Decomissioning 2G and 3G will force operators to share networks at a national scale

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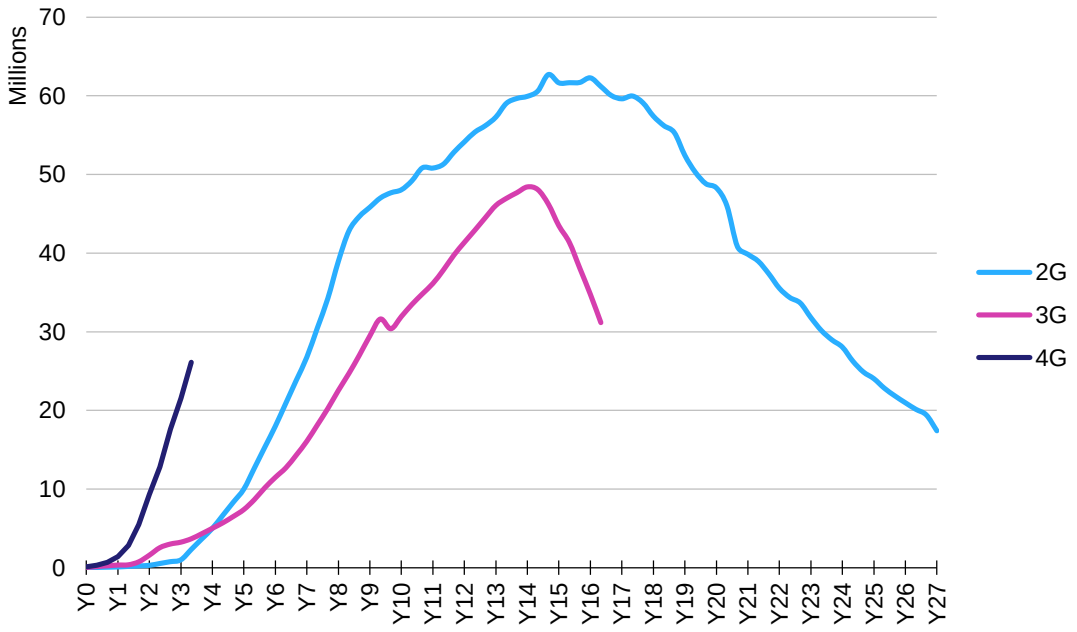
4G take-up across Europe has been impressive, and is starting to make 2G and 3G networks look obsolete. But with a stubborn rump of subscribers, and a range of possible M2M opportunities, operators have to weigh up the pros and cons of switching off obsolescent networks. A perfect solution could be for operators to come together and share a single legacy network.

4G's meteoric rise

The European mobile industry is rushing to satisfy 4G demand, with take-up three times faster than was the case with 3G. EE, the UK's largest MNO and leading 4G operator, now has more traffic on its 4G network than on its 3G network, despite the fact that only 35% of its devices are 4G-capable.

Figure 1: Connections by technology from year of launch, UK [Source: GSMA Intelligence, 2015]



With the fanfare that accompanied the release of 3G technology, there was talk in the industry of switching off 2G networks, but this has yet to happen. Take-up of 3G was unspectacular, stifled by the high cost of handsets and limited coverage caused by technical issues linked to cell breathing and the deployment of high-frequency spectrum. This slow take-up meant 2G networks continued to play an important role plugging the gaps.

4G fixes all: in terms of spectrum 4G can be operated over low frequencies (800MHz) which allow it to match the coverage of 2G networks. At the same time, higher-frequency 4G bands (1800MHz, 2.6GHz) allow 4G to fulfil the needs of the smartphone consumers with exceptional capacity in areas of high footfall.

The final piece of the 4G jigsaw relates to voice traffic. 4G needs to be a standalone technology, optimised for the best customer experience, not pushing customers onto 2G/3G networks to take a voice call. 4G calling (VoLTE) is critical to deliver on the 4G promise and it need to be the highest priority. With 16 live VoLTE networks and a further 90 in testing or deployment[1], operators still have some work to do.

The device challenge

So with declining subscriber numbers and no need to provide voice fall-back for 4G, the future for 3G and 2G networks would be bleak, except for one thing: Operators have thousands of different devices attached to their networks. Whether it's the dogged adherence of some users to their trusty old 2G handsets or the growing array of M2M modules on long-term contracts, operators need a network to support these devices, and switching them off would be extremely unpopular.

This leaves operators with the problem of a dwindling but resilient user base that is inefficiently using expensive spectrum. The scale of this user base cannot justify large and underutilised 3G and 2G networks indefinitely. Step forward the *single legacy network*.

The sharing solution

When the banking industry realised that the days of the humble cheque were numbered, it pooled processing facilities into a single industry unit. This facility was in 'managed decline' from Day 1, with the focus on cost saving and maximising the use of existing assets allowing a phased winding down.

The mobile industry can apply the same principle: operators could combine existing 2G and 3G assets and manage their decline until the last legacy device is switched off. Valuable spectrum can be freed up through spectrum pooling, ideally combining all residual 2G and 3G traffic into the 900MHz band. The single legacy network can then balance the declining demand for 2G and 3G capacity with minimal impact to 4G networks.

Network sharing on this national, multi-operator, scale has its challenges, but they are not insurmountable, particularly for those with experience of network sharing:

- The commercial model will need a lot of development. Ideally the network would cover its own costs. As subscriber numbers dwindle, and the cost per user increases, operators have a clear business case for swapping equipment (above all, users' handsets) to hasten switch-off.
- Resolving the decisions over the equipment and sites to be used for the single legacy network may involve equalisation payments to harmonise benefits to the various operators; these payments are notoriously hard to agree.
- Regulatory hurdles may need to be overcome, particularly with spectrum pooling and operators sharing information over future plans.
- Financing models will also need to be considered, particularly as the cost to consolidate existing 2G and 3G assets could be significant.

Compared to the long-term financial commitment of maintaining competing 2G and 3G networks, the advantages of a single shared legacy network are unambiguous.

The key question is timing

EE has already reached the point where 4G traffic exceeds 3G traffic. The start of an accelerating decline in 3G traffic looks inevitable. Operators face the difficult task of predicting the point at which the value of refarming the 2G and 3G spectrum to 4G will exceed the cost of supporting the remaining 3G and 2G users: at that point it is more economical to switch those users onto a single legacy network.

That tipping point will be different for each operator, but passively waiting for that moment to arrive is not a sustainable strategy. Network-sharing agreements take time to negotiate and even longer to implement. If the decline in 2G/3G is particularly rapid, operators will soon be leaving benefits on the table.

Working out who to share with, which assets to use, the commercial model and most importantly timing can all be done today; operators that watch and wait may well miss the boat.

Analysys Mason has advised operators and investors on every aspect of mobile network sharing for over 10 years. If you are contemplating how to cost-effectively manage legacy networks, please contact Charles Murray on +44 7770 238704 or charles.murray@analysysmason.com; we would be happy to discuss the opportunities and challenges of a single legacy network in your markets.