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2010-01-19

COMMENTS ON THE 1800MHz QUESTION

Hi3G would like to reconfirm its interest in 1800MHz spectrum, and repeat its interest in being awarded 2x20MHz spectrum.

As a single comment on the extension issue; under the condition that the following comments are taken into account, 3 can agree to the proposed extension of 2x10MHz to each of TeliaSonera, Tele2 and Telenor, and to the allocation of spectrum to Swefour. 3 would however firmly oppose and challenge any extension of larger amounts of spectrum to these operators.

On the auction, and as background

3 would like to stress the following four important issues

There are still three incumbents in Sweden

The Swedish mobile market is characterized as highly competitive, resulting in low end user prices. However, even though there are several network owning operators, all these do not compete on comparable terms. The three major operators, TeliaSonera, Tele2 and Telenor, all have several advantages over challenging operators like 3.

TeliaSonera, Tele2 and Telenor have all entered the market at least 10 years before 3. Furthermore, the size of their operations and the number of subscribers give them the advantage of economy of scale. Taken together, this gives them a financial stability and strength which in an auction situation cannot be matched by any other operator on the Swedish market. Besides this, and maybe more importantly, the abundance of frequencies they already have on all bands gives them, and only them, the freedom to fully explore the future developments of LTE.

In the beauty contest for the 3G licenses in 2000, PTS acknowledged the problem with the three incumbents. At that time, PTS defined the incumbents as an oligopolistic market structure. The remedy and very active choice from PTS was to secure at least four market players on a national basis. PTS therefore awarded four 3G licenses, not three. In view of this and market developments, it is 3's firm opinion that PTS is under the obligation to maintain the possibilities for at least four operators to compete on equal terms on the national market. Investments made

by for an example 3 has relied on this, and unless PTS maintains this fundamental approach it would seriously undermine the investments made by 3, and also future incentives to invest in infrastructure in Sweden.

The three operators are incumbents, and regulatory intervention should be imposed to prevent these three from utilizing their market position to the detriment of competition, both on the infrastructure level as well as downstream retail markets.

Tele2 and Telenor must be seen as one entity.

The concentration of dominance with these three incumbents becomes even stronger with the recently announced cooperation between Telenor and Tele2 (under the name Net4Mobility). As far as known, the cooperation will include building a joint 2G and a joint 4G network on a nationwide basis. 3 would like to emphasize that the cooperation is probably an efficient way of building infrastructure. However, in addition to this, the two operators have also announced their intention to pool spectrum for this joint use. Thus, and with regard to spectrum issues, they will in practice act as one entity and accordingly also should be seen as one entity

If Telenor's and Tele2's apparent intention is to pool spectrum, and if they are not seen as one entity, it will only be a blatant way of circumventing any spectrum cap. This creates concern since the possibility to pool spectrum enables them to reach unique and irreplicable maximum speeds as well and irreplicable capacity gains through the means of trunking efficiencies.

3 needs 2x20MHz on the 1800 band, or at least the same amount as the incumbents

The characteristics of LTE are such that the more spectrum you have the faster services can be provided.

The maximum theoretical peak rates achievable using 2x2 MIMO, 64 QAM and coding rate 1/1 are:¹

- With 5 MHz - 42.5 Mbps (36.7)
- With 10 MHz - 85.7 Mbps (73.7)
- With 15 MHz - 128.9 Mbps (110.1)
- With 20 MHz - 172.1 Mbps (149.8)

Capacity is proportional to the amount of available bandwidth/spectrum. However, continuous spectrum allocation will provide better capacity than non-continuous spectrum due to improved trunking efficiency and practical issues such as scheduler limitations.

In the longer perspective it will be possible to use spectrum on several bands (/ie, merge two blocks on the 1800 band with two blocks on the 2500 band). However, this will not happen until LTE Advanced is available (3GPP R10). As far as 3 understands, earliest implementations are expected during 2012 on the system side and from device vendors no earlier than 2015.

¹ The figures within the parenthesis are the limitation set by transport block size (i.e. the maximum peak achievable by one Ue).

3 would like to stress that such a multiple band solution will entail additional costs, technical difficulties, and capacity losses compared to an operation with contiguous single band frequencies. Every band will require its own hardware which results in multiple costs. Multiple band solutions also require coordination of transmitters which in its turn lead to a lower quality of coverage and capacity. From a management point of view, such a multi band operation will be complex and more difficult to operate than a single band operation. Thus, from a competition point of view it is not a comparable option to a contiguous single band operation.

From market perspective offered speed is imperative to be able to compete.

It is 3's firm opinion and experience that without a matching or superior speed offer, a provider of mobile broadband services will not be successful. The possibility to compensate a lower offered speed with a lower price is limited since the price levels of mobile broadband services have already been pushed very low. The key reason besides fierce competition is the settled price levels of the ADSL market.

Thus, without access to an equal amount of spectrum and without the possibility to offer speeds comparable to those of the incumbents, 3 runs the serious and very obvious risk of not being able to compete on a sustainable ground.

Given that PTS is equipping the incumbents with 2x10MHz spectrum, and the incumbents already stated intention to acquire additional spectrum, 3 is expecting them to secure at least 2x20MHz 1800MHz spectrum each. In order to be able to compete, 3 will be forced to secure an equal amount of spectrum.

More importantly, the three incumbents had the financial means to acquire 2x20MHz each in the 2,6GHz auction, while 3 only managed to acquire 2x10MHz. TeliaSonera has already launched LTE services using this spectrum. With the amount of spectrum the incumbents each control on this band, they will be able to provide high speeds, something 3 will not be able to do. 3's only possibility to match such speeds is to acquire sufficient spectrum on the 1800MHz band. Only then will 3 have the possibility to offer comparable speeds. Thus it is necessary for 3 to acquire 2x20MHz and nothing less on the 1800MHz band.

