Review of the wholesale broadband access markets

Statement on market definition, market power determinations and remedies

Statement
Annexes

Notified to the European Commission: 19 May 2014

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Annex 1

List of respondents to the 2013 and 2014 WBA Consultations

A1.1 On 11 July 2013, we published the 2013 WBA Consultation to gather stakeholder views on the key issues with regard to this review.[1]

A1.2 In addition to one respondent that requested to remain anonymous, the following stakeholders provided written responses to the 2013 WBA Consultation:

- BT;
- Everything Everywhere Ltd (EE);
- KCOM Group (KCOM);
- TalkTalk; and
- Virgin Media Limited (Virgin).

A1.3 On 27 January 2014, we published the 2014 WBA Consultation to gather further stakeholder views on the key issues with regard to this review.[2]

A1.4 In addition to one respondent that requested to remain anonymous, the following stakeholders provided written responses to the 2014 WBA Consultation:

- BT;
- EE;
- Prospect; and
- Sky.

A1.5 We have published non-confidential versions of the responses from all the stakeholders listed above. These can be found on our website.[3]

[1] Review of the wholesale broadband access markets, Consultation on market definition, market power determinations and remedies, 11 July 2013, http://stakeholders.ofcom.org.uk/consultations/review-wba-markets/.
[2] http://stakeholders.ofcom.org.uk/binaries/consultations/wba-review-update/summary/wba-review-update.pdf
[3] http://stakeholders.ofcom.org.uk/consultations/review-wba-markets/?showResponses=true and http://stakeholders.ofcom.org.uk/consultations/wba-review-update/?showResponses=true

Annex 2

Draft Legal instruments

NOTIFICATION OF PROPOSALS UNDER SECTIONS 48B AND 80B OF THE COMMUNICATIONS ACT 2003

Proposals for identifying markets, making market power determinations and setting SMP conditions to be imposed on BT and KCOM under section 45 of the Communications Act 2003

Background

1. On 13 May 2004, OFCOM published a regulatory statement entitled *Review of the Wholesale Broadband Access Markets – Identification and analysis of markets, determination of market power and setting of SMP conditions, Final Explanatory Statement and Notification*[4] identifying the service markets for wholesale broadband access services, making market power determinations and setting SMP conditions applying to BT and KCOM.

2. On 21 May 2008, OFCOM published a regulatory statement entitled *Review of the wholesale broadband access markets – Final explanatory statement and notification*[5] identifying the service markets for wholesale broadband access services, making market power determinations and setting SMP conditions applying to BT and KCOM.

3. On 3 December 2010, OFCOM published a further regulatory statement entitled *Review of the wholesale broadband access markets – Statement on market definition, market power determinations and remedies*[6] (the "**2010 WBA Statement**") identifying four separate geographic markets for the provision of wholesale broadband access, determining that BT had significant market power in two of those markets (referred to as Market 1 and Market 2) and KCOM had significant market power in the Hull Area and, as a result of these market power determinations, and in accordance with section 48(1) of the Act, OFCOM set the SMP conditions set out in Schedules 1 to 3 to Annex 1 of the 2010 WBA Statement on BT and KCOM.

4. On 20 July 2011, OFCOM published a regulatory statement entitled *WBA Charge Control – Charge control framework for WBA Market 1 services*[7] (the "**2011 WBA Statement**") setting a further SMP condition on BT by reference to one of the market

4 http://stakeholders.ofcom.org.uk/binaries/consultations/wbamp/summary/broadbandaccessreview.pdf
5 http://www.ofcom.org.uk/consult/condocs/wbamr07/statement/statement.pdf.
6 http://stakeholders.ofcom.org.uk/binaries/consultations/wba/statement/wbastatement.pdf.
7 http://stakeholders.ofcom.org.uk/binaries/consultations/823069/statement/statement.pdf.

power determinations referred to in the 2010 Notification, which imposed a charge control on BT in the provision of WBA services in Market 1.

5. On 11 July 2013, OFCOM published a consultation document entitled *Review of the wholesale broadband access markets – Consultation on market definition, market power determinations and remedies*[8] (the "**2013 WBA Consultation**"). At Annex 6 to that document, OFCOM published a notification under sections 48A and 80A of the Act, which notification set out for domestic consultation its proposals to identify certain markets, make market power determinations and set SMP services conditions. OFCOM invited responses by 25 September 2013.

6. As part of the 2013 WBA Consultation, OFCOM proposed to apply regulatory accounting SMP conditions as set out in the regulatory statement *The regulatory financial reporting obligations on BT and Kingston Communications Final statement and notification – Accounting separation and cost accounting: Final Statement and notification*[9] (the "**2004 Regulatory Accounting Statement**") to certain markets which OFCOM proposed to identify and in relation to which OFCOM proposed BT and KCOM have significant market power. In particular, OFCOM proposed to apply to BT the SMP conditions OA1 to OA28, OA32 and OA33 as set out in Schedule 2 to Annex 2 to the 2004 Regulatory Accounting Statement, as amended by modifications to those SMP conditions. OFCOM also proposed to apply to KCOM the SMP conditions set out in Schedule 2 to Annex 3 to the 2004 Regulatory Accounting Statement (as amended by any subsequent modifications to those SMP conditions), but excluding sub-paragraphs (a) to (c) and (f) of condition OB23, conditions OB28 to OB30 and condition OB33.

7. On 20 December 2013, OFCOM published a consultation document entitled *Regulatory Financial Reporting – A Review*[10] (the "**2013 RFR Consultation**"). In that consultation, OFCOM proposed to amend the proposals set out in the 2013 WBA Consultation in relation to regulatory accounting obligations of BT. In particular, OFCOM no longer proposed to apply to BT the regulatory accounting conditions set out in the 2004 Regulatory Accounting Statement to Market A. OFCOM proposed no changes to the regulatory accounting SMP conditions which currently apply in all other markets. OFCOM invited responses by 14 February 2014.

[8] http://stakeholders.ofcom.org.uk/consultations/review-wba-markets/
[9] http://stakeholders.ofcom.org.uk/binaries/consultations/fin_reporting/statement/finance_report.pdf
[10] http://stakeholders.ofcom.org.uk/binaries/consultations/bt-transparency/summary/BTRFS.pdf

8. On 27 January 2014, and following consideration of certain responses to the 2013 WBA Consultation, OFCOM published a further consultation document entitled *Review of the wholesale broadband access markets - Update on the impact of fibre roll-out and further consultation on the proposed charge control*[11] (the "**2014 WBA Consultation**"). At Annex 8 to that document, OFCOM published a notification under section 48A, which notification set out for domestic consultation its proposals in relation to the market for the provision of wholesale broadband access in Market A to set SMP price control conditions on BT. That proposed SMP services condition 7 replaced the proposed SMP services condition 7 set out in the 2013 WBA Consultation. OFCOM invited responses by 10 March 2014.

9. Copies of the 2013 WBA Consultation and the 2014 WBA Consultation (collectively, the "**WBA Consultation Documents**") and the 2013 RFR Consultation were also sent to the Secretary of State in accordance with sections 48C(1) and 81(1) of the Act.

10. OFCOM received several responses to its proposals set out in the WBA Consultation Documents, and it has considered every such representation. The Secretary of State has not notified OFCOM of any international obligation on the United Kingdom for the purposes of those proposals.

11. On 20 May 2014, following consideration of the responses to the 2013 RFR Consultation and the making of such modifications to its proposals as it considered appropriate, OFCOM published a policy statement entitled *Regulatory Financial Reporting – Final Statement*[12] (the "**2014 RFR Policy Statement**") which set out (among other things) OFCOM's conclusions on the regulatory financial reporting policy that it considered should be applied to BT, including in relation to those markets covered by the Wholesale Broadband Access Market Review in which BT is found to have significant market power.

12. The proposals set out in the WBA Consultation Documents (as amended by the 2013 RFR Consultation) contained proposals of EU significance for the purposes of the Act. Therefore, after making such modifications to the proposals that appeared to OFCOM to be appropriate following domestic consultation, OFCOM hereby send a copy of its proposals, and a draft of the Statement accompanying this notification setting out the reasons for them, to the European Commission, BEREC and the regulatory authorities

[11] http://stakeholders.ofcom.org.uk/binaries/consultations/wba-review-update/summary/wba-review-update.pdf
[12] http://stakeholders.ofcom.org.uk/consultations/regulatory-financial-reporting/statement/

of every other Member State for EU consultation, in accordance with sections 48B(2) and 80B(2) of the Act.

Proposals for service market identifications and market power determinations

13. OFCOM is proposing to identify, in accordance with section 80A of the Act, the following markets for the purpose of making market power determinations:

    (a) wholesale broadband access provided in Market A;

    (b) wholesale broadband access provided in Market B; and

    (c) wholesale broadband access provided in the Hull Area.

14. OFCOM is proposing in accordance with section 80A of the Act to make market power determinations that the following persons have significant market power:

    (a) in relation to the market set out in paragraph 13(a), BT; and

    (b) in relation to the market set out in paragraph 13(c), KCOM.

15. OFCOM is proposing to find that no person has significant market power in the market identified in paragraph 13(b) above.

16. The effect of, and OFCOM's reasons for, making the proposals to identify the markets and to make the market power determinations set out in paragraphs 13 and 14 above (and its reasons for proposing the finding of no SMP set out paragraph 15 above) are set out in the draft Statement accompanying this notification.

Proposals to set and apply, modify and revoke SMP services conditions

17. OFCOM is proposing to set, in relation to the services market referred to in paragraph 13(a) above, the SMP conditions set out in Schedule 1 to this notification to be applied to BT to the extent specified in that Schedule, which SMP conditions shall, unless otherwise stated in that Schedule, take effect from the date of any notification under sections 48(1) and 79(4) of the Act adopting the proposals set out in this notification and shall have effect until the publication of a notification under section 48(1) of the Act revoking such conditions.

18. OFCOM is proposing to set, in relation to the services market referred to in paragraph 13(c) above, the SMP conditions set out in Schedule 2 to this notification to be applied

to KCOM to the extent specified in that Schedule, which SMP conditions shall, unless otherwise stated in that Schedule, take effect from the date of any notification under sections 48(1) and 79(4) of the Act adopting the proposals set out in this notification and shall have effect until the publication of a notification under section 48(1) of the Act revoking such conditions.

19. OFCOM is proposing to modify the July 2004 (BT) Notification as follows –

(a) in Part 1 of Schedule 1 to the July 2004 (BT) Notification, by removing the reference in column 1 of paragraph 12 to “Wholesale Broadband Access in Market 1 as defined in OFCOM’s Notification published on 3 December 2010” and replacing it with “Wholesale Broadband Access in Market A as defined in OFCOM’s Notification published on [*date of publication of the final statement*]” removing the reference in column 2 of paragraph 12 to “3.12.10”; and replacing it with [*date of publication of the final statement*].

(b) in Part 1 of Schedule 1 to the July 2004 (BT) Notification, by removing the reference in column 1 of paragraph 13 to “Wholesale Broadband Access in Market 2 as defined in OFCOM’s Notification published on 3 December 2010”.

We propose that this modification shall take effect from the date of any notification under sections 48(1) and 79(4) of the Act adopting the proposals set out in this notification.

20. OFCOM is proposing to set, in relation to the services market referred to in paragraph 13(c) above, the SMP conditions set out in Schedule 2 to the July 2004 (KCOM) Notification (as amended by any subsequent modifications to those SMP conditions), but excluding sub-paragraphs (a) to (c) and (f) of condition OB23, conditions OB28 to OB30 and condition OB33, to be applied to KCOM. These conditions and the July 2004 (KCOM) Notification are to be read in light of the proposed modifications to that notification set out in paragraph 21 below. We propose that those SMP conditions, and the modifications set out in paragraph 21 below, shall, unless otherwise stated, take effect on the date of publication of any subsequent notification under sections 48(1) and 79(4) of the Act setting those conditions and shall have effect until the publication of a notification under section 48(1) of the Act revoking such conditions.

21. OFCOM is proposing to modify the July 2004 (KCOM) Notification as follows –

(a) in Part 1 of Schedule 1 to the July 2004 (KCOM) Notification, by removing the reference in column 1 of paragraph 8 to “Asymmetric broadband origination in the

Hull Area" and replacing it with "Wholesale broadband access provided in the Hull Area" and by removing the reference in column 2 of paragraph 8 to "3.12.10" and replace it with [*date of publication of the final statement*].

22. OFCOM is proposing, in accordance with section 48(2) of the Act, to revoke all the SMP conditions set out at Annex 1 of the 2010 WBA Statement, (and any subsequent modifications to those SMP conditions), on the date of publication of any notification under sections 48(1) and 79(4) of the Act adopting the proposals set out in this notification. Section 16 of the Interpretation Act 1978 shall apply as if this revocation were a repeal of an enactment by an Act of Parliament.

23. OFCOM is also proposing that the SMP conditions OA1 to OA28, OA32 and OA33 as set out in Schedule 2 to the July 2004 (BT) Notification (as amended by paragraph 19 above) shall be revoked at the end of the 31 July 2014. Section 16 of the Interpretation Act 1978 shall apply as if this revocation were a repeal of an enactment by an Act of Parliament.

24. The effect of, and OFCOM's reasons for making, the proposals in relation to the SMP conditions referred to in paragraphs 17 to 23 above are set out in the draft Statement accompanying this notification.

OFCOM's duties and legal tests

25. In identifying and analysing the markets referred to this notification, and in considering whether to make the proposals set out in this notification, OFCOM has, in accordance with section 79 of the Act, taken due account of all applicable guidelines and recommendations which have been issued or made by the European Commission in pursuance of the provisions of a European Union instrument, and which relate to market identification and analysis or the determination of what constitutes significant market power. In so doing, pursuant to Article 3(3) of Regulation (EC) No 1211/2009, OFCOM has also taken utmost account of any relevant opinion, recommendation, guidelines, advice or regulatory practice adopted by BEREC.

26. OFCOM considers that the proposed SMP conditions in Schedules 1 and 2 comply with the requirements of sections 45 to 47, 87 and 88 of the Act, as appropriate and relevant to each such SMP condition, and further that the proposed modifications and revocations of the SMP conditions referred to above comply with the requirements of sections 45 to 47, 87 and 88 of the Act as appropriate and relevant to them.

27. In making all of the proposals referred to in this notification, OFCOM has considered and acted in accordance with its general duties set out in section 3 of the Act and the six Community requirements in section 4 of the Act.

Interpretation

28. For the purpose of interpreting this notification—

(a) except in so far as the context otherwise requires, words or expressions have the meaning assigned to them in paragraph 29 below, and otherwise any word or expression has the same meaning as it has in the Act;

(b) headings and titles shall be disregarded;

(c) expressions cognate with those referred to in this notification shall be construed accordingly; and

(d) the Interpretation Act 1978 (c. 30) shall apply as if this notification were an Act of Parliament.

29. In this Notification:

(a) **"2004 Regulatory Accounting Statement"** means the statement described in paragraph 6 above;

(b) **"2010 WBA Statement"** means the statement described in paragraph 3 above;

(c) **"2011 WBA Statement"** means the statement described in paragraph 4 above;

(d) "**2013 RFR Consultation**" means the statement described in paragraph 7 above;

(e) "**2013 WBA Consultation**" means the consultation document described in paragraph 5 above;

(f) "**2014 WBA Consultation**" means the consultation document described in paragraph 8 above;

(f) "**2014 RFR Policy Statement**" means the statement described in paragraph 11 above;

(g) **"the Act"** means the Communications Act 2003 (c. 21);

(h) **"BT"** means British Telecommunications plc, whose registered company number is 1800000, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 1159 of the Companies Act 2006;

(i) **"Hull Area"** means the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc, (now known as KCOM);

(j) **"Framework Directive"** means Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services, as amended;

k) **"July 2004 (BT) Notification"** means the notification at Annex 2 of the 2004 Regulatory Accounting Statement imposing various regulatory financial reporting obligations on BT, as subsequently amended;

(l) **"July 2004 (KCOM) Notification"** means the notification at Annex 3 of the 2004 Regulatory Accounting Statement imposing various regulatory financial reporting obligations on KCOM, as subsequently amended;

(m) **"KCOM"** means KCOM Group plc, whose registered company number 2150618, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 1159 of the Companies Act 2006;

(n) **"Market A"** means the area covered by the BT exchanges set out at Appendix 1 to Schedule 1 of this Notification;

(o) **"Market B"** means the area covered by the BT exchanges set out at Appendix 2 to Schedule 1 of to this Notification;

(p) **"OFCOM"** means the Office of Communications as established pursuant to section 1(1) of the Office of Communications Act 2002;

(q) "**WBA Consultation Documents**" means the 2013 WBA Consultation and the 2014 WBA Consultation;

(r) **“United Kingdom”** has the meaning given to it in the Interpretation Act 1978 (c.30).

30. The Schedules to this Notification shall form part of this Notification.

Signed

David Clarkson
Competition Policy Director, OFCOM
A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

19 May 2014

SCHEDULE 1
[DRAFT] SMP conditions to be imposed on BT in Market A

Part 1: Application

The SMP conditions in Part 3 of this Schedule 1 shall, except where specified otherwise, apply to the Dominant Provider in the wholesale broadband access market referred to as Market A in paragraph 13 of the Notification.

Part 2: Definitions and Interpretation

1. In addition to the definitions set out above in this notification, in this Schedule 1—
   (a) "**Access Agreement**" means an agreement entered into between the Dominant Provider and a Third Party for the provision of network access in accordance with Condition 1;
   (b) "**Access Charge Change**" means any amendment to the charges, terms and conditions on which the Dominant Provider provides network access;
   (c) "**Access Charge Change Notice**" means a notice given by the Dominant Provider of an Access Charge Change;
   (d) "**Dominant Provider**" means BT;
   (e) "**Reference Offer**" means the terms and conditions on which the Dominant Provider is willing to enter into an Access Agreement;
   (f) "**Third Party**" means a person providing a public electronic communications network or a person providing a public electronic communications service;

Part 3: The SMP conditions

Condition 1 – Network access on reasonable request

1.1 The Dominant Provider must provide network access to a Third Party where that Third Party, in writing, reasonably requests it.

1.2 The provision of network access by the Dominant Provider in accordance with this condition must –

(a) take place as soon as reasonably practicable after receiving the request from a Third Party;

(b) be on fair and reasonable terms, conditions and charges; and

(c) be on such terms, conditions and charges as OFCOM may from time to time direct.

1.3 The Dominant Provider must comply with any direction OFCOM may make from time to time under this condition.

Condition 2 – Equivalence of Inputs basis

2.1 The Dominant Provider must provide network access in accordance with condition 1 on an Equivalence of Inputs basis.

2.2 Without prejudice to the generality of condition 2.1, the Dominant Provider must not provide (or seek to provide) network access for its own services (including for those of its subsidiaries or partners), unless at the same time the Dominant Provider provides and/or offers to provide such network access to Third Parties on an Equivalence of Inputs basis.

2.3 The obligation in condition 2.1 to provide network access on an Equivalence of Inputs basis shall not apply to-

(a) network access which the Dominant Provider was not providing on an Equivalence of Inputs basis as at [*date condition comes into force*]; and

(b) such provision of network access as Ofcom may from time to time otherwise consent in writing.

2.4 In all circumstances where the obligation in condition 2.1 does not apply, the Dominant Provider must in any event not unduly discriminate against particular persons or against a particular description of persons, in relation to the provision of network access in accordance with condition 1.

2.5 For the purposes of condition 2.4, the Dominant Provider may be deemed to have shown undue discrimination if it unfairly favours to a material extent an activity carried on by it so as to place one or more Third Parties at a competitive disadvantage in relation to activities carried on by the Dominant Provider.

2.6 In this condition 2:

(a) "**Equivalence of Inputs basis**" means that the Dominant Provider must provide, in respect of a particular product or service, the same product or service to all Third Parties and itself on the same timescales, terms and conditions (including price and service levels) by means of the same systems and processes, and includes the provision to all Third Parties and itself of the same Relevant Commercial Information about such products, services, systems and processes as the Dominant Provider provides to its own divisions, subsidiaries or partners subject only to: (a) trivial differences; (b) differences relating to; (i) credit vetting procedures, (ii) payment procedures, (iii) matters of national and crime-related security (which for the avoidance of doubt includes for purposes related to the Regulation of Investigatory Powers Act 2000), physical security, security required to protect the operational integrity of the network, (iv) provisions relating to the termination of a contract, or (v) contractual provisions relating to requirements for a safe working environment; (c) differences relating to the provision of Relevant Commercial Information by the Dominant Provider to its own divisions, subsidiaries or partners where this is necessary for purposes other than relating to the provision of network access to those own divisions, subsidiaries or partners; and (d) such other differences as OFCOM may from time to time consent to in writing. For the avoidance of any doubt, unless seeking OFCOM's consent, the Dominant Provider may not rely on any other reasons in seeking to objectively justify the provision in a different manner. In particular, it includes the use by the Dominant Provider of such systems and processes in the same way as Third Parties and with the same degree of reliability and performance as experienced by Third Parties;

(b) "**Relevant Commercial Information**" means information of a commercially confidential nature relating to products and services to which this condition 2 applies, and which relates to any or all of the following in relation thereto—

i. product development;
ii. pricing;
iii. marketing strategy and intelligence;
iv. product launch dates;
v. cost;
vi. projected sales volumes; or
vii. network coverage and capabilities;

save for any such information in relation to which OFCOM consents in writing to it being treated as falling outside this definition.

Condition 3 – Publication of a Reference Offer

3.1 Except in so far as OFCOM may from time to time otherwise consent in writing, the Dominant Provider must publish a Reference Offer and act in the manner set out below.

3.2 Subject to condition 3.8, the Dominant Provider must ensure that a Reference Offer in relation to the provision of network access pursuant to this condition includes, where applicable, at least the following—

(a) a description of the network access to be provided, including technical characteristics (which shall include information on network configuration where necessary to make effective use of network access);

(b) the locations at which network access will be provided;

(c) any relevant technical standards for network access (including any usage restrictions and other security issues);

(d) the conditions for access to ancillary, supplementary and advanced services (including operational support systems, information systems or databases for pre-ordering, provisioning, ordering, maintenance and repair requests and billing);

(e) any ordering and provisioning procedures;

(f) relevant charges, terms of payment and billing procedures;

(g) details of interoperability tests;

(h) details of maintenance and quality as follows—

(i) specific time scales for the acceptance or refusal of a request for supply and for completion, testing and hand-over or delivery of services and facilities, for provision of support services (such as fault handling and repair);

(ii) service level commitments, namely the quality standards that each party must meet when performing its contractual obligations;

(iii) the amount of compensation payable by one party to another for failure to perform contractual commitments;

(iv) a definition and limitation of liability and indemnity; and

(v) procedures in the event of alterations being proposed to the service offerings, for example, launch of new services, changes to existing services or change to prices;

(i) details of any relevant intellectual property rights;

(j) a dispute resolution procedure to be used between the parties;

(k) details of duration and renegotiation of agreements;

(l) provisions regarding confidentiality of the agreements;

(m) rules of allocation between the parties when supply is limited (for example, for the purpose of co-location or location of masts);

(n) the standard terms and conditions for the provision of network access;

3.3 To the extent that the Dominant Provider provides to itself network access that—

(a) is the same, similar or equivalent to that provided to any other Third Party; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any other Third Party;

in a manner that differs from that detailed in a Reference Offer in relation to network access provided to any Third Party, the Dominant Provider must ensure that it publishes a Reference Offer in relation to the network access that it provides to itself which includes, where relevant, at least those matters detailed in condition 3.2(a) to (n).

3.4 The Dominant Provider must, within one month of the date that this condition enters into force, publish a Reference Offer in relation to any network access that it is providing as at the date that this condition enters into force.

3.5 The Dominant Provider must update and publish the Reference Offer in relation to any amendments or in relation to any further network access provided after the date that this condition enters into force.

3.6 Publication referred to above shall be effected by the Dominant Provider placing a copy of the Reference Offer on any relevant website operated or controlled by the Dominant Provider.

3.7 The Dominant Provider must send a copy of the current version of the Reference Offer to any person at that person's written request (or such parts as have been requested).

3.8 The Dominant Provider must make such modifications to the Reference Offer as OFCOM may direct from time to time.

3.9 The Dominant Provider must provide network access at the charges, terms and conditions in the relevant Reference Offer and must not depart therefrom either directly or indirectly.

3.10 The Dominant Provider must comply with any direction OFCOM may make from time to time under this condition.

Condition 4 – Notification of charges and terms and conditions

4.1 Except in so far as OFCOM may from time to time otherwise consent in writing, the Dominant Provider must publish charges, terms and conditions and act in the manner set out in this condition.

4.2 Where it proposes an Access Charge Change, the Dominant Provider must send to every person with whom it has entered into an Access Agreement pursuant to condition 1, an Access Charge Change Notice.

4.3 The obligation in condition 4.2 shall not apply where the Access Charge Change is directed or determined by OFCOM (including pursuant to the setting of an SMP services condition under the power in section 45 of the Act) or required by a notification or enforcement notification issued by OFCOM under sections 96A or 96C of the Act.

4.4 Subject to condition 4.5, an Access Charge Change Notice must be sent not less than 28 days before any such amendment comes into effect.

4.5 The obligation in condition 4.4 shall not apply to the first Access Charge Change following entry into force of these conditions provided that the only changes being proposed are reductions in charges and no other changes to the terms and conditions on which the Dominant Provider provides network access are being proposed.

4.6 The Dominant Provider must ensure that an Access Charge Change Notice includes—

(a) a description of the network access in question;

(b) a reference to the location in the Dominant Provider’s current Reference Offer of the terms and conditions associated with the provision of that network access;

(c) the current and proposed new charge and/or current and proposed new terms and conditions (as the case may be); and

(d) the date on which, or the period for which, the Access Charge Change will take effect (the “effective date”).

4.7 The Dominant Provider must not apply any Access Charge Change identified in an Access Charge Change Notice before the effective date.

4.8 To the extent that the Dominant Provider provides to itself network access that—

(a) is the same, similar or equivalent to that provided to any Third Party; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any Third Party,

in a manner that differs from that detailed in an Access Charge Change Notice in relation to network access provided to any Third Party, the Dominant Provider must ensure that it sends to OFCOM a notice in relation to the network access that it provides to itself which includes, where relevant, at least those matters detailed in conditions 4.6(a) to (c) and, where the Dominant Provider amends the charges, terms and conditions on which it provides itself with network access, it must ensure it sends to OFCOM a notice equivalent to an Access Charge Change Notice.

Condition 5 – Quality of service

5.1 The Dominant provider must publish all such information as to the quality of service in relation to network access provided by the Dominant Provider pursuant to condition 1 in such manner and form, and including such content, as OFCOM may from time to time direct.

5.2 The Dominant Provider must comply with any direction OFCOM may make from time to time under this condition 5.

Condition 6 – Notification of technical information

6.1 Except in so far as OFCOM may from time to time otherwise consent in writing, where the Dominant Provider provides network access pursuant to condition 1 and proposes new or amended terms and conditions relating to the following—

(a) technical characteristics (including information on network configuration, where necessary, to make effective use of the network access provided);

(b) the locations at which network access will be provided; or

(c) technical standards (including any usage restrictions and other security issues),

the Dominant Provider must publish a written notice (the "Notice") of the new or amended terms and conditions within a reasonable time period but not less than 90 days before either the Dominant Provider enters into an Access Agreement to provide the new network access or the amended terms and conditions of the existing Access Agreement come into effect.

6.2 The obligation in condition 6.1 shall not apply where the new or amended charges or terms and conditions are directed or determined by OFCOM (including pursuant to the setting of an SMP services condition under the power in section 45 of the Act) or are required by a notification or enforcement notification issued by OFCOM under sections 96A or 96C of the Act.

6.3 The Dominant Provider must ensure that the Notice includes—

(a) a description of the network access in question;

(b) a reference to the location in the Dominant Provider's Reference Offer of the relevant terms and conditions;

(c) the date on which or the period for which the Dominant Provider may enter into an Access Agreement to provide the new network access or any amendments to the relevant terms and conditions will take effect (the "effective date").

6.4 The Dominant Provider must not enter into an Access Agreement containing the terms and conditions identified in the Notice or apply any new relevant terms and conditions identified in the Notice before the effective date.

6.5 Publication referred to in condition 6.1 must be effected by the Dominant Provider—

(a) placing a copy of the Notice on any relevant website operated or controlled by the Dominant Provider;

(b) sending a copy of the Notice to OFCOM; and

(c) sending a copy of the Notice to any person at that person's written request, and where the Notice identifies a modification to existing relevant terms and conditions, to every person with which the Dominant Provider has entered into an Access Agreement pursuant to condition 1. The provision of such a copy of the Notice by the Dominant Provider may be subject to a reasonable charge.

Condition 7 – WBA Charge Control in Market A

7.1 The Dominant Provider shall take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change, C_t, (as determined in accordance with conditions 7.3, 7.4 and 7.5 below) in:

(a) the aggregate of Charges for all of the services listed in Part A of the Annex to this condition 7 (all such services together referred to as the "Basket");

(b) the Charge for the service listed in point 2 of the Annex to this condition;

(c) the Charge for the service listed in point 4 of the Annex to this condition;

(d) the Charge for the service listed in point 5 of the Annex to this condition;

(e) the Charge for the service listed in point 6 of the Annex to this condition; and

(f) the Charge for the service listed in point 7 of the Annex to this condition,

is not more than the Controlling Percentage, CP_t, (as determined in accordance with condition 7.6).

7.2 The Dominant Provider shall not make any Charge for the service listed in Part B of the Annex to this condition 7.

7.3 The Percentage Change for the purpose of each of the categories or services specified (each of which is referred to in this paragraph as a "single charge category") in condition 7.1(f) shall be calculated by employing the following formula:

$$C_{t,i} = \frac{\bar{p}_{i,t} - \bar{p}_{i,t-1}}{\bar{p}_{i,t-1}}$$

Where:

$\boldsymbol{C_{t,i}}$ is the Percentage Change in charges for the specific service, *i*, in the single charge category in question during the Relevant Year, *t*;

t refers to the Relevant Year;

t-1 refers to the Prior Year;

$\bar{p}_{i,t}$ is the weighted average Charge made by the Dominant Provider for the specific service, *i*, during the Relevant Year:

Where such Relevant Year Weighted Average Charge shall be calculated by employing the following formula:

$$\bar{p}_{i,t} = \sum_{j=1}^{m}(w_j p_j)$$

Where:

m is the number of periods for which there are distinct Charges during the Relevant Year;

j is a number from 1 to m for each of the m periods during which a Charge is in effect;

w_j, is the proportion of the Relevant Year in which each Charge, p_j, is in effect, calculated by the number of days during which the Charge is in effect and dividing

(1) for the First Relevant Year, by 274;

(2) for the Second Relevant Year, by 366; and

(3) for the Third Relevant Year, by 365.

p_j is the Charge for the specified period, *j*, during the Relevant Year, for the specific service, *i*;

$\bar{p}_{i,t-1}$ is the weighted average Charge made by the Dominant Provider for the specific service, *i*, during the Prior Year:

Where such Prior Year Weighted Average Charge shall be calculated by employing the following formula:

$$\bar{p}_{i,t-1} = \sum_{j=1}^{m}(w_j p_j)$$

Where:

m is the number of periods for which there are distinct Charges during the Prior Year;

j is a number from 1 to m for each of the m periods during which a Charge is in effect;

w_j, is the proportion of the Prior Year in which each Charge, p_j, is in effect, calculated by the number of days during which the Charge is in effect and dividing;

(1) for the First Prior Year, by 365;

(2) for the Second Prior Year, by 274; and

(3) for the Third Prior Year, by 366

p_j is the Charge for the specified period, j, during the Prior Year, for the specific service, i.

7.4 The Percentage Change for the purpose of each of the categories or services specified (each of which is referred to in this paragraph as a "single charge category") in conditions 7.1(b), 7.1(c) 7.1(d) and 7.1(e) shall be calculated by employing the following formula:

$$C_{t,i} = \frac{(\bar{p}_{i,t} - \bar{q}_{i,t}) - (\bar{p}_{i,t-1} - \bar{q}_{i,t-1})}{(\bar{p}_{i,t-1} - \bar{q}_{i,t-1})}$$

Where:

$\boldsymbol{C_{t,i}}$ is the Percentage Change in charges for the specific service, i, in the single charge category in question at a particular time during the Relevant Year, t;

t refers to the Relevant Year;

t-1 refers to the Prior Year;

$\bar{\boldsymbol{p}}_{i,t}$ is as defined in condition 7.3 above, with reference to the services referred to in conditions 7.1(b), 7.1(c) 7.1(d) and 7.1(e);

$\bar{\boldsymbol{q}}_{i,t}$ is the weighted average Charge made by the Dominant Provider to itself for the Input Services used to provide the specific service, *i*, during the Relevant Year:

Where such Relevant Year Weighted Average Charge shall be calculated by employing the following formula:

$$\bar{q}_{i,t} = \sum_{j=1}^{m} ur_j \frac{\sum_{k=1}^{n} q_{j,k} v_{k,t-1}}{z_{t-1}}$$

Where:

t refers to the Relevant Year

t-1 refers to the Prior Year

m is the number of periods for which there are distinct Charges during the Relevant Year;

j is a number from 1 to m for each of the m periods during which a Charge is in effect;

ur_j is the proportion of the Relevant Year in which each Input Service Charge $q_{j,k,}$ is in effect, calculated by the number of days during which the Charge is in effect and dividing

(1) for the First Relevant Year, by 274;

(2) for the Second Relevant Year, by 366; and

(3) for the Third Relevant Year, by 365.

n is the number of Input Services required to provide the specific service, *i*

k is a number from 1 to n for each of the n Input Services required to provide the specific service, *i*

$q_{j,k}$ is the Input Service Charge for the specified period, *j*, during the Relevant Year, for Input Service k required to provide the specific service, *i*

$v_{k,t-1}$ is the volume of Input Service k used to provide the specific service, *i,* in the Prior Year

z_{t-1} is the volume of specific service, *i,* in the Prior Year. It should be consistent with the volume used calculate R_i in condition 7.5.

$\overline{\boldsymbol{p}}_{\boldsymbol{i,t-1}}$ is as defined in condition 7.3 above, with reference to the services referred to in conditions 7.1(b), 7.1(c) 7.1(d) and 7.1(e);

$\overline{\boldsymbol{q}}_{\boldsymbol{i,t-1}}$ is the weighted average Charge made by the Dominant Provider to itself for the Input Services used to provide the specific service, *i*, during the Prior Year:

Where such Prior Year Weighted Average Charge shall be calculated by employing the following formula:

$$\bar{q}_{i,t-1} = \sum_{j=1}^{m} up_j \frac{\sum_{k=1}^{n} q_{j,k} v_{k,t-1}}{z_{t-1}}$$

Where:

t-1 refers to the Prior Year

m is the number of periods for which there are distinct Charges during the Prior Year;

j is a number from 1 to m for each of the m periods during which a Charge is in effect;

up_j is the proportion of the Prior Year in which each Input Service Charge, $q_{j,k}$, is in effect, calculated by the number of days during which the Charge is in effect and dividing;

(1) for the First Prior Year, by 365;

(2) for the Second Prior Year, by 274; and

(3) for the Third Prior Year, by 366

n is the number of Input Services required to provide the specific service, *i*;

k is a number from 1 to n for each of the n Input Services required to provide the specific service, *i*;

$q_{j,k}$ is the Input Service Charge for the specified period, *j*, during the Prior Year, for Input Service k required to provide the specific service, *i*;

$v_{k,t-1}$ is the volume of Input Service k used to provide the specific service, *i,* in the Prior Year;

z_{t-1} is the volume of specific service, *i,* in the Prior Year. It should be consistent with that used to calculate R_i in condition 7.5.

7.5 The Percentage Change for the purpose of the Basket shall be calculated by employing the following formula:

$$C_t = \frac{\sum_{i=1}^{n}\left[(R_i - S_i)\frac{\left(\left\{\overline{p}_{i,t} - \overline{q}_{i,t}\right\} - \left\{\overline{p}_{i,t-1} - \overline{q}_{i,t-1}\right\}\right)}{\left\{\overline{p}_{i,t-1} - \overline{q}_{i,t-1}\right\}}\right]}{\sum_{i=1}^{n}(R_i - S_i)}$$

Where:

$\boldsymbol{C_t}$ is the Percentage Change in the aggregate of Charges for the services in the Basket during the Relevant Year, *t*;

n is the number of individual services in the Basket;

i is a service numbered from 1 to n for each of the n services in the Basket;

$\boldsymbol{R_i}$ is the revenue during the Prior Financial Year in respect of service, *i*;

$\boldsymbol{S_i}$ is the amount of payments made by the Dominant Provider to itself for Input services during the Prior Financial Year used to provide service, *i*;

t refers to the Relevant Year;

t-1 refers to the Prior Year;

$\boldsymbol{\bar{p}_{i,t}}$ is as defined in condition 7.3 above, with reference to the Basket of services referred to in condition 7.1(a);

$\boldsymbol{\bar{p}_{i,t-1}}$ is as defined in condition 7.3 above, with reference to the Basket of services referred to in condition 7.1(a);

$\boldsymbol{\bar{q}_{i,t}}$ is as defined in condition 7.4 above, with reference to the charges for the Input Services for the services included in the Basket referred to in condition 7.1(a);

$\boldsymbol{\bar{q}_{i,t-1}}$ is as defined in condition 7.4 above, with reference to the charges for the Input Services for the services included in the Basket referred to in condition 7.1(a).

7.6 Subject to conditions 7.7, 7.8 and 7.9 below, the Controlling Percentage in relation to any Relevant Year shall be calculated by employing the following formula:

$$CP_t = CPI_t + X$$

Where:

$\boldsymbol{CP_t}$ is the Controlling Percentage for the Relevant Year, rounded to two decimal places;

$\boldsymbol{CPI_t}$ is the change in the Consumer Prices Index in the year of 12 months ending on 31 December immediately before the beginning of the Relevant Year expressed as a percentage, rounded to two decimal places;

X is for each Relevant Year,

(a) for the Basket of services specified in condition 7.1 (a), by [...];

(b) for the service specified in condition 7.1 (b), by [...];

(c) for the service specified in condition 7.1 (c), by [...];

(d) for the service specified in condition 7.1(d), by [...];

(e) for the service specified in condition 7.1(e), by [...]; and

(f) for the service specified in condition 7.1(f), by [...].

7.7 Where the Percentage Change in either the First Relevant Year or the Second Relevant Year is less than the Controlling Percentage (the “Deficiency”), then the Controlling Percentage for the following Relevant Year shall be determined in accordance with condition 7.9.

7.8 Where the Percentage Change in either the First Relevant Year or the Second Relevant Year is more than the Controlling Percentage (the “Excess”), then the Controlling Percentage for the following Relevant Year shall be determined in accordance with condition 7.9.

7.9 In the case of Deficiency (defined in condition 7.7 above) or Excess (defined in condition 7.8 above), the Controlling Percentage will be calculated by employing the following formula:

$$CP_t = [(100\% + CPI_t + X)(100\% + CP_{t-1})/(100\% + C_{t-1})] - 100\%$$

Where:

$\boldsymbol{CP_t}$ is the Controlling Percentage for the Second Relevant Year (in case of Deficiency or Excess in the First Relevant Year) or for the Third Relevant Year (in case of Deficiency or Excess in the Second Relevant Year);

$\boldsymbol{CP_{t-1}}$is the Controlling Percentage for the First Relevant Year (in case of Deficiency or Excess in the First Relevant Year) or for the Second Relevant Year (in case of Deficiency or Excess in the Second Relevant Year);

$\boldsymbol{C_{t-1}}$ is the Percentage Change in the aggregate of Charges for the services in the Basket during the First Relevant Year (in case of Deficiency or Excess in the First Relevant Year) or for the Second Relevant Year (in case of Deficiency or Excess in the Second Relevant Year), calculated in accordance conditions 7.3, 7.4 and 7.5;

$\boldsymbol{X}$ is as set out in condition 7.6 above; and

$\boldsymbol{CPI_t}$ is as set out in condition 7.6 above.

7.10 Where the Percentage Change in any Relevant Year is more than the Controlling Percentage, the Dominant Provider shall, to the extent reasonably possible, and as soon as reasonably practicable, repay the Relevant Excess Revenue to every Affected Communications Provider.

7.11 Where:

(a) the Dominant Provider makes a material change (other than to a Charge) to any service which is subject to this condition 7;

(b) the Dominant Provider makes a change to the date on which its financial year ends; or

(c) there is a material change in the basis of the Consumer Prices Index,

conditions 7.1 to 7.10 shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances.

For the purposes of this paragraph, a material change to any service which is subject to this condition 7 includes (but is not limited to) the introduction of a new service wholly or substantially in substitution for that existing service.

7.12 The Dominant Provider shall record, maintain and supply to Ofcom in an electronic format, no later than three months after the end of each of the Relevant Years, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control. The data shall include:

(a) pursuant to conditions 7.3, 7.4 and 7.5, the calculated Percentage Change relating to the aggregate of Charges for all of the services in the Basket specified in condition 7.1(a) and for each of the single charge categories specified in conditions 7.1(b), 7.1(c), 7.1(d), 7.1(e) and 7.1(f);

(b) all relevant data the Dominant Provider used in the calculation of the Percentage Change as set out in (i) above, including for each specific service, i;

(c) all Charges published by the Dominant Provider from time to time during the Relevant Year and the Prior Year, including the Year they were in force;

(d) the Relevant Year Weighted Average Charges and the Prior Year Weighted Average Charges for all of the services in the Basket specified in condition 7.1(a) and for each of the single charge categories specified in conditions 7.1(b), 7.1(c), 7.1(d), 7.1(e) and 7.1(f) and calculations thereof; and

(e) any other data necessary for monitoring compliance with the charge control.

whereby all relevant revenues in respect of a specific service in the Basket are provided to at least the nearest £1,000.

7.13 If it appears to Ofcom that the Dominant Provider is likely to fail to secure that the Percentage Change does not exceed the Controlling Percentage for the Third Relevant Year, the Dominant Provider shall make such adjustment to any of its charges for the provision of the services listed in conditions 7.1(a) to 7.1(f) and by such day in that Relevant Year (or if appropriate in Ofcom's opinion, by such day that falls after the end of that Relevant Year) as Ofcom may direct for the purpose of avoiding such a failure.

7.14 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this condition 7.

7.15 Conditions 7.1 to 7.13 shall not apply to such extent as Ofcom may direct.

7.16 In this condition:

(a) "**2014 FAMR Notification**" means notification contained in Annex 29 to the Ofcom statement entitled "*Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Statement on the markets, market power determinations and remedies*", dated [*date of publication of the final statement*];

(b) **"Affected Communications Provider"** means each communications provider to whom the Dominant Provider has provided any of the services listed in the Annex to this Schedule 1 during the Relevant Period;

(c) **"Basket"** means the services listed in Part A of the Annex to this condition 7;

(d) **"Charge"** means the charge (being in all cases the amounts offered or charged by the Dominant Provider, excluding any discounts) to a communications provider for a unit of any Charge Controlled Service;

(e) **"Charge Controlled Service"** means a service or Basket of services listed in conditions 7.1 or 7.2;

(f) **"Charge Controlled Product"** means any wholesale broadband access product supplied by the Dominant Provider to communications providers (including itself) based on IP connectivity that allows those communications providers to connect at a number of handover points to the Dominant Provider's network in order to provide a service to end users with an access connection capable of supporting downstream speeds of up to 8Mb/s, such product being currently known as IPstream Connect Max and IPstream Connect Max Premium;

(g) **"Consumer Prices Index"** means the index of consumer prices compiled by an agency or a public body on behalf of Her Majesty's Government or a governmental department (which is the Office of National Statistics at the time of publication of this Notification) from time to time in respect of all items;

(h) **"Controlling Percentage"** is to be determined in accordance with condition 7.6;

(i)**"CPI"** means the amount of the change in the Consumer Prices Index in the period of twelve months ending on 31 December immediately before the beginning of the Relevant Year, expressed as a percentage (rounded to two decimal places) of that Consumer Prices Index as at the beginning of that first mentioned period;

(j)**"Input Service"** means, in relation to each service listed in the Annex to this condition, a service provided by the Dominant Provider to itself and made available to other parties, which the Dominant Provider uses as a specific input for each such service listed in the Annex to this condition. There may be no, one or more than one Input Service used for each service. The Input Services for each service are listed in Part C;

(k) **“Input Service Charge”** means the charge (being in all cases the amounts offered or charged by the Dominant Provider, excluding any discounts) to a communications provider for a unit of any Input Service;

(l)**“Metallic Path Facilities”** means a circuit comprising a pair of twisted metal wires employing electric, magnetic, electro-magnetic, electro-chemical or electro-mechanical energy to convey signals when connected to an electronic communications network;

(m) **“Percentage Change”** is to be determined in accordance with conditions 7.3, 7.4 and 7.5;

(n) **“Prior Financial Year”** means the year of 12 months ending on 31 March immediately preceding the Relevant Year in question;

(o) **“Prior Year”** means each of the following three years:

(1) in relation to the First Relevant Year, the year beginning 1 April 2013 and ending 31 March 2014 (the “First Prior Year”);

(2) in relation to the Second Relevant Year, the period beginning 1 July 2014 and ending 31 March 2015 (the “Second Prior Year”); and

(3) In relation to the Third Relevant Year, the year beginning 1 April 2015 and ending 31 March 2016 (the “Third Prior Year”);

(p) **“Prior Year Weighted Average Charge”** is to be determined in accordance with the relevant formula in conditions 7.3, 7.4 and 7.5;

(q) **“Relevant Excess Revenue”** means the Excess Revenue earned from charging the Affected Communications Provider;

(r) **“Relevant SMPF Special Fault Investigations”** shall be construed as being those SMPF Special Fault Investigations required to support the provision of End User Access Rental Services for the Charge Controlled Products;

(s) **“Relevant SMPF Tie Pair Modification services”** shall comprise those SMPF Tie Pair Modification and SMPF Tie Pair Modification (Multiple Re-termination) services that are used to support the provision of End User Access Rental Services for the Charge Controlled Products;

(t) **"Relevant Tie Cables"** shall be construed as being those Tie Cables used to support the provision of End User Access Rental Services for the Charge Controlled Products, excluding any Tie Cables listed in rows 13 to 22 of the table in Part 1 of the Annex to condition 7A of the 2014 FAMR Notification;

(u) **"Relevant Year"** means each of the following three years:

(1) The period beginning on 1 July 2014 and ending on 31 March 2015 (the "First Relevant Year");

(2) The year beginning on 1 April 2015 and ending on 31 March 2016 (the "Second Relevant Year"); and

(3) The year beginning on 1 April 2016 and ending on 31 March 2017 (the "Third Relevant Year");

(v) **"Relevant Year Weighted Average Charge"** is to be determined in accordance with the relevant formula in conditions 7.3, 7.4 and 7.5;

(w) **"Shared Access"** means the non-voice band frequency of Metallic Path Facilities;

(x) **"Shared Metallic Path Facility (SMPF) New Provide"** means the provision of Shared Access on a line that previously did not have Shared Access, including when the line was previously provided with Metallic Path Facilities;

(y) **"Shared Metallic Path Facility (SMPF) Rental"** shall be construed as rental of access to the non-voice band frequency of Metallic Path Facilities;

(z) **"SMPF Special Fault Investigations"** shall be construed as comprising SMPF Special Fault Investigation 2 (SFI2) – Base module, SMPF Special Fault Investigation 2 (SFI2) – Coop module, SMPF Special Fault

Investigation 2 (SFI2) – Frame direct module, SMPF Special Fault Investigation 2 (SFI2) – Frame module, SMPF Special Fault Investigation 2 (SFI2) – Internal equip module, SMPF Special Fault Investigation 2 (SFI2) – Internal Wiring module and SMPF Special Fault Investigation 2 (SFI2) – Network module, each of which shall have the same meaning as in the 2014 FAMR Notification;

(aa) **"SMPF Tie Pair Modification"** and **"SMPF Tie Pair Modification (Multiple Re-termination)"** shall have the same meaning as in the 2014 FAMR Notification; and

(bb) **"Tie Cables"** shall be construed as having the same meaning as in the 2014 FAMR Notification.

Annex to Condition 7

Part A – Services subject to the charge control pursuant to Condition 7.1

Each of the services set out below is subject to the charge control in condition 7 in so far as and only to the extent that it is provided in connection with the provision by BT of wholesale broadband access services in Market A:

1. **End User Access Connection Services:** i.e. any service required in order to provide the initial connection of an end user to the Dominant Provider's broadband network for the purposes of providing the Charge Controlled Product, such service currently being known as IPstream Connect Max and Max Premium End User Access Connection.

2. **End User Access Rental Services:** i.e. any service related to the ongoing provision of a connection of an end user to the Dominant Provider's broadband network for the purposes of providing the Charge Controlled Product, such service currently being known as IPstream Connect Max and Max Premium End User Access Rental.

3. **End User Bandwidth Rental Services:** i.e. any service in addition to End User Access Rental Services provided on an End User basis and related to the ongoing provision of End User bandwidth by the Dominant Provider to a communications provider, for the purposes of providing the Charge Controlled Product, such service currently being known as IPstream Connect Max and Max Premium EU bandwidth charge per month.

4. **End User Migration Services:** i.e. any service required to migrate an end user of a product provided using the Charge Controlled Product from one communications provider to another (including to or from a retail division or subsidiary of the Dominant Provider) or between a product provided using the Charge Controlled Product and a product provided using other wholesale broadband access services provided by the Dominant Provider, such service currently being known as BT IPstream Connect End User Transfer.

5. **End User Re-grade Services:** i.e. any service required to change the upstream or downstream speed of the connection provided to the end user, where the end user continues to be connected to the same communications provider, where all other features of the service provided by the Dominant Provider to the communications provider stay the same, and where the effect of the change of upstream or downstream speed is such that the service provided by the Dominant Provider is the Charge Controlled Product either prior to or after the re-grade. This would include, for example, re-grading from a lower speed to achieve a downstream speed of up to 8Mbit/s or by re-grading between products that provide a downstream speed of up to 8Mbit/s in order to achieve a different maximum theoretical upstream speed, such service currently being known as BT IPstream Connect End User Re-grade.

6. End User Cancellation Services: i.e. any service required to cancel an order for an End User Access Connection service during the course of connecting that service but prior to the service connection being completed, such service currently being known as IPstream Connect ADSL Cancellation.

7. **Contracted Bandwidth Rental Services:** i.e. any service related to the provision of bandwidth purchased by a communications provider at each of the handover points for the purpose of providing a product to end users which uses the Charge Controlled Product (either individually or in aggregate across handover points), irrespective of the actual bandwidth used, such service currently being known as IPstream Connect Contracted Bandwidth per Mbit/s per node.

8. **Communications Provider Handover Rental Services:** i.e. any service related to the connection by the communications provider at each of the handover locations required to connect to the Charge Controlled Product, such service currently being known as IPstream Connect Communications Provider (CP) Handover.

9. **Interconnect Links:** i.e. any service provided by the Dominant Provider to connect between any of the handover points of the Charge Controlled Product and the communications provider’s network, such service currently being known as IPstream Connect Interconnect Links 1Gbit/s and 10Gbit/s.

