The Economic Benefits to Indonesia of Early Harmonisation and Assignment of the Digital Dividend to Mobile

Indonesia report

The Boston Consulting Group

Agenda

Chapter 1: Key recent developments

Chapter 2: Benefits of allocation to mobile

Chapter 3: Benefits of early harmonisation

Chapter 4: Implications of commitment to non-harmonised band

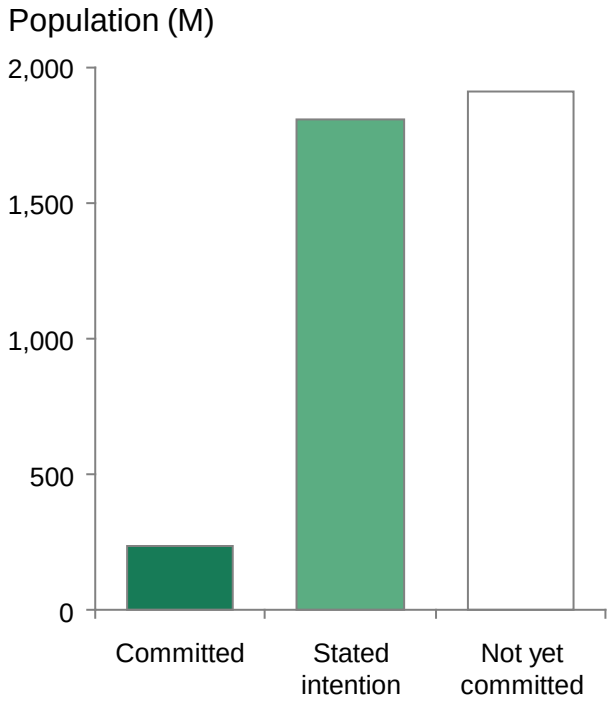
Chapter 5: Recommendations

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Strong and growing commitment to the APT proposed band plan in the 698-806 MHz range in the region



Population of countries that have committed/stated intention exceeds 2B



Note: Countries only include those specified by ITU as Region 3
Source: EIU country data, Government regulatory bodies of the respective countries

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Additional comments on major countries in Asia-Pacific

Country	Status	Comments
Australia	✓	Auction date announced for April 2013 in full alignment with APT band plan
China	✗	Agrees to use the 700Mhz band for mobile, but not committed to a frequency option
India	✓	Has shown intention to follow the APT band plan but Government yet to make a formal announcement on the 700MHz auction
Indonesia	✓	Looking into allocating the 700MHz band (694-806MHz) for mobile broadband
Japan	✓	Awarded 3 licences totaling 2x30 MHz on 27 June, in alignment with the APT band plan
Malaysia	✗	Considers broadcasting on parts of the band ; Companies submitted bids for DTT
New Zealand	✓	700MHz band allocation to mobile in alignment with APT band plan proposed to Cabinet in Oct 2012; Band to be cleared and available nationwide from Dec 2013
Papua New Guinea	✓	2x22.5 MHz (the lower block) allocated to Digicell PNG in April 2012
Singapore	✓	Plans to commit, but concerned about potential interference with Malaysia; Regulators allowed SWSPG[1] to trial mobile broadband within 700 MHz band
South Korea	✓	Will allocate 700MHz after switch over in Dec 2012 to LTE services
Taiwan	✓	Will auction off 9 blocks of 700 MHz band for mobile broadband at end of 2013
Thailand	✓	Announced allocation of 700 MHz band to mobile in May 2012; Approved key draft regulations for digital TV management plan

✓ Committed ✓ Stated intention to commit ✗ Non-committed

1. Singapore White Spaces Pilot Group (Microsoft-led)
Source: GSMA

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Indonesia 700 MHz band plan switchover may be delayed due to slow digital transition

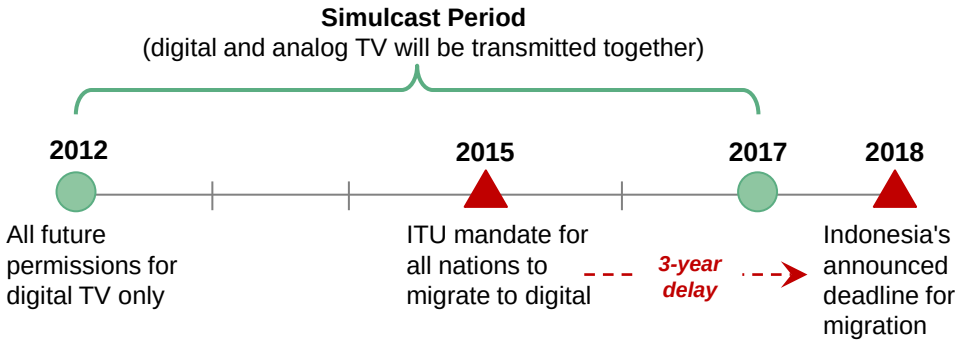
Spectrum allocation to mobile may be delayed until 2018

Spectrum allocation to mobile may be postponed due to delay in digital switchover

- TV broadcasters reluctant to switch citing potential decline in viewers who would have to purchase decoders to receive digital broadcasts

Digital TV migration to be completed by 2018

- MCIT[1] acknowledged the need to migrate in order to keep up with global digital trend



However, government is attempting to accelerate migration

Launched initiatives to speed up the migration process by providing free set-top boxes

- MCIT proposed USD ~11-30M[3] budget; but the Parliament delayed this in Sep 2012
- All new digital TV providers are required to commit to provide 1M free top-set boxes in total

Planned cooperation with China to develop Indonesian digital TV network technology

- Followed up to agreement in 2010 that China will supply digital broadcasting devices

"[China] has distributed 1.4B sets of set-top box decoders and 1.6B transmitters...and the cooperation will improve investment partnership between Indonesia and China..." – China Ministry of Industry and IT

"The technology of digital broadcasting from China is extremely advanced, and it is perfect to meet Indonesia's needs..." – Indonesian TV station

1. Ministry of Communication and Information Technology 2. The International Telecommunication Union 3. 109M to 300M Indonesian rupiah
Source: Press search

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Experiences shows subsidies can accelerate digital transition

Many countries successfully use subsidies to drive digital transition...

Australia



- Household Assistance Program[1] spent USD 15.7M to provide decoders to 38K+ households by May 2011
- Satellite subsidy for black spot areas with household co-payments of ~USD 200

Japan



- Established "eco-points" program for digital TV purchases. Points can be exchanged for other products[1]
- Free set-top boxes distributed to low-income households

Germany



- Set-top boxes subsidy to low-income households (~USD 948K budget for ~6K households)

Italy



- Offer subsidies of USD 90 to each consumer who purchase set-top boxes

UK



- Digital Switchover Help Scheme secured funding of USD 970M to install equipment esp. for older and disabled people

...including emerging countries, such as Mexico

Analog to digital TV transition was main obstacle faced during band clearance in Mexico

- Planned national analog switch-off on 31 Oct 2016

Government financial support can facilitate the transition

- ~USD 200 M estimated for Northern Mexico[2]
  - ~USD 33 M estimated for Tijuana
- Proceeds of sale of the spectrum can compensate for investment of public funds
- Recognized need for strong leadership and coordinated action between stakeholders in managing migration

E.g. Tijuana (pilot city)



- Total subsidy: USD 33M
- Cover decoders, antennas, installation costs and citizen education programs



- Subsidy per home: USD 132
- ~45% for decoders and antennas

1. Store coupons, beer & food coupons, travel coupons, and an array of environmentally-friendly products and regional goods. 2. Program launched in 2009 with total budget in 3 successive cycles of USD 390M

Note: All currencies converted to USD as of 1 Nov 2012

Source: GSMA Case studies for the award of the 700MHz/800MHz band, Japan Ministry of Internal Affairs and Communications, Press search

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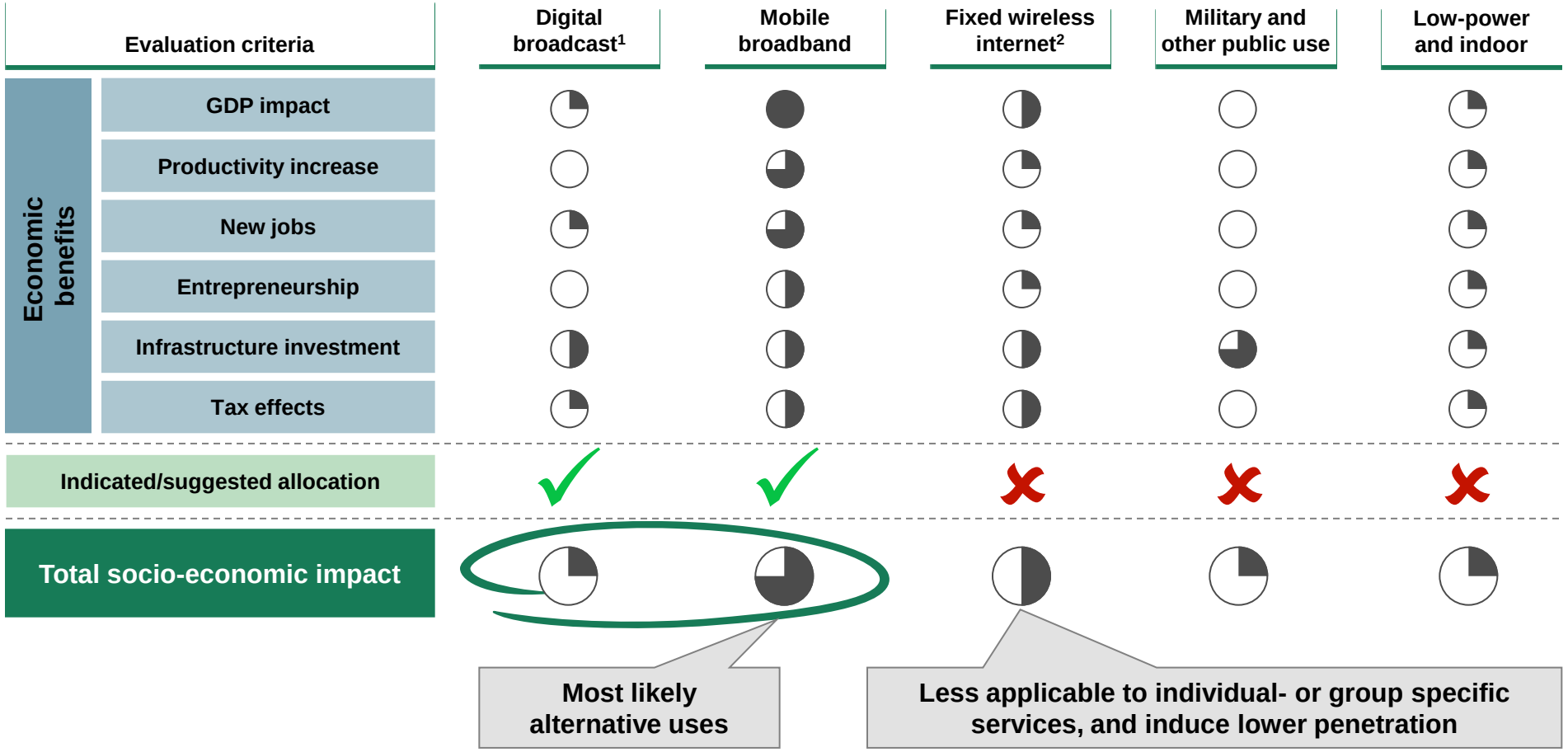
Chapter 3: Benefits of early harmonisation

