 1997 Interconnection Directive, to *all* providers of public electronic communications networks.[49] The obligation to negotiate interconnection does not extend to other forms of access under the Access Directive.[50]

[49] The right of operators to negotiate is similarly enshrined in the Authorisation Directive, Article 4(2)(a).

[50] See Case C-277/07, *Commission v Poland*, 13 November 2008; [2008] ECR I-8403, at para 36.

During the process of negotiating for interconnection, operators may inevitably disclose commercially sensitive information to each other. Such disclosure could be exploited by the receiving operator for its competitive advantage, either (more usually) by undermining the business of the disclosing operator or engaging in anti-competitive behaviour with the disclosing operator. To prevent such conduct, operators are obliged to use any acquired information solely for the purpose of interconnection and not to share it with any other department or subsidiary within the corporate group (Article 4(3)).

The scope of the negotiation provision was examined by the Court of Justice of the European Union (CJEU) in *TeliaSonera Finland Oyj v iMEZ Ab*.[51] In this case, iMEZ, having failed to secure an interconnection agreement with TeliaSonera for the transmission of text (SMS) and multimedia (MMS) messages, requested that the Finnish NRA intervene. The NRA referred the case to arbitration, but the parties failed to reach an agreement. iMEZ then asserted that TeliaSonera had failed to negotiate in 'good faith' by not offering a reciprocal agreement on reasonable conditions, which the NRA accepted and ordered TeliaSonera to recommence negotiations. TeliaSonera appealed this decision to the Supreme Court, which then referred certain questions to the CJEU. The Court held that an NRA does have the authority to decide that a party has failed in its obligation to negotiate in good faith when it has proposed interconnection under unilateral conditions that would not allow customers of the requesting operator to utilize the service. The Court also stated that even if the requesting operator was not able to rely on the obligation to negotiate, because it was not itself an 'operator of public communications networks', the NRA could require that the requested operator provide interoperability of its SMS and MMS messaging using its powers under Article 5.

8.4.2.3 *Other access-related conditions: Article 5*

Article 5(1) of the Access Directive requires national regulatory authorities to encourage, and, where appropriate, ensure adequate access and interconnection, and interoperability of services, in a way that promotes efficiency, sustainable competition, and gives maximum benefit to end-users. The Directive specifically provides that this may include obligations:

- on operators that 'control access to end-users', including in justified cases the obligation to interconnect their networks, to the extent necessary to ensure end-to end connectivity (Article 5(1)(a));
- on operators that 'control access to end-users' to make their services interoperable (Article 5(1)(ab));[52]

[51] Case C-192/08, 12 November 2009; [2009] ECR I-10717.

[52] Inserted in 2009.

- to provide access to application program interfaces (APIs) and electronic program guides (EPGs) on fair, reasonable, and non-discriminatory terms, to the extent necessary to ensure accessibility for end-users to digital radio and television broadcasting services (Article 5(1)(b)).

Article 5(1) goes way beyond anything under the 1997 Interconnection Directive. It should be emphasized that it accords Member States the right to impose access obligations even on operators who do not have market power, where the NRA takes the view that such obligations are needed to ensure 'adequate access and interconnection, and interoperability'.

Conditions imposed under Article 5(1) must be notified to the Commission and other NRAs in accordance with the procedures under Articles 6, 7, and 7a of the Framework Directive, as a check on how these powers are used.[53] Under the original proposal for the Access Directive, the Commission would have been entitled to require conditions set under Article 5(1) to be withdrawn, but this right was not included in the final wording. In 2006, the Commission again proposed an amendment to require prior authorization from the Commission for Article 5(1) obligations,[54] but it was absent from the 2009 Reform; which is illustrative on the ongoing political tussle over the best approach towards harmonization in the European Union.

8.4.2.4 *Imposition of access obligations on operators with SMP: Articles 8–13*

The access obligations under Articles 8 to 13a of the Access Directive may only be applied to undertakings possessing SMP, except in 'exceptional circumstances' (Article 8(3)).

SMP designation A key difference between the access and interconnection regime under the Interconnection Directive and that under the Access Directive concerns the test that is applied to determine whether an undertaking is considered to have SMP. Whilst the Interconnection Directive created a presumption of SMP where an operator had 25 per cent market share, the Access Directive sets a higher hurdle by adopting a definition which is consistent with European competition case law:

> … either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers. (Article 14)

[53] See further Chapter 4, at Section 4.6.

[54] Commission Staff Working Document 'on the Review of the EU Regulatory Framework for electronic communication networks and services – Proposed changes' COM(2006) 334 final, at 5.4.

The process that NRAs are to undertake to determine whether any undertaking in a given market has SMP is set out in the Framework Directive.[55] NRAs are required to take the 'utmost account' of the Commission's guidelines for market analysis and the assessment of SMP[56] (EC Guidelines), and the Commission's Recommendation on the relevant product and service markets.[57]

There is arguably an underlying tension between the requirement that NRAs must on the one hand define markets according to general competition law, and the requirement on the other hand that they must take 'utmost account' of the four markets defined in the Commission's most recent Recommendation. If a national regulatory authority undertakes a study of part of the industry to determine the relevant market, and such study is undertaken strictly in accordance with the tests set out in general competition law, it is hard to see how taking the 'utmost account' of the Commission's list of markets is meant to change or influence that analysis. However, if NRAs define markets that differ from those set out in the recommendation, they are required to undertake a consultation process with other national regulatory authorities and the Commission. The Commission may ultimately require a market definition which departs from its Recommendation to be withdrawn.[58]

Based on its market analysis, each NRA must determine whether the market in question is effectively competitive. If the market is not effectively competitive, the NRA must identify the operators with SMP on that market and impose appropriate, specific, regulatory obligations, or maintain or amend obligations already in place (Article 16(4)). The decision to designate or not designate an operator as having SMP is subject to a consultation procedure under the Framework Directive. The Commission ultimately has the power to require that a market definition or market analysis decision be withdrawn (Article 7).

Where a finding of SMP is made, NRA must impose at least one of the remedies detailed in Articles 9 to 13a of the Access Directive. These wholesale remedies, graduated in nature from mild behavioural obligations to significant structural intervention, are given preference over the imposition of retail remedies under Article 17 of the Universal Services Directive. The intent of the Commission is that these remedies should be exhaustive; therefore, no other obligations in respect of access and interconnection can be imposed unless the

[55] Ibid.

[56] Commission Guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services, OJ C165/6, 11 July 2002.

[57] Commission Recommendation (2014/710/EU) of 9 October 2014, OJ L 295/79, 11 October 2014.

[58] Framework Directive, Arts 6, 7, and 15(3). See further Chapter 4, at 4.6.

national regulatory authority first obtains authorization from the Commission (Article 8(3)).

Remedies The most important obligation for the present discussion is that which can be imposed under Article 12 of the Access Directive and which relates to the provision of 'access to, and use of, specific network facilities', particularly in situations where it is considered that denial of access or unreasonable terms and conditions would hinder the emergence of a sustainable competitive market at the retail level, or would not be in the interest of end-users (Article 12(1)).

The following types of access obligations are specifically envisaged in Article 12:

- giving of access to specified network elements and/or facilities, including those which are 'non-active' such as dark fibre,[59] as well as unbundled access to the local loop and carrier and/or pre-selection;
- negotiating in good faith with undertakings requesting access;
- not withdrawing access to facilities already granted;
- providing specified services on a wholesale basis for resale by third parties;
- granting open access to technical interfaces, protocols, or other key technologies that are indispensable for the interoperability of services or virtual network services;
- providing co-location or other forms of facility sharing, including duct, building, or mast sharing;
- providing specified services needed to ensure interoperability of end-to-end services to users, including facilities for intelligent network services or roaming on mobile networks;
- providing access to operational support systems or similar software systems necessary to ensure fair competition in the provision of services;
- interconnecting networks or network facilities; and
- access to associated services, such as identity, location and presence services. (Article 12(1)(a)–(j))

The imposition of any of the obligations in Articles 9 to 13a must always be based on the nature of the problem identified, be proportionate, and be justified in light of the general policy objectives in the Framework Directive, like consumer protection, the protection of privacy, and ensuring network security and integrity.[60]

[59] 'Dark fibre' is optical fibre transmission capacity which has not been connected to a laser system.

[60] Access Directive, Art 8(4). See also C-28/15, *Koninklijke KPN BV v ACM*, 15 September 2016.