Part B – Services subject to the charge control pursuant to Condition 7.2

End User Cease Services: i.e. any service required to disconnect an end user in Market A from any wholesale broadband access product provided in Market A.

Part C – Input Charges for the services subject to the charge control pursuant to Condition 7.1 and 7.2

The Table below lists the only Input Services that are relevant for the purposes of calculating average Charges made by the Dominant Provider to itself under conditions 7.4 and 7.5.

Service	**Input Service**
End User Access Connection Services	Shared Metallic Path Facility (SMPF) New Provide
End User Access Rental Services	Shared Metallic Path Facility (SMPF) Rental, Relevant SMPF Tie Pair Modification services Relevant SMPF Special Fault Investigations Relevant Tie Cables
End User Bandwidth Rental Services	None
End User Migration Services	None
End User Re-grade Services	None
End User Cancellation Services	None
Contracted Bandwidth Rental Services	None
Communications Provider Handover Rental Services	None
Interconnect Links	None
End User Cease Services	None

Except in so far as the context otherwise requires, the terms or descriptions of products and/or services used in Part C shall be construed as having the same meaning as those provided by the Dominant Provider on its website for definitions and explanations of its products in addition to future product updates. These are as at 10 May 2014 found as follows:

• For SMPF product information, please refer to:
http://www.openreach.co.uk/orpg/home/products/llu/mpf/mpf.do

Condition 8A – Regulatory Financial Reporting

(in force from 1 August 2014)

General requirements

8A.1 The Dominant Provider must maintain a separation for accounting purposes between such different matters relating to network access to the relevant network or the availability of the relevant facilities, as required by conditions 8A.3 to 8A.35 including as OFCOM may from time to time direct under those conditions 8A.3 to 8A.35.

8A.2 The Dominant Provider must comply with such rules made by OFCOM about the use of cost accounting systems as required by conditions 8A.3 to 8A.35 and must comply with such requirements about the description to be made available to the public of the cost accounting system as required by conditions 8A.3 to 8A.35 in each case including as OFCOM may from time to time direct under conditions 8A.3 to 8A.35.

8A.3 Except in so far as OFCOM may consent otherwise in writing, the Dominant Provider shall act in the manner set out in these conditions.

8A.4 OFCOM may from time to time make such directions as they consider appropriate in relation to the Dominant Provider's obligations under these conditions.

8A.5 The Dominant Provider shall comply with any direction OFCOM may make from time to time under these conditions.

8A.6 Where the Dominant Provider is required to comply with:

(i) these conditions;

(ii) the Regulatory Accounting Guidelines; and

(iii) the Regulatory Accounting Principles,

and it appears to the Dominant Provider that any of these requirements conflict with each other in a particular case, the Dominant Provider must resolve such conflict by giving priority to them in the order in which they are set out above.

8A.7 For the purpose of these conditions, publication shall be effected by:

(i) placing a copy of the relevant information on any relevant publicly available website operated or controlled by the Dominant Provider; and

(ii) sending a copy of the relevant information to any person at that person's written request.

Requirements relating to the preparation, audit, delivery and publication of the Regulatory Financial Statements

8A.8 The Dominant Provider shall in respect of the Market, Technical Areas, Products, Network Components and Network Services (as applicable), for each Financial Year:

(i) prepare such Regulatory Financial Statements as directed by OFCOM from time to time in accordance with these conditions, the Regulatory Accounting Guidelines, the Regulatory Accounting Principles and the Accounting Methodology Documents (the relevant Accounting Methodology Documents to be identified in the Regulatory Financial Statements by reference to their date);

(ii) prepare a reconciliation report as set out in condition 8A.23;

(iii) secure the expression of an audit opinion upon the Regulatory Financial Statements as notified by OFCOM from time to time and on the reconciliation report as set out in condition 8A.24;

(iv) secure the approval of the Regulatory Financial Statements by the board of directors of the Dominant Provider and secure the signature of the Regulatory Financial Statements by a director of the Dominant Provider for and on behalf of the board of directors;

(v) deliver to OFCOM copies of the Regulatory Financial Statements, the reconciliation report and any corresponding audit opinion, each and all of which shall be in the form in which they are ultimately to be published, at least two weeks before they are required to be published;

(vi) publish the Regulatory Financial Statements, the reconciliation report and any corresponding audit opinion, within four months after the end of the Financial Year to which they relate;

(vii) ensure that any Regulatory Financial Statement and corresponding audit opinion that it delivers to OFCOM and/or publishes are fit for such purpose (or purposes), if any, as notified by OFCOM in writing; and

(viii) publish with the Regulatory Financial Statements any written statement made by OFCOM and provided to the Dominant Provider commenting on the figures in, the notes to or the presentation of any or all of the Regulatory Financial Statements, the reconciliation report and/or the Accounting Methodology Documents.

8A.9 The Dominant Provider shall make such amendments to the form and content of the Regulatory Financial Statements as are necessary to give effect fully to the requirements of these conditions. The Dominant Provider shall provide to OFCOM particulars of any such amendment, the reasons for it and its effect, when it delivers the Regulatory Financial Statements to OFCOM.

8A.10 The Dominant Provider shall prepare all Regulatory Financial Statements, explanations or other information required by virtue of these conditions on a regulatory asset value adjusted current cost basis as directed by OFCOM from time to time and shall be capable of doing so in relation to any period. Such Regulatory Financial Statements, explanations or other information shall be, in the opinion of OFCOM, meaningfully reconcilable to the Statutory Financial Statements.

8A.11 Each Regulatory Financial Statement shall include Prior Year Comparatives which shall be prepared on a basis consistent with Current Year Figures. The Dominant Provider may depart from this requirement in preparing the Regulatory Financial Statements for a Financial Year if there are reasons for doing so provided that the particulars of the departure, the reasons for it and its effect are stated in a note in the Regulatory Financial Statements in accordance with the Statutory Accounting Standards.

Requirements relating to audit of the Regulatory Financial Statements

8A.12 The Regulatory Auditor that the Dominant Provider from time to time appoints shall at all times be satisfactory to OFCOM having regard to such matters as OFCOM consider appropriate. The Dominant Provider shall notify OFCOM in writing of the

Regulatory Auditor appointed to secure compliance with these conditions before the Regulatory Auditor carries out any work for that purpose. The Dominant Provider shall notify OFCOM of any proposed change of Regulatory Auditor 28 days before effect is given to that change.

8A.13 In the event that the Regulatory Auditor is in the opinion of OFCOM unsatisfactory, the Dominant Provider shall appoint and instruct an Alternative Regulatory Auditor that is at all times satisfactory to OFCOM having regard to such matters as OFCOM consider appropriate. The Dominant Provider shall ensure that the Alternative Regulatory Auditor:

(i) carries out such on-going duties as are required to secure compliance with these conditions;

(ii) carries out work or further work, in addition to that performed by the Statutory Auditor and/or by the former Regulatory Auditor, in relation to such matters connected to compliance with these conditions as are of concern to OFCOM and notified to the Dominant Provider in writing; and/or

(iii) re-performs work previously performed by the Statutory Auditor and/or by the former Regulatory Auditor in relation to such matters connected to compliance with this condition as are of concern to OFCOM and notified to the Dominant Provider in writing.

8A.14 The Dominant Provider shall extend to the Alternative Regulatory Auditor such assistance and co-operation as would be extended to the Statutory Auditor and/or to the Regulatory Auditor and, to the extent similar assistance and co-operation may be required from the Statutory Auditor and/or from the former Regulatory Auditor, the Dominant Provider shall use its best endeavours to secure such assistance and co-operation.

8A.15 The Dominant Provider's letter of engagement appointing the Regulatory Auditor or Alternative Regulatory Auditor shall include such provisions acknowledging the acceptance by the Regulatory Auditor or Alternative Regulatory Auditor of duties and responsibilities to OFCOM in respect of its audit work, audit report and audit opinion as are consistent with the ICAEW Guidance.

8A.16 The Dominant Provider shall use its best endeavours to obtain from the Regulatory Auditor or Alternative Regulatory Auditor any further explanation and clarification of any audit opinion required under these conditions and any other information in respect of the matters which are the subject of that audit opinion as OFCOM shall require.

8A.17 The Dominant Provider shall obtain such assurance statement in the form of the Agreed Upon Procedures in relation to the Dominant Provider's obligations under these conditions as directed by OFCOM.

Requirements relating to the Accounting Methodology Documents

8A.18 The Dominant Provider must prepare, maintain and keep up-to-date the Accounting Methodology Documents in accordance with these conditions, with the Regulatory Accounting Guidelines, and with the Regulatory Accounting Principles.

8A.19 The Dominant Provider must include in the Accounting Methodology Documents documentation setting out a description of each of the Attribution Methods, the Transfer Charge System Methodology, the Accounting Policies and the Long Run Incremental Cost Methodology, to the extent not covered in the Regulatory Accounting Guidelines.

8A.20 The Dominant Provider must deliver an up-to-date version of the Accounting Methodology Documents to OFCOM when it delivers the Regulatory Financial Statements to OFCOM in accordance with condition 8A.8 and publish such up-to-date version on or before the day of publication of the Regulatory Financial Statements which have been prepared in accordance with such version.

Requirements relating to changes to the Regulatory Accounting Methodology and the correction of Material Errors

8A.21 The Dominant Provider must publish and deliver to OFCOM a list of each and every change to the Regulatory Accounting Methodology, by 31 March of the Financial Year in which the change to the Regulatory Accounting Methodology is to be made (the "Change Control Notification"). The Change Control Notification must be accompanied by a description of each of the changes, the reason for making each of the changes (including by reference to their compliance with the Regulatory Accounting Guidelines and the Regulatory Accounting Principles), and the impact of each of the changes on the figures at the level of the Markets and Technical Areas (as applicable) by setting out the figures which were presented in the previous Financial Year alongside the figures that would have been presented had such changes been made in the previous Financial Year.

8A.22 Where in OFCOM's opinion any change referred to in condition 8A.21 does not comply with these conditions, the Regulatory Accounting Principles or the Regulatory Accounting Guidelines, the Dominant Provider shall not make such change, if so directed by OFCOM.

8A.23 The Dominant Provider must prepare a reconciliation report as referred to in condition 8A.8 and as directed by OFCOM from time to time, which sets out changes to the Regulatory Accounting Methodology and the impact of such changes on the Regulatory Financial Statements, and Material Errors corrected in the Regulatory Financial Statements and the impact of such Material Errors on the Regulatory Financial Statements.

8A.24 The Dominant Provider must obtain an audit opinion on the reconciliation report as directed by OFCOM from time to time.

Requirements relating to the Regulatory Accounting System

8A.25 The Dominant Provider's Regulatory Accounting System must be able to produce the Regulatory Financial Statements as directed by OFCOM under condition 8A.8 in accordance with these conditions, the Regulatory Accounting Guidelines, the Regulatory Accounting Principles and the Accounting Methodology Documents.

8A.26 Where the Dominant Provider replaces the whole or part of its Regulatory Accounting System, or substantially modifies such Regulatory Accounting System, the Dominant Provider must:

(i) notify OFCOM in a timely manner of the replacement or modification, and, where so requested by OFCOM, inform OFCOM of progress towards completion and such other information as OFCOM may reasonably request;

(ii) ensure, to the best of its ability, that the replacement or modification does not cause the figures contained in the Regulatory Financial Statements to be different from the figures that would have been contained in the Regulatory Financial Statements had such Regulatory Financial Statements been prepared using the old or unmodified Regulatory

Accounting System;

(iii) in relation to the final Financial Year for which the Regulatory Financial Statements are prepared using the old or unmodified Regulatory Accounting System, prepare a systems reconciliation report, which must:

a. set out the difference between the Current Year Figures presented in the Regulatory Financial Statements and the Current Year Figures had such Regulatory Financial Statements been prepared on the basis of the new or modified Regulatory Accounting System, expressed as a percentage change; and

b. explain each and every Material Difference between the Current Year Figures presented in the Regulatory Financial Statements and the Current Year Figures had such Regulatory Financial Statements been prepared on the basis of the new or modified Regulatory Accounting System;

(iv) publish and deliver the systems reconciliation report to OFCOM by 31 December of the Financial Year for which the figures will be prepared using the new or modified Regulatory Accounting System for the first time;

(v) obtain an assurance statement in the form of Agreed Upon Procedures on the systems reconciliation report, which must report:

a. whether the figures in the systems reconciliation report referred to in condition 8A.26(iii)(a) have been properly extracted from the old or unmodified Regulatory Accounting System and the new or modified Regulatory Accounting System respectively;

b. whether each and every difference in the systems reconciliation report referred to in condition 8A.26(iii)(a) has been correctly calculated; and

c. whether the explanation of each and every Material Difference in the systems reconciliation report referred to in condition 8A.26(iii)(b) is an accurate representation of the cause of each such Material Difference.

(vi) deliver the assurance statement in the form of the Agreed Upon Procedures to OFCOM when it delivers the systems reconciliation report to OFCOM in accordance with condition 8A.26(iv).

(vii) where the systems reconciliation report referred to in condition 8A.26(iii) indicates that the replacement or modification causes the Current Year Figures contained in the Regulatory Financial Statements to be significantly different, either individually or in aggregate, from the Current Year Figures that would have been contained in the Regulatory Financial Statements had such Regulatory Financial Statements been prepared using the new or modified Regulatory Accounting System, prepare, if so directed by OFCOM, the Regulatory Financial Statements on a basis consistent with the old or unmodified Regulatory Accounting System.

Requirements relating to deficiencies in the Regulatory Financial Statements and the Accounting Methodology Documents

8A.27 Where OFCOM have reasonable grounds to believe that any or all of the Regulatory Financial Statements and/or Accounting Methodology Documents are deficient, the Dominant Provider shall, where directed by OFCOM:

(i) amend the Accounting Methodology Documents in order to remedy the deficiencies identified by OFCOM;

(ii) restate the Regulatory Financial Statements identified by OFCOM as requiring restatement in accordance with the Accounting Methodology Documents which have, where necessary, been amended pursuant to condition 8A.27(i);

(iii) prepare a reconciliation report as set out in condition 8A.23, whereby any reference to the Regulatory Financial Statements should be understood as a reference to the restated Regulatory Financial Statements;

(iv) secure in accordance with any relevant notification of OFCOM under this condition the expression of an audit opinion on the restated Regulatory Financial Statements;

(v) deliver to OFCOM the restated Regulatory Financial Statements, the reconciliation report and corresponding audit opinion; and

(vi) publish the restated Regulatory Financial Statements, the reconciliation report and corresponding audit opinion.

Requirements relating to the maintenance of sufficient accounting records

8A.28 The Dominant Provider shall maintain accounting records for a period of six years from the date on which each Regulatory Financial Statement is delivered to OFCOM.

8A.29 The Dominant Provider shall maintain the accounting records in accordance with these conditions, the Regulatory Accounting Guidelines, the Regulatory Accounting Principles and the Accounting Methodology Documents.

8A.30 The Dominant Provider shall maintain accounting records in a form which, on a historical cost basis and on a current cost basis:

(i) separately identifies each of the Markets, Technical Areas, Products, Network Components and Network Services;

(ii) separately attributes the costs, revenues, assets and liabilities of each of the Markets, Technical Areas, Products, Network Components and Network Services; and

(iii) shows and explains the transactions underlying each of the Markets, Technical Areas, Products, Network Components and Network Services.

8A.31 The Dominant Provider shall maintain the accounting records so that they are sufficient:

(i) to provide an adequate explanation of each Regulatory Financial Statement;

(ii) to show that charges are non-discriminatory; and

(iii) to provide a complete justification of the Dominant Provider's charges for Network Access.

Requirement to facilitate on-demand reporting

8A.32 The Dominant Provider shall ensure that its Regulatory Accounting System and accounting records are sufficient to enable the Dominant Provider, at all times, to be capable of preparing in relation to any specified calendar month or months a financial statement in accordance with the Accounting Methodology Documents.

Requirements relating to the preparation and maintenance of a Wholesale Catalogue

8A.33 The Dominant Provider must prepare, maintain and keep up-to-date a Wholesale Catalogue. Such Wholesale Catalogue should separately identify and describe:

(i) External Wholesale Services;

(ii) Internal Wholesale Services;

(iii) Wholesale Services supplied both externally and internally; and

(iv) Network Services and the extent to which these activities are used in the course of supplying Wholesale Services.

8A.34 The Dominant Provider must deliver an up-to-date version of the Wholesale Catalogue to OFCOM when it delivers the Regulatory Financial Statements to OFCOM in accordance with condition 8A.8 and publish such up-to-date version on or before the day of publication of the Regulatory Financial Statements which have been prepared by reference to such version.

Requirements relating to the demonstration of non-discrimination

8A.35 The Dominant Provider shall ensure it is able to demonstrate that at any point in time:

(i) where a Network Service or combination of Network Services is used by the Dominant Provider in providing Internal Wholesale Services, the amount applied and incorporated in the Transfer Charge for the Internal Wholesale Service in respect of the use of the Network Service or combination of Network Services is equivalent to the amount applied and incorporated for the use of the Network Services or combination of Network Services in the charge payable for an equivalent External Wholesale Service;

(ii) the same amount as applied and incorporated in the Transfer Charge for the Internal Wholesale Service in condition 8A.35(i) in respect of the use of the Network Service or combination of Network Services is applied to the Network Service or combination of Network Services whenever it is or they are used by the Dominant Provider in providing that same Internal Wholesale Service; and

(iii) the same amount as applied and incorporated in the Transfer Charge for the equivalent External Wholesale Service in condition 8A.35(i) in respect of the use of the Network Service or combination of Network Services is applied to the Network Service or combination of Network Services whenever it is or they are used by the Dominant Provider in providing that same External Wholesale Service;

(iv) the amount applied and incorporated in the Transfer Charge for the Internal Wholesale Service in condition 8A.32(i) in respect of the use of the Network Service or combination of Network Services shall be the cost of those Network Services unless the Network Service concerned is provided from a Market which is different from the Market which comprises the Internal Wholesale Service.

8A.36 This condition 8A shall enter into force on 1 August 2014 and remain in force until the publication of a notification under section 48(1) of the Act revoking such conditions. For the avoidance of doubt, conditions 8A.1 to 8A.35 shall have effect in relation to the Regulatory Financial Statements for the Financial Year 2014-15 and each subsequent Financial Year.

8A.37 In this condition 8A:

(a) **"Accounting Methodology Documents"** means the documentation maintained by the Dominant Provider setting out in detail the rules, policies, methods, allocations, calculations, assumptions, procedures and Processes used by the Dominant Provider for the purpose of preparing Regulatory Financial Statements in accordance with the Regulatory

Accounting Guidelines and the Regulatory Accounting Principles;

(b) **"Accounting Policies"** means the manner in which the Dominant Provider applies the requirements of Regulatory Accounting Guidelines and the Regulatory Accounting Principles in each of the Regulatory Financial Statements;

(c) **"Alternative Regulatory Auditor"** means any auditor not for the time being appointed as the Dominant Provider's Regulatory Auditor;

(d) **"Agreed Upon Procedures"** means an engagement carried out in accordance with international standard (ISRS 4400) under which the Regulatory Auditor or another independent third party performs a set of audit procedures agreed by OFCOM and based on OFCOM's specific requirements in relation to the Regulatory Financial Statements, and reports the findings of that work to OFCOM;

(e) **"Attribution Methods"** means the practices used by the Dominant Provider to attribute revenue (including appropriate Transfer Charges), costs (including appropriate Transfer Charges), assets and liabilities to activities or, insofar as those activities have been aggregated into Wholesale Segments or Retail Segments in a given Market or Technical Area (as applicable), to each Wholesale Segment or Retail Segment;

(f) **"Current Year Figures"** means, in relation to any set of Regulatory Financial Statements, the amounts relating to the Financial Year to which the statements relate;

(g) **"External Wholesale Services"** means services supplied or offered to any Communications Provider other than the Dominant Provider;

(h) **"Financial Year"** means a financial year of the Dominant Provider in respect of which the Statutory Financial Statements are required to be (or to have been) prepared and audited in accordance with the requirements of the Companies Act 2006;

(i) **"ICAEW Guidance"** means the technical release titled "Reporting to Regulators of Regulated Entities: Audit 05/03" issued by the Audit and Assurance Faculty of the Institute of Chartered Accountants in England &

Wales in October 2003;

(j) **“Internal Wholesale Services”** means services supplied within the Dominant Provider;

(k) **“Long Run Incremental Cost Methodology”** means the long run incremental cost principles, procedures and Processes which form the framework under which long run incremental costs are determined by the Dominant Provider;

(l) **“Market”** means the market to which these conditions apply;

(m) **“Material Error”** means a deviation from accuracy or correctness which meets the materiality threshold as directed by OFCOM from time to time for the purpose of these conditions;

(n) **“Material Difference”** means a difference identified in a systems reconciliation report which meets the materiality threshold as directed by OFCOM from time to time for the purpose of these conditions;

(o) **“Network Component”** means an element of the network that is used to provide Wholesale Services, and, to the extent the network components are used in the Market or Technical Area (as applicable), specified in a direction given by OFCOM from time to time for the purposes of these conditions;

(p) **“Network Services”** means those groups of Network Components used directly (or which in the absence of horizontal or vertical integration would be used directly) in the course of supplying Wholesale Services;

(q) **“Prior Year Comparatives”** means, in relation to any set of Regulatory Financial Statements, the amounts relating to the Financial Year immediately preceding the Financial Year to which the Regulatory Financial Statements relate, re-evaluated if necessary to ensure that such figures are comparable to the Current Year Figures;

(r) **“Process”** means the series of inter-related activities or actions to obtain, record or hold data or information or to carry out any operation or set of operations on the data or information, including:

i. organisation, storage, adaptation, or alteration of the data or information;

ii. retrieval, consultation, computation or use of the data or information;

iii. disclosure of the data or information by transmission, dissemination, or otherwise making available; or

iv. alignment, combination, blocking, erasing or destruction of the data or information;

(s) **"Product"** means any product or service comprised in a Market or Technical Area to which these conditions apply;

(t) **"Regulatory Accounting Guidelines"** means documentation setting out the policies, methodologies, systems, Processes and procedures for deriving or calculating costs, revenues, assets and liabilities as directed by OFCOM from time to time for the purpose of these conditions;

(u) **"Regulatory Accounting Methodology"** means the rules, policies, methods, allocations, calculations, assumptions and procedures used by the Dominant Provider for the purpose of preparing Regulatory Financial Statements.

(v) **"Regulatory Accounting Principles"** means the principles as directed by OFCOM from time to time for the purpose of these conditions;

(w) **"Regulatory Accounting System"** means the set of computerised and manual accounting methods, procedures, Processes and controls established to determine and attribute the costs, revenues, assets and liabilities and summarise, interpret, and present the resultant financial data in an accurate and timely manner;

(x) **"Regulatory Auditor"** means the auditor for the time being appointed by the Dominant Provider in accordance with these conditions;

(y) **"Regulatory Financial Statement"** means any financial statement in respect of a Financial Year prepared or required to be prepared by the

Dominant Provider in accordance with these conditions;

(z) **"Retail Products"** means services used by or offered to any End Users (including the Dominant Provider);

(aa) **"Retail Segments"** means groups of Retail Products;

(bb) **"Statutory Accounting Standards"** means the accounting standards, including the requirements of the Companies Act 2006, by reference to which the Dominant Provider are required to prepare the Statutory Financial Statements;

(cc) **"Statutory Auditor"** means the auditor for the time being appointed by the Dominant Provider in accordance with the requirements of the Companies Act 2006;

(dd) **"Statutory Financial Statements"** means any annual account required to be prepared by the Dominant Provider in accordance with the requirements of the Companies Act 2006;

(ee) **"Technical Area"** means the technical area to which these conditions apply;

(ff) **"Transfer Charge"** means the charge or price that is applied, or deemed to be applied, within the Dominant Provider by one division or business unit of the Dominant Provider to another for the use or provision of an activity or group of activities. For the avoidance of doubt, such activities or group of activities include, amongst other things, Products provided from, to or within the Market or Technical Area (as applicable) and the use of Network Components in the Market or Technical Area (as applicable);

(gg) **"Transfer Charge System Methodology"** means the methodology of the system employed by the Dominant Provider which enables an activity to use a service or good from another activity and to account for it as though it had purchased that service or good from an unrelated party (including accounting for it at an appropriate amount);

(hh) **"Wholesale Catalogue"** means the documentation required to be produced by the Dominant Provider under condition 8A.33;

(ii) **“Wholesale Segments”** means groups of Wholesale Services;

(jj) **“Wholesale Services”** means services related to network access on the Dominant Provider’s network used by or offered to any Communications Provider (including the Dominant Provider).

Condition 8B – Regulatory Financial Reporting

(in force from 1 July 2014 until the end of 30 September 2014)

8B.1 The Dominant Provider shall secure the approval of the Regulatory Financial Statements by the board of directors of the Dominant Provider and secure the signature of the Regulatory Financial Statements by a director of the Dominant Provider for and on behalf of the board of directors.

8B.2 The Dominant Provider shall prepare a reconciliation report which sets out:

(i) each and every change to the Regulatory Accounting Methodology made since the publication of the Regulatory Financial Statements related to the previous Financial Year;

(ii) the impact of all changes to the Regulatory Accounting Methodology on the figures presented in the Regulatory Financial Statements, by setting out for all changes on an aggregated basis, the difference between the Current Year Figures and the Current Year Figures had such changes not been made, expressed as an absolute amount and as a percentage change;

(iii) the impact of each Material Change on the figures presented in the Regulatory Financial Statements at the level of the Markets and Technical Areas (as applicable), by setting out the difference between the Current Year Figures and the Current Year Figures had such Material Change not been made, expressed as an absolute amount and as a percentage change; and

(iv) the impact of all changes which are not Material Changes on the figures presented in the Regulatory Financial Statements at the level of the Markets and Technical Areas (as applicable), by setting out for all changes which are not Material Changes on an aggregated basis, the difference between the Current Year Figures and the Current Year Figures had such changes not been made, expressed as an absolute amount and as a percentage change.

8B.3 The Dominant Provider shall:

(i) deliver to OFCOM a copy of the reconciliation report, which shall be in the form in which it is ultimately to be published, at least two weeks before it is published; and

(ii) publish the reconciliation report by the end of 30 September 2014.

8B.4 This condition 8B shall:

(i) enter into force on 1 July 2014. For the avoidance of doubt, conditions 8B.1 to 8B.3 shall have effect in relation to the Regulatory Financial Statements for the Financial Year 2013-14; and

(ii) continue to apply until the end of 30 September 2014.

8B.5 In this condition 8B:

(a) **"Current Year Figures"** means, in relation to any set of Regulatory Financial Statements, the amounts relating to the Financial Year to which the statements relate.

(b) **"Financial Year"** means a financial year of the Dominant Provider in respect of which the Statutory Financial Statements are required to be (or to have been) prepared or audited in accordance with the requirements of the Companies Act 2006.

(c) **"Market"** means the market to which these conditions apply.

(d) **"Material Change"** means a change which results in an increase or a decrease in any figure presented in the Regulatory Financial Statements by an amount equal to or in excess of 5% or £1 million, whichever is greater.

(e) **"Regulatory Accounting Methodology"** means the rules, policies, methods, allocations, calculations, assumptions and procedures used by the Dominant Provider for the purpose of preparing Regulatory Financial Statements.

(f) **"Regulatory Financial Statement"** means any financial statement in respect of a Financial Year prepared or required to be prepared by the

Dominant Provider in accordance with the conditions set out at Annex 2 of "The regulatory financial reporting obligations on BT and Kingston Communications Final statement and notification" of 22 July 2004.

(g) **"Statutory Financial Statement"** means any annual account required to be prepared by the Dominant Provider in accordance with the requirements of the Companies Act 2006.

(h) **"Technical Area"** means the technical area to which these conditions apply.

Appendix 1

BT exchanges in Market A

(3,196 Exchanges)
CMACK, CMALDM, CMBARF, CMBKN, CMBOB, CMBRAU, CMBRE, CMBWN, CMCHEY, CMCLA, CMCLAV, CMCRI, CMCUR, CMCVROM, CMDIT, CMEARL, CMELMD, CMETT, CMFRA, CMFUR, CMGREA, CMHAMP, CMHASN, CMHIG, CMLAP, CMMART, CMMER, CMMID, CMMOR, CMMORT, CMPAI, CMPAT, CMPEB, CMQUA, CMSFD, CMSHE, CMSNI, CMSON, CMSOUC, CMSWI, CMTAN, CMWEL, CMWESH, CMWHY, CMWOR, CMYOX, EAABR, EAABY, EAACL, EAALB, EAARD, EAARR, EAASD, EAASW, EABAC, EABAD, EABAW, EABBY, EABDC, EABDF, EABEY, EABFD, EABFN, EABIL, EABIN, EABIR, EABKW, EABLY, EABMF, EABMK, EABNC, EABNM, EABNW, EABOT, EABRD, EABRK, EABRP, EABRR, EABRT, EABRU, EABSM, EABTM, EABUR, EABUX, EABYF, EACAA, EACAR, EACAX, EACDN, EACFD, EACHA, EACHF, EACHR, EACHT, EACHY, EACLA, EACLE, EACLV, EACOD, EACOM, EACOP, EACST, EACTD, EACTS, EACUL, EACWT, EADEB, EADED, EADIC, EADNE, EADOC, EAEBG, EAEHL, EAELM, EAELS, EAELV, EAERD, EAESW, EAEXN, EAEYE, EAFDM, EAFFD, EAFIN, EAFLE, EAFLT, EAFML, EAFOU, EAFOW, EAFRP, EAFTN, EAFUN, EAFXD, EAFYF, EAGAR, EAGAY, EAGBF, EAGBN, EAGBT, EAGCR, EAGCT, EAGDE, EAGES, EAGHD, EAGHM, EAGLE, EAGMS, EAGOL, EAGRE, EAGRU, EAGRY, EAGSM, EAGST, EAGWH, EAGYD, EAHBK, EAHBO, EAHDM, EAHDN, EAHEL, EAHEM, EAHEN, EAHER, EAHEV, EAHGM, EAHIC, EAHIL, EAHKD, EAHLM, EAHLT, EAHNF, EAHNG, EAHNS, EAHNT, EAHOH, EAHOM, EAHON, EAHOR, EAHOX, EAHRR, EAHTM, EAHTT, EAHWO, EAILK, EAISL, EAKBC, EAKSH, EAKTN, EALAV, EALAY, EALIN, EALLN, EALOD, EAMEN, EAMET, EAMFD, EAMHD, EAMHM, EAMLK, EAMLS, EAMOR, EAMTC, EAMTS, EAMUL, EANAC, EANAY, EANDL, EANEW, EAOCC, EAOFF, EAORF, EAOUS, EAOVE, EAPEA, EAPEL, EAPLE, EAPOT, EAPRI, EAPUL, EAPUR, EAPYM, EAQUI, EARAD, EARAT, EARAV, EARDH, EARDN, EAREN, EARID, EARMS, EAROO, EAROW, EAROX, EASAL, EASAP, EASBM, EASBN, EASCK, EASCR, EASFR, EASGM, EASGN, EASHI, EASHL, EASHM, EASHR, EASIC, EASIX, EASMA, EASMD, EASNA, EASRM, EASRP, EASRY, EASTB, EASTK, EASTN, EASTR, EASTW, EASUR, EASUT, EASWD, EASWL, EASWM, EASWN, EASWT, EASXP, EASYD, EATER, EATEV, EATFD, EATHA, EATHU, EATIV, EATLL, EATLW, EATNM, EATOL, EATTS, EATWI, EAUBB, EAWAN, EAWAS, EAWCT, EAWEL, EAWEN, EAWEY, EAWIL, EAWIN, EAWIX, EAWKB, EAWLD, EAWLW, EAWLY, EAWMK, EAWOD, EAWOL, EAWOR, EAWRD, EAWRE, EAWRO, EAWRU, EAWSM, EAWSP, EAWST, EAWTN, EAWTS, EAWWR, EAYOX, EMABBOT, EMABRIP, EMALREW, EMALSTO, EMANCAS, EMASFOR, EMBAINT, EMBENEF, EMBENWI, EMBGWOR, EMBILLE, EMBILLI, EMBILST, EMBLAKE, EMBLEAS, EMBLISW, EMBLLTO, EMBOTTE, EMBRAIL, EMBREAD, EMBRIGS, EMBUCKM, EMBULWI, EMBURGH, EMBURTJ, EMBUTTE, EMBYTHO, EMCABYT, EMCARSI, EMCASTO, EMCHRIS, EMCLIFT, EMCLIPS, EMCLOPT, EMCNTON, EMCOGEN, EMCOLLI, EMCOTGR, EMCOTTE, EMCRANF, EMCRGLN, EMCROWL, EMCROXT, EMCRTON, EMCRWLL, EMCTSCK, EMCULVE, EMCWRSL, EMDEEPI, EMDETHI, EMDINGL, EMDNGTN, EMDODDI, EMDOWSB, EMDUDDI, EMEASTB, EMEASTH, EMEASTS, EMEDENH, EMEKKBY, EMELLAS, EMELTON, EMEMPIN, EMESSTL, EMFARNS, EMFENTO, EMFOLKI, EMFOSDY, EMFRIDA, EMFRISK, EMFULBE, EMGADDE, EMGEDNE, EMGILLS, EMGLINT, EMGOSBE, EMGPONT, EMGRETC, EMGRETL, EMGRTFO, EMGRTGL, EMGTTHA, EMGUYHI, EMHACKL, EMHECKI, EMHLLTO, EMHNGTN, EMHOARC, EMHOLSJ, EMHOLSM, EMHRLST, EMHRRBY, EMHUBBE, EMHUGAR, EMHULLA, EMHUSBB, EMINGOL, EMKCLIF, EMKGWOR, EMKINOU, EMKIRKL, EMKMBLT, EMKNIPT, EMKNRSS, EMLANGR, EMLBENN, EMLERRE, EMLOWDH, EMLSTEE, EMMAIDW, EMMANEA, EMMARCH, EMMARSM, EMMEDBO, EMMERES, EMMESHM, EMMLCHA, EMMLTON, EMMNTON, EMMORCO, EMMRTON, EMNEBOR, EMNETHB, EMNEWLE, EMNEWTO, EMNLUFF, EMNWTON, EMOLDLE, EMOSSGA, EMPADVE, EMPAPSA,

EMPARWI, EMPATTI, EMPAULE, EMPEATL, EMPNCHB, EMPREST, EMRANND, EMRGATE, EMROCKI, EMROTTB, EMRRSBB, EMSBSEY, EMSCALF, EMSCREM, EMSHARD, EMSILVE, EMSOMER, EMSPLSB, EMSRAUC, EMSRFLT, EMSTICK, EMSTKEG, EMSTTEL, EMSUDBU, EMSUTER, EMSUTSJ, EMSUTTO, EMSWATN, EMSWSHD, EMTERSJ, EMTGGBY, EMTHIST, EMTHORP, EMTHRAP, EMTHRNY, EMTHURL, EMTILTO, EMTNGND, EMTRVES, EMTTYDD, EMTWCRO, EMWALGR, EMWALSA, EMWDHOU, EMWELFO, EMWELNY, EMWHAPL, EMWHISS, EMWHTTO, EMWINST, EMWINWI, EMWIOTH, EMWISSM, EMWLTHA, EMWLVEY, EMWMNDH, EMWNFLT, EMWOLEY, EMWYSWO, EMYARDL, EMYOULG, ESABE, ESABF, ESABL, ESABN, ESABR, ESABY, ESACB, ESACG, ESAIR, ESALM, ESALY, ESAMU, ESANC, ESARH, ESARN, ESARY, ESASB, ESASH, ESATH, ESAVO, ESAYT, ESBAF, ESBBE, ESBIR, ESBLA, ESBLB, ESBLE, ESBLF, ESBLG, ESBLL, ESBLO, ESBOA, ESBOB, ESBOC, ESBOD, ESBOE, ESBOG, ESBOR, ESBRA, ESBUN, ESBUT, ESCAC, ESCAM, ESCAN, ESCAT, ESCAY, ESCER, ESCHI, ESCLD, ESCLF, ESCLH, ESCLO, ESCLR, ESCLV, ESCOB, ESCOL, ESCOM, ESCOU, ESCOY, ESCRG, ESCRL, ESCRN, ESCRO, ESCSR, ESDEC, ESDEM, ESDIR, ESDOL, ESDOP, ESDOU, ESDRO, ESDUG, ESDUK, ESDUS, ESEAL, ESEAR, ESEDD, ESEDZ, ESELI, ESERR, ESESS, ESETB, ESETV, ESFAR, ESFER, ESFET, ESFIN, ESFLK, ESFOL, ESFOR, ESFOS, ESFRD, ESFRI, ESGAG, ESGAR, ESGAS, ESGAU, ESGIF, ESGLA, ESGLE, ESGLF, ESGLI, ESGLL, ESGLM, ESGOW, ESGRD, ESGRE, ESGRT, ESGSH, ESGUL, ESHER, ESHIL, ESHUM, ESIKR, ESINC, ESINW, ESIVA, ESIVB, ESIVG, ESIVS, ESKCA, ESKEN, ESKGH, ESKGL, ESKIL, ESKIP, ESKKM, ESKLO, ESKLR, ESKLS, ESKNR, ESLAD, ESLAK, ESLAU, ESLCE, ESLEM, ESLEU, ESLGF, ESLIL, ESLIM, ESLIN, ESLOF, ESLON, ESLTA, ESLTF, ESLTM, ESLUN, ESLUT, ESMAD, ESMEI, ESMEK, ESMEL, ESMEN, ESMET, ESMIN, ESMRB, ESMUC, ESMUT, ESNBF, ESNBG, ESNPT, ESNRW, ESNTY, ESOXT, ESPCD, ESPHI, ESPIT, ESPRM, ESPTI, ESRAI, ESRES, ESROX, ESSCO, ESSLA, ESSLY, ESSMA, ESSRA, ESSRK, ESSRM, ESSRT, ESSRY, ESSTB, ESSTC, ESSTF, ESSTH, ESSTM, ESSTN, ESSTO, ESSTW, ESSWI, ESTAR, ESTAY, ESTEA, ESTEM, ESTEV, ESTHO, ESTRO, ESTRY, ESTUM, ESUPL, ESWAL, ESWES, ESWHK, ESWHS, ESWIN, ESWLI, ESYAR, ESYET, ESYRF, LCABT, LCALL, LCAMB, LCAPP, LCARM, LCASD, LCASP, LCBAD, LCBAM, LCBAS, LCBBN, LCBEC, LCBEL, LCBEM, LCBMO, LCBOB, LCBOO, LCBOR, LCBRC, LCBRH, LCBRI, LCBRS, LCBRT, LCBTN, LCBUG, LCBUT, LCCAL, LCCAT, LCCBK, LCCHA, LCCHE, LCCHI, LCCLA, LCCON, LCCRB, LCCRG, LCCRO, LCCRS, LCCTN, LCCUL, LCDEN, LCDLS, LCDUN, LCEGR, LCESK, LCFLO, LCFTN, LCGAL, LCGIL, LCGIS, LCGLE, LCGOS, LCGRC, LCGRE, LCGRS, LCGRY, LCGSF, LCGYG, LCHAC, LCHAL, LCHAS, LCHAW, LCHAY, LCHBY, LCHMK, LCHOL, LCING, LCKFS, LCKIR, LCKKB, LCKLE, LCKST, LCKTH, LCLAM, LCLAZ, LCLGD, LCLKB, LCLNB, LCLOG, LCLOI, LCLOR, LCMEL, LCMIL, LCMLD, LCNBL, LCNBR, LCNIC, LCORT, LCPIL, LCPYB, LCRAU, LCRAV, LCRDH, LCRIC, LCRKF, LCRUF, LCRVW, LCSAM, LCSAT, LCSCA, LCSEA, LCSED, LCSEG, LCSEL, LCSHA, LCSIL, LCSKE, LCSLA, LCSOW, LCSTM, LCSTO, LCSTV, LCSVD, LCTHR, LCTUR, LCWAS, LCWEE, LCWIN, LCWSK, LNCNW, LNNAZ, LNSFD, LSNUT, LSWOL, LVHIG, LVKIN, LVMAN, LVMOO, LVMPK, LVNCB, LVPADPK, LVWTW, LWXEK, MRARL, MRBUC, MRCHI, MRCHL, MRCOM, MRHTN, MRLNR, MRLOW, MRMHE, MRMOB, MRNRD, MRPBY, MRPIC, MRRSP, MRSUT, MRTAD, MRTID, MRWNC, MYADD, MYAIR, MYALD, MYAMP, MYAPP, MYARN, MYART, MYBAG, MYBBY, MYBEE, MYBEN, MYBIL, MYBIR, MYBKA, MYBKE, MYBLU, MYBNS, MYBOL, MYBPI, MYBPM, MYBPW, MYBRE, MYBRN, MYBUB, MYBYP, MYCAM, MYCAW, MYCLO, MYCON, MYCOP, MYCOX, MYCRA, MYDAL, MYDAR, MYDUN, MYEAO, MYEAT, MYELV, MYESC, MYFLM, MYFLX, MYGAT, MYGRA, MYGRE, MYGRG, MYHAC, MYHIP, MYHIR, MYHLI, MYHLM, MYHLP, MYHMB, MYHOV, MYHOW, MYHRW, MYHSM, MYHUB, MYHUG, MYKET, MYKIL, MYKMP, MYKMS, MYKMZ, MYLAN, MYLAS, MYLEC, MYLIN, MYLOC, MYLON, MYMAS, MYMID, MYMLB, MYMMB, MYNGR, MYNND, MYNSY, MYNUN, MYPBG, MYPTN, MYRAM, MYREE, MYRIC, MYRIL, MYRUF, MYRWC, MYSAW, MYSBG, MYSBN, MYSET, MYSHF, MYSKR, MYSKS, MYSNN, MYSPO, MYSPU, MYSTI, MYSTO, MYSYK, MYTHR, MYTHW, MYTIB,

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STDONHD, STDROXF, STDURLY, STEARLD, STEASTE, STEASTK, STEASTS, STFARLY, STFONTM, STFOVNT, STGRATY, STHANLY, STHAZEB, STHINDN, STHRSLY, STHRSTT, STHTHDN, STICHAB, STIDSTN, STKINGS, STLCKLY, STLNKHT, STLONGB, STLONGP, STLYNST, STMARNL, STMARTN, STMARTX, STMCHDV, STMDNTN, STMERE, STMIDWD, STMILAB, STMILOS, STMILSA, STMORDN, STNETBY, STNETHR, STOWSBY, STOXNWD, STPIDTH, STPUDTN, STPWRST, STROCKB, STROPLY, STSHRTN, STSPSLT, STSSCOT, STSTMBN, STSTOKB, STSTPFD, STSTUDL, STSTURM, STSTURN, STSWAY, STTEFFT, STTISBY, STTRTHN, STUPAVN, STWALOP, STWESTL, STWESTW, STWEYHL, STWHPSH, STWINSL, STWITCH, STWLTON, STWRTHM, SWAAI, SWAAV, SWAEN, SWAGL, SWAPO, SWBJY, SWCG, SWCWN, SWDAQ, SWDCP, SWDRW, SWDWQ, SWFBZ, SWFCJ, SWGWN, SWGWR, SWHV, SWJOH, SWKW, SWLAK, SWLAS, SWLCA, SWLCY, SWLDR, SWLDV, SWLGC, SWLHY, SWLJV, SWLKB, SWLKD, SWLKX, SWLKY, SWLLF, SWLLM, SWLLP, SWLLU, SWLLW, SWLNN, SWLPI, SWLQW, SWLY, SWLYA, SWLYJ, SWLYW, SWMAD, SWMDX, SWMF, SWMGX, SWMNF, SWMWY, SWMYE, SWMYG, SWMYU, SWNB, SWNDO, SWNDU, SWNEN, SWNES, SWNNA, SWNTD, SWPBL, SWPEC, SWPEV, SWPHX, SWPM, SWPMQ, SWPOM, SWPQS, SWPRU, SWPTM, SWPUN, SWPYH, SWQCT, SWQFJ, SWQHV, SWQKL, SWQOB, SWQOE, SWRAG, SWRHA, SWRLS, SWRSO, SWRSV, SWSAS, SWSAW, SWSFJ, SWSMX, SWSNI, SWSVB, SWTAF, SWTDE, SWTEK, SWTFS, SWTLL, SWTLU, SWTRH, SWTSA, SWTUC, SWUAH, SWUAZ, SWUCW, SWUGI, SWUGU, SWUHN, SWUTK, SWVLD, SWVVW, SWWCP, SWWHT, SWWJK, SWXSX, SWXTP, SWYDU, SWYRO, SWZEN, SWZFR, SWZIU, SWZIY, SWZKA, SWZLD, SWZMX, SWZNR, SWZNT, SWZWJ, SWZYY, SWZZH, THAG, THBC, THBFD, THBRK, THBT, THCH, THCHD, THCHN, THCKN, THCL, THCLY, THCMN, THCP, THCY, THDF, THDG, THED, THEI, THFTG, THGO, THGRS, THHC, THHD, THHDY, THHF, THHS, THIN, THKB, THKC, THLSN, THMD, THMO, THMS, THNB, THNE, THNL, THOL, THOV, THP, THPC, THPM, THPS, THRD, THRO, THSBN, THSCR, THSE, THSL/UD, THTI, THTV, THUB, THWI, THWN, THWT, WMADB, WMADM, WMARL, WMASN, WMAST, WMAUH, WMBAR, WMBBN, WMBDY, WMBET, WMBGM, WMBIS, WMBLA, WMBLO, WMBLS, WMBRA, WMCAM, WMCBM, WMCHA, WMCHM, WMCLO, WMCOL, WMCOT, WMCRO, WMCUT, WMDAP, WMECC, WMECK, WMELM, WMFAD, WMFIE, WMGNO, WMGRE, WMHAL, WMHAM, WMHAN, WMHAR, WMHAV, WMHIL, WMHIM, WMHOL, WMHSW, WMINK, WMIPN, WMKLT, WMKNI, WMLEI, WMLOW, WMMIC, WMOAK, WMOMB, WMONE, WMPAX, WMPEO, WMPOW, WMRCR, WMRID, WMROK, WMROM, WMRUD, WMSAN, WMSEI, WMSEV, WMSHB, WMSMA, WMSPE, WMSRK, WMSTA, WMSUC, WMSWY, WMUPS, WMUSN, WMWAR, WMWAT, WMWES, WMWET, WMWHE, WMWHS, WMWIC, WMWLY, WMWOO, WMWRK, WMWTM, WMWYB, WMWYC, WMYAR, WNAB, WNADR, WNADV, WNAE, WNAF, WNAGY, WNAML, WNAMU, WNASH, WNASO, WNBAL, WNBAR, WNBAS, WNBC, WNBD, WNBDM, WNBDO, WNBEA, WNBED, WNBEG, WNBER, WNBET, WNBFF, WNBFI, WNBGT, WNBIS, WNBOD, WNBOM, WNBON, WNBOR, WNBOS, WNBOT, WNBRB, WNBRE, WNBRF, WNBRI, WNBRM, WNBRN, WNBRX, WNBRY, WNBS, WNBSN, WNBUK, WNBUN, WNBYC, WNCAL, WNCAW, WNCBG, WNCCA, WNCCG, WNCE, WNCEB, WNCER, WNCH, WNCHB, WNCHE, WNCHK, WNCHO, WNCHR, WNCHW, WNCLE, WNCLF, WNCLI, WNCLU, WNCLY, WNCN, WNCOC, WNCOR, WNCP, WNCRA, WNCRD, WNCRE, WNCRI, WNCRN, WNCRR, WNCRY, WNCSK, WNCST, WNCSW, WNCYD, WNCYF, WNDD, WNDH, WNDLE, WNDLG, WNDLN, WNDM, WNDOL, WNDOR, WNDYF, WNDYS, WNEAR, WNELL, WNERD, WNERW, WNFAI, WNFAR, WNFF, WNFOR, WNFOW, WNGAE, WNGB, WNGCW, WNGD, WNGDR, WNGLA, WNGLB, WNGLC, WNGLW, WNGM, WNGND, WNGOR, WNGUI, WNGW, WNHAD, WNHAE, WNHAL, WNHAM, WNHAN, WNHAR, WNHCP, WNHER, WNHH, WNHL, WNHMR, WNHOD, WNHUN, WNHUX, WNIB, WNIV, WNKER, WNKIN, WNKNG, WNKNI, WNKNO, WNKT, WNKYR, WNLAD, WNLAN, WNLAR, WNLBD, WNLBG, WNLBH, WNLBR, WNLBW, WNLC, WNLDA, WNLDC, WNLDF, WNLDG, WNLDO, WNLEA, WNLEI, WNLEY, WNLFF, WNLFN, WNLFS, WNLFU, WNLGD, WNLGG, WNLGL, WNLGN, WNLGO, WNLGW, WNLGY, WNLIN,