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Mobile and broadcast most likely uses of 700Mhz band based on socio-economic impact and regional observations



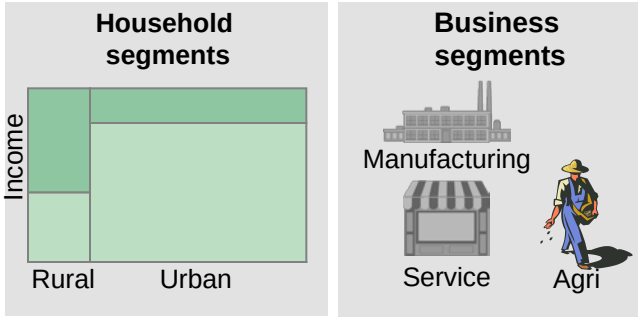
○ No incremental benefit compared to baseline ● High incremental benefit compared to baseline

1. Extending number of channels beyond today's analogue which will be switched over 2. E.g. WiFi, WiMAX
Source: Expert interviews; BCG analysis

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Study builds on rigorous cost-benefit analysis to estimate incremental adoption uplift from mobile broadband

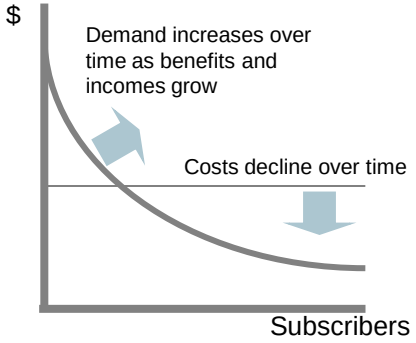
Cost-benefit analysis of businesses and households

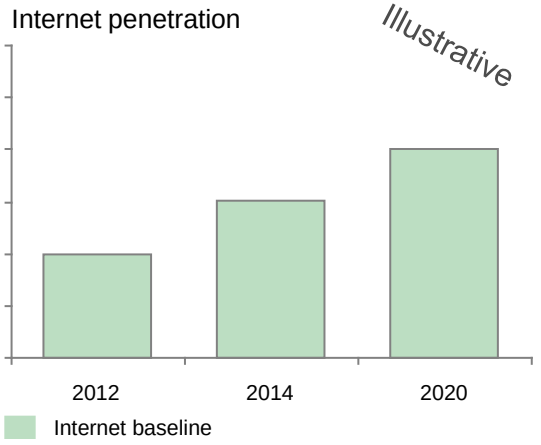


Benefits
- Increased profits for businesses
- Increased income/welfare for households

Costs
- Device
- Subscription/ access

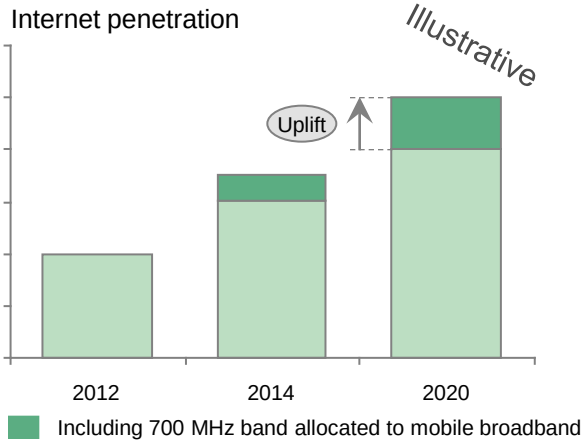
Baseline estimate for Internet penetration





Incremental effect of mobile broadband in 700 MHz band

Mobile broadband in 700 MHz band will increase benefits and reduce costs
- Greater coverage and lower service costs will improve accessibility
- Economic benefits from increased productivity and rate of adoption
- Significant social and economic benefits in rural areas



Note: Figures are illustrative

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Benefits of early IMT harmonisation modeled against DTT usage

Description

Estimate the benefit of early harmonisation on the APT 700 band in two different scenarios

- Harmonisation of mobile services
- Harmonisation of broadcasting services

Benefits are assessed along four economic dimensions

- GDP effects
- Government income
- Job creation
- Business creation

Factor	Assumptions base case	
Roll-out timeline	Start: Full effect:	**2014** **2015**
Service cost decrease[1]	Highly penetrated: Other countries	**6%** **10%**
Increase in rural needs benefit	First year impact: Full effect:	**5%** **10%**
Increase in rural wants benefit	First year impact: Full effect:	**10%** **20%**
Business prod. gains	First year impact: Full effect:	**5%** **10%**
Agricultural prod. increase	First year impact: Full effect:	**5%** **10%**

Early harmonisation of IMT services will serve as baseline against which alternative scenarios are measured

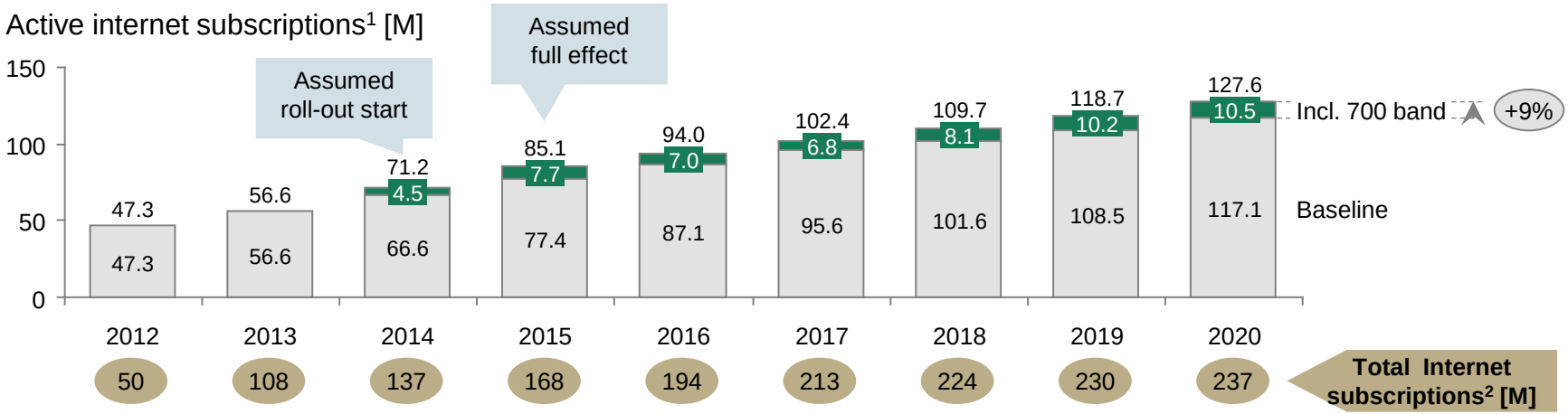
1. First year effect is 50% of stated effect

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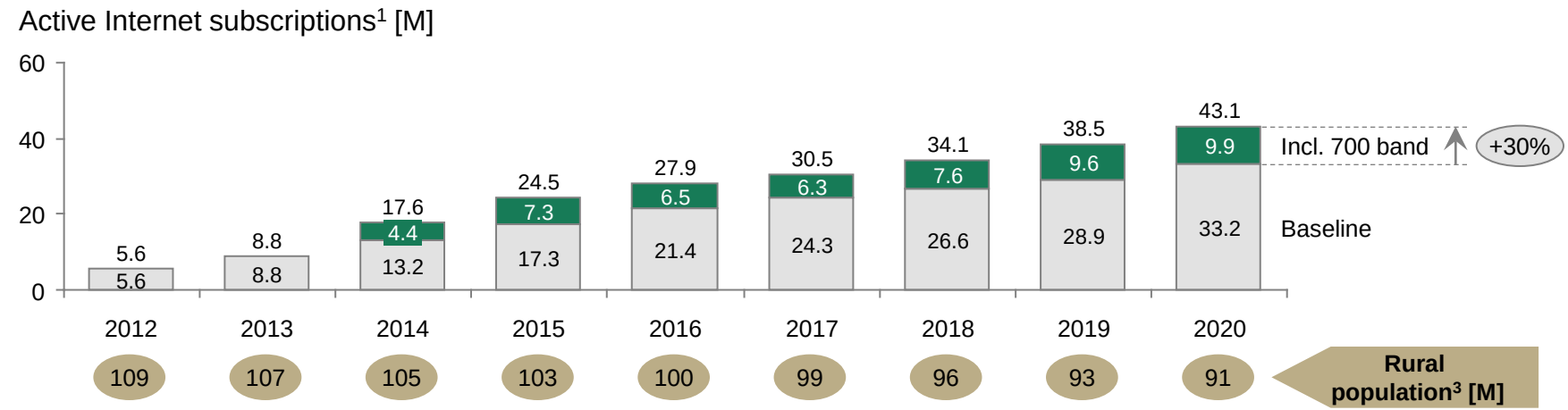
Increase in subscriptions mainly driven by the rural population

Allocating to IMT will increase internet subs. by 9% in Indonesia, and by 30% among rural users

Total



Rural



1. Baseline calculated as Active Subscriptions with actual economic impact. For fixed line Internet, generally Users>Subscriptions, whereas for mobile internet generally Users < Subscriptions
2. Ovum estimates until 2015 for 3G and LTE subscriptions, dial-up and fixed broadband . For 2015-2020, a flattening incremental uptake is assumed 3. EIU estimates

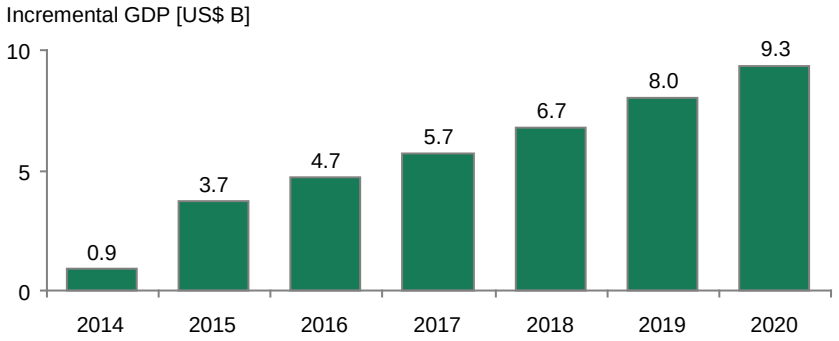
Source:: EIU; ITU; Ovum; BCG analysis

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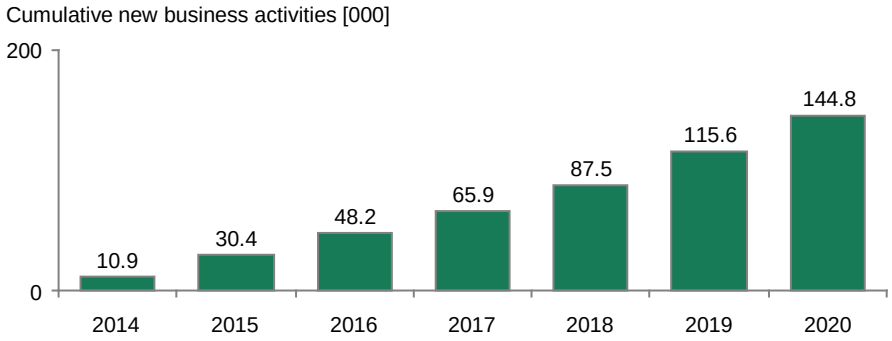
Allocation to mobile will bring significant benefits for Indonesia

