



Digital dividend: clearing the 800 MHz band

Mobile communications cost model

User guide

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Section 1

Introduction

- 1.1 This document is a user manual for the mobile communications cost model described in the “Digital Dividend: clearing the 800 MHz band” consultation document (henceforth the “800 MHz consultation document”).¹ In annex 6 of that document we set out the key results, model structure and some of the underlying assumptions of this model. The results are used in the impact assessment which is set out in annex 5 of the 800 MHz consultation document. This guide should be read in conjunction with the 800 MHz consultation document, and in particular with annexes 5 and 6.
- 1.2 In making available this cost model, we make no representation or give any warranty as to the accuracy, completeness or correctness of the cost model and it is provided 'as is'. It is provided for the purposes set out in this user manual and for no other purpose.
- 1.3 Section 2 describes:
 - 1.3.1 The purpose of the mobile communications model.
 - 1.3.2 Circumstances to note when using the model.
 - 1.3.3 Limits on the use of the model.
 - 1.3.4 How to interpret the results.
 - 1.3.5 How to generate the results outlined in the consultation document.

¹ <http://www.ofcom.org.uk/consult/condocs/800mhz/800mhz.pdf>.

Section 2

Mobile communications cost model

Model Purpose

- 2.1 The purpose of the mobile communications cost model is to provide an estimate of the cost of building a mobile radio network using either 800 or 1800 MHz spectrum². This allows us to form an estimate of the economic value of using the 800 MHz spectrum for mobile communications services under different policy options. These results are then used to inform our assessment of the policy options, as outlined in the 800 MHz consultation document.
- 2.2 For an explanation of the modelling methodology used in the 800 MHz consultation document and how the estimate of the economic value of mobile communications fits within this see figure A2 in annex 6 of the 800 MHz consultation document.
- 2.3 For an outline of the mobile communications cost model see Figure A11 of annex 6.
- 2.4 The model will only generate meaningful results when it is used for the purpose for which it was designed.

Circumstances to note in using the model

- 2.5 The model can be used to provide an estimate of the cost difference of rolling out mobile communications services at 800 MHz rather than 1800 MHz under the assumptions which are set out in annex 6 of the 800 MHz consultation document.
- 2.6 In addition the model includes practical constraints operators may face when upgrading or building new sites. The model can be used to assess the year-by-year practicality of rolling out a network.

Limits on use of the model

- 2.7 This model cannot be used to determine if the rollout of the network modelled is the most likely. It cannot determine if a given rollout is profitable for an operator, or if another network rollout would be more or less profitable.
- 2.8 Simplifying assumptions which limit the use of the model include:
 - The networks modelled are assumed to look indistinguishable to the end user.
 - The networks modelled are assumed to each carry the same quantity of data, even when the higher frequency network has greater capacity (owing to the installation of a larger number of base stations).
 - As the networks are indistinguishable to the end user, there are no differences in the costs in the core and Radio Network Controller section of the networks.
- 2.9 In addition, as discussed in the 800 MHz consultation document the model cannot be used:

² 1800 MHz spectrum means the 1710-1785 MHz and 1805-1880 MHz bands. 800 MHz spectrum means spectrum between 790-862 MHz.

- when the number of sites at 1800 MHz is such that it may be too expensive or impractical to deploy a Long Term Evolution network to model the cost saving for a new operator;
- to model what an operator might be prepared to bid for 800 MHz spectrum at auction; or
- to represent the cost saving for any particular operator.

Interpretation of Results

- 2.10 The numerical results obtained from the model are subject to a high degree of uncertainty. The standardisation process for the technologies which have been modelled has not yet been finalised, nor have these types of networks been rolled out yet in practice. In the 800 MHz consultation document the results were rounded to the nearest £100m to reflect the underlying uncertainty.
- 2.11 The numerical results were based on the period 2010-2026.

How to generate results

- 2.12 The model is a standalone Excel workbook. The workbook contains macros that are used to generate results from multiple scenarios. The macros are not used in the core calculation steps of the model.
- 2.13 All workbooks should be compatible with Microsoft Excel 2000, 2003 or 2007.
- 2.14 The workbooks are set to calculate automatically, but recalculation of tables may require the user to press Ctrl-Alt-F9 to ensure a full recalculation of the model.
- 2.15 A “Contents” worksheet is included at the front of the workbook, displaying the workbook title, objective and a summary of the purpose of each worksheet.
- 2.16 The cell formatting styles used within the workbook are demonstrated on the “Style Guidelines” worksheet. Cell formatting is used to allow the user to distinguish between:
- Parameters, or hard coded cells whose values can be changed
 - Calculations, which contain formulae
 - Outputs, which are of interest to the users
 - Annotations, including name ranges, which provide an explanation to the user
- 2.17 Inputs are provided in two worksheets in the “Control” section of the workbook.
- 2.18 We recommend avoiding using the computer for other tasks while running the model, and in particular embedded macros. In particular, we would recommend against using the “copy to clipboard” function in other programs, while running macros.
- 2.19 To ensure that macros function correctly, the names of sheets should not be altered. In addition no rows or columns should be added or deleted otherwise the output macros/calculation steps may no longer function correctly.

How to generate results – inputs

2.20 There are two input pages:

- Inputs
 - These are the inputs that are not varied between the different scenarios outlined in the 800 MHz consultation document.
- Site Count List
 - These are the inputs that are varied between the different scenarios outlined in the 800 MHz consultation document.

2.21 On the “Site Count List” users can input site count scenarios starting in row 11 and finishing in row 12. The scenarios start in column E and users can add new scenarios from column G onwards if required.

How to generate results – control

2.22 Once relevant inputs have been entered into the sheets listed above results can be generated for the site count scenarios.

2.23 Users should go to the “Results” sheet and enter in the site count scenario they are interested in (in column D). Users should also enter a name into column C.

Users can enter up to five scenarios. Results can then be generated using the “run_outputs” macro (activated using the “run outputs” button on the Results sheet). This cycles through the scenarios and copies and pastes the results into columns H to O. The macro copies and pastes the scenario-sensitivity pair into the “main control” sheet and updates the result. It does this via the “value state” variable. Changing the “value state” variable also changes the results of the model.