



Ministerial
Programme 2012



Planning for Analogue Switchover – utilising the Digital Dividend

Monday 27th February 2012





Ministerial
Programme 2012



- **Importance of Digital Dividend band for delivering Mobile Broadband services**
 - Suvi Linden, ITU Special Envoy for the Broadband Commission for Digital Development
- **Planning for the Switchover**
 - Amit Nagpal, Consultant, Aetha Consulting
- **Case Study: Germany – from start to finish**
 - Dr Rüdiger Hahn , Head of Department, Bundesnetzagentur (Federal Network Agency)
- **Panel session:**
Overcoming challenges for analogue switchover around the world
- **Moderator: Peter Lyons, MEA Spectrum Manager, GSMA**
- **Panelists:**
 - Bitange Ndemo, Permanent Secretary, Ministry of Communications, Kenya
 - Luis Lucatero, Head of Regulatory, Cofetel, Mexico
 - Dr JS Sarma, Chairman, Telecom Regulatory Authority of India, India





Ministerial
Programme 2012



Overview of Digital Dividend to date

Herman Schepers, Head of Spectrum Interventions,
Government & Regulatory Affairs, GSMA





Ministerial Programme 2012



2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014

WRC 03:

Agenda Item
7.2 proposes new
bands to be
recognised for IMT

2003-2006:

ITU working party
8F identifies 470-
806/862MHz – ideal
for low population
density areas

June 2006:

Geneva 06
Agreement replaces
analogue bands for
digital TV

Nov 2007:

WRC 07 identifies
698-862 (Regions 1
and 3)

Jan 2009:

WRC 07 decisions
come into force

WRC 12:

Extra agenda item
to extend Region 1
band down to
698MHz





Ministerial Programme 2012

Band plans:

2 x 30MHz – CEPT / ATU

2 x 45MHz – APT / CITEL

2 x 22MHz – US band plan

Licences issued:

- US (Mar 08)
- Germany (May 10)
- Sweden (Mar 11)
- Spain (Jul 11)
- Italy (Sept 11)
- Portugal (Nov 11)
- France (Dec 11)



- Positive and final outcome achieved
- Moving towards positive outcome, not yet finalised
- Moving slowly due to minor problems or internal challenges
- Major issues lie in way of allocation which may affect regional solutions
- No information yet





Ministerial
Programme 2012



Importance of Digital Dividend band for delivering Mobile Broadband services

Suvi Linden, ITU Special Envoy for the Broadband Commission for Digital Development

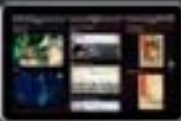


Importance of Digital Dividend band for delivering Mobile Broadband

Suvi Lindén 27.2.2012

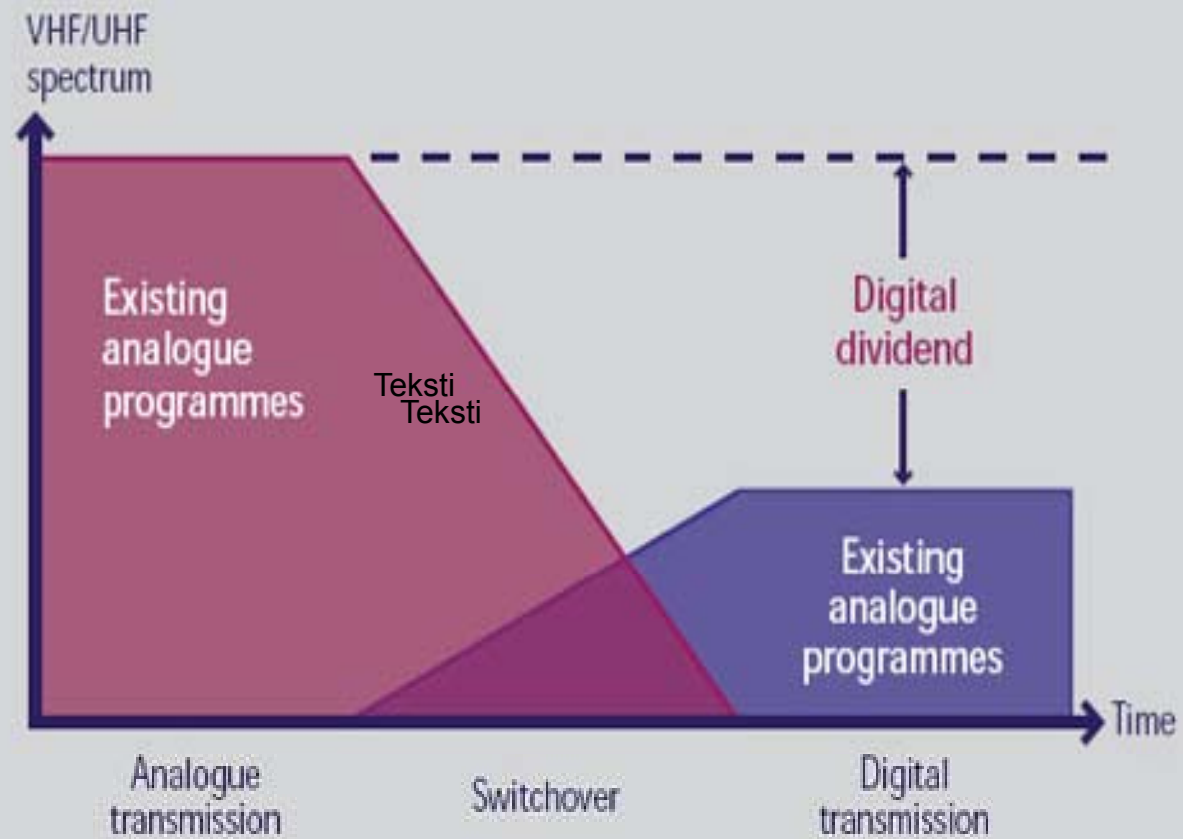
Broadband: Key economic driver for the next decades

Average Traffic Per Mobile Device Type

		2011	2016
		MBs per Month	MBs per Month
Non-Smartphone		4.3	108
M2M		71	266
Smartphone		150	2,576
E-Book Reader		750	2,880
Tablet		517	4,223
Laptop		2,131	6,942

What is the digital dividend?

Figure 1 — Digital dividend spectrum



Accessing the benefits of the digital dividend

How can this dividend be used?

WRC -12

1.The sharing issues in the 800 MHz band were successfully resolved

WRC -12

2. the 700 MHz band to the mobile services in Europe, Africa and Middle East, effective by the end of 2015

-> opens the way for worldwide harmonization of both 700MHz and 800 MHz bands for mobile

WRC -12

3. WRC-15 will consider additional spectrum allocations for mobile communication services

-> mobile services more affordable for end users and will help ITU towards its mandate of “connecting the world”.

Key Messages from Broadband Leadership Summit

- **MDGs:** Broadband accelerates progress
- **Access:** Ensuring universal access to information and the “right to communicate”
- **Economy:** Broadband is critical infrastructure
- **Development:** Broadband benefits all society
- **Partnership:** Public-private sector cooperation
- **Policy:** National broadband plans
- **Innovation:** Private sector has vital role to play

Target 1: Making broadband policy universal

- By 2015, all countries should have a national broadband plan or strategy or include broadband in their Universal Access / Service Definitions

Action to enhance broadband access is more likely when there is a national broadband plan or strategy, or when broadband is included in countries' Universal Access / Service (UAS) definitions

Target 2: Making broadband affordable

- By 2015, entry-level broadband services should be made affordable in developing countries through adequate regulation and market forces (amounting to less than 5% of average monthly income)
- In 49 economies in the world – mostly rich-world economies – broadband access in 2010 cost less than 2% of average income
- This compares to 32 economies in the world in 2010 where broadband access cost more than half of average national income

Target 3: Connecting homes to broadband

- By 2015, 40% of households in developing countries should have Internet access
- In developed countries, more than 2/3 of households already had Internet access at the end of 2010, compared to around 16% of households in the developing world. This is likely to increase significantly by 2015, especially with the rise of mobile Internet
- This target includes access via both fixed and mobile networks

Target 4: Getting people online

- By 2015, Internet user penetration should reach 60% worldwide, 50% in developing countries and 15% in LDCs
- At the end of 2010, 30% of the global population was online. Internet penetration in 2010 stood at 21% in the developing world and at just under 5% in the LDCs



Ministerial
Programme 2012



Planning for the Switchover

Amit Nagpal, Consultant, Aetha Consulting



Planning for the switchover

**Presentation for GSMA Government Ministerial Programme
Mobile World Congress 2012**

27 February 2012



Introduction

- This presentation primarily draws upon research undertaken by Aetha Consulting for the GSM Association on case studies of the digital switchover process
- The objectives of the case studies are to highlight:
 - the major obstacles that each country has faced during the process
 - the steps that have been taken to find solutions
- Studied countries comprised Australia, Finland, Germany, Mexico and the UK
- We hope that stakeholders within countries that are currently in the process of developing and implementing plans for the 700MHz/800MHz band can learn from these experiences



Barriers to enabling future shared use of the band

The challenges faced by regulators and governments in enabling future shared use of the 470-862MHz band between digital TV and mobile broadband are varied

Justification of switchover/band clearance to facilitate mobile broadband use

Economic justification for switchover

- Solid economic evidence is often required before the digital dividend can be allocated to mobile broadband

Structural challenges to band clearance

- Complexities can arise from different bodies being responsible for broadcasting and mobile spectrum

Obstacles faced in migrating the band to new uses and users

Completion of analogue switch-off (ASO)

- The timing of the ASO can be an obstacle to the 700/800MHz band being used for mobile

Clearing DTT from the band

- DTT multiplexes may require relocation from the 700/800MHz band

Clearing PMSE⁽¹⁾ use from the band

- PMSE is often an existing user of the band and may require relocation

Clearing military users from the band

- In many countries the 700/800MHz band is used by the military

Ensuring mobile broadband in the 700MHz/800MHz band does not negatively impact other spectrum uses

DTT use beneath the 700MHz/800MHz band

- Measures may need to be taken to prevent interference to continued DTT use

Cable TV use within the 700MHz/800MHz band

- Measures may need to be taken to prevent interference with cable TV equipment

Uses in neighbouring countries

- Ongoing DTT use in neighbouring countries may interfere with mobile use in the band
- Restrictions to prevent interference to military uses in neighbouring countries may also prevent mobile use in the band

(1) Programme-making and special events. The primary use in the 700MHz/800MHz band is for radio microphones, and in-ear monitors

