World Broadcasting Unions

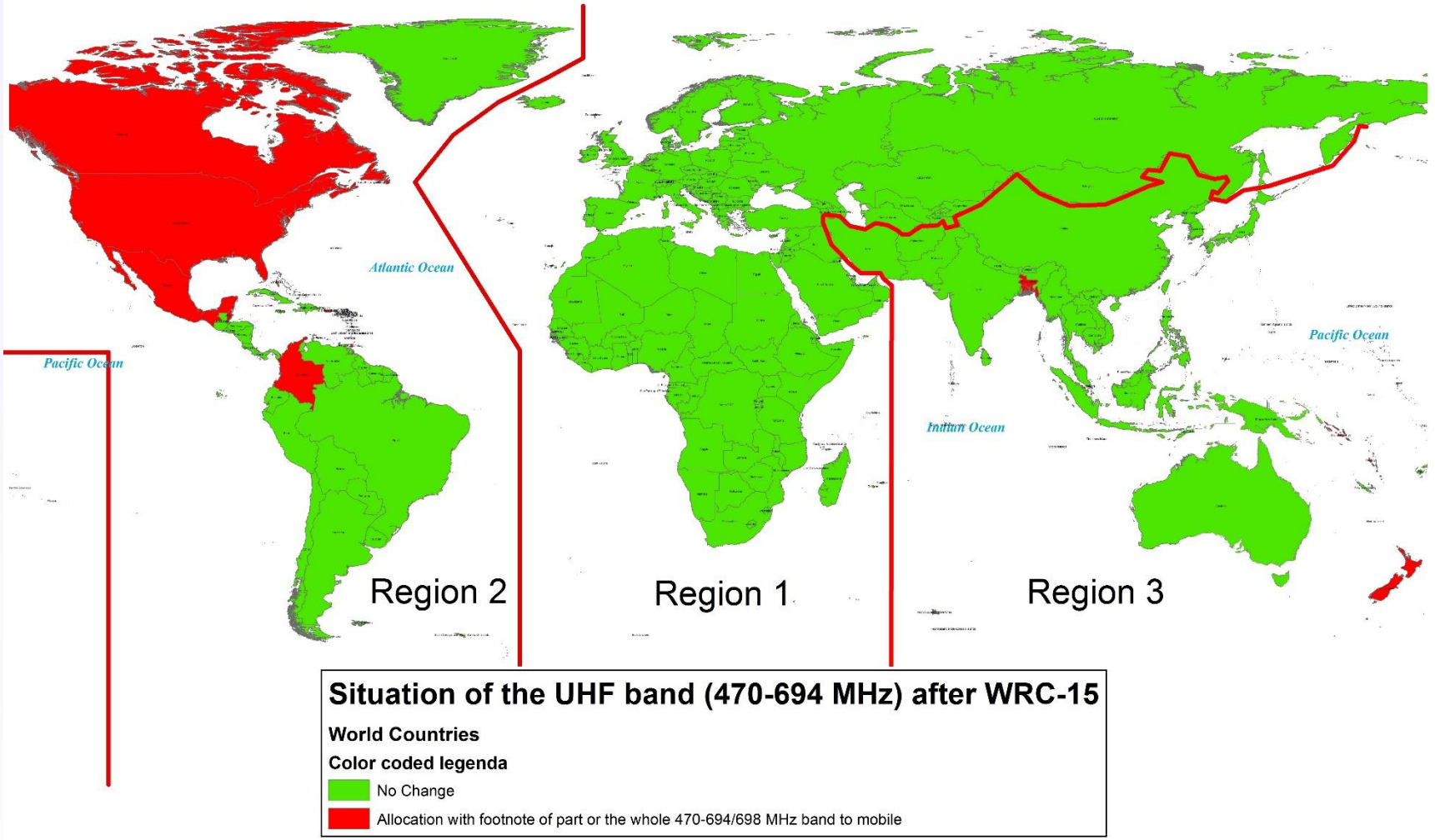
WBU-TC

UHF Spectrum: Key to the Digital Television Switchover

Rationale for keeping the sub 700 MHz

1. WRC-15 affirmed the global allocation to broadcasting in the UHF band.
2. DTT is a vital, unifying, and universal service providing public information and entertainment. It is necessary, successful, economically-attractive and evolving. It is being implemented across the world.
3. IMT has sufficient spectrum, much of which is underutilized or unused.
4. IMT identification in some countries increases cross-border coordination difficulties.
5. PMSE and other unlicensed services can co-exist with DTT but cannot co-exist with IMT.

WRC 15 has secured allocation to Broadcasting



DTT is a Vital, Unifying and Universal Service

1. Informs, educates and entertains
2. Links citizens together across a country in context with the global community.
3. Free to all
4. The most efficient and cost-effective means to communicate with a country's entire population, especially in remote areas.