The first mover advantages are so obvious that once the incumbents all have launched LTE, 3 will not have the possibility to wait for LTE Advanced and multi band solutions to be available.

In summary

The Swedish mobile market is still largely concentrated to the three big operators. With this and the cooperation between Tele2 and Telenor, Sweden runs the risk of returning to an oligopoly. Competition is dependent on 3 being able to keep challenging the incumbents. 3 must therefore be given the fair and reasonable chance to acquire matching amounts of spectrum, and the Net4Mobility cooperation cannot be given the opportunity paralyze competition. This ought also to be a priority for PTS.

Comments on the proposed auction

In order to give challengers a fair and reasonable chance to compete,

- PTS needs to provide operators not granted free 1800MHz spectrum the possibility to participate in a separate allocation for 2x10MHz not open for the incumbents (TeliaSonera, Tele2, Telenor and Swefour).
- In the subsequent auction for the remaining 2x30MHz, PTS needs to impose spectrum caps limiting the total amount of spectrum any operator may hold on the 1800MHz band to 2x20MHz.

A separate allocation not open for the incumbents of 2x10MHz is required

For two reasons 3 believes that a separate allocation not open for the incumbents is required to set a level playing field:

First, from a fairness point of view; PTS is equipping the incumbents with an asset for free. The license extension is currently motivated by their need to maintain GSM services, but within a foreseeable future, GSM will be replaced by LTE. When this happens the three incumbents are likely to compete with any other operator who has managed to acquire 1800MHz spectrum. For the latter this would have entailed investing in the spectrum.

On a principle level non-incumbent operators should be given the possibility to acquire spectrum on equal terms with the incumbents, namely for free, but given that there is a likely spectrum shortage, the least that can be expected is that other interested parties do not have to compete with the incumbents when trying to acquire spectrum in order to reach an equal footing.

Secondly, and maybe more important; without a separate allocation not open for the incumbents, the redistribution of the 1800MHz spectrum runs the risk of becoming an inefficient allocation of spectrum. Even if a challenging operator places a higher value on the spectrum, the incumbents can still be successful in acquiring more spectrum.

If there are complementarities in bidders' valuations for blocks of spectrum (or if bidders have increasing marginal valuation for spectrum) – i.e., if a bidder's valuation for a given amount of spectrum is higher if the bidder already owns some spectrum than if he does not own it – then assigning spectrum prior to the 1800MHz auction provides an advantage to some of the bidders and may result in an inefficient allocation of spectrum.

The separate allocation can be done through the means of a pre auction or with the use of reserved blocks in the auction. It would of course depend on the format of the auction which would be the more suitable.

3 would favor the separate allocation of 2x10MHz being done parallel with the remaining auction. This would give 3 the transparency to correctly value the spectrum. As argued above, the value of a full 2x20MHz block differs from the value of lesser assignment, and to correctly assess its bidding strategy, 3 would want to have the overview.

In further elaboration of the complementary effects, 3 would like to refer to the attached appendix, “*Comments on the 1800 MHz Swedish Auction: The Effects of Complementarities and Predatory Strategies*”, by Professor Marco Pagnozzi of the Università di Napoli Federico II and CSEF.

A spectrum cap on the remaining 30MHz is required

In addition and subsequent to the pre-auction, a spectrum cap must be introduced for the remaining 2x30MHz. The aim need not be to ensure an absolutely even distribution of spectrum, but a cap that gives at least three infrastructure operators (counting Telenor and Tele2 as one, otherwise four) the reasonable possibility to acquire sufficient spectrum.

The spectrum cap should be set at 2x20MHz, including whatever an operator has been given for free or acquired in a pre-auction.

A predatory strategy by incumbents in the 1800MHz auction – i.e., incumbents bidding especially aggressively (and for a larger amount of spectrum than they actually need) in order to prevent competitors from acquiring any spectrum – may otherwise result in a more concentrated and less competitive market for mobile-phone services. A spectrum cap makes predatory strategies ineffective.

Anything less threatens to reintroduce the oligopoly that existed in 2003 prior to 3’s market entry, a competitive situation neither PTS nor the Government of Sweden found or should find acceptable.

Please note that such a spectrum cap would in no way restrict the number of operators but rather ensure the possibility for a minimum number of competitors to acquire spectrum

3 would also here like to refer to the attached appendix, “*Comments on the 1800 MHz Swedish Auction: The Effects of Complementarities and Predatory Strategies*”,

Conclusion

As set out above, PTS needs to arrange for a separate allocation not open for the incumbents who have been granted a free extension. This would give other challengers the possibility to bid for an equal amount of spectrum to come on an equal footing. This is motivated by a strong fairness point of view but also because the allocation of spectrum otherwise runs the risks of inefficiency.

Secondly, in the subsequent auction for the remaining 2x30MHz, PTS must impose spectrum caps. The risk of predatory strategies by the incumbents must be managed and spectrum caps are the most efficient remedy.

3 questions whether or not the present auction proposal is in conformity with EU Guidelines in terms of possible discrimination. Furthermore, 3 questions whether or not the proposal is in conformity with the revised GSM Directive, which requires Member States to take account of the impact on competition when refarming spectrum.

If the current approach is not changed to address the possible competition distortions, it could provoke legal proceedings. This would lead to a delay in the allocation of new spectrum and the refarming of existing spectrum, to the detriment of competition and Swedish consumers.

The flaws in PTS's proposed auction become particularly problematic when taking into account that the licenses that are about to be issued will be valid for at least the next 15 years. Thus, if wrong decisions are taken now, the competitive balance may be tilted in an irreparable way.

Hi3G is of course at your disposal if we can be of any assistance or if any questions should arise.

Yours faithfully

David Mothander
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