Obstacles faced by our case study countries

	Australia	Finland	Germany	Mexico	UK
Justifying the switchover and clearance of the band	Qualitative evidence sufficient to justify 700MHz band	Justification of the 800MHz band straightforward as was not used for TV	Split spectrum responsibility between national government and Länder meant 800MHz band adoption was complicated	Qualitative evidence sufficient to justify 700MHz band	Detailed quantitative assessment of benefits was undertaken
Obstacles faced in migrating to new uses/ users	Large number of DTT channels in the 700MHz band, which could only be relocated after ASO Large number of PMSE users	No DTT use in the 800MHz band PMSE use in the 800MHz requires relocation	DTT/mobile TV use in the 800MHz band, which could only be relocated after ASO Large number of PMSE users	Legacy analogue TV use prevents mobile use before ASO No planned DTT use in the band	Planned DTT use in Ch61& 62 requires relocation Large number of PMSE users in Ch69 require relocation
Ensuring that other spectrum uses are not negatively impacted	DTT use beneath the 700MHz band required protection No neighbouring countries	Agreement that protected Russian military use (ARNS) prevented mobile use in the 800MHz band nationally, in effect	DTT use beneath the 800MHz requires protection Concerns that mobile could interfere with cable TV	DTT use beneath the 700MHz may require protection Neighbours already / are expected to use 700MHz band for mobile	DTT use beneath the 800MHz requires protection

Justifying digital switchover and band clearance

The UK and Germany needed to overcome obstacles to the justify the digital switchover and clearance of the 800MHz band

UK

- Together with branches of the UK government, the regulator Ofcom carried out numerous, extensive and detailed studies into the costs and benefits of awarding the digital dividend for telecoms use, including:
 - A case for digital switchover, primarily made on the cost savings from the switch-off of the analogue infrastructure compared to maintaining dual transmission systems
 - A “Digital Dividend Review” estimated that the value of the digital dividend to be within GBP5–10 billion,⁽¹⁾ based on a wide range of potential alternative uses of the released spectrum, including use for mobile broadband and additional television channels
 - a further analysis was undertaken, specifically on the additional benefits/costs of adopting the 800MHz band in the UK, which resulted in an NPV in the range GBP2 to 3 billion, after accounting for the costs of migrating existing users

Germany

- The process to designate the 800MHz band for mobile use was complicated by the fact that the national government is responsible for mobile services spectrum licensing whereas each of the 16 federal states (Bundesländer) is responsible for the licensing of broadcast spectrum
- The government based the case for reallocating the 800MHz band to mobile use on the ability to provide wireless broadband in rural areas
- Parliament put forward proposals to remove the power of the Bundesländer to restrict the use of the UHF band to broadcasting
- Ultimately, the Bundesrat finally adopted the national government's proposals

(1) Net present value over 20 years



Clearing DTT from the 700MHz/800MHz band

Our case study countries have employed a range of solutions to clear DTT from the band

Actions to accelerate analogue switch-off

- **Australia:** A comprehensive switchover programme was put in place to accelerate ASO. Its initiatives included: a programme of training of retail advisors in electronics stores, labelling of goods into categories of “digital readiness”, a programme of training of TV and antenna installers, and a programme of “endorsed” installers. It also organised a series of targeted subsidies, such as a free decoder for vulnerable collectives, and subsidies for households located outside of coverage areas to receive TV via satellite
- **Mexico:** The regulator COFETEL recently called for financial resources to accelerate ASO, estimating the subsidies required to provide decoders, antennas and related costs to be of the order of USD200 million. COFETEL recommended that this be financed by the public.
- **UK:** A fund of GBP600 million was secured to provide free/subsidised set-top boxes to older people and people with disabilities

The availability of low cost DTT set-top boxes will be key for accelerating digital switchover in emerging markets; this may arise through local/regional manufacturing

Actions to relocate historic uses from the 700MHz/800MHz band

- **Germany:** A compensation scheme was put in place for PMSE users affected by interference from mobile and needed to be relocated to channels 51 to 60 (which required the purchasing of new equipment)
- **UK:** DTT assignments in channels 61 and 62 were relocated primarily to channels 39 and 40. The cost of this was estimated at between GBP85 million and GBP185 million, which was to be funded by the government



Protecting users in adjacent bands from interference

Our case study countries have employed a range of solutions to protect users in neighbouring bands and in neighbouring countries from harmful levels of interference from mobile broadband services

Actions to protect DTT use below the 700MHz/800MHz band

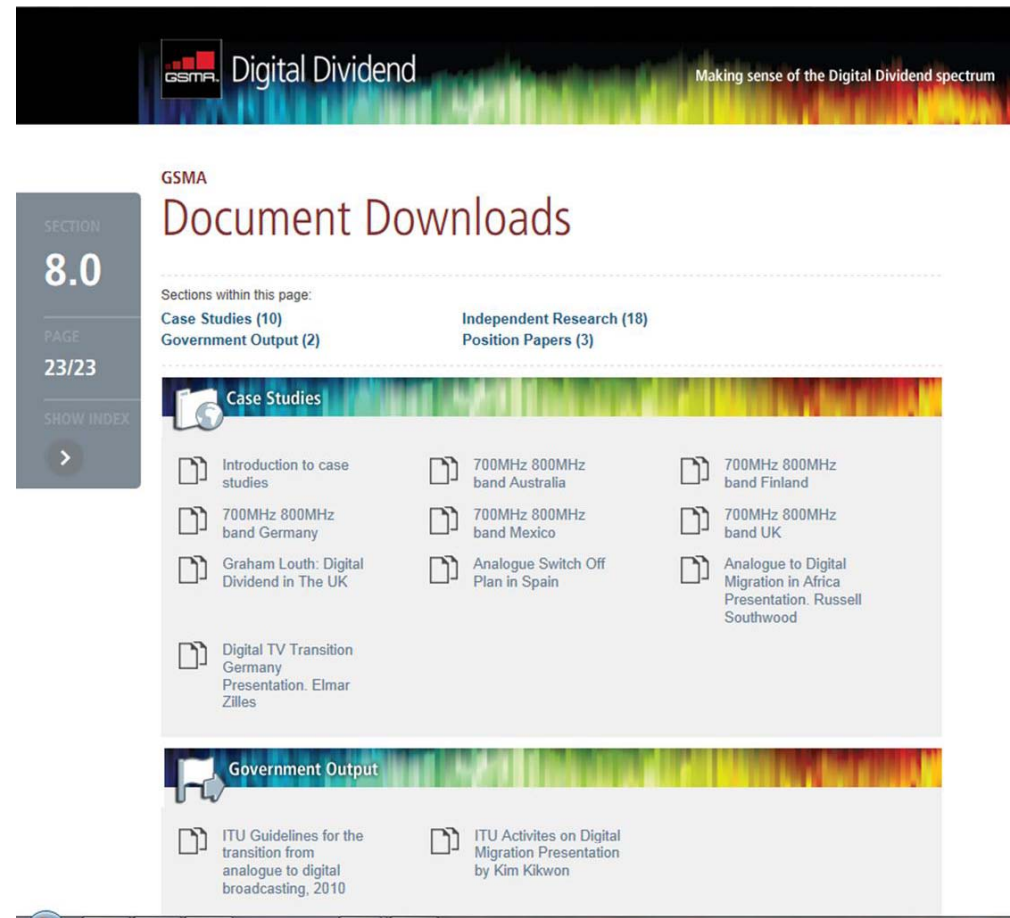
- **Australia:** The regulator ACMA has implemented an additional 4MHz of guard band (9MHz in total) between the 700MHz band and DTT in order to reduce any risk of interference
- **Germany:** The 800MHz licence conditions specified that licensees are responsible for ensuring there is no interference with users in neighbouring bands
- **UK:** The regulator Ofcom undertook research into the potential for mobile use in the 800MHz band to interfere with DTT. These stated that mitigation measures could include the deployment of filters for DTT receivers, filters at mobile base stations, reorientation of aerials, reduction in the power levels and migrating users to other TV platforms. Ofcom estimated that these measures could total around GBP100 million, and proposed that they should be borne by the licensees of the 800MHz band. Ofcom's most recent research has indicated approximately 900 000 DTT-only households could be affected by interference in the absence of the above mitigation measures

Actions to resolve interference issues with neighbouring countries

- **Finland:** Russia currently uses the 800MHz band for ARNS.⁽¹⁾ Existing coordination interference agreements with Russia effectively prevented neighbouring countries (including Finland) from using these frequencies for any other use. Finland, along with several of Russia's other neighbours, entered into negotiations with Russia regarding the 800MHz band, as well as other issues. In the second half of 2011, FICORA reached an agreement with Russia which allowed a full coverage mobile 800MHz network to be placed 55km from the Russian border

(1) Aeronautical radio navigation services

All five case studies can be found in the GSM Association's Digital Dividend toolkit



The screenshot displays the 'Digital Dividend' toolkit interface. At the top, a banner features the GSM logo and the text 'Digital Dividend' and 'Making sense of the Digital Dividend spectrum'. Below this, a sidebar on the left indicates 'SECTION 8.0', 'PAGE 23/23', and a 'SHOW INDEX' button. The main content area is titled 'Document Downloads' and lists sections within the page: 'Case Studies (10)', 'Government Output (2)', 'Independent Research (18)', and 'Position Papers (3)'. The 'Case Studies' section is expanded, showing a grid of document thumbnails with titles such as 'Introduction to case studies', '700MHz 800MHz band Australia', '700MHz 800MHz band Finland', '700MHz 800MHz band Germany', '700MHz 800MHz band Mexico', '700MHz 800MHz band UK', 'Graham Louth: Digital Dividend in The UK', 'Analogue Switch Off Plan in Spain', 'Analogue to Digital Migration in Africa Presentation. Russell Southwood', and 'Digital TV Transition Germany Presentation. Elmar Zilles'. The 'Government Output' section is also visible, showing 'ITU Guidelines for the transition from analogue to digital broadcasting, 2010' and 'ITU Activities on Digital Migration Presentation by Kim Kikwon'.

See <http://serving.webgen.gsm.org/5926DA9A-2DD6-48E7-BAD4-50D4CD3AF30A/projects/Spectrum/DigitalDividend/DDtoolkit/document-downloads.html>

Annex

A.1 Introduction to Aetha Consulting

Aetha Consulting

*Trusted advisor
to the telecoms
industry,
undertaking
data-driven
and quantitative
assessments
to support
strategic and
regulatory
decisions*

Aetha Consulting helps players in the telecommunications industry to develop **creative and sustainable solutions** to the challenges facing them in a constantly changing environment

We specialise in undertaking **rigorous, data-driven and quantitative assessments** to support major strategic and regulatory decisions. We work with our clients to develop the tools and methodologies appropriate to solve each new business problem as it arises

Our staff have been contracted to advise on **key industry issues**, including: market strategy development, radio spectrum policy, spectrum valuation and auction support

We are committed to quality and exceeding our client's expectations. We have a strong track record of successful assignments with **operators, regulators, and manufacturers**, as well as **financial and legal institutions**



Spectrum management experience

We help operators and regulators to analyse the opportunities and threats arising out of changes in their radio spectrum holdings

Recent spectrum assignments and reference projects *

Netherlands: Valuation and auction strategy for an operator ahead of 2.6GHz auction.

