Draft Determination to resolve a dispute between Energis and BT regarding the provision of short haul data services and dense wave division multiplexed services

Consultation document

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Contents

Section 1

Summary

1.1 The draft determination in Chapter 7 below forms Ofcom's proposed resolution of the dispute submitted by Energis regarding BT's refusal to provide wholesale variants of its short haul data services ("SHDS") and dense wave division multiplexed ("DWDM") services.

1.2 In line with its conclusions in the recently published review of retail leased lines, symmetric broadband origination and wholesale trunk segments markets ("the leased lines market review"), Ofcom proposes to determine that a wholesale variant of BT's retail SHDS products falls within the alternative interface symmetric broadband origination ("AISBO") market identified in that review. It was concluded in the leased lines market review that BT has significant market power ("SMP") in the provision of AISBO services and SMP obligations were imposed on BT as a result of this finding, including an obligation to meet all reasonable requests for network access.

1.3 Ofcom proposes to conclude that the wholesale variants of BT's retail DWDM products requested by Energis fall outside the markets defined in the market review. As such, no SMP finding has been made and no obligation imposed on BT to meet requests for network access. Given the lack of network access obligation, Ofcom proposes to resolve the part of the dispute relating to wholesale DWDM products by concluding that BT is under no obligation to provide the network access requested by Energis. Ofcom proposes to reach a similar conclusion in respect of variants of the SHDS products where Energis would provide the network termination equipment (NTE).

1.4 However, as outlined in Chapter 5 below, Ofcom is minded to conclude that the requests for some of the variants of the wholesale SHDS products where BT would provide the NTE are reasonable and that BT must therefore make them available at cost oriented prices and non-discriminatory terms and conditions. Others appear to be unreasonable, on grounds of technical feasibility and lack of reasonable demand.

1.5 The parties to the dispute and any other interested parties have 10 working days in which to provide comments to Ofcom on its proposed resolution of this dispute. Comments should be provided in the method described in Chapter 8 below and should reach Ofcom by no later than 5pm on 2 August 2004. Following the conclusion of this consultation period, Ofcom will consider the responses and publish a final determination to resolve the dispute.

Section 2

Background

2.1 On 3 July 2003, Energis submitted a dispute to the Director General of Telecommunications ("Oftel") for resolution under the Telecommunications (Interconnection) Regulations 1997 (SI 1997/2931) ("the Regulations") regarding BT's refusal to provide wholesale inputs to allow competition with BT's retail short haul data services ("SHDS") and Wavestream products.

2.2 Discussions between Energis and BT on the provision of these products had commenced on 14 May 2002 and continued until 29 October 2002, when BT wrote to Energis advising that:

- BT had already spent considerable effort developing a set of partial private circuits ("PPC") products;
- the interconnection service requested by Energis amounted to little more than fibre provision, and the fibre provide market was competitive;
- the prices for BT's retail SHDS products were already competitively offered; and
- the aim of the Interconnection Directive (97/33/EC) was to establish the interconnection of telecommunications networks. BT suggested that there was a strong likelihood that network would not exist to the end user and that, as a result, interconnection would not be possible. BT also disputed that it had significant market power ("SMP") in the markets for SHDS products.

2.3 On 19 July 2003, Oftel advised Energis and BT that it considered there to be a dispute between the parties and published the scope of the dispute that it intended to resolve. The scope was as follows:

"To determine whether BT should be required to offer and provide interconnection variants of the following retail SHDS products:

(i) LES 2
(ii) LES 3
(iii) FIS
(iv) LES 10
(v) LES 100
(vi) Star Networks
(vii) LES 155
(viii) LES 622
(ix) LES 1000
(x) CES 1000
(xi) Wavestream Connect
(xii) Wavestream Metro and Connect National"

2.4 On 25 July 2003, the Regulations were replaced by the Communications Act 2003 ("the Act"), which implemented the new EC regulatory framework for communications networks and services into UK law. Where the Regulations had only permitted interconnection disputes to be considered, the Act allows for the consideration of disputes concerning, amongst other things, network access.

2.5 Section 188 of the Act requires that disputes be resolved within four months by issuing a determination, except where it is considered that there are alternative

means available for resolving the dispute and unless there are exceptional circumstances that prevent the resolution of the dispute.

2.6 Interconnection disputes submitted prior to 25 July 2003 can be resolved using powers exercisable under the Regulations via the transitional provisions under schedule 18 of the Act. Following Energis's confirmation in November 2003, Oftel agreed to consider the dispute as one referred solely under section 185 of the Act and not under the transitional provisions under schedule 18 and notified the parties accordingly. Oftel further advised that, as set out in its standard dispute resolution procedures, "Dispute resolution under the new EU Directives", that it did not consider it feasible or practical to deal with disputes about the provision of major new products in advance of a market review.

2.7 The relevant market definitions and access obligations relating to the products requested by Energis were being considered by Oftel in its review of retail leased lines, symmetric broadband origination and trunk segments markets (the "leased lines market review"). The ongoing market review led Oftel to conclude that the circumstances surrounding this dispute were exceptional circumstances and that, pursuant to Section 188(5) of the Act, Oftel need not resolve this dispute in four months.

2.8 Oftel advised that it intended to wait until the conclusion of the market definitions and access obligations in the leased lines market review before seeking to resolve this dispute.

2.9 On 29 December 2003 the Office of Communications ("Ofcom") assumed the powers of Oftel in relation to electronic communications networks and services in the UK.

2.10 Ofcom issued a statement on 24 June 2004 setting out its findings as regards the markets for retail leased lines, symmetric broadband origination and wholesale trunk segments. Ofcom therefore considers that it is now in a position to resolve the dispute submitted by Energis, the exceptional circumstances referred to above no longer being applicable.

Section 3

The legal framework

The dispute

3.1 Section 185 of the Act concerns disputes relating to the provision of network access and rights or obligations conferred or imposed under Part 2 of Chapter 3 of the Act. The requirement to provide network access is an obligation that can be imposed on a communications provider under section 87 of the Act where that communications provider has been found to have significant market power (SMP) in a market. Section 87 allows Ofcom to impose requirements regarding the provision of network access, the use of the relevant network and the availability of relevant facilities.

3.2 The dispute brought by Energis relates to the provision of "network access".

3.3 Network access for the purposes of the dispute resolution provisions in the Communications Act 2003 (the "Act") is defined in section 197(1). This says that network access has the same meaning as in Chapter 1 of the Act.

3.4 For the purposes of Chapter 1, network access is defined in section 151(3) and (4). This says:

"(3) In this Chapter references to network access are references to –

(a) interconnection of public electronic communications networks; or

(b) any services, facilities or arrangements which –

(i) are not comprised in interconnection; but

(ii) are services, facilities or arrangements by means of which a communications provider or person making available associated facilities is able, for the purposes of the provision of an electronic communications service (whether by him or by another), to make use of anything mentioned in subsection (4);

and references to providing network access include references to providing any such services, making available any such facilities or entering into any such arrangements.

