



European benchmark of relative spectrum costs

Report for KPN

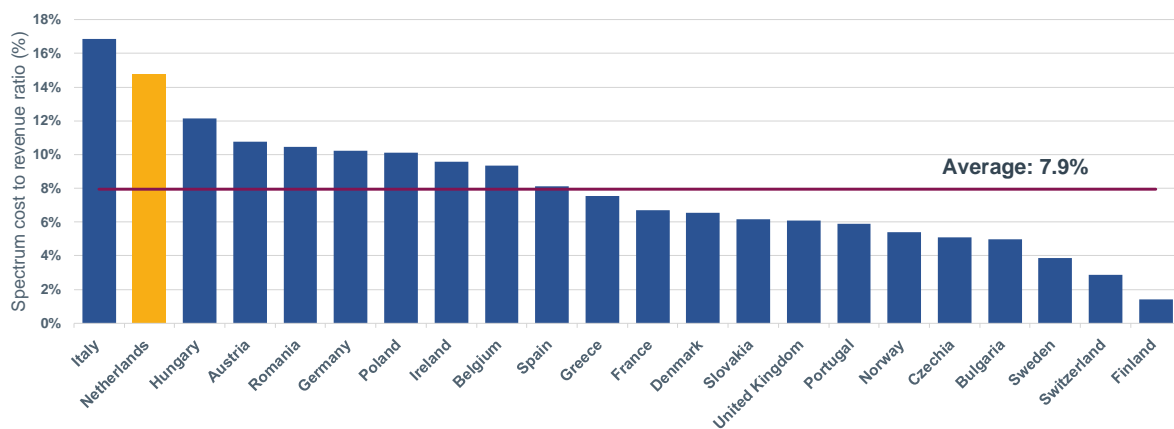
July 2024

This report has been prepared by Aetha Consulting on behalf of KPN to compare the level of spectrum costs faced by mobile network operators (MNOs) in the Netherlands to those across Europe. Our approach has been to calculate and compare the ‘spectrum cost to revenue ratio’ in the Netherlands and 21 other major European countries, updating a benchmark originally prepared in 2021.¹

In calculating this ratio, we have considered the costs of all current spectrum licences held by MNOs, not just those for recently awarded spectrum. We have also included both the upfront payments (translated into an annualised amount) and any annual fees associated with each licence. The resulting annualised spectrum cost for each country has then been divided by annual mobile service revenue for that country. Further details of our approach are provided in Annex A.

The benchmark results are presented in Figure 1 below. Our key finding is that, at 14.8% of mobile service revenues, the Netherlands has the second highest spectrum cost of all 22 major European countries included in our research. This figure is ~6.9 percentage points (>85%) higher than the benchmark average of 7.9%.

Figure 1: Spectrum cost to revenue ratio in European countries [Source: Aetha]