GDP increase of US$ 30B NPV, US$ 7B in taxes, and 145K new businesses and 286K new jobs

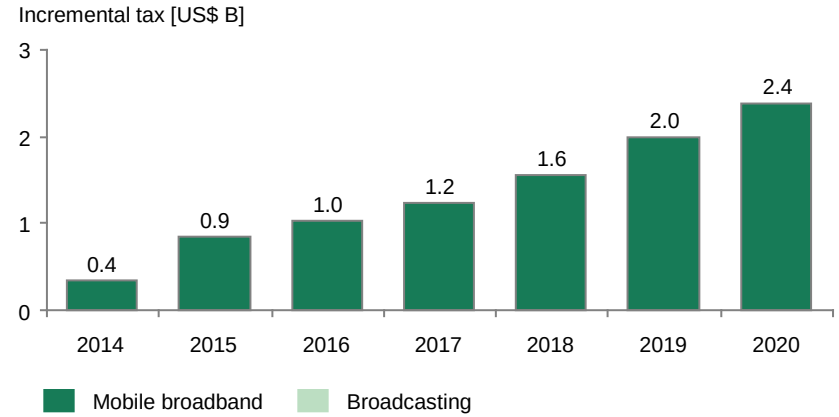
GDP increased US$ 39.1B 2014-2020 (NPV US$ 29.8B)



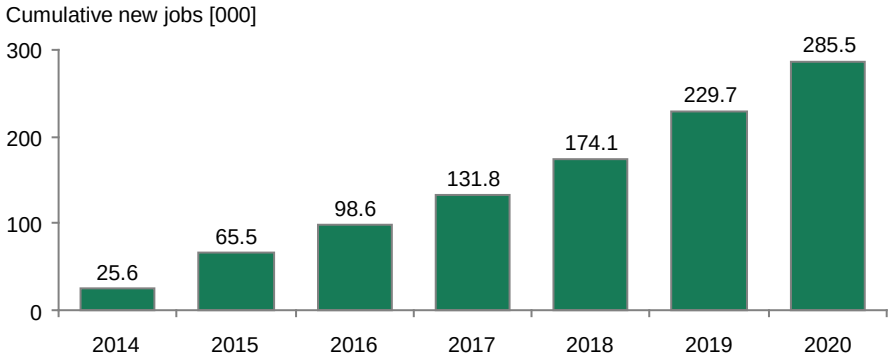
145K new business activities by 2020[1]



Government revenues up US$ 9.4B (NPV US$ 7.2B)



286K additional jobs created by 2020

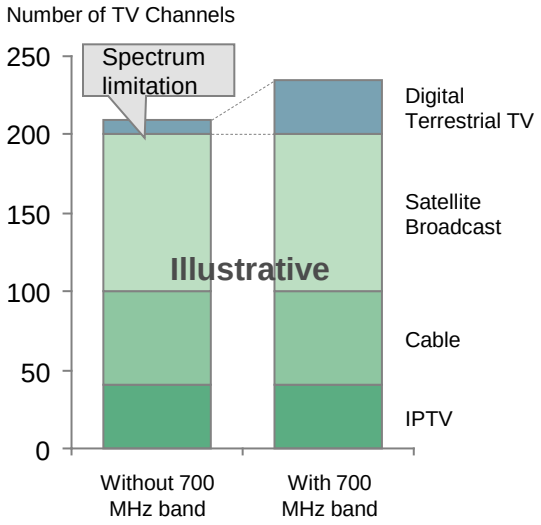


1. Incl. new independent businesses as well as new departments/units/business areas within existing firms
Note: NPV discounted by 4% for Indonesia
Source: Datamonitor; EIU; OECD; World Bank; National statistics units; BCG analysis

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Broadcast impact calculated with best-case assumptions, to ensure conservative estimates of mobile benefit

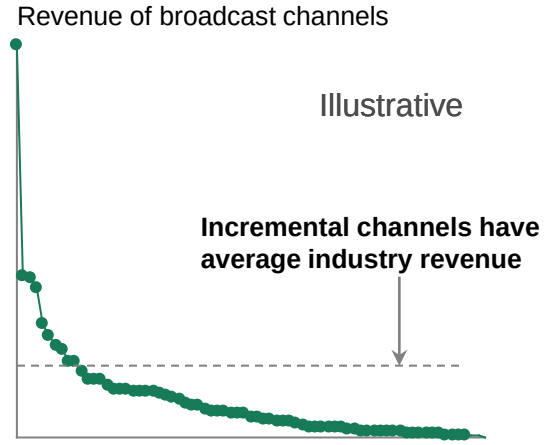
700 MHz band allows more TV channels...



Generous assumptions on additional channels

- 25-35 additional channels are technically possible in most countries
- Possibility that channels may not be commercially viable deliberately excluded

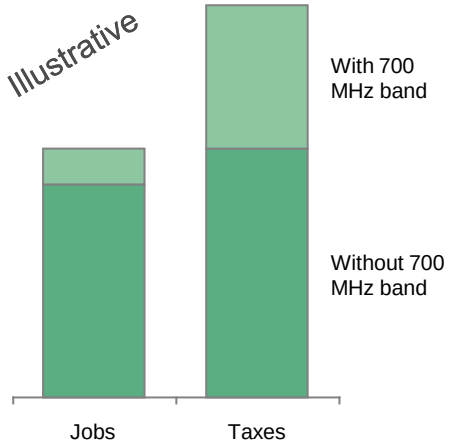
Generating revenue across supply chain...



Optimistic revenue assumptions: overall industry effect may be lower

- Additional channels will cannibalize existing offerings
- Marginal channels likely to be niche

As well as broadcast jobs and taxes



Few spinoff effects to general economy

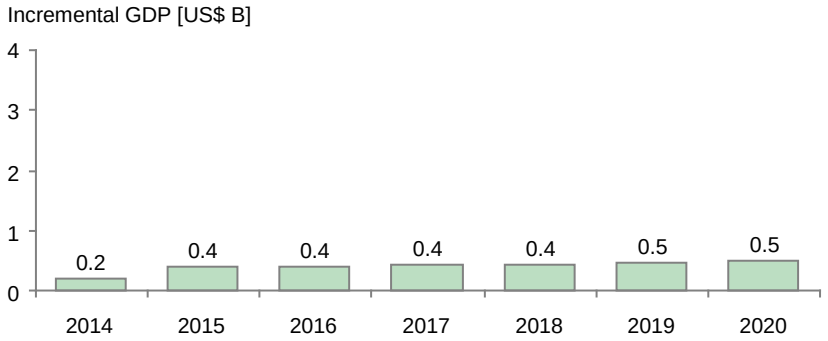
- Existing public service channels already provide wide range of educational content
- Special interest groups well served by cable/satellite

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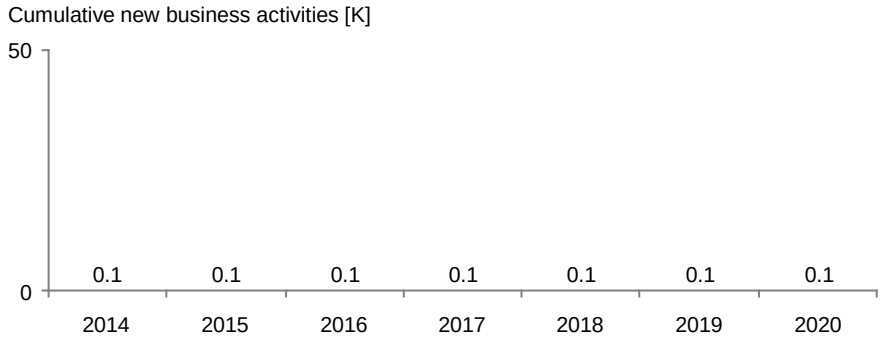
Allocation to DTT will have a smaller economic impact

GDP increase with US$2B NPV, taxes with US$ 1B, with 0.1K new businesses and 2.1K new jobs

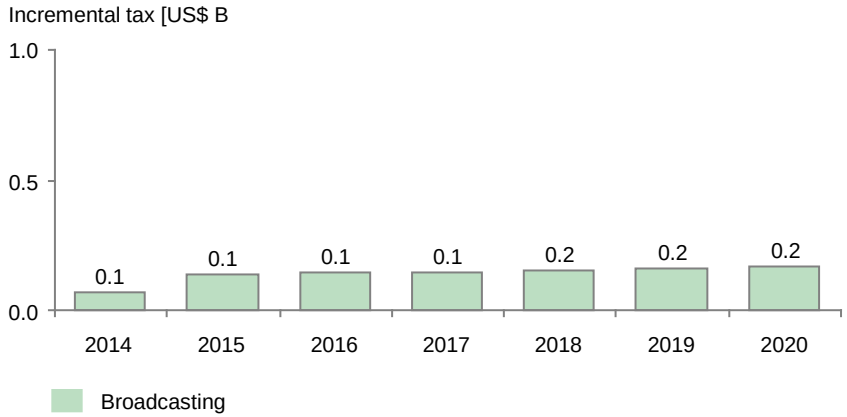
GDP increased US$ 2.8B 2014-2020 (NPV US$ 2.2B)



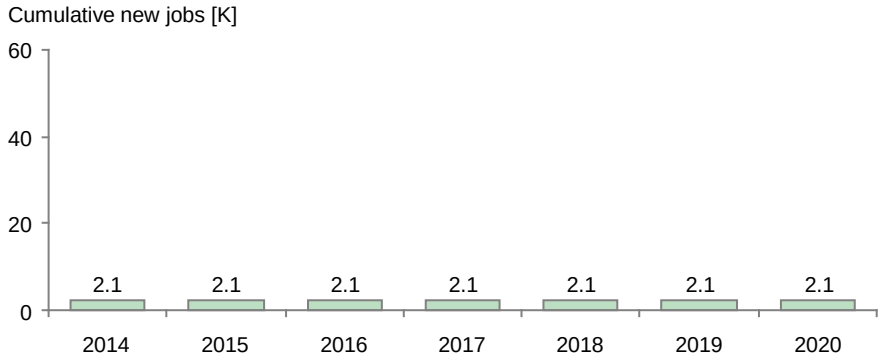
0.1K new business activities by 2020[1]



Government revenues up US$ 1.0B (NPV US$ 0.7B)



2.1K additional jobs created by 2020

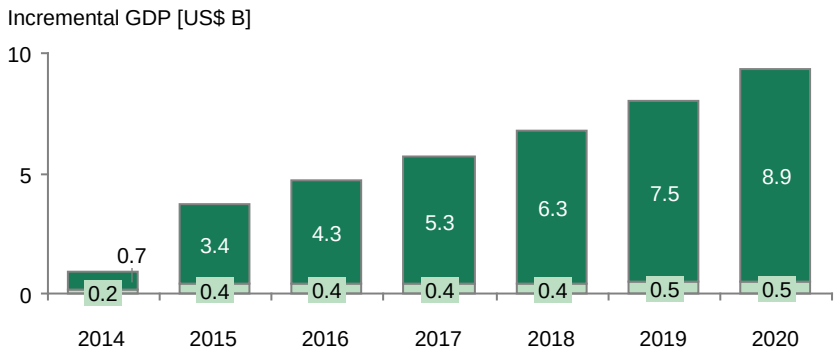


1. Incl. new independent businesses as well as new departments/units/business areas within existing firms
Note: NPV discounted by 4% for Indonesia
Source: Datamonitor; EIU; OECD; World Bank; National statistics units; BCG analysis