(4) The things referred to in subsection (3)(b) are-

(a) any electronic communications network or electronic communications service provided by another communications provider;

(b) any apparatus comprised in such a network or used for the purposes of such a network or service;

(c) any facilities made available by another that are associated facilities by reference to any network or service (whether one provided by that provider or by another);

(d) any other services or facilities which are provided or made available by another person and are capable of being used for the provision of an electronic communications service."

3.5 The products requested by Energis fall within "network access" because they fall within section 151(3)(b)(ii) being any services, facilities or arrangements by means of which a communications provider is able for the purposes of the provision of an "electronic communications service (whether by him or by another)" to make use of "anything mentioned in subsection 4" (and in this case subsection 4(c) – "any facilities made available by another that are associated facilities by reference to any network or service (whether one provided by that provider or by another)").

3.6 This definition therefore requires a number of elements:

- the products requested by Energis to be services, facilities or arrangements
- Energis to be a communications provider
- Energis being able, for the purposes of the provision of an electronic communication service, to make use of something in subsection 4

Services, facilities or arrangements

3.7 The products requested by Energis are services, facilities or arrangements within the ordinary meaning of those words.

Communications provider

3.8 A "communications provider" is defined in section 405(1) of the Act. It is a person who provides an electronic communications network or an electronic communications service.

3.9 An electronic communications network is defined in section 32(1) as:

"(a) a transmission system for the conveyance, by the use of electrical, magnetic or electro-magnetic energy, of signals of any description; and

(b) such of the following as are used, by the person providing the system and in association with it, for the conveyance of the signals-

(i) apparatus comprised in the system;
(ii) apparatus used for the switching or routing of the signals; and
(iii) software and stored data."

3.10 An electronic communications service is defined in section 32(2) as:

"a service consisting in, or having as its principal feature, the conveyance by means of an electronic communications network of signals, except in so far as it is a content service."

3.11 Energis is a communications provider as it provides an electronic communications network and/or electronic communications service(s).

Energis being able, for the purposes of the provision of an electronic communication service, to make use of something in subsection 4

3.12 In this case Energis is able, for the for the purposes of the provision of an electronic communication service, to make use of something in subsection 4.

3.13 Ofcom considers that the products requested by Energis fall within subsection 4(a). This refers to "*any electronic communications network or electronic communications service provided by another communications provider*".

3.14 The products requested by Energis constitute an electronic communications service because, in accordance with the definition of electronic communications service in section 32(2) they form a service that consists in or has as its principal feature the conveyance by means of an electronic communications network of signals, except in so far as it is a content service.

3.15 However, even if the products requested by Energis do not fall within the provisions of subsection 4(a), Ofcom considers that they would fall within subsection 4(d). This refers to "*any other services or facilities which are provided or made available by another person and are capable of being used for the provision of an electronic communications service".*

3.16 The products requested by Energis could be described as services or facilities which are provided or made available by BT and are capable of being used for the provision of an electronic communication service provided by Energis (e.g. end-to-end leased lines).

3.17 Finally, Energis is able to make use of those services described in subsection 4(a) or alternatively 4(d) for the purposes of providing an electronic communication service as defined in section 32(2). This is because its service (i.e. the end-to-end leased lines service) is a service consisting in, or having as its principal feature, the conveyance by means of an electronic communications network of signals, except in so far as it is a content service.

Framework

3.18 In resolving a dispute Ofcom considers it important to take into consideration the relevant regulatory framework which is currently in place. This is particularly important given that Article 20 of the EU Framework Directive (Directive 2002/21/EC) requires Ofcom in resolving a dispute, to respect the provisions of the Framework Directive, Access Directive (Directive 2002/19/EC), Authorisation Directive (Directive 2002/20/EC), Universal Service Directive (Directive 2002/22/EC) and Directive 97/66/EC.

3.19 Consequently, Ofcom's starting point is to determine:

(i) what market(s) the products requested by Energis fall within and whether BT has been designated as having SMP in those market(s);
(ii) if BT has been designated as having SMP, whether a network access obligation has been imposed; and
(iii) if (i) and (ii) are satisfied, does the provision of the products requested by Energis fall within the scope of the network access obligation.

Section 4

Product and regulatory framework analysis

The products

4.1 In its dispute submission, Energis requested that BT be required to make available wholesale inputs that would allow Energis to compete with the following BT retail products:

(i) LES 2
(ii) LES 3
(iii) FIS
(iv) LES 10
(v) LES 100
(vi) Star Networks
(vii) LES 155
(viii) LES 622
(ix) LES 1000
(x) CES 1000
(xi) Wavestream Connect
(xii) Wavestream Metro and Connect National

4.2 These products fall into two main categories; those providing local area network (LAN) extension services ("LES") and the Wavestream products. The LES group consists of the products listed (i) to (x) above and the Wavestream group comprises those numbered (xi) and (xii). Energis is seeking two variants of the identified products; one where BT provides the network terminating equipment ("NTE"), and the other where Energis provides the NTE.

LAN Extension Services

4.3 LES are used to provide a dedicated point-to-point fibre optic connection between two sites. This dispute relates to the retail short haul data service ("SHDS") products that BT uses to provide LES.

4.4 BT currently offers a range of retail SHDS products, the majority of which are Ethernet-based though some are provided by means of Asynchronous Transfer Mode ("ATM"), Fibre Channel and Fibre Distribution Data Interface ("FDDI") technology. Details of the SHDS products are available from BT's website at www.serviceview.bt.com/list/current/docs/Private_Cir_.boo/1309.htm and Energis has requested that BT be required to provide network access variants of all these products. In simple terms, the retail products provided by BT consist of one or two fibre optic cables of generally up to 35km in length that run between two customer sites. The fibre cables have NTE connected to both ends and allow the transmission of Ethernet, ATM, Fibre Channel or FDDI data between the two points.

Wavestream products

4.5 BT's Wavestream product range is based around dense wave division multiplexing ("DWDM") technology. DWDM is a technology that enables a

single fibre to transmit a number of wavelengths of light, with each wavelength providing transmission of data in various formats that can be used to offer a variety of services. They are capable of carrying Synchronous Digital Hierarchy ("SDH"), ATM and Internet Protocol ("IP") as well as Ethernet on separate wavelengths, with each wavelength currently having a capacity of up to 2.5Gbit/s. BT currently offers two main retail DWDM products: 'WaveStream Connect' and 'WaveStream Regional, National & Metro', details of which are available from www.serviceview.bt.com/list/current/docs/DWDM_Wavelength_Svc.boo/sectoc.htm. Energis has requested that BT be required to provide network access variants of both these products.

4.6 The Wavestream products referred to above are typically sold as a "basic" option, whereby they are transparent and enable the purchaser to add customer premises equipment ("CPE") to determine the protocol that is transmitted over the circuit. CPE differs from NTE in that it sits on the customer's side of the network terminating point and does not form part of the BT network. It is the customer's responsibility to ensure that any CPE they add to the circuit are capable of enabling the service they desire to be provided on an end-to-end basis – e.g. where the customer adds Ethernet CPE, it is their responsibility to ensure that the distance limitations of the technology are not exceeded as BT does not guarantee that an Ethernet circuit can be provided, only that a Wavestream circuit is provided.