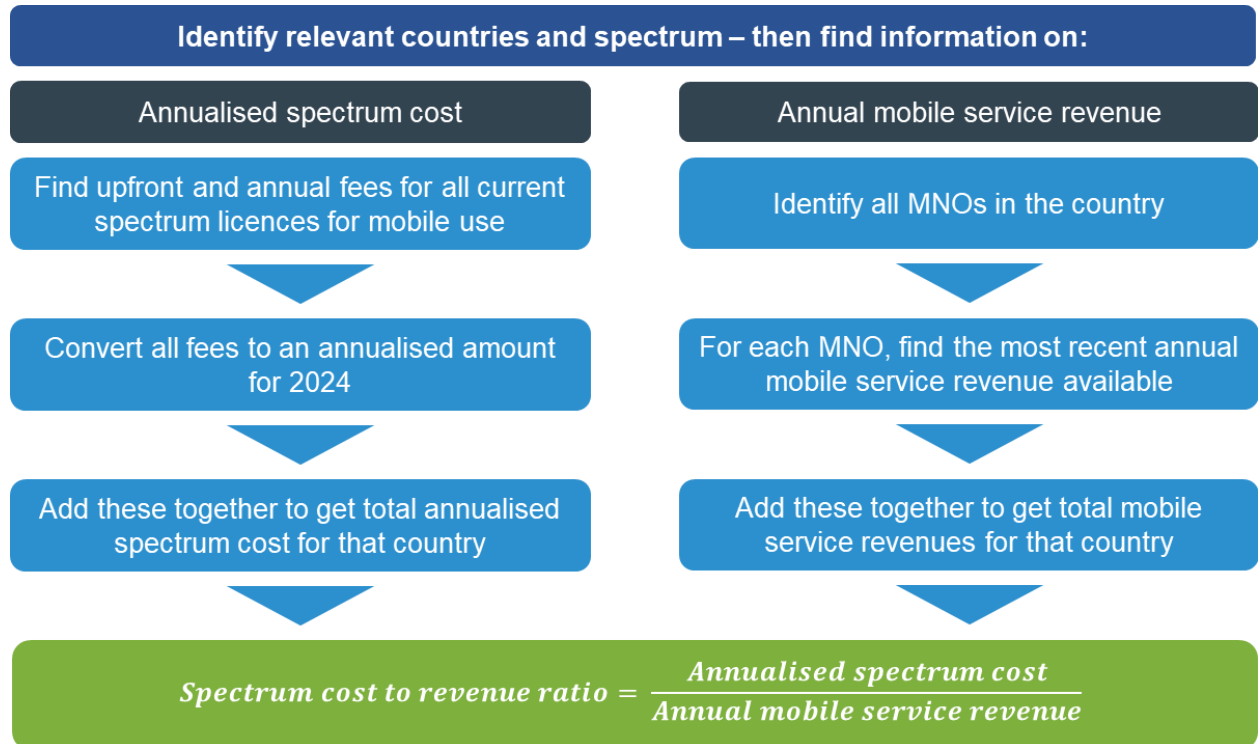
Rising spectrum costs and stagnant mobile service revenues are increasing the spectrum cost burden on MNOs in an unsustainable trend which is confirmed by the results of our analysis. In 2021, we found that the average spectrum cost to revenue ratio in Europe was 7.0%. It has now increased to 7.9%. Likewise, this ratio was 14.2% for the Netherlands in 2021, and has now increased to 14.8%.

¹ The 2021 report has been uploaded to Aetha’s website as supporting information. It was originally submitted to the Ministry of Economic Affairs in 2021 as part of KPN’s response to its consultation on the 3.5GHz auction: <http://www.aethaconsulting.com/wp-content/uploads/2024/07/A-European-benchmark-of-relative-spectrum-costs-23-June-2021-1.pdf>

Annex A Methodology

This report compares relative spectrum costs between European countries. To do so, it calculates the 'spectrum cost to revenue ratio' – i.e. total annual spectrum costs as a proportion of mobile service revenues – as shown in Figure 2. This gives a normalised metric of spectrum cost which accounts for differences in e.g. population and wealth to allow meaningful comparison between countries.

Figure 2: Overview of methodology



The key, and most complex, step in this process is the conversion of spectrum fees to an annualised amount for 2024. To calculate the annualised spectrum cost, we have (for each spectrum licence):

- Identified the 'upfront' spectrum cost and adjusted for any staged payment by discounting this to a present value using a discount rate of 7%
- Converted to EUR using the market exchange rate at the date of award
- Adjusted the fee for CPI inflation in the European Union since the date of award
- Converted to an annualised equivalent using the following formulae and a discount rate (DR) of 7%:

$$\text{Annualised fee} = \frac{\text{Total fee}}{PV_{\text{year}}} \quad \text{where} \quad PV_{\text{year}} = \sum_0^{L-1} \frac{1}{(1 + DR)^l} \quad \text{and } L \text{ is licence duration}$$

- Added any annual fees for the licence (converting to EUR at the market exchange rate).

We have included all EU countries with a population of more than five million people. This covers 19 countries, which together account for 97% of the EU population. In addition, we have included Norway, Switzerland and the UK, all of which also have a population above five million.

For each benchmark country, we have gathered all relevant spectrum licence cost information (both upfront and annual fees) on all major spectrum bands used to provide mobile services. This includes any spectrum in the 700MHz, 800MHz, 900MHz, 1500MHz, 1800MHz, 2.1GHz, 2.3GHz, 2.6GHz, 3.5GHz and 26GHz bands where these bands have been awarded for commercial mobile purposes.