WNLIT, WNLMD, WNLMR, WNLN, WNLNF, WNLNO, WNLNS, WNLNY, WNLON, WNLRD, WNLSF, WNLSN, WNLTH, WNLTN, WNLU, WNLVL, WNLWA, WNLWN, WNLWW, WNLYD, WNLYI, WNLYO, WNMAC, WNMAN, WNMAP, WNMAR, WNMDL, WNMEI, WNMFB, WNMIC, WNMM, WNMOC, WNMOE, WNMON, WNMOS, WNMSB, WNMSL, WNMT, WNMUC, WNMUN, WNNAN, WNNBG, WNNBR, WNNCL, WNNEB, WNNEF, WNNOR, WNNOW, WNNR, WNNTP, WNOOD, WNPAI, WNPAN, WNPBK, WNPCH, WNPCO, WNPDD, WNPEB, WNPEF, WNPEM, WNPEN, WNPG, WNPIP, WNPMN, WNPNL, WNPNN, WNPNR, WNPON, WNPRD, WNPRE, WNPRG, WNPRL, WNPTD, WNPTW, WNQH, WNRAY, WNRC, WNRHD, WNRIW, WNRM, WNRNR, WNRST, WNRYT, WNSAM, WNSAU, WNSEA, WNSEI, WNSHA, WNSSM, WNSSN, WNSTE, WNSW, WNTAL, WNTAR, WNTFG, WNTH, WNTHL, WNTHR, WNTIL, WNTRA, WNTRB, WNTRG, WNTRN, WNTRR, WNTRU, WNTRW, WNTRY, WNTUD, WNTV, WNTYG, WNTYN, WNTYW, WNUB, WNUM, WNUP, WNWA, WNWEO, WNWET, WNWIG, WNWIT, WNWOM, WNWOR, WNWTN, WNWUL, WNWXL, WNYA, WNYO, WSACH, WSAMI, WSAPP, WSARL, WSARN, WSARO, WSARR, WSARY, WSAUC, WSAUG, WSAUL, WSBAA, WSBAB, WSBAE, WSBAG, WSBAH, WSBAL, WSBAM, WSBAN, WSBAV, WSBDD, WSBEN, WSBET, WSBIG, WSBLN, WSBOE, WSBON, WSBOR, WSBOW, WSBRD, WSBRO, WSBRR, WSBUC, WSCAA, WSCAD, WSCAE, WSCAH, WSCAI, WSCAN, WSCAO, WSCAP, WSCAT, WSCHA, WSCHN, WSCLA, WSCLD, WSCLR, WSCMM, WSCOB, WSCOE, WSCOL, WSCOM, WSCON, WSCOR, WSCOS, WSCOU, WSCOV, WSCOY, WSCRC, WSCRE, WSCRG, WSCRH, WSCRI, WSCRJ, WSCRL, WSCRN, WSCRS, WSCRU, WSCRW, WSCSS, WSDAE, WSDAI, WSDAK, WSDAS, WSDAY, WSDER, WSDOL, WSDOW, WSDRE, WSDRG, WSDRN, WSDRY, WSDUE, WSDUI, WSDUN, WSDUO, WSDUR, WSDUS, WSDUU, WSDUY, WSEAG, WSEAS, WSECC, WSELV, WSESK, WSFAI, WSFEN, WSFIN, WSFIO, WSFIV, WSFOR, WSFOT, WSFUR, WSGAE, WSGAI, WSGAR, WSGAT, WSGIG, WSGLC, WSGLE, WSGLL, WSGLU, WSGRS, WSGRT, WSHAU, WSINN, WSINS, WSINV, WSJOB, WSJOP, WSJUR, WSKET, WSKGE, WSKIA, WSKIB, WSKIC, WSKID, WSKIF, WSKIG, WSKII, WSKIK, WSKIN, WSKIO, WSKIP, WSKIU, WSKKC, WSKKD, WSKKE, WSKKF, WSKKL, WSKKN, WSKKO, WSKKR, WSKKZ, WSKLM, WSKLN, WSKRK, WSLAB, WSLAH, WSLAL, WSLAM, WSLAU, WSLEA, WSLED, WSLEN, WSLEW, WSLID, WSLIS, WSLOA, WSLOC, WSLOD, WSLOG, WSLOH, WSLOI, WSLON, WSLOS, WSLOT, WSLUI, WSLUS, WSMAB, WSMAC, WSMAH, WSMIN, WSMIT, WSMOC, WSMOD, WSMOF, WSMON, WSMOS, WSMOU, WSMUI, WSNEA, WSNEB, WSNEC, WSNEG, WSNEL, WSOCH, WSOLD, WSORM, WSPAL, WSPAN, WSPAR, WSPAT, WSPEN, WSPIN, WSPIR, WSPOA, WSPOC, WSPOE, WSPOP, WSPOR, WSPOW, WSRHU, WSRIN, WSROC, WSROT, WSSAL, WSSAN, WSSAQ, WSSCA, WSSHI, WSSKI, WSSKL, WSSLI, WSSOE, WSSOK, WSSOR, WSSTD, WSSTO, WSSTT, WSSTU, WSSYM, WSTAB, WSTAH, WSTAR, WSTAT, WSTAY, WSTHL, WSTIG, WSTIN, WSTIR, WSTOB, WSTOD, WSTOR, WSTOW, WSTUR, WSTWE, WSTWY, WSTYN, WSULV, WSUPL, WSWAT, WSWHB, WSWHH, WSWHI, WSWIG, WWANST, WWASHB, WWASHC, WWASHR, WWASHW, WWBAMP, WWBAWT, WWBCAU, WWBCKL, WWBCKN, WWBCLY, WWBDON, WWBEAF, WWBEAW, WWBERE, WWBFAS, WWBIGB, WWBKNO, WWBLAG, WWBNYM, WWBOSC, WWBOW, WWBRAN, WWBRAY, WWBRDY, WWBREA, WWBROA, WWBROM, WWBRUL, WWBSTM, WWBSTW, WWBTON, WWBTOR, WWBURR, WWCAME, WWCANW, WWCARD, WWCARY, WWCBIS, WWCCKW, WWCFIT, WWCHAG, WWCHID, WWCHIS, WWCHIT, WWCHIV, WWCHLL, WWCHRI, WWCHRM, WWCHUL, WWCLAY, WWCLOV, WWCMAC, WWCMAR, WWCOAD, WWCOLY, WWCONS, WWCOPP, WWCORN, WWCORS, WWCORT, WWCPOL, WWCRAD, WWCRAL, WWCRAN, WWCROY, WWCRWC, WWCSTN, WWCWIC, WWDART, WWDITT, WWDOBW, WWDOLT, WWDOWN, WWDREW, WWDULV, WWDUNS, WWEALL, WWEVER, WWEXBO, WWEXFO, WWEXMN, WWFARW, WWFENI, WWFILL, WWFOWE, WWFRAD, WWFROG, WWGARA, WWGERM, WWGHAM, WWGRAM, WWHARB, WWHART, WWHATH, WWHAWK, WWHBCK, WWHBCM, WWHCRX, WWHELE, WWHEMY, WWHENL, WWHOLB, WWHOLF, WWHOLN, WWHOLS,

WWHTOR, WWILCH, WWINST, WWIPPL, WWISLE, WWKENN, WWKENT, WWKGWR, WWKILK, WWKKWL, WWKSTM, WWLAND, WWLANR, WWLAPF, WWLDOW, WWLEED, WWLIFT, WWLLAW, WWLODD, WWLOST, WWLSTL, WWLSUT, WWLTRE, WWLUPP, WWLVET, WWLWDN, WWLYDF, WWLYNT, WWMABT, WWMARA, WWMARK, WWMAWG, WWMBSH, WWMCAN, WWMDAM, WWMEVA, WWMILV, WWMITC, WWMLBK, WWMMAG, WWMODY, WWMORT, WWMORW, WWMOUS, WWMPRT, WWMSMT, WWMTON, WWMTVY, WWMULL, WWNCAD, WWNCUR, WWNCYR, WWNETH, WWNFER, WWNMOL, WWNPTN, WWNPWI, WWNTAM, WWNTAW, WWNTCY, WWOAKF, WWOSTN, WWPADS, WWPCMB, WWPERR, WWPIPE, WWPISA, WWPLRN, WWPOLP, WWPORL, WWPOST, WWPOUN, WWPRAZ, WWPREA, WWPRIN, WWPSCO, WWPTRE, WWPTWN, WWRACK, WWRILL, WWROBO, WWROCH, WWRUMF, WWSAGN, WWSALC, WWSAMP, WWSBNT, WWSBUR, WWSCAN, WWSCHD, WWSCIL, WWSCLM, WWSDAY, WWSDOM, WWSENN, WWSFLM, WWSGAB, WWSGEN, WWSGER, WWSHAL, WWSHAU, WWSHEB, WWSHIR, WWSIDB, WWSILV, WWSKEV, WWSMAB, WWSMER, WWSMOL, WWSMWG, WWSMWS, WWSOME, WWSOWT, WWSPAX, WWSTAL, WWSTAR, WWSTAV, WWSTIC, WWSTIT, WWSTOC, WWSTOG, WWSTUD, WWSUTT, WWSWIM, WWTEDB, WWTEMP, WWTHRE, WWTIMB, WWTINT, WWTLIZ, WWTORX, WWTREB, WWTREG, WWTRES, WWUPOT, WWVERY, WWWASH, WWWBAY, WWWCKR, WWWDGT, WWWDWN, WWWEEK, WWWEMB, WWWFRD, WWWHEA, WWWHIM, WWWILM, WWWITH, WWWIVE, WWWKLH, WWWMON, WWWMOR, WWWOOD, WWWOOL, WWWSHM, WWWZOY, WWYEAL, WWYETM, WWZELA

Appendix 2

BT exchanges in Market B

(2,390 Exchanges)
CLBER, CLBIS, CLCAN, CLCLE, CLCOV, CLEUS, CLFAR, CLFLE, CLHOL, CLKEN, CLKLG, CLKXX, CLLOW, CLMON, CLMOO, CLNEW, CLSHO, CLSOU, CLSTE, CLUPP, CLWAL, CLWAP, CLWOO, CMACO, CMALB, CMALC, CMALD, CMALL, CMARM, CMASHF, CMASTX, CMBEAC, CMBEAR, CMBED, CMBER, CMBIDF, CMBIL, CMBIN, CMBIR, CMBLAC, CMBNW, CMBRI, CMBRO, CMBRU, CMBYL, CMCAL, CMCAN, CMCAS, CMCEN, CMCGF, CMCHAP, CMCHEL, CMCHY, CMCOD, CMCOLE, CMCRA, CMDD, CMDRU, CMDUN, CMEARD, CMEAS, CMEDG, CMERD, CMEXH, CMFAL, CMFIL, CMFIN, CMFOL, CMFOR, CMFOU, CMGREB, CMHALE, CMHARBO, CMHARBU, CMHEA, CMHED, CMHEN, CMHIGH, CMHIGW, CMHILL, CMHOR, CMJAM, CMKEN, CMKER, CMKINE, CMKING, CMKNO, CMKVR, CMKWD, CMLEA, CMLGS, CMLIC, CMLYE, CMMLD, CMNOR, CMNUN, CMPEL, CMPEN, CMPRI, CMRAD, CMREC, CMRUB, CMRUGB, CMSED, CMSEL, CMSHEL, CMSHI, CMSMBK, CMSME, CMSOL, CMSOUB, CMSPR, CMSTB, CMSTE, CMSTOX, CMSTRA, CMSTRE, CMSUT, CMTET, CMTIL, CMTIP, CMTOL, CMVIC, CMWAL, CMWARW, CMWDGT, CMWED, CMWEE, CMWESB, CMWIL, CMWL, CMWOL, CMWOM, CMWV, CMWYT, EAATT, EAAYL, EABAS, EABCY, EABEC, EABEL, EABGC, EABGY, EABIS, EABLA, EABLU, EABMD, EABND, EABNH, EABNT, EABOR, EABRI, EABRW, EABSE, EABTF, EABWL, EACAI, EACAM, EACFH, EACHE, EACHU, EACLN, EACLY, EACOG, EACOL, EACOS, EACOX, EACRH, EACRO, EACTM, EACVI, EADAN, EADER, EADIS, EADNM, EADOW, EADRA, EADSM, EAEBY, EAELC, EAELY, EAEMS, EAEPP, EAERI, EAEWD, EAEYK, EAFAK, EAFEL, EAFME, EAFOR, EAFOX, EAFRN, EAFSD, EAFUL, EAGBD, EAGDM, EAGHY, EAGIR, EAGOR, EAGRA, EAGWK, EAGYT, EAHAE, EAHAS, EAHAT, EAHAV, EAHAW, EAHEA, EAHED, EAHET, EAHIS, EAHLW, EAHOL, EAHRL, EAHSD, EAHST, EAHSW, EAHTF, EAHUL, EAHWD, EAHWH, EAING, EAIPS, EAKEL, EAKEN, EAKLN, EAKSG, EAKSL, EALAI, EALAK, EALAT, EALGH, EALIT, EALNT, EALOW, EALPT, EALST, EALTN, EALWT, EAMAD, EAMAL, EAMAN, EAMBN, EAMID, EAMIL, EAMKT, EAMRN, EAMUN, EANAR, EANBF, EANCC, EANCN, EANCW, EANEE, EANMK, EANPT, EANWD, EANWS, EAONG, EAORM, EAORS, EAPAK, EAPUC, EARAY, EAREE, EAROC, EARST, EASAB, EASAF, EASBF, EASBW, EASBY, EASCI, EASFM, EASFT, EASHE, EASIL, EASMN, EASND, EASOH, EASOS, EASST, EASTD, EASTF, EASTL, EASTM, EASTT, EASUD, EASWO, EASWV, EASXM, EATHB, EATHE, EATHP, EATIP, EATKL, EATLB, EATRU, EATSC, EAVAN, EAWAR, EAWBS, EAWDB, EAWDF, EAWFD, EAWHI, EAWIV, EAWLM, EAWMS, EAWRI, EAWTB, EAWTH, EAWTL, EAWYM, EMALFRE, EMALLES, EMALVAS, EMAMBER, EMARKWR, EMARNOL, EMASBOU, EMASHBB, EMATTHE, EMAYLES, EMBAKEW, EMBARTO, EMBASFO, EMBEAUM, EMBEEST, EMBELGR, EMBELPE, EMBINGH, EMBIRSS, EMBLDWO, EMBOSTO, EMBOURN, EMBOZEA, EMBRAUN, EMBRIXW, EMBRLAT, EMBROUG, EMBUCKD, EMBULWE, EMBURTO, EMBYFIE, EMCASTL, EMCENTL, EMCHALF, EMCHAPE, EMCHATT, EMCHELL, EMCHSTL, EMCOALV, EMCRRBY, EMDARLE, EMDAVEN, EMDESBO, EMDFFIE, EMDRAYC, EMDRRBB, EMDSSFO, EMDUSTO, EMEARLS, EMEASWI, EMEDWAL, EMEDWIN, EMERRSS, EMESTLE, EMETWLL, EMEVING, EMEYEPE, EMFAZEL, EMFINED, EMFLECK, EMGDDLI, EMGLNFI, EMGRETO, EMGRHAM, EMGSCTE, EMHARDI, EMHARRO, EMHINCK, EMHLBCH, EMHNDON, EMHORSL, EMHTHER, EMHUCKN, EMHURLE, EMIBSTO, EMILKES, EMIRTHL, EMKBWOR, EMKIMBE, EMKINGS, EMKIRKB, EMKIRTO, EMKISLI, EMKRBYM, EMKTTER, EMLANGL, EMLEABR, EMLGHBO, EMLNGBU, EMLONGB, EMLONGE, EMLSUTT, EMLUTTE, EMMAARC, EMMARKB, EMMATLO, EMMELBO, EMMELTN, EMMICKL, EMMKDEE, EMMKFIE, EMMNSFI, EMMONTF, EMMOULT, EMMRKTH, EMNARBO, EMNEWAR, EMNEWOL, EMNORTH, EMOAKHA, EMODDBY, EMORTON, EMOUNDL, EMOVERS, EMPETER,

EMPINXT, EMPLEAS, EMPLUMT, EMPOLSW, EMPRTRE, EMQURRN, EMRADCL, EMRDDEE, EMRDDIN, EMRMSEY, EMROTHW, EMRPLEY, EMRPTON, EMRTHLY, EMRUSHD, EMSANDI, EMSAWTR, EMSHEPS, EMSHIRE, EMSHRWO, EMSKGNS, EMSLEBY, EMSLFRD, EMSOSHM, EMSOUTH, EMSPCOT, EMSPDNG, EMSTBBS, EMSTIVE, EMSTMFD, EMSTNEO, EMSTNYG, EMSUBGE, EMSUTTI, EMSWADL, EMTBSHE, EMTHRNB, EMTMWOR, EMTOWCE, EMTRENT, EMTUTBU, EMUPPIN, EMUPWLL, EMWARBY, EMWARSO, EMWEDDO, EMWELLI, EMWERRI, EMWESSW, EMWESTO, EMWHITT, EMWILLO, EMWIRKS, EMWOLLA, EMWOODB, EMWSBCH, EMWSFRD, EMWSTWO, EMYXLEY, ESABB, ESALL, ESALV, ESANS, ESARB, ESARM, ESARR, ESBAK, ESBAL, ESBAN, ESBAT, ESBAX, ESBLR, ESBLY, ESBON, ESBRE, ESBRF, ESBRO, ESBUC, ESBUR, ESBYB, ESCAR, ESCAU, ESCLA, ESCOC, ESCOR, ESCOW, ESCRA, ESCRF, ESCTN, ESCUP, ESDAB, ESDAL, ESDAV, ESDEA, ESDEN, ESDON, ESDUF, ESDUN, ESDUR, ESDYS, ESEYE, ESFAI, ESFAL, ESFAU, ESFFR, ESFML, ESFOU, ESGAL, ESGLC, ESGLN, ESGLS, ESGRA, ESGRB, ESGRG, ESHAD, ESHAR, ESHAW, ESIKG, ESINN, ESJED, ESKEL, ESKIN, ESKIR, ESKLY, ESKNW, ESKRL, ESKRM, ESLAR, ESLCG, ESLEI, ESLEV, ESLIB, ESLNW, ESLOA, ESLOC, ESLVB, ESLVS, ESMAI, ESMAY, ESMID, ESMNF, ESMON, ESMOR, ESMUI, ESMUS, ESNEW, ESNML, ESNOA, ESNRB, ESPAR, ESPCK, ESPEB, ESPEN, ESPER, ESPOL, ESPOR, ESQUE, ESROS, ESSCN, ESSEL, ESSHO, ESSTA, ESSTI, ESSYB, ESTIL, ESTNT, ESWAV, ESWCA, ESWHA, ESWHI, LCACC, LCADL, LCAIM, LCAIN, LCAOR, LCAPB, LCASB, LCASL, LCATH, LCBAB, LCBAC, LCBAN, LCBAR, LCBIR, LCBLK, LCBLP, LCBOL, LCBRN, LCBUR, LCBUS, LCCAF, LCCAR, LCCHO, LCCHU, LCCLE, LCCLR, LCCLV, LCCOC, LCCOL, LCCOP, LCDAR, LCDAU, LCDTF, LCEAR, LCECC, LCFAR, LCFLW, LCFOM, LCFRE, LCFUL, LCGAR, LCGRH, LCHAM, LCHAR, LCHBK, LCHET, LCHEW, LCHEY, LCHIG, LCHIN, LCHOG, LCHOR, LCKEN, LCKES, LCKHA, LCKNO, LCLAN, LCLAY, LCLEI, LCLEY, LCLIT, LCLON, LCLOT, LCLYT, LCMAR, LCMAT, LCMLM, LCMOR, LCNEL, LCNSH, LCORR, LCPAD, LCPAR, LCPEN, LCPEW, LCPLB, LCPLE, LCPOU, LCPRE, LCRAM, LCRIB, LCROC, LCROS, LCSHW, LCSOU, LCSSH, LCSTA, LCSTD, LCTOD, LCTOT, LCULV, LCWAL, LCWES, LCWET, LCWGT, LCWHA, LCWHI, LCWHW, LCWIG, LCWIL, LCWOR, LNADK, LNBAR, LNBGN, LNBKG, LNBPK, LNCED, LNCHF, LNCLA, LNCUF, LNDAG, LNEDM, LNENF, LNFIN, LNGDM, LNGHL, LNHAC, LNHAI, LNHAT, LNHOD, LNHOR, LNHPK, LNILC, LNILN, LNING, LNLEY, LNLOU, LNLVY, LNMED, LNMUS, LNNFN, LNNWS, LNPFT, LNPGN, LNPKS, LNPON, LNPOP, LNPOT, LNRAI, LNROM, LNSOK, LNSTA, LNSTB, LNSTF, LNTHB, LNTOT, LNUPK, LNUPM, LNWCR, LNWFD, LNWGN, LNWIN, LNWSD, LNWTH, LSADD, LSASH, LSBAL, LSBEC, LSBET, LSBEU, LSBEX, LSBKM, LSBRO, LSBURH, LSBYF, LSCHER, LSCHES, LSCHI, LSCLPM, LSCOB, LSCRAY, LSCRO, LSCTFD, LSCTHM, LSDAR, LSDEP, LSDOW, LSDUL, LSELT, LSEPSM, LSERI, LSESH, LSEWE, LSFARB, LSFARN, LSFOR, LSGIP, LSGRNH, LSGRNW, LSGRO, LSHAY, LSKID, LSKIN, LSLEA, LSLEE, LSLODH, LSMAL, LSMEPK, LSMERS, LSMIT, LSMOG, LSMOL, LSMOR, LSNCHM, LSNOR, LSORP, LSOTT, LSOXS, LSPUR, LSPUT, LSRED, LSREI, LSRIC, LSRUS, LSSAN, LSSID, LSSLA, LSSTR, LSSUN, LSSUR, LSSUT, LSSWA, LSSYD, LSTAD, LSTED, LSTHDT, LSTHMD, LSTHO, LSTUL, LSUWAR, LSWAL, LSWAN, LSWEY, LSWIM, LSWLTN, LSWOO, LSWOR, LSWWKM, LVAIN, LVALL, LVANF, LVARR, LVAUG, LVBIL, LVBIR, LVBOO, LVBRO, LVCAL, LVCEN, LVCHI, LVCLA, LVCRE, LVCUL, LVEAS, LVELL, LVFRO, LVGAT, LVGRE, LVHAL, LVHEL, LVHES, LVHOO, LVHOY, LVHUN, LVHUY, LVIRB, LVLAR, LVLYM, LVMAG, LVMOU, LVMSX, LVNES, LVNET, LVNLW, LVNOR, LVORM, LVPAD, LVPEN, LVPRE, LVRAI, LVRNE, LVRNM, LVROC, LVROY, LVSAI, LVSEF, LVSIM, LVSKE, LVSTA, LVSTK, LVSTO, LVUPH, LVWAL, LVWAR, LVWAT, LVWID, LWACT, LWASH, LWBUS, LWCHI, LWCHO, LWCOL, LWCRI, LWDEN, LWEAL, LWEDG, LWEGH, LWELS, LWFEL, LWGAR, LWGOL, LWGRE, LWHAM, LWHARE, LWHARL, LWHARR, LWHAT, LWHAY, LWHEN, LWHOU, LWISL, LWKGRE, LWKIN, LWKLAN, LWKNE, LWKROA, LWMIL, LWNEDG, LWNOR, LWNWEM, LWNWOO, LWPER, LWPIN, LWRAD, LWRIC, LWRUI, LWSHAR, LWSHE, LWSKY, LWSOU, LWSTAI, LWSTAN, LWTWI, LWUXB, LWWAT, LWWDRA, LWWEM, LWWIL, LWWRA, MRALD,

MRALT, MRARD, MRASH, MRBLA, MRBOL, MRBRA, MRBRO, MRBUR, MRBUX, MRCEN, MRCHA, MRCHE, MRCHO, MRCOL, MRCON, MRDEN, MRDID, MRDIS, MRDRO, MREAS, MRECC, MRFAI, MRGAT, MRGLO, MRHAR, MRHEA, MRHUL, MRHYD, MRIRL, MRKNU, MRLON, MRMAC, MRMAR, MRMDW, MRMER, MRMID, MRMOS, MRMOT, MRMSL, MRNEW, MRNOR, MROLD, MRPEN, MRPOY, MRPRE, MRRAD, MRRIN, MRRUS, MRSAD, MRSAL, MRSAN, MRSTA, MRSTE, MRSTO, MRSWI, MRTRA, MRURM, MRWAL, MRWEA, MRWHA, MRWHI, MRWIL, MRWIN, MRWOO, MRWYT, MYACO, MYADE, MYARM, MYBAT, MYBD, MYBIN, MYBNN, MYBOR, MYBOS, MYBRG, MYBRW, MYCAL, MYCAS, MYCAY, MYCHA, MYCLE, MYCOL, MYCRF, MYCSG, MYCSH, MYCTN, MYCUL, MYDEW, MYDFF, MYDHS, MYDLT, MYDUD, MYELL, MYFIL, MYFLO, MYGIL, MYGOO, MYGRF, MYGUI, MYHAL, MYHAW, MYHAX, MYHBK, MYHEA, MYHEB, MYHEC, MYHGT, MYHHL, MYHLT, MYHMF, MYHMW, MYHNS, MYHOB, MYHON, MYHSF, MYHUD, MYHUM, MYIDL, MYILK, MYILL, MYKEI, MYKEY, MYKKB, MYKNA, MYKNO, MYLAI, MYLEV, MYLOF, MYLOW, MYLS, MYMAL, MYMAN, MYMAR, MYMIL, MYMIR, MYMOO, MYMOR, MYMSG, MYMTH, MYNCV, MYNMN, MYOAT, MYOTL, MYPIC, MYPOC, MYPON, MYPUD, MYQUE, MYROT, MYRPN, MYRPP, MYRWD, MYSAN, MYSCA, MYSEA, MYSEL, MYSEM, MYSHI, MYSKE, MYSKP, MYSLA, MYSML, MYSNH, MYSOW, MYSRB, MYSTE, MYSTR, MYTAD, MYTHN, MYTHT, MYUND, MYWAK, MYWAY, MYWBG, MYWEH, MYWIT, MYYO, NDACO, NDAGR, NDASF, NDAYL, NDBAL, NDBAR, NDBAT, NDBEA, NDBEX, NDBGR, NDBHI, NDBIR, NDBLH, NDBOU, NDBRE, NDBRO, NDCAN, NDCAS, NDCHE, NDCHR, NDCHS, NDCLI, NDCOO, NDCOP, NDCRA, NDCRO, NDDEA, NDDOV, NDDYM, NDEDE, NDEGR, NDFAI, NDFAV, NDFOL, NDFRO, NDGIL, NDGOD, NDGRA, NDGUE, NDHAS, NDHAW, NDHBA, NDHEA, NDHIL, NDHOO, NDHST, NDHYT, NDLAN, NDLEN, NDLIN, NDLON, NDLOO, NDMAI, NDMED, NDMEO, NDMSH, NDMTH, NDNEW, NDNON, NDNRO, NDOTF, NDOTH, NDOXT, NDPEM, NDPWO, NDRAI, NDRAM, NDRYE, NDSAN, NDSEA, NDSEI, NDSEV, NDSHE, NDSHO, NDSIT, NDSML, NDSNO, NDSOU, NDSTA, NDSTR, NDSTU, NDSVA, NDTEN, NDTEY, NDTHA, NDTON, NDTWE, NDUCK, NDWAT, NDWES, NDWET, NDWHI, NDWKI, NDWMA, NEAM, NEAT, NEAW, NEAYC, NEB, NEBA, NEBC, NEBDL, NEBDT, NEBEA, NEBH, NEBL, NEBO, NEBR, NEBRO, NEBUR, NEBW, NECC, NECM, NECN, NECOX, NECR, NECT, NED, NEDB, NEDL, NEDN, NEDU, NEDUDL, NEE, NEEC, NEEHN, NEES, NEESG, NEF, NEFH, NEFN, NEFSL, NEG, NEGF, NEGHD, NEGM, NEHAL, NEHHL, NEHLS, NEHRT, NEHT, NEHWH, NEHYL, NEHZ, NEILB, NEJ, NEJW, NEK, NEKI, NEL, NELC, NELEB, NELF, NELIN, NELM, NEMEA, NEMI, NEMP, NEMTN, NENA, NENN, NENP, NENS, NENT, NENTE, NENTW, NEOC, NEP, NEPH, NEPTE, NERC, NERD, NERE, NERG, NERN, NERT, NES, NESAC, NESAI, NESFE, NESHL, NESHM, NESK, NESLB, NESP, NESS, NESTK, NESTN, NESTO, NESU, NESUN, NESVL, NETL, NETMN, NEW, NEWAS, NEWAU, NEWB, NEWHP, NEWHY, NEWK, NEWLF, NEWN, NEWT, NIAH, NIAL, NIAM, NIAT, NIBA, NIBB, NIBC, NIBM, NIBML, NIBN, NIBNH, NIBO, NIBRH, NIBRS, NIBSB, NIBT, NIBYS, NIC, NICA, NICF, NICGR, NICI, NICK, NICMG, NICMN, NICN, NICR, NICRG, NICTY, NICW, NIDD, NIDG, NIDLD, NIDO, NIDP, NIEAS, NIEG, NIEK, NIFWM, NIGF, NIGGY, NIHO, NIHW, NIKI, NIKNK, NIKS, NIKY, NILDM, NILDW, NILE, NILG, NILN, NILY, NIMA, NIMAL, NIME, NIMF, NIMR, NINE, NINTH, NINTS, NINY, NIOM, NIORM, NIPO, NIPR, NIPS, NIRD, NIRI, NIRT, NISD, NISE, NISTM, NITG, NITP, NIWBY, NIWD, NIWP, NIWT, NSANS, NSASH, NSBBN, NSBCY, NSBDS, NSBKI, NSBLG, NSBMD, NSBNF, NSCTR, NSDEN, NSDGW, NSDYC, NSELG, NSELL, NSFRA, NSFRS, NSHOP, NSHUN, NSICL, NSIGD, NSIMD, NSIUR, NSKEM, NSKGW, NSKIR, NSKNC, NSKTH, NSKTR, NSLER, NSLNG, NSLOS, NSMDF, NSMIN, NSNHL, NSNTH, NSPET, NSPRT, NSSVN, NSTHU, NSWES, NSWIC, SDBGNRR, SDBLLNG, SDBMBRD, SDBRCKL, SDBRGSS, SDBSHM, SDCHCHS, SDCRWLY, SDCSHM, SDCWS, SDESTBR, SDFRHM, SDFRSHW, SDGSPRT, SDHLSHM, SDHMPDN, SDHNFLD, SDHRLY, SDHRNDN, SDHRSHM, SDHRSTP, SDHSSCK, SDHV, SDHVNT, SDHYLNG, SDHYWRD, SDKMPTW, SDLNCNG, SDLSLNT, SDLSS, SDLTTLH, SDLWS, SDMDDLT, SDMDHRS, SDMSWRT, SDNWHVN, SDNWPRT, SDPCHVN, SDPCNTC, SDPGHM, SDPLBRG, SDPLGT, SDPNDHL, SDPNRTH, SDPRTSL, SDPTRSF, SDPVNSY, SDRNDL, SDRSTNG,

SDRTTNG, SDRYD, SDSFRD, SDSHNKL, SDSHRHM, SDSLSY, SDSNDWN, SDSTBBN, SDSTHWC, SDSTHWT, SDSTRGT, SDSTRRN, SDTTCHF, SDVNTNR, SDWCKHM, SDWCNTR, SDWSTCH, SDWSWND, SDWTHDN, SDWTRLV, SDWWST, SDYPTN, SLAC, SLADK, SLARM, SLASC, SLASK, SLBAL, SLBAW, SLBC, SLBCC, SLBEN, SLBH, SLBLR, SLBOI, SLBWD, SLBWH, SLBY, SLBYD, SLCBR, SLCBY, SLCD, SLCL, SLCLS, SLCLY, SLCUD, SLCX, SLDC, SLDCN, SLDF, SLDIO, SLDR, SLEF, SLEK, SLEP, SLFGY, SLGB, SLGL, SLGTP, SLGY, SLHBE, SLHC, SLHLG, SLHLY, SLHTW, SLHWD, SLHX, SLHY, SLHYG, SLIMM, SLIN, SLKIV, SLKKB, SLLH, SLLI, SLMBY, SLMEX, SLMIM, SLMK, SLMOS, SLMT, SLNCU, SLOB, SLOLD, SLPN, SLRF, SLRH, SLRHN, SLRN, SLRSN, SLRU, SLRWM, SLRY, SLSC, SLSEK, SLSF, SLSKT, SLSPK, SLST, SLSW, SLSY, SLTHY, SLTKL, SLWAD, SLWB, SLWBO, SLWD, SLWEL, SLWHT, SLWKT, SLWKZ, SLWL, SLWM, SLWS, SLWSP, SLWTH, SLWW, SLXDS, SMAD, SMAI, SMAM, SMAP, SMAY, SMBA, SMBB, SMBC, SMBCD, SMBD, SMBF, SMBI, SMBK, SMBT, SMBU, SMBWD, SMBY, SMBZ, SMCAR, SMCG, SMCHN, SMCN, SMCO, SMCSH, SMDB, SMDC, SMEB, SMFK, SMGM, SMHD, SMHGN, SMHH, SMHI, SMHR, SMHUR, SMHXT, SMHY, SMKBN, SMKI, SMKO, SMKT, SMLBD, SMLEA, SMLF, SMLH, SMLN, SMLSN, SMLT, SMMC, SMMY, SMNP, SMNPL, SMOA, SMOF, SMOY, SMPEN, SMPRB, SMPT, SMRDB, SMRE, SMSA, SMSFD, SMSH, SMSM, SMSMV, SMSSF, SMSSO, SMSTF, SMSU, SMSX, SMTA, SMTN, SMTR, SMWE, SMWEP, SMWI, SMWLS, SMWLY, SMWN, SMWNG, SMWS, SMWTD, SMWV, SMWW, SSABS, SSALM, SSAVO, SSBAN, SSBAT, SSBBN, SSBCL, SSBED, SSBIS, SSBIT, SSBKE, SSBLE, SSBOA, SSBOW, SSBRI, SSBRK, SSBWD, SSCAL, SSCBD, SSCDR, SSCHI, SSCHN, SSCIN, SSCIR, SSCLE, SSCMN, SSCOL, SSCOR, SSCRD, SSCSY, SSDBK, SSDEV, SSDOW, SSDSY, SSEAS, SSEAV, SSFGN, SSFIS, SSFLT, SSFRO, SSGLA, SSGLR, SSHAW, SSHEN, SSHGH, SSHWK, SSHYW, SSKEY, SSKMD, SSKWD, SSLDY, SSMAL, SSMBH, SSMEL, SSMID, SSNAH, SSNAI, SSNOR, SSPIL, SSPOR, SSPTN, SSRAD, SSRED, SSSFD, SSSHC, SSSHE, SSSHM, SSSHN, SSSHR, SSSOU, SSSSM, SSSTD, SSSTO, SSSTT, SSSWN, SSTHL, SSTHO, SSTIM, SSTRO, SSTXY, SSWAR, SSWCE, SSWEL, SSWES, SSWGN, SSWHI, SSWIB, SSWOB, SSWOR, SSWOT, SSWSM, SSWTC, SSWUE, SSWWS, STALSFD, STAMSBY, STANDVR, STBDSTN, STBINAB, STBISHW, STBLFRD, STBLNFD, STBNMTH, STBOSMB, STBOTLY, STBRDPT, STBSETT, STBURSN, STCANCL, STCFORD, STCHRCH, STDORCH, STDOWTN, STDURRW, STEASTL, STFAIRO, STFAWLY, STFERND, STFORDB, STGILGM, STHAMBL, STHICLF, STHMPTN, STHRSTK, STHYTHE, STLGSHL, STLOCKH, STLYMTN, STLYTMN, STMRHLL, STNEWMN, STNTHBN, STPOOLE, STPORTL, STPRKST, STPRSTN, STRINGW, STROMSY, STRWNMS, STSALIS, STSHABY, STSHRLY, STSOTON, STSTHBN, STSWANG, STTDWTH, STTOTTN, STTWYFD, STUPWEY, STVERWD, STWARHM, STWEYMH, STWIMBN, STWINCH, STWINTN, STWLSTN, STWRMWL, STWSTBN, SWAA, SWAAZ, SWABD, SWABT, SWADW, SWAG, SWAVY, SWBIG, SWBII, SWBIK, SWBNB, SWBNP, SWBPG, SWBSE, SWBUD, SWCAA, SWCAB, SWCFATE, SWCFK, SWCIT, SWCJ, SWCJW, SWCNE, SWCOO, SWCRS, SWCT, SWCTE, SWCUV, SWCXX, SWCYX, SWDPW, SWEBY, SWFBX, SWGAR, SWGBG, SWGBY, SWGC, SWGLN, SWHJL, SWHXM, SWKGH, SWLJ, SWLJZ, SWLLD, SWLLG, SWLLO, SWLLR, SWLNI, SWMAL, SWMDE, SWMES, SWMGR, SWMLZ, SWMMN, SWMMV, SWMT/EX, SWMU, SWMYS, SWNBI, SWNE/CH, SWNE/EX, SWNM, SWNSN, SWNVW, SWOAG, SWPBM, SWPDU, SWPDW, SWPEK, SWPEU, SWPN, SWPND, SWPP, SWPTB, SWPTH, SWPTY, SWQJA, SWQTI, SWRDA, SWRDX, SWRHR, SWRRY, SWRTH, SWRVH, SWRWI, SWSDV, SWSKJ, SWSKU, SWSSQ, SWSX, SWSZX, SWTAJ, SWTAT, SWTB, SWTDU, SWTEZ, SWTFA, SWTR, SWTRF, SWUWN, SWWXC, SWXNH, SWXUU, SWYBL, SWYYN, SWZKS, SWZWM, THAD, THAFD, THAS, THATN, THBA, THBEN, THBG, THBK, THBL, THBN, THBO, THBR, THBW, THBZ, THC, THCDN, THCK, THCN, THCV, THCW, THDC, THDK, THDM, THEAR, THEV, THEY, THFB, THFC, THFJ, THFM, THFN, THFT, THGG, THGI, THGX, THH, THHE, THHH, THHM, THHN, THHRJ, THHT, THHW, THIP, THKE, THLG, THLL, THLM, THLP, THM, THML, THMSD, THNU, THOH, THOK, THRG, THS, THSL, THSPD, THT, THTAD, THTF, THTG, THTH, THTT, THWA, THWDY, THWK,

THWL, THWM, THWO, THWP, THWR, THWTH, THWY, THY, WEWBAY, WEWBLO, WEWHAM, WEWLOR, WEWMAI, WEWMAR, WEWMAY, WEWNPN, WEWPAD, WEWPRI, WEWSOH, WMADY, WMALS, WMASH, WMBAD, WMBEW, WMBID, WMBLY, WMBPZ, WMBUR, WMCHD, WMCHS, WMCIT, WMDIM, WMDRO, WMEND, WMEV, WMFER, WMHAG, WMHAS, WMHCH, WMHX, WMIPS, WMKD, WMKDG, WMKEM, WMLEE, WMLIT, WMLON, WMMAD, WMMAL, WMMFD, WMMTL, WMNAN, WMNEW, WMPER, WMPKR, WMRJ, WMRUG, WMSBH, WMSPA, WMSTD, WMSTJ, WMSTK, WMSTO, WMSTP, WMSTU, WMTEA, WMTRE, WMUTT, WMUUS, WMWLN, WMWR, WNABC, WNAGE, WNBG, WNBH, WNBRS, WNBT, WNBUC, WNBUR, WNBW, WNCA, WNCAG, WNCB, WNCKO, WNCSC, WNCSN, WNCSS, WNDAW, WNDEE, WNDEN, WNDON, WNFL, WNGRE, WNHAT, WNHAW, WNHAY, WNHLN, WNHOL, WNHR, WNHW, WNKEL, WNLDD, WNLED, WNLEO, WNLGF, WNLMY, WNLR, WNLST, WNLUD, WNLW, WNM, WNMB, WNMD, WNMW, WNNN, WNNP, WNOAK, WNOC, WNOSW, WNPEG, WNPOR, WNPRS, WNPWL, WNRE, WNRHU, WNROS, WNROW, WNRUA, WNRUT, WNRWX, WNSA, WNSHI, WNSTI, WNSY, WNTW, WNVAL, WNWCH, WNWEL, WNWEM, WNWPL, WNWX, WNWXN, WRBATT, WRBEL, WRBRIX, WRCHEL, WRECT, WRFULM, WRKGDN, WRNELMS, WRPGRN, WRPIM, WRSKEN, WRSLO, WRSTHBK, WRVAUX, WRWHI, WRWKEN, WRWMIN, WSAIR, WSALE, WSALL, WSANK, WSANN, WSARD, WSAYR, WSBAI, WSBAR, WSBEA, WSBEH, WSBEI, WSBEL, WSBIN, WSBIS, WSBLA, WSBOT, WSBRE, WSBRI, WSBRW, WSBUS, WSCAB, WSCAL, WSCAM, WSCAR, WSCAS, WSCEN, WSCLE, WSCLY, WSCMN, WSCOA, WSCRA, WSCRO, WSCUM, WSDAL, WSDAM, WSDAR, WSDAV, WSDMS, WSDOU, WSDRO, WSDRU, WSDUM, WSDUT, WSEKI, WSERS, WSGAL, WSGIF, WSGIR, WSGLG, WSGOU, WSGOV, WSGRE, WSHAL, WSHAM, WSHEL, WSHOL, WSIBR, WSIRS, WSIRV, WSJOH, WSKBN, WSKIE, WSKIL, WSKIM, WSKIR, WSKIW, WSKIY, WSKKT, WSLAA, WSLAK, WSLAN, WSLAR, WSLES, WSLEX, WSLOE, WSMAR, WSMAU, WSMAY, WSMER, WSMIL, WSMOT, WSNES, WSNEW, WSOBA, WSPAI, WSPOL, WSPOS, WSPRE, WSPRO, WSPTH, WSPTN, WSREN, WSRUT, WSSCO, WSSHE, WSSOU, WSSPR, WSSTE, WSSTN, WSSTR, WSSTW, WSTHO, WSTRO, WSUDD, WSWEK, WSWEM, WSWES, WSWIS, WWAXMI, WWBARN, WWBIDE, WWBLYD, WWBODM, WWBRAU, WWBRIX, WWBTRA, WWBUDE, WWBUDL, WWBURN, WWBWAT, WWCALL, WWCAMB, WWCHEL, WWCHRD, WWCHRS, WWCHUD, WWCRED, WWCREW, WWCRWN, WWCULL, WWDAWL, WWDPRT, WWDRAN, WWEXMO, WWEXTR, WWFALM, WWGUNN, WWHAYL, WWHELS, WWHONI, WWILFR, WWILMI, WWIVYB, WWKNGB, WWLAUN, WWLISK, WWLOOE, WWLPRT, WWLYME, WWMART, WWMINE, WWNABB, WWNANP, WWNEWQ, WWOKEH, WWOSMY, WWPAIG, WWPAR, WWPENZ, WWPINH, WWPRYN, WWPSTK, WWPTON, WWPURI, WWPYTH, WWREDR, WWSALT, WWSAUS, WWSBUD, WWSCOL, WWSEAT, WWSHER, WWSHIP, WWSIDM, WWSIVE, WWSJUS, WWSMAR, WWSPET, WWSTEN, WWTAUN, WWTAVI, WWTEIG, WWTIVE, WWTOPS, WWTORQ, WWTORR, WWTOTN, WWTPNT, WWTRUR, WWWADE, WWWELL, WWWILL, WWWINC, WWYELV, WWYEOV

SCHEDULE 2

[DRAFT] SMP conditions to be imposed on KCOM in the Hull Area

Part 1: Application

The SMP conditions in Part 3 of this Schedule 2 shall, except where specified otherwise, apply to the Dominant Provider in the wholesale broadband access market in the Hull Area referred to in paragraph 13 of the Notification.

Part 2: Definitions and Interpretation

1. In addition to the definitions set out above in this notification, in this Schedule 2—

   (a) "**Access Agreement**" means an agreement entered into between the Dominant Provider and a Third Party for the provision of network access in accordance with condition 1;

   (b) "**Access Charge Change**" means any amendment to the charges, terms and conditions on which the Dominant Provider provides network access;

   (c) "**Access Charge Change Notice**" means a notice given by the Dominant Provider of an Access Charge Change;

   (d) "**Dominant Provider**" means KCOM;

   (e) "**Reference Offer**" means the terms and conditions on which the Dominant Provider is willing to enter into an Access Agreement;

   (f) "**Third Party**" means a person providing a public electronic communications service or a person providing a public electronic communications network;

Part 3: The SMP conditions

Condition 1 – Network access on reasonable request

1.1 The Dominant Provider must provide network access to a Third Party where that Third Party, in writing, reasonably requests it.

1.2 The provision of network access by the Dominant Provider in accordance with this condition must—

(a) take place as soon as reasonably practicable after receiving the request from a Third Party;

(b) be on fair and reasonable terms, conditions and charges; and

(c) be on such terms, conditions and charges as OFCOM may from time to time direct.

1.3 The Dominant Provider must comply with any direction OFCOM may make from time to time under this condition.

Condition 2 – No undue discrimination

2.1 The Dominant Provider must not unduly discriminate against particular persons or against a particular description of persons, in relation to the provision of network access in accordance with condition 1.

2.2 In this condition, the Dominant Provider may be deemed to have shown undue discrimination if it unfairly favours to a material extent an activity carried on by it so as to place one or more Third Parties at a competitive disadvantage in relation to activities carried on by the Dominant Provider.

Condition 3 – Publication of a Reference Offer

3.1 Except in so far as OFCOM may from time to time otherwise consent in writing, the Dominant Provider must publish a Reference Offer and act in the manner set out below.

3.2 Subject to condition 3.8, the Dominant Provider must ensure that a Reference Offer in relation to the provision of network access includes, where applicable, at least the following—

(a) a description of the network access to be provided, including technical characteristics (which shall include information on network configuration where necessary to make effective use of network access);

(b) the locations at which network access will be provided;

(c) any relevant technical standards for network access (including any usage restrictions and other security issues);

(d) the conditions for access to ancillary, supplementary and advanced services (including operational support systems, information systems or databases for pre-ordering, provisioning, ordering, maintenance and repair requests and billing);

(e) any ordering and provisioning procedures;

(f) relevant charges, terms of payment and billing procedures;

(g) details of interoperability tests;

(h) details of maintenance and quality as follows—

(i) specific time scales for the acceptance or refusal of a request for supply and for completion, testing and hand-over or delivery of services and facilities, for provision of support services (such as fault handling and repair);

(ii) service level commitments, namely the quality standards that each party must meet when performing its contractual obligations;

(iii) the amount of compensation payable by one party to another for failure to perform contractual commitments;

(iv) a definition and limitation of liability and indemnity; and

(v) procedures in the event of alterations being proposed to the service offerings, for example, launch of new services, changes to existing services or change to prices;

(i) details of any relevant intellectual property rights;

(j) a dispute resolution procedure to be used between the parties;

(k) details of duration and renegotiation of agreements;

(l) provisions regarding confidentiality of the agreements;

(m) rules of allocation between the parties when supply is limited (for example, for the purpose of co-location or location of masts); and

(n) the standard terms and conditions for the provision of network access.

3.3 To the extent that the Dominant Provider provides to itself network access that—

(a) is the same, similar or equivalent to that provided to any other Third Party; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any other Third Party;

in a manner that differs from that detailed in a Reference Offer in relation to network access provided to any other Third Party, the Dominant Provider must ensure that it publishes a Reference Offer in relation to the network access that it provides to itself which includes, where relevant, at least those matters detailed in condition 3.2(a) to (n).

3.4 The Dominant Provider must, within one month of the date that this condition enters into force, publish a Reference Offer in relation to any network access that it is providing as at the date that this condition enters into force.

3.5 The Dominant Provider must update and publish the Reference Offer in relation to any amendments or in relation to any further network access provided after the date that this condition enters into force.

3.6 Publication referred to above shall be effected by the Dominant Provider placing a copy of the Reference Offer on any relevant website operated or controlled by the Dominant Provider.

3.7 The Dominant Provider must send a copy of the current version of the Reference Offer to any person at that person's written request (or such parts as have been requested).

3.8 The Dominant Provider must make such modifications to the Reference Offer as OFCOM may direct from time to time.

3.9 The Dominant Provider must provide network access at the charges, terms and conditions in the relevant Reference Offer and must not depart therefrom either directly or indirectly.

3.10 The Dominant Provider must comply with any direction OFCOM may make from time to time under this condition.

Condition 4 – Notification of charges and terms and conditions

4.1 Except in so far as OFCOM may from time to time otherwise consent in writing, the Dominant Provider must publish charges, terms and conditions and act in the manner set out in this condition.

4.2 Where it proposes an Access Charge Change, the Dominant Provider must send to every person with which it has entered into an Access Agreement pursuant to condition 1, an Access Charge Change Notice.

4.3 The obligation in condition 4.2 shall not apply where the Access Charge Change is directed or determined by OFCOM (including pursuant to the setting of an SMP condition under the power in section 45 of the Act) or required by a notification or enforcement notification issued by OFCOM under sections 96A or 96C of the Act.

4.4 An Access Charge Change Notice must be sent not less than 28 days before any such amendment comes into effect.

4.5 The Dominant Provider must ensure that an Access Charge Change Notice includes—

(a) a description of the network access in question;

(b) a reference to the location in the Dominant Provider's current Reference Offer of the terms and conditions associated with the provision of that network access;

(c) the current and proposed new charge and/or current and proposed new terms and conditions (as the case may be) and

(d) the date on which, or the period for which, the Access Charge Change will take effect (the "effective date").

4.6 The Dominant Provider must not apply any Access Charge Change identified in an Access Charge Change Notice before the effective date.

4.7 To the extent that the Dominant Provider provides to itself network access that—

(a) is the same, similar or equivalent to that provided to any Third Party; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any Third Party,

in a manner that differs from that detailed in an Access Charge Change Notice in relation to network access provided to any Third Party, the Dominant Provider must ensure that it sends to OFCOM a notice in relation to the network access that it provides to itself which includes, where relevant, at least those matters detailed in conditions 4.5(a) to (c) and, where the Dominant Provider amends the charges, terms and conditions on which it provides itself with network access, it must ensure it sends to OFCOM a notice equivalent to an Access Charge Change Notice.

Condition 5 – Quality of service

5.1 The Dominant provider must publish all such information as to the quality of service in relation to network access provided by the Dominant Provider pursuant to condition 1 in such manner and form, and including such content, as OFCOM may from time to time direct.

5.2 The Dominant Provider must comply with any direction OFCOM may make from time to time under this condition 5.

Condition 6 – Notification of technical information

6.1 Except in so far as OFCOM may from time to time otherwise consent in writing, where the Dominant Provider provides network access pursuant to condition 1 and proposes new or amended terms and conditions relating to the following—

(a) technical characteristics (including information on network configuration, where necessary, to make effective use of the network access provided);

(b) the locations at which network access will be provided; or

(c) technical standards (including any usage restrictions and other security issues),

the Dominant Provider must publish a written notice (the “Notice”) of the new or amended terms and conditions within a reasonable time period but not less than 90 days before either the Dominant Provider enters into an Access Agreement to provide the new network access or the amended terms and conditions of the existing Access Agreement come into effect.

6.2 The obligation in condition 6.1 shall not apply where the new or amended charges or terms and conditions are directed or determined by OFCOM (including pursuant to the setting of an SMP condition under the power in section 45 of the Act) or are required by a notification or enforcement notification issued by OFCOM under sections 96A or 96C of the Act.

6.3 The Dominant Provider must ensure that the Notice includes—

(a) a description of the network access in question;

(b) a reference to the location in the Dominant Provider’s Reference Offer of the relevant terms and conditions;

(c) the date on which or the period for which the Dominant Provider may enter into an Access Agreement to provide the new network access or any amendments to the relevant terms and conditions will take effect (the “effective date”).

6.4 The Dominant Provider must not enter into an Access Agreement containing the terms and conditions identified in the Notice or apply any new relevant terms and conditions identified in the Notice before the effective date.

6.5 Publication referred to in condition 6.1 must be effected by the Dominant Provider—

(a) placing a copy of the Notice on any relevant website operated or controlled by the Dominant Provider;

(b) sending a copy of the Notice to OFCOM; and

(c) sending a copy of the Notice to any person at that person's written request, and where the Notice identifies a modification to existing relevant terms and conditions, to every person with which the Dominant Provider has entered into an Access Agreement pursuant to condition 1. The provision of such a copy of the Notice by the Dominant Provider may be subject to a reasonable charge.

Annex 3

Regulatory framework

Introduction

A3.1 This annex provides an overview of the market review process, to give some additional context and understanding of the matters discussed in this statement, including the legal instrument (statutory notification) published at Annex 2.

A3.2 Market review regulation is technical and complex, including the legislation and the recommendations and guidelines that we need to consider as part of the process. There may be many relevant documents depending on the market and/or issues in question. This overview does not purport to give a full and exhaustive account of all such materials that we have considered in reaching our preliminary views on this market. Some of the key aspects of materials relevant to this market review are, however, discussed in this annex.