4.7 BT additionally offers a "managed" variant of the Wavestream product, Wavestream Modular, whereby it will provide the CPE and assess the ability of the end-to-end circuit to provide the service that the customer is seeking (e.g. it will carry out an assessment as to whether any distance constraints of Ethernet technology would prevent the circuit from working properly). A network access variant of this product was not part of the dispute between Energis and BT and so has not been considered when resolving this dispute.

Product and regulatory framework analysis

Wholesale LES products

4.8 As Ofcom has identified in the leased lines market review statement published on 24 June 2004[1], BT's LES products fall within the retail alternative interface market. In particular, Ofcom stated in paragraph 2.54 of the market review statement that: "the term 'alternative interface' refers to a broad category of products that provide a point-to-point fibre connection (including those products referred to as local area network extension services (LES))". The LES products are symmetric retail circuits offering dedicated capacity between two points using Ethernet, ATM, Fibre Channel or FDDI technology.

4.9 Wholesale equivalents of these products would take the form of a partial private circuit, hereafter termed a LES partial private circuit ("LES PPC"), since, rather than running from a Third Party site to another Third Party site, they would run from a Third Party site to a point of connection. In determining in which wholesale market LES PPC products would fall, it is necessary to look at the two variants sought by Energis and whether the distinction as to who provides the NTE affects the market that the product falls within.

[1] See http://www.ofcom.org.uk/consultations/past/llmr/statement/state_note.pdf

LES products where BT provides the NTE

4.10 The LES PPC products where BT provides the NTE are network access variants of the retail LES products in that they provide symmetric capacity between two points using Ethernet, ATM, Fibre Channel or FDDI.

4.11 In the leased lines market review, Ofcom defined a market for alternative interface symmetric broadband origination (AISBO) services. In paragraph 1 of the Notification set out in Annex D of the market review statement, which formally identified the leased lines markets in which BT had been found to have SMP, Ofcom defined the AISBO market as:

(c) the provision of alternative interface symmetric broadband origination at all bandwidths within the United Kingdom but not including the Hull Area;

4.12 Ofcom identified that network access equivalents of end-to-end LES circuits would fall within the AISBO market at paragraph 2.209 of the review statement where it concluded: ”The AISBO market would potentially include wholesale equivalents of end to end LES circuits”.

4.13 Ofcom concluded in the leased lines market review that BT has SMP in the provision of AISBO services in the UK (excluding the Kingston upon Hull area). As a result of this finding of SMP, Ofcom imposed a number of obligations on BT (see paragraph 6.2 below) – including a requirement to provide network access on reasonable request and to provide such access on cost oriented, non-discriminatory terms.

4.14 Ofcom is therefore satisfied that the LES PPC products where BT provides the NTE fall within a market in which BT has been designated as having SMP.

Energis provided NTE

4.15 The LES PPC products where Energis provides the NTE are significantly different to those where BT provides the NTE. Where Energis provides the NTE, the actual product provided by BT amounts to dark fibre.

4.16 The market for dark fibre is not one that Ofcom reviewed in the leased lines market review, though it was noted at paragraph 2.268 of the review that this market sits upstream of the AISBO market discussed above. Dark fibre provides an input into the AISBO market and a number of other markets identified in the market reviews carried out by Ofcom and Oftel. All of the product markets identified in the leased lines market review are defined on the basis of the protocol running over them. Given that dark fibre has no protocol running over it, it does not fall into any of the markets identified in the leased lines market review. As a result of the market for dark fibre not having been reviewed, no obligations have been imposed on BT in this market, including no requirement to provide network access.

4.17 Ofcom is only obliged to conduct reviews of those markets on the European Commission’s recommended list, of which the market for dark fibre is not one. However, where Ofcom concludes that a dispute about access in a market where access conditions have not been imposed by a market review or in areas where Ofcom has not carried out a review raises significant regulatory issues, then it may carry out a market review into whether an access obligation should be imposed before it resolves the dispute.

4.18 Ofcom does not consider that sufficient regulatory issues exist at present to justify undertaking a review of the market for dark fibre. Dark fibre provides an input into a large number of communications markets, many of which have been reviewed by Ofcom. During the course of these markets reviews, Ofcom has not identified any regulatory issue that would currently require the provision of access to dark fibre as a means of solving it or that could not be addressed through other SMP remedies.

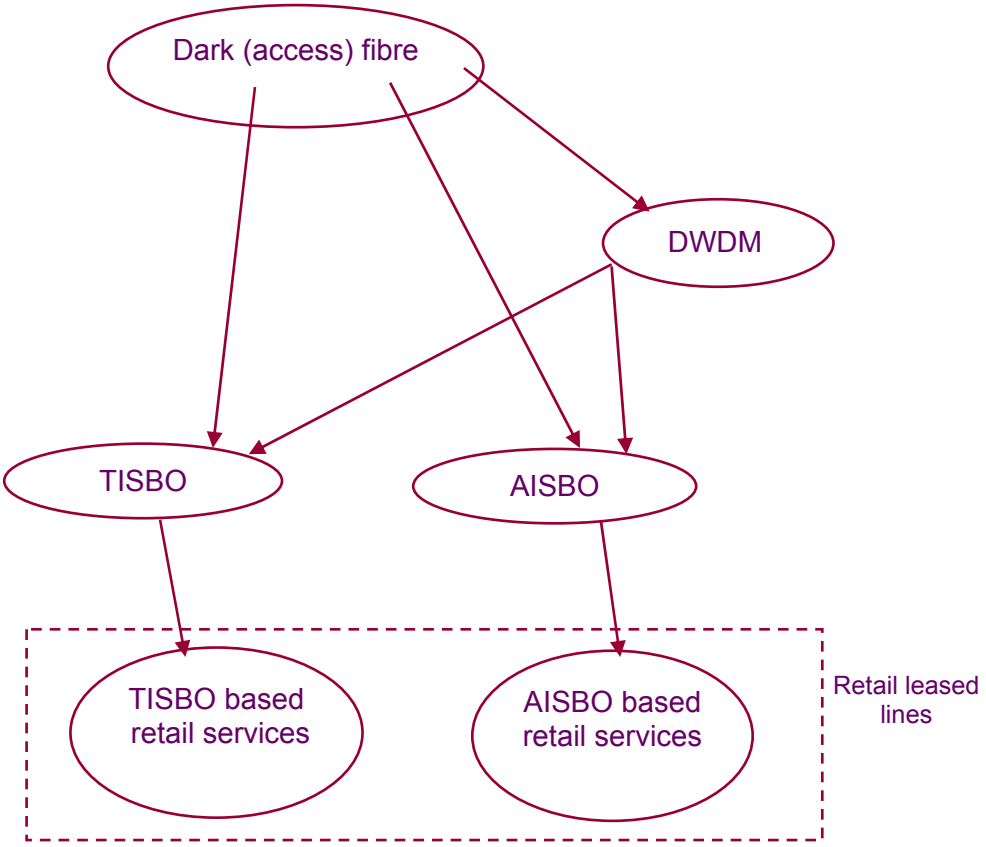
4.19 Although BT has not been found to have SMP in this market Ofcom decided not to send the dispute to Alternative Dispute Resolution ("ADR") because Ofcom was better placed in this instance to deal with all the issues at the same time rather than splitting off the issues relating to a market where neither party had SMP and referring those issues to alternative means for resolving the dispute pursuant to section 186 of the Act. In addition, as the dispute concerned a request for new network access Ofcom felt it was best placed to resolve the dispute in this case.