Where an access obligation is imposed under Article 12, additional factors must be taken into account:

- the technical and economic viability of using or installing competing facilities, in light of the rate of market development, taking into account the nature and type of interconnection and access involved;
- the feasibility of providing the access proposed, in relation to the capacity available;
- the initial investment by the facility owner, bearing in mind the risks involved in making the investment;
- the need to safeguard competition in the long term;
- where appropriate, any relevant intellectual property rights; and
- the provision of pan-European services. (Article 12(2)(a)–(f))

Apart from the access obligations in Article 12, as described, the other regulatory obligations that may be imposed on SMP operators are as follows:

Article 9 *Obligation of transparency*—Operators may be required to make public a range of information, such as accounting information, technical specifications, network characteristics, and terms, conditions and prices, or to publish a 'reference offer'. The reference offer should be sufficiently unbundled to enable a requesting operator to only receive what is necessary for the requested service. Where an operator is required to give access to the local loop, the operator must be required to publish a reference offer which includes the provisions specified in Annex II of the Access Directive;

Article 10 *Obligation of non-discrimination*—Operators may be required to provide equivalent conditions in equivalent circumstances, and provide services and information of the same quality as it provides to its own downstream businesses;

Article 11 *Obligation of accounting separation*—Operators may be required to keep separate accounts in respect of interconnection or access services, including its internal transfer pricing. The regulator shall be able to require the disclosure of accounting data and may publish such information as it considers necessary to contribute to a competitive market, while respecting commercial confidentiality; and

Article 13 *Price control and cost accounting obligations*—In specific circumstances, operators may be subjected to price caps, including controls requiring that prices are 'cost orientated'. The meaning of 'cost orientation' is not further defined, although the CJEU has held that it does not mean the ability to recover all costs incurred by an operator, which meant that a NRA was able to 'set the prices of the services covered by such an obligation below the level of the costs

incurred by that operator to provide them, if those costs are higher than the costs of an efficient operator'.[61] The burden of proving compliance with any obligation of cost-orientation will reside with the operator (Article 13(3)). Reflecting the desire to encourage the deployment of NGNs by SMP operators, NRAs are required to allow 'a reasonable rate of return on adequate capital employed, taking into account any risks specific to a particular new investment network project' (Article 13(1)). Introduced under the 2009 Reforms, this amendment was designed to respond to the threat that Member States could be tempted to grant regulatory 'holidays' to SMP operators, generally the national incumbent, in order to promote investment in NGNs. Such an approach was adopted in Germany in respect of so-called 'new markets', although it was subsequently struck down by the CJEU.[62]

Article 13a *Functional separation*—Introduced under the 2009 Reforms, this is an 'exceptional' structural remedy, under which an operator would be required 'to place its activities related to the wholesale provision of relevant access products in an independently operating business entity'. The remedy is modelled on the UK's experience with BT and Openreach. In addition, the separated undertaking may be subject to any of the behavioural obligations specified in Articles 9–13. As a measure of last resort, imposition of this remedy is subject to a distinct assessment and notification procedure.

While Articles 9–13a are *ex ante* regulatory measures, an additional procedure has been inserted into the Access Directive as an *ex post* response to an undertaking deciding to voluntarily separate its 'local access network assets' into another legal entity (Article 13b). The operator is required to notify the NRA 'in advance and in a timely manner', to enable the NRA to carry out an assessment of the intended separation and impose, maintain, amend, or withdraw any obligations in respect of the operator.

Recommendations Under the Framework Directive, the Commission has the power to publish recommendations designed to address areas where NRAs have adopted divergent approaches to the implementation of their regulated tasks (Article 19(1)). NRAs must 'take the utmost account' of these recommendations and follow 'as a rule', except where it 'is not appropriate to the circumstances that it may depart from it, giving reasons for its position'.[63] A similar power was granted to the Commission under the Interconnection Directive,

[61] Case 277/16, *Polkomtel v Prezes Urzędu Komunikacji Elektronicznej*, 20 December 2017, at para 40.
[62] Case 424/07, *Commission v Germany*, 3 December 2009, [2009] ECR I-11431.
[63] C-28/15, *Koninklijke KPN BV v ACM*, 15 September 2016, at para 38.

but was limited in scope to cost accounting systems and accounting separation (Article 7(5)).

In 2009, the Commission issued a recommendation on 'the regulatory treatment of fixed and mobile termination rates in the EU', designed to further harmonize NRA approaches to cost-orientation under Article 13.[64] The Commission recommends that 'efficient costs' should be based on current costs, the use of a bottom-up modelling approach and long-run incremental costs (LRIC) as the cost methodology.[65]

Concerns about divergent Member State and NRA approaches to encouraging investment in Next Generation Networks lead to the issuance of a recommendation 'on regulated access to Next Generation Access Networks (NGA)'[66]. The recommendation calls upon NRAs to mandate access to a range of facilities controlled by an SMP operator, including its 'civil engineering infrastructure', particularly ducts; as well as the terminating segments of fibre-to-the-home (FTTH), which are replacing the traditional copper segments accessed under LLU. A further recommendation was adopted in 2013 to ensure more consistent approaches to the imposition of non-discrimination obligations and the use of costing methodologies.[67]

8.4.2.5 *Conditional access systems and other facilities: Article 6*

Article 6 of the Access Directive requires Member States to impose a range of conditions in relation to conditional access services for digital television and radio. As noted earlier, conditional access enables broadcasters to make reception of their television and radio signals conditional upon prior authorization such that viewers need descrambling equipment, usually in the form of an authorized access card inserted into a set top box, for viewing or listening to the transmission. These conditions, set out in Part I of Annex I of the Access Directive include an obligation for providers of conditional access to offer services to broadcasters on a fair, reasonable, and non-discriminatory basis, compatible with Community competition law.

Member States may, where certain conditions are met, maintain, amend, or withdraw conditional access conditions if a market review is carried out and shows that one or more operators do not have SMP on the relevant market (Article 6(3)).

[64] Recommendation 2009/396/EC, OJ L 124/67, 20 May 2009.

[65] Ibid, at 2. See further Chapter 2, at Section 2.14.

[66] Recommendation 2010/572/EU, OJ L 251/35, 25 September 2010.

[67] See Commission Recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment, COM(2013) 5761 final, 11 September 2013.

8.4.2.6 *Reform proposals*

In September 2016, the Commission published proposals to reform the Access Directive, as part of a recasting and consolidation of the existing NRF measures.[68] The 2016 Proposals are designed to 'reinforce' the SMP access regime and 'promote infrastructure competition and network deployment by all operators'.[69] In terms of the former, the market analysis procedure would be reformed to codify best practices, such as NRAs taking into account commercial access agreements. The market reviews are also to be extended from three to five years, which would benefit operators in terms of long-term planning and lessen the burden on NRAs. Greater access to an SMP's physical infrastructure is also to be facilitated, as well as the imposition of symmetrical obligations on all operators to ensure access to 'non-replicable network assets, such as in-house wiring and cables'.[70] Existing Commission recommendations on cost-based and tariff-setting methodologies would become binding, with the Commission also proposing to establish 'maximum' voice termination rates in the EU. These latter interventions are being sold as a means of 'alleviating the administrative burden for national regulators', although they clearly also reflect the Commission's desire for greater harmonization through centralizing key decisions.

The 2016 Proposals also address the desire to encourage the deployment of high-capacity networks within the EU. NRAs will be expected to survey current provision to identify 'digital exclusion areas' and measures to tackle them. Going beyond existing facility sharing arrangements, measures will facilitate 'commercial co-investment in new infrastructures', based on a recognition that risk-sharing will need to be greater between SMP operators and access seekers when new access products are developed. Finally, there is a provision addressing the role of NRAs in SMP decisions to switch-off legacy PSTN networks and moving to Next Generation Networks.[71]

The 2016 Proposals will obviously change in the course of the legislative process, but overall they represent an incremental reform rather than an overhaul of the existing regime.

8.4.3 Roaming Regulation

According to the definition of 'access', roaming is a form of access that falls within the scope of the Access Directive. However since 2007, 'Union-wide roaming' has

[68] Proposal for a Directive establishing the European Electronic Communications Code, COM(2016) 590 final, 14 September 2016 ('2016 Proposal').

[69] Ibid, at 15. [70] Ibid.

[71] eg BT has announced its intention to close its legacy PSTN core network by 2025.

been regulated through a separate regime comprising a series of Regulations[72] and implementing measures.[73] Such intervention was considered necessary because the Framework and Access Directives are not considered to provide NRAs 'with sufficient tools to take effective and decisive action',[74] which justifies 'exceptional measures',[75] for four stated reasons. First, the imposition of *ex ante* obligations by NRAs requires the identification of operators with SMP, which has proven difficult in respect of the wholesale market for international roaming. Second, at a retail level, roaming is not identifiable as a distinct market, since it is only one component of a package of services purchased by consumers. Third, roaming involves the conduct of a foreign operator, the 'visited network', over which the NRA where the customers normally reside has no ability to control their behaviour. A final justification is the political desire to promote the achievement of a single European market.[76]

The Roaming Regulations make reference to the ability of NRAs to impose obligations on non-SMP operators under Article 5 of the Access Directive (see 8.4.2.3), but it is only in limited circumstances, where interoperability or end-to-end connectivity is threatened through termination of a roaming agreement, or there is no agreement in place with any wholesale provider.[77]

Between 2007 and June 2017, the Roaming Regulations introduced and progressively lowered the so-called 'euro-tariffs' for calls, SMS, and data until retail roaming charges disappeared and the principle of 'roam like at home' was established throughout the EU. Operators can submit a request to an NRA to apply a surcharge on customers where it is unable to 'recover its overall actual and projected costs', although only in 'exceptional circumstances'.[78] Such a scenario is considered most likely to arise in the case of Mobile Virtual Network Operators (MVNOs).[79] While retail roaming charges have been abolished, charges continue to be regulated at a wholesale level.[80]

8.4.4 Deployment Directive

The deployment of broadband access networks has become a priority issue for the EU and Member States trying to facilitate economic growth through the

[72] Regulation No 717/2007 was amended by No 544/2009, and was then replaced by No 531/2012, which has been amended by No 2120/2015 ('Roaming Regulations').