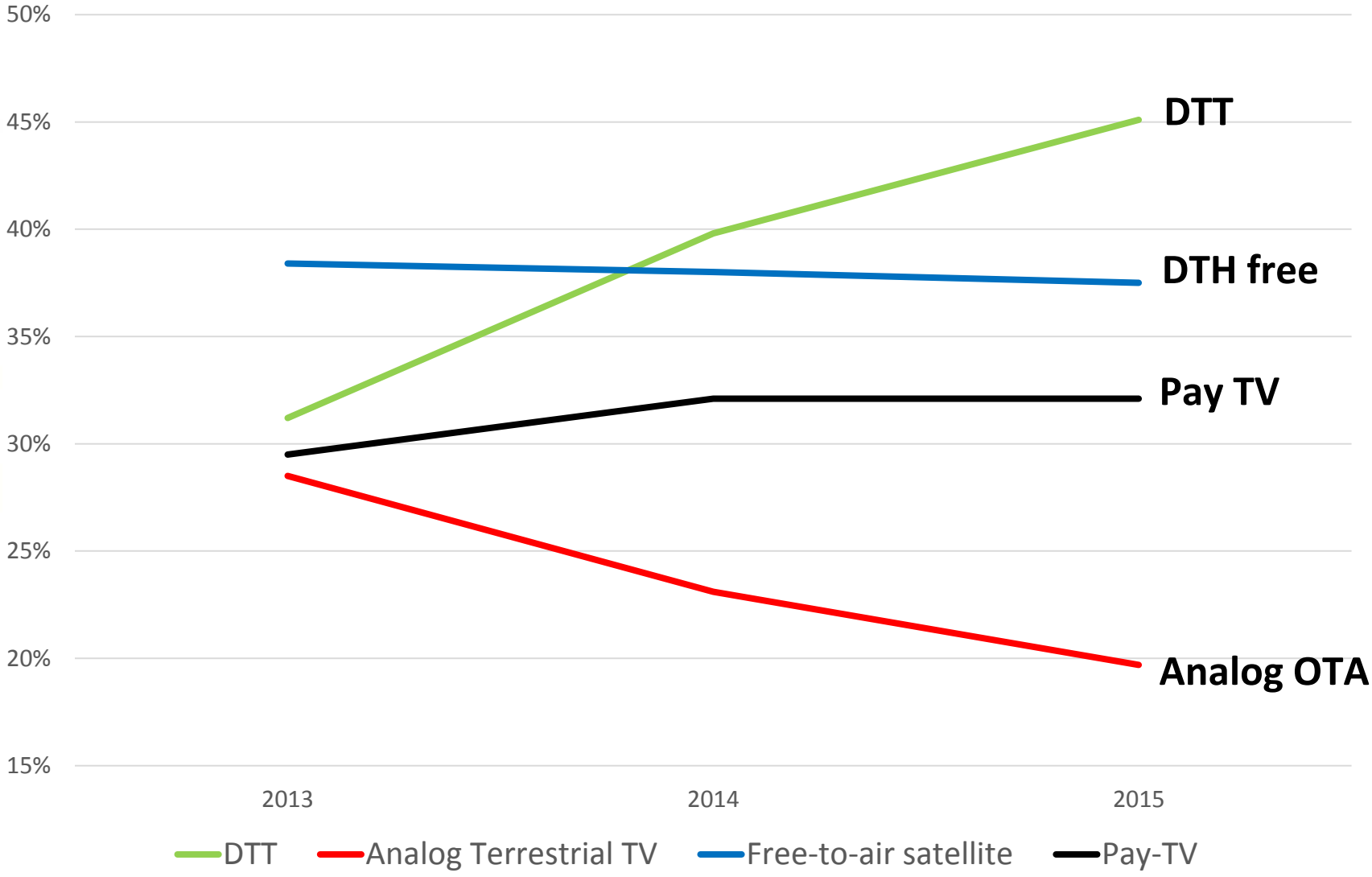
DTT is a Necessary Service

1. A vital part of the communication and information infrastructure of all civil societies

2. Provides critical survival information in emergency situations

DTT is Successful (Brazil)

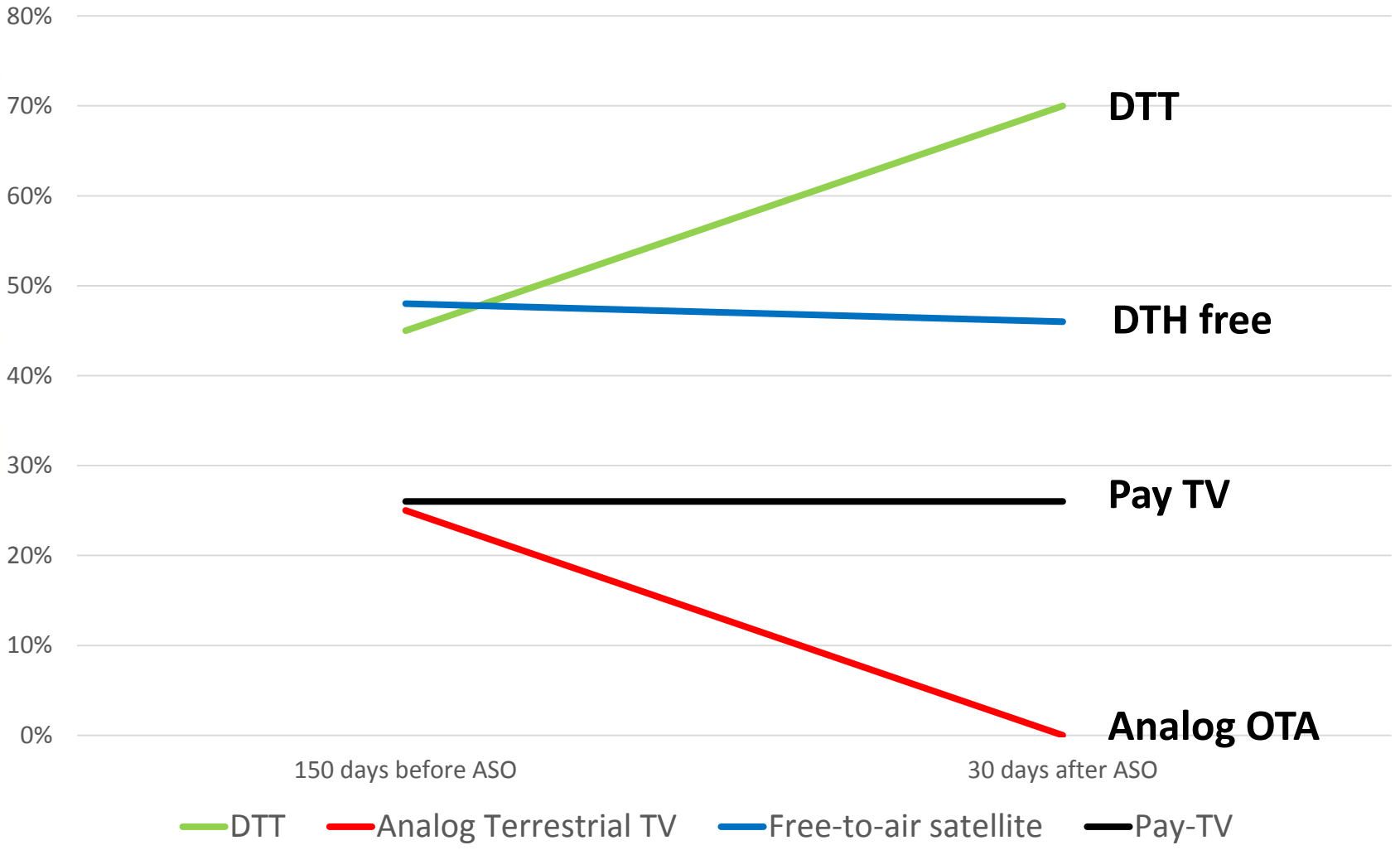
Brazil (before the analog switch-off - 66 million households)