4.20 Given that no access obligation exists to require BT to provide dark fibre, Ofcom proposes to resolve this part of the dispute submitted by Energis by not requiring BT to provide a LES PPC product where Energis provides the necessary NTE.

Wholesale Wavestream products

4.21 As discussed above, the Wavestream products make use of DWDM technology to enable a single fibre circuit to be split into (up to) 32 separate wavelengths. DWDM itself is a technology that sits upstream of the markets defined in the leased lines market review, as was recognised at paragraphs 2.265 to 2.272 of the review statement. In cases where products are offered on a protocol-free basis, they will form part of markets that are upstream of both the retail and wholesale alternative and traditional interface markets. The NTE referred to below is the DWDM equipment that allows the Wavestream service to be provided, rather than any CPE that can additionally be added to determine the protocol that runs over it. The diagram below shows the network hierarchy described above, with dark fibre at the top and retail products at the bottom. A network access variant of the Wavestream product would fall within the DWDM market set out in the diagram.

Figure 4.1: Network hierarchy



BT provided NTE

4.22 As discussed at paragraph 4.6 above, the basic Wavestream product offered by BT is protocol free, with purchasers of it choosing what protocol they wish to use on each individual wavelength by adding their own CPE. This product provided is transparent, lit fibre.

4.23 The network access variant of the Wavestream product would also need to be protocol free, meaning that the product provided by BT would not fit into either the AISBO or TISBO markets but would rather sit upstream of these markets. It would not be until the purchaser of the circuit added CPE to determine what protocol was capable of being provided over the circuit that the product might fall into one of the identified leased lines markets.

4.24 Ofcom has not carried out a review of markets that sit upstream of the AISBO and TISBO markets and as a result, no obligations have been imposed on BT in these markets – including no requirement on it to provide network access.

4.25 Although BT has not been found to have SMP in this market Ofcom decided not to send the dispute to ADR because it was better placed in this instance to deal with all the issues at the same time rather than splitting off the issues relating to a market where neither party had SMP and referring those issues to alternative means for resolving the dispute pursuant to section 186 of the Act. In addition, as the dispute concerned a request for new network access Ofcom felt it was best placed to resolve the dispute in this case.

4.26 Ofcom is only obliged to conduct reviews of those markets on the European Commission's recommended list, of which the market for protocol free DWDM products is not one. However, where Ofcom concludes that a dispute about access in a market where access conditions have not been imposed by a market review or in areas where Ofcom has not carried out a review raises significant regulatory issues, then it may carry out a market review into whether an access obligation should be imposed before it resolves the dispute.

4.27 Ofcom does not consider that sufficient regulatory issues exist at present to justify undertaking a review of the market for protocol free DWDM products. Protocol free DWDM products could provide an input into a number of leased lines markets, many of which have been reviewed by Ofcom. During the course of these markets reviews, Ofcom has not identified any regulatory issue that would currently require the provision of access to protocol free DWDM products as a means of solving it or that could not be addressed through other SMP remedies.

4.28 As no access obligation exists to require BT to provide network access in the protocol free DWDM market, of which the wholesale version of the Wavestream product is a part, Ofcom proposes to resolve this element of the dispute by not requiring BT to provide a network access variant of the Wavestream product range where BT provides the necessary NTE.

Energis provided NTE

4.29 As discussed at paragraphs 4.15 to 4.20 above, any point-to-point product that is provided without NTE will amount to the provision of dark fibre. Ofcom therefore proposes to resolve this element of the dispute by not requiring BT to provide a network access variant of the Wavestream product where Energis provides the NTE for the same reasons as outlined above.

Product and regulatory framework analysis conclusions

4.30 Having taken into consideration the relevant regulatory framework, Ofcom proposes to conclude that the LES PPC products requested by Energis where BT provides the NTE fall within a market in which BT has been designated as having SMP, i.e. AISBO, and that as such the SMP obligations imposed in that market should apply, including the obligation to provide network access on reasonable request. The reasonableness of Energis' request is considered in Chapter 5 below.

4.31 Ofcom further proposes to conclude that all the network access equivalents of the Wavestream products requested by Energis and the LES PPC product where Energis provides the NTE do not fall within markets in which BT has been designated as having SMP. As a result, Ofcom proposes to conclude that there is no obligation on BT to provide the requested products.

Question 1:
Do respondents agree with Ofcom's conclusions as to which markets the products requested by Energis fall within?

Section 5

Assessment of reasonableness

Basis of assessment

5.1 On 13 September 2002, Oftel published the statement *Imposing access obligations under the new EU Directives* ("the Access Guidelines")[2], which provided guidelines on how it proposed to apply certain provisions of the new EU Directives that related to the imposition of access obligations on communications providers designated as having SMP. The Access Guidelines described the circumstances in which Oftel would consider imposing obligations to provide wholesale access products. Ofcom continues to follow these Access Guidelines.

5.2 The Access Guidelines set out two main considerations to be taken into account when assessing whether it is reasonable to require BT to provide the specific products requested by Energis in markets in which it has been found to have SMP and in which a network access obligation has been imposed. These considerations as applied in this case are:

- is it technically feasible for BT to provide the requested products? and
- do the requested products impose an unnecessary burden on BT, taking into account whether there is sufficient demand to cover development costs and the willingness of Energis to accept a level of risk?

5.3 Ofcom proposes in Chapter 4 that the LES PPCs where BT provides the NTE fall into the AISBO market. BT has been found to have SMP in this market. It is therefore appropriate to consider whether it is reasonable to require BT to provide the specific LES PPC products requested by Energis. Given Ofcom's conclusions above that BT is not obliged to provide network access products where Energis provides the NTE, the LES PPC products discussed refer only to those products where BT provides the NTE and not where Energis does so.

The products

5.4 The LES PPC products requested by Energis can be further split into two broad groups, on the basis of the way in which the product is handed over to Energis:

(i) products that are terminated via use of NTE at Energis' point of connection with BT (see Figure 6.1 below); and
(ii) products that are handed over to Energis through the interconnection of fibre (see Figure 6.2 below).