UK: Study for Ofcom regarding the liberalisation of 2G spectrum.

USA: Valuation of 220MHz spectrum for two railroad companies.



Denmark: Support to NITA to award spectrum in the 2.1GHz, 2.6GHz and 800MHz bands

Poland: Valuation support to a mobile operator ahead of the 2008 900MHz auction.

Hong Kong: Advised OFTA to implement a spectrum trading regime.

France: Study for ARCEP to quantify the economic benefits of uses of the digital dividend.

Germany: Spectrum valuation support for an operator ahead of the 'big bang' auction

UAE: Advised the regulator regarding digital TV switchover.

Singapore: Supported IDA to develop a strategy for the digital dividend.

* A significant amount of the experience shown was gained by our team members prior to joining Aetha

Our staff have supported operators in over 25 spectrum auctions worldwide in the last 10 years including:

- 800MHz and 2.6GHz (4G) auctions in Europe including Austria, Germany, Italy, the Netherlands and Switzerland
- 2.1GHz (3G) auctions in Asia including India, Hong Kong, Singapore and Taiwan
- New entrant licence acquisition opportunities in countries such as the AWS auction in Canada and 2G/3G auctions in Egypt, Iran, Kuwait, Libya and Qatar.

Our consultants have assisted regulators to award spectrum including supporting the UK and Danish Governments with awards of 420MHz, 800MHz, 1.5GHz, 2.1GHz and 2.6GHz spectrum



Contact details

Amit Nagpal

Partner

amit.nagpal@aethaconsulting.com

Tel: +44 7546 912355

Aetha Consulting Limited

Coton Hall

10 Brookfield Road

Coton

Cambridge

CB23 7PT

United Kingdom

www.aethaconsulting.com



Contact details

Amit Nagpal

Partner

amit.nagpal@aethaconsulting.com

Tel: +44 7546 912355

Aetha Consulting Limited

Coton Hall

10 Brookfield Road

Coton

Cambridge

CB23 7PT

United Kingdom

www.aethaconsulting.com





Ministerial
Programme 2012



Case Study: Germany – from start to finish

Dr Rüdiger Hahn , Head of Department,
Bundesnetzagentur (Federal Network Agency)





Bundesnetzagentur



www.bundesnetzagentur.de

Thematic Workshop

Case Study: Germany – from start to finish

Dr. Rüdiger Hahn

Barcelona, 27th February 2012

Overview

Starting position

Decisions

Auction

Aftermath

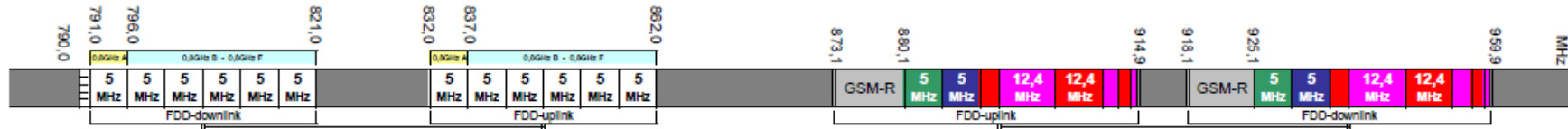
Overview

Starting position

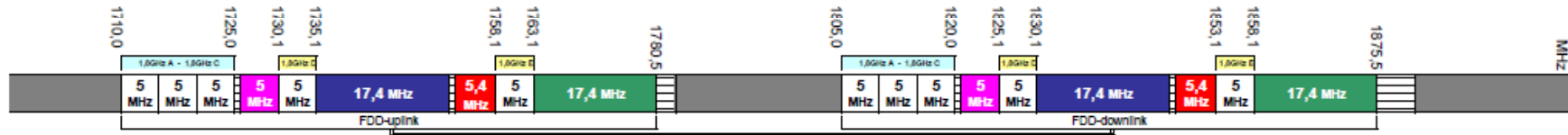
Spectrum before Auction



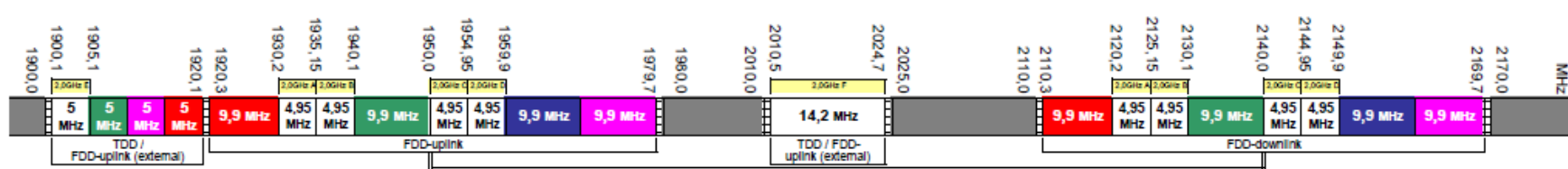
• Frequency bands 800 MHz and 900 MHz



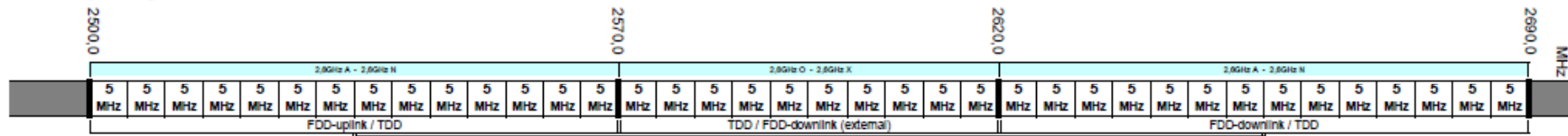
• Frequency band 1.8 GHz



• Frequency band 2.0 GHz



• Frequency band 2.6 GHz

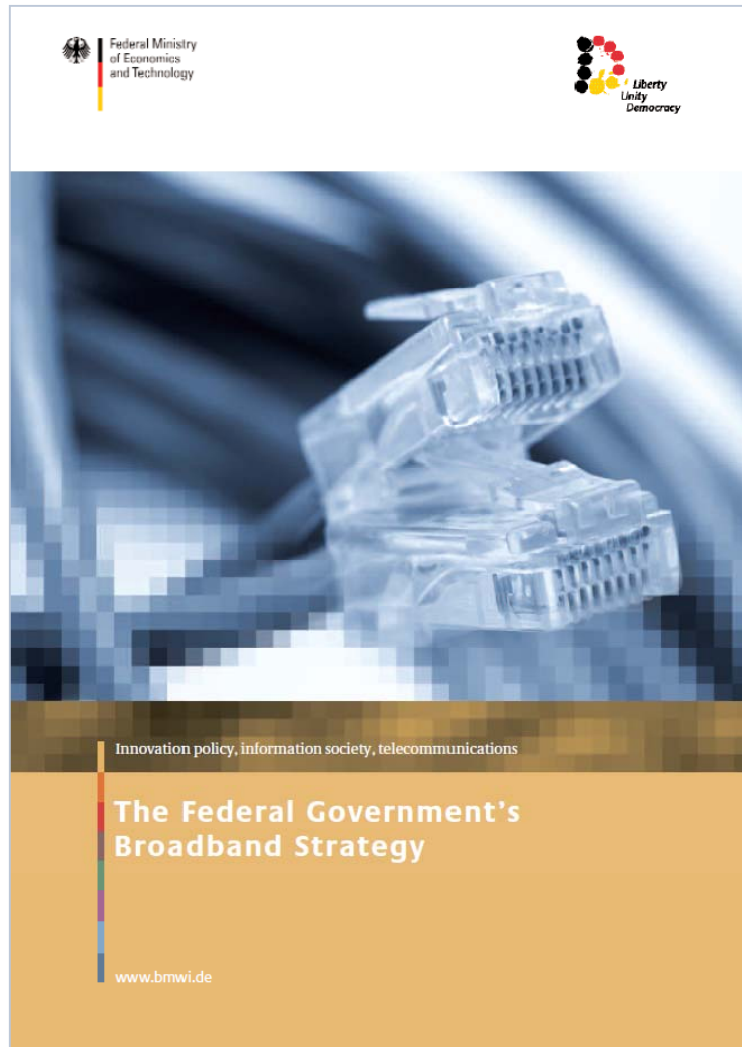


Frequency holdings before Auction



Frequency Range				
900 MHz	2 × 12,4	2 × 12,4	2 × 5	2 × 5
1.8 GHz	2 × 5	2 × 5,4	2 × 17,4	2 × 17,4
2.1 GHz	2 × 9,9	2 × 9,9	2 × 9,9	2 × 9,9
Σ paired spectrum	2 × 27,3	2 × 27,7	2 × 32,3	2 × 32,3
2.1 GHz (unpaired)	5	5	5	0
Σ spectrum (in total)	59,6	60,4	69,6	64,6

German approach



Flexibilisation
of
licenses

Award
of new
spectrum

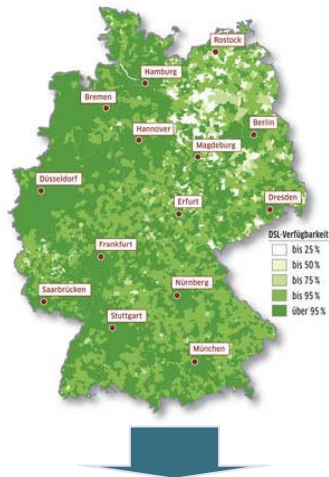
Overview

Decisions



Principle obligation:

- at least 25% of the population as from 1 January 2014
- at least 50% as from 1 January 2016



Municipality	Population	DSL availability
Rostock	179,000	über 95%
Hamburg	1,860,000	über 95%
Berlin	3,660,000	über 95%
Dresden	550,000	über 95%
Leipzig	590,000	über 95%
Chemnitz	260,000	über 95%
Regensburg	135,000	über 95%
Nürnberg	515,000	über 95%
München	1,470,000	über 95%
Stuttgart	630,000	über 95%
Frankfurt	750,000	über 95%
Köln	1,070,000	über 95%
Düsseldorf	620,000	über 95%
Saarbrücken	180,000	über 95%