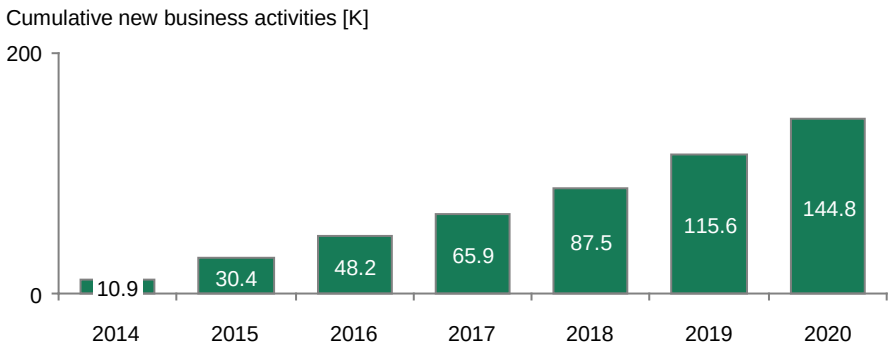
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Allocation of 700 MHz band to mobile will have significant incremental benefits over broadcasting in Indonesia

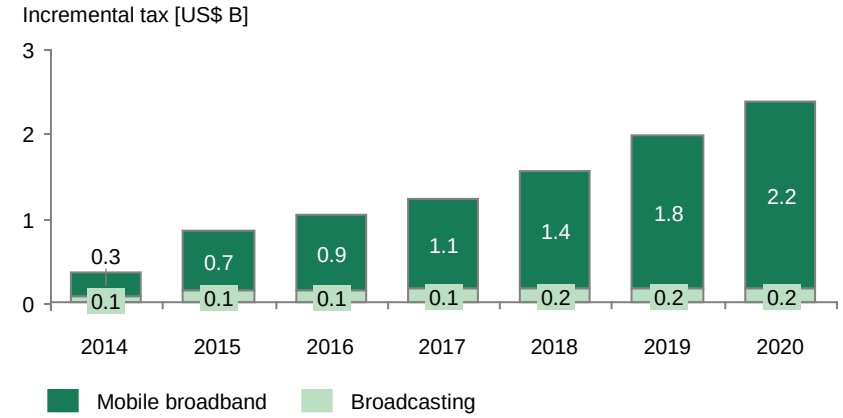
GDP increased US$ 36.3B 2014-2020 (NPV US$ 27.7B)



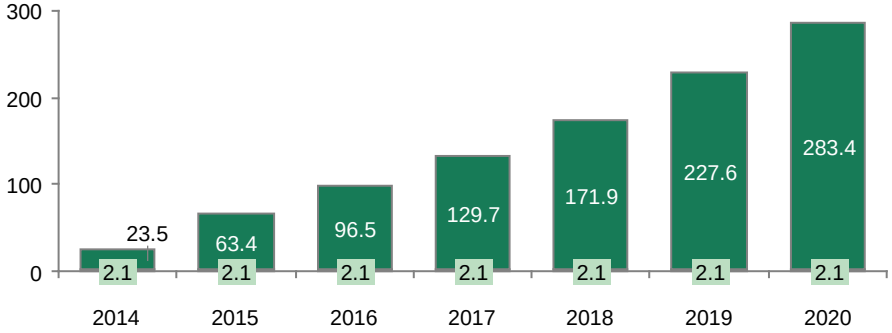
145K new business activities by 2020[1]



Government revenues up US$ 8.4B (NPV US$ 6.5B)



283K additional jobs created by 2020



1. Incl. new independent businesses as well as new departments/units/business areas within existing firms
Note: NPV discounted by 4% for Indonesia
Source: Datamonitor; EIU; OECD; World Bank; National statistics units; BCG analysis

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Delaying the decision would affect rollout and hence impact total benefits

Description

Estimate the opportunity cost of delaying the decision about harmonisation in two scenarios:

- Roll-out in 2016 relative to the early harmonisation baseline
- Roll-out in 2018 relative to the early harmonisation baseline

Opportunity cost is estimated along main socio-economic effects

- New business creation from entrepreneurship and ISP value chain
- Job creation associated with new businesses
- Incremental GDP from productivity increase and new business creation
- Government revenues from income tax from new employees, corporate tax and VAT

Factor	Assumption
Roll-out timeline[1]	Baseline roll-out: **2014** Delayed roll-out: **2016/18**
Service cost decrease	First year impact: **5%** Full effect: **10%**
Increase in rural needs benefit	First year impact: **5%** Full effect: **10%**
Increase in rural wants benefit	First year impact: **10%** Full effect: **20%**
Business prod. gains	First year impact: **5%** Full effect: **10%**
Agricultural prod. increase	First year impact: **5%** Full effect: **10%**

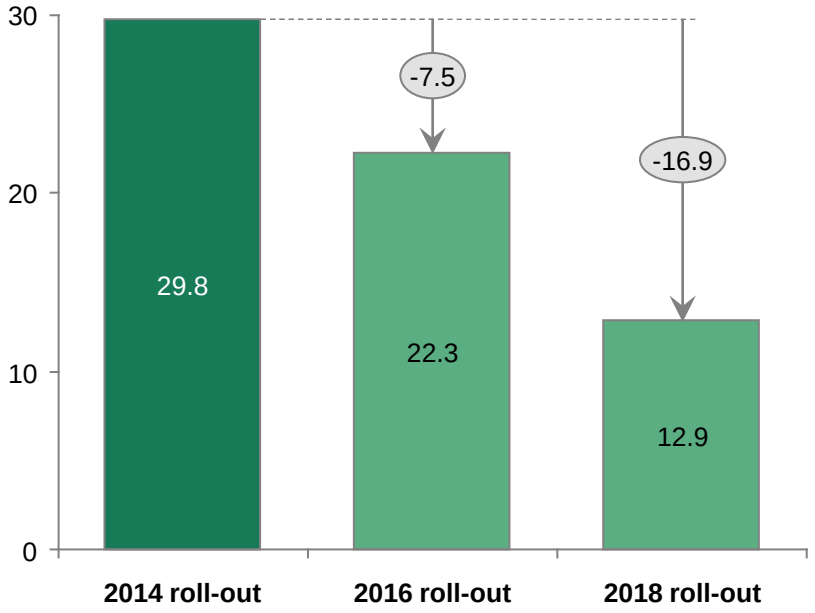
1. First year impact assumed half of full effect

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Delays will have major implications in Indonesia

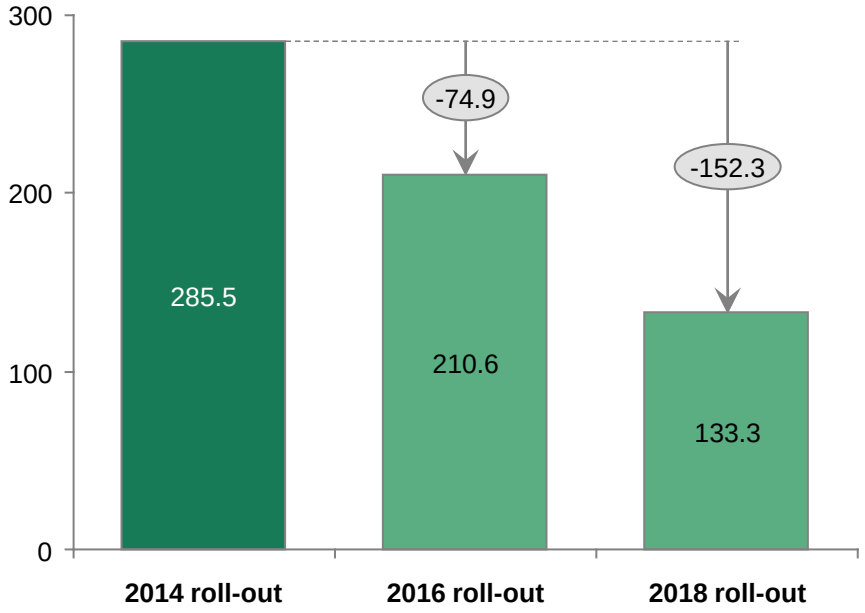
Delaying the decision will have major impact on GDP ...

Incremental GDP by 2020 [US$ B][1]



...and reduce number of jobs created

Jobs created in 2020 [K]



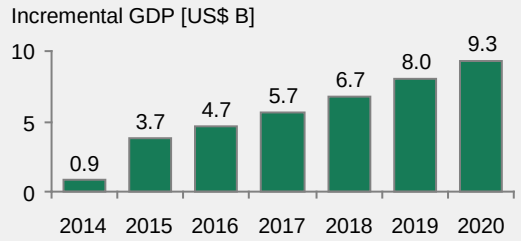
2.5B tax[1] and 39K businesses lost with 2016 roll-out
4.7B tax[1] and 79K businesses lost with 2018 roll-out

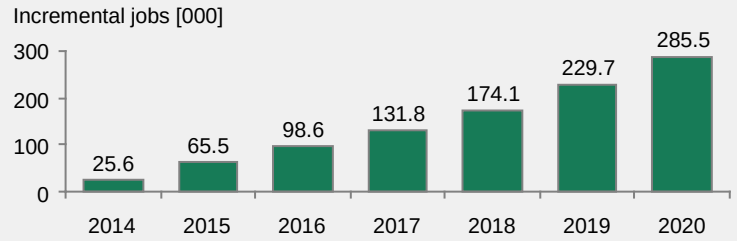
1. 2012 Net Present Value of lost GDP due to delay, assuming spectrum will be used analog broadcasting, and hence not for digital broadcasting or mobile
Source: Datamonitor; EIU; OECD; World Bank; National statistics units; BCG analysis

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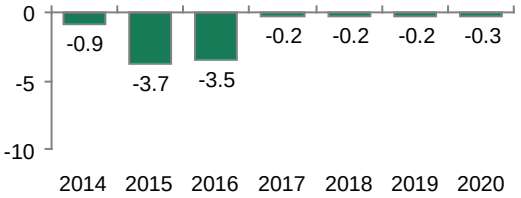
Delays will have major implications for income and employment in Indonesia

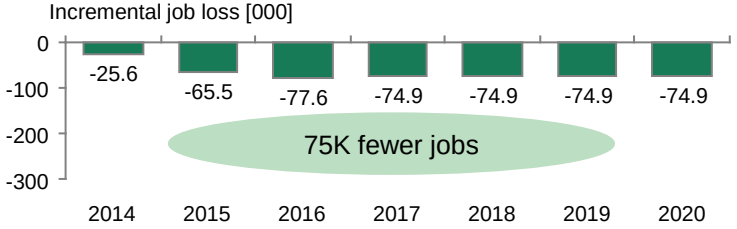
Harmonisation	Delaying the decision have major impact on short term GDP effects...		...and leave more people unemployed	
Baseline (2014)	Incremental GDP [US$ B]	NPV: 29.8B	Incremental jobs [000]	
2016	Incremental GDP loss [US$ B]	- 7.5B	Incremental job loss [000]	75K fewer jobs
2018	Incremental GDP loss [US$ B]	-16.9B	Incremental job loss [000]	152K fewer jobs

