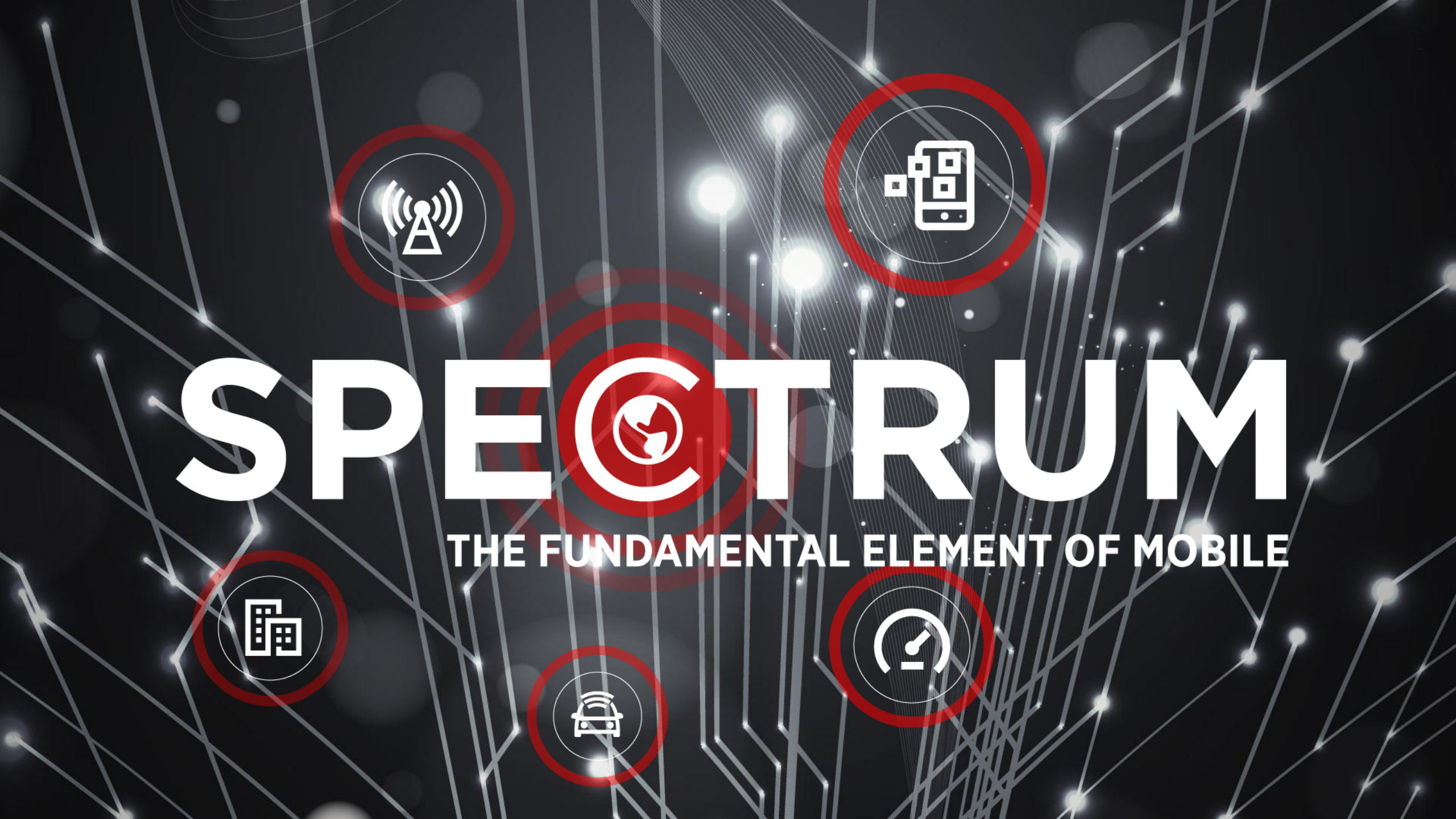
SPECTRUM
THE FUNDAMENTAL ELEMENT OF MOBILE