Special obligation for “digital dividend”:

- Federal Government’s Broadband Strategy
- Federal states compiled “white spaces” on municipality level
- Four priority stages:
 - (1) inhabitants < 5,000
 - (2) 5,000 < inhabitants < 20,000
 - (3) 20,000 < inhabitants < 50,000
 - (4) 50,000 < inhabitants
- at least 90% of the population of the relevant municipalities per Federal state by end of 2016

Minimum bid



Acceleration of
bidding process

Low barriers for
SME

Prove seriousness
of application

As-if
no auction

Fees as
reference figure

Block	Minimum bid
2 x 5 MHz (paired)	€ 2,500,000
1 x 5 MHz (unpaired)	€ 1,250,000
1 x 14.2 MHz (unpaired)	€ 3,550,000

Overview

Auction

12 April 2010: Starting the clock



Results of the final bidding round



End of Auction

Frequenzbereich	Block	Ausstattung	Höchstbieter	Höchstgebot (€ in Tsd)
-----------------	-------	-------------	--------------	------------------------

0,8 GHz (gepaart)	0,8 GHz A	2x5 MHz konkret	To2 GER	616.595
	0,8 GHz B	2x5 MHz abstrakt	To2 GER	595.760
	0,8 GHz C	2x5 MHz abstrakt	Telekom D	570.849
	0,8 GHz D	2x5 MHz abstrakt	Telekom D	582.949
	0,8 GHz E	2x5 MHz abstrakt	Vodafone	583.005
	0,8 GHz F	2x5 MHz abstrakt	Vodafone	627.317

1,8 GHz (gepaart)	1,8 GHz A	2x5 MHz abstrakt	Telekom D	20.700
	1,8 GHz B	2x5 MHz abstrakt	Telekom D	20.700
	1,8 GHz C	2x5 MHz abstrakt	Telekom D	19.869
	1,8 GHz D	2x5 MHz konkret	E-Plus Grp	21.550
	1,8 GHz E	2x5 MHz konkret	E-Plus Grp	21.536

2,0 GHz (gepaart)	2,0 GHz A	2x4,95 MHz konkret	Vodafone	93.757
	2,0 GHz B	2x4,95 MHz konkret	E-Plus Grp	103.323
	2,0 GHz C	2x4,95 MHz konkret	E-Plus Grp	84.064
	2,0 GHz D	2x4,95 MHz konkret	To2 GER	66.931

2,0 GHz (ungepaart)	2,0 GHz E	1x5 MHz konkret	To2 GER	5.731
	2,0 GHz F	1x14,2 MHz konkret	To2 GER	5.715

Ausgeschiedene Bieter:

Frequenzbereich	Block	Ausstattung	Höchstbieter	Höchstgebot (€ in Tsd)
-----------------	-------	-------------	--------------	------------------------

2,6 GHz (gepaart)	2,6 GHz A	2x5 MHz abstrakt	Telekom D	19.096
	2,6 GHz B	2x5 MHz abstrakt	Telekom D	19.025
	2,6 GHz C	2x5 MHz abstrakt	To2 GER	17.364
	2,6 GHz D	2x5 MHz abstrakt	To2 GER	17.364
	2,6 GHz E	2x5 MHz abstrakt	Vodafone	18.948
	2,6 GHz F	2x5 MHz abstrakt	Vodafone	19.025
	2,6 GHz G	2x5 MHz abstrakt	Telekom D	19.069
	2,6 GHz H	2x5 MHz abstrakt	Telekom D	19.038
	2,6 GHz I	2x5 MHz abstrakt	To2 GER	18.948
	2,6 GHz J	2x5 MHz abstrakt	E-Plus Grp	18.931
	2,6 GHz K	2x5 MHz abstrakt	E-Plus Grp	17.739
	2,6 GHz L	2x5 MHz abstrakt	To2 GER	17.739
	2,6 GHz M	2x5 MHz abstrakt	Vodafone	17.739
	2,6 GHz N	2x5 MHz abstrakt	Vodafone	17.752

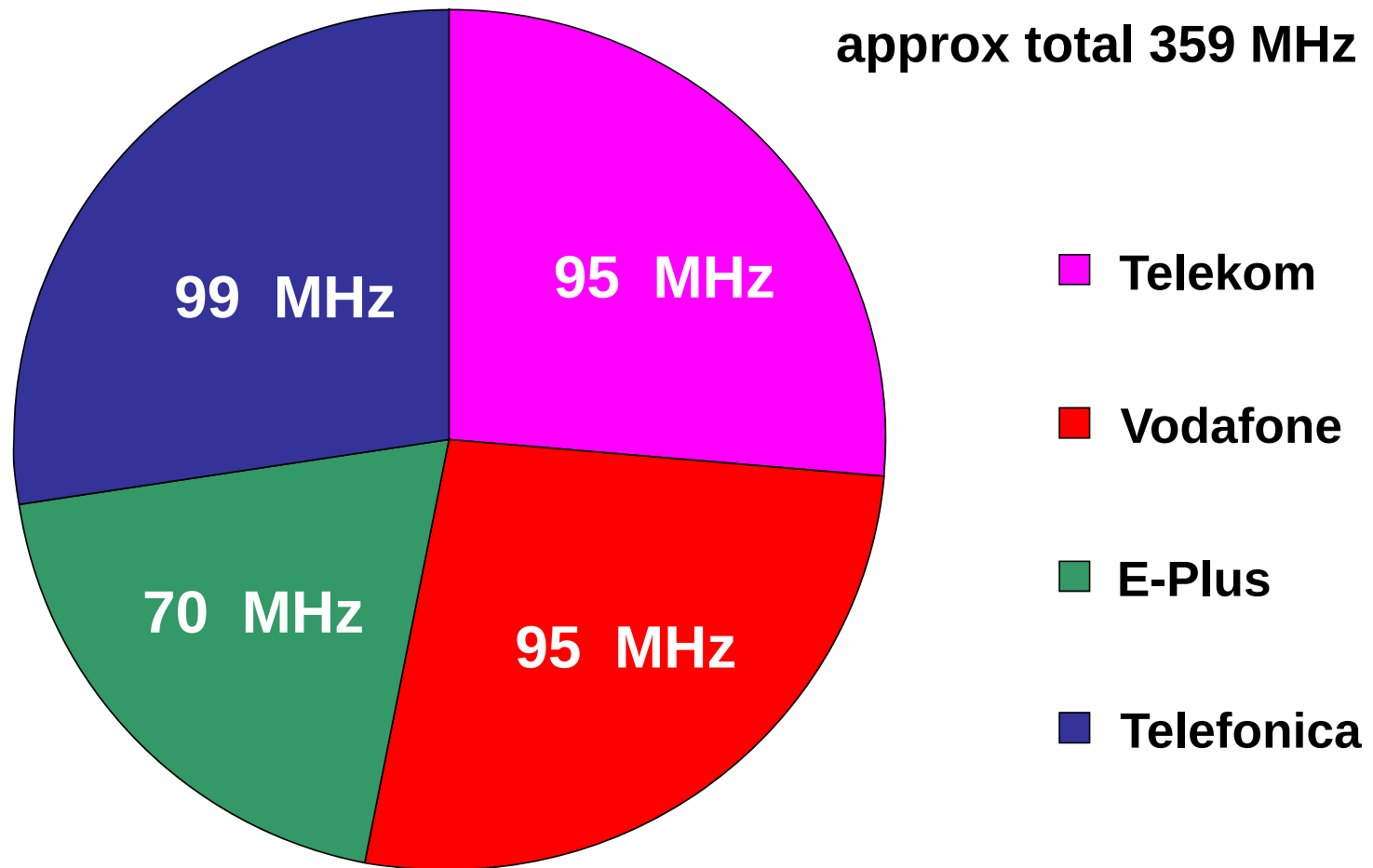
2,6 GHz (ungepaart)	2,6 GHz O	1x5 MHz abstrakt	Vodafone	9.130
	2,6 GHz P	1x5 MHz abstrakt	Vodafone	9.130
	2,6 GHz Q	1x5 MHz abstrakt	Telekom D	8.598
	2,6 GHz R	1x5 MHz abstrakt	Vodafone	8.598
	2,6 GHz S	1x5 MHz abstrakt	Vodafone	9.051
	2,6 GHz T	1x5 MHz abstrakt	Vodafone	9.051
	2,6 GHz U	1x5 MHz abstrakt	E-Plus Grp	8.273
	2,6 GHz V	1x5 MHz abstrakt	To2 GER	8.229
	2,6 GHz W	1x5 MHz abstrakt	To2 GER	8.229
	2,6 GHz X	1x5 MHz abstrakt	To2 GER	8.229
	2,6 GHz Y	1x5 MHz abstrakt	To2 GER	8.229
	2,6 GHz Z	1x5 MHz abstrakt	To2 GER	8.229