Market review concept

A3.3 The concept of a market review refers to procedures under which we, at regular intervals, identify relevant markets appropriate to national circumstances and carry out analyses of these markets to determine whether they are effectively competitive before then deciding on appropriate remedies, known as SMP obligations or conditions (we explain the concept of SMP below).

A3.4 In carrying out this work, we act in our capacity as the sector-specific regulator for the UK communications industries, particularly relating to our role as the regulator for telecommunications. Our functions in this regard are to be found in Part 2 of the Communications Act 2003 (the 2003 Act).[13] We exercise those functions within the framework harmonised across the European Union for the regulation of electronic communications by the Member States (known as the Common Regulatory Framework or the 'CRF'), as transposed by the 2003 Act. The applicable rules[14] are contained in a package of five EC Directives, of which two Directives are immediately relevant for present purposes, namely:

- Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services (the 'Framework Directive'); and

- Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities (the 'Access Directive').

A3.5 The Directives require that NRAs (such as Ofcom) carry out reviews of competition in communications markets to ensure that SMP regulation remains appropriate and proportionate in the light of changing market conditions.

A3.6 Each market review normally involves three analytical stages, namely:

[13] http://www.legislation.gov.uk/ukpga/2003/21/contents

[14] The Directives were subsequently amended on 19 December 2009. The amendments have been transposed into the national legislation and applied with effect from 26 May 2011 and any references in this statement to the 2003 Act should be read accordingly.

- the procedure for the identification and definition of the relevant markets (the market definition procedure);
- the procedure for the assessment of competition in each market, in particular whether the relevant market is effectively competitive (the market analysis procedure); and
- the procedure for the assessment of appropriate regulatory obligations (the remedies procedure).

A3.7 These stages are normally carried out together.

Market definition procedure

A3.8 The 2003 Act provides that, before making a market power determination,[15] we must identify the market which is, in our opinion, the one which, in the circumstances of the UK, is the market in relation to which it is appropriate to consider making such a determination and to analyse that market.

A3.9 The Framework Directive requires that NRAs shall, taking the utmost account of the 2007 Recommendation on Markets[16] and SMP Guidelines[17] published by the European Commission ('EC'), define the relevant markets appropriate to national circumstances, in particular relevant geographic markets within their territory, in accordance with the principles of competition law.

A3.10 The 2007 Recommendation on Markets identifies a set of product and service markets within the electronic communications sector in which *ex ante* regulation may be warranted.[18] Its purpose is twofold. First, it seeks to achieve harmonisation across the single market by ensuring that the same markets will be subject to a market analysis in all Member States. Second, the 2007 Recommendation on Markets seeks to provide legal certainty by making market players aware in advance of the markets to be analysed. However, NRAs are able to regulate markets that differ from those identified in the 2007 Recommendation on Markets where this is justified by national circumstances, taking account of the three cumulative criteria referred to in the 2007 Recommendation on Markets (the 'three-criteria test') and where the EC does not raise any objections.

A3.11 Under the three-criteria test, when identifying markets other than those in the 2007Recommendation on Markets, the NRA needs to ensure that each of the following three criteria are cumulatively met:

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[15] The market power determination concept is used in the Act to refer to a determination that a person has SMP in an identified services market.

[16] EC, *Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services*, (2007/879/EC), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:344:0065:0069:en:PDF.

[17] EC, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF.

[18] The 2007 Recommendation on Markets is currently under review. The EC is expected to publish a revised recommendation in due course.

- the presence of high and non-transitory barriers to entry. These may be of a structural, legal or regulatory nature;

- a market structure which does not tend towards effective competition within the relevant time horizon. The application of this criterion involves examining the state of competition behind the barriers to entry; and

- the insufficiency of competition law alone to adequately address the market failure(s) concerned.

A3.12 The fact that an NRA identifies the product and service markets listed in the 2007Recommendation on Markets or identifies other product and service markets that meet the three-criteria test does not automatically mean that regulation is warranted. Market definition is not an end in itself but rather a means of assessing effective competition. The three-criteria test is also different from the SMP assessment because the test's focus is on the general structure and market characteristics.

A3.13 The relationship between the market definitions identified in this review and those listed in the 2007 Recommendation on Markets is discussed in relevant parts of this statement.

A3.14 The SMP Guidelines make clear that market definition is not a mechanical or abstract process. It requires an analysis of any available evidence of past market behaviour and an overall understanding of the mechanics of a given market sector. As market analysis has to be forward-looking, the SMP Guidelines state that NRAs should determine whether the market is prospectively competitive, and thus whether any lack of effective competition is durable, by taking into account expected or foreseeable market developments over the course of a reasonable period. The SMP Guidelines clarify that NRAs enjoy discretionary powers which reflect the complexity of all the relevant factors that must be assessed (economic, factual and legal) when identifying the relevant market, and assessing whether an undertaking has SMP.

A3.15 The SMP Guidelines also describe how competition law methodologies may be used by NRAs in their analysis. In particular, there are two dimensions to the definition of a relevant market: the relevant products to be included in the same market and the geographic extent of the market. Ofcom's approach to market definition follows that used by the UK competition authorities, which is in line with the approach adopted by the EC.

A3.16 While competition law methodologies are being used in identifying the *ex ante* markets, the markets identified will not necessarily be identical to markets defined in individual competition law cases, especially as the *ex ante* markets are based on an overall forward-looking assessment of the structure and the functioning of the market under examination. Accordingly, the economic analysis carried out for the purpose of this review, including the markets we have identified, is without prejudice to any analysis that may be carried out in relation to any investigation pursuant to the Competition Act 1998[19] (relating to the application of the Chapter I or II

[19] http://www.legislation.gov.uk/ukpga/1998/41/contents

prohibitions or Article 101 or 102 of the Treaty on the Functioning of the European Union[20]) or the Enterprise Act 2002.[21]

Market analysis procedure

Effective competition

A3.17 The 2003 Act requires that we carry out market analyses of identified markets for the purpose of making or reviewing market power determinations. Such analyses are normally to be carried out within two years from the adoption of a revised recommendation on markets, where that recommendation identifies a market not previously notified to the EC, or within three years from the publication of a previous market power determination relating to that market.[22]

A3.18 In carrying out a market analysis, the key issue for an NRA is to determine whether the market in question is effectively competitive. The 27th recital to the Framework Directive clarifies the meaning of that concept. Namely, "*[it] is essential that ex ante regulatory obligations should only be imposed where there is not effective competition, i.e. in markets where there are one or more undertakings with significant market power, and where national and Community competition law remedies are not sufficient to address the problem*".

A3.19 The definition of SMP is equivalent to the concept of dominance as defined in competition law. In essence, it means that Ofcom needs to determine whether any undertaking in the relevant market is in a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers. The Framework Directive requires that NRAs must carry out their market analysis taking the utmost account of the SMP Guidelines, which emphasise that NRAs should undertake a thorough and overall analysis of the economic characteristics of the relevant market before coming to a conclusion as to the existence of SMP.

A3.20 In that regard, the SMP Guidelines set out, additionally to market shares, a number of criteria that can be used by NRAs to measure the power of an undertaking to behave to an appreciable extent independently of its competitors, customers and consumers, including:

- overall size of the undertaking;
- control of infrastructure not easily duplicated;
- technological advantages or superiority;
- absence of or low countervailing buying power;
- easy or privileged access to capital markets/financial;

[20] Previously Article 81 and Article 82 of the EC Treaty, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:083:FULL:EN:PDF.
[21] http://www.legislation.gov.uk/ukpga/2002/40/contents
[22] The 2003 Act was amended on 26 May 2011 to include these requirements following amendment to the Directives on 19 December 2009. However, the 2003 Act provides for a transitional provision which means that the requirement to notify the EC within 3 years from a previous market power determination only applies where that market power determination was made after 25 May 2011. The market power determinations under review in this document were made prior to 25 May 2011.

- resources;
- product/services diversification (e.g. bundled products or services);
- economies of scale;
- economies of scope;
- vertical integration;
- highly developed distribution and sales network;
- absence of potential competition; and
- barriers to expansion.

A3.21 A dominant position can derive from a combination of these criteria, which when taken separately may not necessarily be determinative.

Sufficiency of competition law

A3.22 As part of our overall forward-looking analysis, we also assess whether competition law by itself (without *ex ante* regulation) is sufficient, within the relevant markets we have defined, to address the competition problems we have identified. Aside from the need to address this issue as part of the three-criteria test, we also consider this matter in our assessment of the appropriate remedies which, as explained below, are based on the nature of the specific competition problems we identify within the relevant markets as defined. We also note that the SMP Guidelines clarify that, if NRAs designate undertakings as having SMP, they must impose on them one or more regulatory obligations.

A3.23 In considering this matter, we bear in mind the specific characteristics of the relevant markets we have defined. Generally, the case for *ex ante* regulation is based on the existence of market failures, which, by themselves or in combination, mean that the establishment of competition might not be possible if the regulator relied solely on *ex post* competition law powers that have been established for dealing with more conventional sectors of the economy. Therefore, it is appropriate for *ex ante* regulation to be used to address these market failures along with any entry barriers that might otherwise prevent effective competition from becoming established within the relevant markets we have defined. By imposing *ex ante* regulation that promotes competition, it may be possible to reduce such regulation over time, as markets become more competitive, allowing greater reliance on *ex post* competition law.

A3.24 *Ex post* competition law is also unlikely in itself to bring about (or promote) effective competition, as it prohibits the abuse of dominance rather than the holding of a dominant position itself. In contrast, *ex ante* regulation is normally aimed at actively promoting the development of competition through attempting to reduce the level of market power (or dominance) in the identified relevant markets, thereby encouraging the establishment of effective competition. This is particularly the case when addressing the effects of network externalities, which generally reinforce a dominant position. As noted above, under *ex post* competition law there is no prohibition on the holding of a position of dominance in itself, and it is, therefore, normally more appropriate to address the impact of network externalities through *ex ante* obligations.

A3.25 Additionally, unless we consider otherwise in relation to a specific obligation in this review, we generally take the view that *ex ante* regulation is needed to create legal certainty for the market under review. Linked to that certainty is the fact that the SMP obligations we have proposed are necessary to enable us to intervene in a timely manner. For some other specific obligations, we generally consider that they are needed as competition law would not remedy the particular market failure, or we believe that specific clarity and detail of the obligation is required to achieve a particular result.

Remedies procedure

Powers and legal tests

A3.26 The Framework Directive prescribes what regulatory action NRAs must take depending upon whether or not an identified relevant market has been found effectively competitive. Where a market has been found effectively competitive, NRAs are not allowed to impose SMP obligations and must withdraw such obligations where they already exist. On the other hand, where the market is found not effectively competitive, the NRAs must identify the undertakings with SMP in that market and then impose appropriate obligations.

A3.27 NRAs have a suite of regulatory tools at their disposal, as reflected in the 2003 Act. Specifically, the Access Directive specifies a number of SMP obligations, including transparency, non-discrimination, accounting separation, access to and use of specific network elements and facilities, price control and cost accounting. When imposing a specific obligation, the NRA will need to demonstrate that the obligation in question is based on the nature of the problem identified, proportionate and justified in the light of the policy objectives as set out in Article 8 of the Framework Directive.

A3.28 Specifically, for each and every proposed SMP obligation, we explain why it satisfies the test that the obligation is:

- objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates;
- not such as to discriminate unduly against particular persons or against a particular description of persons;
- proportionate to what the condition or modification is intended to achieve; and
- transparent in relation to what is intended to be achieved.

A3.29 Additional legal requirements may also need to be satisfied depending on the SMP obligation in question. For example, in the case of price controls, the NRA's market analysis must indicate that the lack of effective competition means that the CP concerned may sustain prices at an excessively high level, or may apply a price squeeze, to the detriment of end-users. In that instance, NRAs must take into account the investment made by the CP and allow it a reasonable rate of return on adequate capital employed, taking into account any risks specific to a particular new investment, as well as ensure that any cost recovery mechanism or pricing methodology that is mandated serves to promote efficiency and sustainable competition and maximise consumer benefits. Where an obligation to provide third parties with network access is considered appropriate, NRAs must take into account factors including the feasibility of the proposed network access, the technical and economic viability of creating networks[23] that would make the network access unnecessary, the investment of the network operator who is required to provide access[24] and the need to secure effective competition[25] in the long term.

A3.30 To the extent relevant to this review, we demonstrate the application of these requirements to the SMP obligations in question in the relevant parts of this document. In doing so, we also set our assessment of how, in our opinion, the performance of our general duties under section 3 of the 2003 Act is secured or furthered by our regulatory intervention, and that it is in accordance with the six Community requirements in section 4 of the 2003 Act. This assessment is also relevant to our assessment of the likely impact of implementing our proposals.

Ofcom's general duties – section 3 of the 2003 Act

A3.31 Under the 2003 Act, our principal duty in carrying out our functions is to further the interests of citizens in relation to communications matters and to further the interests of consumers in relevant markets, where appropriate by promoting competition.

A3.32 In doing so, we are required to secure a number of specific objectives and to have regard to a number of matters set out in section 3 of the 2003 Act.

A3.33 In performing our duties, we are also required to have regard to a range of other considerations, as appear to us to be relevant in the circumstances. For the purpose of this review, we consider that a number of such considerations are relevant, in particular:

- the desirability of promoting competition in relevant markets;
- the desirability of encouraging investment and innovation in relevant markets; and
- the desirability of encouraging the availability and use of high speed data transfer services throughout the UK.

A3.34 We have also had regard to the principles under which regulatory activities should be transparent, accountable, proportionate, consistent, and targeted only at cases in which action is needed, as well as the interest of consumers in respect of choice, price, quality of service and value for money.

A3.35 Ofcom has, however, a wide measure of discretion in balancing its statutory duties and objectives. In doing so, we will take account of all relevant considerations, including responses received during our consultation process, in reaching our conclusions.

[23] Including the viability of other network access products, whether provided by the dominant provider or another person.
[24] Taking account of any public investment made.
[25] Including, where it appears to us to be appropriate, economically efficient infrastructure-based competition.

European Community requirements for regulation – sections 4 and 4A of the 2003 Act and Article 3 of the BEREC Regulation

A3.36 As noted above, our functions exercised in this review fall under the CRF. As such, section 4 of the 2003 Act requires us to act in accordance with the six European Community requirements for regulation.

A3.37 In summary, these six requirements are:

- to promote competition in the provision of electronic communications networks and services, associated facilities and the supply of directories;
- to contribute to the development of the European internal market;
- to promote the interests of all persons who are citizens of the EU;
- to take account of the desirability of Ofcom's carrying out of its functions in a manner which, so far as practicable, does not favour one form of or means of providing electronic communications networks, services or associated facilities over another (i.e. to be technologically neutral);
- to encourage, to such extent as Ofcom considers appropriate for certain prescribed purposes, the provision of network access and service interoperability, namely securing efficient and sustainable competition, efficient investment and innovation, and the maximum benefit for customers of CPs; and
- to encourage compliance with certain standards in order to facilitate service interoperability and secure freedom of choice for the customers of CPs.

A3.38 We considered that the first, third, fourth and fifth of those requirements are of particular relevance to the matters under review and that no conflict arises in this regard with those specific objectives in section 3 of the 2003 Act that we consider are particularly relevant in this context.

A3.39 Section 4A of the 2003 Act requires Ofcom, in carrying out certain of its functions (including, among others, Ofcom's functions in relation to market reviews under the CRF) to take due account of applicable recommendations issued by the EC under Article 19(1) of the Framework Directive. Where we decide not to follow such a recommendation, we must notify the EC of that decision and the reasons for it.

A3.40 Similarly, Article 3(3) of the Regulation establishing BEREC[26] requires NRAs to take utmost account of any opinion, recommendation, guidelines, advice or regulatory best practice adopted by BEREC.

A3.41 Accordingly, we have taken due account of the applicable EC recommendations, (including, in the context of this review, the NGA Recommendation[27] and the

[26] *Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 establishing the Body of European Regulators of Electronic Communications (BEREC) and the Office (the BEREC Regulation)*, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0001:0010:EN:PDF.

[27] *Commission Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGA) (2010/572/EU)*, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:251:0035:0048:EN:PDF

Costing and Non-Discrimination Recommendation[28]) and utmost account of the applicable opinions, recommendations, guidelines, advice and regulatory best practices adopted by BEREC relevant to the matters under consideration in this review.

Impact assessment – section 7 of the 2003 Act

A3.42 The analysis presented in the whole of this statement represents an impact assessment, as defined in section 7 of the 2003 Act.

A3.43 Impact assessments provide a valuable way of assessing different options for regulation and showing why the preferred option was chosen. They form part of best practice policy-making. This is reflected in section 7 of the 2003 Act, which means that generally Ofcom has to carry out impact assessments where its proposals would be likely to have a significant effect on businesses or the general public, or when there is a major change in Ofcom's activities. However, as a matter of policy Ofcom is committed to carrying out and publishing impact assessments in relation to the great majority of its policy decisions. For further information about Ofcom's approach to impact assessments, see the guidelines, Better policy-making: Ofcom's approach to impact assessment, which are on the Ofcom website: http://www.ofcom.org.uk/consult/policy_making/guidelines.pdf.

A3.44 Specifically, pursuant to section 7, an impact assessment must set out how, in our opinion, the performance of our general duties (within the meaning of section 3 of the 2003 Act) is secured or furthered by or in relation to what we propose.

A3.45 Ofcom is separately required by statute to assess the potential impact of all our functions, policies, projects and practices on race, disability and gender equality. This assessment is set out at Annex 9.

Regulated entity

A3.46 The power in the 2003 Act to impose an SMP obligation by means of an SMP services condition provides that it is to be applied only to a 'person' whom we have determined to be a 'person' having SMP in a specific market for electronic communications networks, electronic communications services or associated facilities (i.e. the 'services market').

A3.47 The Framework Directive requires that, where an NRA determines that a relevant market is not effectively competitive, it shall identify 'undertakings' with SMP on that market and impose appropriate specific regulatory obligations. For the purposes of EU competition law, 'undertaking' includes companies within the same corporate group (for example, where a company within that group is not independent in its decision making).[29]

A3.48 We consider it appropriate to prevent a dominant provider to whom an SMP service condition is applied, which is part of a group of companies, exploiting the principle of corporate separation. The dominant provider should not use another member of

[28] *Commission Recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment:* http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013H0466&from=EN.

[29] *Viho v Commission,* Case C-73/95 P [1996] ECR I-5447. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:61995CJ0073:EN:PDF.

its group to carry out activities or to fail to comply with a condition, which would otherwise render the dominant provider in breach of its obligations.

A3.49 To secure that aim, we apply the SMP conditions to the person in relation to which we have made the market power determination in question by reference to the so-called 'Dominant Provider', which we define as "[*X plc*], whose registered company number is [*000*] and any [*X plc*] subsidiary or holding company, or any subsidiary of that holding company, all as defined in section 1159 of the Companies Act 2006".

Annex 4

General analytical approach to market definition and SMP assessment

Introduction

A4.1 This annex sets out in general terms the processes that we have followed in defining the markets within this review, how and on what basis we assess whether anyone has SMP in a given market, whether SMP conditions should be imposed in a relevant market, and in what form. Sections 3 to 5 (market definition and SMP analysis) set out in more detail how we have applied our approach in each relevant market.

The time period under review

A4.2 Rather than just looking at the current position, market reviews look ahead to how competitive conditions may change in future. Our evaluation of the current market takes into account past developments and evidence, before then considering the foreseeable market changes that we expect to affect its development over the period to April 2017. This forecast period reflects the period covered by this market review.

A4.3 The forward look period that we have used does not preclude us reviewing the market before that point should the market develop in way we have not foreseen to the extent that it is likely to affect the competitive conditions that are operating.

Approach to market definition

A4.4 In defining markets for market review purposes, our main EU law obligation is to define relevant markets appropriate to national circumstances in accordance with the principles of competition law, taking the utmost account of the 2007 Recommendation on Markets and the SMP Guidelines.[30]

A4.5 There are two dimensions to the definition of the relevant market: the relevant products to be included within the market and the geographic extent of the market. It is often practical to define the relevant product market before exploring the geographic dimension of the market.

A4.6 While we describe below our analytical approach to market definition, it should be borne in mind that this is not a mechanical or abstract process. The approach is a dynamic one based on our overall understanding of the relevant markets, taking account of available evidence of past behaviour as well as our forward-looking analysis over the forecast period, reflecting the characteristics of the relevant retail and wholesale markets and the factors likely to influence their competitive development.

[30] Article 15(3), EC, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), 11 July 2002, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF.

A4.7 It should therefore be recognised that the market definition exercise is not an end in itself, but, rather, a means to an end. Market definition aids the assessment of whether end-users of a product are protected by effective competition and thus whether there is a requirement for the imposition of *ex ante* regulation. It is in this light that we have conducted our market definitions in this review.

A4.8 In particular, when identifying markets that differ from those in the 2007 Recommendation on Markets, the three criteria test is applied to identify markets that are susceptible to *ex ante* regulation. The market definition exercise goes to this end.

A4.9 To re-iterate, the three criteria that must cumulatively be met are:[31]

- the presence of high and non-transitory barriers to entry, which may be of a structural, legal or regulatory nature;
- a market structure which does not tend towards effective competition within the relevant time horizon (the application of this criterion involves examining the state of competition behind the barriers to entry); and
- the insufficiency of competition law alone to adequately address the market failure(s) concerned.

A4.10 If these conditions are met, it may be appropriate to impose ex-ante regulation in the market. In formulating our proposals, we have taken utmost account of the SMP Guidelines and the 2007 Recommendation on Markets, as well as the accompanying Explanatory Memorandum (the 'Explanatory Memorandum').[32]

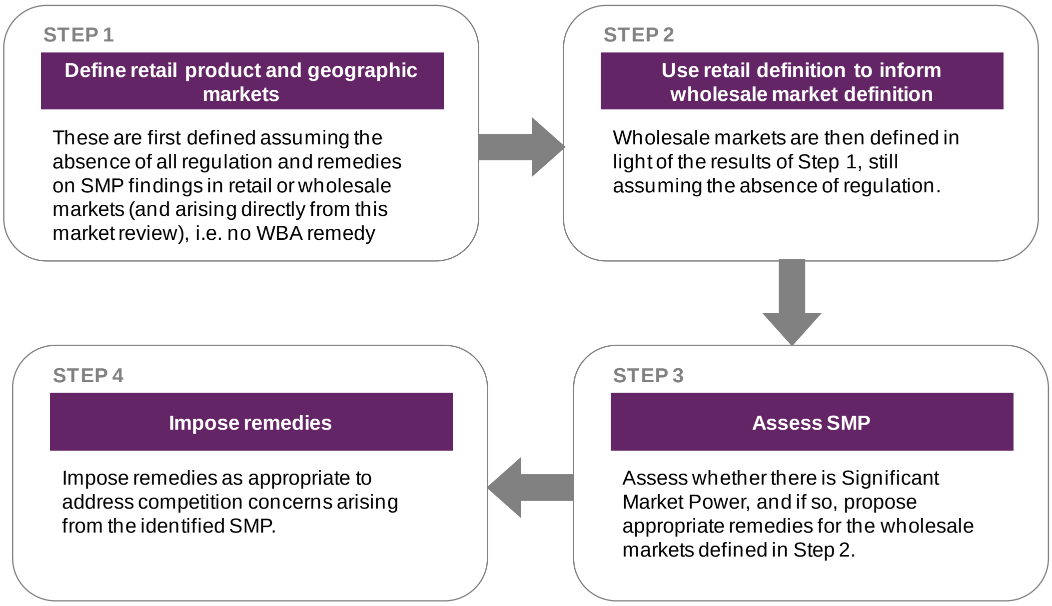
Sequencing of our analysis

A4.11 We now provide an overview of the stages involved in assessing whether or not it is appropriate to impose *ex ante* regulation. Figure A9.1 sets out the sequencing of our analysis.

[31] As set out in paragraph 5 of EC, *Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, (2007/879/EC),* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:344:0065:0069:en:PDF.

[32] EC, *Explanatory note accompanying the Commission recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and the Council on a common regulatory framework for electronic communications networks and services*, https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/sec_2007_1483_2_0.pdf.

Figure A4.1: Sequencing of market definition, SMP and remedies analysis



A4.12 The order in which we carry out the various steps is linked with another aspect that often needs to be taken into account – especially in the electronic communications sector – namely the level of the supply chain (e.g. retail, wholesale) that is being analysed. Our usual starting point for identifying markets where there may be a requirement for the imposition of *ex ante* regulation is the definition of retail markets from a forward-looking perspective (Step 1). The wholesale market is defined subsequent to this exercise being carried out (Step 2).

A4.13 The analysis of retail market definition is logically prior to the definition of wholesale markets because the demand for the upstream wholesale service is a derived demand – i.e. the level of the demand for the upstream input depends on the demand for the retail service. Hence the range of available substitutes at the downstream (retail) level will inform the likely range of substitutes for the upstream (wholesale) service. This is because a rise in the price of a wholesale service which is passed through in the price of downstream retail services will cause retail customers to switch to substitute retail products, reducing demand for the wholesale input. We refer to this as an indirect constraint.

A4.14 Consequently, Step 1 (retail market definition) and Step 2 (wholesale market definition) should be regarded as one exercise, the ultimate purpose of which is to define those wholesale markets in the UK where there may be a requirement for the imposition of *ex ante* regulation.[33]

[33] See, in this respect, Recital 4 of the 2007 EC Recommendation which states that "*[h]aving defined retail markets, it is then appropriate to identify relevant wholesale markets*" (emphasis added) (EC, *Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, (2007/879/EC)*, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:344:0065:0069:en:PDF). See also section 2.1, EC, *Explanatory note accompanying the Commission recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and the Council on a common regulatory framework for electronic communications networks and services*, https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/sec_2007_1483_2_0.pdf) and paragraph

A4.15 We have thus considered the definition of retail and wholesale markets and, in relevant cases, whether the wholesale market is one in which *ex ante* regulation may be appropriate (if so, we have then formally identified a relevant market).[34] Step 3 in our analysis is assessing whether or not there is SMP. In the event that we find that SMP exists, we then go on to consider appropriate remedies for the relevant market (Step 4).

Market definition

Demand-side and supply-side substitution

A4.16 Market boundaries are determined by identifying constraints on the price setting behaviour of firms.[35] There are two main constraints to consider:

- first, to what extent it is possible for a customer to substitute other services for those in question in response to a relative price increase ('demand-side substitution'); and
- second, to what extent suppliers can switch, or increase, production to supply the relevant products or services in response to a relative price increase ('supply-side substitution').

A4.17 The hypothetical monopolist test ('HMT') is a useful tool often used to identify close demand-side and supply-side substitutes. In this test, a product is considered to constitute a separate market if the hypothetical monopolist supplier could impose a small but significant non-transitory increase in price ('SSNIP') above the competitive level without losing sales to such a degree as to make this price rise unprofitable. If such a price rise would be unprofitable, because consumers would switch to other products or because suppliers of other products would begin to compete with the hypothetical monopolist, then the market definition should be expanded to include the substitute products.

A4.18 We must first therefore address the issue of which product(s) should form the starting point for the application of the HMT. We refer to this starting point as the 'focal product.'[36] Paragraph 41 of the SMP Guidelines states that "*As a starting point, an NRA should apply this test firstly to an electronic communications service*

44, (EC, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), 11 July 2002, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF).

[34] See Recital 5 and Recommendation 2 of EC, *Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, (2007/879/EC),* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:344:0065:0069:en:PDF).

[35] See paragraph 38 of EC, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), 11 July 2002, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF.

[36] This reflects the terminology used by the OFT (OFT, *Market definition*, December 2004, OFT403, www.oft.gov.uk/shared_oft/business_leaflets/ca98_guidelines/oft403.pdf). This guidance has been adopted by the Competition and Markets Authority ('CMA') Board.

or product offered in a given geographical area, the characteristics of which may be such as to justify the imposition of regulatory obligations …"[37]

A4.19 We define markets first on the demand-side, considering if other services could be considered as substitutes by consumers in the event of the hypothetical monopolist supplier introducing a SSNIP above the competitive level.

A4.20 Then, where relevant, we assess supply-side substitution possibilities to consider whether they provide any additional constraints on the pricing behaviour of the hypothetical monopolist which have not been captured by the demand-side analysis. In this assessment, supply-side substitution is considered to be a low cost form of entry which can take place within a reasonable timeframe (e.g. up to 12 months). The key point is that, for supply-side substitution to be relevant, not only must suppliers be able, in theory, to enter the market quickly and at low cost by virtue of their existing position in the supply of other products or geographic areas, but there must also be an additional competitive constraint arising from such entry into the supply of the service in question.

A4.21 Therefore, in identifying potential supply-side substitutes, it is important that providers of these services have not already been taken into consideration. There might be suppliers who provide other services but who might also be materially present in the provision of demand-side substitutes to the service for which the hypothetical monopolist has raised its price. Such suppliers are not relevant to supply-side substitution since they supply services already identified as demand-side substitutes. As such, their entry has already been taken into account and so supply-side substitution from these suppliers cannot provide an additional competitive constraint on the hypothetical monopolist. However, the impact of expansion by such suppliers can be taken into account in the assessment of market power.

Bundling

A4.22 A common feature of the telecoms sector is the supply of bundles of different services. The Explanatory Memorandum explains that in most cases the individual services in a bundle are not good demand-side substitutes of each other, yet may be considered as part of the same retail market if there is no independent demand for individual parts of the bundle.

A4.23 However, the Explanatory Memorandum goes on to say that if, in the presence of a SSNIP there is evidence that a sufficient number of customers would "unpick" the bundle and obtain the service elements of the bundle separately, then it can be concluded that the service elements constitute the relevant markets in their own right.

A4.24 BEREC's report on bundles expands on this and says that economies of scope and transaction cost savings might make it less likely that consumers will "unpick" a bundle.[38] It also suggests that evidence relating to consumer switching between bundled and unbundled products, switching costs, and the take-up of bundles

[37] *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), 11 July 2002, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF.

[38] BEREC, BoR (10) 64, *BEREC report on the impact of bundled offers in retail and wholesale market definition*, December 2010, http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/?doc=209.

compared to individual products (and the availability of individual products) can be used to infer substitutability of bundled and unbundled products.

Homogeneous competitive conditions

A4.25 In certain circumstances, it may also be appropriate to define a product market by grouping together services which are subject to homogeneous competitive conditions, despite the absence of demand- and supply-side substitutability. Homogeneity of competitive conditions is chiefly used in defining geographic markets to combine, into a single market, different geographic areas in which competitive conditions are nonetheless sufficiently homogeneous. However, it can also be used in the product market definition analysis. This approach can help streamline the subsequent market power analysis by reducing the need to review multiple markets for products the provision of which is subject to homogeneous competitive conditions.

A4.26 However, combining products and services based on homogenous competition conditions, is – by definition – only appropriate where this would not alter any subsequent findings on SMP (relative to defining those markets separately and making separate market power assessments accordingly). Provided this is the case, then we consider applying this criterion to both our product and geographic market definition analysis is appropriate since market definition, as explained above, is a means to an end and the end is an assessment of the effectiveness of competition in the relevant market which involves carrying out the market power analysis.

A4.27 Our approach also takes into account the SMP Guidelines. In particular, paragraph 56 of the SMP Guidelines states that:

> "According to established case-law, the relevant geographic market comprises an area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which area the conditions of competition are similar or sufficiently homogeneous and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are appreciably different…"

A4.28 Hence, subject to the relevant caveats above, where there are geographic areas where competitive conditions are sufficiently homogeneous, the definition of the relevant geographic market will include all of those areas within one market.

Common pricing constraints

A4.29 Another factor that is sometimes considered in setting market boundaries is whether there exist common pricing constraints across customers, services or geographic areas (i.e. areas in which a firm voluntarily offers its services at a geographically uniform price). Where common pricing constraints exist, the geographic areas in which they apply could be included within the same relevant market even if demand-side and supply-side substitutes are not present. Failure to consider the existence of a common pricing constraint could lead to unduly narrow markets being defined.

Relevance of existing regulation – the modified Greenfield approach

A4.30 When we conduct our analysis to define the relevant retail and wholesale markets we assume that there is no SMP regulation in place in the market under consideration or in downstream markets – the so-called 'modified Greenfield approach'.[39]

A4.31 This approach means we conduct Step 1 and Step 2 of the approach set out in Figure A9.1 in the absence of SMP regulation. To do otherwise would mean that the subsequent wholesale market power assessment (Step 3) would be informed by a previous retail market definition that itself relied on a wholesale regulatory remedy arising from the finding of wholesale market power. This would be a circular and incorrect approach to market definition.

A4.32 However, at both Steps 1 and 2, it remains appropriate to take into account *ex ante* regulation arising from SMP findings in markets other than those being defined. Further, having defined the wholesale market, it may be necessary to go on to consider whether *ex ante* regulation is necessary at the retail level. In carrying out this retail level assessment, it is appropriate to take into account any regulation that is upstream of the market being considered, as upstream regulation (e.g. wholesale remedies) has the potential to affect the competitive state of downstream (i.e. retail) markets (indeed, this is generally one of the main intentions of upstream regulation).

Geographic market

A4.33 In addition to the product(s) to be included within a market, market definition also requires the geographic extent of the market to be specified. The geographic market is the area within which demand side and/or supply side substitution can take place and is defined using a similar approach to that used to define the product market. We have considered the geographic extent of each relevant market covered in this market review.

A4.34 There are a number of possible approaches to geographic market definition. One approach would be to begin with a narrowly-defined area and then consider whether a price increase by a hypothetical monopolist in that narrowly defined area would encourage customers to switch to suppliers located outside the area (demand-side substitution) or CPs outside the area to begin to offer services in the area (supply-side substitution). If demand and/or supply side substitution is sufficient to constrain prices then it is appropriate to expand the geographic market boundary.

A4.35 We recognise that in certain communications (product) markets in the UK, there could be different competitive pressures in different geographic areas. In this case, we therefore have to consider whether it would be appropriate to identify separate geographic markets for some services (note also that the discussion above about homogenous competitive conditions and common pricing constraints is relevant). Defining separate markets by geographic area may be problematic because, due to the dynamic nature of communications markets, the boundary between areas

[39] See also section 2.5 of EC, *Explanatory note accompanying the Commission recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and the Council on a common regulatory framework for electronic communications networks and services*, https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/sec_2007_1483_2_0.pdf.

where there are different competitive pressures may be unstable and change over time, rendering the market definition obsolete.

A4.36 An alternative approach is to define geographic markets in a broader sense. This involves defining a single geographic market but recognising that this single market has local geographical characteristics. That is to say, recognising that within the single market there are geographic areas where competition is more developed than in other geographic areas. This avoids the difficulties of proliferation and instability in the definition.

Market power assessment

A4.37 As we recognise above, market definition is not an end in itself. The definition of the scope of the relevant economic market is carried out in order to identify the product(s) and the geographic area over which a competition assessment can be made of CPs' ability to act to an appreciable extent independently of competitors, customers and consumers, i.e. whether there are any CPs that hold a position of SMP within a particular market.

Definition of SMP

A4.38 Sections 45, 46 and 78 of the 2003 Act grant us the power under certain circumstances to set conditions which require CPs to do certain things. Specifically, sections 46(7) and 46(8) state that SMP services conditions may be imposed on a particular person who is either a CP or a person who makes associated facilities available, and who has been determined to have SMP in a services market (i.e. a specific market for electronic communications networks, electronic communications services or associated facilities).

A4.39 Accordingly, having identified the relevant product and geographic market(s) and, where relevant having identified the market as susceptible to *ex ante* regulation, we go on to analyse each market in order to assess whether any person or persons have SMP as defined in section 78 of the 2003 Act (construed in accordance with Article 14 of the Framework Directive). Section 78 of the 2003 Act provides that SMP is defined as being equivalent to the competition law concept of dominance in accordance with Article 14(2) of the Framework Directive which provides:

> "An undertaking shall be deemed to have significant market power if, 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."

A4.40 Further, Article 14(3) of the Framework Directive states that:

> "Where an undertaking has significant market power on a specific market, it may also be deemed to have significant market power on a closely related market, where the links between the two markets are such as to allow the market power held in one market to be leveraged into the other market, thereby strengthening the market power of the undertaking."

A4.41 Therefore, in the relevant market, one or more undertakings may be designated as having SMP where that undertaking or undertakings enjoy a position of dominance. Also, an undertaking may be designated as having SMP where it could lever its market power from a closely related market into the relevant market, thereby strengthening its market power in the relevant market.

A4.42 In assessing whether an undertaking has SMP, we take due account of the SMP Guidelines as we are required to do under section 79 of the 2003 Act. Where relevant, we have also considered the application of the equivalent guidelines published by Oftel.[40]

The criteria for assessing SMP

A4.43 The SMP Guidelines require NRAs to assess whether competition in a market is effective. This assessment is undertaken through a forward looking evaluation of the market (i.e. determining whether the market is prospectively competitive), taking into account foreseeable developments and a number of relevant criteria.[41]

A4.44 Our assessments of SMP are concerned with the prospects for competition over the review period of three years. Ultimately, we want to understand how the markets are likely to develop, and whether competition is likely to be, or become, effective during this review period. Below we set out certain key factors that we are likely to consider when assessing SMP.[42]

A4.45 Where a market is found to be competitive then no SMP conditions can be imposed. Section 84(4) of the 2003 Act requires that any SMP condition in that market, applying to a person by reference to a market power determination made of the basis of an earlier analysis, must be revoked.

Market shares

A4.46 In the SMP Guidelines, the EC discusses market shares as being an indicator of (although not sufficient alone to establish) market power:

> "…Market shares are often used as a proxy for market power. Although a high market share alone is not sufficient to establish the possession of significant market power (dominance), it is unlikely that a firm without a significant share of the relevant market would be in a dominant position. Thus, undertakings with market shares of no more than 25% are not likely to enjoy a (single) dominant position on the market concerned. In the Commission's decision making practice, single dominance concerns normally arise in the case of undertakings with market shares of over 40%, although the Commission may in some cases have concerns about dominance even with lower market shares, as dominance may occur without the existence of a large market share. According to established case-law, very large market shares — in excess of 50% — are in

[40] Oftel, *Oftel's market review guidelines: criteria for the assessment of significant market power*, 5 August 2002, www.ofcom.org.uk/static/archive/oftel/publications/about_oftel/2002/smpg0802.htm.

[41] See, for example, paragraphs 19 and 20, and the opening words of paragraph 75, of the SMP Guidelines.

[42] The factors listed in this Annex are not intended to be exhaustive – other evidence may be relevant. Paragraph 78 of the SMP Guidelines lists the following criteria that could be used to assess market power: overall size of the undertaking; control of infrastructure not easily duplicated; technological advantages or superiority; absence of, or low, countervailing buying power; easy or privileged access to capital markets/financial resources; product/services diversification (e.g. bundled products or services); economies of scale; economies of scope; vertical integration; a highly developed distribution and sales network; absence of potential competition; and barriers to expansion.

themselves, save in exceptional circumstances, evidence of the existence of a dominant position…"[43]

A4.47 Market shares and market share trends provide an indication of how competitive a market has been in the past. If a firm has a persistently high market share, then that in itself gives rise to a presumption of SMP. However, changes in market share are also relevant to our assessment of prospects for competition. For example, a market share trend which shows a decline may suggest that competition will provide an effective constraint within the time period over which the SMP assessment is being conducted, although it does not preclude the finding of SMP.[44]

Barriers to entry and expansion

A4.48 Entry barriers are important in the assessment of potential competition.[45] The lower entry barriers are, the more likely it is that potential competition will prevent undertakings already within a market from profitably sustaining prices above competitive levels. Moreover, the competitive constraint imposed by potential entrants is not simply about introducing a new product to the market. To be an effective competitive constraint, a new entrant must be able to attain a large enough scale to have a competitive impact on undertakings already in the market. This may entail entry on a small scale, followed by growth. Accordingly, whether there are barriers to expansion is also relevant to an SMP assessment. Many of the factors that may make entry harder might also make it harder for undertakings that have recently entered the market to expand their market shares and hence their competitive impact.

A4.49 A related factor is the growth in demand in the market. In general, CPs are more willing to invest in a growing market (and less willing in a declining market). As a result, barriers to entry and expansion tend to be less of an impediment to competition in rapidly growing markets.

Countervailing buyer power

A4.50 A concentrated market need not lead to harmful outcomes if buyers have sufficient countervailing buyer power to curtail the exercise of market power. In general, purchasers may have a degree of buyer power where they purchase large volumes and can make a credible threat to switch supplier or to meet their requirements through self-supply to a significant degree. It is important to note, however, that the volumes involved must be large enough to make a material difference to the profitability of the current supplier. That is, an individual wholesale customer must represent a significant proportion of the total volume supplied by the relevant CP.

[43] Paragraph 75, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), 11 July 2002, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF.

[44] See, for example, paragraph 75, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), 11 July 2002, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF.

[45] Paragraph 80, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), 11 July 2002, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF.

Excessive pricing and profitability

A4.51 In a competitive market, individual firms should not be able to persistently raise prices above costs and sustain excess profits. As costs fall, prices should be expected to fall too if competition is effective.

A4.52 The ability, therefore, to price at a level that keeps profits persistently and significantly above the competitive level is an important indicator of market power. The SMP Guidelines refer to the importance, when assessing market power on an ex-ante basis, of considering the power of undertakings to raise prices without incurring a significant loss of sales or revenue (factors that may explain excess profits in the short term, such as greater innovation and efficiency, or unexpected changes in demand, should however be considered in interpreting high profit figures).[46]

A4.53 The reverse is not true: consistently low profits, i.e. profits at or below the cost of capital, cannot be taken as evidence of an absence of market power. It may simply be evidence of inefficiency. For example, if a firm with SMP were to have inefficiently high costs, it may charge a price above the level we would expect to see in a competitive market but this would not result in high profits. In addition, price regulation exists in many of the wholesale markets considered, and therefore low profits may simply be the result of regulation rather than a reflection of the underlying competitive conditions.

[46] Paragraph 73, *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), 11 July 2002, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF.

Annex 5

Residential and business broadband pricing information

A5.1 This annex sets out a selection of tariff information for residential and business fixed line broadband services from the main UK broadband providers. We included pricing analysis in our 2013 WBA Consultation based on March 2013 data. We present the same analysis here, using more up-to date tariff data from March 2014.

A5.2 This annex describes the offers provided by a selection (six) of the most popular ISPs. These are; BT, EE, Plus.net, Sky,[47] TalkTalk and Virgin. We have used this analysis to inform our product market definition (see Section 3). The tariff information was sourced solely from providers' websites.

A5.3 We can see that:

- Speed and download allowance are usually the two biggest influences on the price of a broadband tariff. Most ISPs' marketing emphasises the headline (up-to) download speed as well as the data allowance. In many cases the data allowance is labelled as 'unlimited', although it is almost always subject to some sort of fair-use policy.
- Most ISPs bundle together broadband and line-rental service to form a broadband package. Some providers allow customers to take just the broadband service, and use a line-rental product from another provider, but this is not common. In most cases a broadband and line-rental bundle will work out cheaper, either through a lower tariff fee or lower connection/installation cost.
- A number of ISPs offer broadband services in areas where they have no network of their own, using a WBA service. These 'off-net' services are invariably more expensive than 'on-net' (LLU-based) self-supply.
- Some ISPs (e.g. EE, Plus.net and BT for business broadband) vary tariff prices depending on whether a premise is served by an exchange designated by Ofcom as belonging to Market 1 or 2 in the 2010 Review, charging a higher price in those areas.

BT

A5.4 In February 2013 BT changed a number of its broadband tariffs and introduced some new ones. This gave rise to a departure from its previous pricing policy of matching ADSL and fibre broadband tariff prices and established lower prices for its ADSL tariffs than for its fibre ('Infinity') tariffs. We note that BT includes its BT Sport for free in all residential broadband tariffs.[48]

A5.5 As of March 2014, BT offered four ADSL broadband tariffs aimed at residential consumers. These are shown in Table A5.1.

[47] Following Sky's acquisition of O2 broadband customers in May 2013, O2 no longer exists as an independent operator, therefore we have not included its tariffs in our analysis.
[48] http://www.btplc.com/news/articles/showarticle.cfm?articleid=%7B3c92e33b-6f97-420c-a5e2-3cdbc4d95929%7D

Table A5.1: BT's ADSL residential broadband tariffs

	'Broadband'	'Broadband Extra'	'Unlimited Broadband'	'Unlimited Broadband Extra'
Contract length	18 Months			
Price (inc VAT) per month	£7.50 for first 6 months £10.00 thereafter	£6.00 for first 6 months £12.00 thereafter	£8.00 for first 6 months £16.00 thereafter	£10.50 for first 6 months £21.00 thereafter
One-off fees	None			
Download speed	Up to 16Mbit/s			
Upload speed	Up to 1Mbit/s			
Monthly usage	10GB	10GB	Unlimited	Unlimited
Line rental	£15.99 per month or £141.00 for 12 months up-front (equating to £11.75 per month)			
Router	BT Home Hub wireless router included free of charge			
Additional services	2GB BT Cloud	2GB BT Cloud and BT NetProtect Plus	2GB BT Cloud	50GB BT Cloud and BT NetProtect Plus

Source: BT's website, checked on 26/03/2014.[49]

A5.6 BT introduced its fibre Infinity residential packages in January 2010,[50] and advertises its offer by adding that its "new fibre optic broadband technology deliver[s] the internet at ground-breaking speeds". BT advertises four main Infinity broadband tariffs on its website with three at speeds of up-to 38Mbit/s and one at up-to 76Mbit/s.

[49] http://www.productsandservices.bt.com/products/broadband/packages
[50] http://www.btplc.com/news/articles/showarticle.cfm?articleid=%7Bf9f6f1ad-c4f6-442d-bf7e-ffcc7847631c%7D

Table A5.2: BT's Infinity residential broadband tariffs

	Infinity 1	BT Infinity Extra	Unlimited Infinity 1	Unlimited Infinity 2
Contract length	18 Months			
Price (inc VAT) per month	£15.00	£8.00 for first 6 months £16.00 thereafter	£16.00 for first 3 months £23.00 thereafter	£20.00 for first 3 months £26.00 thereafter
One-off fees	£30.00 activation fee	£30.00 activation fee	£30.00 activation fee	None
Download speed	Up to 38Mbit/s	Up to 38Mbit/s	Up to 38Mbit/s	Up to 76Mbit/s
Upload speed	Up to 9.5Mbit/s	Up to 9.5Mbit/s	Up to 9.5Mbit/s	Up to 19Mbit/s
Monthly usage	20GB	40GB	Unlimited	Unlimited
Line rental	£15.99 per month or £141.00 for 12 months up-front (equating to £11.75 per month)			
Router	Free BT Infinity Home Hub wireless router			
Security	Advanced McAfee security			

Source: BT's website checked on 26/03/2014.[51]

A5.7 BT offers four business broadband tariffs; two for ADSL and two for fibre. ADSL products can come with 12 or 24 month contracts, fibre contracts carry a minimum 24 month contract. Unlike its residential broadband tariffs, BT charges different prices depending on the (Ofcom defined) 2010 WBA market in which the premise is located, with higher prices in Markets 1 and 2 compared to Market 3.

[51] http://www.productsandservices.bt.com/products/broadband/packages

Table A5.3: BT's ADSL business broadband tariffs[52]

	Basic Broadband		Unlimited Broadband	
Contract length	24 Months	12 Months	24 Months	12 Months
Price (exc VAT) per month				
Market 1/2 Exchange	£14.00	£19.00	£19.00	£24.00
Market 3 Exchange	£11.00	£16.00	£16.00	£21.00
One-off fees	£105.00 installation fee £59.00 router fee	£120.00 installation fee £59.00 router fee	£105.00 installation fee £59.00 router fee	£120.00 installation fee £59.00 router fee
Download speed	Up to 17Mbit/s			
Upload speed	Up to 1Mbit/s			
Monthly usage	10GB		Unlimited	
Line rental	£18.00 per month			
Router	£59.00 for standard BT Home Hub wireless router			
Security	Advanced McAfee security			

Source: BT's website checked on 26/03/2014.[53]

[52] http://business.bt.com/packages/broadband-and-phone/
[53] http://business.bt.com/packages/broadband-and-phone/

Table A5.4: BT's Infinity business broadband tariffs

	Option 1		Option 2	
Contract length	24 Months			
Price (exc VAT) per month	£30.00	£35.00	£35.00	£40.00
One-off fees	£105.00 installation fee			
Download speed	Up to 38Mbit/s		Up to 76Mbit/s	
Upload speed	Up to 9.5Mbit/s		Up to 19Mbit/s	
Monthly usage	100GB	Unlimited	100GB	Unlimited
Line rental	£18.00 per month			
Router	Free BT Infinity Home Hub wireless router			
Security	Advanced McAfee security			

Source: BT's website checked on 26/03/2014.[54]

Plus.net

A5.8 Plus.net is a wholly owned subsidiary of BT providing broadband services on both ADSL and fibre technologies. Plus.net offers two ADSL and two fibre broadband tariffs. The ADSL tariffs can be taken with either a one or 12 month contract; fibre tariffs carry a mandatory 18 month contract term.

A5.9 Plus.net charge a £7 premium on residential broadband tariffs for customers located in Market 1 (geographically defined by Ofcom), compared to Markets 2 or 3.[55] The table below details Plus.net's residential broadband tariffs for Markets 2 and 3.[56] The cost for each tariff in Market 1 will be £7 higher.

[54] http://www2.bt.com/static/i/btretail/panretail/terms/pdfs/bt1130a_charges.pdf
[55] Plus.net also charges higher prices for its business broadband tariffs when the serving exchange is in (Ofcom 2010 defined) Market 1 as opposed to Market 2 or 3.
[56] http://www.plus.net/support/broadband/products/low_cost_areas.shtml

Table A5.5: Plus.net's residential broadband tariffs, Market 2 and 3

	Essentials	Unlimited	Fibre Essentials	Fibre Unlimited
Contract length	12 months or 1 month		18 months	
Price (inc VAT) per month				
1 month contract	£8.49	£12.49	N/A	N/A
12 month contract	£1.99 for 12 months £5.99 after	£3.25 for 12 months £9.99 after	N/A	N/A
18 month contract	N/A	N/A	£15.99	£19.99
One-off fees	Zero connection fee for 12 month contract with phone £25 connection fee for 12 month contract without phone £25 connection fee for 1 month contract with phone £50 connection fee for 1 month contract without phone		Zero connection fee for tariffs with phone £25 connection fee for existing customer contracts without phone £50 connection fee for new customer contracts without phone	
Download speed	Up to 16Mbit/s	Up to 16Mbit/s	Up to 38Mbit/s	Up to 76Mbit/s
Upload speed	Up to 1Mbit/s	Up to 1Mbit/s	Up to 9.5Mbit/s	Up to 19.5Mbit/s
Monthly usage*	10GB	Unlimited	40GB	Unlimited
Line rental	£14.50 per month			
Router	Wireless router included free of charge			

*Usage limits do not apply between midnight to 8am.

Source: Plus.net's website checked on 26/03/2014.[57]

A5.10 Plus.net offers two ADSL business broadband tariffs, with the option of a 1, 12 or 24 month contract. Again Plus.net charge a premium for customers located in Market 1, however the premium is slightly less, at £5 or £6.

