Annex 18

Impact of delay on cost and benefits of release

A18.1   This annex estimates the impact on the net benefits if the release of 900MHz spectrum is delayed. Delay will affect the benefits of release by reducing the efficiency benefits and competition benefits. However, the costs of release may also fall. Each is discussed in turn.

Efficiency benefits

A18.2   The impact of delay on the efficiency benefits of spectrum release is very significant.

A18.3   To illustrate this impact we have assessed the impact of delay on the magnitude of the efficiency benefits under our 1 block partial release option.[1] This can be assessed using the cost difference model (as set out in annex 15). To estimate the impact of delaying release we have used the following assumptions about the time at which spectrum is available to operators who do not currently have access to 900MHz.

Table 1: Timing of spectrum availability assumptions

Input	If no release	If released block available in 2011	If released block available in 2012	If release block available in 2013
Dates when operators can begin deploying a low frequency network (using 800MHz if released 900MHz is not available)	2012	2011	2012	2013
Date when operators no longer need to expand their existing UMTS 2100 networks	2014	2011	2012	2013
Date when operators can decommission part of their UMTS2100 networks	2016	2013	2014	2015

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[1] See annex 7, table 7 for the efficiency benefits used in our cost benefit analysis.

A18.4   These timing assumptions, in particular the deployment timings, are slightly different to those used to estimate the efficiency benefits in annex 7. As can be seen in table 1 above, for these purposes, we have assumed operators begin deploying a low frequency network in 2011 if release occurs in 2011. However, in annex 7 it is assumed that deployment begins 2010. This simplification assumption was made to allow easier interpretation of the results.

A18.5   Table 2 below shows the impact on the efficiency benefits of 1 block release for both single operators and RAN sharing operators using the timing assumptions set out in table 1 above.

A18.6   The results in table 2 are generated using the approach set out in annex 7 for estimating productive efficiency benefits (see paragraphs A7.78 to A7.117 and table 3). The results shown when there is no release use rollout profile A. When there is release the results are generated using rollout profile C but using the availability assumptions set out in table 1 above.

Table 2: Impact of availability assumptions on costs

Network costs £m NPV (calculated over 20 year)	If no release	If released block available in 2011	If released block available in 2012	If release block available in 2013
Single operator				
Costs	850	550	800	825
Cost difference	n.a.	300	50	25
Reduction in efficiency benefits as a result of delay	n.a.	n.a.	-250	-25
RAN sharing network (assumed to be 2 operators sharing)				
Costs of RAN sharing network	1600	825	1500	1500
Cost difference	n.a.	775	100	100
Reduction in efficiency benefits as a result of delay	n.a.	n.a.	-675	0

A18.7   The single operator results are shown for our medium significance scenario when both the single and RAN sharing 2100MHz operators can match (i.e. when the cost difference is such that it is still profitable for single operators to match using 2100MHz). The RAN shared network results are shown for our medium significance scenario when only the RAN sharing 2100MHz operators can match. The RAN shared network results when the cost difference is such that it is still profitable for single operators to also match show the same relationship between the cost of difference and the delay to release.

A18.8   Given the slightly different timing assumptions (see paragraph A18.4), there are some minor differences between the cost estimates shown in table 2 above and those shown in table 3 of annex 7. For example, the cost for a single operator to deploy 900MHz is shown as £525m in table 3 of annex 7, whereas in the table above it is shown as £550m. Similarly, for a RAN shared network the cost is shown as £800m in table 3 of annex 7, whereas in the table above it is shown as £825m.

A18.9   As can be seen in table 1, if the date of release is delayed by one year (e.g. 2012 rather than 2011) then the efficiency benefits for a single operator could fall by £250m (from £300m to £50m). For a RAN shared network the efficiency benefits could fall by £675m (from £775m to £100m) for a one year delay.

A18.10   Given the magnitude of these impacts we assessed the sensitivity of these results to some of the key assumptions underlying the efficiency benefits results. One assumption which we varied is the assumption that the 2100MHz operators perfectly match the service provided by the 900MHz operators during the delay to release. The results in table 3 below show the impact of delay if we assume that the roll out is capped at 1,500 new sites each year. This is a tighter limit on the number of sites which can be rolled out each year than used when assessing the efficiency benefits under our medium significance scenario (as set out in table 7 of annex 7).

Table 3: Impact of availability assumptions on costs (with tighter limit)

Network costs £m NPV (calculated over 20 year)	If no release	If released block available in 2011	If released block available in 2012	If release block available in 2013
Single operator				
Costs of single operator	875	525	750	825
Cost difference	n.a.	350	125	50
Reduction in efficiency benefits as a result of delay	n.a.	n.a.	-225	-75
RAN sharing network (assumed to be 2 operators sharing)				
Costs of RAN sharing network (assumed to be two operators sharing)	1700	800	1100	1400
Cost difference	n.a.	900	600	300
Reduction in efficiency benefits as a result of delay	n.a.	n.a.	-300	-300

A18.11   Based on the tighter assumption about the levels of sites which can be rolled out, the impact of delay is more closely related to length of the delay. Without this cap most of the benefits are lost during the first year of delay. However, with the additional cap, the loss of benefits is more evenly spread over the first and second years. This effect is more pronounced for the RAN sharing network.

A18.12   Using these new assumptions, if the date of release is put back by only one year, we estimate that the efficiency benefits for a single operator could fall by around £225m (£350m to £125m), while for a RAN shared network the efficiency benefits could fall by around £300m (£900m to £600m).

A18.13   However, it could be argued that these results understate the impact of delay to release, as by imposing this cap there could also be a competition effect during the period of delay, which we have not taken into account here.

Competition benefits

A18.14   The competition benefits of spectrum release (these are the benefits of release that primarily arise in the high significance scenario in our cost benefit analysis, and which are set out in table 2 of annex 7), depend upon the number of players with access to 900MHz spectrum.

A18.15   Table 4 below shows the impact on the competition benefits of 1 years delay assuming for the case where release increases the number of players from 2 to 3, and 2 to 4.

Table 4: Impact on competition benefits from one year delay of release

£m NPV (over 20 years)		Benefits if release in 2011	Reduction in benefits if release in 2012
2 to 3	Total welfare	425	-150
	Consumer surplus	1,000	-350
2 to 4	Total welfare	625	-215
	Consumer surplus	1,700	-590

A18.16   Hence, these results show that for each year of delay, approximately a third of the competition benefits are lost.

A18.17   The impact of delay on the competition benefits is set out in greater detail in tables 2 and 3 of annex 9.

A18.18   Thus we see that a delay of a year or more in the release of 900MHz spectrum would result in a significant reduction in the competition benefits of release.

Cost of release

A18.19   Delay to the date of release could also reduce the costs of release. The impact of delay on the costs is set out in annex 16 (see tables 50, 54 and 57) and is summarised in the table below. This shows that delaying release of 1 block of

spectrum from 2011 to 2012 reduces the release costs by £10m to £20m. Delaying by a further year reduces the costs even further.

Table 5: Impact of delay on cost of release

Cost of release – 1 block, Approach 3 £m	Low	High
Release in 2011	60	90
Release in 2012	50	70
Release in 2013a (20% reduction in current 2G traffic levels at time of release)	35	40
Release in 2013b (50% reduction in current 2G traffic levels at time of release)	20	25