Source: IBGE

DTT is Successful (Rio Verde)

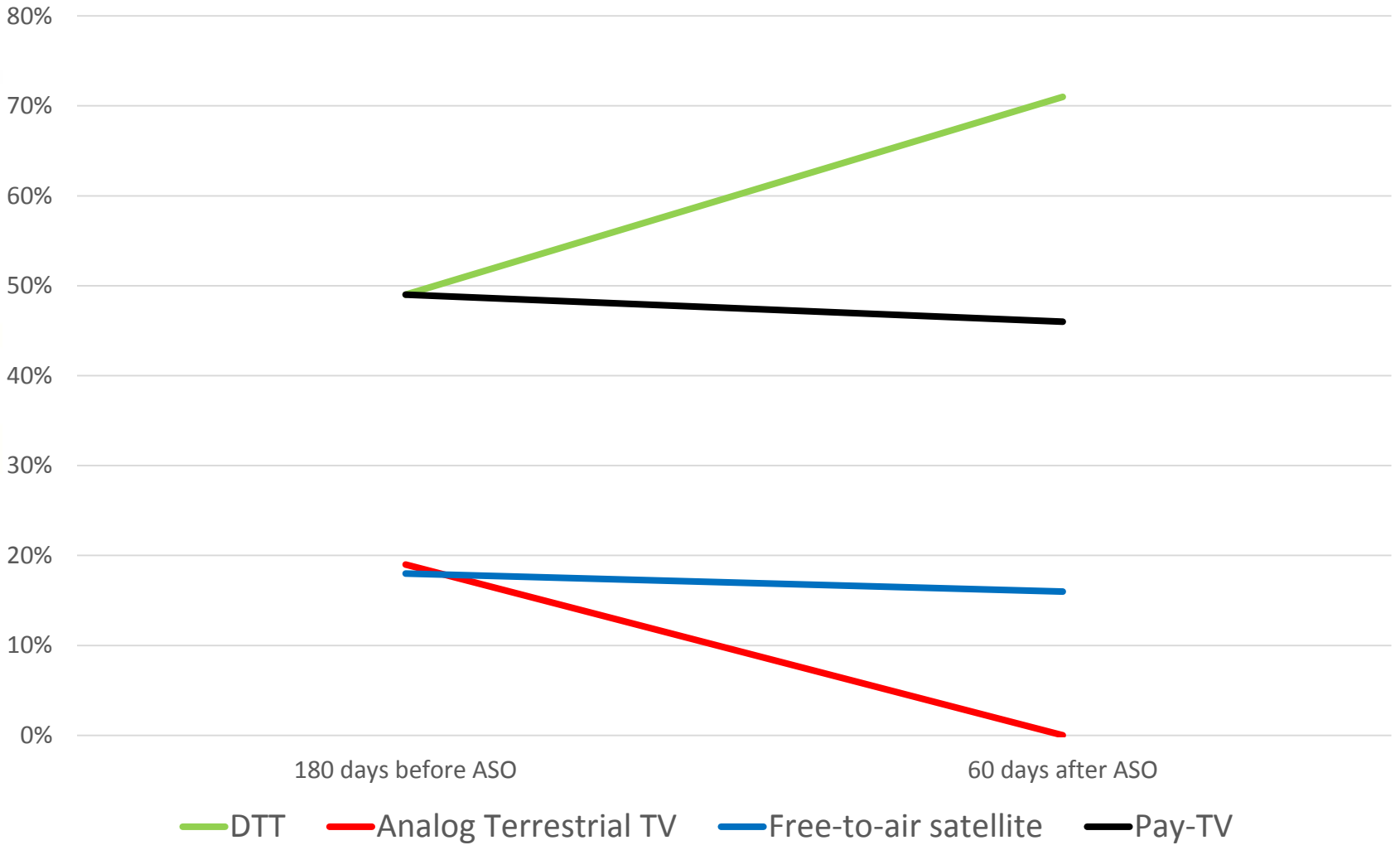
Brazil (during the analog switch-off)
Rio Verde/GO (ASO: February 29, 2016 / 65,000 households)



Source: IBOPE Inteligência

DTT is Successful (Brazilia)