5.5 Each of these options is considered below against the criteria for reasonableness set out above.

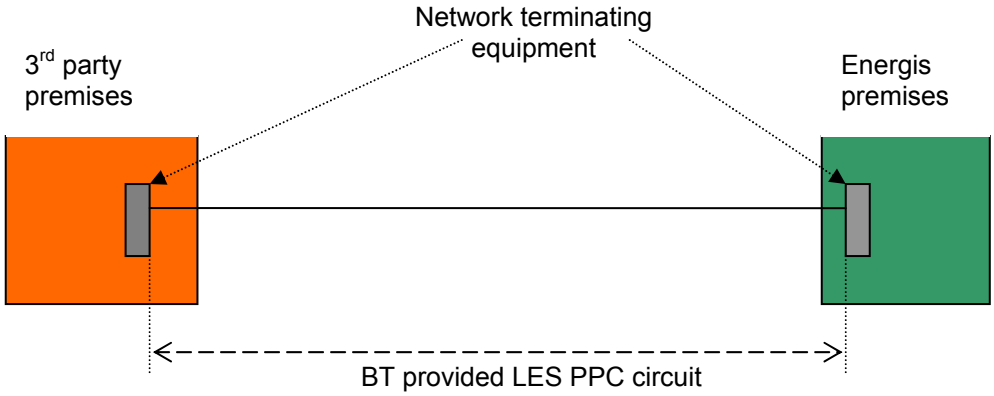
(i) Products terminated on NTE

5.6 These variants of the LES PPC product would see BT provide an end-to-end circuit running from a third party site (Energis' customer) to an Energis point of

[2] http://www.ofcom.org.uk/static/archive/oftel/publications/ind_guidelines/acce0902.htm.

connection with the BT network. The circuit would not, however, be interconnected at this point but rather terminated via BT-provided NTE.

Figure 5.1: Products terminated on NTE



Technical feasibility

5.7 Technically, the circuit provided by BT in Figure 5.1 above would be very similar to the retail LES products sold by BT. The circuit is delivered over Ethernet and is provided with NTE at both ends. Once the circuit is terminated at Energis' premises, Energis can combine it with its own network to onward route the circuit to another 3rd party premises, thereby providing an end-to-end circuit to the purchaser.

5.8 Given that the product in Figure 5.1 is technically very similar to the retail LES products already provided by BT, Ofcom has concluded that it is technically feasible for BT to provide such wholesale LES PPC variants.

Cost recovery

5.9 Given the similarities between the proposed LES PPC products that are terminated via use of NTE and the existing retail LES products, little product development or system change would be required in order to provide them. The main changes would be amendments to include the new product lines in the ordering and billing systems as the actual circuits provided would be physically the same as the existing retail products so would not require major new development. Demand forecasts obtained by Ofcom from Energis and other communications providers suggests that over 5,000 wholesale circuits are likely to be required over the next two years. Given this level of demand, the additional cost of the developments necessary for BT to provide the products is likely to fall a small proportion of the total cost of the LES PPC product. The charges for the LES PPC products should still be sufficiently low as to make them more attractive than the equivalent retail products. Ofcom therefore considers that BT can reasonably be expected to recover the product development costs of LES PPCs that are terminated via NTEs through the connection and rental charges of those products.

5.10 Ofcom notes, however, that BT has withdrawn, or is about to withdraw, from new supply three of the retail products on Energis' original list. In particular, the LES 3 and FIS products are no longer available for new supply, and as from October 2004 BT has advised that it intends to withdraw from new supply LES

2 circuits. BT has advised that the reason for withdrawing these products from new supply was the technical obsolescence of the equipment used to provide the products and a subsequent lack of demand for them. Given this, Ofcom proposes to conclude that it would not be reasonable to require BT to provide LES PPC variants of these products due to the apparent lack of demand for them. In addition, Star Networks is essentially a discount scheme, rather than a specific product, that offers reduced connection charges due to cost savings for certain LES circuits where those circuits are connected to the same central hub. Ofcom considers that these cost savings should be reflected in the cost of providing the LES PPCs, rather than through the provision of a separate product. This issue is discussed further in Chapter 6.

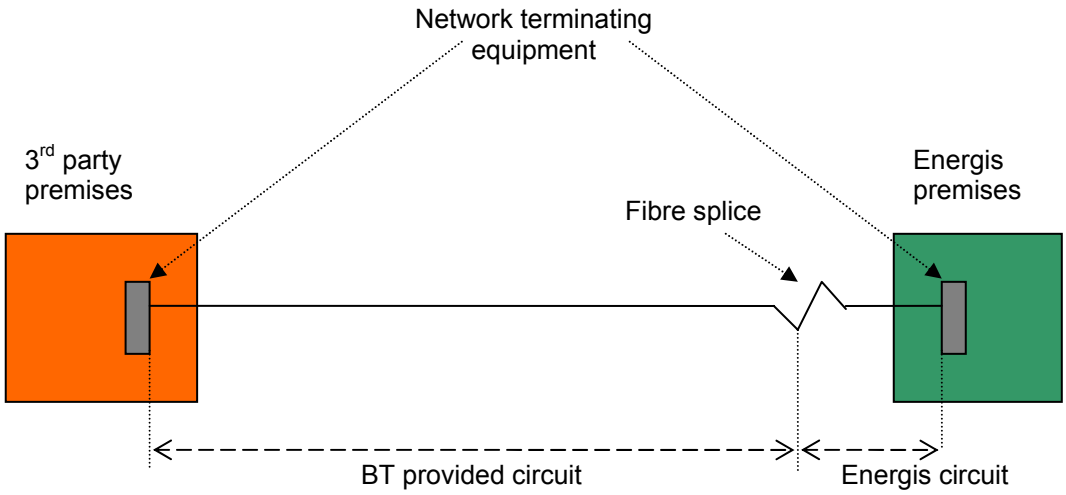
Conclusion on reasonableness

5.11 On the basis of its reasoning set out above, Ofcom has concluded that it is technically feasible for BT to provide the NTE-terminating LES PPC products requested by Energis and that, if required to do so, BT can reasonably expect to receive at least a reasonable rate of return from doing so. Ofcom has therefore concluded that BT should be required to provide a LES PPC product that terminates through the use of NTE.

(ii) Products handed over via fibre interconnection

5.12 LES PPC products handed over via a fibre splice would see BT provide a similar circuit to that described in Figure 5.1 above, with the exception that instead of terminating at an Energis point of connection, the circuit would be left as bare fibre at the Energis point of connection to enable Energis to splice it to one of its own fibres and interconnect it directly into its network. This could take the form of in-span handover ("ISH") or customer-sited handover ("CSH").

Figure 5.2: Products handed over via fibre interconnection



Technical feasibility

5.13 The circuit in Figure 5.2 above is technically very different to the retail LES products currently offered by BT. Rather than being terminated, the BT-provided fibre circuit is interconnected with an Energis fibre, either for

termination at an Energis premises or for onward routing to another third party site for termination.

5.14 There are currently, however, no industry standards as regards the interoperability or operation of Ethernet-based products interconnected in this manner (unlike for SDH-based products, where interoperability standards have previously been agreed for interconnection) and new standards would need to be agreed before such a product could be provided. The lack of such standards would not prevent BT from providing the requested product but the ensuing problems could prevent the service from being workable on an end-to-end basis. These problems include:

- Ongoing fault diagnosis and management problems i.e. who monitors the line for faults and how are these faults located when the circuit consists of fibre belonging to two communications providers?
- Circuit length and fibre compatibility issues i.e. given distance limitations of the technology, who is responsible for measuring the total length of the circuit and ensuring that it doesn't exceed limitations? What happens if the fibres being spliced are not compatible?