[57] http://www.plus.net/home-broadband/

Table A5.6: Plus.net's ADSL business broadband tariffs

	Business Broadband		Unlimited Business Broadband	
Contract length	1, 12, or 24 months			
Market (2010)	Market 1	Market 2/3	Market 1	Market 2/3
Price (exc VAT) per month				
1 month contract	£17.00	£12.00	£22.00	£17.00
12 month contract	£15.00	£10.00	£20.00	£15.00
24 month contract	£13.00	£8.00	£18.00	£13.00
One-off fees	1 month contract: £25.00 router fee and £40.00 activation fee 12 or 24 month contract: None			
Download speed	Up to 17Mbit/s			
Upload speed	Up to 1Mbit/s			
Monthly usage	25GB		Unlimited	
Line rental	£10.50 on a 24 month contract, £12.50 on a 12 month contract and £14.50 with no contract			
Router	Wireless router included free of charge			

Source: Plus.net's website checked on 26/03/2014.[58]

A5.11 Plus.net offers two fibre business broadband tariffs, with the option of either a 12 or 24 month contract.

[58] http://www.plus.net/business/broadband/

Table A5.7: Plus.net's fibre business broadband tariffs

	Business Fibre Broadband		Unlimited Business Fibre Broadband	
Contract length	12 or 24 months			
Market (2010)	Market 1	Market 2/3	Market 1	Market 2/3
Price (exc VAT) per month				
12 month contract	£31.00	£25.00	£41.00	£35.00
24 month contract	£29.00	£23.00	£39.00	£33.00
One-off fees	None			
Download speed	Up to 40Mbit/s		Up to 70Mbit/s	
Upload speed	Up to 19.5Mbit/s		Up to 19.5Mbit/s	
Monthly usage	50GB		Unlimited	
Line rental	£10.50 on a 24 month contract, £12.50 on a 12 month			
Router	Wireless router included free of charge			

Source: Plus.net's website checked on 26/03/2014.[59]

EE

A5.12 EE was formed in 2010 following the merger of T-Mobile UK and Orange UK. Orange was (as well as a mobile operator) an LLU-based broadband provider, with a substantial share of the UK broadband market. When EE was formed, it undertook a migration programme to move all its subscribers off LLU-based broadband. EE now only uses WBA products to provide broadband services to its customers.

A5.13 EE has focused on fibre broadband (although it does offer one ADSL tariff). The company advertises itself as a superfast provider and emphasises its 4G mobile offerings. EE offers two fibre broadband tariffs, one up-to 38Mbit/s speed tariff and one up-to 76Mbit/s tariff, both of which come with unlimited data allowance. All fibre tariffs require an 18 month contract commitment, whereas the ADSL tariff requires only a 12 month commitment.

A5.14 EE offers a £10 discount on tariff fees (across all tariffs) for existing T-Mobile/Orange/EE customers, but charges a £15 premium on ADSL tariffs for premises in Market 1 or 2 areas.

[59] http://www.plus.net/business/broadband/

Table A5.8: EE's residential broadband tariffs

	Broadband (ADSL)	Unlimited Fibre (38Mbit/s)	Unlimited Fibre (76Mbit/s)
Contract length	12 Months	18 Months	
Price (inc VAT) per month			
T-Mob/Orange/EE customer	£6	£8.00 for first 6 months £16.00 thereafter	£13.00 for first 6 months £26.00 thereafter
Non T-Mob/Orange/EE customer	£16	£26.00	£36.00
One-off fees	None	£25.00 connection fee	
Download speed	Up to 14Mbit/s	Up to 38Mbit/s	Up to 76Mbit/s
Upload speed	Not advertised	Up to 9.5Mbit/s	Up to 20Mbit/s
Monthly usage	Unlimited	Unlimited	Unlimited
Line rental	£15.40 per month or £132.00 for 12 months up-front (equating to £11.00 per month)		
Router	Wireless router included free of charge		

Source: EE's website checked on 26/03/2014.[60]

A5.15 While EE does offer business marketed broadband tariffs, it does not publish tariff details on its website. We therefore did not include them in this analysis.

Sky

A5.16 Sky offers four 'on-net' tariffs; two ADSL and two fibre. Its 'Lite' (ADSL) tariff includes only 2GB of monthly usage, and is offered for free but exclusively to SkyTV subscribers. Sky offers its unlimited ADSL and fibre packages to all (existing and non-existing Sky subscribers).

A5.17 Sky also offers an 'off-net' service, called 'Sky Broadband Connect', which it charges at £17 per month.

[60] https://broadband.ee.co.uk/packages

Table A5.9: Sky's residential broadband tariffs

	Lite	Unlimited	Fibre Unlimited	Fibre Unlimited Pro	Connect (outside LLU)
Contract length	12 months				
Price (inc VAT) per month	Free	£3.75 for first 12 months £7.50 thereafter	£10.00 for first 6 months £20.00 thereafter	£30.00	£17.00
One-off fees	None	None	£50.00 connection fee		£30 connection fee
Download speed	Up to 20Mbit/s	Up to 20Mbit/s	Up to 38Mbit/s	Up to 76Mbit/s	Case-by-case
Upload speed	Up to 1.3Mbit/s	Up to 1.3Mbit/s	Up to 2Mbit/s	Up to 19Mbit/s	Case-by-case
Monthly usage	2GB	Unlimited			40GB
Line rental	£15.40 per month				
Router	Free for new Sky Broadband customers £69.00 charge for existing Sky Broadband customers				

Source: Sky's website checked on 26/03/2014.[61]

A5.18 At the time of research Sky was not offering any business (marketed) broadband tariffs.

TalkTalk

A5.19 TalkTalk offers a single unlimited ADSL broadband service called 'Essentials', and offers the option to upgrade to fibre for either a £10 or £15 monthly premium (depend on speeds). All broadband tariffs are bundled with its fixed line service.

A5.20 TalkTalk also provides 'off-net' broadband services to a number of existing customers located in areas outside of its own network; however it no longer offers this service to new customers.

[61] http://www.sky.com/shop/broadband-talk/broadband-compare/

Table A5.10: TalkTalk's residential broadband tariffs

	Essentials	Fibre Medium	Fibre Large
Contract length	12 months	18 months	
Price (inc VAT) per month	£2.50	£12.50	£17.50
One-off fees	None	£30.00 connection fee	£30.00 connection fee
Download speed	Up to 16Mbit/s	Up to 38Mbit/s	Up to 76Mbit/s
Upload speed	Case-by-case	Up to 2Mbit/s	Up to 20Mbit/s
Monthly usage	Unlimited	Unlimited	Unlimited
Line rental	£15.95 per month		
Router	Wireless router included free of charge		

Source: TalkTalk's website checked on 26/03/2014.[62]

A5.21 TalkTalk offers two business broadband tariffs, one fibre and one ADSL, both of which come with unlimited data allowance.

Table A5.11: TalkTalk's business broadband tariffs

	Business Broadband	Business Broadband Fibre
Contract length	24 months	
Price (exc VAT) per month	£4.00	£19.00
One-off fees	£36.00 connection fee	
Download speed	Up to 17Mbit/s	Up to 76Mbit/s
Upload speed	Up to 1Mbit/s	Up to 20Mbit/s
Monthly usage	Unlimited	
Line rental	£17.40 per month	
Router	Wireless router included free of charge	

Source: TalkTalk's website checked on 26/03/2014.[63]

[62] http://sales.talktalk.co.uk/product/broadband/essentials, https://sales.talktalk.co.uk/product/fibre
[63] http://www.talktalkbusiness.co.uk/Documents/Legal/Master_Price_List-Connect-v1.2.pdf

Virgin

A5.22 Virgin is a long-standing quad-play service provider, offering a mix of broadband, TV, mobile and fixed phone services. Virgin offers three cable broadband services.

Table A5.12: Virgin's cable residential broadband tariffs

	Up to 50Mb	Up to 100Mb	Up to 152Mb
Contract length	18 months		
Price (inc VAT) per month	£7.50 for first 6 months £15.50 thereafter	£12.50 for first 6 months £20.50 thereafter	£20.00 for first 6 months £28.00 thereafter
One-off fees	None		
Download speed	Up to 30Mbit/s	Up to 60Mbit/s	Up to 100Mbit/s
Upload speed	Up to 3Mbit/s	Up to 6Mbit/s	Up to 10Mbit/s
Monthly usage	Unlimited		
Line rental	£15.99 per month		
Router	Wireless router included free of charge		

Source: Virgin's website checked on 26/03/2014.[64]

A5.23 Historically, Virgin has offered broadband tariffs for customers outside its cable network called 'National Broadband'. In late-2013, Virgin stopped advertising/offering this service to new customers.

A5.24 At the time of research, Virgin offered a single business broadband tariff, which offered a 50Mbit/s download (and 5Mbit/s upload) speed, with unlimited data allowance for £46.80 (inc. VAT) per month. The tariff carried a connection fee of £298.80.

Price analysis

A5.25 Following the exercise of gathering the broadband tariff information (as shown in tables A5.1 to A5.12), we analysed the data, computing the average monthly cost (to the consumer) for each tariff.

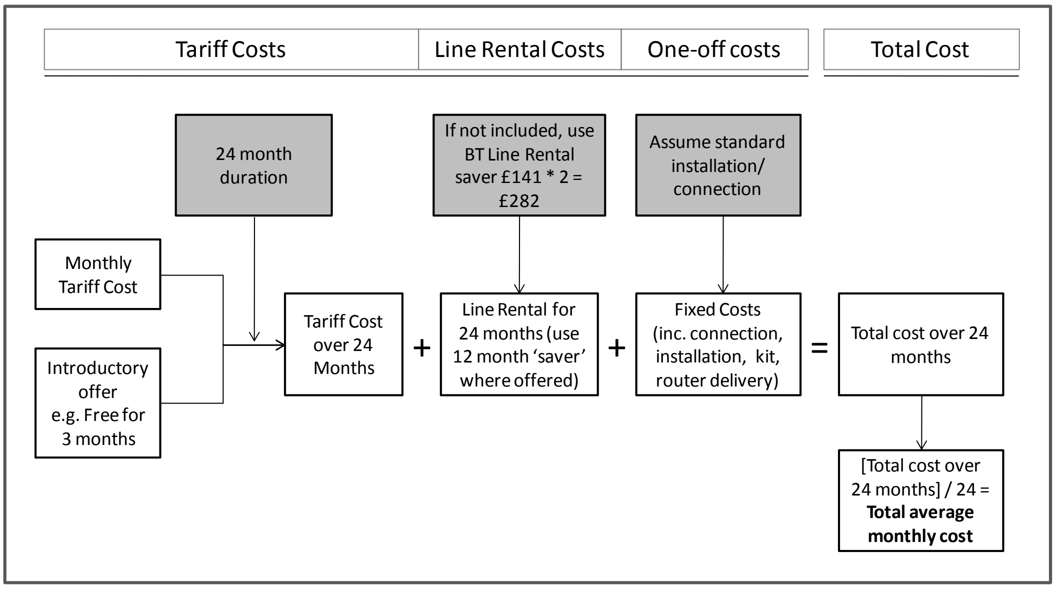
A5.26 The remainder of this annex contains an overview of the methodology and outputs of the broadband pricing analysis that we carried out to inform our definition of the relevant broadband product market as set out in Section 3. We have considered both residential and business broadband, in ADSL, fibre and cable technologies.

[64] http://store.virginmedia.com/national-broadband/compare-broadband/index.html

Methodology for broadband market pricing analysis

A5.27 The methodology we used to calculate monthly broadband cost (to the consumer), follows the process shown in Figure A5.1. The dark grey boxes denote the imposed assumptions.

Figure A5.1: Pricing analysis methodology



A5.28 The four main assumptions we made in this analysis (shown in the grey boxes in Figure A5.1) were:

1. **Tariff duration:** we used a 24 month contract horizon;

2. **Relevant bundle:** we included the cost of line rental;

   (a) We used a line-rental upfront payment option if offered[65]

   (b) We used BT's 'Line Rental Saver' if ISP did not offer a phone service[66]

3. **Kit / installation / connection fees:** We included only standard installation, connection and kit (router) fees; and

4. **Promotions:** We only took into account discounted tariff costs and did not account for other promotions such as retail vouchers or cashback offers.

A5.29 ISPs offer many different contract lengths, ranging from 1 to 24 months. Of the tariffs we analysed, there were five different contract durations offered, 1, 3, 12, 18 and 24 months. To compare the distinct offers in a meaningful way, we chose to compute average costs on the basis of a 24 month contract. Therefore we applied a 24 month duration, over which the monthly tariff, line rental and one-off (fixed) costs were distributed. This meant that all tariff contracts other than 24 months had to be

[65] Up front line rental 'saver' products come in the form of a 12 month line rental contract, for which all costs are paid up front. Instead of paying 12 monthly instalments, there is just a one-off payment at the start of the contract which is always less than the sum of the 12 monthly instalments. To cover the 24 month horizon, two (consecutive) line-rental 'saver' products would be required.
[66] BT's 'Line Rental Saver' is BT's version of the upfront payment line-rental product. It is a 12 month contract, costing £159.84 (equating to £13.32 per month).

scaled. Note however that only the variable costs (monthly tariff fee and line rental) were scaled; the fixed cost remained constant.

A5.30 Since broadband services require phone line/line rental, we included the price of this in the pricing analysis. In most cases the phone line was already included in the broadband tariff bundle. For line rental, many ISPs offer discounts for upfront payment of a 12 month line rental contract. The pricing analysis used this option where available (and assumed it was taken for both 12 month parts of the contract's duration). In instances where line rental was not included/offered for a broadband tariff, we assumed the phone line was provided by BT and the price for this was taken into account. We used the price of BT's line rental product at the reduced rate associated with a 12 month line rental contract.

A5.31 For installation/connection/router fees, we only included the standard fees. We did not include any fees associated with non-standard installation/connection, such as for installing a new telephone line, or where an engineer call-out was required. Additionally, we only used the most basic router cost.

A5.32 We took into account introductory monthly discounts (as advertised on the ISP's website). For example, we included promotions for "zero monthly fee for the first 6 months". Conversely we have not accounted for ancillary promotions/perks not directly affecting the tariff, line rental or (standard) one-off costs. Examples of such ancillary promotions/perks include residential vouchers and cashback offers.

A5.33 Figure A5.1 summarises the methodology used for our broadband market pricing analysis. To give an example, we calculate below the monthly cost for a broadband contract priced at £15 per month, that offers 'half price broadband for the first 6 months', whose line-rental is bundled with the broadband tariff and costs £15 per month (or £120 per year if paid upfront), and requires (standard) connection/installation fees totalling £60.The total monthly average cost for this is calculated as follows:

- Tariff costs for 24 months: [£15 x 18] + [£7.5 x 6] = £315
- Line rental costs for 24 months: [£120 x 2] = £240
- One-off costs: £60

Total cost over 24 months: [£315 + £240 + £60] = £615

Monthly cost: [£615 / 24] = £25.63

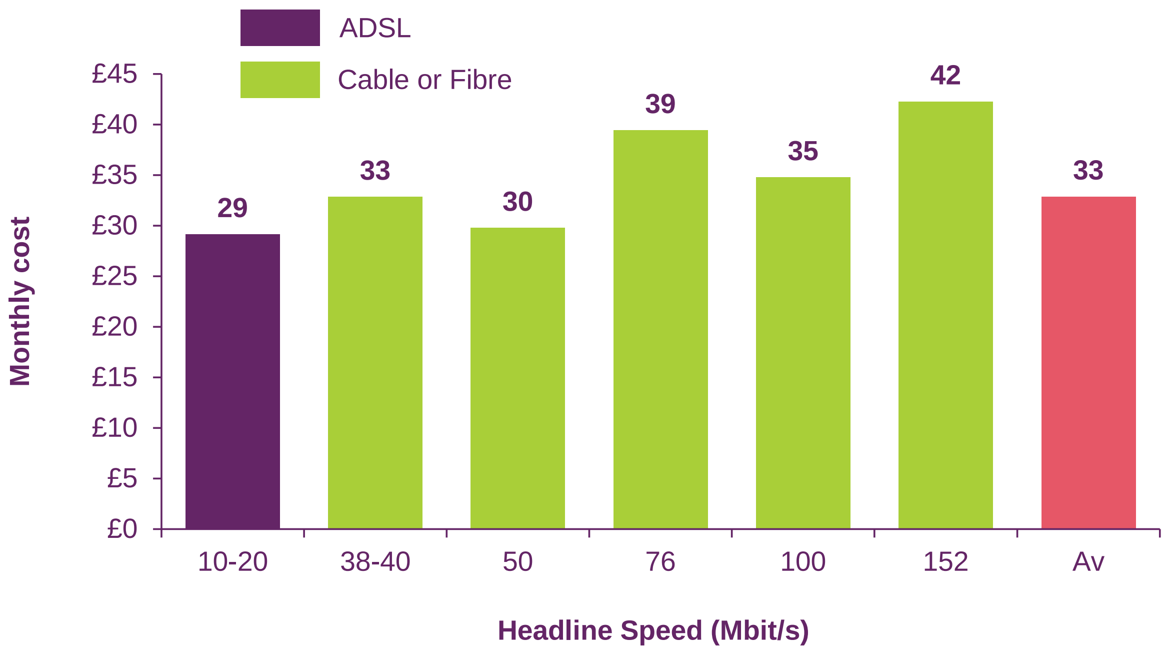
Residential broadband market analysis

A5.34 From the seven ISPs we analysed, we identified 44 residential broadband tariff combinations. These combinations refer to varying any of the above factors: speed; inclusive allowance; contract duration; and existing customer discounts. Of these 44 residential broadband tariff combinations, 35 included unlimited data allowance.

A5.35 Due to technological standards, broadband services are usually provided in set (incremental) speeds (or 'headline') speeds, based on the technology and equipment being used. Across the 35 unlimited tariffs there were 7 different advertised headline speeds, ranging from 10Mbit/s (for ADSL) to 152Mbit/s (for fibre).

A5.36 Figure A5.2 shows average total monthly residential broadband costs for the 35 residential broadband tariffs that include unlimited data. We have combined 10-20Mbit/s and 38-40Mbit/s tariffs since the underlying technology is the same (ADSL2+ and VDSL respectively) and the variation in advertised speeds is likely to be the result of marketing (and not differences in technical capability). The purple bars represent ADSL technology and the green bars represent cable[67] or fibre. The red bar labelled 'Av' displays the average monthly cost across all unlimited residential broadband tariffs.[68]

Figure A5.2: Average monthly cost of unlimited residential broadband for different headline speeds



Source: Ofcom calculations based on tariff data from ISPs' websites.

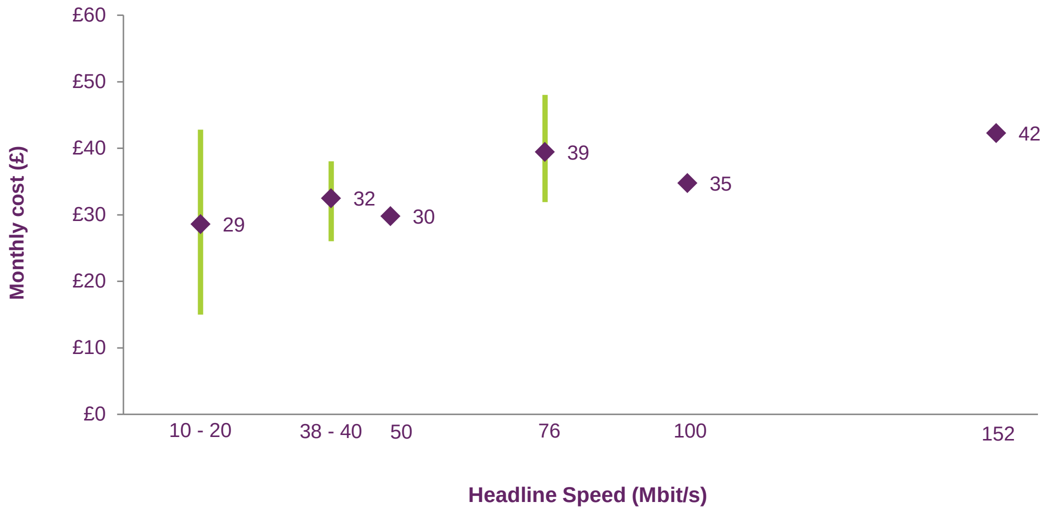
A5.37 Figure A5.2 shows that as the headline speed of a residential broadband tariff increases, so does the average monthly cost.

A5.38 As well as the cost of broadband tariffs increasing with headline speed, a number of other factors (such as data allowance, contract term and existing customer discounts) also affect the bundled cost of a broadband tariff. Such factors resulted in quite substantial variability in monthly cost (around the averages shown in Figure A5.2).

A5.39 Figure A5.3 shows the range (in addition to the average) of monthly costs for residential broadband tariffs, for each headline speed category.

[67] Virgin is the only provider of cable broadband in our analysis.
[68] The average price is calculated by summing the average monthly cost for each residential broadband tariff, and dividing by the total number of tariffs. Since around 60% of all tariffs we collected were ADSL (due to ISPs offering generally more ADSL tariffs than fibre), the average is being pulled down towards the ADSL average.

Figure A5.3: Range and average monthly cost of residential broadband for different headline speeds



Source: Ofcom calculations based on tariff data from ISPs' websites.

A5.40 Figure A5.3 shows that for each speed, there can be significant overlap (in terms of monthly cost) with other headline speeds. This means that some subscribers are able to switch to a faster service for equal or lesser cost (although it may mean they will have less inclusive allowance, be required to sign up for a longer contract, or have to sign-up to one of the ISP's other services e.g. mobile).

Business broadband market analysis

A5.41 Of the six broadband service providers, only four (BT, Plus.net, TalkTalk and Virgin) published on their websites business targeted broadband tariffs. From these four providers, we identified 25 business broadband tariff combinations.

A5.42 The main factors affecting the business broadband tariffs (besides speed) was data allowance (of these 25 business broadband tariff combinations, 14 included unlimited data allowance) and supporting services (such as improved customer support/technical assistance, static IP addresses and premium e-mail services).

A5.43 Since business broadband uses similar technological standards as residential broadband, potential up-to speeds are broadly similar. Across the 25 business broadband tariffs there were 5 different advertised headline speeds, ranging from 17Mbit/s (for ADSL) to 76Mbit/s (for fibre).

A5.44 Business broadband contract durations showed much less variation that residential. Across the 25 identified business broadband tariffs there were only two contract durations offered, 12 or 24 months.

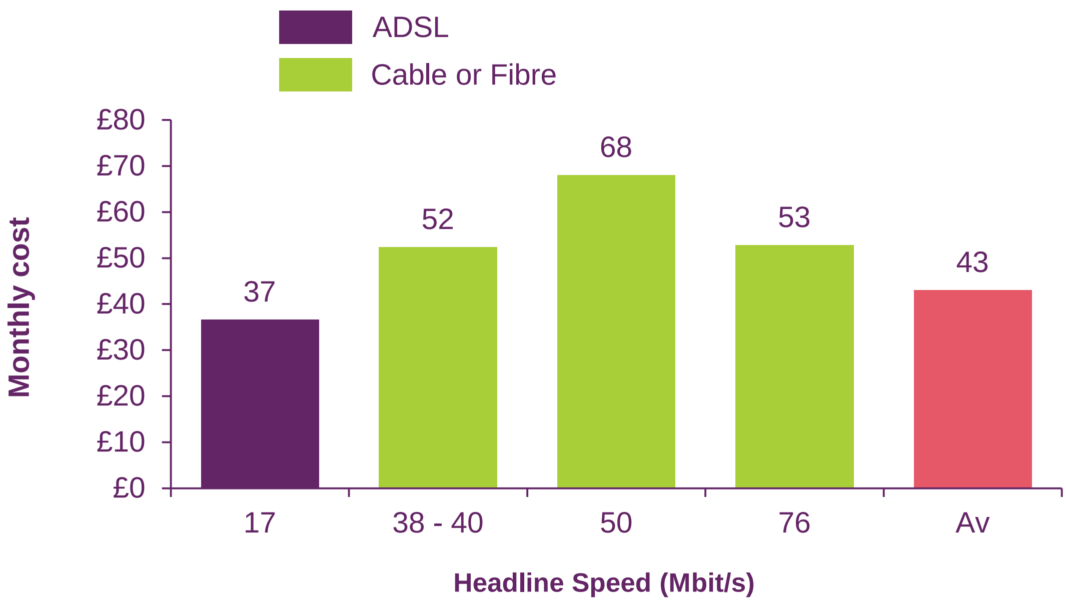
A5.45 Unlike residential broadband, there were no instances of promotional discounts for new subscribers for business broadband tariffs.

A5.46 Figure A5.4 shows the monthly business broadband costs for all business broadband tariffs.[69] The purple bars represent ADSL technology and the green bars

[69] There were no unlimited business broadband tariffs with a headline speed of 16.4Mbit/s.

represent cable or fibre. The red bar shows the average monthly cost across all unlimited business tariffs.[70]

Figure A5.4: Average monthly cost of business broadband for different headline speeds



Source: Ofcom calculations based on tariff data from ISPs' websites.

A5.47 As can be seen from Figure A5.4, the monthly cost of unlimited business broadband tends to increase with headline speed.[71]

A5.48 The average cost for unlimited business broadband is, however, substantially higher than residential. This is likely to be driven by the fact that the majority of unlimited residential tariffs were (lower-priced) ADSL, whereas for business the majority of tariffs are cable or fibre. In addition, the higher prices are likely to reflect the add-on services included with business broadband tariffs.

A5.49 As well as the cost of business broadband tariffs increasing with headline speed, a number of other factors (especially inclusive data allowance and add-on services) also affect the cost of a broadband tariff. These factors resulted in some variability in the monthly costs shown in Figure A5.4. Figure A5.5 shows the range and average total monthly cost for the 25 business broadband tariffs our research identified, for each headline speed category.

[70] The average price is calculated by summing the average monthly cost for each business broadband tariff, and dividing by the total number of tariffs

[71] We note the highest price is for 50 Mbit/s services. This is Virgin's business broadband product. The rest of the data points are services provided over ADSL or VULA.

Figure A5.5: Range and average monthly cost of business broadband for different headline speeds

Source: Ofcom calculations based on tariff data from ISPs' websites.

Business broadband tariff ranges appear to have a fairly high degree of variability for the lower headline speed tariffs. There is a significant amount of overlap between business broadband tariffs of different headline speed, with some 17Mbit/s business broadband tariffs being more expensive than significantly faster tariffs. This could however be driven by the other tariff factors, such as additional customer support, included static IPs, and connection fees.

Annex 6

Geographic analysis

A6.1 A key part of the process for our geographic market assessment is our analysis of data provided by CPs. This annex describes the approach and results of this geographical analysis.

A6.2 As described in Section 4, we use the local exchange as the relevant geographic unit in our assessment. At present there are 5,586 local exchanges in BT's network and 14 in KCOM's network.[72]

A6.3 The rest of this annex is structured as follows:

- sources of data (from CPs and other sources) used to conduct our analysis;
- responses we received to the 2013 WBA Consultation regarding data issues, [73] and our comments on them;
- data on active circuits;
- defining principal operators (POs);
- grouping of exchanges;
- distribution of BT's service share in BT+2 exchanges that have prevailed for varying lengths of time; and
- a map showing the geographic areas falling within Market A and Market B.

Data sources

A6.4 The inputs to our model come from the following sources:

[72] As discussed in Section 4, we define the Hull Area (where KCOM is the predominant fixed network provider) as a separate geographical market. Accordingly, this Annex focuses on the UK excluding the Hull Area.
[73] We note that we did not receive any responses to the 2014 WBA Consultation regarding data issues.

Table A6.1: Inputs and source

	Source	Description	Date	Reference
1	Ordnance Survey	Delivery Points (DPs) per postcode for Northern Ireland	Q4, 2006	Ordnance Survey, 2006.
2	Ordnance Survey	DPs per postcode, for UK.	July 2012	Ordnance Survey, July 2012.
3	Openreach	Correlation between BT Local Exchange Codes and Postcodes.	Q4, 2012	Openreach's response via email on 22 March 2013 and 8 November 2013.
4	Openreach	Number of MPF/SMPF active circuits, per Openreach Customer, per BT Local Exchange.	October, 2013	BT response to question 1.1 of the 6th s.135 notice 14 October 2013. Amended in accordance with Openreach email responses on 15 March 2013, 22 May 2013[74] and 27 November 2013.
5	Openreach	Openreach customers' plans to roll-out LLU to BT Local Exchanges	October, 2013	BT response to question 1.2 of the 6th s.135 notice 14 October 2013. Additional data and/or corrections provided by Openreach via email on 27 November 2013.
6	Virgin	Number of premises passed by Virgin's cable network.	September, 2013	Virgin response to question 1.1 of the 4th s.135 notice, 19 November 2013.
7	Virgin	Number of premises served by Virgin's cable network.	September, 2013	Virgin response to question 1.1 of the 4th s.135 notice, 19 November 2013.
8	BT Wholesale	IP Stream ADSL active circuits per BT Local Exchange and per BT Wholesale customer.	September, 2013	BT response to question 2.2 of the 6th s.135 notice 14 October 2013.
9	BT Wholesale	DataStream ADSL active circuits per BT Local Exchange and per BT Wholesale customer.	September, 2013	BT response to question 2.2 of the 6th s.135 notice 14th October 2013.
10	BT Wholesale	WBC ADSL active circuits per BT Local Exchange and per BT Wholesale customer.	September, 2013	BT response to question 2.2 of the 6th s.135 notice 14th October 2013. Corrections provided by BT via email on 19 November 2013.
11	KCOM	Number of active circuits per KCOM Local Exchange.	November, 2012	KCOM response to question 1.1 of the s.135 notice 28 November 2012.

2013 WBA Consultation

Consultation Responses

A6.5 BT stated in its response that all exchanges containing zero active connections (also called "phantom" exchanges) should be removed from our list of regulated

[74] Corrections that we received on 15 March 2013 and 22 May 2013 were confirmed to be applicable to the data we received on October 2013.

exchanges. Specifically, it identified three exchanges where there are no live circuits that we have included in Market A: EACTP, which is an area served by the Caxton (EACAX) exchange, LNDZ2 (London Docklands Zone 2), which is served from Poplar Exchange (LNPOP), and STTOLRY, which is now part of the Handley (STHANLY) exchange.

A6.6 Furthermore, BT stated that some exchange buildings in the City of London have been redeveloped, centralizing and consolidating equipment into fewer exchanges. These are: Wood Street exchange (CLWOO), which shares the same building as the Faraday exchange (CLFAR); and Fleet exchange (CLFLE), which shares the same building as the Moorgate exchange (CLMOO). BT explained that LLU operators present in each of these exchange buildings are able to service both co-located exchanges and, therefore, should be included in the market depending on the number of POs present in the exchange building, which would be Market B.

A6.7 In addition, BT raised concerns about our data analysis with regards to Virgin, regarding the presence of some Virgin active connections for which the premises were not recorded as being ‘passed’. BT stated that it thought Ofcom had only identified “a portion of these errors.”

A6.8 BT also raised concern with mis-matching postcodes, suggesting we conduct further checks for anomalies that might arise as a result of combining two databases (i.e. BT’s and Virgin’s). BT explained that for our calculations of exchange size, it is likely that mis-matched postcodes will not be spread evenly across the UK, but will be clustered in areas where postcodes have changed and the BT and Virgin systems are using postcode lists from different dates. BT went on to state that if the postcode mis-match was of a similar order to the customer mis-match of 1.5%, this would equates to almost 200,000 delivery points, and a cluster of mis-matched homes in an exchange area of 1,000 to 3,000, which could be significant in the marginal exchanges, for which Virgin’s coverage could determine the market allocation for the exchange.

A6.9 We note that no operator other than BT provided comments on our data analysis.

Our comments

A6.10 Taking into consideration BT’s information on “phantom” exchanges, we have removed exchange codes EACTP, LNDZ2 and STTOLRY from the list of Market A exchanges.

A6.11 Our analysis has identified that Wood Street, Faraday, Moorgate and Fleet exchange areas are indeed each being served by a minimum of three POs and, therefore, are included into Market B, in accordance with our geographic market definition (see paragraph 4.211).

A6.12 Upon further investigation, we identified that the cause of a significant number of postcode mis-matches was due to a mixed use of capitals and small letters across databases, as well as erroneous character spacing in postcodes. To address this, prior to comparing postcodes we converted small letters to capital and we removed space characters. This pre-processing step allowed for a significant reduction (from the 2013 WBA Consultation) in postcode mis-matching, to an accuracy level that is very similar to that achieved in 2010 WBA Statement.

A6.13 Regarding Virgin data issues, for the purposes of this Statement, we asked Virgin to include all premises being served in their calculation of premises passed. We received updated data on this basis and our analysis was updated accordingly.

Data on active circuits

A6.14 The data from Openreach on active circuits includes broadband connections provided via MPF and SMPF on BT's copper network (either by BT or by an LLU operator) and the data from Virgin includes the active circuits using its cable network. We recognise that some active circuits will be used for services we propose are outside the WBA market, such as symmetric services including Ethernet in the First Mile (EFM). Given the low proportion of such circuits we do not believe this is likely to have a significant effect on our analysis.

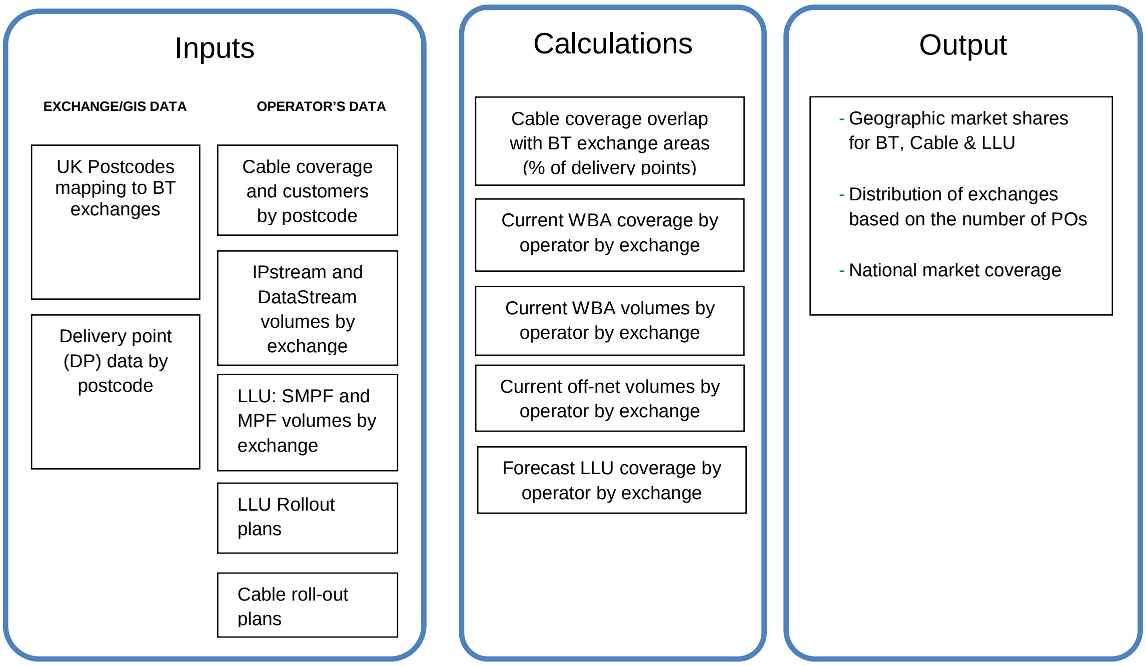
A6.15 We have excluded fibre-based circuits (GEA products) from our active circuit data (as explained in paragraph 4.81) since we consider the impact of fibre-based broadband services separately, see paragraphs 4.156 to 4.199.

Overview of the structure of the model

A6.16 Figure A6.1 shows an overview of the main steps (inputs, calculations and outputs) of the model we used to assess and define geographic markets.

A6.17 The model determines the number of exchanges with any given number of operators present and the wholesale market shares within each of those exchanges. It also determines the national coverage of each operator in terms of exchanges and premises.

Figure A6.1: Overview of the model



BT and KCOM exchange data

A6.18 We have examined the data from BT as provided in responses to information requests in September 2013 (as set out in Table A6.1 above) against that used in the 2010 WBA Statement.

A6.19 In the 2010 WBA Statement, we included 5,589 BT exchanges in our defined markets (Market 1, Market 2 and Market 3). This included 26 exchanges where BT informed us it did not provide broadband services.

A6.20 Since then, BT has removed one exchange (STWHTLY) due to it being merged with STLOCKH. It has added one exchange (CMCVROM). BT still does not provide broadband services in the 26 exchanges identified last time and, in addition, three exchanges included last time (EACTP, LNDZ2 and STTOLRY) now have no live circuits. Hence, the total number of exchanges in the UK excluding Hull (Market A and Market B combined) is 5586, 3 less than in the 2010 WBA Statement.

A6.21 In the 2010 WBA Statement we identified 14 exchanges in the Hull Area operated by KCOM. We excluded two KCOM exchanges where no broadband service is provided, and two other data records provided by KCOM related to street cabinet deployments.

A6.22 In its data provided for this review, KCOM provided 30 records in total. Of these, we again exclude two exchanges where broadband is not provided. In addition there are now 14 records related to street cabinet deployment. Removing these leaves 14 exchanges.

Roll-out plan data

A6.23 The information on future roll-out plans identified the stages of each CP's most recent forecast roll-out plans based on Openreach's infrastructure planning process, namely:

- Step 1: Advanced Provisioning Order (APO) submitted by CP;
- Step 2: APO survey completed by Openreach;
- Step 3: Firm order submitted by CP;
- Step 4: Multi User Area (MUA) build completed by Openreach; and
- Steps 5 and 6: Point of Presence (POP) install completed and handed over to CP.

A6.24 The first two steps provide CPs with a view of whether their proposed roll-outs are feasible or not. Once Openreach responds (step 2), CPs may confirm their order to Openreach (step 3). On receipt of a firm order Openreach carries out the necessary work to prepare, build and handover the LLU space to the CP (steps 4 to 6).

A6.25 As described in paragraphs 4.99 to 4.115, we have considered planned LLU roll-out at either steps 1 or 2 as "uncommitted". Once a firm order is submitted (step 3) we consider the roll-out to be "committed". We only include "committed" planned roll-out into our allocation of exchanges into geographic markets.

Exchange size calculation

A6.26 The first step in our analysis is to estimate the total number of DPs in each exchange (the exchange size). To do this, we map each UK DP to a local exchange, by combining Ordnance Survey delivery point data for UK postcodes with BT's data mapping UK postcodes to each exchange.[75] This allows us to estimate the size of each local exchange, in terms of the total number of DPs served.

A6.27 We identified 7,779 postcodes which were initially allocated to two or three different exchanges. These represent 104,763 DPs (less than 0.4% of the total number of DPs in the UK).[76] We considered several ways of allocating DPs to exchanges in order to avoid double counting these postcodes. However, the number of postcodes and the corresponding number of DPs are very small. Therefore we decided to take a simple approach of assigning the DPs to the last exchange in alphabetical order. Given the scale of this issue, this simplification will not have a material impact on the accuracy of our results.

A6.28 We note that we were unable to match 0.74% (11,958) of postcodes, accounting for 1.96% of UK DPs.[77] We compensated for this by uplifting the number of DPs in each exchange by 1.96%.

Virgin's network and cable overlap calculations

A6.29 Since Virgin's footprint does not align exactly with BT exchange areas, we have had to map Virgin's network onto BT's local exchange areas, in order to assess competitive conditions within each exchange area (our relevant geographic unit).

A6.30 Virgin provided data on its broadband cable coverage by specifying the number of DPs it can presently offer service to in each postcode. The data provided by Virgin had a minor inconsistency in that some premises that were served or passed by Virgin could not be mapped onto any of BT's local exchanges.

A6.31 To deal with the issue, we uplifted the number of premises Virgin served or passed in other areas by the proportion of premises that could not be mapped. The unmapped served premises account for 0.72% of the total number of DPs passed. The corresponding uplift factor is small and it is very unlikely to affect our assessment.[78] As such, we have attempted taken to reduce the mismatch of postcodes but, taking into consideration that the underlying datasets are provided by different stakeholders and they are based on different databases of UK's postcodes, we do not consider it practically feasible to perfectly match all postcodes.

A6.32 In terms of UK DPs, Virgin coverage decreased from [✂] between June 2010 and December 2012.[79] This is because Virgin has updated its records further since the last review and, in addition, has identified some areas where it no longer offers

[75] A small amount of data loss occurs in this process because either: (i) a postcode is allocated to two or three different exchanges; or (ii) a postcode could not be matched.
[76] Ofcom calculations based on BT response to Q.1 of s.135 notice, 14 October 2013, email from BT to Ofcom dated 08/11/2013, and Virgin response to Q.1 of s.135 notice, 19 November 2013.
[77] Ibid
[78] Ibid
[79] Ofcom calculations based on BT response to Q.1 of s.135 notice, 14 October 2013 and Virgin response to Q.1 of s.135 notice, 19 November 2013.

service.[80] As set out in Section 4, we consider Virgin as being present within a local exchange when the overlap is at least 65%. At the end of December 2012, there were [✂] local exchanges where Virgin's coverage is at least 65%. In comparison, at end of June 2010, there were [✂] exchanges where Virgin's overlap was at least 65%.[81]

A6.33 We have not taken into account Virgin's roll-out plans, for reasons explained in paragraph 4.7.

The principal operators (POs)

A6.34 [✂] exchanges (95.5% of UK delivery points) have been unbundled by at least one CP.[82] The coverage of individual CPs varies, with a number of CPs focusing on narrow geographic areas, whereas a small number of operators are able to serve a large proportion of all UK premises. Table A6.2 below shows that in September 2013, there were seven CPs with UK coverage in excess of 10%, while five of them (including BT) had coverage of over 40%.

Table A6.2: Top seven CPs by UK network coverage (excluding the Hull Area), September 2013

Operator	Coverage (UK excluding the Hull Area),
BT	100%
TalkTalk	94.4%
Sky	90.1%
Vodafone[83]	60.3%
Virgin	40-50% [✂]
Updata	18.8%
Zen	16.1%

Source: Ofcom calculation from data provided by Openreach and Virgin.[84]

A6.35 As discussed in paragraphs 4.84 to 4.98, we have defined five POs upon which our forward looking geographic market assessment is based. These are BT, Sky, TalkTalk, Virgin and Vodafone.

A6.36 As explained in paragraph 4.71, we do not include Virgin's planned network roll-outs in our assessment. For the other POs (excluding BT), we consider planned LLU deployments, and as discussed in paragraphs 4.99 to 4.115, we categorise planned LLU roll-outs based on whether they are "committed" or not.

[80] This is mainly due to [✂].
[81] Ofcom calculations based on BT response to Q.1 of s.135 notice, 14 October 2013 and Virgin response to Q.1 of s.135 notice, 19 November 2013.
[82] Ibid
[83] Vodafone is the owner of Cable & Wireless Ltd, for whom these figures correspond.
[84] Ofcom calculations based on BT response to Q.1 of s.135 notice, 14 October 2013 and Virgin response to Q.1 of s.135 notice, 19 November 2013.

A6.37 We classify all operators with planned roll-outs that are “committed” as present in the exchange. Table A6.3 below shows the coverage of each LLU PO when we include “committed” LLU roll-outs. The table also shows the coverage if we include all planned LLU roll-outs (i.e. roll-outs that we have classified as uncommitted).

Table A6.3: Forecasted UK coverage by LLU Principal Operators (excluding the Hull Area), September 2013

	UK coverage – “Committed” planned LLU roll-out	UK coverage – “Uncommitted” planned LLU roll-out
TalkTalk	94.7%	95.1%
Sky	90.1%	90-94% [✂]
Vodafone	64.3%	64.4%

Source: Ofcom calculation from data provided by Openreach and Virgin.[85]

A6.38 In Table A6.4 we group exchanges based on the number of POs present, and show how the size of each group of exchanges, in terms of the number of exchanges and coverage of UK DPs, varies depending on whether we only include actual roll-out, committed roll-out or both committed and uncommitted roll-out.

Table A6.4: Number of exchanges and UK coverage for exchanges grouped by number of POs present (excluding the Hull Area), September 2013

	No planned LLU roll-out		“Committed” planned LLU roll-out		“Uncommitted” planned LLU roll-out	
BT-only	2562	5.48%	2508	5.20%	2393	4.82%
BT + 1	618	4.21%	662	4.39%	771	4.69%
BT + 2	1214	23.16%	1124	20.11%	1130	20.18%
BT + 3	650	31.70%	721	33.65%	721	33.65%
BT + 4	516	35.43%	545	36.64%	545	36.64%

Source: Ofcom calculation from data provided by Openreach and Virgin.[86]

Grouping of exchanges

A6.39 As discussed in Section 4, for exchanges outside of the Hull Area, we have identified two geographic markets based on the number of POs providing services in the exchange area. We classify exchanges in which no more than two POs are present, or forecast to be present, as Market A.[87] We classify exchange areas

[85] Ofcom calculations based on BT response to Q.1 of s.135 notice, 14 October 2013 and Virgin response to Q.1 of s.135 notice, 19 November 2013.
[86] Ofcom calculations based on BT response to Q.1 of s.135 notice, 14 October 2013 and Virgin response to Q.1 of s.135 notice, 19 November 2013.
[87] Market A also includes 26 exchanges in which there are no current active CPs, as we explained in paragraph A6.20.

where BT plus two or more other POs are present, or forecast to be present, as Market B.

A6.40 In Table A6.5 we allocate exchanges into geographic markets (excluding the Hull Area), and show how the size of each market, in terms of the number of exchanges and coverage of UK DPs, varies depending on whether we only include actual roll-out, committed roll-out or both committed and uncommitted roll-out.

Table A6.5: Exchanges grouped by Market A and Market B (excluding the Hull Area), September 2013

	No planned LLU roll-out		"Committed" planned LLU roll-out		"Uncommitted" planned LLU roll-out	
Market A	3,180	9.7%	3,170	9.6%	3,164	9.5%
Market B	2,380	90.3%	2,390	90.4%	2,396	90.5%

Source: Ofcom calculation from data provided by Openreach and Virgin. [88]

Sensitivity analysis for Virgin coverage threshold

A6.41 In order to inform our assessment, we have conducted further analysis to consider the impact of reducing the threshold that determines whether Virgin is present at the level of an exchange from 65% to 50%. Table A6.6 shows the impact is minimal, with only 0.2% of UK premises being reclassified if the threshold is moved from 65% to 50.[89]

Table A6.6: Impact of lowering cable operator presence threshold to 50%, compared to 65%, exchanges and UK coverage (excluding Hull Area)

	Actual number and UK coverage Overlap >=50%		Actual number and UK coverage Overlap >=65%	
Market A	3,149	9.4%	3,170	9.6%
Market B	2,410	90.6%	2,390	90.4%

Source: Ofcom calculation from data provided by Openreach and Virgin. [90]

Wholesale broadband access markets

A6.42 We now include the Hull Area in our exchange groupings to establish a complete list of markets across the UK, along with the number of exchanges in each and corresponding coverage of all UK premises. As discussed in paragraphs 4.99 to 4.115, we include committed LLU roll-out, but not uncommitted roll-out, in allocating exchanges. The three geographic UK WBA markets are shown in Table A6.7 below.

[88] Ofcom calculations based on BT response to Q.1 of s.135 notice, 14 October 2013 and Virgin response to Q.1 of s.135 notice, 19 November 2013.
[89] Ibid
[90] Ibid

Table A6.7: Geographic market definition, September 2013

	Number of exchanges	UK coverage
The Hull Area	14	0.7%
Market A[91]	3,196	9.5%
Market B	2,390	89.8%

Source: Ofcom calculation from data provided by Openreach, Virgin and KCOM.

Comparison with 2010 WBA

A6.43 Table A6.8 provides a comparison between the market definition in the 2010 WBA Market Review and our market definition in this Statement. It shows the number of exchanges classified in Market 1, 2 and 3 in 2010, further broken down by the number of POs (and for exchanges with three POs by whether they had more or less than 50% market share). The table compares this with the number of exchanges classified in Market A and B in this Statement. These exchanges are also broken down by number of POs (and for exchanges with three POs by whether they had more or less than 50% market share). Table A6.9 gives the same information in terms of UK coverage (excluding the Hull Area).

Table A6.8: Comparison of market exchange allocations (excluding the Hull Area) in 2010, and those in this Statement

<table>
<tr><th></th><th colspan="2">Exchanges in 2010</th><th></th><th colspan="2">Exchanges for this review</th><th></th></tr>
<tr><td>Market 1</td><td>3,389</td><td>3,389</td><td>BT-only</td><td>2508</td><td rowspan="2">3,170[92]</td><td rowspan="2">Market A</td></tr>
<tr><td rowspan="2">Market 2</td><td rowspan="2">660</td><td>407</td><td>BT+1</td><td>662</td></tr>
<tr><td>[✂]</td><td>BT+2 (BT>50%)</td><td>[✂]</td><td rowspan="5">2,390</td><td rowspan="5">Market B</td></tr>
<tr><td rowspan="4">Market 3</td><td rowspan="4">1,540</td><td>[✂]</td><td>BT+2 (BT<50%)</td><td>[✂]</td></tr>
<tr><td>384</td><td>BT+3</td><td>721</td></tr>
<tr><td>458</td><td>BT+4</td><td>545</td></tr>
<tr><td>501</td><td>BT+5</td><td>-</td></tr>
</table>

Source: Ofcom calculation from data provided by Openreach and Virgin.

[91] We include in Market A also the 26 exchanges that currently have zero active connections, see paragraph A6.20.
[92] Market A also includes 26 exchanges in which there are no current active CPs, as we explained in paragraph A6.20. This mean's market A actually contains 3,196.