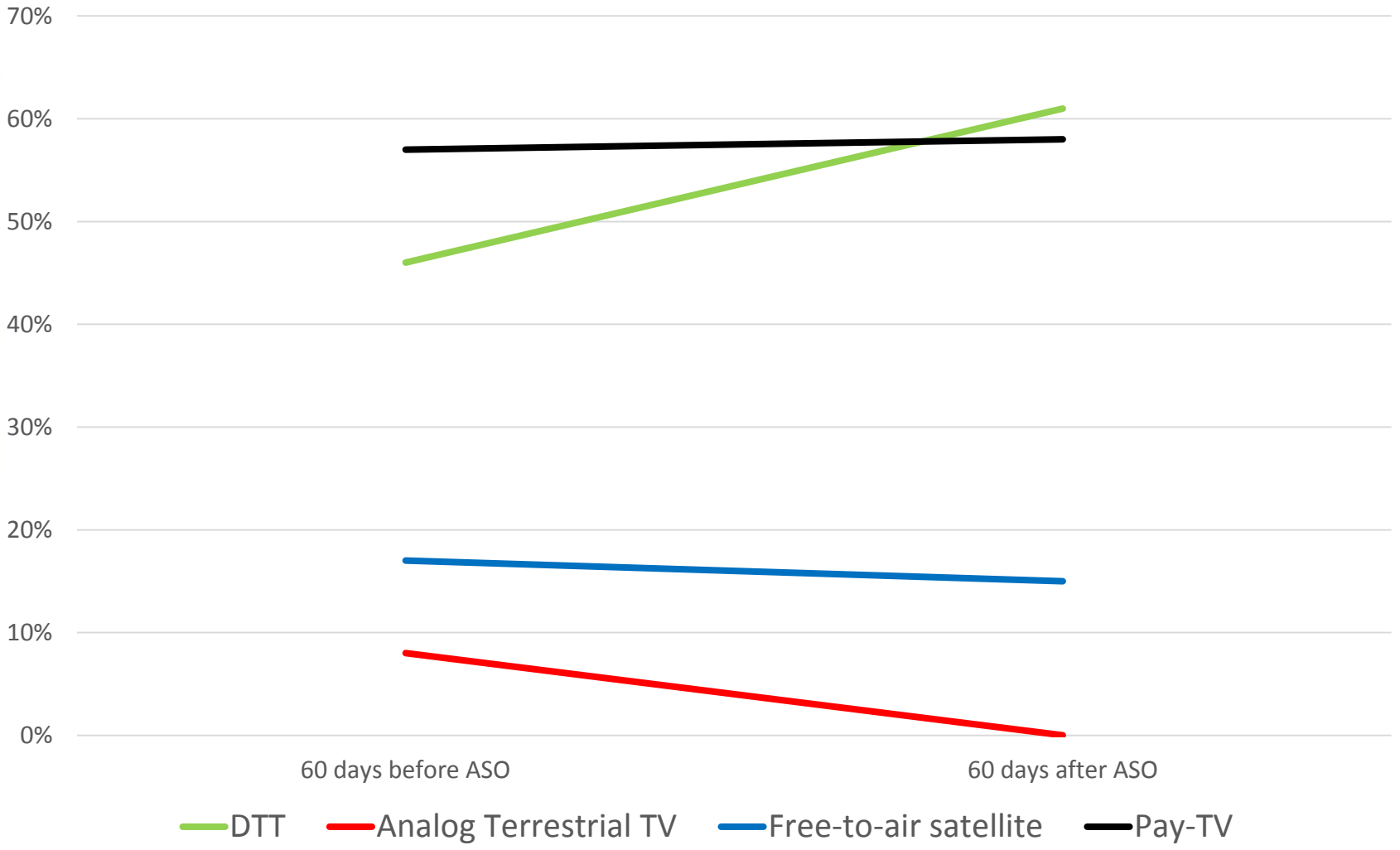
Brazil (during the analog switch-off)
Brasília/DF (ASO: November 17, 2016 / 1.3 million households)



Source: IBOPE Inteligência

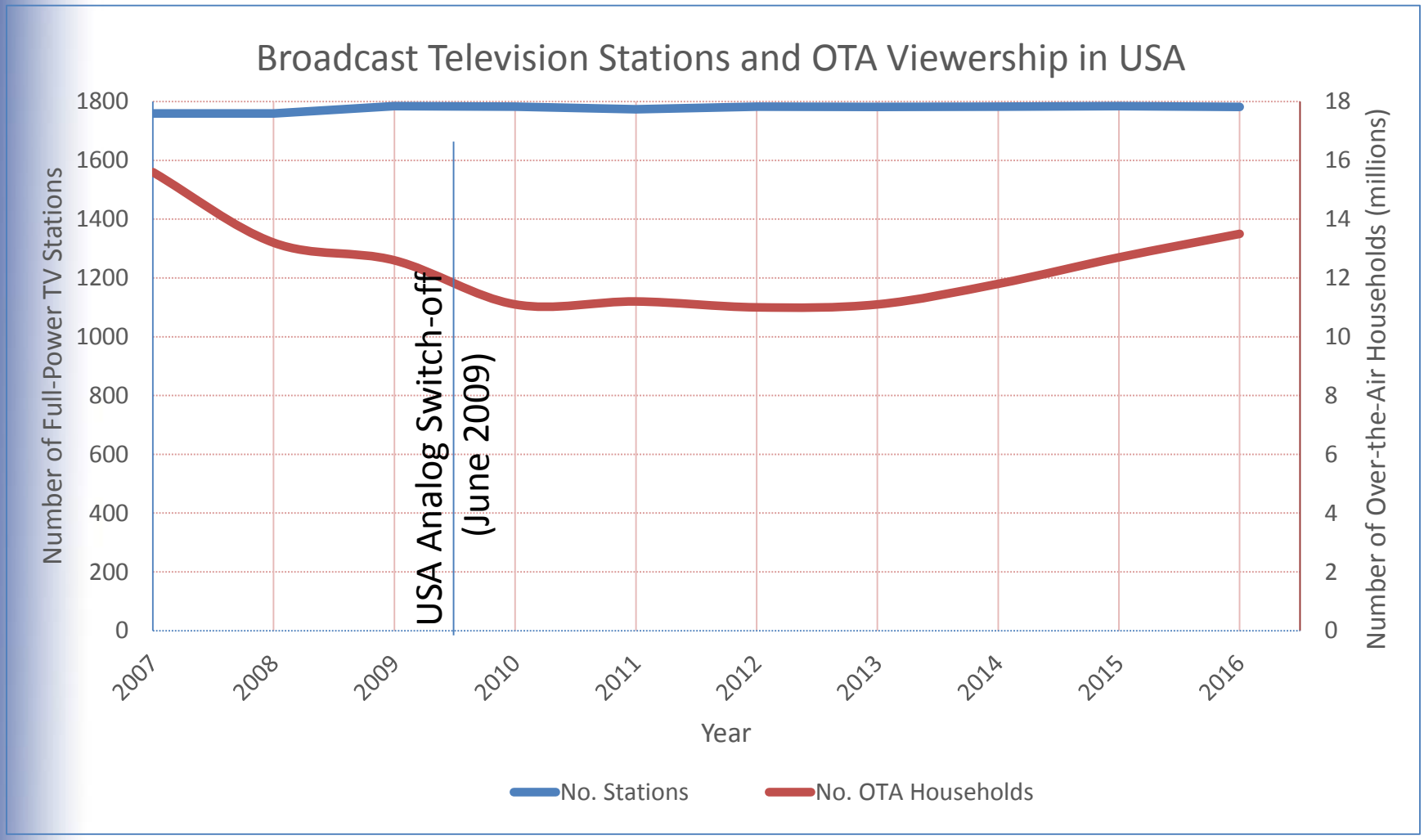
DTT is Successful (Sao Paulo)

Brazil (during the analog switch-off)
São Paulo/SP (ASO: March 29, 2017 / 7 million households)