5.15 Ofcom is therefore satisfied that it is not currently technically feasible for BT to provide workable network access variants of the LES products that are handed over via fibre interconnection.

Cost recovery

5.16 As the products handed over via fibre interconnection lack terminating equipment at both ends of the fibre provided by BT and do not necessarily pass through a BT exchange, existing methods of fault diagnosis and testing would not work. BT would therefore need to develop new fault diagnosis and testing procedures, at additional cost. This additional cost, which is likely to be substantial and which BT is entitled to recover through its wholesale charges for the products, could result in products that are more expensive than the network access products handed over via an NTE or at least in products that are sufficiently close in cost that the advantages of this option over the NTE-terminated option would be minimal.

5.17 As discussed in paragraph 5.9 above, demand forecasts for these products are in the region of 5,000 over the next two years. If this demand is split equally between the NTE-terminated and fibre interconnection variants, the likelihood of BT recovering its costs of providing some or all of the products is significantly reduced. This is especially the case with the products handed over via fibre interconnection as the additional development cost might well make them more expensive than the products terminating via NTE. Energis has advised that it is unwilling to accept any risk by committing to jointly fund the cost of product development or commit to a certain level of forecasting of the products, with the result that BT faces all the risk of financial loss if there is little or no demand for the fibre interconnection variant of the LES PPC product once it has been developed. Given the choice of the potentially expensive fibre interconnection products or the cheaper NTE-terminated products, communications providers are unlikely to purchase the more expensive products (or purchase them in far smaller numbers than forecast), with the result that BT appears unlikely to recover its costs for those products.

Conclusion on reasonableness

5.18 On the basis of the reasoning set out above, Ofcom has concluded that it is not currently technically feasible for BT to provide a workable wholesale LES PPC product that is handed over via fibre interconnection. Even were such products technically feasible, Ofcom is not satisfied that the development costs of such products would be sufficiently low as to make them attractive to communications providers when compared with the costs of the NTE-terminated variants. Ofcom has therefore concluded that BT should not be required to make available these network access products.

Conclusions

5.19 On the basis of its analysis of the reasonableness criteria in Oftel's Access Guidelines, Ofcom proposes to conclude that BT should be required to provide LES PPCs that terminate via NTE. It is technically feasible to provide such products and BT appears likely to recover its costs of providing these new products. BT should therefore make available LES PPC equivalents of all the following retail products requested by Energis that are available for new supply:

(i) LES 10
(ii) LES 100
(iii) LES 155
(iv) LES 622
(v) LES 1000
(vi) CES 1000

5.20 Ofcom has concluded that as the LES 2, LES 3 and FIS products are either no longer available for new supply or are shortly to be withdrawn from new supply by BT, that it would not be reasonable to require LES PPC variants of these products to be provided. Ofcom has further concluded that as Star Networks essentially amounts to a discount scheme for other LES products, this would be better addressed through the pricing of the LES PPCs than by requiring BT to provide a network access variant of the product.

5.21 Ofcom has, however, concluded that it would not be reasonable to require BT to provide fibre interconnection variants of these LES PPC products as it is not currently technically feasible to provide workable variants of these products and it is unclear that BT would recover its costs of development even if the technical issues were overcome.

Question 2:
Do respondents agree with Ofcom's assessment of the reasonableness of the products requested by Energis?

Section 6

Requirement to provide network access

6.1 Given its proposed conclusion that the LES PPC products requested by Energis where BT provides the NTE fall within the AISBO market in which BT has been designated as having SMP and that it is reasonable to require BT to provide some of the variants of the LES PPCs requested by Energis, it remains for Ofcom to set the general principles covering the prices and terms of supply for these products.

6.2 As a result of its conclusion in the leased lines market review that BT has SMP in the market for AISBO products, Ofcom imposed a number of conditions on BT that set out its obligations in the AISBO market. The conditions, set out in Annex D of the leased lines market review, are as follows (the numbers in brackets indicate the number of the specific SMP condition):

(i) Obligation to provide network access on reasonable request (HH1)
(ii) Requirement not to unduly discriminate (HH2)
(iii) Basis of charges obligation (HH3)
(iv) Requirement to publish a reference offer (HH4)
(v) Obligation to give notice of changes to prices, terms and conditions for existing (90 days) and new (28 days) services (HH5)
(vi) Requirement to provide quality of service information (HH6)
(vii) Requirement to notify technical information (HH7)
(viii) Obligations relating to requests for new network access (HH8)

6.3 Ofcom notes that the obligation to provide network access extends to all reasonable requests for network access products that fall within the AISBO market, and not just PPC equivalents of BT's retail alternative interface products.

Terms and conditions of the required LES PPC products

6.4 In addition to the obligation to provide network access in the form of LES PPCs, the other conditions set out in the leased lines market review statement will also apply to these products as a result of the conclusion that LES PPCs fall within the AISBO market. As such, the LES PPC products must be offered on cost oriented, non discriminatory terms. These terms should reflect, in cases where there is a discrepancy between the two, the cost to BT of providing the network access to Energis (or any other communications provider), rather than the cost of providing a similar circuit to retail providers as a number of the costs associated with the retail products are not relevant to the provision of a network access product.

6.5 The LES PPCs that BT is required to provide are subject to the requirement that their charges are cost orientated. That requirement does not necessarily mean that the charges should reflect actually incurred costs. If circuits are provided in a way which artificially inflates costs then a cost orientated charge would not reflect the recovery of such costs. Such a situation may occur where the use of DWDM to facilitate the provision of multiple LES PPCs is clearly the

most efficient means of providing such circuits and the charge were not set on this basis.

6.6 For the avoidance of doubt, this does not amount to an obligation on BT to provide a network access variant of the Wavestream product. Rather it reflects the view that BT should not be permitted to artificially inflate costs by providing circuits in a manner that is clearly not efficient.

6.7 The non-discrimination obligation requires BT to offer the LES PPC products on the same prices, terms and conditions as it provides equivalent inputs into its own retail products. Where BT makes available new retail alternative products, Ofcom would therefore expect it to make available a network access LES PPC variant at the same time.

6.8 Energis has advised during the course of the dispute that it would like to see BT provide alternative NTEs to those used on its retail products. In particular:

- Energis would like the ability to specify the size of the chassis used to house the equipment at the third party site so that it can plan for future upgrades to the service it provides to the third party;
- Where able, Energis would like to offer single fibre working so as to reduce fibre costs; and
- Energis also requires hot-standby channel cards.

6.9 These options do not form part of the dispute that was originally submitted to Oftel by Energis, the scope of which was finalised in August 2003, and so are not covered in Ofcom's resolution of this dispute. Ofcom would, however, note that the network access obligation imposed on BT as a result of the finding that it has SMP in the AISBO market applies to all reasonable requests for products that fall within this market and not just to the network access equivalents of the retail alternative interface products offered by BT.

Implementation timescales

6.10 Given the similarities between the proposed LES PPC products and the retail LES products, Ofcom is of the view that BT should be able to publish a reference offer that includes the relevant charges and the standard terms and conditions on which it will make the LES PPC products available within 30 working days of the final determination coming into force, in accordance with SMP condition HH4.