Table A6.9: Comparison of coverage for market exchange allocations (excluding the Hull Area) in 2010, and those in this Statement

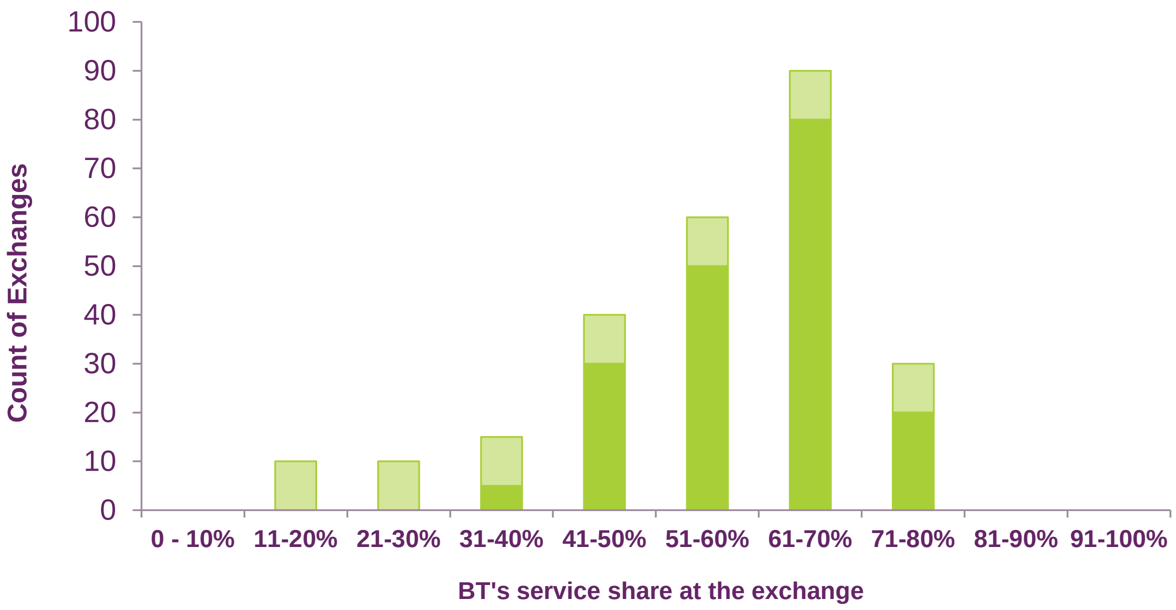
<table>
<tr><th></th><th colspan="2">Exchanges in 2010</th><th></th><th colspan="2">Exchanges for this review</th><th></th></tr>
<tr><td>Market 1</td><td>12%</td><td>12%</td><td>BT-only</td><td>5.2%</td><td rowspan="2">9.5%</td><td rowspan="2">Market A</td></tr>
<tr><td rowspan="2">Market 2</td><td rowspan="2">10%</td><td>5%</td><td>BT+1</td><td>4.4%</td></tr>
<tr><td>[✂]</td><td>BT+2 (BT>50%)</td><td>[✂]</td><td rowspan="5">89.8%</td><td rowspan="5">Market B</td></tr>
<tr><td rowspan="4">Market 3</td><td rowspan="4">78%</td><td>[✂]</td><td>BT+2 (BT<50%)</td><td>[✂]</td></tr>
<tr><td>14%</td><td>BT+3</td><td>33.4%</td></tr>
<tr><td>24%</td><td>BT+4</td><td>36.4%</td></tr>
<tr><td>34%</td><td>BT+5</td><td>-</td></tr>
</table>

Source: Ofcom calculation from data provided by Openreach and Virgin.

Distribution of BT+2 exchanges

A6.44 In Section 4,[93] we presented analysis on how BT's service share in BT+2 exchanges falls over time. In that section we showed how the distribution of BT+2 exchanges that had prevailed for four or more years, was clustered around the average. Figures A6.2 to A6.5 below provide the same analysis for BT+2 exchanges which have prevailed for 0-1, 1-2, 2-3 and 3-4 years.

Figure A6.2: BT+2 exchanges where the third PO has been present for 0 to 1 years, broken down by BT's service share (September 2013)



[93] Paragraphs 4.128 to 4.133.

Figure A6.3: BT+2 exchanges where the third PO has been present for 1 to 2 years, broken down by BT's service share (September 2013)

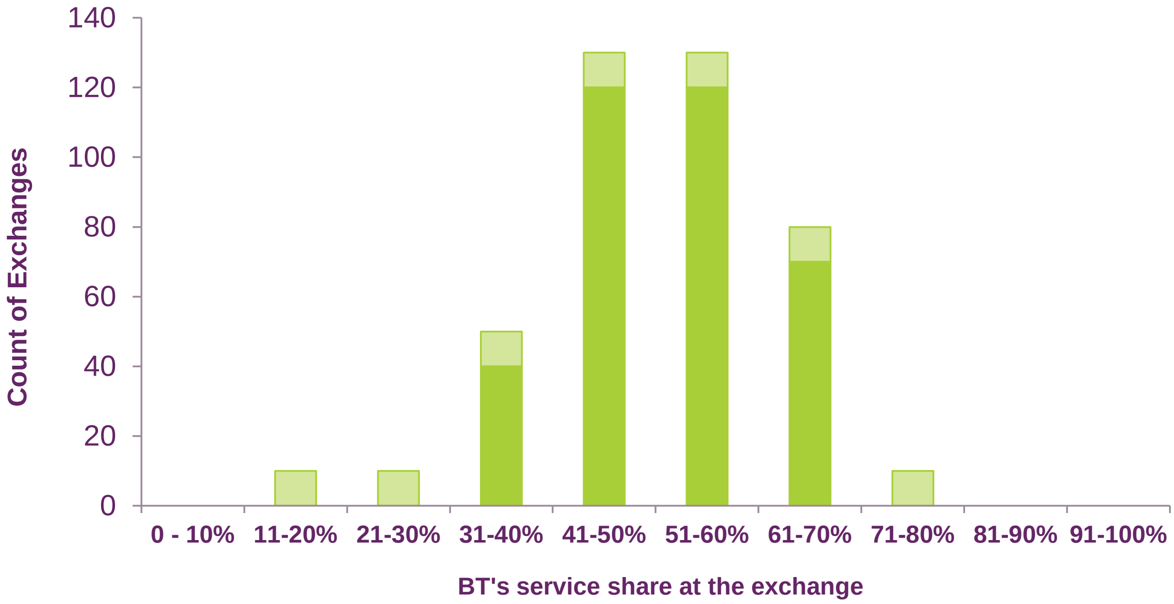


Figure A6.4: BT+2 exchanges where the third PO has been present for 2 to 3 years, broken down by BT's service share (September 2013)

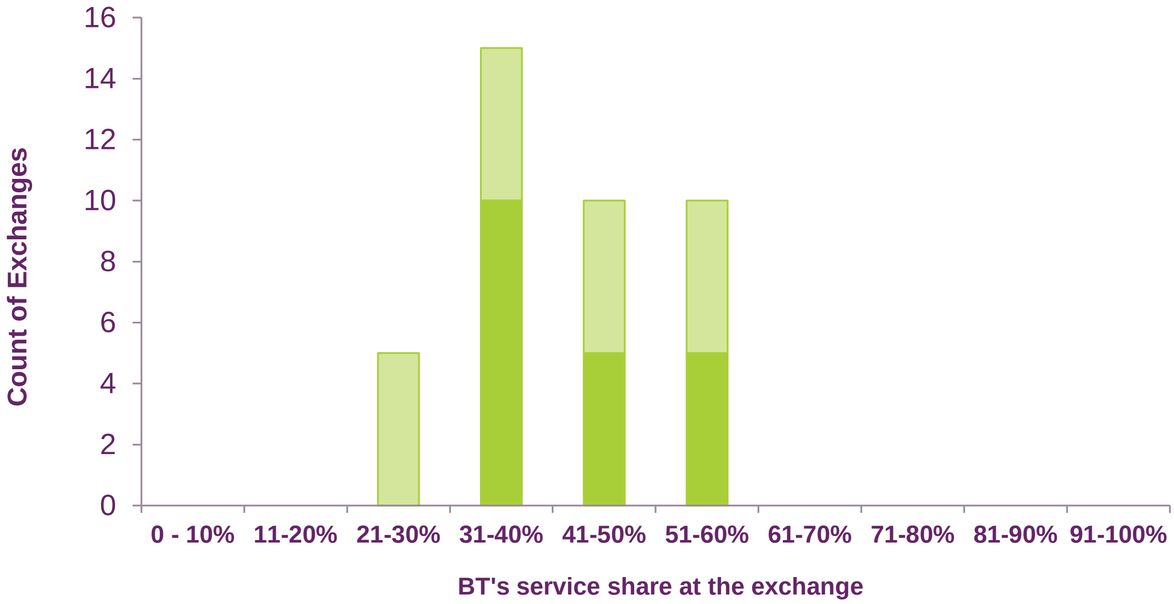
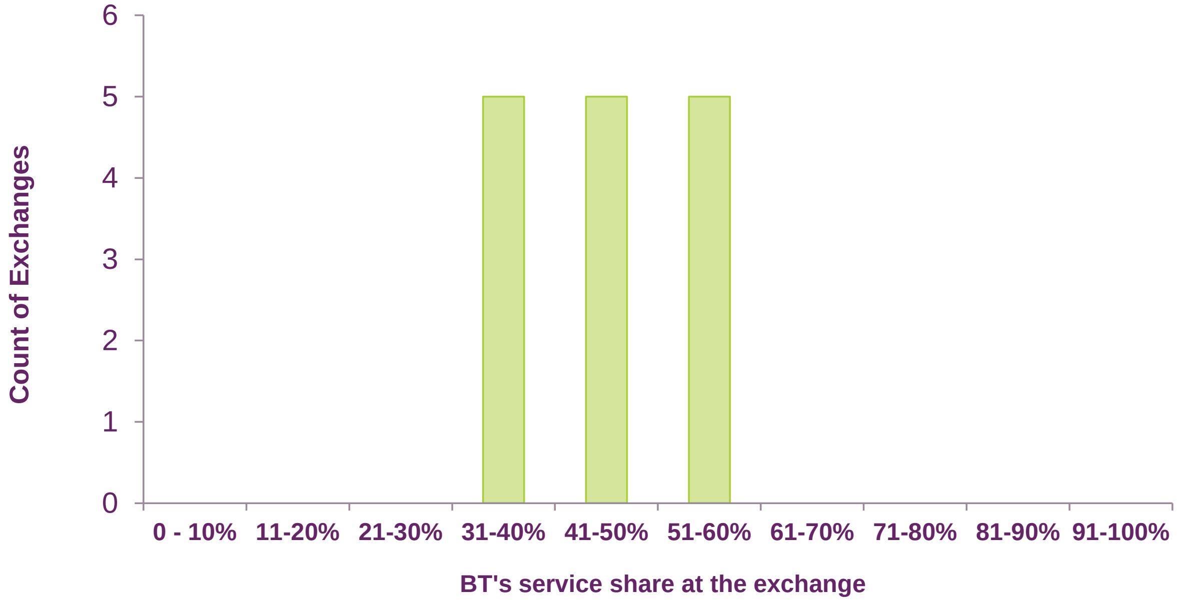


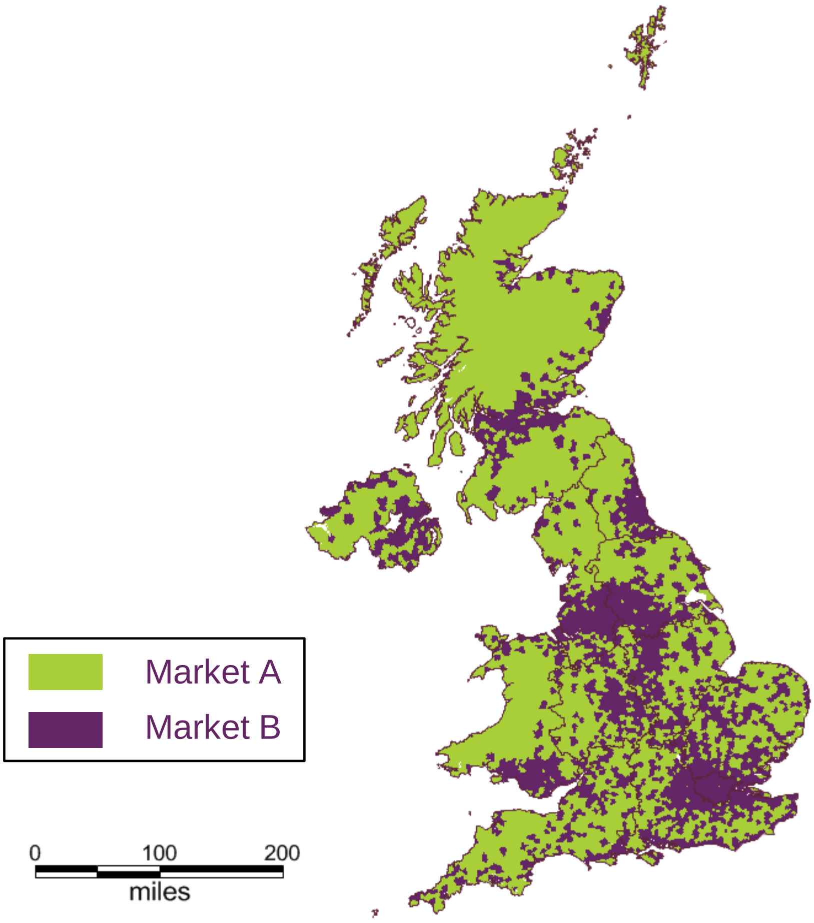
Figure A6.5: BT+2 exchanges where the third PO has been present for 3 to 4 years, broken down by BT's service share (September 2013)



Map of geographical coverage of markets

A6.45 Figure A6.6 provides a geographic representation of Market A and Market B, highlighting those parts of the country covered by each.

Figure A6.6: Geographical map of Market A and Market B coverage



Annex 7

Charge control: forecasting assumptions

Introduction

A7.1 This annex explains the main assumptions we have made to forecast costs and revenues. In this annex we set out our analysis for our assumptions relating to:

- volume forecasting;
- AVEs and CVEs;
- cost inflation;
- efficiency; and
- WACC.

A7.2 For each issue we set out the proposals we consulted upon in either the 2013 WBA Consultation or the 2014 WBA Consultation, summarise the responses we received and set out our conclusions.

We have adopted a modified medium volume growth assumption

Our proposals

A7.3 In the 2013 WBA Consultation we proposed to model end user rentals and contracted bandwidth only. We proposed high, medium and low volume assumptions for end user volumes as shown in Table 7.1 below (as discussed in Section 7, this shows the net effect of penetration growth, losses to other CPs using LLU or fibre, and losses to BDUK fibre).

Table A7.1: Forecasts of growth in end user rental volumes

	2012/13	2013/14	2014/15	2015/16	2016/17
High	-1.0%	0.9%	2.3%	0.3%	-3.3%
Medium	-1.0%	-0.1%	-0.8%	-5.9%	-10.5%
Low	-1.0%	-0.7%	-2.3%	-9.1%	-16.5%

Source: 2012/13 growth derived from BT's response to question 2 of S135 Notice under Communications Act of 19 June 2013.

A7.4 Similarly, we proposed high, medium and low volume assumptions for bandwidth volumes. First we forecast growth in contracted bandwidth per end-user. Table 7.2 shows our proposals in the 2013 WBA Consultation.

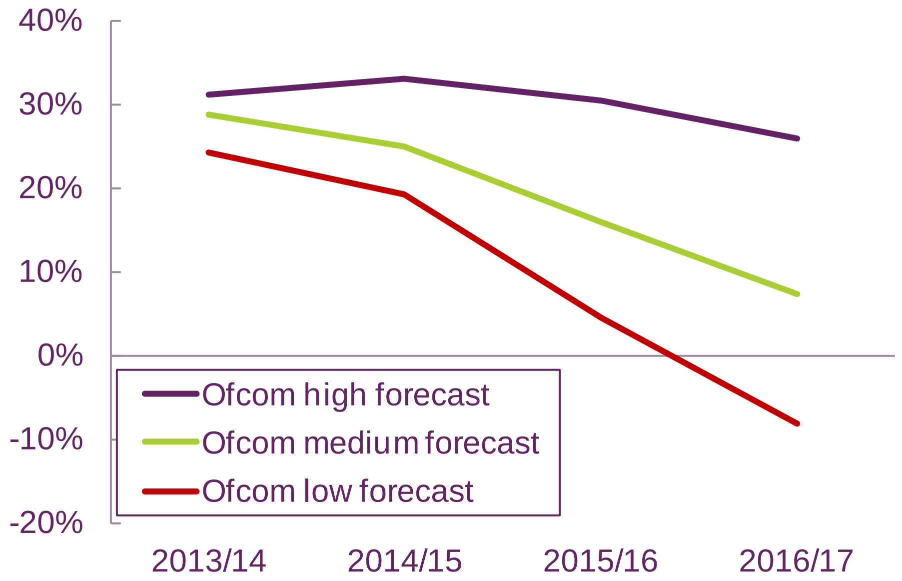
Table A7.2: Assumptions for bandwidth volumes per end user

	2012/13	2013/14	2014/15	2015/16	2016/17
High	39%	30%	30%	30%	30%
Medium	39%	29%	26%	23%	20%
Low	39%	25%	20%	15%	10%

Source: 2012/13 growth derived from BT's response to question 2 of S135 Notice under Communications Act of 19 June 2013.

A7.5 We then combined these with our end-user rental forecasts to give total demand for contracted bandwidth, as shown by Figure 7.3.

Figure A7.3: Forecasts of growth in total bandwidth volumes



Source: 2012/13 growth derived from BT's response to question 2 of S135 Notice under Communications Act of 19 June 2013.

A7.6 In the 2013 WBA Consultation, we noted that in the absence of strong reasons to select either end of the range of plausible volume assumptions, it was likely we would adopt our medium volume scenario.

A7.7 We did not propose any changes to our volume forecasts in the 2014 WBA Consultation.

Consultation responses

A7.8 Four respondents (BT, EE, TalkTalk and [✂]) commented on our volume assumptions in response to the 2013 WBA Consultation. BT, EE and Prospect also commented on our volume assumptions in response to the 2014 WBA Consultation. The comments we received fell into one of the following three categories: base volume data; methodology for forecasting volumes; and the level of the volume forecast.

A7.9 We summarise the comments on each of these issues in turn below, before going on to give our responses to each point raised.

The base volume data

A7.10 BT argued that Ofcom's model overestimates end user volumes and that the loss of volume to LLU (MPF) operators and fibre-based services is happening faster than anticipated in Ofcom's scenarios, driven by wholesale-level as well as retail-level competition.[94] For this reason BT stated that Ofcom should update the charge control model with the latest available information from the 2013 RFS and the current cost forecasts which include an updated impact of copper competition and fibre rollout. BT claimed that this shows much lower volumes of IPstream Connect in 2012/13 than were assumed in Ofcom's model. BT stated that given the sensitivity of Ofcom's forecast of unit costs to volumes, it is key that Ofcom updates its model to reflect the latest available information.

The methodology for forecasting volumes

A7.11 BT believed that once Ofcom has rebased its input volumes on the 2013 RFS, further migration to WBC beyond this starting point should be ignored in line with the anchor pricing approach.

A7.12 BT highlighted that the 2013 Narrowband Market Review assumptions for bandwidth show much slower growth and that "*Ofcom must ensure consistency between assumptions produced concurrently...*"[95]

A7.13 EE submitted that all of BT's current and future forecast customers within the boundaries of the current Market A exchanges should be assumed to be supplied via BT's IPstream ADSL technology irrespective of whether BT ultimately chooses to serve those customers using ADSL2+ (WBC), fibre or any other form of fixed broadband technology.

A7.14 TalkTalk believed that generally the approach and assumptions used by Ofcom should be aligned with those used in the LLU / WLR CC. It stated that the assumptions used, for example, for volumes should be consistent between the two charge controls, unless there is some good reason for differences to exist.

The level of the volume forecast

A7.15 BT believed that Ofcom should use its low forecast volume assumptions for both rental and bandwidth. It provided analysis which produced estimates of rental and bandwidth growth below Ofcom's low case.

A7.16 EE believed that our volume growth forecasts are too low, as a result of Market A being defined too widely, to include exchanges where material competition over BDUK fibre is likely.

A7.17 [✂] suggested that the declination in the Low and Medium forecast is too aggressive and was focused on residential services.

[94] The decline in end user volumes assumed in Ofcom's central case is 0.1% between 2012/13 and 2013/14. However, BT argued that the actual drop in volumes as at the end of January 2014 was [✂].
[95] Paragraph 118, BT response to the 2013 WBA Consultation.

Our conclusions

A7.18 Under our anchor pricing approach, we forecast BT's forward-looking costs for those connections that BT either wholesales to itself or to other CPs in Market A. We refer to these connections as BT's WBA (end-user) volumes. BT's WBA volume forecasts therefore include broadband connections BT provides over copper access lines (via IPstream Connect and WBC) as well as connections BT provides via WBC FTTx over commercially deployed fibre. It does not include broadband connections that other CPs either wholesale to other CPs or use to supply their own retail products, based on LLU (for copper) and VULA (for fibre). We also exclude from our volume forecasts broadband connections based on BDUK-funded fibre rollouts, for reasons we explain in paragraphs 7.146 to 7.152. Combining our forecast of BT's WBA volumes with forecasts for per-user bandwidth, we calculate the total forecast bandwidth demand for BT, which we then use to model BT's costs.

A7.19 For this charge control model, we have based BT's costs on 2012/13 data (which constitutes the base year of our charge control model). In contrast, in the 2013 WBA Consultation we based our charge control model on 2011/12 data, and therefore needed to include estimates/forecasts for end-user volumes and bandwidth for 2012/13. Given that the model's base year is now 2012/13, we only need to model BT's Market A WBA volume growth (in each year) from 2013/14 to 2016/17. Therefore, in addition to considering the three-year review period, we only needed to forecast WBA volumes in one year preceding the review period.

A7.20 BT noted in its 2013 WBA Consultation response that we should use the latest available data for our volume forecasts. We have updated our volume analysis to include the most recent data on BT's connections (as of February 2014). In addition, where we have considered other sources of information, such as third party forecasts, we have used the most up-to date data available to us.

A7.21 In its 2013 WBA Consultation response, TalkTalk stated that the approach and assumptions used by Ofcom should be aligned with those used in the LLU / WLR CC. Our assumptions are consistent, except where specific market conditions or data are different.

A7.22 The remainder of this section is structured as follows:

- Firstly we explain how we have calculated BT's WBA end user volume growth for 2013/14, based on actual data.
- Secondly we explain how we have calculated BT's WBA end user volume growth for 2014/15, 2015/16 and 2016/17, based on assumptions about market growth (LLU take-up and market penetration) and BDUK rollout and take-up.
- Finally we explain how we have forecast per-user bandwidth growth, based on CPs' forecasts.

2013/14 BT WBA end user volume growth

A7.23 Given the first forecasting year in the charge control model is 2013/14, we have taken a view of the 2013/14 growth for WBA end user volumes.

A7.24 We have obtained data for February 2012 to February 2014 from BT on the number of broadband connections, in each exchange, broken down by service, for each operator.[96] In combination with our data on the allocation of individual exchanges to Market A, we used this data to determine the mid-year growth rate of BT's Market A WBA volumes for 2013/2014. This gives a growth in end users of approximately [✂]. Since this is an observed growth figure, it takes account of all factors, such as penetration growth, LLU migration and fibre re-grades. We have used this figure in our model.

<u>2014/15 – 2016/17 BT's WBA end user volume growth</u>

A7.25 We calculate BT's WBA end user volume growth for the remaining years of our model (the charge control period); 2014/15, 2015/16, and 2016/17, by considering two factors:

- **BT's WBA Market growth**: We first look at how BT's total Market A WBA end user volumes will grow over the relevant period. We do this by considering two opposing effects; the expected growth in the total number of BT's Market A WBA volumes due to increasing broadband penetration, and the expected decrease in BT's WBA volumes as a result of end-user migration to broadband services wholesaled by other CPs, i.e. those provided through LLU and VULA[97].

- **Take up of BDUK Fibre**: We then quantify how many of BT's WBA volumes in each year should be removed based on how many connections will migrate to fibre based broadband services in BDUK-funded areas.[98] We therefore need to forecast the proposed fibre rollout as a result of BDUK funding and take up by end users of services on this fibre network expected over the next few years.

A7.26 Below we describe each of these two factors, and the assumptions we make to calculate BT's WBA volume growth forecasts for 2014/15, 2015/16 and 2016/17.

A7.27 In the 2013 WBA Consultation we presented three volume scenarios 'High', 'Medium' and 'Low'. In its response, BT claimed that we should use our low scenario given that it believed it was a more reasonable forecast. BT explained a number of issues with our underlying assumptions, which result in a lower volume growth assumption than our Medium growth assumption. [✂] in its response suggested that the declination in the Low and Medium forecast was too aggressive (although did not give any evidence to support this view). We consider each of these points below.

A7.28 In its 2013 WBA Consultation response [✂] also stated that our forecasts were too focused on residential services. We discuss our assessment of the inclusion of business and residential services as falling within the same product market in our Product Market Definition section, paragraphs 3.84 to 3.114.

A7.29 Taking into account responses to the consultations, we have adopted our medium scenario, and made the necessary adjustments to it (such as updating data and changing assumptions about fibre rollout) for this statement.

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[96] Ofcom calculations based on BT response to S135 Notice under Communications Act of 9 October 2013 and 18 November 2013

[97] We only consider commercial VULA migration here, since we go on to consider non-commercial (BDUK) based fibre below.

[98] We explain why we exclude fibre served on BDUK rollout from our model in section 7, paragraph 7.146 to 7.152.

BT's WBA Market growth

A7.30 Historically, growth in BT's WBA volumes in those exchanges allocated to Market A has been reasonably flat, with little significant variation over time. This is the result of increased BT WBA connections due to increased broadband penetration, offset by a decline in the number of BT WBA connections as a result of LLU (and to a much lesser extent commercial VULA) roll-out and market capture by CPs.

A7.31 As in the 2013 WBA Consultation we have used Analysys Mason's[99] forecasts of growth in total UK broadband connections. We have, however, used the most up-to-date forecast available (from March 2014), which gives forecast growth of: 3.9% in 2014; 3.0% in 2015; 2.4% in 2016; and 2.0% in 2017. The average annual growth rate over this period is 2.8%.[100]

A7.32 BT will also lose WBA customers in Market A over the charge control period, as a result of on-going consumer churn to other LLU operators, particularly as much of this entry is relatively recent. It will also lose volumes to VULA operators. Here we consider the migration to VULA offered on commercial fibre only. The impact of BDUK fibre is discussed in paragraphs A7.37 to A7.45.

A7.33 To consider the impact of this churn, we have considered data on churn between December 2012 and December 2013. Over this period, in Market A, around [✂][101] customers migrated to LLU products and [✂] to VULA products, representing a loss in BT volumes of [✂] [less than 5%].[102] This is slightly lower than the total Market A LLU and VULA migrations from the previous year (December 2011 to December 2012) which represented a loss in BT volumes of around [✂] [less than 5%]. This may reflect a slowdown in migrations to LLU and VULA over time as market shares begin to stabilise following entry.

A7.34 Combining the effects of market penetration and losses to other CPs using LLU and VULA on BT's commercial fibre deployments in Market A, we observe that these two effects approximately offset each other. We note that while we observed [✂] growth in BT's WBA volumes in 2013/14 (see paragraph A7.24), this has slowed, and by the end of 2013, month-on-month growth was around [✂]. We expect this to continue, due to the offsetting of market penetration with LLU/VULA migration and therefore conclude that it is reasonable to assume BT's WBA volumes remain flat throughout 2014/15, 2015/16 and 2016/17.

A7.35 We note that given the inherent uncertainty around forecasts for penetration and LLU/VULA take-up, and given the fact that our assumptions about the impact of BDUK fibre rollouts (below) have a much more significant impact on the final outputs for volume growth, we do not consider it necessary to conduct significant further work to assess market growth more precisely, and therefore adopt a 0% figure for our market growth assumption.

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[99] Analysys Mason report, Fixed network data traffic worldwide: forecasts and analysis 2014–2019, March 2014.

[100] We note that the Analysis Mason forecasts are consistent with those that can be derived from the LLU / WLR CC model, in which we have yearly broadband line penetration growth of around 3% from 2013/14 to 2015/16, and falls to 2.1% in 2016/17.

[101] Market A MPF+SMPF increased from approximately [✂] to [✂] from December 2012 to December 2013.

[102] Ofcom calculations based on BT response to S135 Notice under Communications Act of 9 October 2013 and 18 November 2013

A7.36 This market growth assumption is slightly lower than that in our medium scenario in the 2013 WBA Consultation. This is because the latest data has suggested migration to LLU and VULA in Market A has had a slightly larger effect on BT's WBA end user volumes than we expected. We have therefore slightly revised down (from 1% in the 2013 WBA Consultation to 0% for this statement) BT's WBA market growth assumption.

BDUK fibre: Rollout

A7.37 In addition to the forecast above, we need to take account of the impact of fibre deployed under the BDUK scheme. We have explained in paragraphs 7.146 to 7.152 in section 7 that it is appropriate to remove these volumes from our forecasts. We explain below how we have forecast these volumes.

A7.38 Firstly we considered how many Market A WBA connections are in BDUK-funded areas for each year of the control. In the 2013 WBA Consultation, we had very limited data on fibre rollout in Market A. We also did not have details on completed or planned commercial fibre rollout in Market A and so we assumed that all fibre coverage in Market A was, and would continue to be, BDUK funded fibre. We gathered data from BT in October 2013 and November 2013, on its existing and planned fibre rollouts in Market A, by funding source.[103] Based on this data, BT expects around [✂] of Market A premises to be covered with fibre by April 2017. Of this, [✂] - which covers ([✂] of Market A premises - will be based on commercially funded fibre rollouts.

A7.39 BT's forecasts on commercial and BDUK funded fibre coverage of Market A is set out in Table A7.4 below.

Table A7.4: Cumulative Market A end-year fibre coverage, by funding source[104]

	1 April 2015	1 April 2016	1 April 2017
Commercial fibre	[✂]	[✂]	[✂]
BDUK fibre	[✂]	[✂]	[✂]
Fibre Coverage	[✂]	[✂]	[✂]

A7.40 BT informed us that it expects around [✂] of BDUK rollout could be delayed or dropped-out of the deployment plans completely [✂].[105] We have scaled down BT's forecasts by [✂] to make some allowance for deployments being delayed or dropped, but also to recognise that there is uncertainty over the extent of these issues and that they may ultimately be resolved within the review period.

[103] Ofcom calculations based on BT response to S135 Notice under Communications Act of 9 October 2013 and 18 November 2013
[104] Ofcom calculations based on BT response to S135 Notice under Communications Act of 9 October 2013 and 18 November 2013
[105] Q.1, BT's response to S135 Notice under Communications Act of 9 October 2013

Table A7.5: BDUK rollout phasing, downscaled for delays

	1 April 2015	1 April 2016	1 April 2017
BDUK fibre	[✂] [45% to 50%]	[✂] [55% to 60%]	[✂] [60% to 65%]

BDUK fibre: End-user take-up

A7.41 We have also considered what proportion of end users would take up BDUK fibre (where available). Combining these forecasts with our rollout forecasts will give us an estimate for the number of BDUK fibre connections. The assumptions used for BDUK fibre take-up are unchanged from those proposed in the 2013 WBA Consultation. No respondents raised our take-up forecasts.

A7.42 To consider what the take-up of BDUK fibre-based broadband services in Market A might be, we firstly considered data on national take-up of superfast broadband. In the 2013 WBA Consultation, we noted that take-up of superfast broadband in the UK as a whole increased from 0.2% of all connections in early 2010 to 18% by Q1 2013.[106] This has since risen to 25%,[107] and is likely to continue to grow.

A7.43 At the time of publishing our 2013 WBA Consultation, there existed a wide range of forecasts for end-user take-up, with Analysys Mason[108] forecasting a take-up rate for superfast broadband connections of 45-55% by 2017. It was our view that a significant proportion of connections would be superfast by 2017, materially higher than today.

A7.44 We noted that there were factors which could result in take-up rates in Market A being either greater or lower than those nationally by the end of the charge control period as summarised in Table A7.6 below.

[106] Ofcom calculations based on Virgin and BT published annual reports, which state there were approximately 1.5 million BT SFBB connections and 2.5 million Virgin SFBB connections as of Q1 2013.
[107] Ofcom, UK fixed-line broadband performance, November 2013 (April 2014) pages 7-8 http://stakeholders.ofcom.org.uk/binaries/research/broadband-research/november2013/Fixed_bb_speeds_Nov_2013.pdf
[108] Analysys Mason, Western European telecoms market: trends and forecasts 2013-2018, June 2013

Table A7.6: Factors influencing take-up rate in Market A

Factor	Direction of influence
BT Retail has a higher market share in Market A than nationally. BT Retail has been relatively successful in converting its existing base to superfast broadband.	⇧
Current services available in Market A are likely to be of a lower quality than those available nationally (on average).	⇧
Virgin has been responsible for helping to drive superfast broadband take-up, but is unlikely to be present in Market A.	⇩
Nationally SFBB has been available in certain areas since late 2008 to early 2009.[109] As roll-out has yet to start in many Market A areas take-up may lag the national level.	⇩

A7.45 We believe that it is possible for take-up in Market A to be at average national levels by the end of the charge control period. However given that the majority of BDUK is not planned to be rolled out until one year into the charge control, we would anticipate that it is unlikely to exceed 45% by the end of the period.[110] Conversely we have considered what the lower bound might be. The current level of national fibre take-up is currently at 25%[111] but this is partly driven by Virgin's presence, which has little presence in Market A. As such, the lower bound may be likely to be slightly lower than the current national average take-up. We therefore consider 20% is a reasonable lower-bound for BDUK fibre take-up in Market A by the end of the period.[112] This gives a reasonable range for BDUK of 20-45% by the end of the period. This is consistent with the range we proposed in the 2013 WBA Consultation. We consider our medium scenario in the 2013 WBA Consultation, which has an end-period BDUK take-up figure of 35%, remains a reasonable assumption on likely take-up of BDUK. Our final assumptions on take-up are shown in Table A7.7. These are consistent with the medium take-up forecasts in the 2013 WBA Consultation.

Table A7.7: Take-up rate assumptions for BDUK funded fibre in Market A

	1 April 2015	1 April 2016	1 April 2017
BDUK take-up (where available)	13%	24%	35%

[109] Figure 5.2, UK super-fast broadband roll-out timeline, Ofcom, Communications Market Report: UK, Research Document, 4 August 2011.http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr11/telecoms-networks/.
[110] This formed the end-period BDUK take-up in our high scenario in the 2013 WBA Consultation.
[111] Ofcom, UK fixed-line broadband performance, November 2013 (April 2014) pages 7-8 http://stakeholders.ofcom.org.uk/binaries/research/broadband-research/november2013/Fixed_bb_speeds_Nov_2013.pdf
[112] This formed the end-period BDUK take-up in our low scenario in the 2013 WBA Consultation.

Final BT WBA volume growth figures

A7.46 Based on the assumptions discussed above, we have forecast BT's WBA volume growth in our charge control model as set out in Table A7.8 below. As discussed above, for 2013/14 we have used actual data to derive our assumption. For the remaining years, given that we have assumed market growth (absent BDUK) is flat (0% in each year), the growth figures are driven by our assumptions for BDUK. We combine our BDUK coverage and take-up assumptions to forecast BDUK volumes at the end of each year, which are then removed from the total WBA volumes. We then convert volumes to mid-year values before computing the mid-year growth rates.

Table A7.8: BT's WBA volume growth figures per year

	2013/14	2014/15	2015/16	2016/17
BT WBA volume growth	1.0%	-3.0%	-7.2%	-8.4%
	Actual	Forecasted		

A7.47 As a result of the more detailed data regarding BDUK and commercial fibre rollout, our estimates of BT's WBA volumes that will migrate to BDUK-funded fibre services is lower than those forecast for the 2013 WBA Consultation. This means we now have higher total WBA end user volumes in each forecast year.

Forecasts of contracted bandwidth

A7.48 We have also forecast demand for contracted bandwidth over the charge control. Our general approach was to forecast contracted bandwidth per end-user and then apply this to our forecasts of end-user rental volumes to produce a total contracted bandwidth assumption.

A7.49 As for BT's WBA end-users volumes, we considered each of the four years (2013/14, 2014/15, 2015/16 and 2016/17).

A7.50 In its response to the 2013 WBA Consultation, BT stated that the 2013 Narrowband Market Review assumptions for bandwidth were for much slower growth and that Ofcom must ensure consistency between assumptions produced concurrently. The 2013 Narrowband Market Review Statement computed bandwidth forecasts out to 2020/21. Due to the uncertainty surrounding forecasts over so many years, it took a simplified approach where the average bandwidth growth from 2005/6 (based on Ofcom's own assumption) to 2011/12 (based on data supplied by CPs at the time) was used to calculate an average growth rate which was applied to each year to 2020/21. For the WBA charge control, we have forecast bandwidth growth for only the next four years and we have forecast a bandwidth growth rate for each year. The data on which we have based our forecasts indicates bandwidth growth is falling over time. These forecasts are derived from the latest data provided in response to our information requests related to this review. We discuss below how we derived these forecasts from data provided by CPs in response to formal information requests.

A7.51 Our forecast in this review is based on the most up to date data from CPs and covers a period corresponding to the earlier years in the forecasts used in the 2013 Narrowband Market Review Statement. We do not agree that our bandwidth forecasts in this review need to be consistent with the 2013 Narrowband Market Review Statement where newer data suggests a different forecast would be more appropriate, or that, in any case, the two forecasts are inconsistent when the different approaches and time periods are taken into account.

A7.52 For our 2013 WBA Consultation, we obtained forecasts of contracted bandwidth per connection from CPs. We received national and Market 1 bandwidth forecasts from BT, Vodafone (C&W), TalkTalk, Sky, EE and Virgin. We adopted an implicit assumption that demand for contracted bandwidth per end-user would be the same for customers in Market A as it is for those in Market 1. These forecasts varied significantly, with some CPs predicting quite low growth for services based on BT's WBA services but higher growth on their own networks. Lower growth rates tended to be associated with CPs with relatively few customers for BT's WBA services. There was some agreement that there would be some flattening of demand over the period of the next charge control.

A7.53 In September 2013,[113] we received updated forecasts for end-user bandwidth from CPs, which we used for our assessment of bandwidth for this statement.

A7.54 We combined the September 2013 forecasts into a single forecast, based on the weight of volume that each operator has in Market A, to reflect the average per-user bandwidth across all CPs.

A7.55 Table A7.9 below summarises our forecasts for contracted bandwidth in Market A, in terms of growth in contracted bandwidth per end-user. Table 7.10 below shows the total contracted bandwidth in Market A for all users.

Table A7.9: Ofcom's forecast of growth in contracted bandwidth per end-user in Market A

	2013/14	2014/15	2015/16	2016/17
Bandwidth growth	30%	25%	20%	15%

Table A7.10: Ofcom's forecast of growth in total contracted bandwidth in Market A

	2013/14	2014/15	2015/16	2016/17
Total bandwidth growth	31.3%	21.2%	11.3%	5.4%

We have adopted asset and cost volume elasticity assumptions based on a LRIC/FAC ratio

Introduction

A7.56 In this section we set out our assessment of the AVEs and CVEs we use to forecast costs over the period of the charge control. Based on the analysis below we have adopted the same AVE and CVE of 0.80 for end-user rentals services and the same AVE and CVE of 0.66 for bandwidth services.

[113] Response from CPs to S135 Notices under Communications Act in November 2013.

Consultation proposals

A7.57 Table A7.11 below shows the AVEs and CVEs we proposed to use within our charge control model in the 2013 WBA Consultation.

Table A7.11: Ofcom's proposed CVE and AVE assumptions

	CVE	AVE
End User Rentals	0.82	0.82
Contracted Bandwidth	0.65	0.65

Consultation responses

A7.58 Three respondents commented on our proposed AVEs and CVEs assumptions in response to the 2013 WBA Consultation.

A7.59 BT considered that the AVE and CVE used for bandwidth are appropriate but that Ofcom should use a lower AVE of 0.32 and a lower CVE of 0.49 for end-user rentals. BT derived these using assumptions about the proportion of DSLAM costs that it believed were fixed with respect to end-users as opposed to variable and the percentage of DSLAMs that should be allocated to bandwidth services. BT noted that Ofcom's end-user AVE and CVE suggest that only 18% of the total costs are fixed which BT believed was unreasonably low given the "tail" of a large number of exchanges in Market A where costs will be largely fixed: there will be many exchanges in Market A that will only have one DSLAM and so a high proportion of costs will be fixed compared to the WBA market in aggregate).

A7.60 EE noted that the nature of additional bandwidth costs would mean that it would expect there to be significant economies of scale in relation to AVE and CVE costs. The 0.65 elasticity used for both cost and asset volume elasticities may therefore be relatively high and warrant further investigation.

A7.61 [✂] stated that in principle, the supply of broadband services at the scale deployed by BT does not have significant efficiencies to realise, therefore logically we would agree with Ofcom that the CVEs and AVEs should be closer to 1 than to 0. As to whether or not the precise figure is correct, it stated it trusted that Ofcom had adequately modelled the data and questioned BT's assumptions where applicable.

Our conclusions

A7.62 For the purpose of our cost modelling we require CVEs and AVEs to estimate the impact of changes in end user rental volumes and bandwidth demand on BT's operating costs and capital costs for WBA services.[114] In principle, the CVE or AVE for a service should therefore represent the ratio of the relevant marginal cost to fully allocated cost for the service.

A7.63 In our 2013 WBA Consultation we explained that we calculated the CVEs and AVEs used in our modelling from the DLRIC/FAC ratios for WBA services published in BT's RFS. We have subsequently recalculated the CVEs and AVEs using LRIC/FAC ratios for the WBA services we are modelling from 2012/13 component

[114] A CVE of 1 indicates that if volumes were to increase by 10% then operating costs would also increase by 10%, resulting in constant unit costs. A CVE of 0.5 means that for the same volume increase costs would only increase by 5%, resulting in reducing unit costs.

LRIC and FAC data supplied by BT.[115] We consider that LRIC/FAC is a better basis for estimating CVEs and AVEs than DLRIC/FAC, since DLRIC may include an allocation of fixed and common costs that do not vary with the relevant service volume.[116] In so doing we have ensured that these ratios are based on data that is consistent with the rest of the model – i.e. they use data consistent with that presented in the 2013 RFS October Report and they also exclude costs for 21CN components.

A7.64 Consistent with the approach adopted in other charge controls we have revised the component LRICs BT supplied when they were reported to be greater than the corresponding FAC.[117] This affected capital costs on *Broadband line testing systems* and a small amount of mean capital employed on end user rentals on *SG&A broadband*, for both of which we reset the LRIC to be the same as the FAC. The only other instance where this occurred was bandwidth costs on *DSLAM capital maintenance* for which we reset the ratio to be the same as that for end-user rentals. None of these adjustments made a material difference to the overall ratios.

A7.65 The service LRICs that we use to calculate the LRIC/FAC ratios are provided by BT and are based on BT's LRIC model. This model uses cost-volume relationships to describe how costs vary as volumes change and these are used to estimate LRIC costs for components and ultimately services. A key assumption of the LRIC model is that costs, in particular for some assets with long lives, are potentially fully scalable in the long run. However, the cost-volume relationships within the model, particularly those for operating costs, do show how BT expects costs to change as volumes change.

A7.66 We have reviewed BT's response and further analysis it has submitted[118] in relation to AVEs and CVEs for end-user rental services. BT argued that since many exchanges in Market A have only one DSLAM there is limited potential for scalability of DSLAM related costs as volumes decrease. We note that:

i) DSLAMs have two cost drivers: end-user rentals and bandwidth services. There will be exchanges in Market A with more than one DSLAM, where at least one may have been installed to meet demand for bandwidth. BT's analysis assumes that as end-user volumes decrease these extra "bandwidth" DSLAMs are fixed and cannot be removed. It is however possible and would be appropriate to remove such DSLAMs if end-user volumes and/or demand for bandwidth fell. BT's analysis assumes that many exchanges in Market A are single-DSLAM exchanges and so a high proportion of costs will be fixed compared to the WBA market in aggregate. However our analysis of BT's data suggests that about 66% of Market A exchanges contain more than one DSLAM. As such, we do not consider the issue is not as great as BT suggests.

ii) Not all end-user rentals costs relate to DSLAMs. Firstly, BT's RFS shows that the costs for end-user rentals have material contributions from three non-21CN related components: *SG&A Broadband costs*, *Broadband line testing systems* as

[115] Question A8, BT response to S135 Notice under Communications Act of 20 March 2014.
[116] We made a similar point in the 2013 BCMR Statement. See for example paragraph 19.268. http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity/statement/Sections17-24.pdf
[117] We made similar adjustments in the LLU / WLR CC. See for example the discussion of the CVEs for PSTN line test equipment and Broadband Line testing systems in paragraphs 6.90 to 6.92 of the 2013 LLU WLR Charge Control Consultation.
[118] See paragraph A7.59.

well as *DSLAM capital/maintenance.*[119] Secondly DSLAM costs are a relatively small proportion of *DSLAM capital/maintenance* costs with at least some of the remainder, notably maintenance and power costs, variable with end users. Whilst BT's analysis reflects the second point to some extent it does not reflect the first and so will overstate the fixed nature of end-user rental costs.

A7.67 We have considered BT's approach to deriving AVEs and CVEs for DSLAMs to take account of modularity effects but do not agree it correctly captures cost volume relationships for DSLAMs. We have also considered whether, to address BT's point, we could take an alternate approach to establishing AVEs and CVEs, which we would need to apply to both end user rentals and bandwidth to ensure a consistent approach. Based on the available data, we do not believe there is a more robust approach to setting AVEs and CVEs than to use the LRIC/FAC ratios we have used.

A7.68 We believe our approach on AVEs and CVEs for bandwidth and end user rentals is the best we can take given the data available to us. The AVEs and CVEs have been calculated from data that is consistent with that used in the rest of the charge control model and in a way consistent with that used to estimate AVEs and CVEs in other charge controls. We are interested in how costs would vary in the longer run for our modelling and we do not consider that we have, or could obtain from BT, a consistent set of data that would allow us to carry out analysis to derive AVEs and CVEs on an alternative basis. We have carried out some cost analysis over the short term but, as we explain in paragraphs A7.179 to A7.181 below, we are cautious about the results of this assessment and do not consider that it provides a better basis for establishing AVEs and CVEs. The alternative to using AVEs and CVEs would be to develop a bottom-up approach to assessing the volumes on a per exchange basis and apply an assumed asset price for new equipment to assess costs. We explain in paragraphs 7.157 to 7.159 why we have not followed a bottom-up approach.

A7.69 Table A7.12 shows the LRIC/FAC ratios. Table A7.13 shows the AVEs and CVEs we use in our model, derived from these LRIC/FAC ratios.

Table A7.12: LRIC/FAC ratios for key WBA services

	LRIC/FAC
End User Rentals	0.80
Contracted Bandwidth	0.66

Source: Ofcom analysis of BT response to question A8, BT response to S135 Notice under Communications Act of 20 March 2014.

Table A7.13: Ofcom's CVE and AVE assumptions

	CVE	AVE
End User Rentals	0.80	0.80
Contracted Bandwidth	0.66	0.66

[119] See for example page 116 of BT's 2013 RFS.

We have modified our assumptions on input cost inflation

Introduction

A7.70 In this section we set out our assessment of the input cost inflation we have forecast over the period of the charge control. Based on the analysis below we have adopted an input cost inflation assumption of 3.0% per annum. We apply this to all operating costs, i.e. both pay and non-pay.

Consultation proposals

A7.71 Our assumptions on input cost inflation set out the inflation estimates used to forecast operating costs to 2016/17 in the model. In the 2013 WBA Consultation, in line with our simplified modelling methodology we applied the same forecast inflation rate (of CPI) to both pay and non-pay operating costs. Our choice of CPI was driven by our view that some costs were likely to increase at a faster rate that CPI and some at a slower rate than CPI. So for example we believed that accommodation costs, which we estimated at 35% of WBA non-EOI costs, would increase by 3% per annum, i.e. faster than CPI. In contrast we believed total pay costs, which we estimated accounted for 30-40% of WBA non-EOI costs, would increase by less than CPI. On balance we believed that CPI was a reasonable assumption. We did not update our input cost inflation forecast in the 2014 WBA Consultation.

Consultation responses

A7.72 We only received responses on input cost inflation from BT. BT's response was contained in its answer to question 7.2 to the 2013 WBA Consultation. This response mainly related to the choice of CPI as the inflation index rather than RPI. BT argued that if we were to continue to use CPI as the inflation index "*then additional adjustments need to be made to accommodate costs that increase more in line with RPI rather than CPI*". Its response focused on pay and accommodation costs, the latter of which also included power costs.

A7.73 On **pay** costs BT argued that the wage settlements agreed with the CWU have been close to the rate of RPI in the March preceding the beginning of the agreement period for which the deal was agreed, and provided Table A7.14 below[120].

Table A7.14: Wage settlements between BT and the CWU, 2008 to 2013

Year	Wage Settlement	RPI in Previous March
April 2008	4.3%	3.8%
April 2009	0.0%	-0.4%
April 2010 (3 year deal)	3.0% + 3month backdate	4.4%
April 2011	3.0% (part of 3 year deal)	
April 2012	3.0% (part of 3 year deal)	
April 2013	2.8% + £200 lump sum	3.3%

[120] Page 20, BT's response to 2013 WBA Consultation.

A7.74 It then argued that recovery in the economy would lead to future wage settlements increasing by more than the RPI, support for which came from an average earnings growth forecast index published by the OBR (see Table A7.15 below).

Table A7.15: extract from Table 3.5 in Office of Budgetary Responsibility publication Economic and Fiscal Outlook March 2012[121]

	Outturn 2011	Outturn 2012	Outturn 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017
CPI	4.5%	2.8%	2.8%	2.4%	2.1%	2.0%	2.0%
RPI	5.2%	3.2%	3.2%	2.8%	3.2%	3.6%	3.9%
Wages and Salaries	2.7%	2.8%	2.4%	3.1%	4.3%	4.8%	4.8%

A7.75 BT stated that it expected **accommodation** costs (including power consumed) to track RPI more closely than CPI. Accommodation rental costs would increase at 3% per annum, above CPI but below RPI. However it expected electricity costs to increase at a higher rate than RPI and supported this with forecasts from the Department of Energy and Climate Change published in October 2012.

A7.76 BT subsequently provided further evidence to support its arguments on cost inflation[122] and referred to this evidence in further comments in its response to the 2014 WBA Consultation[123]. It continued to argue that "*BT's accommodation costs are subject to price inflation of [✂] per annum, around [✂] faster than CPI inflation*". It provided further evidence on pay and electricity costs.

A7.77 On pay costs BT referred to updated earnings indices published on the OBR website in December 2013 which BT claimed indicated that pay cost inflation was now ahead of CPI and forecast to grow more rapidly. On power costs it referred to updated DECC forecasts published in December 2013. It argued that prices on the Openreach price list [✂].

A7.78 Weighting these different input assumptions together using a more detailed breakdown of WBA costs, BT then argued that an input cost inflation assumption of 4% per annum would be more appropriate. BT's overall conclusion was that Ofcom should use more specific input cost inflation assumptions to forecast costs rather than adopt CPI as a proxy.

Our analysis

A7.79 We believe that BT has raised some legitimate arguments on input cost inflation and have taken them into account in our discussion below. The discussion below is structured as follows:

- first we discuss inflation of total pay costs;
- then we discuss non-pay cost inflation; and

121 Figures are percentage change on a year earlier.
122 BT presentation dated 10 February 2014, email from BT (Ed Pigott) dated 14 February 2014.
123 BT response to 2014 WBA Consultation, paragraphs 10.3 and 10.4.

- finally, we combine our estimates to derive our final input cost inflation assumption of 3.0%.

A7.80 In considering cost inflation, we have taken account of the distribution of WBA costs provided by BT.[124] The tables below summarise the distribution of WBA costs by BT operating division and by cost sector. We use this data to combine our more detailed assumptions to calculate an overall input cost inflation figure.