4.384.646.000 €

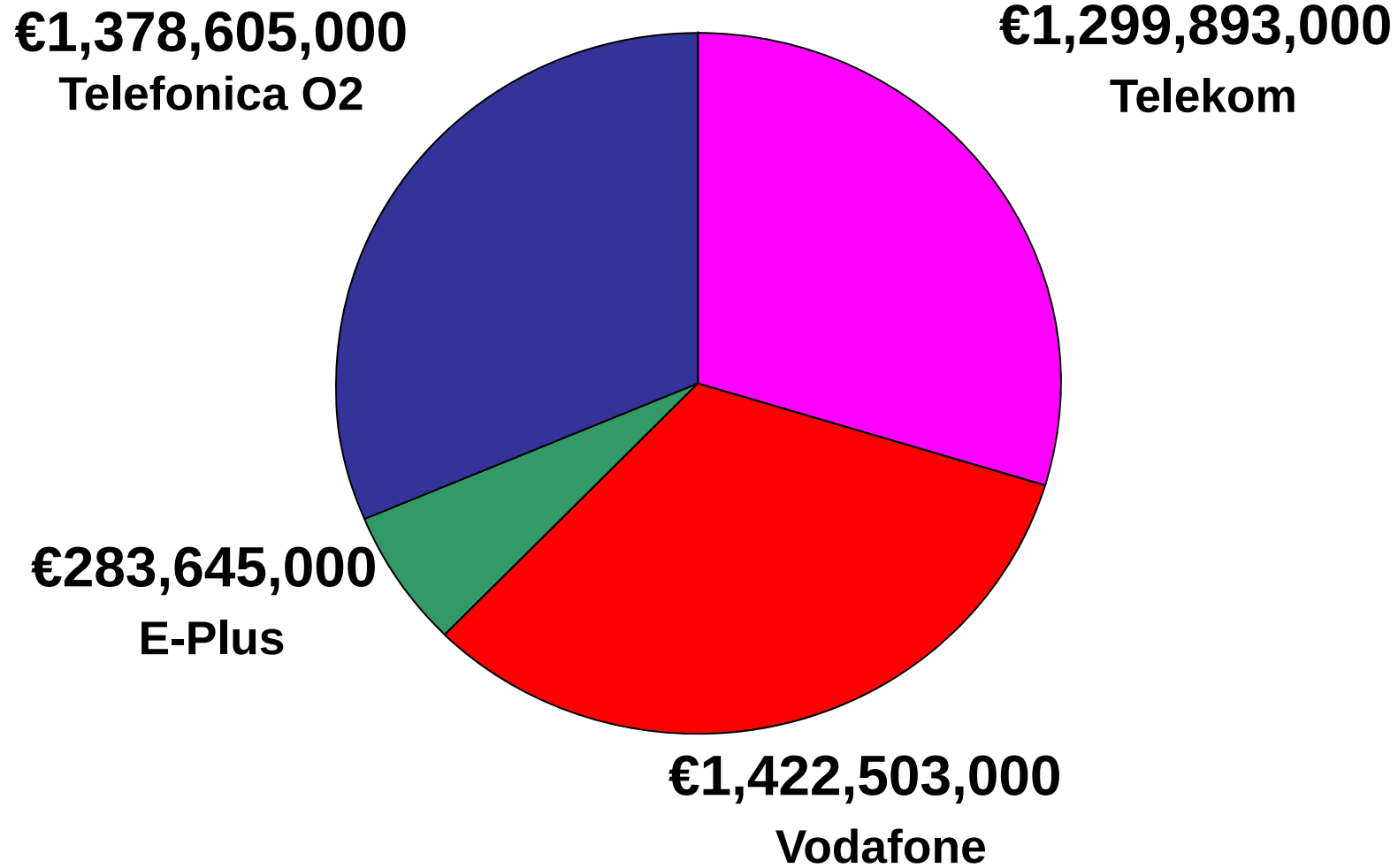


- **360** MHz
- **41** frequency blocks
- **4** frequency bands (800 MHz, 1.8 GHz, 2.1 GHz, 2.6 GHz)
- **1** auction
- **6** applicants
- **4** bidders
- **6** weeks
- **224** rounds

