# FRONTIER ECONOMICS STUDIES: FICTION VS REALITY OF C-BAND REALLOCATION IMPACTS

**Studies by Frontier Economics on C-band reallocation* aim at comparing benefits vs. costs of C-band re-allocation, calculated as the gross-value added to the economy. The studies cover three regions: Asia Pacific, Africa and Arab States and compare the benefits of using C-band for mobile use with the costs of reallocating spectrum for satellite operators. The benefits are computed using the auction price of 2.6 GHz as a benchmark for C-band value, after adjusting it for country-specific and technical differences. The results obtained for case-study countries are extrapolated for the considered regions.**

* "Economic assessment of C-band re-allocation", "Economic assessment of C-band re-allocation in Africa" and "Economic assessment of C-band re-allocation in the Arab States region" all published by GSMA

## Missing elements in the Frontier Economic studies: impacts and stakeholders

| Impact on | Existing players and users | New players and users |
|---|---|---|
| **Costs** | Reallocation costs for satellite operators | Costs for mobile operators |
| **Benefits** | Lost revenues for satellite operators; and lost benefits for users from disrupted / unavailable services | Benefits for mobile operators |

Covered by the methodological approach

Not covered by the methodological approach

## Frontier Economics studies: selection of methodological flaws

### Ignores cost of reallocation

The impact on existing C-band users and the stakeholders they serve is ignored. C-band services they rely on cannot be cost-effectively migrated to other frequencies. Reallocation would have socio-economic impacts going well beyond those on operators

### Uses incomparable benchmarks

Economic benefits are overestimated by using auctions on 2.6 GHz - a band with different characteristics - as a benchmark for spectrum value rather than 3.5 GHz auctions

### Incorrect approach to calculations

Country specific factors, obtained by using an inaccurate calculation approach, further inflate spectrum value for some of the case study countries. Wrong quantifications are then extrapolated for the considered regions

### Multiplier effect of errors

These two errors described above generate a multiplier effect that leads to further overestimating calculated benefits

### Overlooks alternatives

Efficiency gains deriving from the usage of alternative methods to provide capacity (additional network deployment, off-loading mobile traffic onto fixed networks, etc.) are expressed qualitatively but are not quantified. Alternatives options to C-band for spectrum usage are also ignored.

**The methodology proposed by Frontier Economics presents an incomplete and inaccurate analysis by failing to consider the impacts on existing users and operators and by overestimating reallocation benefits for mobile operators**

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# PLUM REPORT FOR HUAWEI: A PARTIAL VIEW ON SPECTRUM SHARING BENEFITS

The Plum study for Huawei "The economic benefits from the use of C-band (3600-4200 MHz) for mobile broadband in the UK" considers the economic benefits of sharing C-band for mobile data services in the UK. Benefits are calculated as the reduction of cost that operators could experience to satisfy mobile demand growth (e.g. savings on macro cell and outdoor small cell deployments). Mobile operators benefits are quantified for a "base case" and two alternative cases with greater spectrum availability. Alternative cases are based on two technical solutions proposed in the study:
"link performance aware frequency sharing" and "advanced frequency sharing"

This study has just been extended to 3 other EU countries (Hungary, Italy, Sweden).

## Missing elements in the Plum study: impacts and stakeholders

| Impact on | Existing players and users | New players and users |
|---|---|---|
| Costs | Spectrum sharing impacts on satellite operators and users | Costs for mobile operators |
| Benefits | Lost revenues for satellite operators; and Lost benefits for users from unavailability or disruption of existing services | Benefits from avoided capacity upgrade investments to be sustained by mobile operators |

Covered by the methodological approach

Not covered by the methodological approach

## Plum study: selection of methodological flaws

**Mobile-centric view**

The study offers a mobile-centric view, covering only the benefits for mobile operators, and does not consider the current use of C-band and the resulting value

**No consideration of alternative bands**

No alternative bands to the C-band are considered, meaning that benefits and costs of spectrum sharing are not compared with those in other possible bands so as to establish the optimal approach

**Unproven technical concepts**

Link-performance aware and advanced frequency sharing are unproven sharing techniques, making most of the study results questionable because large benefits are estimated based on unverified solutions

**Ignores disruption costs**

Considered costs do not cover the disruption of service to current users of the C-band (e.g. Broadcasting, PMSE), leading to an overestimation of total benefits

**Inaccurate assumptions**

Inaccurate assumptions on UK population growth and subscriber density (overestimated), as well as on cell spectrum efficiency (underestimated) are salient flaws for the calculation of benefits for mobile operators of C-band sharing

**The study presents a very partial view on the impact of C-band sharing for mobile use. Quantification of benefits is biased due to the use of unproven technical solutions and to the presence of inaccurate assumptions**

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