Effective price benchmarking

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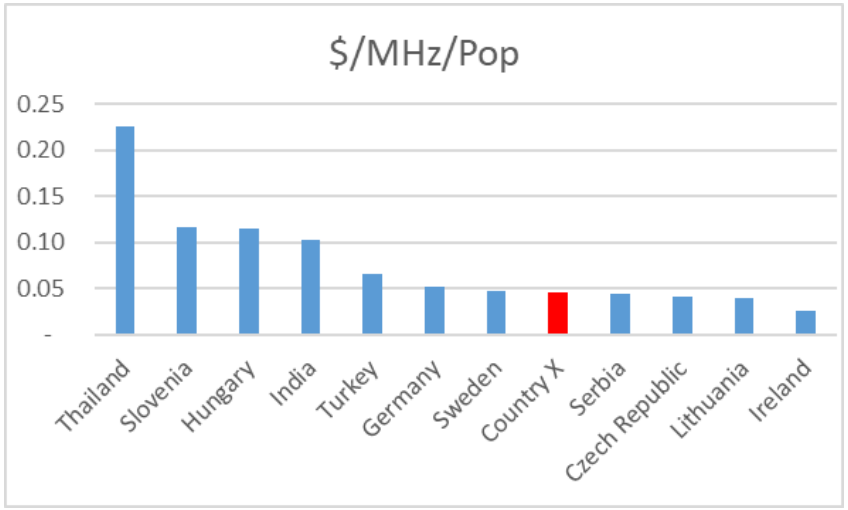
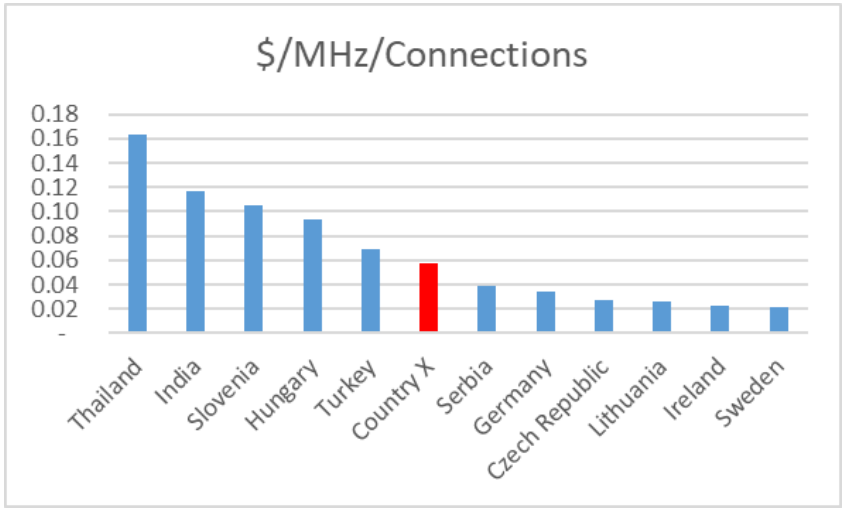
Senior Spectrum Director – GSMA

Effective Benchmarking 1/3

Simple benchmarking: price per population or connections?





Advantage: less historical variation, could compare potential of the markets (potential number of consumers).
Disadvantage: do not take into account mobile penetration, so only if all markets have fairly similar adoption

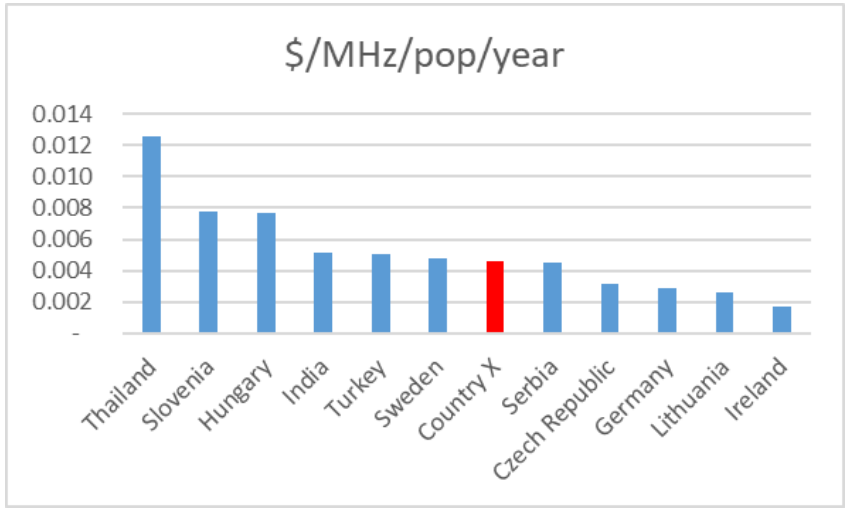
Prices for country X appear to be reasonable