Outcome of the auction

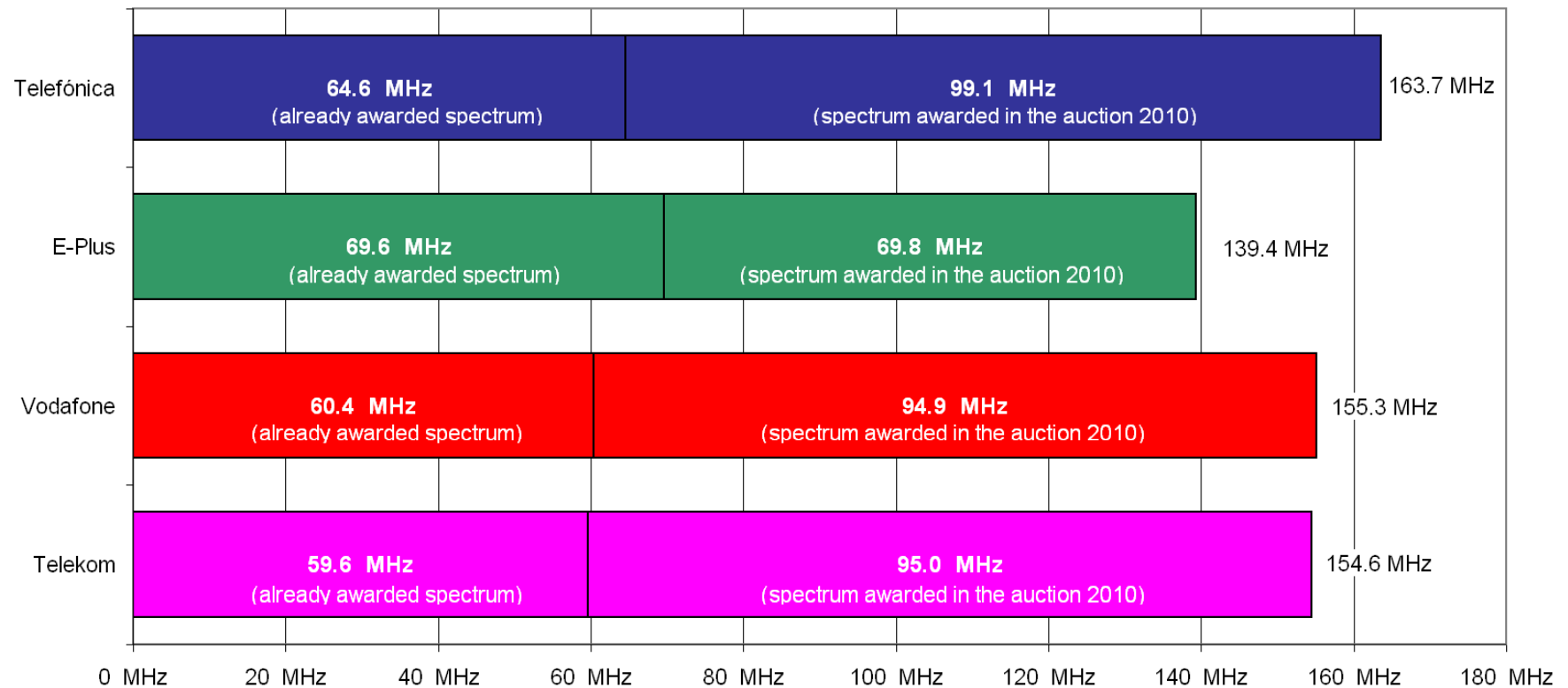


Highest bids per operator





Spectrum of the mobile network operators after the auction



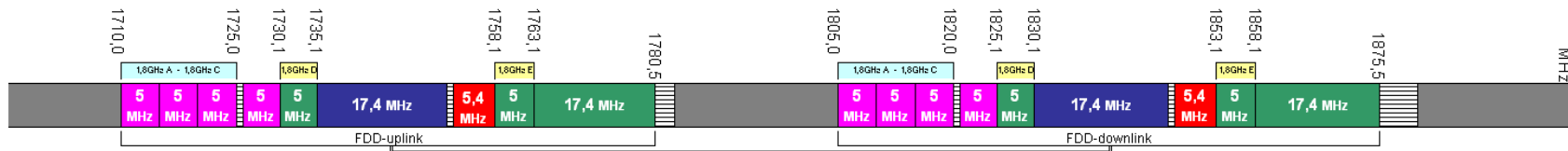
Current spectrum distribution



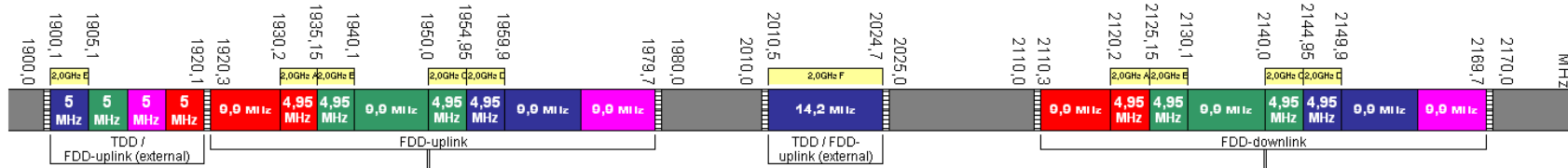
• Frequency bands 800 MHz and 900 MHz



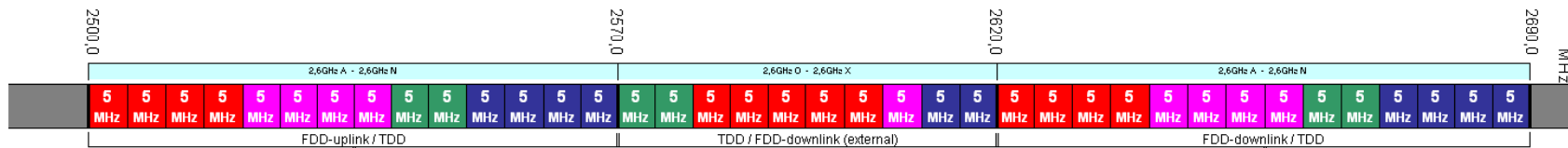
• Frequency band 1.8 GHz



• Frequency band 2.1 GHz



• Frequency band 2.6 GHz



Overview

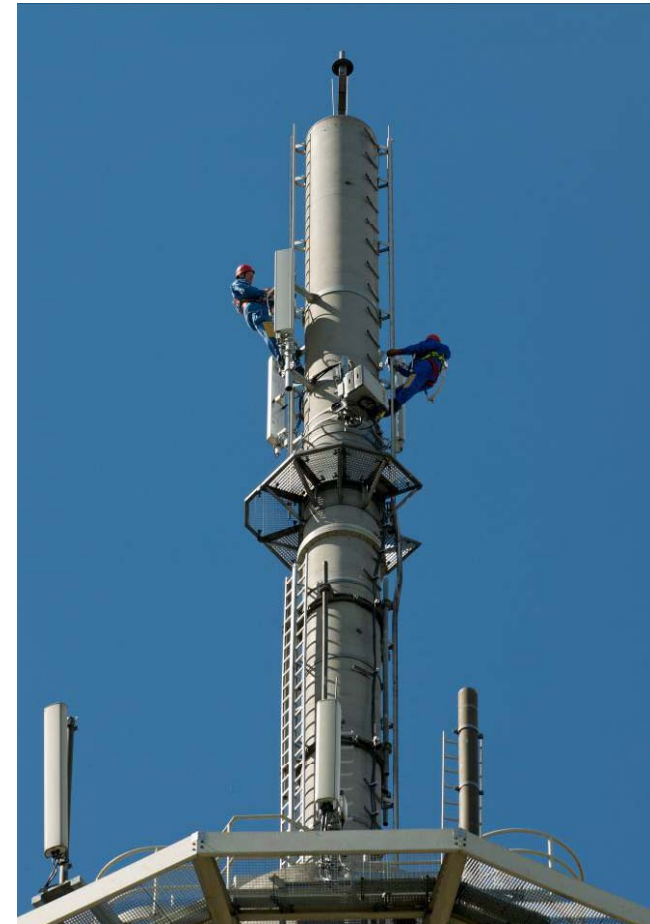
Aftermath



Site-specific parameters

Transparent procedure

No interference yet



© Deutsche Telekom AG

800 MHz Coverage



10 of 16 Federal states covered

7448* LTE-800 sites approved

2332* sites in commercial operation

* as of January 2012



Site-specific parameters



LTE at 800 MHz

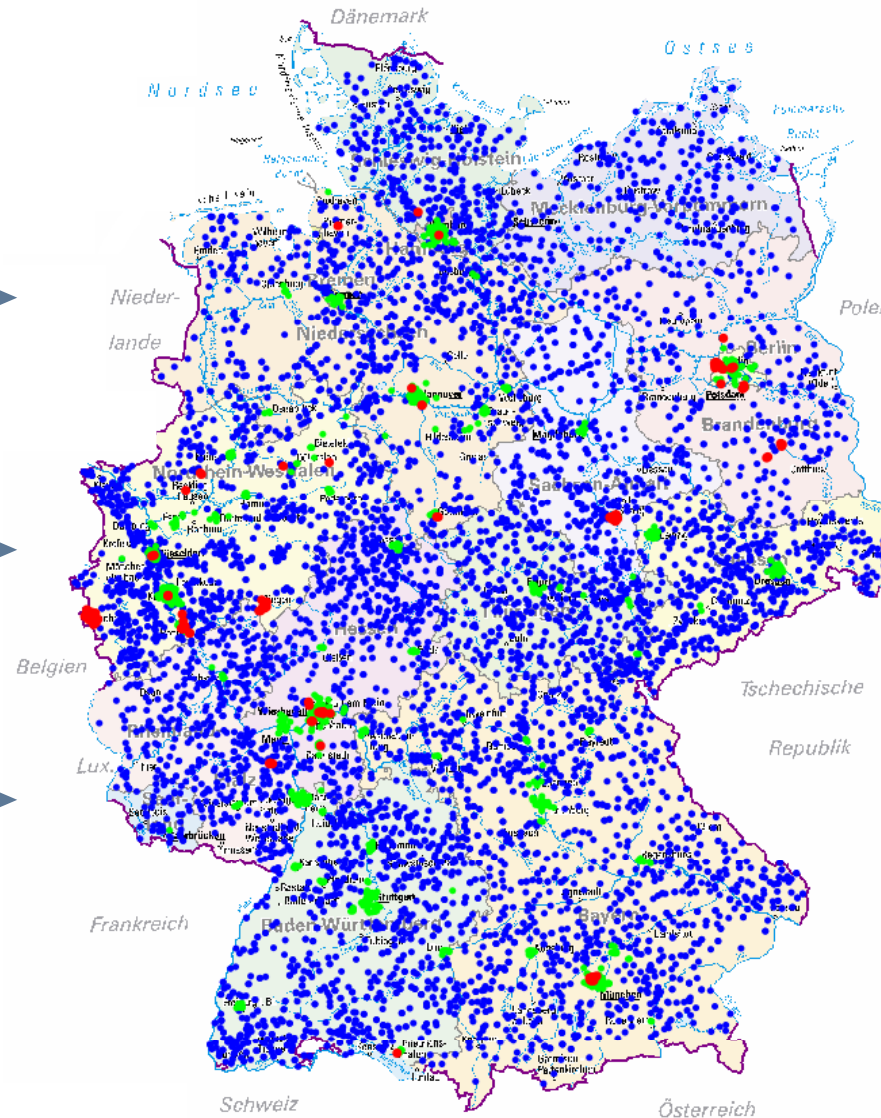
7,448 sites

LTE at 1.8 GHz

1,254 sites

LTE at 2.6 GHz

203 sites



Examination of existing assignments



2. Member States shall, when implementing this Directive, examine whether the existing assignment of the 900 MHz band to the competing mobile operators in their territory is likely to distort competition in the mobile markets concerned and, where justified and proportionate, they shall address such distortions in accordance with Article 14 of Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive) (**).



From our point of view a combination of spectrum costs and networks costs is the most suitable indicator to objectively determine competitive distortions. [...] We do not see indicators for distortions of competition stemming from spectrum distribution and the flexibilization of the 900 MHz band.



Expiry of GSM licences
by the end of 2016

Statements of interest in
usage by January 2012

Project 2016

Page 1 of 26

Translation¹

**Demand identification proceedings
for the frequency bands at 900 MHz and 1800 MHz**

(BK - 1-11/003)

Also the Bundesnetzagentur's Official Gazette No. 23/2011

¹ In case of divergent interpretation only the German text shall prevail.



Bundesnetzagentur

Dr. Rüdiger Hahn
Head of Department 2
Legal Aspects of Telecommunications Regulation, Frequency Regulation

www.bundesnetzagentur.de



Ministerial
Programme 2012



Panel session:

Overcoming challenges for analogue switchover around the world

Moderator:

Peter Lyons, MEA Spectrum Manager, GSMA

Panelists:

Bitange Ndemo, Permanent Secretary, Ministry of Communications, Kenya

Luis Lucatero, Head of Regulatory, Cofetel, Mexico

Dr JS Sarma, Chairman, Telecom Regulatory Authority of India, India



Mobile Internet for the poorest: Making the most of the 700MHz band

Luis Lucatero
Chief of Regulatory Policy
COFETEL, Mexico

THIS DOCUMENT DOES NOT REPRESENT
THE OFFICIAL VIEWS OF COFETEL

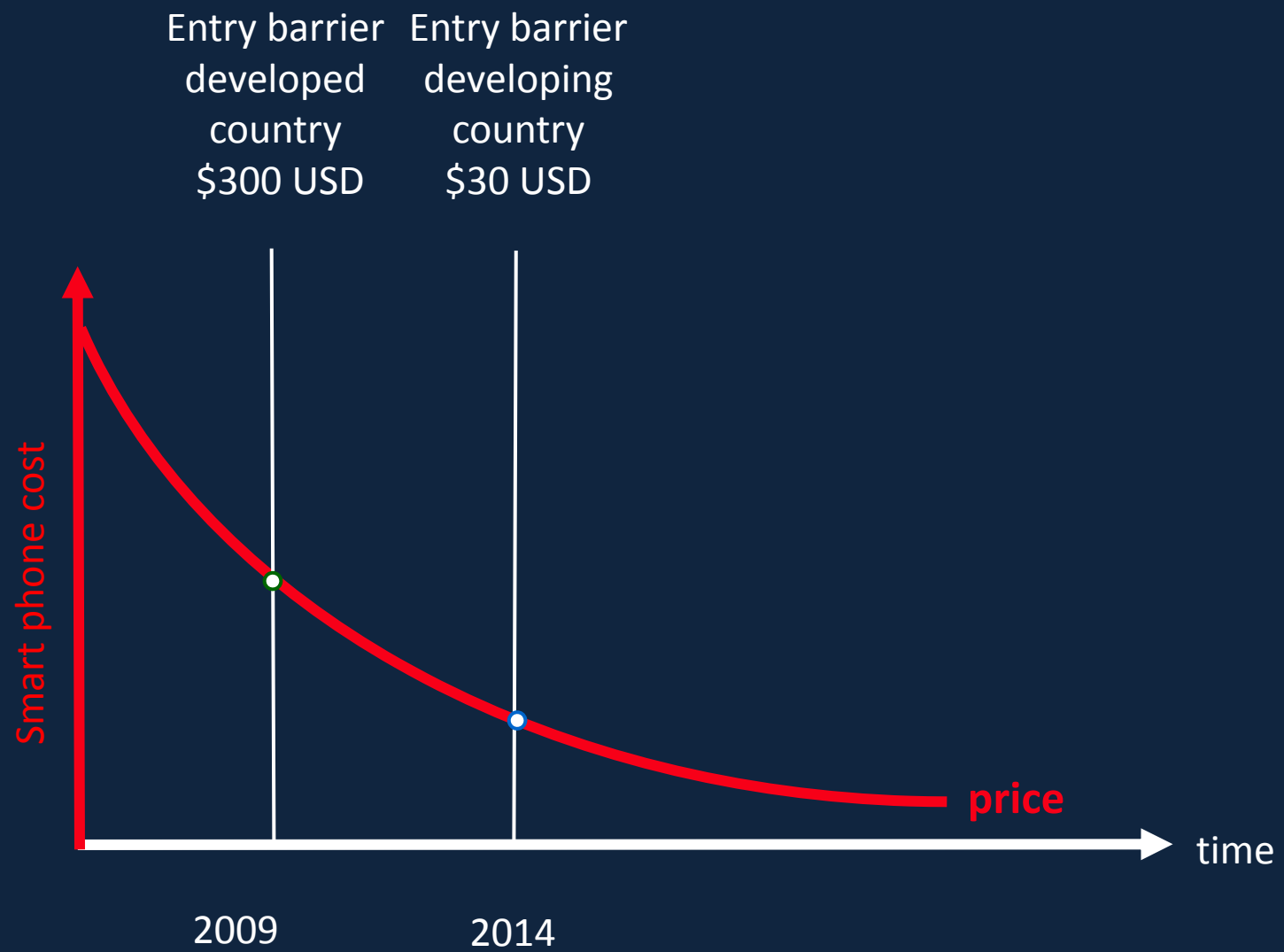
Regulatory Policy: What guides us?