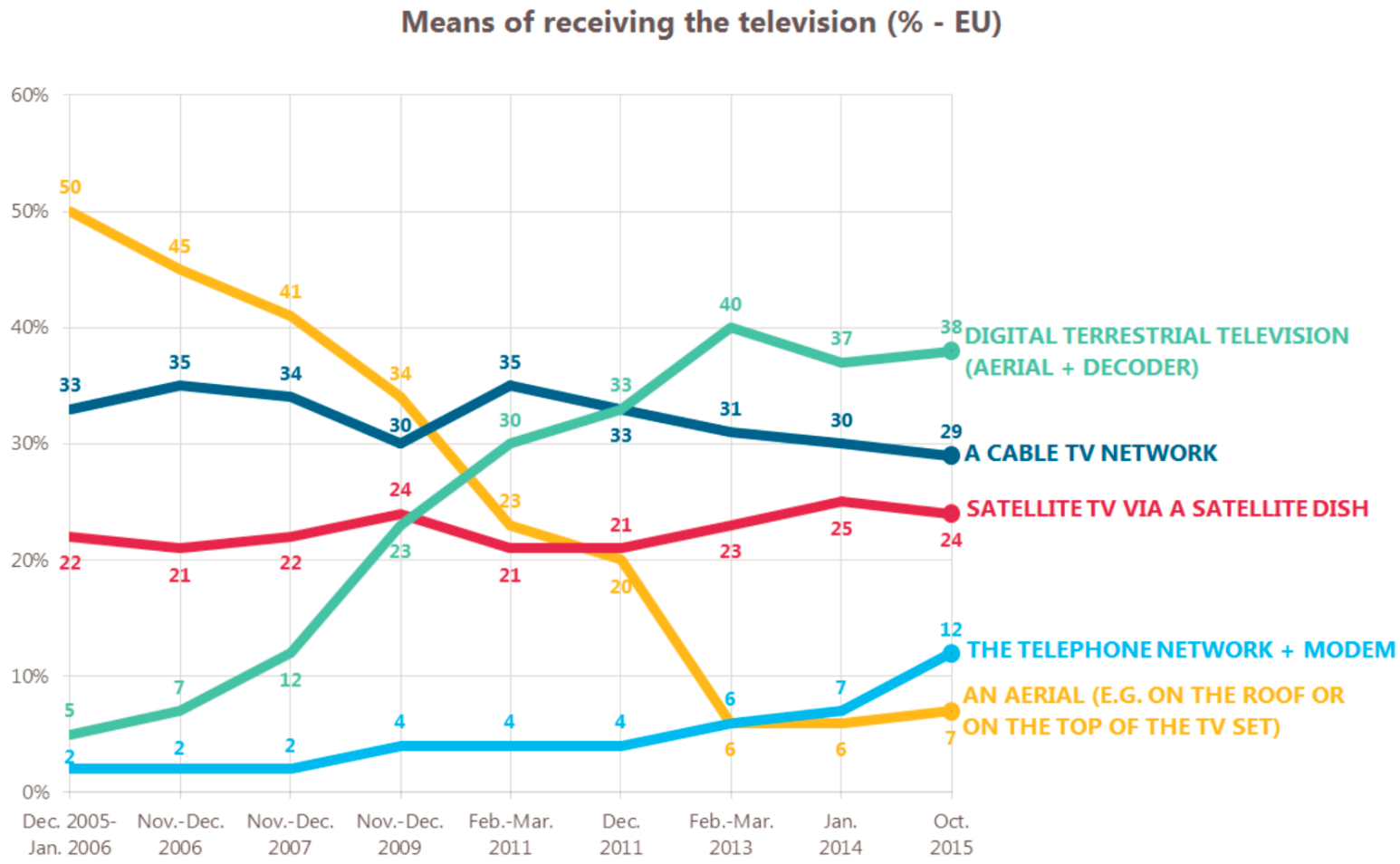
Source: IBOPE Inteligência

DTT is Successful (USA)



Sources: US FCC, Nielsen

DTT is Successful (Europe)



Base: Respondents who have television in the household (n = 26680)

Fieldwork
October 2015
Publication
May 2016

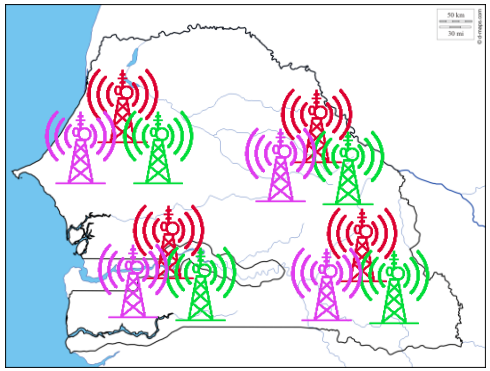
Special Eurobarometer 438

DTT is economically attractive

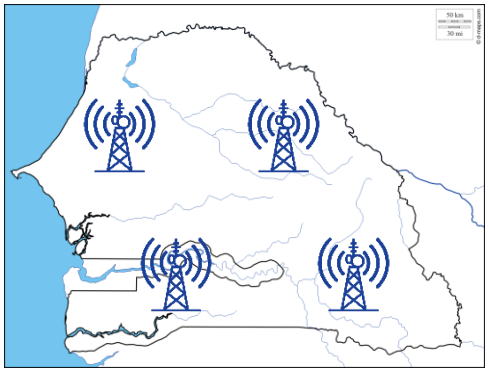
Cost savings due to digital multiplexing capabilities and power reduction (-7 to -10 dB), compared to Analogue TV