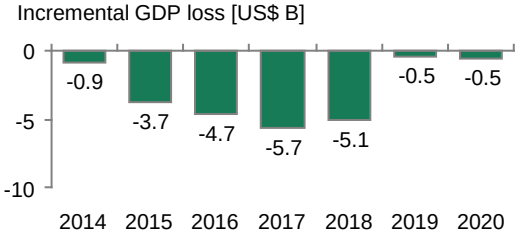


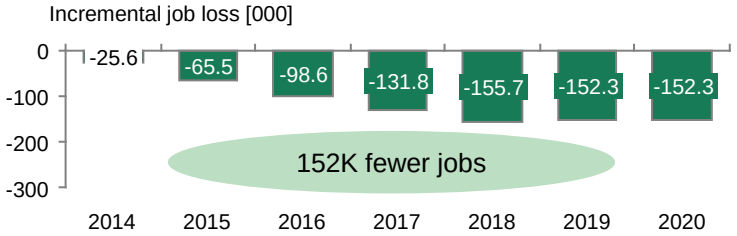


Total loss (NPV)[1]







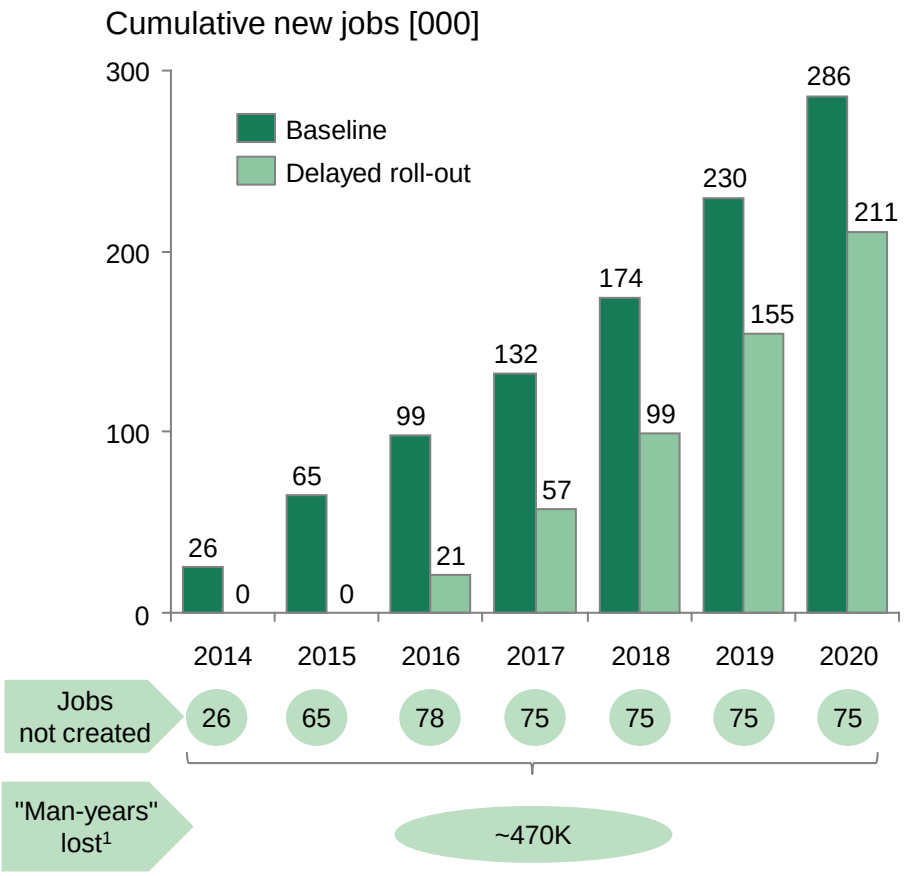


1. 2012 Net Present Value of lost GDP due to delay, assuming spectrum will be used analog broadcasting, and hence not for digital broadcasting or mobile. Includes both direct and indirect effects.
Source: Datamonitor; EIU; OECD; World Bank; National statistics units; BCG analysis

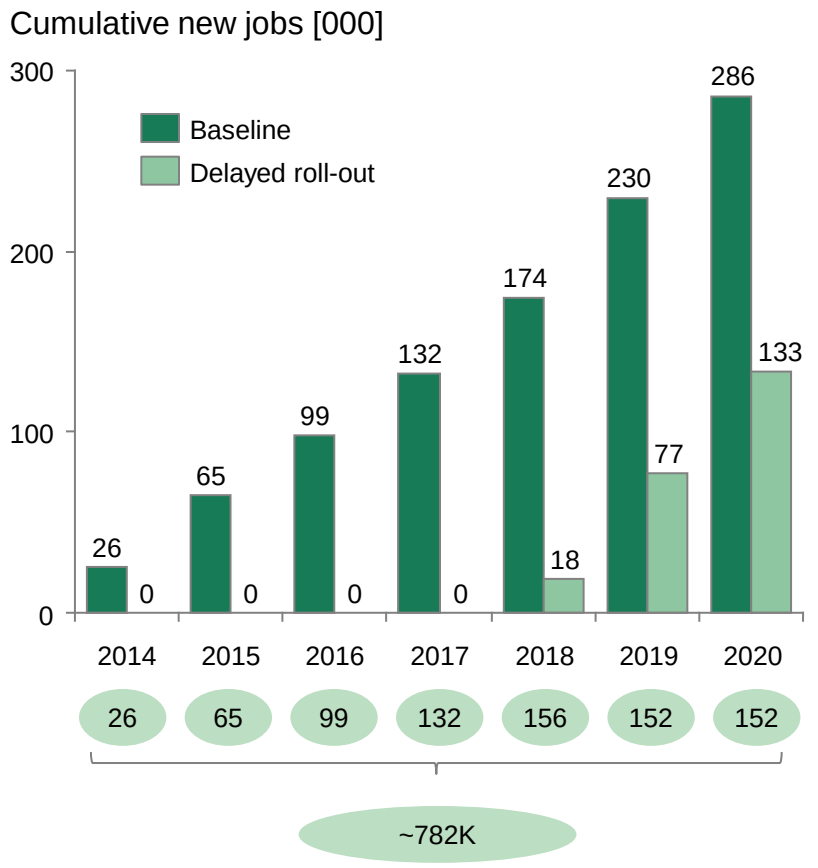
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Delaying roll-out implies a significant reduction in job creation over a multi-year horizon

2016 roll-out implies 470K man-years lost



2018 roll-out implies 782K man-years lost



Note: a "man-year" refers to a job opening that exists for an entire year
1. Cumulative sum of all jobs lost due to delayed roll-out
Source: Datamonitor; EIU; OECD; World Bank; National statistics units; BCG analysis

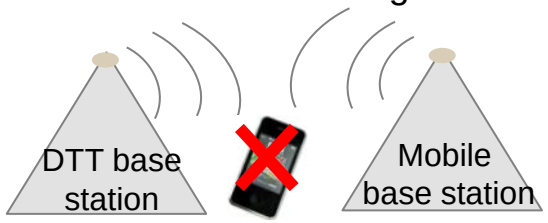
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Both delay and non-harmonization impact neighboring countries through interference

Delayed or non-harmonized allocation will reduce quality of service

If signals directly interfere which each other on the same frequency, the signals risk either cancelling each other out, or one signal over-powers the other in the following cases:

- Signal overload occurs when signal from interference source 1 will be swamped so the signal cannot be transmitted
- Receiver is not able to distinguish the wanted signal from the unwanted signal



Such interference will cause a reduction in quality of the desired signal

Neighboring countries can be directly affected within a range of´~200 km

Separation distance matrix

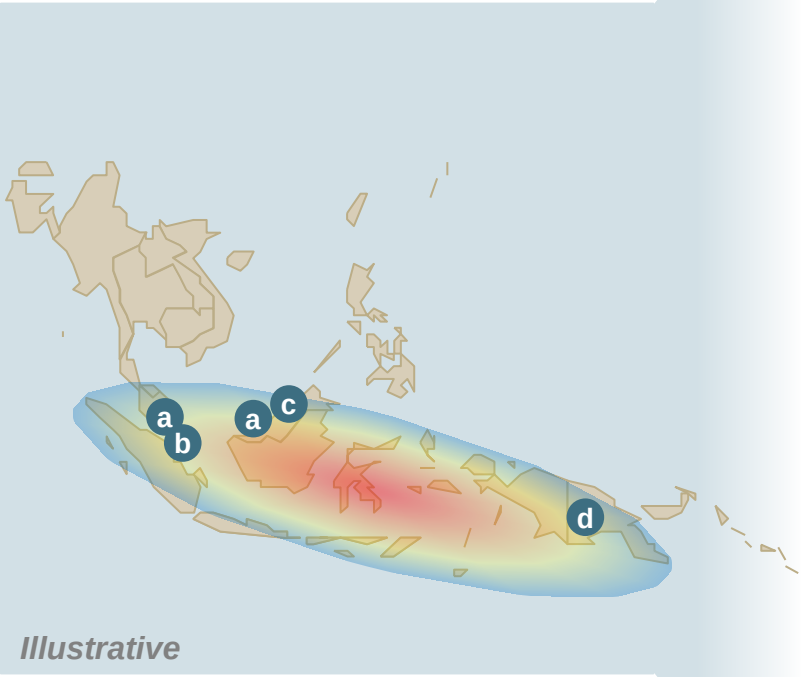
	To DTT	To cellular (base station)	To cellular (mobile station)
From DTT	130 km	180 km	70 km
From cellular (base station)	18 km	220 km	24 km
From cellular (mobile station)	650 m	6 km	900 m

Decision on DTT allocation may undermine desired effect of harmonisation in the region

Source: Ægis "UHF Technical Compatibility Issues"; Expert calls

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Delay will have severe impact on neighbours