Table A7.16: Breakdown of WBA Operating Costs by BT Division

Division	% of Operating Costs
Technology, Services and Operations (TSO)	[✂] [80-90%]
Wholesale Markets	[✂] [0-10%]
Facilities	[✂] [0-10%]

Table A7.17: Breakdown of WBA Operating Costs by Cost Sector

Cost sector	% of Operating Costs
Pay	[✂]
Accommodation	[✂]
- Electricity	[✂]
- Other including Facilities, Rents and Cumulo	[✂]
Other Non-pay	[✂]

Pay Cost Inflation

A7.81 In this section we discuss how we have assessed inflation in total pay costs relevant to WBA services over the charge control period. When discussing pay costs we will draw a distinction between wages and salaries costs and total pay costs. The latter includes wages and salaries but also pension and social security costs.

A7.82 Our analysis of pay cost inflation is structured as follows:

- We first discuss whether CWU wage settlements should be used to determine total pay cost inflation using BT Group data and other data we have gathered from BT. Based on this analysis we conclude it should not be. We would like to use the total pay costs of the divisions that provide most of the staff involved in WBA services as the basis of our inflation assumptions. But we do not have total pay costs for these divisions split by wages and salaries, pension costs and social security costs. However total pay cost inflation in these divisions has been similar to that within BT Group as a whole so we consider using BT Group pay costs as a proxy for the pay costs within these divisions.

[124] Questions A5 and A6, BT response to S135 Notice under Communications Act of 20 March 2014. In answer to question A5 BT provided breakdowns by broad cost sector such as, for example, Maintenance, Computing, Accommodation, Finance and Billing etc). In answer to question A6 BT provided a breakdown of costs by division. In both cases total operating costs were consistent with those used in the charge control model – i.e. they excluded costs for 21CN cost components and were consistent with those reported in the 2013 RFS October Report.

- To be comfortable with this, we have checked whether BT Group is in line with the industry. We have undertaken some simple benchmarking on wages and salaries against the sector generally and some further cross checks again total pay costs of other companies. These comparisons suggest BT Group does indeed align with the sector in general.

- Based on this, we assume total pay costs for BT Group will provide the best available proxy for how total pay costs will change in the divisions that provide WBA.

- We then analyse the three main elements of BT's total pay costs – wage and salary costs, social security costs and pension costs. We make separate assumptions about each element to construct our overall estimate of total pay cost inflation. We explain that:

    - BT's wage and salary costs have historically increased in line with the average earnings index data published by Office of Budget Responsibility (OBR) so we use the OBR forecast to forecast BT's future wage and salary costs.

    - We will apply the same OBR forecast to social security costs and why we believe this assumption is reasonable.

    - BT's pension costs are falling and explain that we expect this to continue.

- Finally, we combine these forecasts to determine a final forecast for pay inflation of 2.5%.

Assessment of the CWU pay deal as a proxy for pay inflation

A7.83 Tables A7.16 and A7.17 above show that TSO and BT Wholesale cover the great majority of WBA operating costs and that [✂] of these were pay costs.

A7.84 To help inform our analysis of pay inflation and efficiency, we sought management accounting information from BT for BT Wholesale and TSO (as well as TSO's predecessor organisations: BT Operate and BTID). We specifically asked for cost "bridges" that show how costs move from one year to the next. These bridges generally attribute changes in costs into one of four categories: Price (i.e. Inflation effects), Volume effects, Efficiencies achieved (which will include general cost reduction programmes and targets), and Other, which will cover one-off costs and accounting changes. We refer to a cost bridge that analyses costs in this way as a PVEO analysis.

A7.85 We requested PVEO analyses covering movements in year-on-year actual costs from 2010/11 to 2016/17. However, BT was only able to provide movements in terms of actual out-turn costs for each year to forecasted costs for the following year. It was also only able to provide this data out to 2014/15. To test the validity of the data, we checked the forecasted out-turns for BT Wholesale for each year in this data to BT Wholesale's reported costs in BT's segmented results in its annual report and accounts. The forecast outturn costs were close to the actual outturn costs reported, and so we believe these forecasts are reasonably reliable.

A7.86 We have used these PVEO analyses not only to assess input cost inflation but also to help assess appropriate efficiency targets. A benefit of this approach is that it allows us to be consistent across these two assumptions.

A7.87 BT's PVEO analyses show how a division's costs change from one year to the next. In general these costs are split between external costs, i.e. those directly incurred by the BT division, and internal costs, i.e. transfer charges of costs incurred by other BT divisions. Pay costs are generally analysed separately to non-pay costs. The pay costs are total pay costs and so include pension costs, social security costs and wages and salaries. The different pay cost elements are not analysed separately. For our analysis of total pay cost inflation we have extracted inflation in total pay costs as forecast by BT Wholesale and TSO and its predecessor organisations over a number of years.

A7.88 We have also analysed BT Group pay cost data as reported in BT's annual accounts.[125] BT Group staff costs are broken down by wages and salaries, social security costs, pension costs, and share based payments expenses. Dividing these by average employee numbers that are also reported in BT's accounts[126] produces average pay costs per employee for each of these categories over a number of years.

A7.89 Table A7.18 below compares the outputs from our historic analysis of PVEO pay cost data[127] and historic movements in BT Group pay/employee with the CWU pay deal data provided by BT.

Table A7.18: Historic Pay cost inflation comparisons

	2008/9	2009/10	2010/11	2011/12	2012/13	CAGR 5 Years	CAGR 2 Years
PVEO Analyses of total pay cost inflation							
- BT Wholesale				[✂]	[✂]		[✂]
- BTID + BT Operate				[✂]	[✂]		[✂]
- BTW + BTID + BTO				[✂]	[✂]		[✂]
BT Group Pay Data							
Wages and Salaries/employee	4.0%	3.1%	-0.5%	4.7%	-0.4%	2.2%	2.1%
Wages and Salaries and share payments/employee	5.5%	1.7%	-0.5%	4.9%	-0.6%	2.2%	2.1%
Social Security Costs/employee	1.6%	14.8%	7.5%	3.8%	-0.7%	5.3%	1.6%
Pension Costs/employee	-14.7%	-38.0%	44.2%	-1.5%	-6.5%	-6.8%	-4.0%
Total BT Group Pay costs/employee[128]	2.8%	-1.2%	2.9%	4.3%	-1.1%	1.5%	1.6%
CWU Wage settlements	4.3%	0%	3%	3%	3%	2.7%	3.0%

[125] For example in BT's 2013 Statutory Annual accounts, Staff costs summaries for 2010/11 to 2012/13 are presented in Note 6 to the accounts on page 119.
[126] In BT's 2012/13 Statutory Accounts employee numbers are presented in note 7 on page 120.
[127] Question A6, BT response to S135 Notice under Communications Act of 18 November 2013.
[128] Within BT's Statutory Accounts BT refers to what we call Total Pay costs as total staff costs.

A7.90 The above table shows that:

- Increases in BT Group total pay costs per employee were below the CWU wage settlement in all years except 2011/12. The average growth in BT Group total pay costs per employee was only 1.6% (when considering the CAGR for two years), compared to the average rise in CWU wage settlements of 3% per annum. It was also lower over five years (1.5% versus 2.7%).

- The average increase in BT Group wages and salaries per employee of 2.1% (including or excluding share payment expenses) was less than the average rise under the CWU pay deal of 3%.

- [✂]

- [✂] In the analysis and comparisons below we therefore use BT Group wages and salaries data as a proxy for that within the relevant WBA divisions - BT Wholesale and TSO (and formerly, BT Operate and BTID) - because we do not have wages and salaries information separately for these divisions.

A7.91 Based on this data we reject BT's implicit argument that CWU wage settlements provide a useful input into future inflation in total pay costs for the WBA charge control for two main reasons:

- Total pay costs include pensions and social security costs as well as wages and salaries: the CWU deal is only relevant to the latter; and

- Increases in wages (i.e. excluding pension costs and social security costs) under the CWU pay deal have been higher than the increases in wages and salary costs per employee within BT Group. This may be due to a number of factors, including, for example, grade mix. BT Wholesale, BT Operate and BTID may have a higher proportion of managers and professional grades whose salaries and terms and conditions were not subject to the CWU pay deal – i.e. the CWU pay deal may not be as relevant to the overall costs for these divisions.

Consideration of BT Group salaries and wages costs versus those in the communications sector

A7.92 The above analysis is based on BT and CWU pay data, i.e. matters largely internal to BT. To assess our pay inflation assumption, we have also undertaken some simple benchmarking of pay costs, including wages and salaries, across the telecoms sector. Table A7.19 below shows that the average increase in BT wages and salaries per employee over the last few years has been 2.2% against the Information and Communication Sector average weekly earnings growth[129] of 2.3% as reported by the Office of National Statistics (ONS).

Table A7.19: Comparison of growth in BT average wage costs with the Information and Communication Sector average

	2008/09	2009/10	2010/11	2011/12	2012/13	CAGR 5 Years
Change in BT Group wages and salaries	4.0%	3.1%	-0.5%	4.7%	-0.4%	2.2%

[129] Index K5EX as reported in: http://www.ons.gov.uk/ons/datasets-and-tables/data-selector.html?cdid=K5EX&dataset=emp&table-id=AWE10

costs/employee						
Change in average weekly earnings growth for employees in the Information and Communications Sector	4.6%	-0.9%	2.7%	3.4%	1.8%	2.3%

A7.93 We have also compared BT's wages and salaries per employee against those of Sky and TalkTalk as reported within the latter organisations' reports and accounts over the period 2008/9 to 2012/13[130]. These show that pure wage inflation was higher in BT than in Sky but significantly higher in TalkTalk, although average wage levels per employee were much lower in TalkTalk at the start of the period. Pension costs per employee were higher in BT but were offset by much higher share option scheme payments in Sky and to a lesser extent by share based payments in TalkTalk. Social security costs for all three companies fluctuated considerably with those in TalkTalk increasingly significantly, but by 2012/13 these were broadly similar on a per employee basis. The net effect of all these different movements is that total pay costs per employee were very similar across the three companies in 2012/13. Inflation in total pay costs over the 5 years was lower in BT than in Sky and much lower than in TalkTalk, where average wage levels were much lower in 2008/09.

A7.94 It would be wrong to read too much into these differences because, for example, skill mixes may be different within each organisation: for example there may be different proportions of call centre staff, operational and marketing people. However it does tend to provide further support that inflation in both wages and salaries and total pay costs in BT has not been out of line with the sector generally.

A7.95 We have therefore focused the remainder of our analysis on how total pay costs might inflate within BT Group, particularly those BT divisions that provide most of the resource to provide BT's WBA services.

BT historic pension costs

A7.96 One of the major reasons why increases in BT's pay costs appear lower than the CWU headline wage settlement deal is reductions in pension costs. Table A7.18 above shows that BT's average pension costs per employee have reduced significantly in nominal terms recently (for example by 6.8% over the period 2007/8 to 2012/13. BT's recent annual report and accounts note that the number of active employees who remain on defined benefit schemes has also declined over the last four years (see Table A7.20 below). This has led to decreases in BT's costs of supporting these schemes. The costs of defined contribution schemes have increased over the period but pension costs have declined quite considerably. These cost movements are shown in Table A7.21 below.

[130] TalkTalk, Financial accounts, http://www.talktalkgroup.com/investors/reports/2013.aspx, and Sky, Financial accounts, https://corporate.sky.com/investors/latest_results/q3-1314.

Table A7.20: BT Pension Costs: active members in defined benefit plans[131]

	31/3/2010	31/3/2011	31/3/2012	31/3/2013
Total Active Members in Defined Benefit schemes	55,000	50,500	46,500	44,000

Table A7.21: BT Pension Costs[132]

	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	CAGR 5 Years
Defined benefit plans	£576m	£459m	£206m	£297m	£267m	£225m	
- Change		-20.3%	-55.1%	44.2%	-10.1%	-15.7%	-17.1%
Defined contribution plans	£50m	£85m	£98m	£119m	£126m	£136m	
- Change		50%	15.3%	21.4%	5.9%	7.9%	22.2%
Total	£626m	£544m	£304m	£416m	£393m	£361m	
- Change		-13.1%	-44.1%	36.8%	-5.5%	-8.1%	-10.4%
Average BT Group people	108,500	110,600	99,700	94,600	90,700	89,100	
Change in BT Pension costs/employee		-14.7%	-38.0%	44.2%	-1.5%	-6.5%	-6.8%
BT Pension costs as % of BT Total Pay costs	11.7%	9.7%	6.1%	8.5%	8.0%	7.6%	

A7.97 Just under half BT Group people were active members of defined benefits schemes as at 31 March 2013, and these schemes are more expensive to run than defined contribution plans: average costs per employee appear around 70-100% higher. Our view is that people who retire over the charge control period are more likely to have been on defined benefit schemes. We therefore expect the percentage of staff on defined benefit schemes to continue to decrease over the charge control period so that pension costs will continue to fall. This in turn will continue to dilute the effect of any salary and wage increases on the overall average pay costs per employee.

Forecasting future inflation in total pay costs

A7.98 In order to forecast pay cost inflation for the charge control period, we need to make assumptions about the different elements of total pay costs: wages and salaries, social security costs and pensions. As a starting point we assume that changes in BT Group pay costs are a reasonable proxy for those likely to be experienced by BT people supporting WBA services.

A7.99 In summary we assume that:

- BT Group wages and salaries per employee will grow in line with the latest forecasts of average earnings as published within the OBR Economic and Fiscal outlook supplementary economy tables;
- Social security payments per employee will also increase in line with this index; and

[131] BT Statutory Accounts. See for example note 19 on page 132 to 141 of the 2013 report.
[132] BT Statutory Accounts. See for example note 19 on page 132 to 141 of the 2013 report.

- Pension/costs per employee will continue to reduce in nominal terms.

A7.100 BT argued that it expected future wage settlements to increase by more than RPI and supported its argument using earning indices published by the OBR in its Economic and Fiscal outlook supplementary economy tables. Table A7.22 below compares the historic average earning indices and CPI and RPI as published on the OBR web-site[133] together with increases in BT Group wages and salaries per employee[134]. This shows that historically BT Group wages and Salaries per employee have increased by less than RPI and CPI. Further, it shows that the growth in BT wages and salaries per employee has been broadly in line with the average earnings index that the OBR publishes.

Table A7.22: Comparison of BT Wages and Salaries/Employee with OBR reported average earnings indices

	2009/10	2010/11	2011/12	2012/13	CAGR 4 Years
CPI	2.2%	3.5%	4.3%	2.6%	3.1%
RPI	0.5%	4.9%	4.8%	3.1%	3.3%
OBR : Average Earnings Index	3.0%	1.0%	2.7%	1.0%	1.9%
Change in BT Group Wages and Salaries/Employee	3.1%	-0.5%	4.7%	-0.4%	1.7%

A7.101 Based on Table A7.22 above we have used the OBR forecasts of the average earnings index to project forward average BT wages and salaries per employee.

A7.102 We assume social security costs per employee will increase in the same way as wages and salaries per employee. Table A7.18 above shows that these have fluctuated considerably over the last few years but they have been more stable and slightly less than wage inflation over the last two years.

A7.103 For the reasons outlined in paragraphs A7.96 and A7.97 above we expect average pension costs per employee to reduce in nominal terms over the charge control period. With the increases we are forecasting in wages and salaries (including share based payments) and social security costs we expect pension costs to continue to fall as a percentage of total pay costs. We assume that pension costs per employee will fall by 4% per annum in nominal terms, the same as the average over the last two years (see Table A7.18) and that they will account for on average 7% of total pay costs over the charge control period compared to 7.6% in 2012/13 (see Table A7.21 above). The net effect of this assumption is that, for the range of wage inflation we are considering, total pay cost inflation is reduced below the assumed inflation in wages and salaries per employee by about 0.5%.[135] We note

[133] See tables 1.6 and 1.7, http://budgetresponsibility.org.uk/pubs/March_2014_EFO_Economy_Supplementary_Tables.xls.
[134] We will apply this assumption to both wages and salaries and share based payment expenses. Table A7.18 above shows that within BT Group these have grown at the same rate.
[135] If 93% of total pay costs increase by 3% (as shown in Table A7.23, whereas the remaining 7% are pensions related and decrease by 4% the overall increase is 2.51%. The dilution impact of pensions is then 0.49% (3% - 2.51%).

that this is consistent with the historic effect.[136] Table A7.23 below shows the effect of combining the above assumptions. We have decided therefore to adopt a pay inflation assumption of 2.5% per annum.

Table A7.23: Ofcom's Total Pay Cost Inflation assumptions

	2013/14	2014/15	2015/16	2016/17	CAGR 4 Years
OBR : Average Earnings Index (Applied to wages and salaries and social security costs/employee)	2.6%	2.4%	3.3%	3.7%	3.0%
Effect of reduction in pension costs/employee	-0.5%	-0.5%	-0.5%	-0.5%	-0.5%
Final forecast of total pay cost inflation	2.1%	1.9%	2.8%	3.3%	2.5%

A7.104 We have cross checked the above forecasts against forecasts of total pay cost inflation for BT's TSO and Wholesale Markets Divisions in 2013/14 and 2014/15 as provided within their respective PVEO analyses. The PVEO based forecasts are [✂] over these two years than those in the table above.

A7.105 In other charge controls it has been noted that assumptions that we make on pay inflation may affect BT's ability and incentives to negotiate lower levels of pay increases in the future and potentially its bargaining position. In considering pay cost inflation and other cost inflation assumptions we are cognisant that our decisions have the potential to have an impact on the positions between stakeholders in the markets concerned. However, whilst we accept that the pay cost assumptions we use are a particularly sensitive area we do not consider that it is appropriate to isolate any particular assumption as the charge control adopts many assumptions (e.g. that on the level of efficiency to be achieved) which are designed to operate together in a holistic manner to derive the appropriate charges for the relevant services. After careful review of the evidence we believe we have decided upon a pay cost assumption of 2.5% per annum that we feel is appropriate for the period of the charge control.

Non-Pay Cost Inflation

A7.106 Table A7.17 above showed that the majority of non-pay costs (some [✂] of total WBA operating costs) are **accommodation** related. These cover Electricity (about [✂] of total WBA operating costs), Cumulo ([✂]) and Facilities ([✂]) with the remainder ([✂]) being mainly rental charges paid on exchange buildings[137].

A7.107 We agree with BT that rental charges should be forecast to increase at 3% per annum, consistent with its agreement with TelerealTrillium.[138] Facilities costs are

[136] For example Table A7.18 shows that BT group total pay costs/employee have grown by 1.6% per annum since 2010/11, whereas wages and salaries/employee have grown by 2.1%, a difference of 0.5%.

[137] The percentages in this paragraph were provided by BT in answer to questions A5 and A6 of BT's response to S135 Notice under Communications Act of 20 March 2014 with the exception of the Cumulo percentage that was provided in an answer to a follow-up question provided on 6 December 2013 and confirmed within BT's response to S135 Notice under Communications Act of 16 January 2014.

[138] See for example: http://www.btplc.com/report/financial_fixedassets.shtml.

not subject to the same agreement. We have therefore assumed that Facilities costs will increase in line with CPI as BT suggests for other non-pay cost items. Cumulo rates generally increase annually in line with RPI as at the previous September.[139]

A7.108 **Electricity** costs in the UK have risen in recent years. We sought further information from BT about what it has paid per kwh for Electricity over the period 2010/11 to 2012/13.[140] We have also used BT's own internal forecasts of electricity cost inflation that support its management accounting planning and budgeting process[141]. We have then compared these with the latest Department for Climate Change (DECC) forecasts to which BT referred.[142]

A7.109 The DECC forecasts[143] provide historic retail prices for two classifications of users: services and industrial. The forecasts also show a 'Low', 'High', and Reference scenario for each of these two classes of user. The DECC Reference scenario forecast increases in electricity prices (in p/kWh) over the charge control period to be materially higher than both RPI and CPI for both groups of users (see Table A7.24 below). We therefore agree with BT that, given the relative importance of electricity costs within the WBA cost base, we should reflect increases in electricity costs of in our cost inflation assumptions.

Table A7.24: DECC September 2013 Reference Scenario Electricity price forecasts v RPI and CPI forecast[144]

DECC Reference scenario	2013/14	2014/15	2015/16	2016/17	CAGR 4 Years
Services	5.0%	11.4%	9.9%	5.9%	8.0%
Industrials	4.4%	11.4%	10.7%	8.2%	8.6%
RPI forecast	2.50%	2.85%	3.05%	3.20%	2.90%
CPI forecast	1.60%	2.08%	2.03%	2.10%	1.95%

A7.110 BT's subsequently suggested[145] that we should adopt [✂]. We believe that the services forecasts are the more relevant as both Openreach's charges[146] and [✂] are closer to those that DECC report for services users. These two comparisons are shown in Table A7.25 below.

[139] The relevant governments have already notified rate poundages in England, Scotland, Wales and Northern Ireland in 2013/14 and 2014/15. BT makes regular appeals of its rateable values and in recent years this has reduced. However, any reduction to Cumulo will be captured within our review of the appropriate efficiency measure to apply in the charge control.
[140] Question A7, BT's response to S135 Notice under Communications Act of 20 March 2014.
[141] From the PVEO analysis referred to in paragraph A7.84 to A7.87 above. From question A6 of BT response to S135 Notice under Communications Act of 18 November 2013.
[142] From BT PVEO analyses for BT Operate and BT TSO provided in answer to question A6 of BT response to S135 Notice under Communications Act of 18 November 2013. For more detail on BT's PVEO analyses see paragraphs A7.84 to A7.87 above.
[143] *https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2013*
[144] The DECC forecasts are presented in terms of 2013 prices and for calendar years. We have converted these to nominal prices using a GDP deflator series http://www.ons.gov.uk/ons/datasets-and-tables/data-selector.html?cdid=L8GG&dataset=qna&table-id=N and then to financial years by applying appropriate weights.
[145] Email from BT (Ed Pigott), dated 14 February 2014.
[146] See: http://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=5aGuTJ%2Bu7bjhXjKH3sW9KvqqAFdbfkJJvFiM9%2FNj42QlMnGHsqdC0vzO163bJmh34D91D7M0q8u%2F%0AIlSgtIFAKw%3D%3D

Table A7.25: Electricity Cost Comparisons[147]

Openreach Prices	31/08/2010	01/04/2011	01/04/2012
	8.120	8.520	9.050

	2010/11	2011/12	2012/13
DECC Forecasts			
Services – low			8.879
Services – Reference scenario	7.951	8.419	9.035
Services – high			9.193
Industrials – low			7.512
Industrials - Reference scenario	6.809	7.272	7.668
Industrials – high			7.826
BT Group cost	[✂]	[✂]	[✂]

Source: Openreach price list, DECC, BT and Ofcom Analysis

A7.111 Based on the data in Table A7.25 above, we believe the DECC forecasts provide a reasonable basis on which to estimate electricity cost inflation. BT argued that we should adopt the high DECC forecast on the basis that current Openreach prices appear to track this better to date. We do not agree with BT. [✂][148]. In relation to Openreach prices, we understand that these are not pure "pass through" but include some mark-up.[149] We also understand that BT purchases some electricity in advance so the current Openreach prices may already reflect some future increases.

A7.112 Therefore, we have forecast Electricity costs using the DECC Reference scenario forecasts for Services users. This assumption results in electricity costs increasing by around 8% per annum over the period of the charge control.

A7.113 Finally we have undertaken some further analysis of **other WBA non-pay costs**. These contain a small contribution for Payments to other CPs (POLOs)[150]. Prices for POLOs are expected to decrease in nominal terms. For simplicity we have assumed POLOs will be subject to no cost inflation, i.e. they will remain flat in nominal terms. POLOs account for a very small proportion of WBA costs so this assumption has little impact on our overall input cost inflation assumption.

[147] The DECC forecasts are presented in terms of 2013 prices and for calendar years, see https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2013. We have converted them to nominal prices using GDP deflator, HM Treasury, 'GDP deflators at market prices, and money GDP:December 2013', https://www.gov.uk/government/publications/gdp-deflators-at-market-prices-and-money-gdp-march-2013 and then to financial years using appropriate weights.
[148] Actual BT payments on electricity from question A7 of BT response to S135 Notice under Communications Act of 20 March 2014. Future projections from cost inflation assumptions within BT's PVEO analyses for BT's TSO division provided in answer to question A6 of BT response to S135 Notice under Communications Act of 18 November 2013.
[149] See for example paragraphs 4.372 and 4.373 of the 2012 LLU WLR Charge Control Statement.
[150] Historically these have been referred to as Payments to Other Licenced Operators (POLOs).

A7.114 For the remaining non-pay costs, which, as shown in Table A7.17 above, account for [✂], we have used evidence from the PVEO analyses discussed above in paragraphs A7.84-A7.87.

A7.115 Historically, inflation within TSO and its predecessor divisions for these other non-pay costs has been [✂] as can be seen in Table A7.26 below). Within BT's PVEO "bridges" these non-pay costs have been generally forecast to reduce as a result of contract renegotiation. We have treated these cost savings as contributing to efficiency gains rather than cost inflation, consistent with BT's treatment[151] (see also paragraph A7.185 below).

Table A7.26: Other Non-pay cost inflation by BT division

Division	2011/12	2012/13	2013/14	2014/15
BTID + BT Operate	[✂]	[✂]		
TSO			[✂]	[✂]

Source: Ofcom analysis of BT management accounting data supplied by BT in answer to question A6 of S135 Notice under Communications Act of 18 November 2013.

A7.116 As shown in Table A7.16 above, TSO (and its predecessor organisations) are responsible for a large proportion of WBA input costs. However, it is unlikely that TSO will incur all the remaining non-pay WBA costs, though it is likely to be responsible for the great majority within some cost sectors, notably maintenance, general management and computing. Together, costs in these sectors account for around half of the non-pay costs that we have not already discussed. We have therefore assumed that half of these remaining non-pay costs are subject to cost inflation of 0.5% per annum on the basis of the historic and forecast movements given in Table A7.26 above. We assume the remaining 50% will be subject to more general cost inflation of CPI.

Conclusions

A7.117 The final input cost inflation assumption we adopt is 3.0% per annum. This is the result of weighting the above pay and non-pay input cost inflation assumptions by the cost weights which we summarised in Table A7.16 and 7.17 above. Table A7.27 below summarises the key elements of this calculation.

Table A7.27: Ofcom assumption on Cost inflation for WBA charge Control

Cost Item	Assumption	Weights
Pay	2.5% pa	[✂]
Accommodation Facilities Services	CPI	[✂]
Electricity	8% pa	[✂]
Cumulo	RPI	[✂]
Other accommodation (predominantly rents)	3% pa	[✂]
POLOs	0% pa	[✂]

[151] We could alternatively have treated these costs savings from contract renegotiation as contributing to negative cost inflation. Doing so would have reduced our cost inflation assumption but would have had had an impact on our assessment of efficiency gains.

Other non pay (contract related)	0.5% pa	[✂]
Other non pay items not considered above	CPI	[✂]

A7.118 Finally we have used the same methodology as above to estimate that inflation over the period 2010/11 to 2012/13 was 2.7% per annum on WBA services, which we use in our analysis of historic efficiency of WBA services (see paragraph A7.175 below). Cost inflation over this period was lower than we predict going forward as it reflects lower electricity and pay cost inflation over the period but slightly higher RPI and CPI figures.

A7.119 Where we use forecasts of CPI and RPI, these are the same as those within the 2014 FAMR Draft Statement. They have been derived from the latest Treasury consensus forecasts and are summarised in Table A7.28 below.

Table A7.28: Forecasts of RPI and CPI[152]

	2013/14	2014/15	2015/16	2016/17
CPI	1.60%	2.08%	2.03%	2.10%
RPI	2.50%	2.85%	3.05%	3.20%

We have adopted an efficiency assumption of 5%

Introduction and definition of efficiency gains

A7.120 In this section we set out our assessment of the efficiency gains we have forecast to be delivered by BT over the period of the charge control. Based on the analysis below we believe that BT should be capable of achieving an efficiency of 5% per annum.

A7.121 In our modelling, we have a single efficiency assumption that:

- is applied to operating costs only, i.e. it excludes depreciation and any other capital costs such as capital expenditure;
- is independent of volume effects;
- is independent of input price changes and so can be thought of as a measure of total factor productivity. For a given level of output if captures how much inputs can be reduced, ignoring input price changes;
- captures the effect of all means of delivering efficiency cost savings including savings that might be achieved by doing things less often (e.g. through reduced fault visits), more quickly (e.g. through reduced task times) or for less money (e.g. reduced contract payments);
- is the efficiency rate that could be achieved by an efficient hypothetical on-going network, consistent with our anchor pricing approach; and

[152] CPI and RPI forecasts derived from page 23, Medium-term forecasts of HM Treasury, Forecasts for the UK economy: a comparison of independent forecasts, February 2014. We have converted from calendar years (as reported by HM Treasury) to financial years using quarterly weightings.

- includes both “catch-up” and “frontier shift”. Catch-up is the change in costs required to bring BT in line with an efficient operator. Frontier shift is the movement in efficiency expected by an efficient operator over time. We have not separately estimated how much is frontier shift and how much is catch-up efficiency.

Consultation proposals

A7.122 In the 2013 WBA Consultation, we proposed a “low” efficiency assumption of 3.5% per annum and a “moderate” efficiency assumption of 5% per annum. This was based on analysis of unit costs as published within BT’s RFS, comparisons with other recent charge controls and a BT stakeholder presentation made in May 2013.[153] Our base case assumption assumed efficiency gains of 5%, which we applied to operating costs only.

A7.123 In our 2014 WBA Consultation we stated that further to BT’s response to the 2013 WBA Consultation, we had obtained further evidence from BT relating to historic and potential efficiency improvements under our formal powers. As we were still considering this evidence when we published the 2014 WBA Consultation, for the purposes of the 2014 WBA Consultation we modelled both the low efficiency assumption of 3.5% and the moderate efficiency assumption of 5% per annum proposed in the 2013 WBA Consultation.

Consultation responses

A7.124 BT, [✂], TalkTalk and EE all commented on our efficiency target proposals in response to the 2013 WBA Consultation. BT, EE and Prospect provided further comments in response to the 2014 WBA Consultation.

A7.125 BT believed that the evidence indicates that 3.5% is the maximum value of efficiency gains that is reasonable and there is evidence to support the use of a 1.5% efficiency adjustment. In contrast EE considered that Ofcom’s proposed efficiency target has been set materially too low given the unit cost analysis.

A7.126 BT’s response included a study by Deloitte which found that BT is the most efficient operator compared to the peer group in the study and thus BT argued that Ofcom should not apply any "catch up" efficiency challenge. BT then went on to argue that efficiency improvement should be set by reference to the "frontier shift". The Deloitte study showed that this was broadly equal to inflation and thus supported an efficiency improvement of around 3% per annum.

A7.127 BT also referred to a range of other historic exogenous benchmarking studies which suggested a trend rate of efficiency improvements in the range 1% to 3% per annum.

A7.128 BT also argued that it expected efficiency targets to be similar to those set for Traditional Interface (TI) services as these use the same SDH technology that is used to supply IPStream Connect services. It noted that the 2013 BCMR Statement had concluded that the efficiency improvement target for TISBO services should be 1.5% per annum, and believed this provided a relevant benchmark for this charge

[153] BT Group plc, 4th Quarter and year to March 31, 2013 and Investor Slide Results and Business Update, part 2, 10 May 2013. https://www.btplc.com/Sharesandperformance/Quarterlyresults/PDFdownloads/q413_slides_update_part2.pdf

control. BT also believed the Ethernet charge control was not relevant because these services were delivered using a different, newer technology.

A7.129 BT argued that the caveats that we had made on our unit cost analysis meant there were shortcomings with it. In particular BT said that any evaluation of efficiency gains needed to take into account the impact that changes to volumes have on costs, especially when volumes grow. BT therefore believed that Ofcom was at risk of double-counting efficiencies arising from economies of scale as these are already incorporated into the cost modelling through the use of CVEs and AVEs.

A7.130 BT presented its own unit cost analysis, which included 2013 RFS data and which suggested that whilst unit costs had reduced significantly in 2011/12 there were increases in 2012/13. BT believed the changes in bandwidth unit costs were largely due to increases in volumes rather than reductions in costs. BT subsequently presented updated analysis[154] of operating costs for IPStream Connect costs in Market 1 which attempted to remove these volume effects and which again BT said showed that unit costs had increased in 12/13.

A7.131 BT also rejected the use of the BT stakeholder presentation referred to above as providing evidence to support an efficiency target of 5% per annum. In particular it noted that these comparisons were not based on measures of total factor productivity but "*gave weight to financial measures of performance, such as Opex Cost relative to exchange line revenue earnings.*"[155]

A7.132 In response to the 2014 WBA Consultation BT noted the outputs from another [✂] benchmarking report, [✂][156] When BT submitted the report to Ofcom it urged Ofcom "*to exercise caution in interpreting the content to the report as part of setting any WBA charge control*" and that any gaps identified *" …are not savings targets, … generally gaps indicate an area to explore to verify improvement opportunity*". BT also noted that the findings of the study "*cannot be directly mapped onto BT's organisational business units or onto product cost stacks*"[157].

A7.133 EE believed Ofcom should place strong weight on BT's historic actual Market 1 performance, once the impact of non-representative changes had been taken into consideration. EE also considered that it was important for BT to be "*given challenging efficiency targets, as these are markets where it by definition has a complete monopoly, and competition is not providing any efficiency incentive. It is also important that BT is not able to use profits from these uncompetitive markets to cross subsidise other markets – all of which points to a need for a robust efficiency assumption*."[158]

A7.134 Whilst EE accepted that one-off annual fluctuations need to be disregarded, it remained of the view that Ofcom had set the efficiency targets for the WBA charge control too low, based on the very materially larger efficiency savings that BT appeared to have achieved historically.

A7.135 [✂] did not consider BT is an efficient operator (it provided examples in particular of operational inefficiencies) and therefore it argued that there was scope for further

[154] BT Presentation to Ofcom entitled "WBA Charge Control", at meeting on 11 November 2013.
[155] Paragraph 140, Page 28, BT's response to the 2013 WBA Consultation.
[156] Question 1, BT response to S135 Notice under Communications Act of 27 January 2014.
[157] Covering letter, BT response to S135 Notice under Communications Act of 27 January 2014.
[158] Answer to question 7.13, page 26 of EE's response to 2013 WBA Consultation.

efficiency savings. For that reason it suggested that the starting point should be the highest perceived possible efficiency savings and adjusted backwards accordingly.

A7.136 TalkTalk believed that generally, the approach and assumptions used by Ofcom should be aligned with those used in the LLU / WLR CC. For example volumes, efficiency improvement, and cost allocations should be consistent between the two charge controls, unless there is some good reason for differences to exist. For instance, TalkTalk argued, "*it appears that BT itself considers that there was more potential for efficiency improvement in Openreach (i.e. LLU/WLR) than the rest of BT (which includes WBA*)".

A7.137 Prospect argued that a cost proposal whose central case has BT's costs falling by inflation minus 12.3% – on top of an efficiency assumption which already assumes cost reductions of 5% – is unreasonable in market areas which competition has already rejected as being not worthwhile to serve. On that basis Prospect suggested that Ofcom has not paid due attention to the burdens that this will create for BT and for its staff, who have to bear the brunt of efficiency improvements.[159]

Our analysis

A7.138 In this section we first discuss BT's arguments and evidence for lower efficiency targets. In general we do not agree with BT's arguments. We address these in the following order:

- BT Public statements;
- The Deloitte and other econometric efficiency studies;
- Other [✂] benchmarking; and
- The relevance of TI services as an appropriate benchmark for WBA services.

A7.139 We then discuss the further analysis of BT's past and future efficiency gains that we have undertaken in response to BT's and other stakeholders' comments. This will cover further analysis of BT's RFS unit cost data and analysis of BT management accounting data.

A7.140 Based on this data, we conclude that an efficiency assumption of 5% is appropriate.

BT Public Statements

A7.141 In the 2013 WBA Consultation we noted a presentation made by BT's Group Finance Director in March 2013 as part of the 2012/13 Quarter 4 results briefing to analysts. This included the statement that "there remain significant opportunities to deliver cost transformation over the next few years".[160]

A7.142 This presentation included reference to an International Benchmarking Study in which BT participated in 2011. This study identified future cost reduction opportunities at the time of over £1bn for the whole of BT. Areas with cost gaps included: "Technical services", "IT services" and "Network operations" which were

[159] Prospect provided evidence from its annual surveys of *"the likely impact of further demands for efficiencies and cost reductions on workers who are already extremely pushed in terms of their working hours"* and *"the lack of control over pace and intensity of work caused by poor job loading"* (paragraph 41).

[160] Paragraphs A12.71-12.72 of the 2013 WBA Consultation.

in the 2nd, 3rd and 4th quartiles respectively in 2011/12.[161] These areas cover a large proportion of the input costs for WBA services.

A7.143 In particular the presentation noted that the creation of the TSO division provided process re-engineering opportunities that would lead to savings of over £100m over three years.[162] Table A7.16 above in the input cost inflation section of this annex has already shown that TSO accounts for a large proportion of WBA operating costs.

A7.144 In its response to our 2013 LLU WLR Charge Control Consultation, BT argued that the BT analyst briefing did not support our proposed baseline efficiency target of 5% because a 5% target implied total savings of £2.8bn in real terms over the price control period (not £1bn).[163] BT also noted that the external benchmark comparisons we referred to within BT's presentation gave weight to financial measures and were therefore not relevant to Ofcom's review.[164]

A7.145 We consider that the external international benchmarks cited in the BT presentation are relevant due to the weight BT gave to them in external briefings in their statements on potential cost savings.[165] We also consider that £1bn represents only a proportion of the efficiencies that BT identified in its briefing. In particular, BT's Group Finance Director made reference to frontier shift efficiencies,[166] additional efficiencies beyond the £1bn[167] and said that the benchmark on which the calculation was based was "*not a great benchmark because the industry is not efficient in some of these areas*."[168]

A7.146 Interpreting the Group Finance Director's comments, we calculate that the efficiency estimate described equates to an annual efficiency rate of between 4.5% and 5%. (This includes catch-up efficiencies, quantified to be £1bn in 2012/13, achieved over three years[169], combined with additional efficiencies offsetting inflation; these may consist of both frontier shift and catch-up efficiencies.)

A7.147 BT's Group Finance Director stated that "*when we talk about cost savings of a billion, the billion is in relation to where it is now*" and stated that inflation would also be offset. Volume impacts and costs of achieving efficiencies were not explicitly

161 Slide 5, Slides Part 2, BT, Results for the Fourth Quarter and Year to 31 March 2013, 10 May 2013, www.btplc.com/Sharesandperformance/Quarterlyresults/PDFdownloads/q413_slides_update_part2.pdf.

162 See slide 7. Slides Part 2, BT, Results for the Fourth Quarter and Year to 31 March 2013, 10 May 2013, www.btplc.com/Sharesandperformance/Quarterlyresults/PDFdownloads/q413_slides_update_part2.pdf. The transcript provides further detail. https://www.btplc.com/Sharesandperformance/Quarterlyresults/PDFdownloads/q413_transcript2.pdf

163 Paragraph 140 of BT's response to the 2013 WBA Consultation.

164 Paragraph 140 of BT's response to the 2013 WBA Consultation.

165 Page 1, BT Group plc; Q4 2012/13 results presentation transcript, Part 2, 10 May 2013.

166 Page 9 BT Group plc; Q4 2012/13 results presentation transcript, Part 2, 10 May 2013 " *. . I gave you those numbers, that's assuming everyone stands still. Now, I should have made it clear the market moves on, people get more efficien*t".

167 Page 12 BT Group plc; Q4 2012/13 results presentation transcript, Part 2, 10 May 2013 " *. . We will swallow the impact of inflation going forward as well, and when we talk about cost savings of a billion, the billion is in relation to where it is now. If inflation comes along, we'll swallow that in terms of further efficiencies.*"

168 Page 2 BT Group plc; Q4 2012/13 results presentation transcript, Part 2, 10 May 2013.

169 Page 1 BT Group plc; Q4 2012/13 results presentation transcript, Part 2, 10 May 2013, Slide 4, "*there are plenty more opportunities . . .over the next three years".*

discussed and it is not clear whether the end result of £1bn had been estimated net of their impact or otherwise. Further, the data presented was BT specific, although we observe above that WBA costs were identified within areas where cost gaps exist through both the benchmarking and the briefing. The benchmarks were also referred to as not being efficient, which implies that we should also expect some further scope for catch-up.

A7.148 Overall, we conclude that BT's public statements and interpretation of an international benchmarking report suggests that there are potential efficiency savings of between 4.5% and 5%. Further, they identify opportunities for considerable cost savings over the charge control period, some of which would be appropriate for WBA services. Of significance to our analysis is the evidence it provides that there are still significant catch-up efficiencies to be made by BT. The 4.5% to 5% range is subject to considerable assumptions, is based on BT-wide, not WBA specific, data, and may not take into account the costs of achieving efficiencies, volume impacts or limitations in the benchmarked data set. Whilst the precise range of potential efficiencies suggested may be subject to some uncertainty, we do consider this analysis to be a useful input due to its use of data external to BT.

The Deloitte and other econometric efficiency studies

A7.149 BT submitted a report by Deloitte[170] which analysed the comparative efficiency of BT's Network Business as part of its response to our 2013 WBA Consultation. The report compared BT against a group of seven international operators[171] over the period 2005 to 2011. It found that BT was the most efficient operator within the sample in terms of network operations and that there was no shift in the cost frontier over time in nominal terms. BT cited the findings of this report as support for its argument that there was no potential for catch up efficiency and that the trend rate of efficiency improvement was around 3% per annum.[172]

A7.150 We consider this result in the context of BT statements made to analysts[173] regarding efficiency gains which BT expected to realise, which we have discussed in paragraphs A7.141 to A7.148 above. These public statements appear to contradict the conclusions of this BT commissioned Deloitte Report. We note that although BT's public statements related to BT as a whole, and the Deloitte Report relates to BT's network business, the public statements reference the network business as being an area in which gains are expected.

A7.151 We consider that the Deloitte report has limitations, which relate to the approach and dataset. The approach seeks to improve on a similar study carried out by Deloitte in 2012[174] by addressing concerns raised by Ofcom[175]. These concerns were that the number of observations in the original model was low relative to the number of explanatory variables, resulting in a model that could be over-fitted. Ofcom also noted that the structure of the model, which pooled the observations into one dataset, required that any element of an operator's cost which was unique to that operator and fixed over time was unrelated to all the explanatory variables in

[170] Deloitte, Analysis of the Efficiency of BT's Regulated Operations, 19 September 2013.
[171] BT is compared against BTC, Vivacom, Eircom, Etisalat, France Telecom, Telecom Italia, Telefonica Spain, and Telekom South Africa.
[172] See for example paragraphs 129 and 130 of BT's response to the 2013 WBA Consultation.
[173] See the section on "BT Public Statements" above, paragraphs A7.141 to A7.148
[174] Deloitte, Analysis of the Efficiency of BT's Regulated Operations, A report for BT, dated 16 February 2012 (the Deloitte Report).
[175] Paragraph A5.77, Page 32, 2012 Leased Lines Charge Control Consultation.

the equation. We considered that there were a number of reasons why this assumption might not hold.

A7.152 The updated report uses different techniques on an augmented data set; however, we have similar concerns to those raised with the original report. Whilst the sample size has increased, it remains small for the model being estimated. Panel data techniques typically require a large number of observations in either the time series or the cross section; this data set has eight panel observations and six time series observations.

A7.153 The report uses a panel-based stochastic frontier approach to the econometric estimation. This approach allows for company-specific inefficiency to enter the model and explicitly recognises the panel structure of the data (in contrast to the previous pooled approach). However, it still places a strong requirement on the data for consistent estimation of parameters, namely that the company-specific inefficiency term is uncorrelated with the explanatory variables. As in the previous version of this report we consider that there are a number of reasons why this assumption might not hold; for example, larger firms may be systematically more (or less) efficient in their use of inputs.

A7.154 Apart from statistical considerations we also question the relevance of the study for assessing efficiency for WBA services. Firstly we note that Deloitte themselves question the robustness of the xDSL bandwidth data series, the one variable that is included to reflect WBA type activity.[176]

A7.155 But we also note that the study is based on accounting cost data and therefore estimates the efficiency effects of operating costs and capital costs via depreciation charges and a cost of capital on net replacement costs. There are two points to note on this. The first is that in the WBA charge control we apply our efficiency assumption only to operating costs. We do not apply efficiency to capital costs. Secondly the report also describes adjustments made to BT's CCA accounts, for example for the valuation of duct assets, but not any that may have been made for other operators. In particular it is not clear whether any adjustments have been made to correct for differences in asset vintages between operators. In general BT's WBA assets are heavily depreciated which is one reason why we have applied a hypothetical ongoing network (HON) adjustment to the base costs in our model. If other operators have less depreciated networks then that will make them appear less efficient and BT appear more so.

A7.156 Overall, we consider that the Deloitte report has significant limitations, and so place low weight on it in our consideration of an appropriate efficiency target. We note though that it provides some support for efficiency improvements of at least 2% to 3% per annum. This may understate the operating cost efficiency estimates required for this charge control due to the coverage (operating costs as opposed to all accounting costs) and potential asset vintage differences that we note above. The updated study does not address the concerns we raised with the original Deloitte report and appears to (indirectly) contradict BT public statements that in 2012/13 there were potential catch-up efficiency gains which BT expected to realise.

A7.157 BT's response also referred to other efficiency studies using exogenous benchmarking data. It stated that these suggested that the trend rate of efficiency

[176] See paragraph 3.4 of the Deloitte Report.

improvements had been in the range 1% to 3%. It summarised these studies in a table which is replicated in Table A7.29 below.

Table A7.29: Network Total Factor Productivity – econometric studies[177]

Measure	Range	Source
BT's real unit cost reduction (including distance-related costs and volumes)	0.9% to 2.6%	Ofcom (2009)
Standard TFP analysis	1.0%	Deloitte (2010)
Econometric TFP (Ofcom's Törnqvist index)	2.8%	Deloitte (2011)
Stochastic frontier analysis (Deloitte)	0.6% to 1.0%	Deloitte (2011)
Stochastic frontier analysis (NERA)	2.5% to 3.0%	NERA (2008)
Econometric TFP (NERA)	~2.0%	Deloitte (2010)

A7.158 We note that these studies are at least 3 years old and are based on data that is now less relevant. We give very low weight to the results of these studies in our assessment of an appropriate efficiency target.

[✂] Other Benchmarking

A7.159 BT provided some further confidential information. [✂][178]

A7.160 [✂][179]

A7.161 As noted in paragraph A7.132 above [✂]

A7.162 We have found it difficult to analyse the report. [✂][180]

A7.163 [✂]

A7.164 We therefore consider this report of limited use for helping to set an appropriate efficiency target for WBA services particularly in the light of BT's own caution about how to interpret it. Consequently we give low weight to it in our final assessment.

The relevance of TI services as an appropriate benchmark for WBA services

A7.165 BT argued that it expected efficiency targets to be similar to those set for TI services as these use the same SDH technology that is used to supply IPStream Connect services. The 2013 BCMR Statement had concluded that the efficiency improvement target for TISBO services should be 1.5% per annum.

A7.166 We agree with BT that IPStream Connect services use the same technology as TI services, and so the efficiency assumed for TI services is a benchmark we should take into account when considering our efficiency assumption.

A7.167 However, there are a number of other factors to take into account.

[177] Figure 10 in BT's response to the 2013 WBA consultation.
[178] [□]
[179] [□]
[180] [□]

A7.168 The analysis that underpins the figure of 1.5% was TI service-specific: it was based on BT's FAC allocations of operating costs to TI services. TI services may use some of the same assets as IPStream but allocations of some operating costs e.g. power and people related costs, could vary between services and between time periods.

A7.169 In the 2013 BCMR Statement we did not make adjustments to reflect a HON even though we noted that the TI network was heavily depreciated. We concluded in that control "*that the uplift would overstate the cost of running the network* … *We consider that it is sufficient to allow the amount of 21CN costs that BT currently uses to repair the TI network*".[181] In WBA we do apply a HON adjustment along with asset life assumptions and, in addition, we remove some costs related to providing WBA services on technology other than that used by the anchor product. BT suggested that the HON uplift was not relevant to our efficiency assumption as it only relates to capital employed and depreciation. We discuss the relevance of the HON uplift in our efficiency assumptions below in paragraph A7.190.

A7.170 The analysis of TISBO service unit costs was undertaken on BT's allocation of operating costs over the period 2005/06 to 2010/11.[182] This analysis is now less relevant and where available we would give more weight to recent performance and future plans for cost savings.

A7.171 Overall, we believe that the assumption we adopted for TI services provides a relevant benchmark to consider in our assessment of efficiency but note that due to the differences explained above there are limitations as to how much weight the TI efficiency assumption should be given when considering WBA services.

Further Ofcom Unit Cost Analysis

A7.172 In paragraphs A12.68 to A12.70 of the 2013 WBA Consultation we presented a simple analysis of unit costs from the RFS. This showed that unit costs of IPstream services had reduced significantly in 2011/12 compared to 2010/11. We however noted the limitations of this analysis in paragraph A12.69 and BT made further criticisms as set out in paragraphs A7.129 to A7.130 above.

A7.173 BT also provided a summary of its own unit cost analysis.[183] This considered IPstream Connect services in Market 1 and removed economies of scale through volume effects but did so using BT's estimate of the end user rental CVE, which we discuss and reject in paragraphs A7.66 to A7.67 above. The costs included those for 21CN components that we have removed from our cost model. Lastly BT assumed RPI for cost inflation. This analysis showed that there had been some significant changes in unit costs between 2010/11 and 2012/13 with bandwidth unit costs decreasing over the period but end-user rentals increasing. Given our view on BT's end-user rental CVE and the lack of consistency with the costs we wish to model we sought to update and extend our previous analysis but using a similar approach to that adopted by BT.

A7.174 Unfortunately we have been unable to draw definitive conclusions from this analysis. Our view is that the results have been affected by the very significant changes in the volumes of WBA services, particularly in Market 2 and 3 (as defined

[181] Ofcom, 2013 BCMR Statement, Sections 17-24, paragraph 19.199
[182] See paragraph A5.62 of the 2012 BCMR Consultation, http://stakeholders.ofcom.org.uk/binaries/consultations/llcc-2012/annexes/LLCC_Annexes_2012.pdf
[183] BT Presentation, WBA Charge Control, 11 November 2013.

in the 2010 WBA Statement) over the period we were analysing. Consequently we give no weight to this analysis in our assessment of future efficiency gains. In the remainder of this section we provide a brief outline of what we did and a brief description of the results we observed.