6.11 Ofcom recognises that the changes necessary to BT's ordering and billing systems in order to make the LES PPC products available are likely to take longer than 30 working days to implement. Ofcom therefore proposes to allow BT an additional 30 days in which to make the necessary changes to its systems. LES PPC products should therefore be made available for new supply within 60 working days of the final determination coming into effect.

Question 3:
Do respondents agree with the proposed implementation timescales for the products requested by Energis?

Compatibility with Ofcom's duties

6.12 Ofcom considers that the proposed resolution of the dispute detailed above is in line with its duties under sections 3 and 4 of the Act. In particular, Ofcom believes that in line with its duties in sections 3(4)(b) and 4(8), the proposals will promote competition in the retail alternative interface leased lines markets by enabling communications providers to compete more widely with BT, thereby furthering the interests of consumers.

Section 7

The draft determination

DETERMINATION UNDER SECTIONS 188 AND 190 OF THE COMMUNICATIONS ACT 2003 FOR RESOLVING A DISPUTE BETWEEN EMERGIS COMMUNICATIONS LIMITED ("ENERGIS") AND BRITISH TELECOMMUNICATIONS PLC ("BT") CONCERNING THE PROVISION OF NETWORK ACCESS PRODUCTS TO ALLOW ENERGIS TO COMPETE WITH BT'S RETAIL SHORT HAUL DATA SERVICES ("SHDS") AND WAVESTREAM PRODUCTS

WHEREAS:

(A) Section 188(2) of the Communications Act 2003 (the "Act") provides that where there is a dispute between different communications providers relating to the provision of network access, and Ofcom has decided pursuant to section 186(2) of the Act that it is appropriate for them to handle the dispute, Ofcom must consider the dispute and make a determination for resolving it. The determination that Ofcom makes for resolving the dispute must be notified to the parties in accordance with section 188(7) of the Act, together with a full statement of the reasons on which the determination is based.

(B) Section 190 of the Act sets out the scope of Ofcom's powers on resolving a dispute which may include, in accordance with section 190(2) of the Act, a direction imposing an obligation on the parties to the dispute to enter into a transaction between themselves on the terms and conditions fixed by Ofcom.

(C) On 3 July 2003, Energis wrote to the Director General of Telecommunications (the "Director General") and requested that he resolve a dispute between Energis and BT regarding the provision of network access products to allow Energis to compete with BT's retail SHDS and Wavestream products.

(D) On 14 November 2003 and following Energis's confirmation, the Director General agreed to consider the dispute entirely under section 185 of the Act.

(E) In order to resolve this dispute Ofcom has considered amongst other things the information provided by the parties and the relevant duties set out in sections 3 and 4 of the Act.

(F) Ofcom issued a draft of the Determination and the explanatory statement to Energis and BT on 19 July 2004. Responses were invited by 2 August 2004.

(G) Ofcom received comments which it has taken into account in making its final decision.

(H) An explanation of the background to the dispute and Ofcom's reasons for making this Determination are set out in the explanatory statement accompanying this Determination.

NOW, THEREFORE, PURSUANT TO SECTIONS 188 AND 190 OF THE ACT OFCOM MAKE THE FOLLOWING DETERMINATION:

1. Within 60 days of the date that this Determination comes into force, BT shall be required to provide to Energis, between a third party site and a point of connection with Energis' network, dedicated alternative interface symmetric broadband origination network access variants of the retail products listed below, details of which can be found in Section 12, Part 11 of BT's published price list[3].

   (a) LES 10
   (b) LES 100
   (c) LES 155
   (d) LES 622
   (e) LES 1000
   (f) CES 1000

2. The charge for the network access products listed in paragraph 1 of this Determination should be reasonably derived from the costs of provision based on a forward looking long run incremental cost approach and allowing an appropriate mark up for the recovery of common costs including an appropriate return on capital employed.

3. BT shall, within 30 days of the date that this Determination comes into force, publish a reference offer in relation to the network access products listed in paragraph 1 of this Determination.

4. BT may provide if it so wishes, but shall not be required to provide to Energis, network access variants of the following retail products:

   (a) LES 2
   (b) LES 3
   (c) FIS
   (d) Star Networks
   (e) Wavestream Connect
   (f) Wavestream Metro and Connect National (now known as Wavestream Regional, National and Metro)
   (g) Any variants of the products listed in paragraph 1 of this Determination where Energis provides its own network terminating equipment.

5. Words or expressions used in this Determination shall have the same meaning as in the Act, except as otherwise stated in this Determination and as follows:

   (a) "BT" means British Telecommunications plc, whose registered company number is 1800000, and British Telecommunications plc subsidiary or holding company, or any subsidiary of that holding company, all as defined by Section 736 of the Companies Act 1985 as amended by the Companies Act 1989.

   (b) "CES" means fibre channel local area network extension services.

   (c) "FIS" means fibre distribution data interface interconnection services.

   (d) "LES" means local area network extension services.

[3] See http://www.serviceview.bt.com/list/current/docs/Private_Cir_.boo/1309.htm

(e) "Ofcom" means the Office of Communications.

6. For the purpose of interpreting this Determination:

(a) headings and titles shall be disregarded; and,

(b) the Interpretation Act 1978 shall apply as if this Determination were an Act of Parliament.

7. This Determination shall take effect on the day it is published.

8. This Determination is binding on Energis and BT in accordance with section 190(8) of the Act.

Section 8

Responding to this consultation

How to respond

Ofcom invites written views and comments on the issues raised in this document, to be made by 5pm on Monday, 2 August 2004.

Ofcom strongly prefers to receive responses as e-mail attachments, in Microsoft Word format, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 2), among other things to indicate whether or not there are confidentiality issues. The cover sheet can be downloaded from the 'Consultations' section of our website.

Please can you send your response to martin.hill@ofcom.org.uk.

Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.

Martin Hill
Competition and Markets
3rd Floor
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Fax: 020 7981 3990

Note that we do not need a hard copy in addition to an electronic version. Also note that Ofcom will not routinely acknowledge receipt of responses.

It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex 3. It would also help if you can explain why you hold your views, and how Ofcom's proposals would impact on you.

Further information

If you have any questions about the issues raised in this consultation, or need advice on the appropriate form of response, please contact Martin Hill on 020 7783 4334.

Confidentiality

Ofcom thinks it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk, ideally on receipt (when respondents confirm on their response cover sheer that this is acceptable).

All comments will be treated as non-confidential unless respondents specify that part or all of the response is confidential and should not be disclosed. Please place any

confidential parts of a response in a separate annex, so that non-confidential parts may be published along with the respondent's identity.

Ofcom reserves its power to disclose certain confidential information where this is necessary to fulfil its functions, although in practice it would do so only in limited circumstances.

Please also note that copyright and all other intellectual property in responses will be assumed to be assigned to Ofcom unless specifically retained.

Next steps

Following the end of the consultation period, Ofcom intends to publish a statement and final determination once it has taken into consideration the comments made during the consultation period.

Please note that you can register to get automatic notifications of when Ofcom documents are published, at http://www.ofcom.org.uk/static/subscribe/select_list.htm.