Impact

a Malaysia



- Malaysia will potentially have interference from both Sumatra and Borneo
- Large parts of country directly affected, hence is likely to inhibit efficient roll-out nationwide

b Singapore



- Singapore will not be able to use the 700-MHz band for LTE due to interference

c Brunei



- Brunei will not be able to use the 700-MHz band for LTE due to interference

d Papua New Guinea

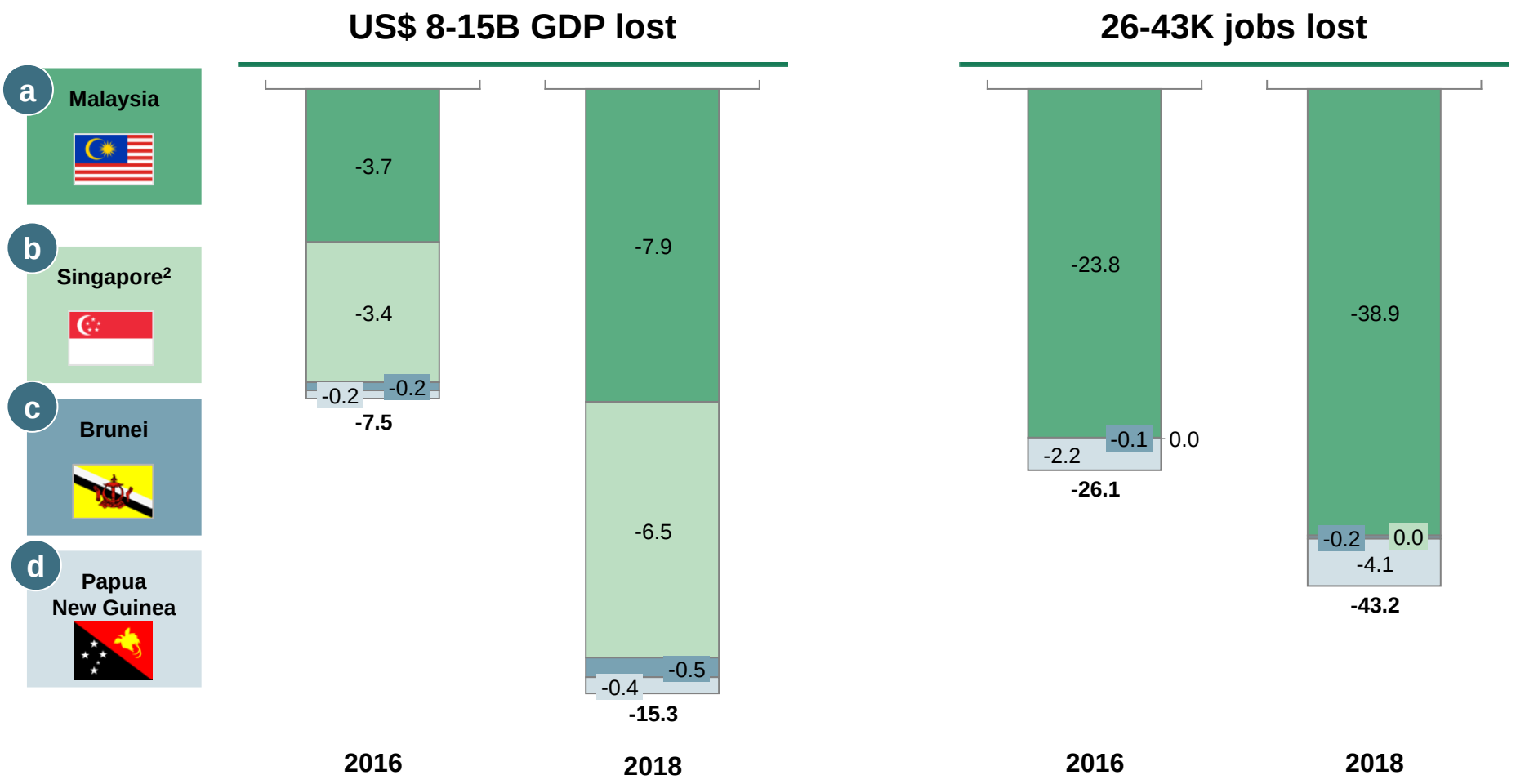


- Papua New Guinea will potentially have interference with the Indonesian side
- Large parts of country directly affected, hence is likely to inhibit efficient roll-out nationwide

Note: An 200 km interference zone assumed from Indonesian territories
Source: Expert interviews, BCG analysis

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Neighbouring countries could lose US$ 8-15B GDP and 26-43K jobs if Indonesia delays switchover[1]



1. Total NPV 2014-2020. Loss assessed by running the BCG socio-economic analysis model with delay scenarios for each country cluster . Malaysia modeled independently, Singapore and Brunei extrapolated from South Korea cluster model, and Papua New Guinea from India cluster model 2. Singapore assumed to enjoy no business and job creation given 100% urban population
Source: BCG analysis

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Agenda

Chapter 1: Key recent developments

Chapter 2: Benefits of allocation to mobile

Chapter 3: Benefits of early harmonisation

Chapter 4: Implications of commitment to non-harmonised band

Chapter 5: Recommendations

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Implications of fragmentation assessed for both Indonesia and neighboring countries

Description
Estimate the impact of Indonesia adopting a non-harmonised DTT/IMT allocation in the 700MHz band
Implications of non-harmonisation will be assessed among two main
4.1 Effect on own country – Loss of mobile coverage – Interference mitigation costs – Increased handset costs
4.2 Effect on neighboring countries – Cross-border interference

	Factor	Assumption		Base case
	Roll-out timeline	Start: Full effect:	**2014** **2015**	**2014** **2015**
↓	**Service cost decrease**	First year impact: Full effect:	**2,5%** **5%**	**5%** **10%**
↑	**Handset cost if non-harmonised**	Cost increase:	**+$4.5**	**$0**
↓	**Increase in rural needs benefit**	First year impact: Full effect:	**4.5%** **9%**	**5%** **10%**
↓	**Increase in rural wants benefit**	First year impact: Full effect:	**9%** **18%**	**10%** **20%**
	Business prod. gains	First year impact: Full effect:	**5%** **10%**	**5%** **10%**
	Agricultural prod. increase	First year impact: Full effect:	**5%** **10%**	**5%** **10%**

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Non-harmonisation will reduce the socio-economic benefits

Reduction in benefits caused by less scale effects and reduced quality of services due to interference

	Rationale	Assumption
Service cost decrease	• We originally assumed that there will be a direct cost reduction by the 700 roll-out • However, the benefit will be halved due to costs of interference mitigation and lack of scale effects in a non-harmonised scenario • Estimates based on discussions with CTOs	First year impact: **2,5%** Full effect: **5%**
Increase in handset cost	• We originally assumed scale effects of handsets in case of harmonisation • However, in a non-harmonisation scenario the cost of handsets will increase due to need for unique handsets • Estimate based on RTT study and with discussions with Ericsson and Qualcomm	Cost increase: **$4.5**
Increase in rural needs/ want benefit	• We originally assumed that access to 700 band mobile services will move rural needs closer to urban • However, direct interference will affect quality of services on both sides of the border even after applying mitigation techniques, and thereby reduce the benefits for 10% of the rural population	**Needs:** First year impact: **4.5%** Full effect: **9%** **Wants:** First year impact: **9%** Full effect: **18%**

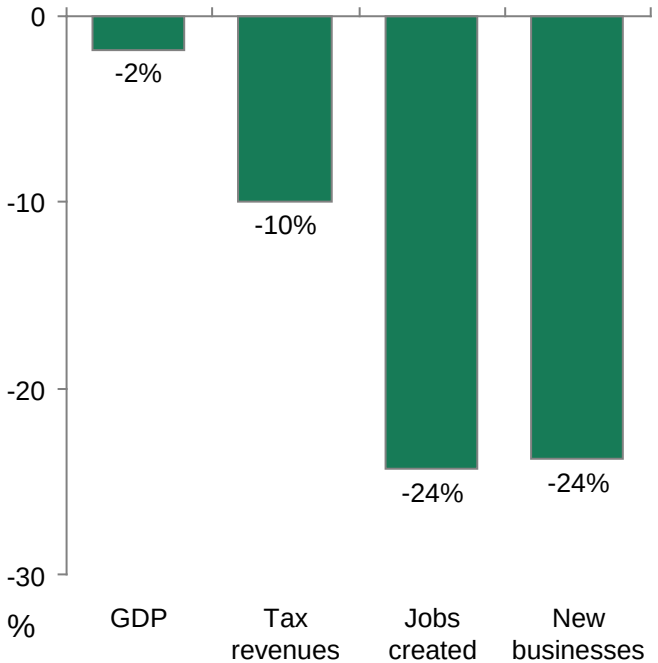
Source: Expert interviews, BCG analysis

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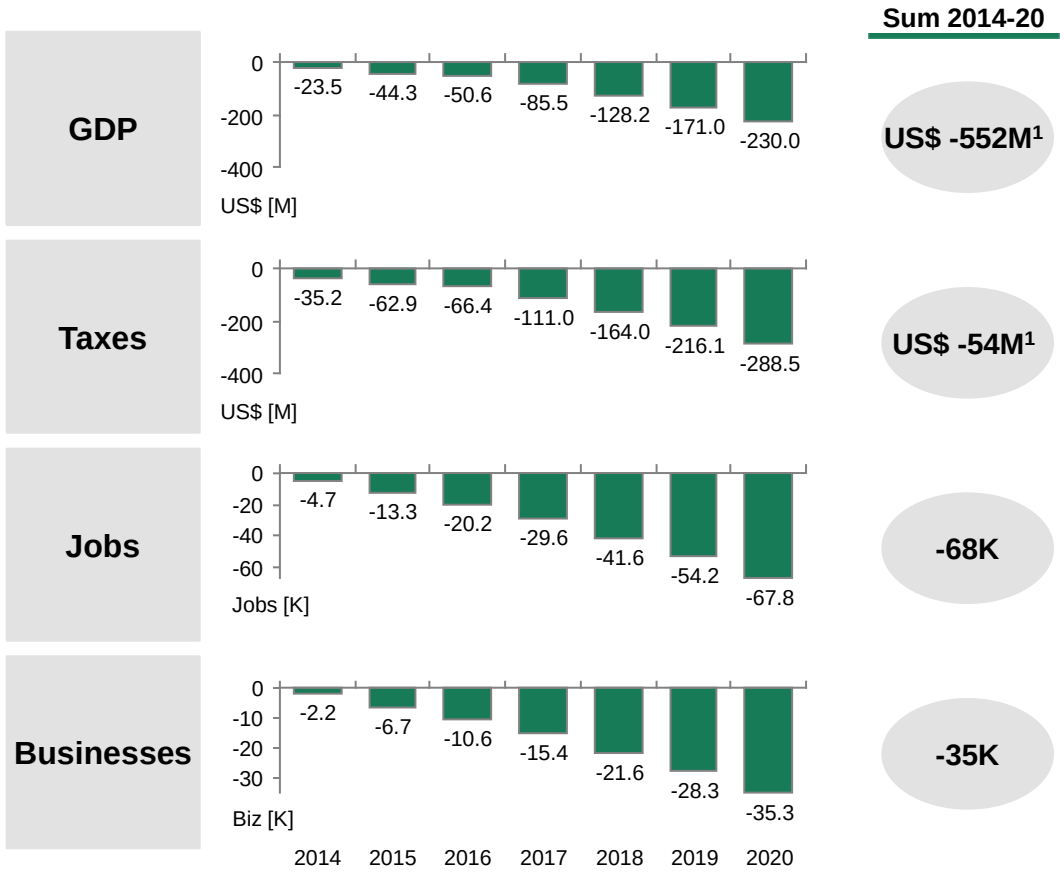
Fragmentation will reduce benefits for Indonesia

GDP uplift reduced by US$ 552M, taxes by US$ 54M, 68K fewer jobs, 35K fewer businesses

Benefits of the 700 band reduced by 2-24% for Indonesia...