[73] eg Commission Implementing Regulation (EU) 2017/2311 setting the weighted average of maximum mobile termination rates across the Union, OJ L 331/39, 14 December 2017.

[74] Regulation No 717/2007, at recital 4. [75] Ibid, at recital 13. [76] Ibid, at recitals 6–8 and 10.

[77] Regulation No 531/2012, at recital 81 and Art 16(5). [78] Ibid, at Art 6(c).

[79] Commission Implementing Regulation (EU) 2016/2286, OJ L 344/46, 17 December 2016, at recital 27.

[80] See n 76.

digital economy.[81] To lower the cost of such deployment, improved access to existing physical infrastructure, such as pipes, ducts, and masts, is seen as a key facilitator. While such access could be mandated through the Access Directive (Article 5) or the Framework Directive (Article 12), both are restricted in scope by being limited in application to providers of electronic communication services, preventing measures being imposed across other utility sectors with similar network infrastructures.

To address this lacuna, a Directive was adopted applicable to a broad range of 'network operators', including gas, electricity, water, and transport services.[82] The measure requires that all network operators should have a right to offer access to its physical infrastructure for electronic communication networks, as well as an obligation 'to meet all reasonable requests for access … under fair and reasonable terms and conditions' (Article 3). To facilitate such access, network operators must provide certain information to providers of 'public communication networks', either upon request or via a 'single information point', subject to any limitations required for reasons of network security and integrity, national security, public health and safety, or commercial confidentiality (Article 4).

Where new physical infrastructure needs to be built, network operators shall have a right to negotiate agreements for the coordination of any 'civil works'[83] required to build the infrastructure. Such coordination is also seen as a means of reducing the social and environmental costs associated with such works, including pollution and traffic congestion (Recital 13). However, an obligation to meet any reasonable request for coordination only arises where the works are being financed in whole or part through public funds (Article 5). As with access to existing physical infrastructure, network operators have transparency obligations in respect of 'on-going or planned' civil works (Article 6).

Another perceived obstacle to network deployment is the number and variety of different permissions that may be required to carry out any works, such as building, planning, and environmental permits; as well as the lengthy procedures associated with their issuance. Member States are therefore required to establish 'single information point' systems to make available information on the procedures and conditions applicable to such permits and require that the competent authorities grant or refuse any such permits within four months from receipt of a completed request (Article 7).

[81] Commission Communication, 'A Digital Agenda for Europe', COM(2010) 245 final/2, 26 August 2010.

[82] Directive 2014/61/EU on measures to reduce the cost of deploying high-speed electronic communications networks, OJ L 155/1, 23 May 2014 ('Deployment Directive').

[83] This 'means every outcome of building or civil engineering works taken as a whole which is sufficient of itself to fulfil an economic or technical function and entails one or more elements of a physical infrastructure' (Art 2(4)).

The final perceived bottleneck addressed by the Deployment Directive is 'in-building physical infrastructure',[84] the facilities within end-user premises that enable operators to provide access through network termination points. Member States are required to ensure that all new buildings from 1 January 2017 specify in the building permit the need to equip such buildings with 'high-speed-ready' infrastructure (Article 8). Rights-holders in respect of such 'in-house physical infrastructure' must then meet all reasonable requests for access from public communication networks (Article 9(3)). If agreement on access cannot be reached within a two-month period from receipt of an access request, then the dispute can be referred to a national dispute settlement body; which in the case of the UK is Ofcom.[85]

8.5 UNITED KINGDOM ACCESS AND INTERCONNECTION REGIME

Shortly after the EU review of telecommunications started in 1999, the UK also began a review of the regulatory environment governing the communications industry, starting with the Communications White Paper in 2000. This review led, eventually, to the passage of the Communications Act 2003, which implemented the Access and Framework Directives (and the other EU Directives which required implementation by July 2003), and brought about further sweeping changes, including the formation of Ofcom, which commenced its operations in December 2003.

'Interconnection' is defined in the Communications Act 2003, s 151(2) and largely replicates the definition in the Access Directive. 'Network access' is defined in s 151(3) and (4) of the Communications Act. It includes, apart from interconnection, access to a range of electronic communications networks, services, and facilities for the purpose of the provision of an electronic communications service. Whilst it is not as prescriptive as the definition of 'access' in the Access Directive, in that it does not give specific examples of the types of access covered, it is almost certainly as broad.

The following sections explain how the UK has implemented both the facility sharing provision under the Framework Directive, the four categories of access obligations in the Access Directive, already mentioned; as well as the Deployment

[84] This 'means physical infrastructure or installations at the end-user's location, including elements under joint ownership, intended to host wired and/or wireless access networks, where such access networks are capable of delivering electronic communications services and connecting the building access point with the network termination point' (Art 2(7)).

[85] The Communications (Access to Infrastructure) Regulations 2016, SI 2016/700, at Pt 3 ('Infrastructure Access Regulations').

Directive.[86] Finally, consideration is given to the role of state aid in regulating 'access' in the UK.

8.5.1 Facility sharing

The facility sharing provisions were transposed into the Communications Act 2003 under the 'access-related conditions', s 73(3). The provision was amended in 2011, in order to transpose the 2009 Reforms.[87] The limitation to situations where there is 'no viable alternative' has been deleted and instead Ofcom can set such conditions for the purpose of 'encouraging efficient investment in infrastructure' and 'promoting innovation' (s 73(3A)). In its response to the consultation, the Government noted that operators have expressed concerns about how Ofcom might exercise such power, but promised further guidance from Ofcom.[88]

In terms of establishing an inventory of facilities, the Government decided not to require Ofcom to build a comprehensive inventory, due to the cost burden on network operators and security and commercial concerns.[89] It decided instead to amend Ofcom's ad-hoc information-gathering powers to include 'identifying electronic communications apparatus that is suitable for shared use' (s 135(3)(ig)). In addition, Ofcom was given the power to make available information about facilities that in its opinion are 'suitable for shared use' (s 76A). Although not required to establish an inventory, Ofcom has stated that it will keep the issue under review.[90] In accordance with the Deployment Directive, network operators now have a right to request 'discloseable information' from an 'infrastructure operator', subject to various conditions;[91] but the option of establishing a 'single information point' has not been taken up by the UK government.

Prior to the 2011 Regulations, Ofcom had already been given a new obligation to report on the UK's communications infrastructure, which includes the need to report on 'the extent to which UK networks share infrastructure' (ss 134A and 134B).[92] The first report was published in November

[86] Some of the determinations and guidelines discussed in this section were published by the DGT, others were published by Oftel, whilst those published since 29 December 2003 were published by Ofcom. To avoid confusion, this section will refer to Ofcom in the main text, whilst referencing the actual publishing body in the footnotes.

[87] The Electronic Communications and Wireless Telegraphy Regulations 2011, SI 2011/1210 ('2011 Regulations').

[88] DCMS, *Implementing the revised EU Electronic Communications Framework: HMG Response*, April 2011, at para 48. Such guidance does not appear to have been forthcoming.

[89] Ibid, para 59. [90] Ofcom, *Infrastructure Report*, 1 November 2011, at para 3.19.

[91] Infrastructure Access Regulations, at reg 4 (in respect of physical infrastructure) and reg 8 (in respect of civil works).

[92] Inserted by the Digital Economy Act 2010, s 1. Ofcom is obliged to publish a report every three years (s 134A(4)), but has since committed to providing updates on an annual basis.

2011.[93] Addressing network sharing, Ofcom noted that it would expect any company seeking shared access to infrastructure to attempt to negotiate a commercial agreement in the first instance, before it would consider regulatory intervention;[94] which is consistent with its approach to handling disputes in general.[95]

Ofcom reported in 2011 and 2014 that there had been limited sharing of passive infrastructure in respect of access networks, which is expected to change with the implementation of the Deployment Directive.

8.5.2 General interconnection obligation

One of the first tasks undertaken in preparation for the implementation of the Directives was the drafting of the General Conditions of Entitlement.[96]

Condition 1 of the General Conditions of Entitlement requires every person who provides a 'public electronic communications network' (PECN) to negotiate with other such providers 'with a view to concluding an agreement (or an amendment to an existing agreement) for Interconnection within a reasonable period'. This condition implements the obligation in Article 4(1) of the Access Directive.

