

**Presentation to the Panel on Information Technology and Broadcasting,  
Legislative Council of the Hong Kong SAR**

# Study on the implementation of spectrum trading in Hong Kong

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## Focus of the consultancy study

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- The Commerce and Economic Development Bureau asked Analysys Mason and DotEcon to provide an assessment on the potential implementation of spectrum trading in Hong Kong, taking account of the latest market developments
- This presentation summarises our findings and recommendations on the following points:
  - Latest overseas experience
  - Demand for and supply of spectrum for trading in Hong Kong
  - Potential costs and benefits of a spectrum trading regime in Hong Kong
  - Recommendations on possible approach to implementing spectrum trading regime in Hong Kong
  - Alternative approaches to improving spectrum efficiency

## Spectrum trading

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*“Spectrum trading, or the transfer of Spectrum User Rights, denotes a mechanism whereby rights of use are transferred from one user to another for a certain price. In contrast to a system in which spectrum is returned to the regulator and then re-assigned, the trading approach is characterized by:*

- Transfers of rights are initiated voluntarily by the present user;*
- The sum paid by the new owner of the Spectrum User Rights is retained, in full or in part, by the previous owner.”*

**ITU, 2006**

Spectrum trading is a secondary spectrum assignment mechanism where licensees buy and sell spectrum against a monetary consideration

## Context-dependent benefits, unconditional costs and risks

### Benefits

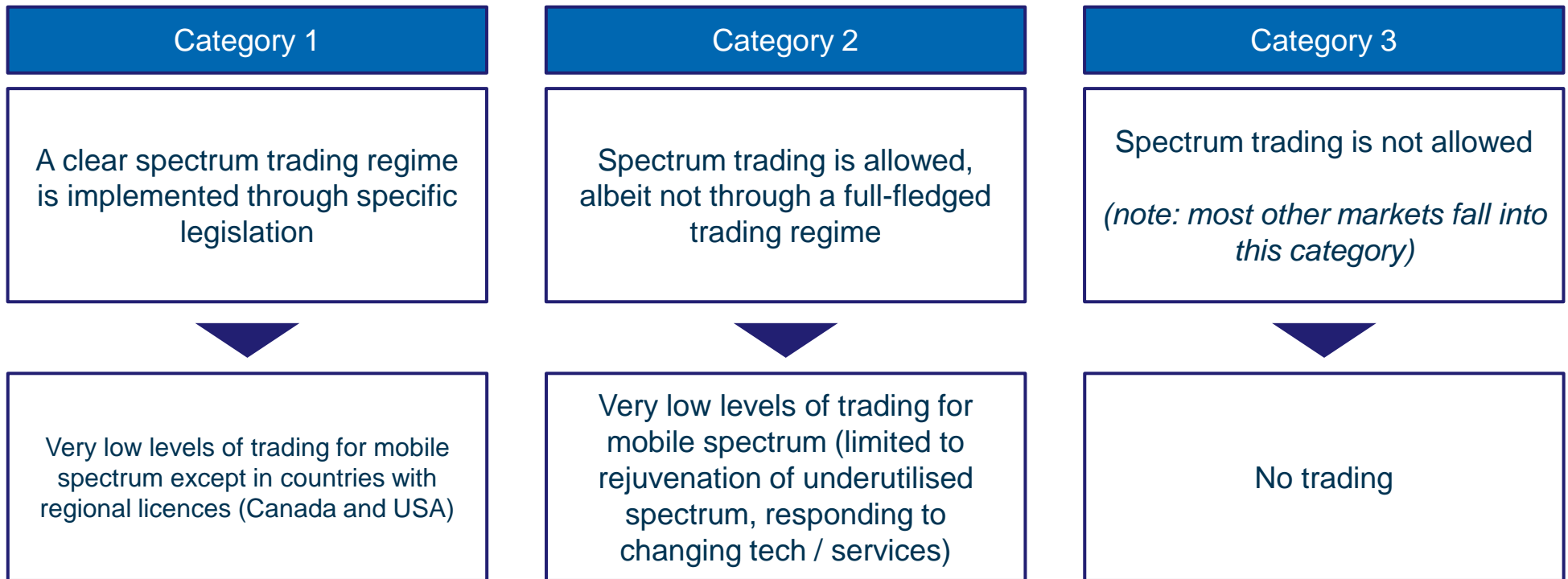
- Aggregation of regional spectrum holdings
- Rejuvenation of underutilised spectrum
- Lower barriers to expansion
- Flexibility to allow spectrum use to evolve with changing market demands
- Additional incentives to change the use of spectrum with perpetual licensing
- Reduction of administrative burden on the regulator

### Costs and risks

- Spectrum hoarding
- Windfall profits and other private profits from spectrum trading
- Over-concentration of spectrum leading to foreclosure of competition
- Loss of harmonisation
- Increased risk of interference
- Distortion of auction dynamics