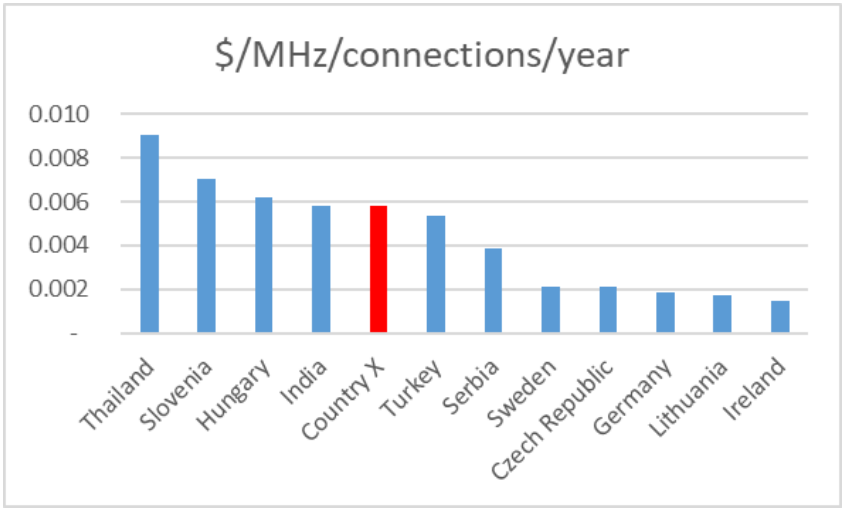
Advantage: more meaningful if mobile penetration is very different
Disadvantage: more historical variation, need connection figure on the year of auction

Because the penetration is low, price in country X is effectively higher for the operators.

Effective Benchmarking 2/3

Take into account the license terms, especially the duration (in years):





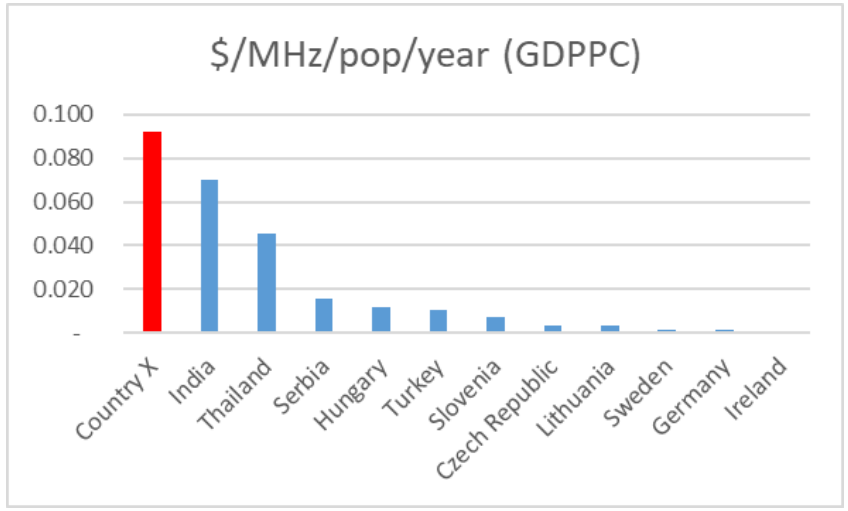
Advantage: simple, and easy to understand numbers
Disadvantage: still comparing “apple and oranges” unless they are very similar revenue

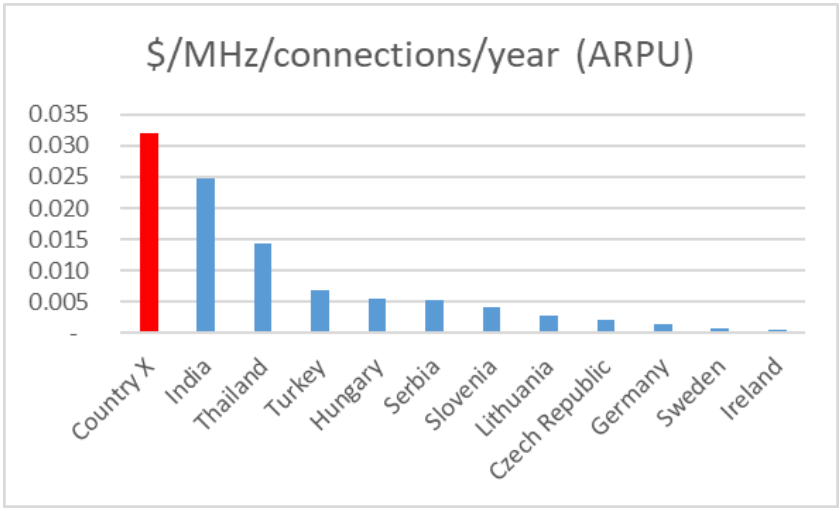
Mostly used for news headline, to compare to historical prices or across different bands, of the same country.