The definition of PECN is such that it encompasses a transmission system, and the associated apparatus, software, and data used with the system for the conveyance of signals, where such system is provided wholly or mainly for making electronic communications services available to members of the public.[97]

As the Communications Act 2003, s 32(4)(a) provides that the 'provision' of an electronic communications network includes references to 'its establishment, maintenance and operation', it is clear that the 'provision' of a PECN is not the same as ownership of the network, although some degree of 'direction or control' over it is required (s 32(4)(b)). This issue is further explored in a statement issued by Ofcom in May 2003,[98] which states that the provider of a single network node who is willing to obtain transmission infrastructure that builds towards an electronic communications network will fall within the definition of a 'public electronic communications network'. Therefore, by way of an example used in the Statement, where provider A seeks interconnection from provider B, the links between provider A's node and provider B's node will constitute provider A's transmission system, whether the link is self-provided, leased from provider B, or leased from another provider altogether.[99]

[93] Ofcom, 'Infrastructure Report', 1 November 2011. It was renamed the 'Connected Nations Report' in 2015.
[94] Ibid, at para 3.18. [95] See Chapter 3, at 3.3.7.3. [96] See further Chapter 6.
[97] See Part 1 of the General Conditions and General Condition 1.4.
[98] Oftel, *Guidelines for the interconnection of public electronic communications networks* (2003).
[99] Ibid, para 4.8.

Ofcom's statement is also helpful in analysing whether an electronic communications network is 'provided wholly or mainly for making electronic communications services available to members of the public'. The statement provides that a publicly available service is one that is available to anyone willing to pay for it and abide by the applicable terms and conditions.[100] A service with only one customer can be considered to be publicly available where it is genuinely available to others on good faith, but, conversely, a service with more than one customer would not necessarily be considered to be available to the public, such as a landlord providing services to tenants on a single premises where such services are not available except to those tenants. 'Members of the public' does not require that the service has to be usable by individuals. A service of such a scale that it is only useful to large corporate customers will be considered to be available to members of the public provided that it is generally available to such potential customers.

A service would not normally be considered to be available to members of the public where the provider earns a substantial proportion (ie 80 per cent or more) of its revenue from members of its corporate group. This is an important point, because it means that entities that only provide communications services to other members of their corporate group do not have a right to interconnection. Without this rule it would be open to large companies to obtain interconnection services from operators with SMP at cost-orientated prices (where cost-orientated prices have been imposed), and even to charge other operators for termination of calls onto their network. This would be intolerable from a public policy point of view, as interconnection rights and obligations should only accrue to those who invest in infrastructure used to provide truly public services, and who contribute to the competitive market.

The Interconnection Directive required operators to register with Oftel to be included on the 'Annex II list' in order to acquire rights and obligations to interconnect. By contrast, under the new regime no registration is required; the only legal requirement is that of providing a PECN. Ofcom initially decided to maintain a list, similar to the Annex II list, to simplify the process of negotiating interconnection. The list was known as the voluntary register of public electronic communications networks. To be included on the register, operators were required to submit an application form to Ofcom specifying details of how their network qualifies as a PECN. Ofcom subsequently decided to abandon the register on the grounds that it was difficult to administer and did not provide sufficient benefits to operators.

[100] Ibid, Chapter 6.

8.5.3 Imposition of obligations on operators with SMP

The Communications Act 2003 sets out the definition of SMP (s 78), the procedure that Ofcom must follow in reviewing markets (s 79(1)–(3)) and consulting and making determinations that one or more operators has SMP in a given market (ss 79(4)–81), and the conditions that Ofcom may impose on such operators (ss 87–91). The provisions in the Act largely correspond with the relevant Articles in the Framework and Access Directives.

NRAs were required to commence the enormous administrative feat involved in undertaking market reviews as soon as possible after the adoption of the Market Recommendation, in February 2003.[101] As the Communications Act was not in force at that time, special legislation was passed to ensure that the DGT had the power to undertake the tasks necessary to carry out the reviews required by the Framework Directive.[102]

8.5.3.1 *Ofcom's Access Guidelines*

Ofcom published market review guidelines in August 2002.[103] These guidelines are used in conjunction with the EC Guidelines when assessing whether any undertaking in a given market possesses SMP. Although Ofcom's guidelines complement the EC Guidelines on most points, they also set out several pages of additional criteria that Ofcom considers should be taken into account when carrying out the analysis.

In order to ensure that both SMP operators and competing operators would have a fair expectation of the kind of access obligations that Ofcom was likely to consider appropriate when conducting its market reviews, Ofcom also published guidelines ('Access Guidelines')[104] explaining how it proposed to apply the conditions that it is entitled to impose on SMP undertakings under the Access Directive. The Access Guidelines indicate the nature of the products Ofcom would expect to be supplied as a result of such an obligation being imposed, and the conditions under which such products should be made available. While the Access Guidelines are clearly dated, they remain a useful indicator of the range of issues that may be considered and the types of remedies that may be imposed on operators possessing SMP.

Obligation to supply wholesale access products When imposing an obligation to provide access to wholesale products, Ofcom has often required the SMP

[101] Framework Directive, Art 16(1).

[102] See Electronic Communications (Market Analysis) Regulations 2003, SI 2003/330.

[103] Oftel, *Market review guidelines: criteria for the assessment of significant market power* (2002).

[104] Oftel, 'Imposing access obligations under the new EU Directives', 13 September 2002, <http://webarchive.nationalarchives.gov.uk/20080714072725/http://www.ofcom.org.uk/static/archive/oftel/publications/ind_guidelines/acce0902.htm>.

operator to 'meet all reasonable requests for access'. The Access Guidelines state that Ofcom is likely to consider that a request which is technically feasible is 'reasonable' if the SMP operator can reasonably expect to receive at least a reasonable rate of return on any necessary investments when the access product is supplied at a price the requesting operator is willing to pay. Only in 'extreme examples' should a request for access be denied on the basis that the request is unreasonable.[105]

New products and innovative products The Access Guidelines also provide guidance on the situation arising when a competing operator demands a new wholesale product or where products become available because of innovation on the part of the SMP operator.

In the case of a demand on an SMP operator to make a new or untested wholesale access product available to a competitor, it can be difficult to determine whether demand for the product will materialize. It is therefore difficult to determine whether the SMP operator can expect a reasonable rate of return on the investment that they will make, which is Ofcom's test for whether a request is 'reasonable'. The Access Guidelines state that if the SMP operator will incur significant development costs in supplying a product for which demand is uncertain, the requesting operator may be required to take on an appropriate level of risk. This could involve:

- the requesting operator committing to a level of demand at a price that would justify investment by the SMP operator in supplying the wholesale product; or
- allowing the SMP operator to specify a pricing structure based on forecast demand and/or specify a process of balancing payments between the SMP operator and the requesting operator at the end of a set period, based on actual demand.

The development costs would need to be incurred in a reasonable and efficient way by the SMP operator.[106]

In the case of products developed as a result of innovation (and, typically, significant investment) by an SMP operator, the Access Guidelines state that SMP operators should be required to supply an equivalent wholesale product when introducing innovative retail products. The same applies when an innovative wholesale product is made available by an SMP operator to its own vertically integrated retail business.

[105] Ibid, at 13. [106] Ibid.

The risk with this approach, obviously, is that SMP operators will be disincentivized from investing in the development of new services, because they will be required to share the results of their innovation with their competitors, rather than being able to gain a competitive advantage and increased market share by being 'first to market'. The Access Guidelines propose that this problem should be dealt with by allowing SMP operators to impose sufficiently generous terms in the supply of innovative wholesale products to other operators. Where a new or innovative product involves a high level of risk, cost-based price controls will normally be avoided, even if the SMP operator has very high market share. In such markets, either no charge control, or a retail minus form of regulation may be more appropriate. A retail minus pricing model would in this case allow an element of supernormal profit to be built into the retail price to be retained by the SMP operator. Setting any kind of cost-based charge control risks distortion of commercial and investment decisions and discouragement of innovative market offerings, ultimately to the detriment of consumers.[107]

Access to information protected by intellectual property rights The Access Guidelines state that if information which is protected by intellectual property rights is essential to allow competitors to the SMP operator to offer a competing product, the SMP operator would be expected to make the information available. The operator requesting the information would be expected to demonstrate that it is indeed essential.[108]

Terms and conditions governing access Ofcom attaches obligations relating to fairness, reasonableness, and timeliness to all access conditions.[109] Terms should be consistent with those which would be offered in a competitive market, should be sensible and practical, should include obligations in relation to time lines, such as reasonable service levels and penalties for non-delivery, and should provide sufficiently unbundled services, so that a competing operator pays only for what it needs.[110]

The Access Guidelines also envisage that conditions may be imposed on an SMP operator in relation to the process under which competing operators request new products. Ofcom expects SMP operators to deal with such requests within a

[107] Ibid, 14, 33–35.

[108] Ibid, 35. Note that this rule does not apply to standard network interfaces, which must be made available in all cases under the interface publication rules.

[109] eg Ofcom, 'Review of the wholesale broadband access markets', 26 June 2014, Annex 2, Schedule 1, 'SMP Conditions imposed on BT in Market A', Part 3, at Condition 1.2.

