



ASIA-PACIFIC TELECOMMUNITY  
1<sup>st</sup> Meeting of SATRC Working Group on Spectrum in  
SAP-IV  
10 – 11 October 2012, Dhaka, Bangladesh

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**APT Secretariat**

**HARMONIZATION OF THE USE OF 700MHZ BAND IN SATRC  
COUNTRIES - APT'S INITIATIVES**

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# Harmonization of the Use of 700MHz Band in SATRC Countries – APT Initiatives



ASIA PACIFIC TELECOMMUNITY



SAPIV: 1<sup>ST</sup> MEETING OF THE SATRC WORKING GROUP ON SPECTRUM  
10 – 11 OCTOBER 2012, DHAKA, BANGLADESH

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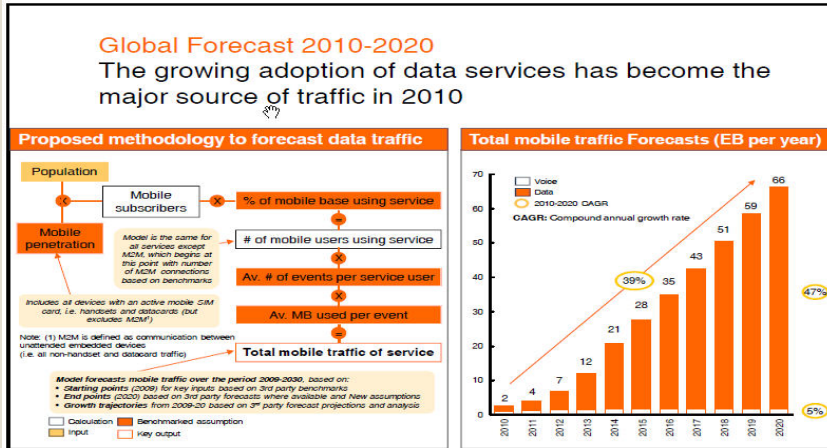


- Why 700 MHz Band on Focus?
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- Impact of APT's Outcomes
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## Why 700MHz Band on Focus?



- Lack of Spectrum for Mobile Broadband!



## Why 700MHz Band on Focus?



- WRC-07 identified 108MHz of Digital Dividend Spectrum from 698 – 806 MHz for nine countries in Region 3 for IMT
- It is found that allocating this spectrum to mobile broadband would add US\$729 Billion to the GDP Asia-Pacific nations by 2020. In case of allocation to broadcasting the amount will be US\$71 Billion.
- It is expected to add 2.2 Million more jobs and generate 4.7 times more in tax revenue compared to broadcast

## Why 700MHz Band on Focus



- In technical terms 700MHz offer several advantages for operators:
  - Propagation characteristics of 700MHz band
  - Wider coverage; less number of network infrastructure cost
  - Improve indoor quality of mobile broadband in urban area

## APT's Initiatives on 700 MHz Band



### APT AWG 700 MHz Band Plan Development

#### Process and timeline

- ▶ **March 2008** - Spectrum Working Group initiated study of the UHF Digital Dividend, with the aim of developing a harmonized band plan
  - Direct result of WRC-07 decision to identify spectrum for IMT
- ▶ **September 2010** - Finalized work on the new 700 MHz band plan(s)
  - APT Report 14: *Harmonized Frequency Arrangements for the Band 698-806 MHz*
  - Consensus Agreement
- ▶ **September 2011** - Finalized work on 2<sup>nd</sup> Report providing guidance on mobile user equipment out-of-band emission levels to facilitate co-existence with adjacent band broadcast TV services
  - APT Report 24: *Implementation Issues Associated with Use of the Band 698 – 806 MHz by Mobile Services*
- ▶ **Process was deliberate**
  - Developed over 2.5 year period with considerable technical study by industry and governments
  - Gathered views of APT members through information survey
  - Prepared interim report with candidate band plan proposals – up to eight
  - Focused technical studies on candidate band plans
  - Set up technical correspondence group to work between meetings and analyze proposals
  - Held technical seminars to further vet studies
- ▶ High degree of cooperation among industry stakeholders (governments, vendors, operators, associations) was key