Reduce transactional costs (including tools)

Defragmentation of supply and demand

Induction of social cohesion

Neutralize undesirable market effects





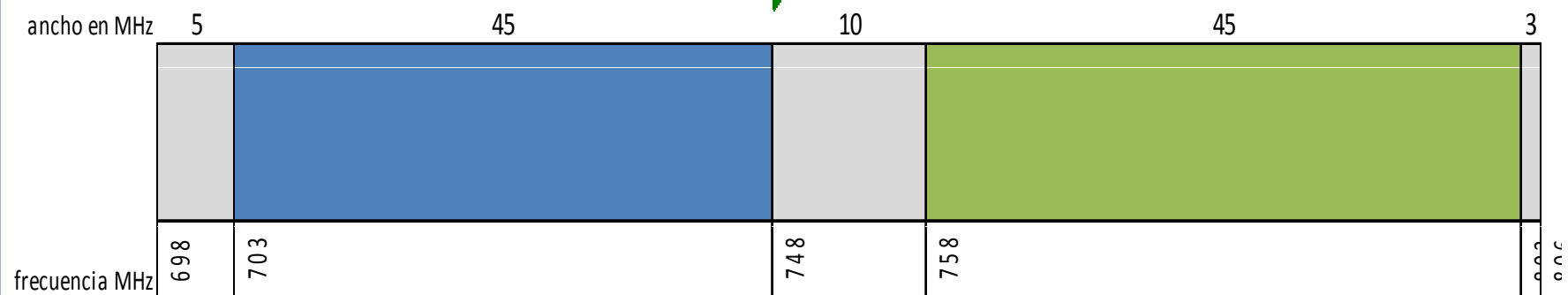
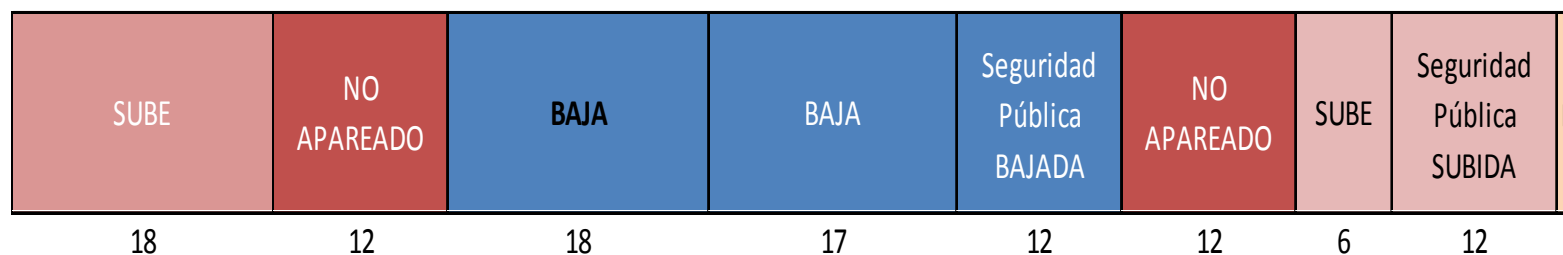
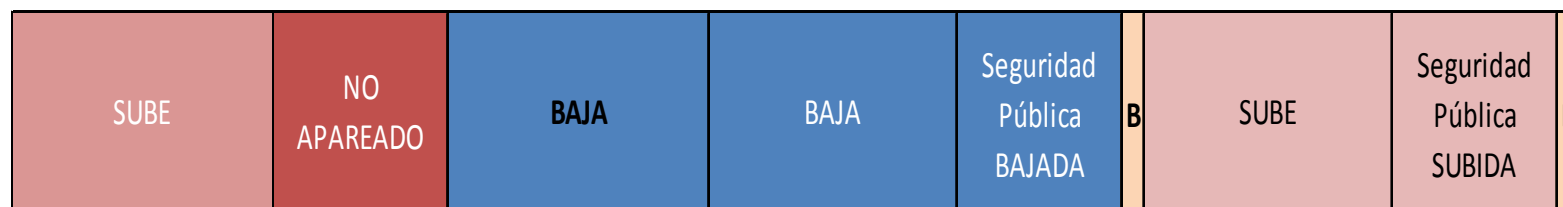
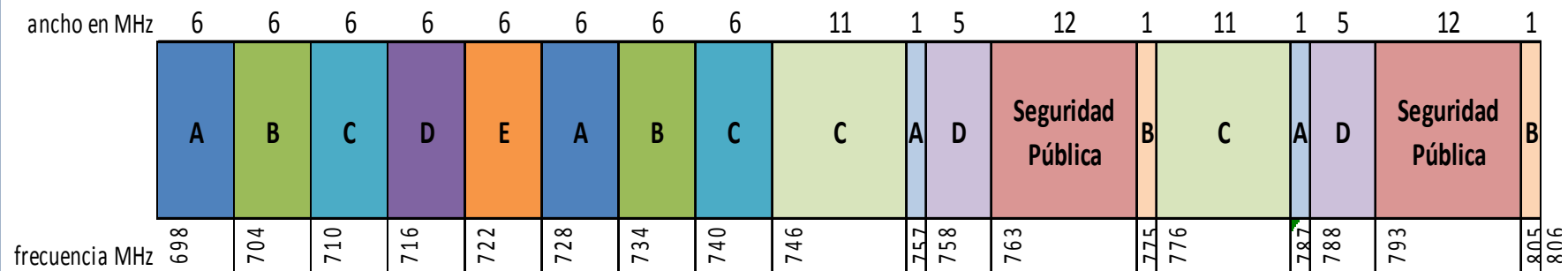
The 700MHz band

Large channels: low latency high throughput

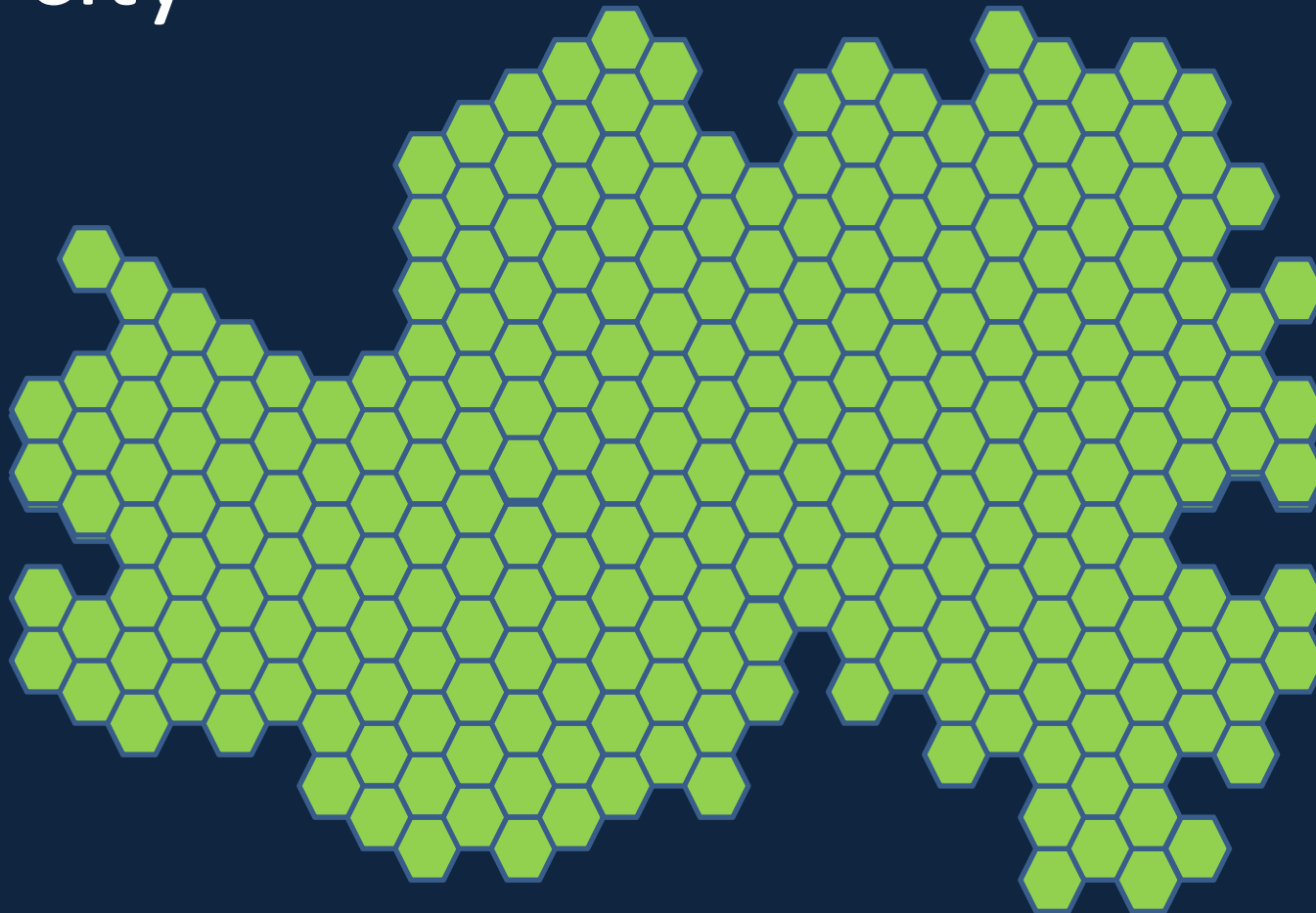
Low frequency: Affordable coverage

High spectrum efficiency: LTE

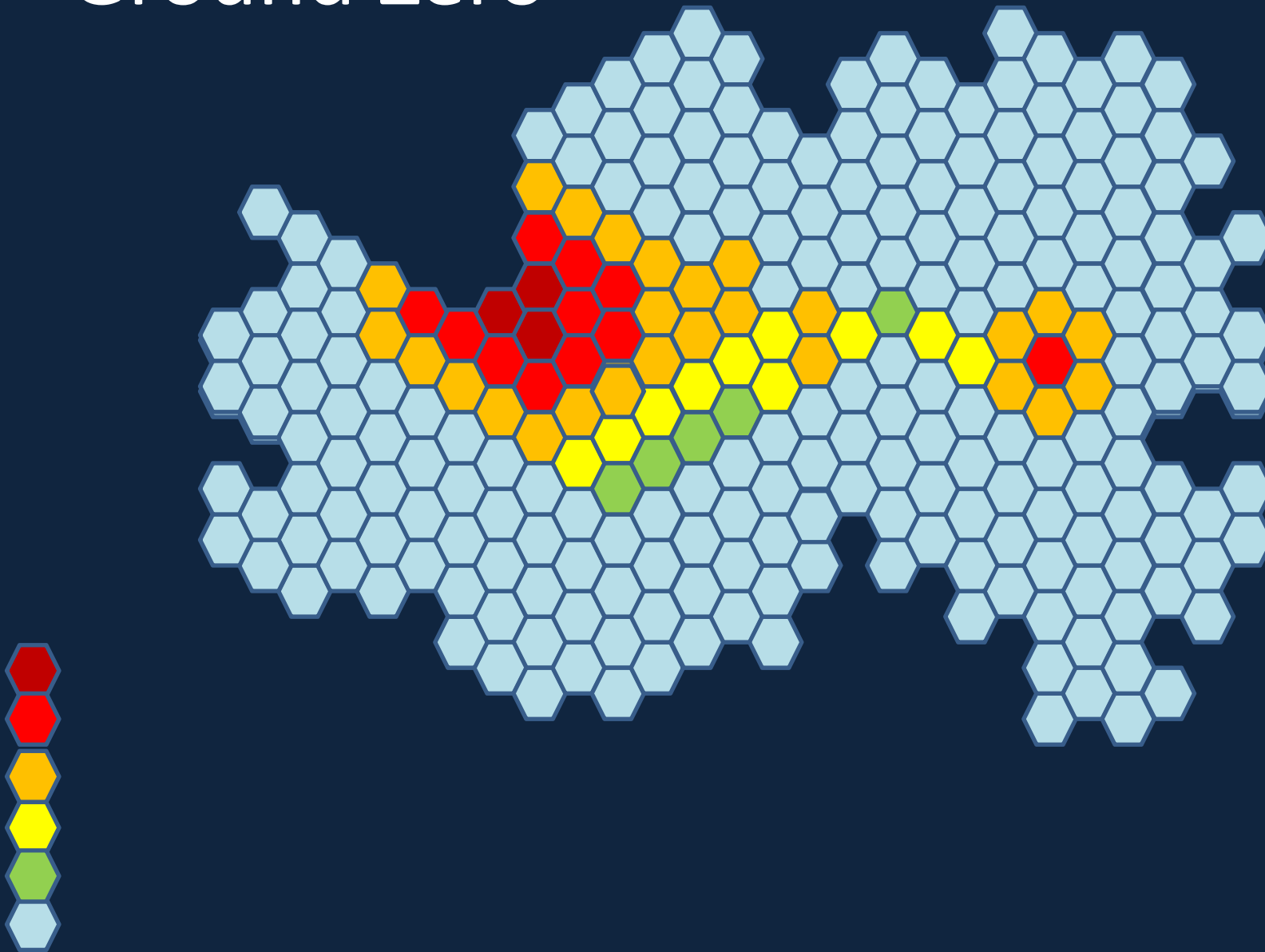
No spectrum for official use: capacity models