[110] Oftel, n 98, 22–23.

reasonable timescale and to enter into discussions with competing operators if further information or clarity is needed.[111]

Imposition of non-discrimination obligations Non-discrimination obligations become particularly relevant where an SMP operator is vertically integrated. The Access Guidelines stated that there is a rebuttable presumption that discrimination by a vertically integrated SMP operator in favour of its downstream business would have a 'material adverse effect on competition' (3.9). Both the scope of the rebuttable presumption and the test have since evolved, with the presumption being applied only to 'non-price differences in transaction conditions', while the test has become 'capable of harm to competition'.[112] Vertically integrated SMP operators will therefore normally be required to ensure that they provide services on equivalent terms and conditions as are available to subsidiaries and partners, and that they can objectively justify any differentiation. The application of different pricing may be justified on the basis of different underlying costs, or different levels of risk. The Access Guidelines state that the non-discrimination rule would not always prevent volume discounts from being applied, provided that they are applied in a consistent manner. However, a volume discount that benefited the downstream business of an SMP operator disproportionately, by virtue of its size, would not be permitted.[113]

Imposition of transparency obligations The Access Guidelines state that any new wholesale product offered by an SMP operator will normally need to be published in the form of a reference offer. Initial reference offers for new products, and changes and updates to a reference offer for an existing product, should be released in a timely manner, allowing enough time for a reasonably efficient operator to make necessary preparations. Information (including terms, conditions, and prices) must be supplied to any downstream business at the same time that it is released to the market. Sufficient information should be given at the time of or before the launch of a product to enable competitors to make full and effective use of the product supplied, although the disclosure of such information can be made subject to a confidentiality agreement. A list of the minimum information that must be included in a reference offer, as well as its applicability and availability, is now set out by Ofcom in respect of each market review.[114]

[111] Ibid, 24. [112] Ofcom, 'Undue discrimination by SMP providers', 15 November 2005.

[113] Access Guidelines, at 16–17 and 30–31.

[114] eg Ofcom statement, 'Business Connectivity Market Review—Volume 1', 28 April 2016, at paras 8.110–8.124.

Imposition of charge controls In general, Ofcom considers that in markets which are not effectively competitive, and where there is little prospect of this changing in the short-term future, the imposition of charge controls on SMP operators, in the form of cost-based prices, are generally appropriate. Prices subject to price control should still allow a return on capital that takes into account the level of risk involved. As competition evolves, price caps should be relaxed.

In markets which are not effectively competitive, but where market power is diminishing, the Access Guidelines propose that it may be sufficient to rely on the imposition of a general non-discrimination obligation, implemented by requiring that charges are based on a retail minus model. Whilst allowing the SMP operator to recover the same margin as it recovers when retailing the service itself, retail minus price models are intended to prevent the SMP operator from 'squeezing' its competitors' margins.[115]

Imposition of obligations relating to accounting separation According to the Access Guidelines, the main purpose of obliging operators to prepare and publish regulatory financial information is to ensure compliance with the non-discrimination obligations (to prevent margin squeezing), and to prevent anti-competitive cross-subsidy. The information may also be used in setting charge controls, conducting sector reviews, and in specific case work. Typically, separate statements would be required in relation to the different activities of a vertically integrated operator. As it is generally not feasible for NRAs to continually monitor prices, where there are incentives for SMP operators to impose a margin squeeze, it may be appropriate to also require publication of prices in the relevant downstream market, so that any margin squeeze would be highly visible.[116]

8.5.3.2 *Market reviews and remedies*

The process of identifying relevant markets, operators with SMP, and appropriate remedies was commenced in the UK soon after the publication of the Commission's first Market Recommendation. The analysis must then be repeated every three years, unless an extension is obtained.[117] At the completion of each review a consultation document is published, setting out the relevant markets, proposed findings of SMP, and any proposed SMP conditions, and inviting comments. After the consultation, the draft determinations of market power and SMP conditions are then notified to the European Commission for comment,[118] before the final determination comes into effect. Even then, Ofcom's decision may be subject to appeal

[115] Access Guidelines, 19–21. See also Chapter 2, at Section 2.15.1.5. [116] Ibid, 21–22.
[117] Framework Directive, Art 16(6). [118] In accordance with ibid, Art 7(3).

before the Competition Appeals Tribunal (CAT), which has quashed its decisions on both geographic and product market definitions,[119] and further appeals from the CAT.[120]

The size of this task should be appreciated. The UK market reviews total many thousands of pages of detailed analysis. A detailed analysis of each of the market reviews is beyond the scope of this chapter.[121]

8.5.4 Article 5 access-related conditions

As already noted, apart from the general interconnection condition and SMP conditions, Article 5 of the Access Directive entitles national regulatory authorities to impose certain further access conditions.

The Article 5 conditions may be imposed where necessary to ensure adequate access and interconnection, and interoperability of services. In particular, NRAs may impose access-related conditions to ensure end-to-end connectivity, and to ensure accessibility for end-users to digital radio and television broadcasting through access to application programme interfaces and electronic programme guides. These provisions of Article 5 are reflected in ss 73 and 74 of the Communications Act. As in the Access Directive, these conditions can be imposed even where no operator possesses SMP in a market. Ofcom has indicated that it will construe its rights to impose such conditions restrictively, and expects the use of access-related conditions to be very limited.[122]

The following sections examine the circumstances where Ofcom has considered imposing Article 5 access-related conditions.

8.5.4.1 *End-to-end connectivity*

In guidance published in May 2003,[123] Ofcom considered the question of whether specific obligations were needed to ensure end-to-end connectivity, that is, connectivity enabling users to contact users and services on other networks as well as those on the same network. Achieving end-to-end connectivity would require that all operators both *purchase* call termination services from all other operators, and *provide* call termination services when requested. If imposed, operators would have been positively required to ensure that they are directly or indirectly connected with all other operators and purchase call termination from those

[119] eg *British Telecommunications plc v Ofcom* [2017] CAT 25.

[120] eg *Hutchison 3G (UK) Limited v Office of Communications* [2009] EWCA Civ 683.

[121] See further Chapter 2, at Section 2.15.1.6 et seq.

[122] DGT, National Roaming Condition, A consultation on proposals to set a national roaming condition after 25 July 2003 (2003), 4.

[123] DGT, *End-to-end connectivity; Guidance issued by the Director General of Telecommunications* (2003).

operators whenever one of their customers wants to reach a user or service on that other network, and positively required to ensure that they terminate any call received onto their network. These obligations would have gone beyond the obligation to negotiate interconnection on request, which all operators are required to do under Condition 1 of the General Conditions of Entitlement.

Ofcom concluded that the imposition of obligations to ensure end-to-end connectivity was not appropriate, for several reasons. In considering imposing an obligation to *purchase* call termination from other operators, Ofcom considered that the imposition of such an obligation on the universal service providers (that is, BT and KCom) would be disproportionate. This is because those operators must in any case meet reasonable requests for access to publicly available telephone services, which, it is implied, includes being able to contact other customers and services, irrespective of the terminating network. For operators other than BT and KCom, Ofcom considered that the commercial incentives to provide end-to-end connectivity were sufficiently strong to ensure that they seek to purchase call termination without any additional obligation to ensure that they do. This is clearly correct, as it is almost unthinkable that an operator would seek to set up a new service that did not allow customers to contact users and services on other networks.

Ofcom considered that it was not necessary to impose any additional obligation on any operator to *provide* call termination services to other operators because almost all public electronic communications networks are already under an SMP condition requiring them to provide call termination to all other public electronic communications networks on fair and reasonable terms.

8.5.4.2 *National roaming*

Before the auction for 3G mobile spectrum in 2000, the DGT sought to amend the PTO licences of the 2G operators who were bidding for 3G spectrum, requiring them to provide 'national roaming' to the new entrant who was awarded spectrum in the auction. In the end, because of the timing of a legal challenge,[124] amendments were only made to the licences of O2 and Vodafone, who voluntarily accepted the condition. The national roaming condition, Condition 69A, required O2 and Vodafone to negotiate a national roaming agreement with the new entrant 3G operator, '3', allowing its users to roam onto their 2G network. The aim of the condition was to address the concern that 2G mobile network operators which won 3G licences would be able to offer basic 2G services to customers whilst building

[124] Mercury, trading as One-2-One, appealed the decision to impose the condition and was initially successful (Moses J, QBD, 6 August 1999); although it was overturned in *Mercury Personal Communications Ltd v Secretary of State for Trade & Industry* [2000] UKCLR 143.

out their 3G network, whereas a new entrant would not have this advantage, and would not be able to compete.

With the abolition of telecommunications licences in July 2003, Ofcom had to consider whether to re-impose national roaming obligations on 2G operators under the new regulatory regime. The initial conclusion of its predecessor, Oftel, was that all four of the UK's 2G operators should be subject to a new 'access-related condition', under the Communications Act 2003, ss 73–74, requiring them to provide national roaming on fair, reasonable, and not unduly discriminatory terms.[125] Instead, Ofcom decided to issue continuation notices to O2 and Vodafone, pending a further consultation in July 2004. In this consultation, Ofcom proposed that any access condition be removed in favour of 'less intrusive regulation', on the grounds that there was sufficient commercial interest in the offering of national roaming to 3 and Ofcom's ability to intervene to resolve any disputes if they arose.[126] However, 3 asked Ofcom to delay the withdrawal of the condition until it had re-tendered for the roaming contract, which it successfully completed in 2006, signing a contract with Orange for national roaming outside the 88 per cent coverage it had already built. The condition has since been withdrawn.