Program 1
Program 2
Program 3
3 networks, high cost

Analogue terrestrial television



Digital terrestrial television



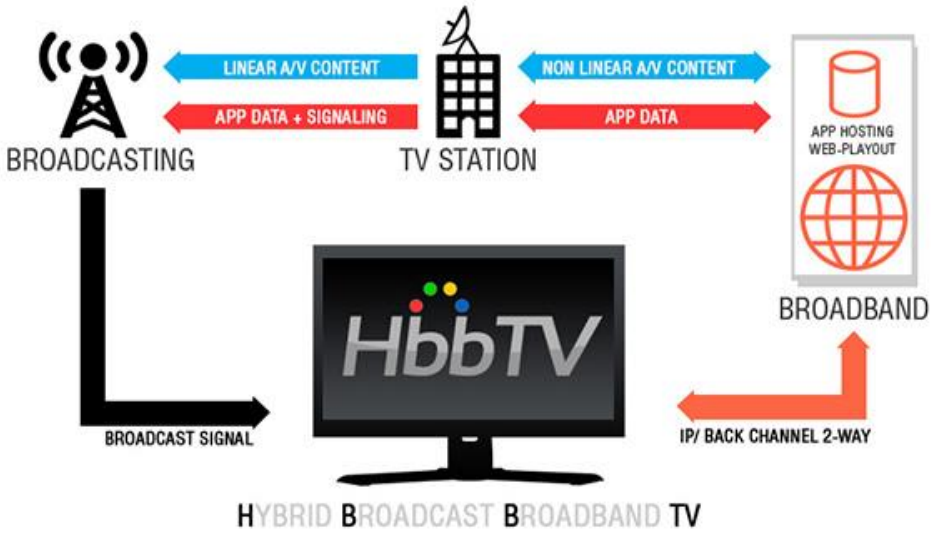
MUX
Program 1
Program 2
Program 3
Additional program
Additional program

Shared network,
shared costs

Cost efficient coverage due to high tower topology, compared to low tower / cellular networks

DTT is Evolving

1. Better quality: HDTV and UHDTV enabled by new coding and compression techniques, DVB-T2, MPEG4, HEVC.
2. Advanced Features: HDR, HFR, Wider Colour Space, NGA
3. Interactivity: HbbTV
4. Reception on mobile devices (smartphones, tablets) using Wi-Fi for distribution within the home (SatIP in Europe)



Implementation Schedules

1. ISDB-T countries of Region 2

Country	Adoption	Launch	ASO plan
Brazil	2006	2007	2023
Peru	2009	2010	2028
Argentina	2009	2010	2019
Chile	2009	2012	2020
Venezuela	2009	2011	2021
Ecuador	2010	2012	2018
Costa Rica	2010	2014	2017
Paraguay	2010	2011	
Bolivia	2010	2011	2019
Uruguay	2010	2012	
Guatemala	2013	2018	2022
Honduras	2013		
Nicaragua	2015		
El Salvador	2017	2017	

Source: DiBEG

Implementation schedules

2. **In Region 1 / Europe – Almost all countries have completed Digital Switch-On (DSO) and Analogue Switch-Off (ASO)**
   - ✓ 45 have already completed both – All using DVB-T/T2
   - ✓ 2 have set a deadline for ASO (2018 and 2019)
   - ✓ 1 still to decide a deadline for ASO

3. **In Region 1 / Africa – Steady progress in Digital Switch-On (DSO)**
   - ✓ 31 countries have started DTT or set a deadline to start it
     30 using DVBT/T2 and 1 using ISDB-T (Botswana)
   - ✓ 10 countries yet to decide a DSO date
   - ✓ 7 countries are uncertain about a DSO date

IMT Already has Sufficient Spectrum (Some of Which is Unused)

- The USA has 4 major wireless providers providing nationwide service.*
- Each of the 4 nationwide providers has 110–200 Mhz of spectrum below 3 GHz, some of which is unused
- Additionally, speculators are holding spectrum, mostly unused, in the hopes of selling it to one of the nationwide carriers. One speculator holds over 90 MHz of unused spectrum below 3 GHz.*
- "We don't have a spectrum shortage and never will," Marty Cooper, inventor of the cell phone.*

* Sources: US FCC Wireless Competition Report (2015), Bloomberg Intelligence (2017), Marconi Symposium (2014).