A7.175 We updated our analysis of historic unit cost movements to address the limitations in the previous analysis by:

- Extending the analysis to cover three years rather than two years. Like BT we considered changes from 2010/11 to 2011/12 and from 2011/12 to 2012/13;

- Restricting the analysis to operating costs, excluding any EOI charges, as we apply our efficiency assumption only to these costs. Our updated analysis therefore excludes the effects of any changes in depreciation and other capital costs;

- Analysing costs not just within Market 1 but also across all three WBA markets for IPstream Connect and WBC separately. Allocation of certain shared WBA costs across the three markets may change between years - for example the costs of the ATM platform and other network costs. Analysing costs across the three markets should have minimised the impact of these allocation changes, though there may be other allocation changes that this will not control for;

- Making allowance for volume effects and cost inflation. Paragraph A7.121 above noted that we are seeking to determine a rate that is independent of volume effects and input price changes. We have estimated efficiency consistent with the way we estimate operating costs within the model by assuming CVEs of 0.80 for end-user rentals and 0.66 for bandwidth consistent with those we adopt in the remainder of the model and assuming cost inflation of 2.7%[184]; and

- Excluding 21CN costs from the analysis of IPstream Connect unit costs.

A7.176 Our analysis confirmed some of BT's results. Bandwidth unit costs dropped significantly over the period, implying large gains in efficiency for both IPstream Connect and WBC services regardless of whether the analysis was conducted for Market 1 or across all three geographic markets. This was true for both nominal unit costs and volume and inflation adjusted unit costs.

A7.177 In contrast, IPstream Connect end-user rental unit costs increased over the period, and showed larger increases in volume and inflation adjusted unit costs across all markets than for just Market 1. WBC end-user rental unit costs decreased across all markets (but showed a slight increase in Market 1). Taking IPstream Connect and WBC together showed small unit cost reductions.

A7.178 These results need to be viewed in light of the considerable volume changes over this period. During the three year period we have considered, end-user volumes for IPstream Connect and WBC together, across all markets, were broadly flat. However there was significant migration from IPstream Connect to WBC in Markets 2 and 3. This migration also impacted bandwidth volumes. IPstream Connect contracted bandwidth volumes grew in Market 1 but, due to the migration of customers in Markets 2 and 3 from IPstream Connect to WBC, IPstream Connect

[184] The cost inflation assumption we have used in this analysis is lower than that we have adopted in the model. We discuss the reasons for this in paragraph A7.118 above.

contracted bandwidth volumes in total across all markets fell. WBC contracted bandwidth grew in all markets.

A7.179 The above suggests we should be cautious in how we interpret our results. The way that volume effects are removed, to the extent that this is practicable, has a material impact. The CVEs that we apply in the model, and which we have used in the analysis above, reflect variability and scalability of costs in the long run. They are usually applied to relatively modest volume changes on a steady-state network. Our anchor pricing approach takes this approach by including all volumes on a single services/network. However in this unit cost analysis we have used CVEs to remove volume effects over a relatively short period during which there were large volume swings as a result of customer migrations between products.

A7.180 The CVEs may not correctly capture the volume and cost re-allocation effects in the WBA markets due to these large-scale migrations. The result of this would be to over- or under-estimate unit cost changes where volumes are affected by the migration between products evident in the WBA market.

A7.181 Therefore, we do not consider that we can draw definitive conclusions from our updated unit cost analysis. The results are mixed and there are some issues with the data. We are not confident we have been able to remove the effect of the resulting changes in volumes and cost allocations in a reliable way.

Analysis of management accounting information

A7.182 Table A7.16 show that TSO and BT Wholesale cover the great majority of WBA operating costs. As we note above in our discussion of input cost inflation we sought management accounting information for BT Wholesale and TSO divisions and TSO's predecessor organisations, BT Operate and BTID. We specifically asked for "PVEO bridges" that showed how costs move from one year to the next.[185] We have used these bridges to help inform our choice of an appropriate efficiency target for WBA services.

A7.183 Paragraph A7.85 above noted that we received PVEO analyses for the period 2010/11 to 2014/15. As with our review of input cost inflation we have restricted our analysis to external operating costs (i.e. those directly incurred by the relevant division) and have ignored internal operating costs (transfer charges of costs incurred by other divisions). We have also excluded capital expenditure (as we apply our efficiency assumption to operating costs alone), other operating Income and POLOs paid by BT Wholesale within this analysis. As noted in Table A7.27 above, POLOs account for [✂] of WBA service costs but are a significant proportion of BT Wholesale's cost base.

A7.184 Most of BT Wholesale's costs are either POLOs or internal transfers from other divisions, including TSO. Its external costs mainly relate to pay costs for its own people. These cover about [✂][186] of total BT Wholesale non-POLO costs.

A7.185 In contrast [✂][187] of TSO's costs (and those of its predecessor organisations) are external costs. These cover total pay costs of TSO's staff but most of the remaining

[185] See paragraphs A7.84 to A7.85.
[186] Ofcom analysis of BT's response to Question A6, BT response to S135 Notice under Communications Act of 18 November 2013.
[187] Ofcom analysis of BT's response to Question A6, BT response to S135 Notice under Communications Act of 18 November 2013.

non pay costs appear to cover the costs of contracts with third party suppliers. As we noted in paragraph A7.115 these appear to have been a source of cost reductions for TSO and its predecessor organisations in recent years. We have treated these as contributing to efficiency savings rather than cost inflation.

A7.186 Table A7.30 below summarises the results of our analysis of these PVEO bridges. These figures represent savings in operating costs having first removed the effects of input cost inflation, volumes effects and other one-off cost accounting changes as recorded within these PVEO analyses. This suggests that the divisions supporting WBA services have historically achieved quite large efficiency gains though efficiency gains in BT's TSO division were forecast to reduce in the future. The 2014/15 analysis was part of the forward look prepared to support the 2013/14 planning process and may now be out of date.

Table A7.30: Analysis of efficiency by BT Division using management accounting information

Division	2011/12	2012/13	2013/14	2014/15
BT Wholesale	[✂]	[✂]	[✂]	[✂]
BT Operate + BTID	[✂]	[✂]		
TSO			[✂]	[✂]

Source: Ofcom analysis of BT management accounting information[188]

A7.187 There are some potential criticisms of this analysis. These are that:

- It is based on management accounting information, whereas the cost model is based on costs taken from BT's RFS.
- The cost data is not WBA specific. It covers the costs of activities that span a wide range of products and services. Many of these will be provided using newer technology than that we are assuming with the WBA cost model for Market A.
- The volumes used in the PVEO analyses are different to those used in the WBA charge control.
- The analysis excludes accommodation costs that make up some 22% of WBA costs.

A7.188 However, we still consider the data shown in Table A7.30 is relevant in assessing efficiency on WBA services in our model because:

- BT Wholesale and particularly TSO are the BT divisions whose costs form the majority of WBA operating costs. Cost savings in these divisions should flow through to all WBA products including IPstream Connect.
- We have only analysed operating costs: we have not considered capital or equipment costs. The relevant costs are therefore maintenance costs and other process related support costs. The opportunities for savings on many of these are less likely to be technology dependent.

[188] BT's response to Question A6, BT response to S135 Notice under Communications Act of 18 November 2013.

- We do not have detail on how the volume effects have been assessed within the PVEO analyses, but in general we have observed that these are quite low and in general are below the level of growth in WBA services, particularly demand for contracted bandwidth. So whilst it is likely that the volumes are different to those used within the cost modelling, if these analyses were to reflect the higher growth for WBA services then that would lead to a higher volume effect. For the PVEO analysis then to still maintain the same end of year position would then imply that efficiency savings would need to be higher.

- The PVEO analyses recorded some savings in internal accommodation charges over the period. We have not included these as our analysis excluded internal transfer charges. But BT has forecast some, albeit relatively modest, cost savings on accommodation.

A7.189 We therefore believe that this analysis of internal management accounting data provides a useful input into our assessment of future efficiency gains on WBA services. This analysis suggests relatively high historic and forward looking cost reductions in the BT divisions[189] whose costs form the majority of the WBA operating cost base. There are some caveats associated with this analysis but it does point to efficiency improvements consistent with, or even above, the high end of the range on which we consulted (i.e. 5%)

The impact of our HON assumptions

A7.190 BT's costs for maintaining the broadband network may be increasing due to the age of the equipment and this could be reflected in its view on efficiency.[190] However, the HON adjustment allows for aging assets to be replaced and so higher costs related to maintaining an aging network would not arise. We believe this provides some support for a higher efficiency assumption to reflect the lower operational costs arising under our HON approach as compared to BT's actual network costs, though we also note that we have increased asset lives in our model, and this could reduce the effect of this.

Final conclusions on Efficiency

A7.191 In the 2013 WBA Consultation we proposed 5% efficiency and in the 2014 WBA Consultation a range of 3.5% to 5%.

[189] We also note, for example, in BT's recent results for the fourth quarter and full year to 31 March 2014, that BT Wholesale's "*Operating costs decreased 18% in the quarter. Underlying operating costs excluding transit reduced 11% reflecting lower cost of sales, due to the lower revenue, and the benefit of our cost transformation activities. We reduced selling and general administration costs 22% in the quarter*." https://www.btplc.com/News/ResultsPDF/q414-release.pdf. Slide 29 of the presentation covered cost transformation, about which Gavin Patterson (BT CEO) said: "*Now cost transformation has been something we've been delivering on for a number of years. Indeed, we've saved over £5bn over the last five years. That does not mean we're going to slow down. We still see opportunities across the group as a whole, particularly on an end-to-end basis, and it doesn't mean that we're going to sacrifice service.*" https://www.btplc.com/Sharesandperformance/Quarterlyresults/PDFdownloads/q414-transcript.pdf

[190] BT made a similar argument in response to the 2013 NBMR Consultation, where it argued its costs would increase to maintain aging equipment, paragraph 9.31-9.32, BT, BT response to the 2013 Narrowband Market Review Consultation, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/responses/BT.pdf). Some of this equipment is common to narrowband and broadband services (such as SDH infrastructure) and we would generally expect the same trend of increasing costs as equipment ages for all BT's electronic equipment.

A7.192 BT presented a number of reports to support its argument for a number at or below the bottom of the 2014 WBA Consultation range. However:

- We consider the Deloitte report has significant limitations and accordingly we give it very low weight in our considerations; and

- We consider the other [✂] benchmarking of limited use for helping to set an appropriate efficiency target for WBA services particularly in the light of BT's own caution about how to interpret it.

A7.193 We have taken the following into account in considering our final efficiency assumption:

- BT's argument that the efficiency of 1.5% as set in the charge control for TI services is a relevant consideration;

- BT's public statements identify opportunities for cost savings;

- our analysis of TSO and BT Wholesale management accounting data identifies historic cost reductions and points to potential efficiency improvements consistent with, or even above, the high end of the range on which we consulted (i.e. 5%); and

- our HON approach would suggest that older assets with higher operational costs would be replaced by newer equipment with lower operational costs, offering opportunity for further cost savings.

A7.194 The efficiency assumption in the TI charge control points to an assumption at or below the bottom end of our range. However, the TI charge control is based on old data (for the period 2005/6 to 2010/11) and so whilst we think this is a relevant data point, we would not want to place too much weight on this figure.

A7.195 The more up to date data from BT's public statements and management accounting indicates a figure towards the top end of, or above, our range. But this relates to total divisional costs rather than product specific costs and we need to take this into account when considering how much weight to place on this data.

A7.196 Our HON approach would also suggest a higher efficiency figure compared to the efficiency in the TI charge control, though it does not provide data on which to base a specific assumption.

A7.197 We believe that our analysis supports an efficiency assumption in the range on which we consulted and may suggest a higher rather than a lower figure, but does not clearly point to a specific value. A challenging efficiency will lead to prices of WBA services being lower, which in turn could lead to consumers being offered better value services (either through lower prices, less restricted bandwidth usage or both). Taken together with our analysis that our range of 3.5% to 5% is reasonable, this leads us to conclude that an efficiency assumption of 5% is appropriate.

We have updated and used the Rest of BT rate for the cost of capital

Consultation proposals

A7.198 Our proposed approach to calculating the WACC applicable to the charge controlled parts of the BT business is set out more fully in the 2014 FAMR Draft Statement (see Annex 14). Our long-standing approach has been to disaggregate the BT Group WACC to separate out the WACC for the copper access network business (hereafter referred to as “Openreach”) from the remainder of BT Group businesses (hereafter the “Rest of BT”). We do this because we consider that the systematic risk profile of the Openreach copper access network is sufficiently distinct (specifically, lower in risk) than the Rest of BT.

A7.199 In the 2013 WBA Consultation we proposed that we should set the charge control on WBA services using the Rest of BT WACC of 9.9% pre-tax nominal that we had estimated in the 2013 BCMR Statement. We noted however that we would review the WACC calculation prior to the statement to take account of up to date data.

Consultation responses

A7.200 Four respondents commented on our proposed approach to the WACC in response to the 2013 WBA Consultation.

A7.201 EE and [✂] agreed with the use of the Rest of BT rate for the WACC.

A7.202 [✂] did not consider that the Rest of BT rate was an acceptable proxy because it believed that elements of the charge controlled products are held within both Openreach (in particular backhaul related products and exchange infrastructure) and BT Wholesale. [✂] said “*if it were exclusively BT Openreach, there would be no doubt it would be that rate which was used; if it were wholly BT Wholesale, then we would concur that the Rest of BT rate was acceptable. We do not have enough visibility to ascertain the appropriate split, however, it logically has to sit below where Ofcom is suggesting. An even mix of BT Openreach and Wholesale would, at the least, suggest the unmodified BT Group rate was most appropriate*.”[191]

A7.203 BT did not comment on whether or not it was appropriate to use the Rest of BT WACC for the WBA charge control (although it provided a number of comments on how Ofcom should calculate the WACC which we have addressed in Annex 14 of the 2014 FAMR Draft Statement).

Our conclusion

A7.204 In line with our approach in the 2011 WBA Charge Control we consulted on using the Rest of BT WACC to set the WBA charge control. Two of the three respondents that commented on our proposed approach in the 2013 WBA Consultation agreed with us.

A7.205 In relation to the comments made by [✂] it is correct that some of the input costs used to provide WBA services originate in Openreach. These Openreach input costs are predominately charges for EOI services of which the largest is the SMPF rental charge. These EOI services are regulated within the charge controls applied to LLU and WLR (where the Openreach WACC is applied) and so are not covered

[191] [☐] response to question 7.12 of the 2013 WBA Consu

by the WBA charge control. We refer to this as an upstream input approach in this charge control. Under this approach the WBA charge control regulates the difference between the SMPF rental charge, for example, and the final charge of the relevant WBA product.

A7.206 However, nearly all (around 95%) of the remaining (i.e. non-EOI) WBA costs sit outside Openreach in BT's Wholesale and TSO divisions. Therefore, we do not agree with the argument that the BT Group WACC would be more appropriate on the basis that we should be using a WACC lying between that determined for Openreach and that determined for the Rest of BT. Since nearly all the costs and activities subject to the WBA charge controls are provided outside Openreach, we consider that the Rest of BT WACC is more appropriate.

A7.207 In Table A7.31 below we present a summary of the WACC for Openreach, BT Group and the Rest of BT consistent with those in the 2013 BCMR Statement (which we used in the 2013 WBA Consultation) and in Table A7.32 we present the final WACC values for the different parts of BT as determined in the 2014 FAMR Draft Statement.[192]

Table A7.31: Estimate of BT WACC, 2013 BCMR Statement

	Openreach	BT Group	Rest of BT
Real risk free rate	1.3%	1.3%	1.3%
RPI inflation	2.8%	2.8%	2.8%
Nominal risk free rate	4.1%	4.1%	4.1%
ERP	5%	5%	5%
BT Group equity Beta		1.01	
Gearing (2 year average)		40%	
Asset beta	0.60	0.67	0.74
Debt beta	0.15	0.15	0.15
Gearing (forward look)	32%	32%	32%
Re-levered equity beta	0.81	0.91	1.01
Debt premium	1.7%	2.0%	2.3%
Corporate tax rate	20%	20%	20%
Pre-tax real WACC	5.9%	6.4%	6.9%
Pre-tax nominal WACC	8.8%	9.3%	9.9%

Note: Real WACC is calculated by deflating the nominal WACC by RPI. Because the charge control cost model is in nominal terms, the real WACC is not used in that model.

[192] For details on how we have derived these updated WACC estimates see the 2014 LLU WLR Statement.

Table A7.32 - Estimate of BT WACC, The 2014 FAMR Statement

	Openreach	BT Group	Rest of BT
Real risk free rate	1.3%	1.3%	1.3%
RPI inflation	3.2%	3.2%	3.2%
Nominal risk free rate	4.5%	4.5%	4.5%
ERP	5%	5%	5%
BT Group equity Beta		1.01	
Gearing (2 year average)		32%	
Asset beta	0.50	0.72	0.83
Debt beta	0.10	0.10	0.10
Gearing (forward look)	32%	32%	32%
Re-levered equity beta	0.69	1.01	1.17
Debt premium	1.0%	1.25%	1.5%
Corporate tax rate	20%	20%	20%
Pre-tax real WACC	5.2%	6.6%	7.3%
Pre-tax nominal WACC	8.6%	10.0%	10.8%

Note: Real WACC is calculated by deflating the nominal WACC by RPI. Because the charge control cost model is in nominal terms, the real WACC is not used in that model.

A7.208 The tables above show that there has been an increase in our estimate of the Rest of BT WACC; from 9.9% pre-tax nominal at the time of our consultation to 10.8% pre-tax nominal now. In Table A7.33 below we present the inputs that have changed since our consultation and their relative contribution to the increase in our WACC estimates for each part of BT Group's business.[193]

Table A7.33: Changes in pre-tax nominal WACC from 2013 BCMR Statement

	BT Group	Openreach	Rest of BT
Per 2013 BCMR Statement	9.3%	8.8%	9.9%
Gearing	0.4%		
Asset beta/weighting		(0.6%)	0.8%
Debt premium and debt beta	(0.2%)	(0.1%)	(0.3%)
Inflation	0.5%	0.5%	0.5%
Per 2014 LLU WLR Statement	10.0%	8.6%	10.8%

Note: reductions are shown in parentheses; all changes are percentage point changes. Some numbers subject to rounding.

[193] It should be noted that several of the variables used in calculating the WACC under our methodology are interdependent in the sense that the value of one affects the other.

A7.209 In summary, the main reasons for the change in the Rest of BT WACC since our 2013 WBA Consultation are:

i) the change in the asset beta (from 0.74 in the 2013 WBA Consultation to 0.83) and the weighting of the Rest of BT in BT Group's business (which has increased from 1/2 to 2/3, in parallel with a decrease in the weight of Openreach from 1/2 to 1/3[194]), have contributed an increase of 0.8% points;

ii) the increase in our RPI inflation assumption (from 2.8% to 3.2%) has contributed an increase of 0.5 percentage points[195]; and

iii) the reduction in the Rest of BT's debt premium (from 2.3% to 1.5%) and the associated change in the debt beta (from 0.15 to 0.1) has contributed a decrease of 0.3 percentage points.

A7.210 As noted above we explain in more detail the rationale for these changes in Annex 14 of the 2014 FAMR Draft Statement.

A7.211 The largest individual contributor to the change in the Rest of BT WACC is the change to the asset beta of Openreach and the Rest of BT. We have assumed a lower asset beta for Openreach (0.5) in the 2014 FAMR Draft Statement than at the time of the 2013 BCMR Statement (0.6), for the reasons described in the 2014 FAMR Draft Statement. On the other hand, the asset beta of BT Group (which we obtain directly from market data) has increased from 0.67 at the time of the 2013 BCMR Statement to 0.72 in the 2014 LLU WLR Statement. Our methodology to disaggregate BT Group's WACC requires that the sum of the asset betas of Openreach and Rest of BT weighted by the economic value of each part of the business equates to the asset beta of BT Group. We have concluded that an increase in the asset beta of the Rest of BT is more consistent with the evidence discussed in the 2014 FAMR Draft Statement, and follows from the constraint in our methodology that the disaggregated asset betas sum to the asset beta of BT Group.

A7.212 This increase notwithstanding, the upward change in the Rest of BT asset beta has been moderated by our change to the weightings of each part of the business. In the 2013 BCMR Statement we used a 50/50 weighting between Openreach and the Rest of BT respectively, based on the book value of the MCE in the two parts of the business. However, as explained in the 2014 FAMR Draft Statement, we now consider that reliance on book values of MCE is likely to be a less reliable indicator of the relative economic value of the assets in question and have preferred to rely on other measures (such as the respective shares of EBITDA relative to BT Group or the regulatory measure of asset values for Openreach copper access relative to BT Group enterprise value), which suggest a 1/3:2/3 ratio between Openreach and Rest of BT is more appropriate. In the 2014 FAMR Draft Statement we note that the significant increase in BT Group's market capitalisation since 2009 is more likely to be attributable to parts of the business outside the Openreach copper access network – i.e. investments sitting in the Rest of BT. As a result, we consider it appropriate that the weighting for the Rest of BT is increased (from the previous

[194] These changes are reflected under the category "Asset beta/weighting" in Table A7.33 above.
[195] The impact on the pre-tax nominal WACC is higher than the 0.4 percentage point change in the inflation rate because when calculating the pre-tax nominal WACC the cost of equity is translated into pre-tax terms by dividing by 1-tax rate of 20%. In pre-tax nominal terms therefore the impact of inflation is around 0.5%.

assumption of 50%) to 2/3, consistent with these other measures of the relative economic value of each part of the business.

A7.213 We recognise that changes in the economic value and apparent systematic risk of the Rest of BT raise the question of whether we should continue to use the Rest of BT WACC to set the charge controls applied to BT's services other than LLU and WLR, such as WBA. However, this is a particularly complex question and our approach to disaggregation based only on separating the copper access business from the Rest of BT is a long-standing one and has also been considered and approved by the Competition Commission[196].

A7.214 We believe that considering an alternative approach would involve significant further analysis, and we would wish to consult stakeholders if we thought such analysis pointed towards adopting an alternative approach to disaggregation. We note that any changes to the methodology we use to determine the cost of capital for WBA services is also likely to affect the way we set charge controls for wholesale services in other, much larger, markets. Thus, in the interest of not delaying our decisions in this market review and that for LLU and WLR, and in the interests of regulatory stability, we consider it appropriate to continue with our long-standing approach to disaggregation for the time being. We propose to consider the merits of alternative approaches to disaggregation in our next significant review of BT's wholesale services, most likely our next business connectivity market review.

A7.215 Finally, it should also be noted that another important driver of the increase in the pre-tax nominal WACC for the Rest of BT is the change in the RPI inflation assumption that we use to calculate the WACC, which has increased from 2.8% in the 2013 BCMR Statement to 3.2% in the 2014 FAMR Draft Statement. If our inflation assumption had remained at the level in the 2013 BCMR Statement, the Rest of BT WACC would have been 10.3%, significantly closer to the value in the 2013 WBA Consultation.

A7.216 In light of the support from all but one stakeholder to our proposal to use the Rest of BT WACC, and in the interests of regulatory consistency, we have decided to continue to use the Rest of BT WACC in setting the WBA charge control. Our revised estimate of the pre-tax nominal WACC for WBA services is therefore 10.8%.

[196] Case 1112/3/3/09 *Cable & Wireless v Office of Communications*, Competition Commission Determination, 30 June 2010. http://www.catribunal.org.uk/files/1112_Cable_Wireless_Determination_300610.pdf

Annex 8

Equality impact assessment

Introduction

A8.1 Ofcom is required by statute to assess the potential impact of all our functions, policies, projects and practices on race, disability and gender equality. We fulfil these obligations by carrying out an Equality Impact Assessment (EIA), which examines whether or not the remedies that we have proposed for the wholesale narrowband markets would have an adverse impact on equality. EIAs also assist us in making sure that we are meeting our principal duty of furthering the interests of citizens and consumers regardless of their background or identity.

A8.2 Unless we otherwise state in this document, it is not apparent to us that the outcome of our review is likely to have any particular impact on race, disability or gender equality. Specifically, we do not envisage the impact of any outcome to be to the detriment of any group of society.

A8.3 Nor are we envisaging any need to carry out separate EIAs in relation to race or gender equality or equality schemes under the Northern Ireland and Disability Equality Schemes. This is because we anticipate that our regulatory intervention will affect all industry stakeholders equally and will not have a differential impact in relation to people of different gender or ethnicity, on consumers in Northern Ireland or on disabled consumers compared to consumers in general. Similarly, we are not envisaging making a distinction between consumers in different parts of the UK or between consumers on low incomes. Again, we believe that our intervention will not have a particular effect on one group of consumers over another.

The aim of our WBA market review

A8.4 The aim of the current WBA market review is to assess the state of competition in the wholesale broadband access market and, if any operator is found to have SMP, to impose regulatory obligations designed to promote competition and to protect consumers. The WBA market concerns the wholesale broadband products that CPs provide for themselves and sell to each other. This market is important for consumers because these services are one of the building blocks of the retail broadband offers that CPs market to consumers.

A8.5 The main stages in developing the proposed regulatory obligations were:

- A programme of extensive research and data collection to inform our analysis;
- Definition of the relevant product and geographic markets;
- Assessment of SMP in the relevant markets; and
- Determination of the appropriate remedies to be imposed on those operators found to have SMP (BT and KCOM).

Equality impact assessment

A8.6 We have considered whether the remedies that we have proposed for the WBA markets would have an adverse impact on promoting equality. In particular we have considered whether the remedies would have a different or adverse effect on UK consumers and citizens with respect to: age, disability, gender reassignment, pregnancy and maternity, race, religion, sex and sexual orientation, and, in Northern Ireland, religious belief and dependents.

A8.7 The intention behind our approach to regulating the WBA markets is to impose a set of regulatory obligations on CPs with SMP requiring them to provide other CPs with wholesale broadband products on regulated terms, which will lead to the promotion of competition at the retail level for the benefit of consumers.

A8.8 We do not have information on whether there is any correlation between the CPs that purchase WBA products and the defined equality groups. However, we do not have any reason to suspect that the benefit of the regulatory remedies that we are proposing would not be the same for all residential and business retail users, nor that there would be a correlation between the affected residential and business end users and any of the above defined equality groups. On that basis we believed that it would be disproportionate to commission relevant research.

A8.9 We also did not find any reason to suspect that there would be potential for negative impacts against the defined equality groups.

Annex 9

Sources of evidence

Introduction

A9.1 We have noted throughout this statement the evidence we have relied on in relation to our findings and how we have relied upon that evidence. This annex lists the main sources of evidence used. We also list all responses to our various consultations and to our various section 135 notices.

A9.2 Whilst this annex lists the main evidence we have relied upon, the list is for convenience only and is not intended to be exhaustive.

List of respondents to the 2012 WBA Call for Inputs

A9.3 On 9 November 2012, we published the 2012 WBA Call for Inputs to gather input from stakeholders on the key issues with regard to this review.[197]

A9.4 We have published non-confidential versions of the responses we have received on our website.[198]

List of respondents to the 2013 WBA Consultation

A9.5 On 11 July 2013, we published the 2013 WBA Consultation to gather stakeholder views on the key issues with regard to this review.[199]

A9.6 In addition to one respondent that requested to remain anonymous, the following stakeholders provided written responses to the 2013 WBA Consultation:

- BT;
- Everything Everywhere Ltd (EE);
- KCOM Group (KCOM);
- TalkTalk Group (TalkTalk); and
- Virgin Media Limited (Virgin);

A9.7 We have published non-confidential versions of the responses from all the companies listed above. These can be found on our website.[200]

[197] Review of the wholesale broadband access markets, Call for Inputs, 9 November 2012, http://stakeholders.ofcom.org.uk/consultations/review-wholesale-broadband/summary.
[198] http://stakeholders.ofcom.org.uk/consultations/review-wholesale-broadband/?showResponses=true&pageNum=1#responses.
[199] Review of the wholesale broadband access markets, Consultation on market definition, market power determinations and remedies, 11 July 2013, http://stakeholders.ofcom.org.uk/consultations/review-wba-markets/.
[200] http://stakeholders.ofcom.org.uk/consultations/review-wba-markets/?showResponses=true

List of respondents to the 2014 WBA Consultation

A9.8 On 24 January 2014, we published the 2014 WBA Consultation to further inform our analysis and seek stakeholders' views on revised and new proposals on the charge control.[201]

A9.9 The following stakeholders provided written responses to the 2014 WBA Consultation:

- BT;
- EE;
- Prospect; and
- British Sky Broadcasting Limited (Sky);

A9.10 We have published non-confidential versions of the responses from all the companies listed above. These can be found on our website.[202]

Information-gathering using statutory powers (s135)

A9.11 During this market review and the 2012 Fixed Access Market Reviews, we have issued a series of notices under section 135 of the 2003 Act, requiring various CPs to provide specified information as set out in these notices. These information requests are listed below.

A9.12 Information request of 28 November 2012 regarding copper connections in the UK, including future roll-out, fibre connections in the UK, including future roll-out, cable connections in the UK, including future roll-out, the provision of wholesale broadband services in the UK, the retail broadband services in the UK and stakeholders' business plan in the Hull Area. Request sent to and response received from:

- BT Group;
- CWW/Vodafone;
- KCOM;
- Sky;
- TalkTalk Group;
- Telefónica O2; and
- Virgin.

[201] Review of the wholesale broadband access markets, Update on the impact of fibre roll-out and further consultation on the proposed charge control, Consultation, 27 January 2014, http://stakeholders.ofcom.org.uk/binaries/consultations/wba-review-update/summary/wba-review-update.pdf.

[202] http://stakeholders.ofcom.org.uk/consultations/wba-review-update/?showResponses=true.

A9.13 Information request of 26 November 2012 regarding forecasts for use of MPF, capital investment in NGA networks, standard and superfast broadband customer numbers, upgrade and switching information, GEA migration costs, superfast broadband strategy, superfast broadband demand forecasts, competitor analyses for superfast broadband, marketing spend on superfast services, usage information for SLU, PIA and FVA, plans for vectoring, ISDN30 customer details, and ISDN30, ISDN2 and IP-based telephony volume data. Request sent to and response received from:

- BT Group.

A9.14 Information request of 26 November 2012 regarding local access provision in Hull, the number of unbundled local exchanges, the number of business and residential analogue lines, use of the Business Voice Reseller product, superfast broadband demand forecasts, marketing spend on superfast services and ISDN30, ISDN2 and IP-based telephony volume data. Request sent to and response received from:

- KCOM.

A9.15 Information request of 26 November 2012 regarding capital investment in networks, superfast broadband strategy, superfast broadband demand forecasts, competitor analyses for superfast broadband, marketing spend on superfast services, usage information for SLU and PIA and ISDN30 IP-based telephony volume data. Request sent to and response received from:

- Virgin.

A9.16 Information request of 26 November 2012 regarding superfast broadband strategy, superfast broadband demand forecasts, competitor analyses for superfast broadband, marketing spend on superfast services, usage information for SLU and PIA, and ISDN30 and IP-based telephony volume data. Request sent to and response received from:

- CWW/Vodafone; and

- TTG.

A9.17 Information request of 26 November 2012 regarding superfast broadband strategy, superfast broadband demand forecasts, competitor analyses for superfast broadband, marketing spend on superfast services and usage information for SLU and PIA. Request sent to and response received from:

- EE;

- Telefónica O2; and

- Sky.

A9.18 Information request of 26 November 2012 regarding ISDN30 and IP-based telephony volume data. Request sent to and response received from:

- Verizon; and

- Colt.

A9.19 Information request of 19 March 2013 regarding returns for wholesale broadband access in Markets 1, 2 and 3 as defined in Ofcom's 2010 WBA Statement, WBC revenue and cost information in Markets 1, 2, and 3, contracted bandwidth and end user rental volumes across Markets 1, 2 and 3, the likely costs of rolling out WBC services across the rest of the UK, BT's plans for the roll-out of WBC services and the discounts which BT Retail offers to customers. Request sent to and response received from:

- BT Group.

A9.20 Information request of 2 April 2013 regarding internet service providers to which the relevant CP has sold wholesale broadband access services and information on switching the provider of wholesale broadband access services. Request sent to and response received from:

- Post Office.

A9.21 Information request of 20 August 2013 regarding further information on returns for wholesale broadband access in Markets 1 as defined in Ofcom's 2010 WBA Market Review Statement. Request sent to and response received from:

- BT Group.

A9.22 Information request of 9 October 2013 regarding the roll-out of commercially-funded and state-funded fibre in the UK. Request sent to and response received from:

- BT Group.

A9.23 Information request of 14 October 2013 regarding exchange data and LLU roll-out data. Request sent to and response received from:

- BT Group.

A9.24 Information request of 18 November 2013 regarding further information on the following:

- the anticipated roll-out of commercially-funded and state-funded fibre in the UK;
- component level costs for wholesale broadband access in Markets 1,2, and 3 as defined in Ofcom's 2010 WBA Market Review Statement;
- BT's internal forecasts of its efficiency improvements;
- how BT has allocated costs relating to 21CN components in the Regulatory Financial Statements; and
- actual and forecast volumes of WBA services.

Request sent to and response received from:

- BT Group.

A9.25 Information request of 16 January 2014 regarding additional information, updates and clarifications on information previously provided.

Request sent to and response received from:

- BT Group.

A9.26 Information request of 19 November 2013 regarding further information on the following:

- business plans for the residential broadband market, and
- forecasts of bandwidth requirements of end users.

Request sent to and response received from:

- Vodafone.

A9.27 Information request of 19 November 2013 regarding further information on the following:

- forecasts of bandwidth requirements of end users.

Request sent to and response received from:

- EE Limited.

A9.28 Information request of 19 November 2013 regarding further information on the following:

- network coverage in the Hull area; and
- services that the CP provides and/or intends to provide in the Hull area,

Request sent to and response received from:

- MS3 Networks Limited.

A9.29 Information request of 19 November 2013 regarding further information on the following:

- internal documents setting out the CP's future strategy in relation to superfast broadband, how much it had spent on marketing superfast broadband, as well as its view and forecasts of subscribers in the superfast broadband market, and
- forecasts of bandwidth requirements of end users.

Request sent to and response received from:

- Sky.

A9.30 Information request of 19 November 2013 regarding further information on the following:

- internal documents setting out the CP's future strategy in relation to superfast broadband, how much it had spent on marketing superfast broadband, as well as its view and forecasts of subscribers in the superfast broadband market, and

- forecasts of bandwidth requirements of end users.

Request sent to and response received from:

- TalkTalk.

A9.31 Information request of 19 November 2013 regarding further information on the following:

- cable connections in the UK, including future rollout;
- fibre connections in the UK, and
- forecasts of bandwidth requirements of end users.

Request sent to and response received from:

- Virgin.

A9.32 Information request of 27 January 2014 regarding further information on BT's potential efficiency improvements.

Request sent to and response received from:

- BT Group.

A9.33 Information request of 20 March 2014 regarding further information on revenues, costs, investment and service volumes for wholesale broadband access in Market 1.

Request sent to and response received from:

- BT Group.

Ofcom documents

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Annex 10

Glossary and defined terms

3G: Third generation of mobile telephony systems, including the UMTS™ technology standard.

4G: Fourth generation of mobile telephony systems, including the LTE™ technology standard.

21CN: BT's next generation network upgrade.

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.

Access Network: The part of the network that connects directly to customers from the local telephone exchange.

Asymmetric Digital Subscriber Line (ADSL): a digital technology that allows the local loop to send a large quantity of data in one direction and a lesser quantity in the other.

Advance Point of Presence Ordering process (APO process): Openreach process by which CPs place orders for accommodation services within BT's exchanges

Asset Volume Elasticity (AVE): The percentage increase in capital costs required for a 1% increase in volume.

Asynchronous Transfer Mode (ATM): A network technology that uses asynchronous time division multiplexing techniques and which supports data transmissions at up to 622Mbit/s.

Backhaul: Connection from the first access node (for example the local exchange or street cabinet) to the core network.

Bandwidth: The measure of the how much data can be carried across a link in the network.

Body of European Regulators for Electronic Communications (BEREC): The Body of European Regulators for Electronic Communications (BEREC) was established by Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 and it replaced the European Regulators Group for electronic communications networks and services which was established as an advisory group to the Commission in 2002.

Broadband Delivery UK (BDUK): Broadband Delivery UK (BDUK) is a team within the Department for Culture, Media and Sport that has a role to set up, operate, monitor and act as the national competence centre for the UK-wide broadband state-aid scheme, as this has been approved by the European Commission with the State Aid Decision SA.33671 (2012/N).

Broadband Remote Access Server (BRAS): A network element that aggregates end user access sessions on a broadband network. The BRAS provides a point where policy management and quality of service can be administered.

Broadband: A service or connection which is capable of supporting always-on services which provide the end-user with high data transfer speeds.

BT: British Telecommunications plc.

Business Connectivity Market Review (BCMR): An Ofcom market review published in March 2013, in which Ofcom set out our view of competition and imposed regulation in relation to the market for leased lines in the UK.

Bottom-up Long Run Incremental Costs-plus (BU LRIC+): It is a modelling approach that develops a cost model starting from the expected demand in terms of subscribers and traffic. It then models the efficient network that is required to meet the expected demand, and assesses the related costs according to a theoretical network-engineering model. The purpose of a bottom-up model is to calculate the cost on the basis of an efficient network using the newest technology employed in large-scale networks. LRIC+ refers to the long run incremental costs of providing the service plus an appropriate mark up to take account of BT's common costs.

CAT: Competition Appeal Tribunal

CC: Competition Commission

CFI: Call for Inputs

Charge control: A control which sets the maximum price that a communication provider can charge for a particular product or service. Most charge controls are imposed for a defined period.

Cable modem: A cable modem is a device that enables a consumer to access the Internet via a cable access line.

Core network: The backbone of a communications network, which carries different services such as voice or data around the country.

Communications provider (CP): A person who provides an Electronic Communications Network or provides an Electronic Communications Service.

Cost Volume Elasticity (CVE): The percentage increase in operating costs for a 1% increase in volume.

Customer Premises Equipment (CPE): Any terminal and associated equipment that is connected to an electronic communications service at customers' premises. Equipment is often provided and connected by consumers and includes for example, telephones, answering machines, and modems.

Consumer price index (CPI): The consumer price index (CPI) is a measure of inflation. It measures changes in the price level of consumer goods and services purchased by households. The most significant item excluded in the CPI, but included in the RPI, is mortgage interest rate payments.

Current Cost Accounting (CCA): An accounting convention, where assets are valued and depreciated according to their current replacement cost whilst maintaining the operating or financial capital of the business entity.

Current Generation Access (CGA): A copper-based access network that can support a maximum download speed of 24 Mbit/s.

Data Over Cable Service Interface Specification (DOCSIS): The international standards for sending data over a cable network.

DECC: Department for Climate Change

Digital Subscriber Line (**DSL):** A family of technologies generically referred to as DSL, or xDSL, capable of transforming ordinary local loops into high-speed digital lines, capable of supporting advanced services such as fast Internet access and video-on-demand. ADSL (Asymmetric Digital Subscriber Line), HDSL (High bit rate Digital Subscriber Line) and VDSL (Very high data rate Digital Subscriber Line) are all variants of xDSL.

Digital Subscriber Loop Access Multiplexer (DSLAM): Apparatus used to terminate DSL enabled local loops, which comprises a bank of DSL modems and a multiplexer which combines many local loops into one data path.

Distributed long run incremental cost (DLRIC): The LRIC of the individual service with a share of costs which are common to other services over BT's core network.

Distributed stand alone cost (DSAC): An accounting approach estimated by adding to the DLRIC a proportionate share of the inter-increment common costs. Rather than all common costs shared by a service being allocated to the service under consideration, the common costs are instead allocated amongst all the services that share the network increment.

Delivery Points (DP): Customer premises (both residential and business) to which telecommunications services could be provided.

European Regulators Group (ERG): A group of national regulators within Europe of which Ofcom was a member. The ERG was replaced by BEREC.

Ethernet: A packet-based technology originally developed for and still widely used in Local Area Networks. Ethernet networking protocols are defined in IEEE 802.3 and published by the Institute of Electrical and Electronic Engineers.

Ethernet in the First Mile (EFM): A network technology for the delivery of Ethernet services over access networks. Although the technology also encompasses fibre access networks, in common usage EFM refers to the provision of Ethernet services over copper access networks.

Equi-proportional Mark-Up (EPMU): The application of the same percentage mark-up to the incremental costs of two or more services.

Equivalence of Input (EOI): A remedy designed to prevent a vertically-integrated company from discriminating between its competitors and its own business in providing upstream inputs. This requires the regulated firm to provide the same wholesale products to all CPs including its own downstream division on the same timescales, terms and conditions (including price and service levels) by means of the same systems and processes, and includes the provision to all CPs (including its own downstream division) of the same commercial information about such products, services, systems and processes.

Equivalence of Outputs (EOO): The provision of wholesale inputs to access seekers in a manner, which is comparable, in terms of functionality and price, to those the SMP operator provides internally to its own downstream business e.g. it's retail arm, albeit using potentially different systems and processes.

EE: Everything Everywhere Limited

Fibre To The Cabinet (FTTC): An access network structure in which an optical fibre extends from the exchange to the cabinet. The street cabinet is usually located only a few hundred metres from the subscriber's premises. The remaining part of the access network from the cabinet to the customer is usually copper wire but could use another technology, such as wireless.

Fibre To The Premises (FTTP): An access network structure in which the optical fibre network runs from the local exchange to the end user's house or business premise. The optical fibre may be point-to-point – there is one dedicated fibre connection for each home – or may use a shared infrastructure such as a GPON. Sometimes also referred to as Fibre To The Home (FTTH).

Fully allocated cost (FAC): An accounting approach under which all the costs of the company are distributed between its various products and services. The fully allocated cost of a product or service may therefore include some common costs that are not directly attributable to the service.

Fixed wireless access (FWA): Radio link to the home or the office from a cell site or base station, replacing the traditional local loop.

Gamma: Gamma Telecom Limited

Gbit/s: Gigabits per second (1 Gigabit = 1,000,000,000 bits) A measure of bandwidth in a digital system.

Gigabit Passive Optical Network (GPON): A shared fibre network architecture that can be used for next generation access.

Gross Replacement Cost (GRC): The cost of replacing an existing tangible fixed asset with an identical or substantially similar new asset having a similar production or service capacity.

Generic Ethernet Access (GEA): BT's wholesale non-physical product providing CPs with access to higher speed broadband products

Hull Area: The area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and KCOM plc (formerly Kingston Communications (Hull) plc).

High Definition IP television (HD IPTV): High definition television/video media delivered via IP, rather than a traditional broadcast network.

HCA (historical cost accounting) depreciation: The measure of the cost in terms of its original purchase price of the economic benefits of tangible fixed assets that have been consumed during a period. Consumption includes the wearing out, using up or other reduction in the useful economic life of a tangible fixed asset whether arising from use, effluxion of time or obsolescence through either changes in technology or demand for the goods and services produced by the asset.

Hypothetical ongoing network (HON): A modelled network used for the purposes of assessing the cost base on which to base a charge control. The costs are assumed to include all those costs that would be incurred in running the network on an ongoing basis.

Internet Protocol (IP): The packet data protocol used for routing and carriage of messages across the Internet and similar networks.

IP network: a network that uses IP; for example the Internet is a public IP network.

Internet Service Provider (ISP): An organisation that provides internet access services.

IPstream: A BT Wholesale Broadband Access product, offering maximum downstream speeds of up to 8Mbit/s.

Integrated services digital network (ISDN): A set of communications standards for digital transmission of voice, video, data, and other network services over the traditional circuits of the PSTN.

ISDN2: Integrated Service Digital Network standard, providing a connection to the end customer (usually over a copper access network) comprising two 64kbit/s digital channels.

ISDN30: A digital telephone service that provides up to the equivalent of 30 analogue lines over a common digital bearer circuit. These lines provide digital voice telephony, data services and a wide range of ancillary services.

Jitter: A measure of the variation of delay in transmission over a transmission path.

Kbit/s: Kilobits per second (1 kilobit = 1,000 bits) A measure of bandwidth in a digital system.

KCOM: KCOM plc (formerly Kingston Communications (Hull) PLC).

Latency: A measure of delay in transmission over a transmission path.

Linear HD: A High Definition television/video media programme shown at the time of network broadcast, irrespective of the method of broadcast.

Linear 3D: A Three Dimensional (3D) television/video media programme shown at the time of network broadcast, irrespective of the method of broadcast.

Local loop: The access network connection between the customer’s premises and the local serving exchange, usually comprised of two copper wires twisted together.

Local loop unbundling (LLU): A process by which a dominant provider’s local loops are physically disconnected from its network and connected to competing provider’s networks. This enables operators other than the incumbent to use the local loop to provide services directly to customers.

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.

Long-term evolution (LTE): Technology standard which forms part of the development of 4G mobile systems that started with 2G and 3G networks.

Mbit/s: Megabits per second (1 Megabit = 1 million bits). A measure of bandwidth in a digital system.

Main distribution frame (MDF): The equipment where local loops terminate and cross connection to competing providers' equipment can be made by flexible jumpers.

Metallic Path Facility (MPF): The provision of access to the copper wires from the customer premises to a BT MDF that covers the full available frequency range, including both narrowband and broadband channels, allowing a competing provider to provide the customer with both voice and/or data services over such copper wires.

Modem: Abbreviation of modulate-demodulate, a device that converts a digital signal into analogue for transmission purposes. It also receives analogue transmissions and converts them back to digital.

Mean capital employed (MCE): The mean value of the assets that contribute to a company's ability to generate revenues.

Multi Service Access Node (MSAN): A network access device associated with an IP-based core network that provides network interfaces for telephony, broadband and other services. MSANs are typically installed in a telephone exchange or a roadside cabinet.

Modern equivalent asset (MEA): The approach to set charges by basing costs and asset values on what is believed to be the most efficient available technology that performs the same function as the current

Multi User Area (MUA): Area within a BT exchange in which multiple CPs can purchase space, for the purposes of installing broadband and/or leased line equipment.

Narrowband: A service or connection that provides a maximum speed of up to 64kbit/s per circuit (and therefore up to 128kbit/s in the case of ISDN2). Narrowband modems generally offer a maximum rate of 56kbit/s.

Next Generation Access (NGA): Wired access networks which consist wholly or in part of optical elements and which are capable of delivering broadband access services with enhanced characteristics (such as higher throughput) as compared to those provided over already existing copper networks. In most cases NGAs are the result of an upgrade of an already existing copper or co-axial access network

Next Generation Network (NGN): A network that uses new (usually IP) technology in the core and backhaul to provide all services over a single platform.

Net replacement cost (NRC): Gross replacement cost less accumulated depreciation based on gross replacement cost. An alternative is *Depreciated replacement cost (of tangible fixed assets other than property:-*The cost of replacing an existing tangible fixed asset with an identical or substantially similar new asset having a similar production or service capacity, from which appropriate deductions are made to reflect the value attributable to the remaining portion of the total useful economic life of the asset and the residual value at the end of the asset's useful economic life.

OBR: Office of Budget Responsibility

Ofcom: The Office of Communications.

OFS: Office of National Statistics

Openreach: The access division of BT established by Undertakings in 2005.

Public Switched Telephone Network (PSTN): A telecommunications network that uses circuit switched technology to provide voice telephony services.

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.

Passive Infrastructure Access (PIA): A remedy requiring BT to provide CPs with access to its passive access network infrastructure (i.e. ducts and poles).

Point of Presence (POP): A node in a CP's network (such as an exchange or other operational building), generally one used to serve customers in a particular locality.

Regulatory Asset Base (RAB): The total capital value of the assets used to calculate the costs of the regulated services.

Regulatory financial statements (RFS): The financial statements that BT is required by Ofcom to prepare, have audited and publish.

Return on capital employed (ROCE): The ratio of accounting profit to capital employed. The measure of capital employed can be either Historic Cost Accounting (HCA) or Current Cost Accounting (CCA).

Retail price index (RPI): A measure of inflation published monthly by the Office for National Statistics. It measures the change in the cost of a basket of retail goods and services.

Stand Alone Cost (SAC): An accounting approach under which the total cost incurred in providing a product is allocated to that product.

SSNIP: Small but Significant Non-transitory Increase in Price, usually considered to be 5 to 10 per cent, which is part of the hypothetical monopolist test used in market definition analysis.

Sub-loop unbundling (SLU): Like local loop unbundling (LLU), except that communications providers interconnect at a point between the exchange and the end user, usually at the cabinet.

Superfast Broadband (SFBB): A broadband connection that can support a maximum download speed of 30Mbps or greater.

Symmetric Digital Subscriber Line (SDSL): A DSL variant that allows broadband signals to be transmitted at the same rate from end user to exchange as from exchange to end user.

Service Level Agreement (SLA): A contract between a network service provider and a customer that specifies, usually in measurable terms, what services the network service provider will furnish.

Service Level Guarantee (SLG): A contractual agreement specifying the compensation payable if the service provider fails to deliver the agreed service performance.

Sky: British Sky Broadcasting Limited

Synchronous Digital Hierarchy (SDH): A digital transmission standard that is widely used in communications networks.

SMP: The Significant Market Power test is set out in European Directives. It is used by National Regulatory Authorities (NRAs) such as Ofcom to identify those communications providers who must meet additional obligations under the relevant Directive.

Shared metallic path facility (SMPF)/shared access: The provision of access to the copper wires from the customer's premises to a BT MDF that allows a competing provider to provide the customer with broadband services, while the dominant provider continues to provide the customer with conventional narrowband communications.

TalkTalk: TalkTalk Group Limited

Traffic shaping: When certain types of packets are given priority as they pass through the network, or when customers connection speed is managed to take account of the level of demand on the network.

Very high bitrate DSL (VDSL): An upgrade to ADSL technology which allows for higher speed access over copper lines. It is likely to be the technology which will be used in FTTC deployments.

Virgin: Virgin Media Limited

Virtual Unbundled Local Access (VULA): It provides a connection from the nearest 'local' aggregation point to the customer premise.

Virtual Private Network (VPN): A technology allowing users to make inter-site connections over a public telecommunications network that is software partitioned to emulate the service offered by a physically distinct private network.

Voice over IP (VoIP): A generic term used to describe telephony services provided over IP networks.

Weighted average cost of capital (WACC): The rate that a company is expected to pay on average to all its security holders to finance its assets.

Wide Area Network (WAN): A geographically dispersed telecommunications network, typically a corporate network linking multiple sites at different locations.

Wholesale Broadband Access (WBA): Is between the WLA market and retail market for provision of fixed telecommunications services to end users.

Wholesale Broadband Connect (WBC): A BT Wholesale Broadband Access product, using ADSL2+ technology to offer maximum downstream speeds of up to 24Mbit/s, or using Openreach's GEA product to offer speeds above 30Mb/s where GEA is available.

Wholesale Local Access (WLA) Market: The wholesale market for fixed telecommunications infrastructure, specifically the physical connection between end users' premises and a local exchange.

Wave Division Multiplex (WDM): An optical frequency division multiplexing transmission technology that enables multiple high capacity circuits, to share an optical fibre pair by modulating each on a different optical wavelength.

Wholesale Line Rental (WLR): The service offered by BT to other UK communications providers to enable them to offer retail line rental services in competition with BT's own retail services. Line rental is offered along with calls (and other service elements, such as broadband) to retail customers.

WiFi: Short range wireless technologies that allow an over-the-air connection between a wireless device and a base station, or between two wireless devices. WiFi has a range of over 30 metres indoors, and around a kilometre outside.

The Worldwide Interoperability for Microwave access (WiMax): A wireless technology, similar to WiFi, but with a longer range which can cover many kilometres. WiMAX has been considered as a wireless alternative to fixed access connections to provide high speed access links instead of using copper to properties.