Ofcom's consultation processes

Ofcom is keen to make responding to consultations easy, and has published some consultation principles (see Annex 1) which it seeks to follow, including on the length of consultations.

This consultation is shorter than Ofcom's standard 10 week period because it relates to a dispute. As explained in Ofcom's published consultation guidelines, available at http://www.ofcom.org.uk/consultations/consult_method/consult_guide.pdf, the consultation period for disputes will be limited to no more than 10 days.

If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk. We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, whose views are less likely to be obtained in a formal consultation.

If you would like to discuss these issues, or Ofcom's consultation processes more generally, you can alternatively contact Philip Rutnam, Partner, Competition and Strategic Resources, who is Ofcom's consultation champion:

Philip Rutnam
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA
Tel: 020 7981 3585
Fax: 020 7981 3333
E-mail: philip.rutnam@ofcom.org.uk

Annex 1

Ofcom's consultation principles

Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

1. Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

2. We will be clear about who we are consulting, why, on what questions and for how long.

3. We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened version for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

4. We will normally allow ten weeks for responses to consultations on issues of general interest.

5. There will be a person within Ofcom who will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. This individual (who we call the consultation champion) will also be the main person to contact with views on the way we run our consultations.

6. If we are not able to follow one of these principles, we will explain why. This may be because a particular issue is urgent. If we need to reduce the amount of time we have set aside for a consultation, we will let those concerned know beforehand that this is a 'red flag consultation' which needs their urgent attention.

After the consultation

7. We will look at each response carefully and with an open mind. We will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 2

Consultation response cover sheet

A2.1 In the interests of transparency, we will publish all consultation responses in full on our website, www.ofcom.org.uk, unless a respondent specifies that all or part of their response is confidential. We will also refer to the contents of a response when explaining our decision, unless we are asked not to.

A2.2 We have produced a cover sheet for responses (see below) and would be very grateful if you could send one with your response. This will speed up our processing of responses, and help to maintain confidentiality by allowing you to state very clearly what you don't want to be published. We will keep your completed cover sheets confidential.

A2.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to confirm on the response cover sheet that Ofcom can publish their responses upon receipt.

A2.4 We strongly prefer to receive responses in the form of a Microsoft Word attachment to an email. Our website therefore includes an electronic copy of this cover sheet, which you can download from the 'Consultations' section of our website.

A2.5 Please put any confidential parts of your response in a separate annex to your response, so that they are clearly identified. This can include information such as your personal background and experience. If you want your name, contact details, or job title to remain confidential, please provide them in your cover sheet only so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title: Draft Determination to resolve a dispute between Energis and BT regarding the provision of short haul data services and dense wave division multiplexed services

To (Ofcom contact): Martin Hill

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

What do you want Ofcom to keep confidential?

Nothing	☐	Name/contact details/ job title	☐
Whole response	☐	Organisation	☐
Part of the response	☐	If there is no separate annex, which parts?	

If you want part of your response, your name or your organisation to be confidential, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

Yes	☐	No	☐

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response. It can be published in full on Ofcom's website, unless otherwise specified on this cover sheet, and all intellectual property rights in the response vest with Ofcom. If I have sent my response by email, Ofcom can disregard any standard email text about not disclosing email contents and attachments.

Ofcom can publish my response: on receipt ☐ once the consultation ends ☐

Name Signed (if hard copy)

Annex 3

Consultation questions

Question 1:
Do respondents agree with Ofcom's conclusions as to which markets the products requested by Energis fall within?

Question 2:
Do respondents agree with Ofcom's assessment of the reasonableness of the products requested by Energis?

Question 3:
Do respondents agree with the proposed implementation timescales for the products requested by Energis?

Annex 4

Glossary

Alternative interface symmetric broadband origination (AISBO)
A form of symmetric broadband origination service providing symmetric capacity between two sites, generally using an Ethernet IEEE 802.3 interface.

ATM (Asynchronous Transfer Mode)
A technology that enables data transfer asynchronously relative to its input into the communications system. The data is put into cells and transmitted through the network to be re-constructed at the output.

Bandwidth
The physical characteristic of a telecommunications system that indicates the speed at which information can be transferred. In analogue systems, it is measured in cycles per second (Hertz) and in digital systems in bits per second (Bit/s).

Customer Sited Handover (CSH)
Interconnection occurs at a communications provider's premises.

Customer Premises Equipment (CPE)
Sometimes referred to as customer apparatus or consumer equipment, being equipment on consumers' premises which is not part of the public telecommunications network and which is directly or indirectly attached to it.

DWDM (Dense Wave Division Multiplexor)
A technology that uses high frequency lasers to provide transmission of multiple wavelengths of light (currently 32-128 wavelengths) over a single fibre.

DLE (Digital Local Exchange)
The telephone exchange to which customers are connected, usually via a concentrator.

DMSU (Digital Main Switching Unit)
The main type of tandem switch, primarily used for conveying long distance calls. DMSUs form the backbone of the trunk network.

Fibre Distribution Data Interface (FDDI)
An interface that enables the high speed transfer of data.

In Span Handover (ISH)
Interconnection occuring at a point between BT's premises and a communications provider's premises

kbit/s
kilobits per second. A measure of speed of transfer of digital information.

Leased line
A permanently connected communications link between two premises dedicated to the customers' exclusive use.

LES (Local Area Network extension services)

The generic name given by BT to its range of (primarily) Ethernet based point-to-point leased lines.

Long Run Incremental Cost (LRIC)
The cost caused by the provision of a defined increment of output given that costs can, if necessary, be varied and that some level of output is already produced.

Mbit/s
Megabits per second. A measure of speed of transfer of digital information.

Network Terminating Equipment (NTE)
The equipment used to terminate a circuit at a third party site. NTE is considered to form part of the network.

Partial Private Circuit (PPC)
A generic term used to describe a category of private circuits that terminate at a point of connection between two communications providers' networks. It is therefore the provision of transparent transmission capacity between a customer's premises and a point of connection between the two communications providers' networks. It may also be termed a part leased line.

Points of Connection (POC)
A point where one communications provider interconnects with another communications provider for the purposes of connecting their networks to 3rd party customers in order to provide services to those end customers.

Short haul data services (SHDS)
The name given by BT to its range of retail alternative interface leased lines products.

SDH (Synchronous Digital Hierarchy)
A method of digital transmission where transmission streams are packed in such a way to allow simple multiplexing and demultiplexing and the addition or removal of individual streams from larger assemblies.

Symmetric broadband origination (SBO)
A symmetric broadband origination service provides symmetric capacity from a customer's premises to an appropriate point of aggregation, generally referred to as a node, in the network hierarchy. In this context, a "customer" refers to any public electronic communications network provider or end user.

Tier 1
A tier in BT's SDH network that denotes a network of nodes covering areas of high population. These nodes are connected by very high capacity line systems and denote the BT trunk network.

Traditional interface symmetric broadband origination (TISBO)
A form of symmetric broadband origination service providing symmetric capacity from a customer's premises to an appropriate point of aggregation in the network hierarchy, using a CCITT G703 interface.