Unused IMT Spectrum

ANALYSIS OF THE WORLD-WIDE LICENSING AND USAGE OF IMT SPECTRUM

LS telcom

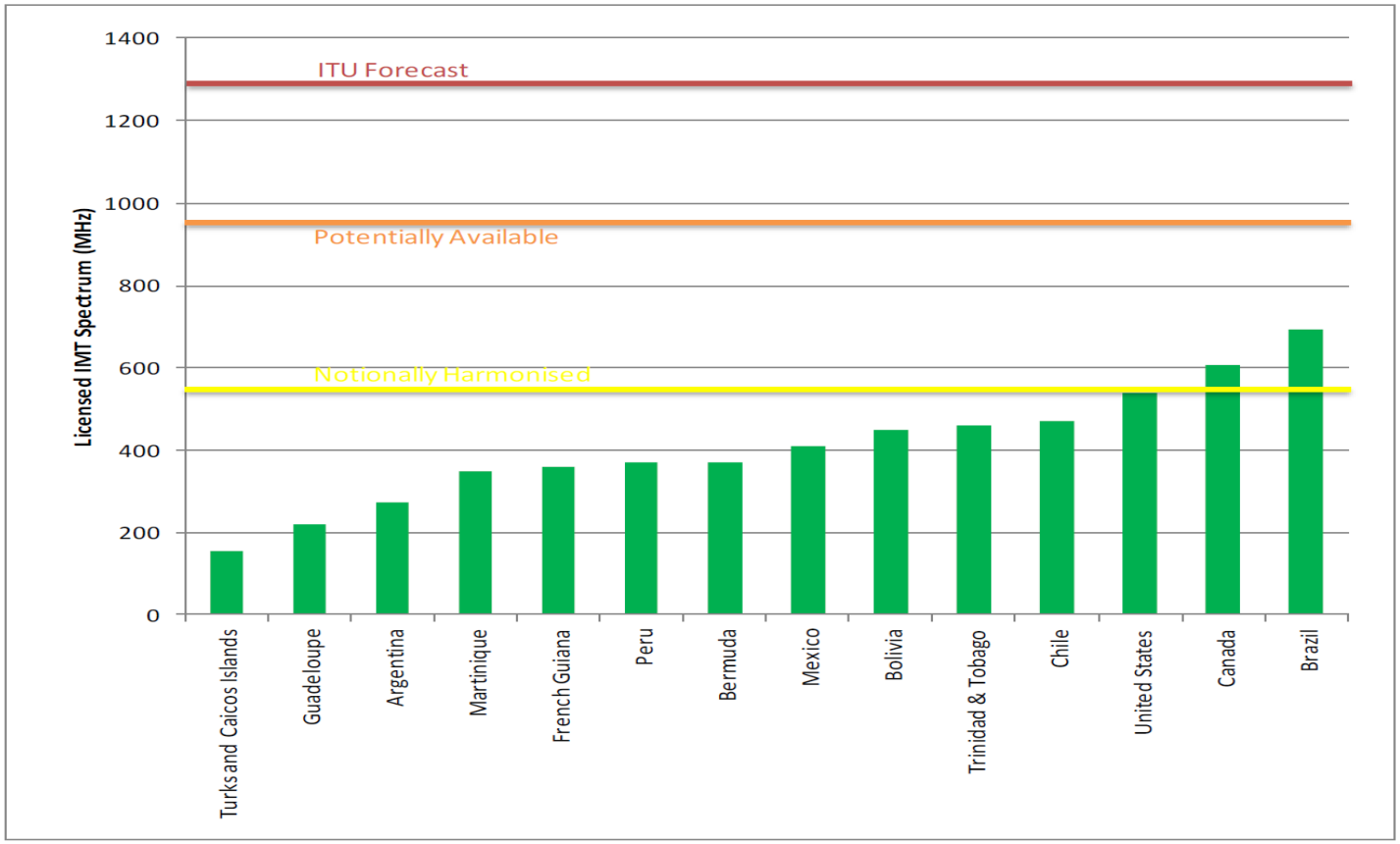
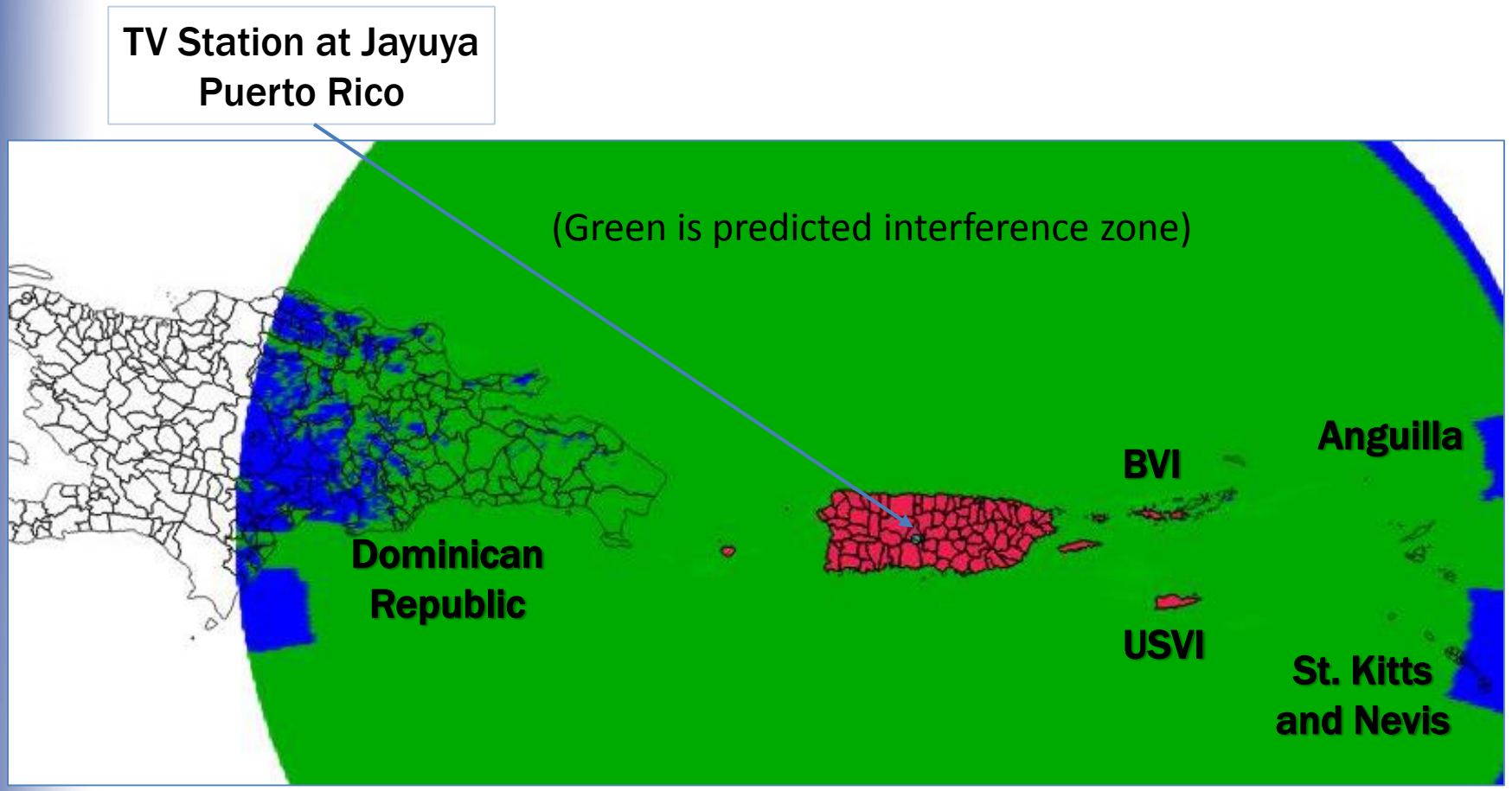