Because Country X has a shorter license term than most of this data set (~ 20 years), it is effectively more expensive on per year basis

Effective Benchmarking 3/3

Take into account the willingness to pay from consumers (Gross Domestic Product per Capita- GDPPC as proxy) or potential revenue for operators (Average Revenue Per User - ARPU)





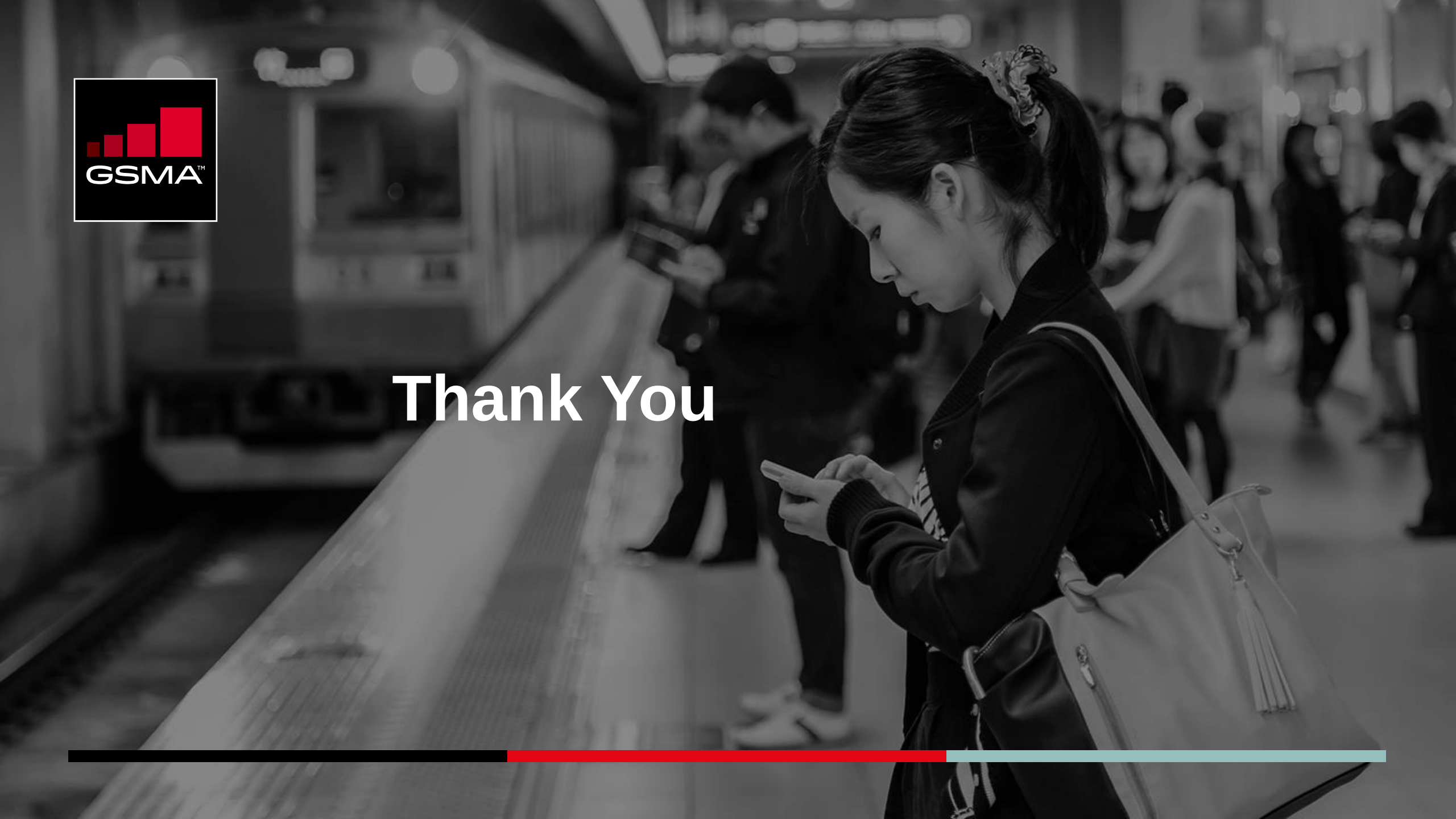
Normalisation per GDPPC

$$\frac{\text{Reserve price in \$}}{\text{MHz x Population x Licensing duration}} \times \frac{\text{Average GDPPC}}{\text{GDPPC of CountryX}}$$

Normalisation per ARPU

$$\frac{\text{Reserve price in \$}}{\text{MHz x connections x Licensing duration}} \times \frac{\text{Average ARPU}}{\text{APRU of CountryX}}$$

Country X come out as the most expensive country for the operator to acquire spectrum compare to the rest of dataset, once we take into account its ARPU and GDPPC.



Thank You