8.5.5 Article 6 access-related conditions

Article 6 of the Access Directive requires that the conditions set out in Part I of Annex I of the Access Directive must be imposed on providers of conditional access services. As noted earlier, conditional access services allow broadcasters to make the receipt of their television and radio signals in intelligible form conditional on prior authorization, as well as enabling the provision of interactive services. Sections 73(5) and 75(2) of the Communications Act require Ofcom to impose access-related conditions in relation to conditional access. Section 76 is concerned with the modification and revocation of such conditions.

Following a consultation, Ofcom set access-related conditions in relation to conditional access on 24 July 2003, so that they were in place at the commencement of the new regulatory regime.[127] The conditions were applied to Sky Subscribers Services Limited (SSSL) in respect of its digital satellite platform and mirror the conditions required to be set under Part I of Annex I of the Access Directive. These include the requirement to provide conditional access services to broadcasters on a fair, reasonable, and non-discriminatory basis, to keep separate financial accounts, and to publish charges terms and conditions in relation to conditional

[125] Oftel, *National Roaming Condition*, 15 May 2003. [126] Ofcom, *National Roaming*, 22 July 2004.

[127] DGT, *The regulation of conditional access, Setting of regulatory conditions; Explanatory statement and formal notification pursuant to section 48(1) of the Communications Act 2003* (2003).

access services. Ofcom carried out a market review of 'wholesale digital platform services' in 2006, as well as issuing guidance on how it interprets the obligations on SSSL.[128] In 2015, Ofcom let the access control obligations lapse, on the grounds that SSSL had made voluntary commitments that achieve the same outcomes, while Ofcom retained the necessary powers to intervene if required.[129]

8.5.6 Dispute resolution

Section 185 of the Communications Act 2003 empowers Ofcom to deal with certain disputes between operators in relation to network access.[130] Sections 94 to 104 set out Ofcom's rights in relation to the enforcement of conditions which it has imposed (including SMP conditions and the General Conditions of Entitlement). Notably, civil proceedings can be brought by one operator against another where the first operator suffers loss occasioned by the other operator's breach of a condition. However, Ofcom's consent is required before such proceedings can be brought.[131]

Ofcom has issued guidelines for handling disputes and complaints. It is clear that in relation to both disputes and complaints Ofcom expects the party raising the issue with Ofcom to provide substantial evidence before Ofcom will consider taking action.[132]

8.5.7 Broadband UK

As noted previously, much of the focus on 'access' issues is currently driven by a policy concern to promote the roll-out of NGNs, in the UK as well as other jurisdictions. In addition to providing market participants and new entrants with regulated access incentives, however, governments are also directly intervening in the market through the public funding or subsidization of NGN roll-out by network operators. Such schemes impact on access and interconnection through the conditionality imposed on the receipt of such state funding. State aid may, in itself, create competition problems and is therefore regulated at an EU level;[133] but in terms of access, governments will generally impose pro-access contractual obligations upon any undertaking that receives public monies.

[128] Ofcom, 'Review of Wholesale Digital Platform Services', 10 October 2006 and 'Provision of Technical Platform Services—Guidelines and Explanatory Statement', 21 September 2006.

[129] Ofcom, 'Review of Sky's Access Control Services Regulation', 17 March 2015.

[130] Section 185A was inserted in 2003, enabling Ofcom to invite parties to refer a dispute.

[131] Communications Act 2003, s 104(4).

[132] Ofcom, *Dispute Resolution Guidelines* (7 June 2011).

[133] Commission Communication, EU Guidelines for the application of State aid rules in relation to rapid deployment of broadband networks, OJ C 25/1, 26 January 2013.

In the UK, the Department for Culture Media and Sport has established a team, Broadband Delivery UK, to allocate and distribute public funds designated for broadband roll-out in rural areas.[134] Local authorities can submit plans and apply for a share of the monies; which, if allocated, the work would then be put out to tender to potential suppliers.

8.6 PRACTICAL AND CONTRACTUAL ISSUES IN NEGOTIATING CIRCUIT-SWITCHED ACCESS AGREEMENTS

Every time that access arrangements are entered into there should, of course, be a contract in place setting out the parties' rights and responsibilities. This section will examine some of the practical and contractual issues that are likely to arise when negotiating arrangements for access to parts of the public switched network. IP interconnection agreements are discussed in Section 8.7.

Access agreements are by no means a generic set. For example, a complex agreement to establish a mobile virtual network[135] will have little in common with a basic agreement to interconnect two networks. One factor that does act to distinguish between different kinds of access agreements, however, is whether either party has SMP in the relevant market and, in particular, whether an SMP party is required to publish a reference offer for the access that is sought. This section will analyse first some aspects of those access arrangements not subject to a reference offer, with a particular focus on interconnection agreements. Some special considerations relevant to reference offers will then be examined.

8.6.1 Bespoke access contracts

Whilst a growing number of complex access arrangements exist, a common arrangement that operators deal with on a day-to-day basis remains interconnection. With new telephony providers entering the market on a fairly regular basis, legal advisers and contract managers at telecommunications companies see a steady flow of interconnection agreements. A new entrant is likely first to seek to establish interconnection with the incumbent operator, in order to take advantage of transit services needed to establish connectivity with other operators. This agreement will usually be covered by the incumbent's reference offer; see Section

[134] See <https://www.gov.uk/guidance/broadband-delivery-uk>. See also Commission Press Release, Commission endorses UK National Broadband Scheme for 2016–2020, IP/16/1904, 26 May 2016.

[135] A mobile virtual network agreement gives one operator, usually with limited infrastructure of its own, and without a licence for radio spectrum, the right of access to parts of the network of a mobile operator in order to provide mobile telephony services to its own customers. See further Chapter 11, at Section 11.2.5.

8.6.2. The new entrant may then seek direct interconnection agreements with other operators.

Interconnection agreements are usually bilateral; that is, they govern the terms on which each party will terminate traffic onto the other party's network. Each party is usually subject to almost identical obligations, including identical warranties, and the same exclusions and limits on liability. For this reason, bilateral interconnection negotiations are often fairly harmonious. The parties should still ensure, however, that the contract gives them the legal protection they need. If it is unclear or poorly drafted, it will be of no help to the parties in the event of a later contractual dispute that the initial contract negotiations were not difficult. Interconnection agreements will, of course, contain many of the terms that you would expect to see in any commercial agreement, including provisions setting out payment arrangements, confidentiality, limitations and exclusions of liability, and provisions relating to whether the agreement can be assigned or transferred. The following sections describe some provisions that are particular to interconnection agreements.

8.6.1.1 *Location of the points of interconnection*

The interconnection agreement should set out the location of one or more points of interconnection. It will usually be appropriate to provide that the parties may also agree additional locations for additional points of interconnection at a later time. This way, the parties do not need to enter into another agreement just to establish another point of interconnection.

The most common place to locate a point of interconnection is at the site of a switch of one of the parties. This is commonly described as 'customer sited interconnection'. The location of the point of interconnection at some other location is commonly referred to as 'in-span interconnection'.

With customer sited interconnection arrangements, one party will need to locate (or 'co-locate') equipment inside the other's premises. The agreement should provide when and how the co-locating party is to get access to the other's premises to install and maintain such equipment. The party providing co-location may require the other to indemnify it for any damage caused in its premises.

8.6.1.2 *Termination charges*

The agreement will set out the charges levied by each party for the termination of calls onto its network. Termination charges are usually calculated on the length of the call, so the interconnection agreement will usually specify a charge per minute. The applicable rates may vary according to the time of day.

As already noted, in the UK every public electronic communications network providing mobile call termination or geographic call termination has been

determined as having SMP in the market for the termination of calls onto their respective networks.[136] Ofcom's approach in imposing SMP conditions in respect of call termination services has varied according to the structure of related markets, and whether each operator possesses market power in the related market for call origination. As a result, in the mobile market Vodafone, O2, T-Mobile, and Orange were required to comply with charge controls in respect of their 2G call termination services. In the fixed market, BT is required to base its call termination charges on efficiently incurred long-run incremental costs, reducing each year in line with charge controls, and each other operator providing call termination services is required to provide such services on terms, conditions, and charges that are fair and reasonable.

New-entrant fixed telephony operators must, therefore, only levy fair and reasonable termination charges. However, as a dispute between BT and Telewest has demonstrated, in practice Ofcom requires that charges for fixed geographic call termination are calculated on the basis of 'reciprocal charging'.[137] This means that fixed geographic call charges will be calculated according to a formula based on BT's regulated charges. There is some room for the charges to vary if there are relevant differences between the terminating network and BT's network, but in practice reciprocal charging usually means that each party's termination rates are identical.[138]

8.6.1.3 *Forecasting and provision of capacity*

Interconnection agreements will provide how the parties determine the capacity requirements for each point of interconnection (port capacity), and may require that the parties try to ensure that sufficient capacity is maintained to meet 'busy hour' traffic demands. The parties will usually be required to give each other rolling traffic forecasts, on the basis of which orders for capacity at a particular point of interconnection are placed.