Figure 4-3: IMT spectrum licensed in Region 2

IMT-DTT Cross-border Interference Issues

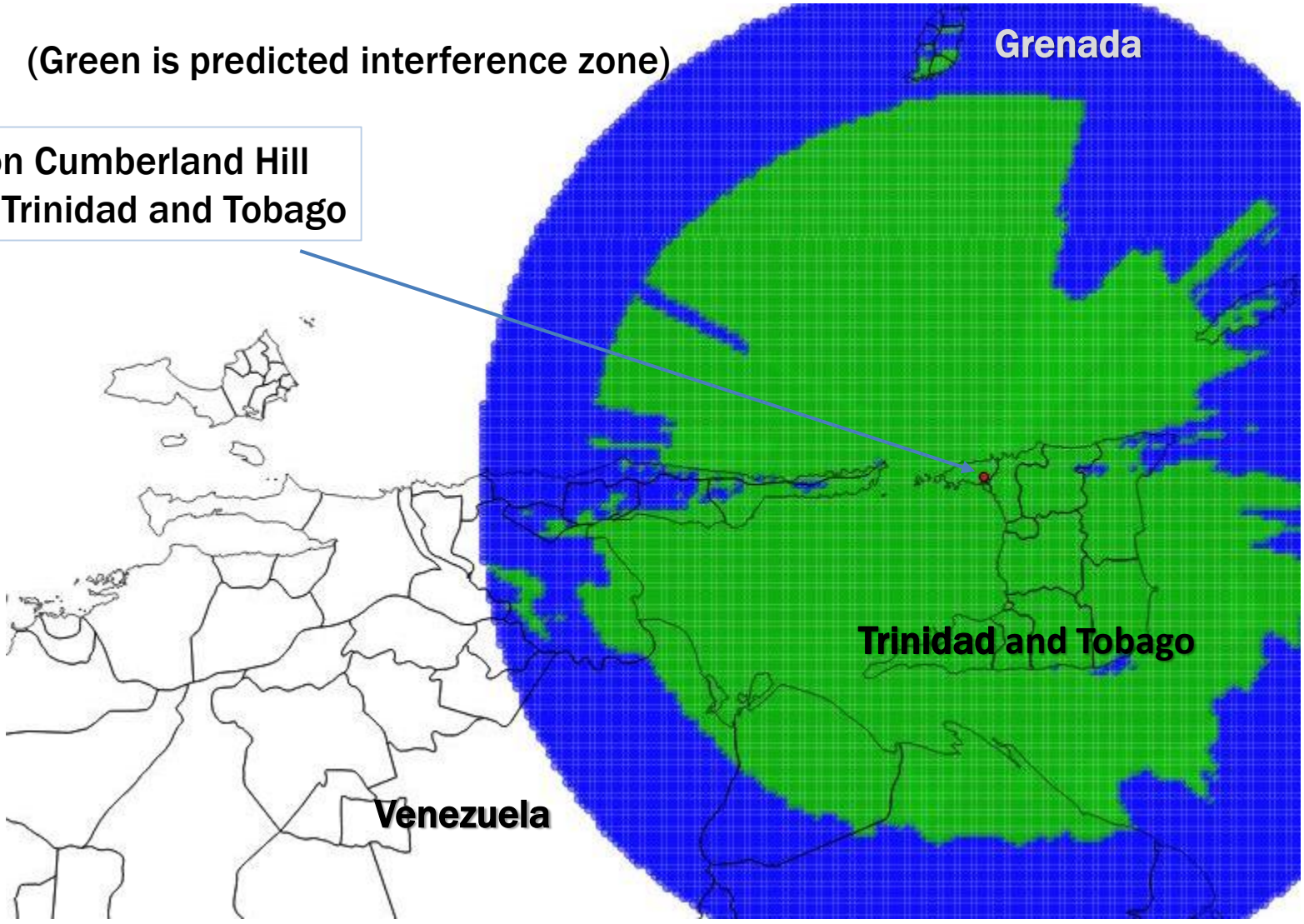
- Sharing between Broadcast Television and IMT requires 200+ km separation (ITU JTG 4-5-6-7)



IMT-DTT Cross-border Interference Issues

- Sharing between Broadcast Television and IMT requires 200+ (Green is predicted interference zone)

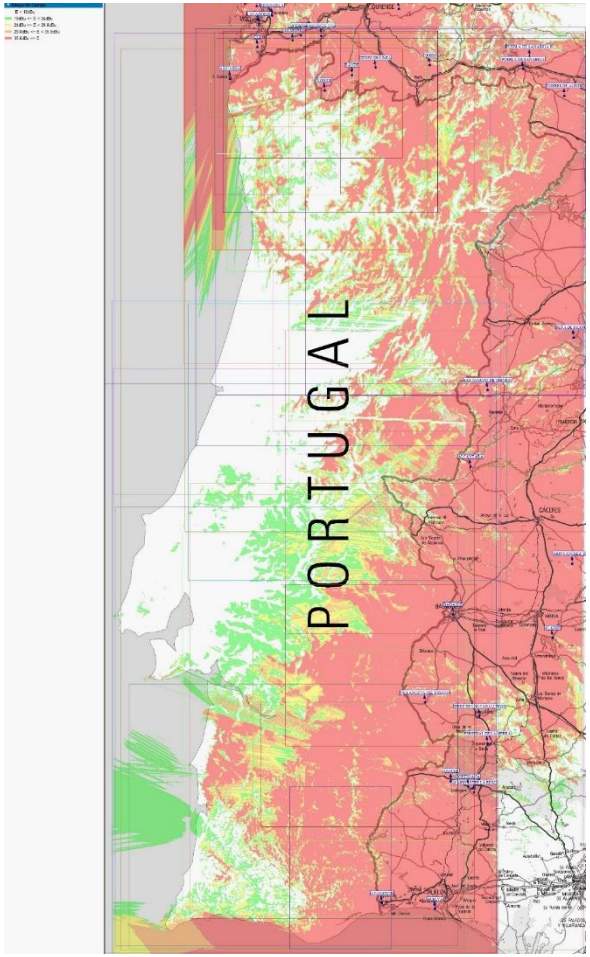
TV Station on Cumberland Hill
Port of Spain, Trinidad and Tobago



IMT/DTT Interference Areas in Portugal (solved)

See Annex 4 of National field reports on the introduction of IMT in the bands with co-primary allocation to the broadcasting and the mobile services

- http://www.itu.int/pub/R-REP-BT.2301



IMT-PMSE and IMT-Unlicensed Co-existence Issues

- Unlicensed TV White Space (TVWS) devices have shown promise for providing low-bandwidth internet access to remote locations
- TVWS spectrum access requires that a database assigns frequencies opportunistically
- TVWS frequency assignments are feasible for static transmitters, such as broadcast, but are infeasible in spectrum used for mobile IMT.
- Similar conflicts will exist with PMSE/wireless microphone uses in IMT spectrum

Conclusions

1. UHF spectrum is an essential resource for DTT and no changes should be made to existing allocations

2. No case for a global mobile allocation and IMT identification in the sub-700 MHz band