## Outcomes of APT's Initiatives: APT700



### APT Work is Complete

Report 14: *Harmonized Frequency Arrangements for the Band 698-806 MHz\**

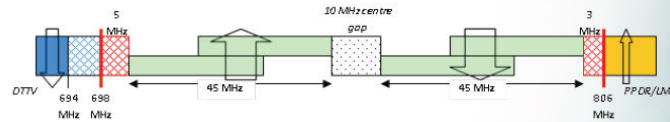


Figure 1: Harmonised FDD Arrangement of 698-806 MHz band

#### ▶ FDD band plan

- 2 x 45 MHz from 703-748 / 758-803 MHz – likely to require dual duplexer implementation
- Conventional duplex – minimizes harmonic interference into GNSS/GPS
- Internal guardband from 698-703 MHz and 803-806 MHz – facilitates co-existence with other services



#### ▶ TDD band plan

- Internal guardbands similar to that of FDD band plan

\* Source: <http://www.apf.int/AWF-RECREP>

## Outcomes of APT's Initiatives: APT700



### APT Work is Complete

Report 24: *Implementation Issues Associated with Use of the Band 698 – 806 MHz by Mobile Services\**

- ▶ APT Report 24 provides guidance on UE out-of-band emission levels:

▪ *“Considering technical and economic factors associated with UE equipment, it was concluded that the average out of band emissions of IMT UE, measured over the bandwidth of the applicable television channel in the country of deployment, must not exceed -34 dBm/MHz below 694 MHz.”*

- ▶ No guidance in Report 24 on the UE out-of-band emission levels from 694 MHz to 698 MHz. Instead, APT deferred any decision on this to the 3GPP standards development due to the technological advances in filter technology.

## Impact of APT700



- APT's 700 MHz Band Plan (APT700) created a lot of interest in the world both in the Administrations and Industry
- Currently, two harmonized band plan in place for 700MHz
  - APT700
  - US 700 Band Plan
  - A comparison view point among the plans when considered by an Administration

## Impact of APT700



	US plan	APT plan
Global economies of scale	400 million users	4 billion users
Amount of spectrum harmonised for large scale commercial use	37 per cent	83 per cent
Amount of spectrum dedicated to public safety	16 per cent	0 per cent
Number of 2 x 10 MHz networks that can be supported	2	4
Number of 2 x 15 MHz networks that can be supported	0	3
Number of 2 x 20 MHz networks that can be supported	0	2
Portability of one network to another within same band	No	Yes
Connectivity model for law enforcement, ambulance and intelligence services	Dedicated network, dedicated spectrum, investment made by public safety agencies	Commercial network, dedicated capacity guaranteed, investment made by private operators
Cost of covering the entire population	\$800 million	\$150 million
Minimum time it will take to deploy a network covering the entire population of Mexico City	2.5 years	1.5 years

## Impact of APT700



### 3GPP Standardization of APT 700 MHz Band Plan(s)

#### Band 28 (FDD 703-748 / 758 - 803 MHz)

- ▶ All CR's (change requests) were agreed and work completed at RAN4 #63 meeting in Czech Republic May 21-25, 2012
- ▶ Work item will be submitted for closure to the 3PP RAN4 Plenary this week in Slovenia (13-15 June 2012). Technical aspects:
  - The 36.101 CR is in [R4-123624](#)
  - For co-existence with DTV service in 694-698 MHz adjacent bands, specified out-of-band emission level of -26.2 dBm/6 MHz across 694-698 MHz and introduction of Network Signaled (NS) value
    - Equivalent value to that recommended by APT at 694 MHz in dBm/MHz (-34 dBm/MHz)
  - Japan national issues – will resolve internally
  - Self-band protection is defined at -32 dBm/MHz
- ▶ 3GPP members who supported work item include: Alcatel-Lucent, CATT, China Mobile, Ericsson, ETRI, HiSilicon, Huawei, KDDI, KT Corporation, LG Electronics Inc, LG-Ericsson Co., Ltd., Motorola Mobility, NII Holdings, Nokia, Nokia Siemens Networks, NTT DOCOMO, Qualcomm Inc., Samsung, ST-Ericsson, Telefónica S.A., Vodafone, ZTE