New entrant operators will have no historical data on which to base their traffic forecasts. Whilst there is an entire science dedicated to this area, some element of guesswork will be required. New entrants should therefore resist any provisions that impose penalties for incorrect forecasts, as they are much more likely to get it wrong than a party that has been running its network for some time.

[136] See further Chapter 2, at Section 2.15.2.

[137] Ofcom, *Resolution of a dispute between BT and Telewest about reciprocal charging arrangements for call termination rates* (16 April 2004).

[138] See Ofcom, 'Determination to resolve dispute between Opal Telecom and BT about Opal's fixed geographic termination rates', 29 October 2009.

8.6.1.4 *Interconnection circuits*

Interconnection circuits are links, such as leased lines, that connect a party's network with the point of interconnection. Each party will generally be responsible for ensuring that sufficient links are in place in order that it can terminate calls received via the point of interconnection.

8.6.1.5 *Technical requirements*

A minimum standard for the number of permitted 'dropped calls' (ie calls that are cut off) is common. Interconnection agreements usually also require compliance with a range of standards, as well as with detailed operational manuals developed by the parties.

8.6.2 Reference offers

Reference offers are standard contracts setting out the terms on which an operator will enter into access arrangements. As noted above, NRAs are empowered by the Access Directive to require operators with SMP in a given market to publish a reference offer for network access.

As the largest SMP operator in the UK, BT is required to publish reference offers for a large number of different services. Rather than publishing a separate agreement for each different type of access, BT historically published a small number of agreements with schedules for each different service. However, with the operational separation of BT and the establishment of Openreach, each SMP product now has a distinct reference offer.[139]

Regulators like reference offers because they can see exactly what terms an SMP operator is offering. The other principal advantage is that they eliminate the possibility of the SMP operator unduly discriminating in the terms it offers different operators, because the terms are identical. For this reason, the terms set out in reference offers are usually not open to negotiation.

8.7 PRACTICAL AND CONTRACTUAL ISSUES IN NEGOTIATING IP INTERCONNECTION AGREEMENTS

The internet is characterized by connected networks, and internet users expect close to full connectivity with every website and email address around the world. ISPs, therefore, need to ensure that they have direct or indirect connectivity in place with every other network which makes up the internet. As identified earlier, there are two main ways of achieving IP interconnection: peering arrangements,

[139] Available from <www.openreach.co.uk>.

and paying transit arrangements. A new-entrant ISP is likely to start with one or more paying transit arrangement to achieve worldwide connectivity in one step, and then to pursue peering arrangements with local ISPs once it has established its business, in order to reduce costly transit charges.

Although some descriptions of internet industries give an impression that they are unregulated (and unregulatable!), IP interconnection falls within the definition of interconnection under the Access Directive, and, as such, is regulated in the same manner as other forms of interconnection.[140] As a consequence, those providing a public electronic communications network (which would catch all publicly available ISPs) must generally negotiate IP interconnection with each other on request. IP interconnection agreements are also subject to the same dispute resolution mechanisms as other interconnection agreements, as set above.

8.7.1 Peering agreements

Whilst the term 'peering' is used in different ways, it usually describes an arrangement between two ISPs under which they agree to directly connect their networks to provide reciprocal access to each others' users, for no charge.[141] To prevent networks taking advantage of this situation and sending all their traffic for free across the networks with which they are peering, peering agreements prohibit the exchange of traffic that has originated from, or is destined for, third party networks; that is, the agreements prohibit the exchange of 'transit traffic'.

There are some clear advantages with establishing peering. There are obvious cost advantages where the traffic flowing in each direction is approximately equal, as operators will not need to invest in the accounting infrastructure needed to bill each other for traffic passing over the point of interconnection. Another cost saving arises from the fact that neither party needs to pay a third party upstream transit provider for carrying the traffic between the two networks. One study showed that the cost of carrying traffic to the peering point of interconnection can be less expensive by a factor of ten, than transit services which achieve the same connectivity.[142] There are also some technical advantages with peering, as compared with transit. As the traffic does not traverse third party networks, the connection can

[140] However, the Commission has not identified 'wholesale internet connectivity' as a market for the purpose of *ex ante* market analysis. See Commission Staff Working Document, accompanying Recommendation 2007/879/EC, SEC(2007) 1483/2 rev1, at 37.

[141] In circuit-switched interconnection, similar such arrangements are generally referred to as 'bill and keep'.

[142] Norton, WB, *Internet Service Providers and Peering* (2003), 3. Available at <http://cseweb.ucsd.edu/classes/wi01/cse222/papers/norton-isp-draft00.pdf>.

potentially be faster and more reliable, resulting in lower 'latency', meaning that less packets of data are lost.

It is obviously in ISPs' interest to ensure faster traffic consumption, particularly if they are billing their users based on the amount of data downloaded!

Peering is not always the right solution, however. The most common reason why parties will not peer is that the traffic flow between them is asymmetrical, and one party will therefore bear a greater proportion of the cost of peering.[143] This is not only a question of the respective size of the networks, but also of whether the networks are content-rich. A network that is content-rich will have a small amount of inbound traffic (such as in the form of requests for data on the websites it hosts), but will generate a large amount of outbound traffic (in the form of the content from those websites being sent to the network from which the request was generated). The relative bargaining position of the parties will in this case influence whether a peering arrangement or a paying transit arrangement is established.

In considering a potential peering partner, an ISP is therefore likely to examine how much incoming traffic on its network originates from the potential peer, and how much outgoing traffic is addressed to the potential peer.[144] Calculations are then made to assess whether peering is likely to reduce the cost of the transit between the two networks. Peering will require investment in router capacity and interconnection circuits to carry traffic to the point of interconnection, so will only be justified if significant savings in transit costs will follow.

Some ISPs, particularly large ones, have peering policies which are freely available.[145] Any ISP that meets the criteria can apply to become a peering partner of that ISP. Backbone ISPs' peering policies can include requirements that the peering partner has presence in four or more regions where both parties have a presence, along with sufficient transport bandwidth and traffic volume to warrant direct interconnection.[146]

Once the parties have decided to establish peering arrangements, they will enter into negotiations on the contractual terms that will govern the relationship. Whilst some peering agreements run to hundreds of pages, most are very short and informal documents compared with typical switched interconnection

[143] For further discussion on the advantages and disadvantages with peering, see further ibid, 3–5.

[144] Internet traffic carries in it data that indicates which ISP the traffic originated from ('originating autonomous system' or 'originating AS') and is destined for ('terminating autonomous system' or 'terminating AS'). An ISP may therefore sample their inbound and outbound traffic and determine approximately how much of it originated from another ISPs' network (in the case of inbound traffic) or is bound for routers on the other ISP's network (in the case of outbound traffic).

[145] For example, 'Verizon Business Interconnection Policy for Internet Networks', available at < http://www.verizonenterprise.com/terms/peering/>.

[146] See n 142, 3–4.

agreements.[147] The agreements may be bilateral or multilateral, private or public. Because no charges are levied, peering partners do not treat each other as customers, but as equals. Sometimes this means that each party will be prepared to accept limited contractual undertakings from the other party (such as extremely limited warranties and no service level guarantees) on the basis that they want their own obligations to be as limited as possible. Many peering agreements may be said to lack teeth, but this is a reflection of the perceived low risks involved.

Notwithstanding this, there are a number of considerations that legal advisers reviewing peering agreements should be alert to. The sections below examine some of the issues that need to be addressed.

8.7.1.1 *Access to the peer's users*

A peering agreement should provide each party only with access to the other's users and should explicitly prohibit transit traffic being sent over the points of interconnection. Without this provision, operators could be required to carry any traffic originating from their peer across their network without receiving any payment for doing so; this would obviously go against the spirit of the peering arrangement.

The parties can normally identify and stop transit traffic because each party's AS numbers and router addresses will be included in the peering agreement. Packets of data with other AS numbers or originating from other routers can therefore be recognized.

8.7.1.2 *Location of the points of interconnection*

One of the first issues that the parties are likely to discuss and agree upon is the location(s) of the point(s) of interconnection. In some large cities, one option may be to interconnect at a public internet exchange, such as London Internet Exchange (LINX), where numerous network operators directly interconnect at one geographic location. Public internet exchanges manage the interconnection on their members' behalf and require their members to comply with common technical requirements. Some are run on a not-for-profit basis, with each member only contributing to the cost of running the exchange, whereas others are run by profit-making entities. Internet exchanges such as LINX have hundreds of ISP members, and one or both parties negotiating peering may already have a presence at the exchange. In these circumstances establishing peering may take as little as a matter of hours once the agreement has been signed.

There are some clear advantages with interconnecting at a public internet exchange, a primary one being that each ISP will only need to have one single

[147] BEREC Report, 'An assessment of IP interconnection in the context of Net Neutrality', BoR (12) 130, 6 December 2012, notes, '99% of interconnection arrangements are concluded on a handshake basis'!

interconnection circuit between its network and the exchange in order to peer with many other networks. Some internet exchanges also have standard bilateral agreements on which their members contract, which can significantly simplify negotiations.[148]

Peering at a public internet exchange will not always be viable or desirable, however. For remote networks, the closest exchange may be far from any of the operator's network nodes,[149] or an operator may anticipate having few regional peering partners, meaning that peering at the exchange does not result in benefits from economies of scale. In these cases operators will enter into arrangements to peer at private peering points. Private peering points give the parties greater control over the interconnection, and, accordingly, much greater control over the quality of the service that can be expected.

