GSMA

The Impact of Spectrum Set-Asides on 5G

Finland

Incentivising innovation without set-asides through licence conditions and cooperation



Key lessons

What: Obligation for 3500 MHz licence holders to negotiate private network contracts or sub-licence spectrum

Why: Deployment of innovative industry uses without affecting mobile usability

How: Requirement for operators to respond to tenders launched by industry users to negotiate access to 3500 MHz

Impact: Increased collaboration between operators and industry whilst providing strong investment incentives in 5G mobile networks

Overview

- The objective of the Finnish traffic and communication ministry and regulator has been to make Finland a 5G frontrunner in research and development, promoting innovative business solutions.
- To foster the deployment of local private networks in Finland, 3500 MHz licence holders were required to provide network services on request or to sub-licence the spectrum.
- This approach has positively contributed to an increasing number of innovative cooperations between industry users and mobile operators – even where the local services have not been actively requested as defined in the 3500 MHz licenses.
- At the same time, the absence of a set-aside in one of the key mobile bands has ensured Finnish operators were not inhibited and could quickly deploy 5G using up to 130 MHz.

Background

As part of a policy to promote Finland as a 5G innovator and testbed, licence conditions in the 3500 MHz mobile spectrum auction in 2018 fostered the provision of private network services without a dedicated set-aside.

The licence conditions stipulate that mobile operators must, where requested by tender, deploy a private network that meets the specified customer needs in a localised area, such as a hospital, port, or industrial facility. Operators can charge reasonable, non-discriminatory fees for these deployments. Alternatively, if they consider the tender requirements overly onerous, they must sub-licence 3500 MHz spectrum within the specified area instead.

Separately, enterprises as well as research and educational facilities (or the operators providing services for such users) can apply to Finnish regulator Traficom for local access to a dedicated set-aside of 20 MHz in the 2300 MHz band and 850 MHz in the 26 GHz band. In these bands, up to six-year licences are granted to applicants on a case-by-case basis. The fees are affordable by design and depend on the requested bandwidth and population coverage. Networks operating outdoors in close-by geographic areas must subsequently synchronise to avoid interference, whilst some areas have significant restrictions in the 2300 MHz band due to incumbent usage by wireless cameras. Whilst the use of these bands is limited to private and minor public service in a local area, the applicant for the set-aside can also be a mobile operator, reflecting their role in providing tailored local services.

Main lessons

In February 2022, Telia became the first mobile operator globally to deploy a virtual private network based on slicing and edge computing. The installation was made at Swedish company Sandvik's Finnish test mine. Further private network deployments, with mobile operators as a partner, include projects for automated port operations, mission-critical networks for nuclear waste disposal, and for improving safety and operations in a gold mine.

Traficom does not publish details of the take-up of private networks or spectrum leasing. However, the test cases highlight the incentives for deploying innovative 5G networks inherent in the 3500 MHz licence conditions, fostering cooperation between operators and industry users.

According to Traficom, eleven licensees are using the 2300 MHz set-aside, and only four licensees are using the 26 GHz set-aside as of September 2022. Whilst the 2300 MHz band is not used for wide-area mobile services in Finland today, the band has been made available in neighbouring countries – therefore, this comparatively small set-aside may create a long-term economic cost by hindering a re-assignment of the band to public mobile networks if the clearance of other uses in the 2300 MHz band is possible in future. Such concerns are less prevalent for 26 GHz, where mobile operators today have access to 800 MHz each.



Obligations via licence conditions



Focus on cooperation (between MNOs and verticals)



Cutting-edge pilot projects emerging

Final impact

Finland met the spectrum needs of nationwide and private networks without a set-aside in any core bands. In doing so, the authorities created an efficient compromise that has preserved spectrum usability and created incentives to invest in mobile connectivity.

Finnish operators are among the world leaders in 5G deployment. Telia had infrastructure ready ahead of the auction in September 2018, allowing it to launch a pre-commercial network in November 2018. All three operators launched 5G services in 2019 and expanded network coverage throughout the coming years. Telia then launched 5G Standalone in November 2021, making it one of the first operators to do so in Europe.

Finland has seen successful and innovative cooperations between industry and mobile operators, whilst there has been relatively limited interest for licenses in the spectrum reserved for local mobile licenses in the 2300 MHz and 26 GHz bands. In a country where mobile data use per population is among highest in the world, future spectrum allocations should take these developments into account, relying on cooperations where possible rather than raising the risk of underutilised spectrum assets through dedicated set-asides.