## Impact of APT700



### 3GPP Standardization of APT 700 MHz Band Plan(s)

#### Band 44 (TDD 703 – 803 MHz)

- ▶ All CR's were agreed and work completed at RAN4 #63 meeting in Czech Republic May 21-25, 2012
- ▶ Work item will be submitted for closure to the 3PP RAN4 Plenary this week in Slovenia (13-15 June 2012). Technical aspects:
  - The 36.101 CR is in [R4-123696](#)
  - Emission limits to reduce the risk of harmonic interference into RNSS/GPS devices (inter-device coexistence) would not be specified in 36.101 but included in the Technical Report (TR) as a working assumption [R4-123605](#)
- ▶ 3GPP members who supported work item include: same list as Band 28
- ▶ Not as much focus and attention on TDD studies as there was on FDD studies



## Impact of APT700



### Recent Developments at National Level in Asia Pacific

- ▶ **Australia**
  - Adopted APT FDD 2 x 45 MHz band plan; will auction this spectrum together with 2.5 GHz in November 2012
- ▶ **Japan - Rthree pairs of 2 x 10 MHz in summer 2012 in accordance with APT FDD band plan**
- ▶ **Korea**
  - Allocated 2 x 20 MHz in accordance with the APT FDD band plan; usage of remaining spectrum officially not yet decided. Strong support for APT FDD band plan. Analog switch off complete by end-2012.
- ▶ **Papau New Guinea – Adopted APT FDD 2 x 45 MHz band plan**
- ▶ **Tonga - Adopted APT FDD 2 x 45 MHz band plan**
- ▶ **New Zealand**
  - Considering to auction in accordance with APT FDD 2 x 45 MHz band plan with spectrum rights commencing on December 1<sup>st</sup>, 2013. Official announcements on auction/timing expected soon
- ▶ **Taiwan**
  - Proposals tabled to auction in 2013/2014 in accordance with APT FDD 2 x 45 MHz band plan and assign to three 2 x 15 MHz licenses. Final decisions expected in 2012.
- ▶ **India**
  - Adopted National Frequency Allocation plan stipulating a requirement for IMT in 698-806 MHz; TRAI has proposed to auction in 2013 based on allocation of 2 x 45 MHz of spectrum for mobile
- ▶ **.Indonesia. Singapore. Thailand. Vietnam – positive track**

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## Impact of APT700



- **Outside Asia-Pacific Region**
  - Mexico already adopted APT700
  - Chile will adopt APT700 in 2013
  - Colombia adopted APT700
  - Costa Rica on the way to APT700
  - Panama on the way to APT700
  - Peru to adopt APT700
  - Uruguay will follow APT700
  - In Brazil it is under consideration
  - African Telecommunication Union (ATU) Members are also keen to adopt APT700 plan once this band is allocated to MOBILE in Region 1

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## Impact of APT700



- **Interesting Fact to Notice:**
  - First case in the history of mobile telecommunication that APT region is leading the industry direction
  - A more number of countries are interested in APT700 Band plan than Asia-Pacific Countries!!
  - Largest mobile industrial associations such as GSMA, 3GPP are providing full technical support for the worldwide implementation of APT700
  - A great opportunity to create worldwide harmonization !!
  - Economy of Scale

## Context of SATRC and What SATRC can do?



- **From the view point of SATRC:**
  - There is no pressure from Broadcasting Industry as this band is mostly unused in SATRC Countries (Except Iran)
  - It is comparatively earlier to use the band for IMT services compared to many other countries
  - Mostly under developed, developing and small developing island economies
  - Created unique opportunity to achieve harmonization and economy of scale which is important for these economies

## Context of SATRC and What SATRC can do?



- What SATRC can do?
  - Should allocate the 698-806 MHz band to mobile broadband services (IMT)
  - Should adopt APT700 Band plan to achieve maximum benefit
  - Do you want to go out of harmonization?:
    - ✘ Non-harmonization would reduce the benefits of 700 MHz band
    - ✘ It will reduce the handset affordability
    - ✘ Increase network deployment cost
    - ✘ Create Cross-border interference
    - ✘ Limit international roaming

## Context of SATRC and What SATRC can do?



- Delay in decision will also cost the Administration
- SATRC WG Spectrum should submit a comprehensive technical/economic feasibility report and suggest the Council in favor of the adoption of APT700 MHz band plan
- **Our target: All SATRC Members announce the adoption of APT700 MHz Band Plan by 2013 !!!**
- Any Question?



If you have any query please email us at [aptsatrc@apt.int](mailto:aptsatrc@apt.int)

**THANK YOU!**

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