...comprising US$ 552M in GDP, US$ 54M in taxes, 68K jobs and 35K businesses

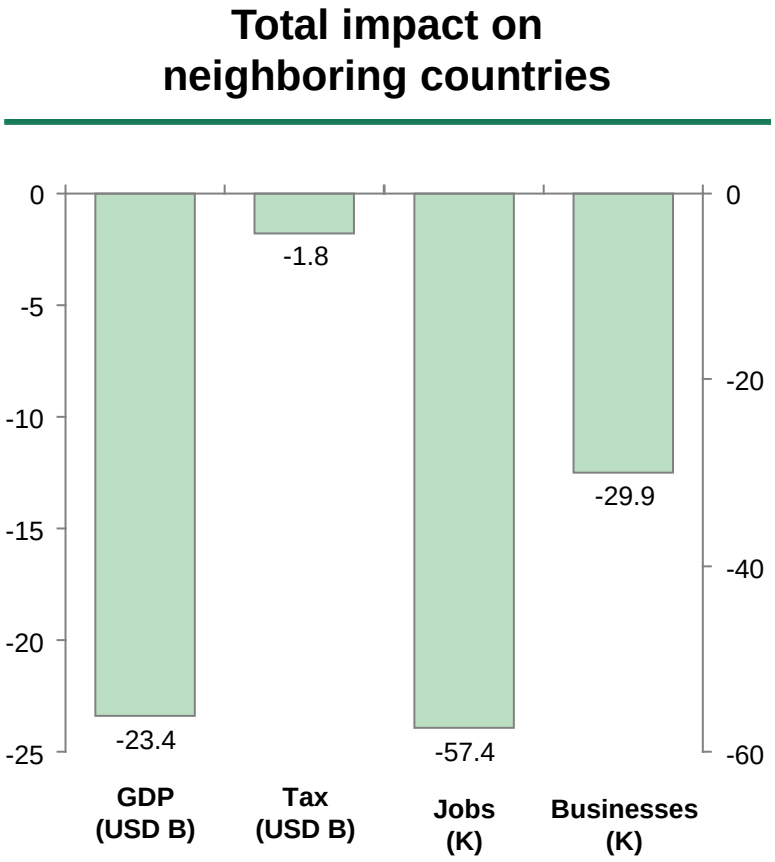


1. 2012 Net Present Value

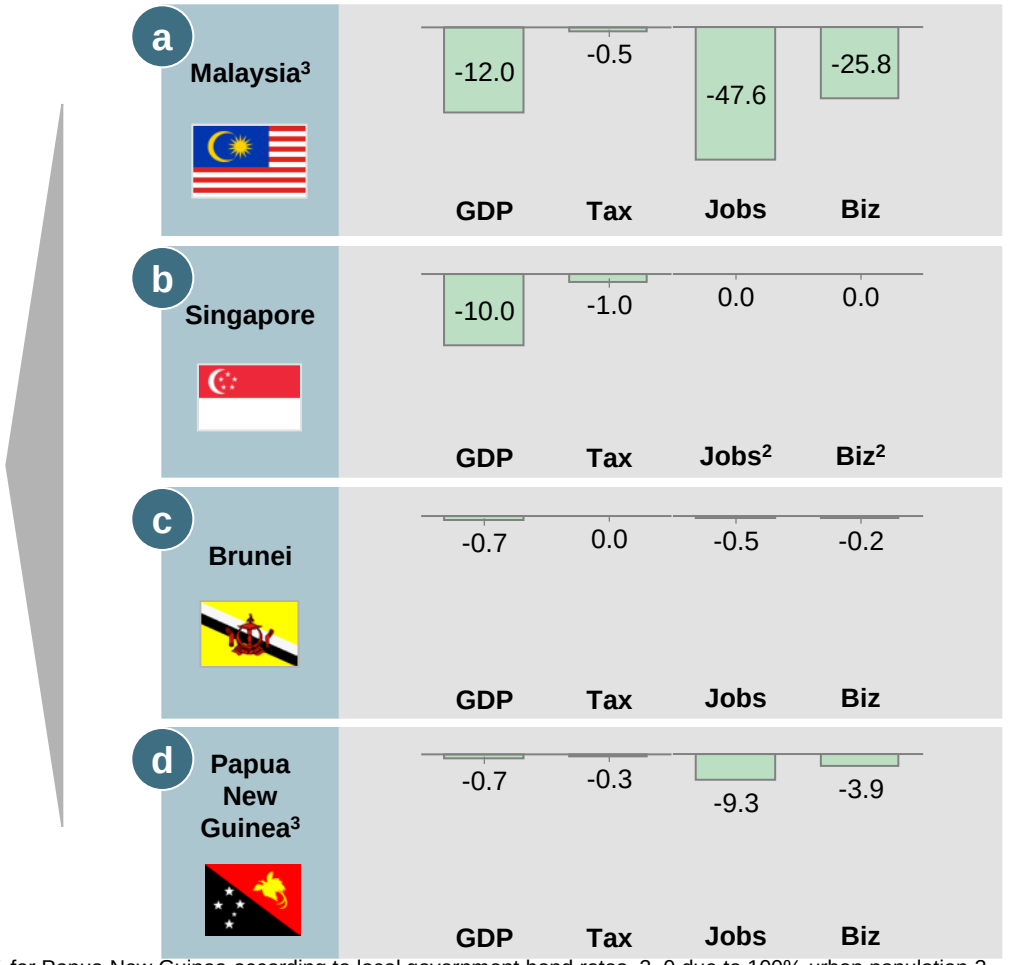
Source: BCG analysis

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Neighboring countries could lose US$ 23B in GDP, US$ 2B in taxes, 57K jobs and 30K businesses up to 2020



Non-harmonization will have a perpetual effect on neighbors



1. NPV 2012-2020 discounted at 1.5% for Singapore and Brunei, 2.8% for Malaysia and 5% for Papua New Guinea according to local government bond rates 2. 0 due to 100% urban population 3. Assumes entire country is affected
Source: BCG analysis

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Using 700Mhz band for mobile broadband will bring significant social benefits for Indonesia

Mobile broadband addresses most of National Priorities...

Medium Term Development Plan 2010-2015: 11 National Priorities

*"Increasing **quality of human resources**, capacity building in **science and technology**, strengthening **economic competitiveness**"*

i	Bureaucracy Reform	✓
ii	Accessible Education	✓
iii	Improved Healthcare	✓
iv	Reduced Poverty	✓
v	Food Security	✗
vi	Developed Infrastructure	✓
vii	Favorable Business Climate	✓
viii	Energy Security	✗
ix	Sustainable Environment	✓
x	Peaceful Frontier Areas	✗
xi	Creativity & Cultural Diversity	✓

✓ Direct benefits from mobile broadband

✓ Benefits from higher penetration

✗ Limited benefits from mobile broadband

Source: Indonesia Medium Term Development Plan 2010-2015, BCG analysis

...with key benefits

Allocating Digital Dividend to mobile broadband will be highly beneficial for Indonesia, especially in rural areas

- Mobile penetration will increase by 30% in rural areas, hence more people have access to the internet and the services provided on it
- High bandwidth from broadband enables delivery of more powerful services

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Mobile broadband can provide step change in education and healthcare in rural areas

ii Accessible & enhanced education

Mobile broadband enhances accessibility to education in rural areas

- Low cost high-speed internet access ideal for rural areas with poor infrastructure
  - Fast set-up and expansion
  - Wide reach



Rich and dynamic classroom experience

- Virtual classrooms via webcams and electronic whiteboards
- Increase interaction and collaboration among schools
- E.g., Connect To Learn students in Africa can interact with classrooms in the United States via webcam





iii Improved & wider healthcare delivery

Mobile broadband facilitates remote diagnostics and increases healthcare coverage in rural areas

- Remote monitoring and video-consultations with specialists in hospitals
- Higher coverage esp. for emergency responses
- E.g., Sana mobile app is used by health care workers to record patient's data and transmit to medical specialists wirelessly





High bandwidth enables delivery of more powerful services, over and above the benefits of higher penetration

Source: GSMA, Connect To Learn, Sana, Motorola, Press search

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Case study: Connect To Learn uses mobile broadband to bring e-learning to schools in Africa

Background

Poor education for African children

- ~70% of African girls in some sub-Saharan countries do not get a secondary education
- Many are unable to afford to stay in school after age 12

Mobile broadband can be leveraged to bring high quality education to rural children

- Collaborative effort among organizations

ERICSSON

MILLENNIUM PROMISE

THE EARTH INSTITUTE COLUMBIA UNIVERSITY

Approach: E-learning

Millennium cities and cloud-based ICT solution for schools

- Implement mobile broadband and cloud solutions in schools so students have access to internet resources
- Ericsson provides the fixed wireless terminal devices and Airtel mobile operator provides 3G SIM cards

"[Schools are now] able to provide to educational services far more efficiently and effectively in places that would be nearly impossible to reach at least in this decade without this type of mobile broadband." – VP of Sustainability Ericsson

School2School promotes cross-cultural learning by connecting classrooms from Millennium cities in Africa to classrooms in the United States

- Interactive, collaborative learning experience enhanced by real-time webcam in classrooms





5th Graders in the US connecting with students in Tanzania

Impact

Significant impact after first year and still expanding

- Reached a total of 5,000 students
- Raised more than USD 1M
- Started Millennium Villages in Ghana, Tanzania, Kenya, Uganda in 2011

First term report cards show high marks for Connect To Learn scholarship recipients

- Many students expressed their aspirations to become doctors, teachers, members of Parliament, etc.

Source: Connect2Learn website, GSMA

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Case study: Sana uses mobile broadband to enable remote diagnostics and telemedicine in rural areas

Background

Accessibility, affordability and availability of doctors are the main health care issues in rural areas

Mobile broadband can enable remote diagnostics & telemedicine to patients in rural areas

- Between 80-90% of the world's population live within range of a cell phone tower
- Shortage of health care specialists but abundant supply of local community workers

Approach: Remote diagnostics

Sana connects rural patients with remote medical specialists through community health-workers equipped with **mobile phones**



Community health workers **capture patient images** on Sana mobile app



Doctors connect to OpenMRS platform to provide **live consultation**



India
- Oral cancer and cardiovascular disease screening

Brazil
- Ophthalmic screening

Swaziland
- Post-surgical follow-up

Impact

Sana is expanding projects worldwide
- Screened ~6K people in Bangalore for diseases as of July 2011 with plan to scale to 1.5M people over the next year

Overall, telemedicine has many socio-economic benefits
- WHO reports doctors can double number of patients reached in rural areas through remote diagnostics and telemedicine
- Patients save time, personal costs and burden of travelling
- Enhance data collection for statistical purposes

Source: Sana website, GSMA

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Call to action

Digital switchover is a once-in-a-lifetime opportunity to allocate spectrum to its most productive use

Mobile broadband will generate significantly more economic and social benefits for Indonesia than alternative uses like broadcasting

International harmonization in line with the ITU guidelines is critical to reap the full benefits of the 'Digital Dividend'

Prompt action is needed to maximize the benefits as delays in switchover will also have adverse effects on Indonesia and its neighbours

Many countries have successfully accelerated digital switchover by setting up a coordinated process and focusing on public communications and subsidies

Significant opportunity for Indonesia to take leadership on an international issue with real, long-term impact

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Key success factors to accelerate digital switchover

Analog Switch-Off (ASO) is required to clear the 700 MHz band for mobile use

I **Timely & coordinated ASO process**	• Adopt clear, timely analog switch-off goal • Coordination between government, regulators, public & private broadcasters, telco operators e.g. setting up taskforce
II **Public communication & media campaigns**	• Clearly communicate analog switch-off "roadmap" • Develop media strategy and initiatives to raise public awareness & collaboration
III **Subsidies to increase digital receivers**	• Government subsidies and private sector funding (i.e. telco operators) in providing set-top boxes • Cooperation with manufacturers to create economies of scale and reduce equipment prices

Source: ITU, Japan Ministry of Internal Affairs and Communications, Press Search

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Case study: Australia set up Digital Switchover Taskforce to oversee end-to-end ASO process

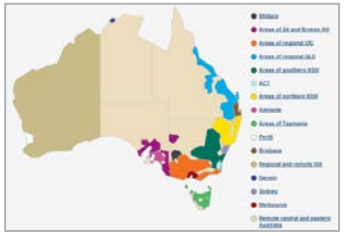
I Taskforce to drive ASO process

"Digital Switchover Taskforce" set-up within Dep. of Communications

- ASO program to start in 2010 with completion in 2013

Clear roll-out plan for each region

- Make use of "pilot" switch-offs to create highly visible media stories



Taskforce coordinated key activities

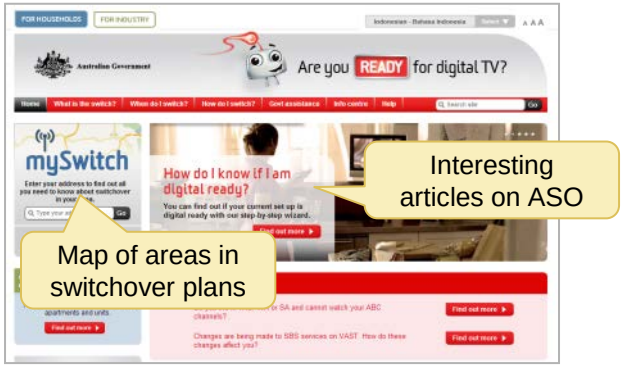
- Advise government on policy settings, implementation & issues
- Convene meetings between stakeholders i.e. broadcasters, retailers, manufacturers, antenna technicians, housing agencies, etc.