Private peering is typically arranged by each party obtaining co-location services at a telecommunications exchange, and then establishing interconnection between the networks. The parties may find that they have points of presence[150] in common exchanges already, in which case establishing the physical interconnection can be achieved very quickly. If peering points are needed at further exchanges where the parties do not have points of presence, then they will need to agree which exchange(s) best suit their needs, and approach those exchange(s) to obtain co-location.

Many cost and operational issues will influence the decision when choosing an exchange, including whether competitively priced interconnection circuits are available between the parties' respective networks and a particular exchange.

It is not uncommon for large networks to establish peering at a variety of public internet exchanges and private peering points. Some peering agreements provide that the parties are required to investigate moving the location of a point of interconnection from a public internet exchange to a private peering point if and when the volume of traffic exchanged over the point of interconnection exceeds a certain level.

This is intended to give operators greater control over the quality of service at those points of interconnection which carry the heaviest traffic.

8.7.1.3 *Compliance with peering criteria*

As already noted, many network operators have formal or informal criteria when choosing peering partners. What happens, however, when the parties have entered

[148] See, for example, the LINX bilateral interconnect agreement at <https://www.linx.net/about/good-of-the-internet/bcps/inter-peer-technical-resolution>.

[149] A network node describes a point in the network at which interconnection can be established.

[150] A point of presence is a point in the network from which users are connected.

into a peering relationship and the peering partner subsequently fails to meet the criteria? For example, many operators will only be looking to peer with networks where the traffic flow between the two networks is relatively equal. However, the ratio of traffic transmitted from one network to the other may change over time, for example if one network operator develops its hosting business and becomes a net exporter of content.

Peering agreements sometimes deal with this by setting a traffic ratio (eg 4:1 outbound traffic to inbound traffic). The parties agree to peer (without settlement) up to the ratio, beyond which they must pay the other party, usually for each Megabyte of outbound traffic. This arrangement is a form of paid transit arrangement, discussed further. The issue of traffic ratios was brought into focus in 2003 in a dispute in the US between America Online (AOL) and Cogent Communications Group. AOL offered peering when the traffic ratio was no more than 2:1 and when the ratio with Cogent reached 3:1, AOL terminated the peering connection. In enforcing its traffic ratio criteria, America Online began to charge Cogent for traffic that had previously been exchanged free of charge.[151]

Another example where peering criteria may be enforced is where one operator requires the other's network to have certain minimum characteristics. If the characteristics are not met, then sometimes transit charges are payable, such as if a minimum threshold for packet loss is exceeded.

Any provisions in a peering agreement that can potentially change the nature of the relationship to a paying transit relationship should be closely reviewed by legal advisers.

8.7.1.4 *Confidentiality and security*

As with switched interconnection agreements, there are two distinct confidentiality concerns: confidentiality of customer information and communications, and confidentiality of business information shared between the parties for the purpose of peering. Although limited, necessary traffic analysis may be permitted by the peering agreement, it will usually prohibit the capture of the content of any traffic exchanged between the parties' networks.

Standard confidentiality clauses should always be included to protect against the disclosure of business information learned through the peering relationship, and, importantly, against the use of such information for any purpose other than the performance of the agreement.

[151] See Noguchi, Y, 'Peering dispute with AOL slows Cogent customer access', *Washington Post*, 27 December 2003, available at <http://legalminds.lp.findlaw.com/list/cyberia-l/msg42080.html>.

8.7.1.5 *Sharing of costs*

Where the parties interconnect at a public internet exchange, they will each have a separate agreement with the body that runs the exchange governing the costs of running the exchange, and so such costs will not need to be dealt with in the peering agreement. Where a private peering point is used, however, the parties must determine how costs are to be divided between them. Each operator may pay half, or the costs may be split based on the amount of traffic exchanged in each direction.

8.7.1.6 *Technical and operational schedules*

The information in the technical and operational schedules may include information such as the physical addresses of the points of interconnection, details of the parties' infrastructure, and the parties' contact details. Contact details will in most cases include details for a 24-hour network operation centre. Provisions for disaster recovery are also becoming more common.

8.7.2 Paying transit agreements

In this chapter, the term 'paying transit' is used to refer to any IP interconnection arrangements that are not settlement free. Historically, smaller ISPs would enter into paying transit arrangements with transit providers in order to obtain connectivity with third party networks that were beyond the smaller ISP's reach. The exchange of traffic between users of the small ISP and users of the transit provider was often governed by a peering arrangement, with points of interconnection often established at public internet exchanges.

This changed, however, between 1996 and 1998, when many of the large US backbone providers radically changed their peering criteria. Within a very short time many pulled out of public internet exchanges and changed the majority of their peering partners into paying customers. Backbone providers commonly only peer with a very small number of their largest competitors. Paying transit arrangements, therefore, now describe both the arrangement under which an operator transits traffic between two different networks for a fee, and the arrangement under which it charges for access to its own users and content hosted on its own network.[152] However, a recent relative decline in IP-transit has been attributed to the growth of Content Distribution Networks (CDNs),[153] which are designed to

[152] A detailed discussion of the series of events in the US in this period is included in Cukier, KN, 'Peering and fearing: ISP Interconnection and Regulatory Issues', <http://www.cukier.com/writings/peering-cukier-dec97.html>.

[153] Both third party CDN service providers, such as Akamai, and self-provision CDNs, such as Netflix Open Connect.

address latency concerns for sensitive traffic, such as streaming video services, as well as greater regional peering, enabling circumvention of transit provided by the tier 1 backbone providers.[154]

Many ISPs find that they must pay their upstream internet access provider or backbone provider a fee, often called a 'download fee' for inbound traffic received over a point of interconnection, whether the traffic has originated on a third party network or the internet access provider/backbone provider's own network. The download fee will be charged, for example, when a user on the downstream ISP downloads a web page hosted on the backbone provider's network or on any network from which the backbone provider has agreed to provide transit.

Some internet access providers/backbone providers also charge a fee, sometimes called a 'backchannel fee', for data received onto their network from the downstream network. A backchannel fee will be charged to the downstream network, for example, when a user on the backbone provider's network, or on any network to which the backbone provider has agreed to provide transit, downloads a web page hosted on the downstream network.[155]

ISPs can find, therefore, that they are paying for both inbound and outbound traffic carried by their upstream access provider. Although some content-rich networks are able to negotiate a more favourable position, many ISPs cannot. These arrangements have caused some disquiet amongst small and medium sized ISPs. Unsurprisingly, in paying transit arrangements customers look for more detailed and more onerous contractual terms from their transit providers than they do from their peering partners. Some of these terms will be similar to those described for peering agreements, above. Some of the terms that are likely to differ are considered in the following sections.

8.7.2.1 *Access to all networks*

Unlike peering partners, who will only provide access to users on their own network, transit providers can provide access to virtually all other networks on the public internet through upstream transit agreements. The paying transit agreement will set out which routes the agreement applies to. This will not, obviously, include those routes where the customer network has established private peering relationships or where other transit arrangements are in place.

8.7.2.2 *Location of the points of interconnection*

Whilst it is possible to establish paying transit arrangements at public internet exchanges, private interconnection arrangements are more common because the transit operator has better control over quality of service.

[154] See n 152, at 58.

[155] A good explanation of the payment arrangements can be found in the ACCC discussion paper 'Internet Interconnection Service' (2003).

8.7.2.3 *Service levels*

Detailed schedules are likely to specify service level guarantees and may specify service credits or liquidated damages in the event that the service levels are not met.

8.7.2.4 *Charges*

Much detail is likely to be dedicated to how the charges payable are to be calculated, invoiced, and paid. Numerous different models may be used to calculate transit charges, including on a per byte basis or on a port basis (ie a flat-rate charge). Discounts may be applied based on volume or the perceived value of the content hosted on the customer network.

8.8 CONCLUDING REMARKS AND FUTURE TRENDS

The interconnection and access regime does not have a significant impact on interconnection and access arrangements between two operators who do not possess SMP. Although the regime requires them to negotiate interconnection with each other, there are commercial incentives for them to do so in any case. In this respect the regime may be said to merely reinforce rational market behaviour.

However, it is apparent that competing operators in the EU continue to rely heavily on the existence of sector-specific rules, particularly in the form of *ex ante* conditions and directions on network access, to obtain access rights from operators with SMP. This appears to be as much the case under the Access Directive as under the Interconnection Directive before that. Although there is no doubt that general competition law would prohibit the refusal to supply access in many cases,[156] it seems unlikely, for example, that general competition law would have resulted in competing operators obtaining rights access to FRIACO interconnection, ATM interconnection, and to wholesale line rental.

However, the gradual erosion of the market shares held by incumbents, and the emergence of new technologies in which they do not have a stranglehold, such as voice-over IP, is likely to prompt incumbents to argue for the retreat of the sector-specific rules. This is an ongoing battleground between incumbent operators and their competitors.

[156] See further Chapter 10.