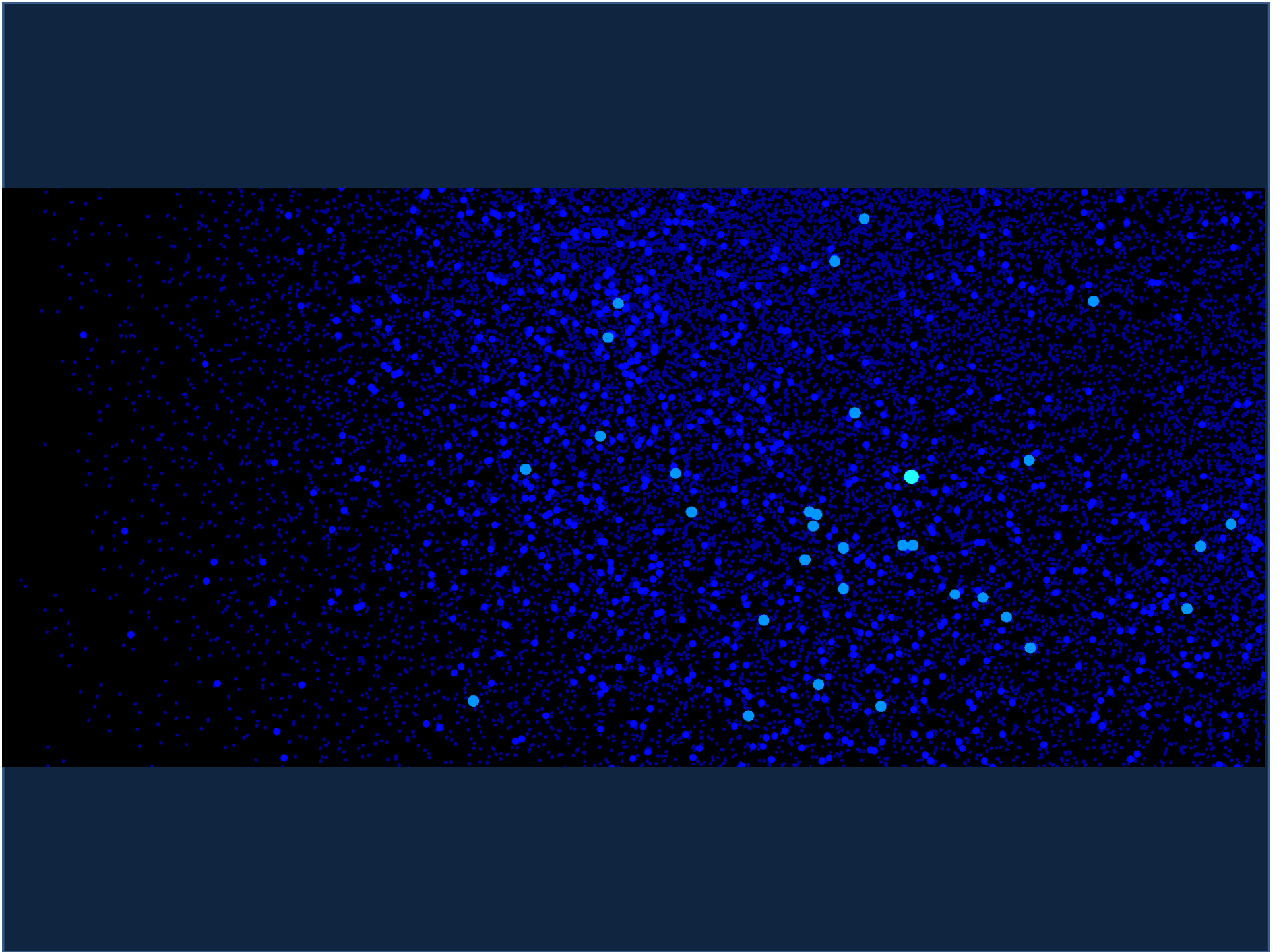


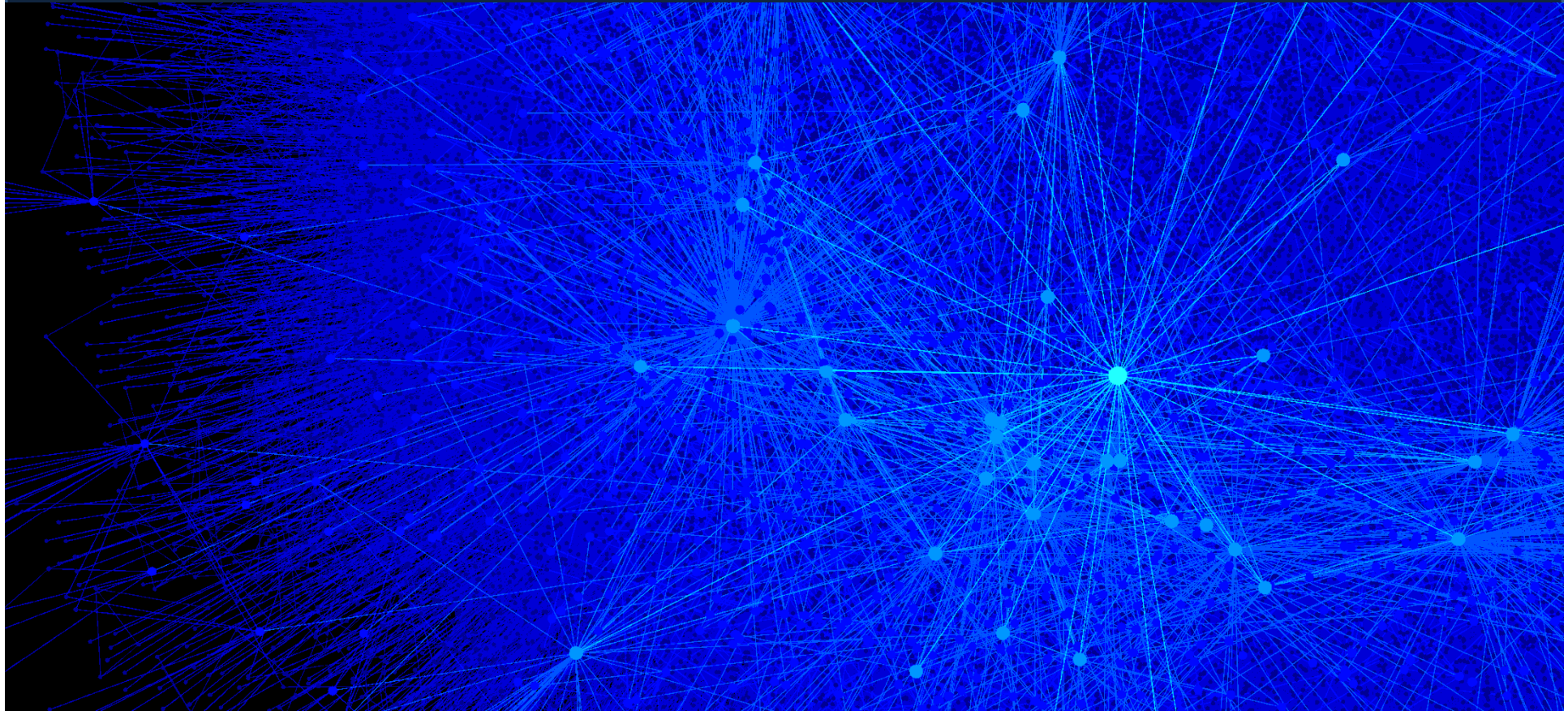
My city



Ground Zero







Reduced transactional costs
Defragmented supply and demand
Enhanced social cohesion
Neutralized undesirable market effects



Thank You

Please visit www.gsma.com/DDtoolkit for
detailed information



Digital Dividend Toolkit

1.0
INTRODUCTION

Introduction to the Toolkit

The ITU's Digital Dividend Toolkit is designed to give one-stop access to the latest policies on the Digital Dividend, allow existing thinking on the subject and highlight areas of best practice.

As existing information on the Digital Dividend is increasingly fragmented, fragmented and often outdated, the Toolkit provides a central point of reference for those who wish to advance the Digital Dividend agenda. It is a key tool for those who wish to advance the Digital Dividend agenda. It is a key tool for those who wish to advance the Digital Dividend agenda.

2.1
SCOPE

Networks and Devices for Mobile Broadband

Mobile broadband as defined by the GSM family of technologies has been a great success. The market has grown from two deployed HSPA networks in 2006 to over 200 by May 2011. Operators are now looking to the Digital Dividend to deploy the next generation of mobile technologies, LTE, with several LTE networks already deployed and nearly 30 early commitments using the digital dividend.

Region	Number of operators	Number of users
Asia Pacific	15	1
Europe	40	2
Latin America	40	1
Middle East	10	1
North America	20	1

3.2
HIST

ITU Processes

Long before consumers are able to make use of affordable mobile broadband devices, governments and industry must work together to achieve international agreement on a number of issues. Chief among these is the identification of internationally harmonised spectrum bands.

There is a key role for the ITU in this process. The ITU is the only international organization that has the authority to allocate radio frequency spectrum on a global basis. The ITU is the only international organization that has the authority to allocate radio frequency spectrum on a global basis.