II Various consumer-orientated initiatives

Taskforce has a range of consumer-orientated initiatives

- Training retail advisors in electronic stores
- Labeling of goods in retail stores into 3 categories of "digital readiness"
- Training TV and antenna installers
- "Endorsed" installers

Created www.digitalready.gov.au to provide ASO info to public



III Subsidies to provide digital TV equipment

Launched Household Assistance Scheme (HAS) in 2009

- Provided free decoders for eligible households
- Budget was allocated in 3 successive cycles

Pilot ($3M) → Regional ($69M) → Remaining & state capitals ($309M)

- As of May 2011, $15.1M assisted 38K+ households

Satellite Subsidy Scheme (SSS) for non-covered areas in 2010



- Satellite service to provide post-ASO coverage for viewers in "black-spot" areas
- Subsidy is $400 per household with co-payment of ~$200-$350

Note: All currency in Australian dollars
Source: GSMA : Case studies for the award of the 700MHz/800MHz band Australia, Digital Ready website

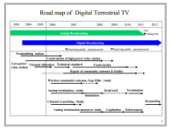
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Case Study: Japan rolled out comprehensive Master Plan and public campaigns to drive ASO

I Concrete ASO Master Plan

Rolled out Master Plan with fixed deadline of 24 July 2011

- Started in 3 metropolitan areas[1] by 2003, mid-sized cities by 2006 and the rest by 2011
- Issued Annual Plans with milestone targets corresponding to major int'l events e.g. World Cup in Germany, Beijing Olympics





Set up 51 "Digi-Suppo" support centers for ASO

- Cooperate with broadcasters, manufacturers and electricians in every prefecture to provide consultation for citizens
- Temporary Q&A booths
- Volunteers called up elderly to confirm digital switchover

II Comprehensive public campaigns

"Digitalization of Terrestrial TV Broadcasting" media campaign









Public announcements on digital spread rate & ASO notifications

- Publish surveys on digital spread rate and viewer's awareness of ASO to constantly show progress
- On-screen indications whether viewers were watching digital or analog programs

III Incentives to boost digital TV purchase

Gov established "eco-points" to incentivize digital TV purchase

- Purchasing digital TVs during campaign will earn "eco-points", which can be exchanged for wide-range of other products[3]

Lowering prices of set-top boxes to increase uptake

- Standardizing minimum functional requirements and tech development efforts of manufacturers led to ~80% price reduction of flat panel TVs[4]
- 25M shipments of flat panel TVs in 2010 (vs. 10M in 2003)

Subsidies to ensure full coverage

- Free set-top boxes have been distributed to low income households since 2009

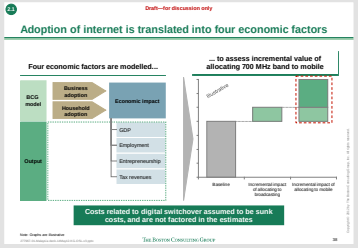
1. Tokyo, Nagoya and Osaka 2. "Chideji" means "Terrestrial Digital TV" 3. Store coupons, beer & food coupons, travel coupons, and an array of environmentally-friendly products and regional goods.
4. From ~USD 7,362 in 2003 to ~USD 1,207 in 2010
Source: Japan Ministry of Internal Affairs and Communications, Digital Broadcasting Expert Group (DiBEG), Press search

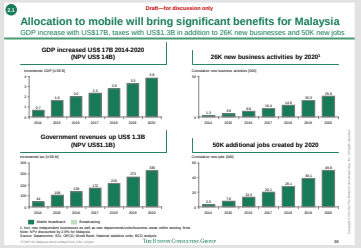
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Appendix

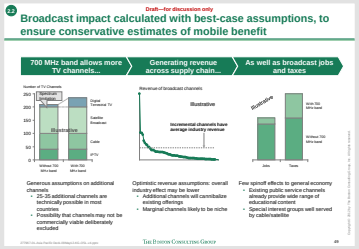
We model the impact of mobile and broadcasting spectrum allocation in order to compare the benefits of the two solutions

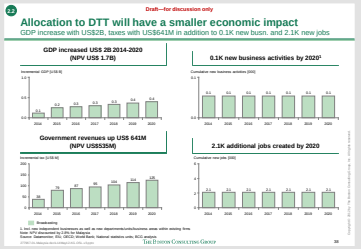
2.1 Harmonisation of mobile services (IMT)



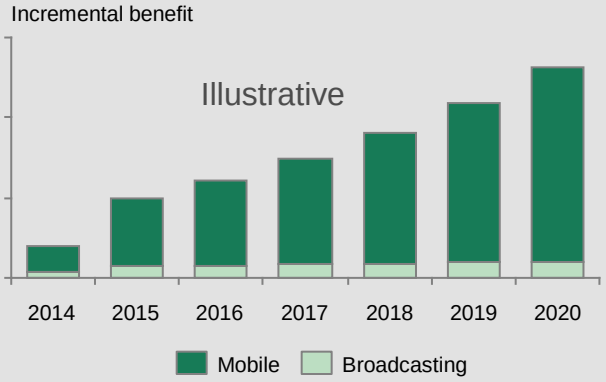


2.2 Harmonisation of broadcasting services (DTT)





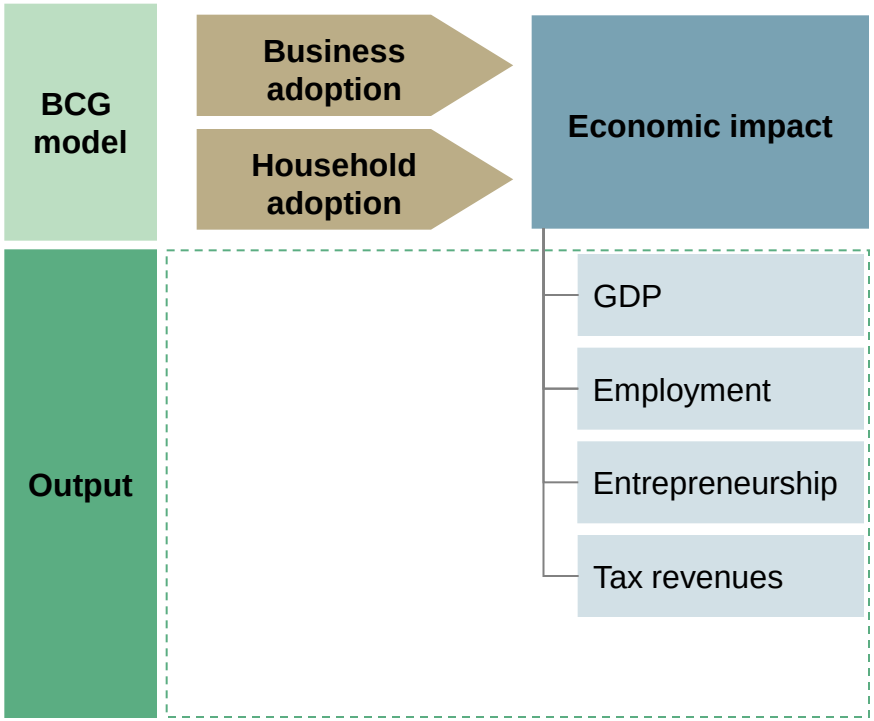
2.3 Incremental benefit of mobile services relative to broadcasting services



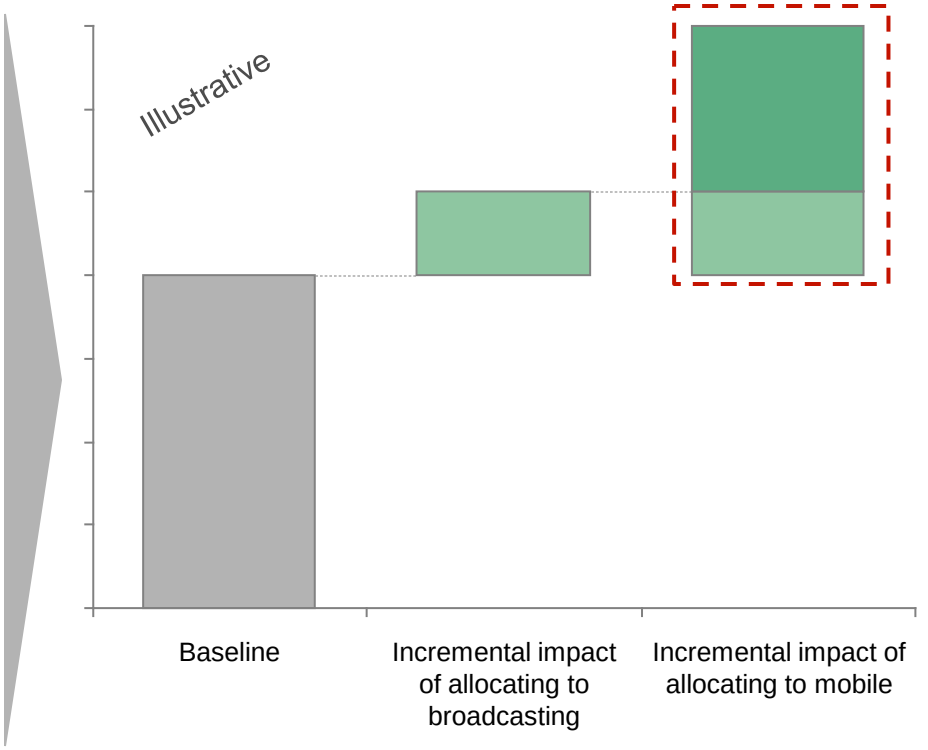
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Adoption of internet is translated into four economic factors

Four economic factors are modeled...



... to assess incremental value of allocating 700 MHz band to mobile



Costs related to digital switchover assumed to be sunk costs, and are not factored in the estimates

Note: Graphs are illustrative

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