The actual benefits of spectrum trading are strongly context-dependent and may not be applicable to Hong Kong, whilst risks and costs exist regardless

## International experience: very few trades in mobile spectrum



There are relatively few examples of mobile spectrum trades, most of them not relevant to Hong Kong's situation

*Note: flags reflect international markets considered in the study; the vast majority of other markets have no spectrum trading regime*

## High demand for mobile spectrum, no incentive for licensees to supply

Hong Kong's spectrum management regime is effective in promoting efficient use of spectrum

- New spectrum assigned for a fixed term (not perpetually), e.g. through auction
- Spectrum generally re-planned by the Communications Authority (CA) to ensure efficient allocation, re-assigned upon expiry of term through auctions
- Periodic opportunities to acquire, surrender or reorganise spectrum holdings

Mechanisms such as network sharing and capacity leasing (e.g. MVNOs) can respond to short-term needs

- Operators are allowed to engage in network sharing (antennae, sites, radios)
- Capacity leasing arrangements are common, and do permit spectrum capacity to be shared between more than one service provider

Demand for mobile spectrum is high, as a result market supply would be scarce

- Growth in mobile data traffic and preparation for 5G support demand for mobile spectrum, currently and for the foreseeable future
- Supply of spectrum from existing MNOs for trading is unlikely given needs

No critical bottlenecks in mobile spectrum requiring spectrum trading to resolve; if trading was allowed, activity and therefore benefits would likely be very low

# Benefits limited in the short term and uncertain in the medium term; costs and risks need to be mitigated regardless

	+ Benefits for Hong Kong	- Costs and risks
Short term (~5 years)	<ul style="list-style-type: none"> <li>Flexibility in terms of acquisition and disposal of existing holding and asymmetric spectrum transfers</li> <li>No real consolidation benefit as no regional licences, no perpetual licences and spectrum is utilised efficiently</li> </ul>	<ul style="list-style-type: none"> <li>Significant time to implement</li> <li>Low level of interest in the market</li> <li>Concerns by some MNOs</li> <li>Windfall / private profits</li> <li>Competition issues (hoarding, concentration, distorted auctions)</li> </ul>
Medium term (5–10 years)	<ul style="list-style-type: none"> <li>Main focus in mobile is 5G</li> <li>Large emerging supply of spectrum in high frequency bands, for trading could be one management mechanism</li> </ul>	<ul style="list-style-type: none"> <li>5G standards are still evolving and use cases remain unclear</li> <li>Large supply of standardised in mm bands (24-86GHz) and new sharing models potentially leading to new primary assignment approaches</li> </ul>

The CA should continue to monitor 5G developments and appropriate spectrum management approaches

# Implementation approaches and potential alternative enhancements to the existing spectrum management regime

## Implementing trading

### Scope of tradable spectrum

- Any transfer of spectrum assigned through a market-based mechanism (e.g. mobile), including all rights and obligations

### Process and implementation

- Notification to the CA, review and decision at the CA's discretion, decision and rationale published

### Safeguards

- Competitive and technical assessments as part of the applications to trade; remaining risks of windfall/private profits

Spectrum trading can be implemented, some risks and costs will remain

## Other enhancements

### Enhanced mobile network sharing arrangement

- Combining network and capacity leasing, whilst retaining logically separate RANs

### Periodically-adjusted SUF

- Apply SUFs to bands assigned administratively to promote fluid reassignment as bands become congested

### Enhanced spectrum swap

- Asymmetric / inter-band swaps could be allowed by the CA, but all proposed conditions should be carefully assessed

These enhancements could improve the flexibility of mobile spectrum management in the short to medium term



# Conclusions

**1**

**There is limited evidence that spectrum trading is necessary or beneficial in the Hong Kong context**

*Trading of mobile spectrum is rare, even in countries with a mature trading regime, except where licences are geographic or where primary assignments are proving inefficient. In Hong Kong, the spectrum management regime is reasonably effective in promoting efficient use of spectrum.*

**2**

**There is limited scope for trading to have an impact in Hong Kong in the short term**

*Setting up a spectrum trading regime is long and costly, whilst existing regulatory mechanisms are effective and can be further enhanced by the CA and the Government without introducing spectrum trading.*

**3**

**Benefits are unlikely to justify the costs and risks of implementing spectrum trading in Hong Kong**

*Hong Kong enjoys high utilisation of mobile spectrum, with limited prospects for mobile spectrum to be supplied for trades.*

**4**

**In the medium term, 5G development/use cases/spectrum assignment approach are uncertain, and may obviate the need for trading**

*5G developments and use cases are still evolving; supply of 5G spectrum will be large (e.g. mmWave). Should it be the CA's view that there are no competing demands for 5G spectrum in the primary assignment, the spectrum may be assigned administratively. In such a scenario, spectrum trading is irrelevant.*