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Broadband Challenges, Industry Perspective

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Telkom Group CTO/CIO

Regional Workshop

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PT Telkom Indonesia

Telkom Indonesia at a Glance

Government : 52.6%

Public : 47.4%

Telkom Indonesia is listed at

IDX

NYSE

Telkom's Business Portfolio:

TIMES → Telecommunication, Information, Media, Edutainment and Services

Telkom Indonesia as a holding company have 4 main subsidiaries:

- **Mobile Business** – Telkomsel
- **Multimedia Business** – Telkommetra
- **International Business** – Telin
- **Infrastructure Business** – Telkominfra

Telkom's Achievement:

Key Indicators (IDR Bn)	EoY 2014	YoY Growth	1H 2015	YoY Growth
Revenue	89,696	8.1%	48,840	12.2%
Expenses	61,393	6.4%	33,717	14.4%
Operating Profit	29,377	5.5%	15,123	7.5%
EBITDA	46,508	6.6%	23,540	6.3%
Net Income	14,638	3.0%	7,447	2.2%
Subscribers (000)	**EoY 2014**	**YoY Growth**	**1H 2015**	**YoY Growth**
Broadband				
Fixed Broadband	3,400	12.8%	3,729	15.9%
Mobile Broadband/Telkomsel Flash	31,216	80.7%	33,627	84.8%
Cellular				
Postpaid	2,851	14.5%	3,049	16.6%
Prepaid	137,734	6.8%	141,016	4.6%
Total	140,585	6.9%	144,065	4.9%
Fixed Line				
POTS	9,698	3.7%	10,190	7.0%

Telkom's Price per Share of Common Stock (IDR):

Telkom Group's Highlight:

Telkomsel → Triple Double Digit Growth; 4G: The First mobile operator to commercially market the 4G LTE in Indonesia

IDN (Indonesia Digital Network) → id-Access (True Broadband Access); id-Ring (Nationwide Broadband Backbone); id-Con (Convergence Digital Innovation)

International Expansion → 10 International footprints: Singapore, Hongkong, Timor Leste, Australia, Macau, Taiwan, USA, Malaysia, Myanmar, Arab Saudi

Telkom Group's Business Portfolio

16 Business Portfolio: 9 Product Portfolio and 7 Customer Portfolio

1 — Product Portfolio

ME

- Digital Life (7)
- Digital Home (8)
- Digital Advertising (9)

I

- **Platform Services (4)**
  - Managed Apps & SI
  - BPM
  - Premise Integration
  - E-Payment
  - DataCenter & Cloud
  - M2M
- **Big Data (5)**
  - Big Data
- **Ecosystem Solution (6)**
  - E-Health
  - E-Tourism
  - E-Transportation
  - E-Gov

T

- **Fixed Services (1)**
  - Triple Play
  - Fixed Broadband
  - WiFi
- **Mobile Services (2)**
  - Mobile Services
  - Mobile broadband
- **NW & Infra Services (3)**
  - Network Service
  - Interconnection & International Traffic
  - Satellite
  - Tower

2 — Customer Portfolio

Services

OUTLINE

1 Global Broadband Facts

2 Indonesia's Broadband Facts

3 Broadband Roll Out Challenges

Global Fixed Broadband Industry

The global fixed broadband continues to grow with a total of 711 Million subscribers at the end of 2014

Fixed Broadband Subscriber

2014

711 Million

28% receive speed >= 25 Mbps

2020

814 Million

75% receive speed >= 25 Mbps

2014-2020

2.3%

CAGR

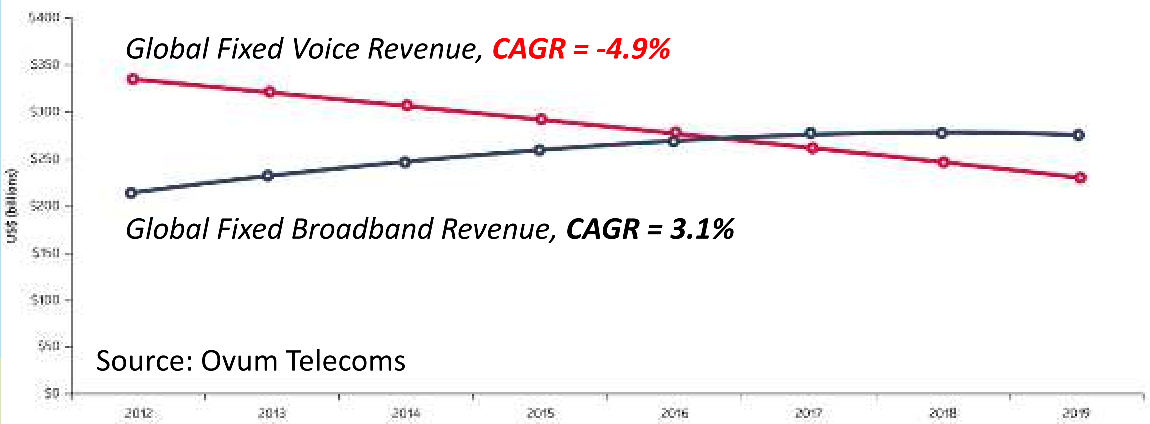
Proportion by type

2014		2020
19.9%	Cable Modem ↑	20.2%
26.9%	FTTx ↑	41.1%
51.5%	DSL ↓	37.4%
1.7%	OTHERS* ↓	1.3%

*) Others: Fixed WiMax, Satellite, PLC

Source: Broadbandtrends

Global Fixed Voice Revenue vs Global Fixed Broadband Revenue



Fixed broadband subscriptions by country (Millions)

1. China: 200
2. USA: 98
3. Japan: 37
4. Germany: 30
5. France: 26

36. Indonesia: 3

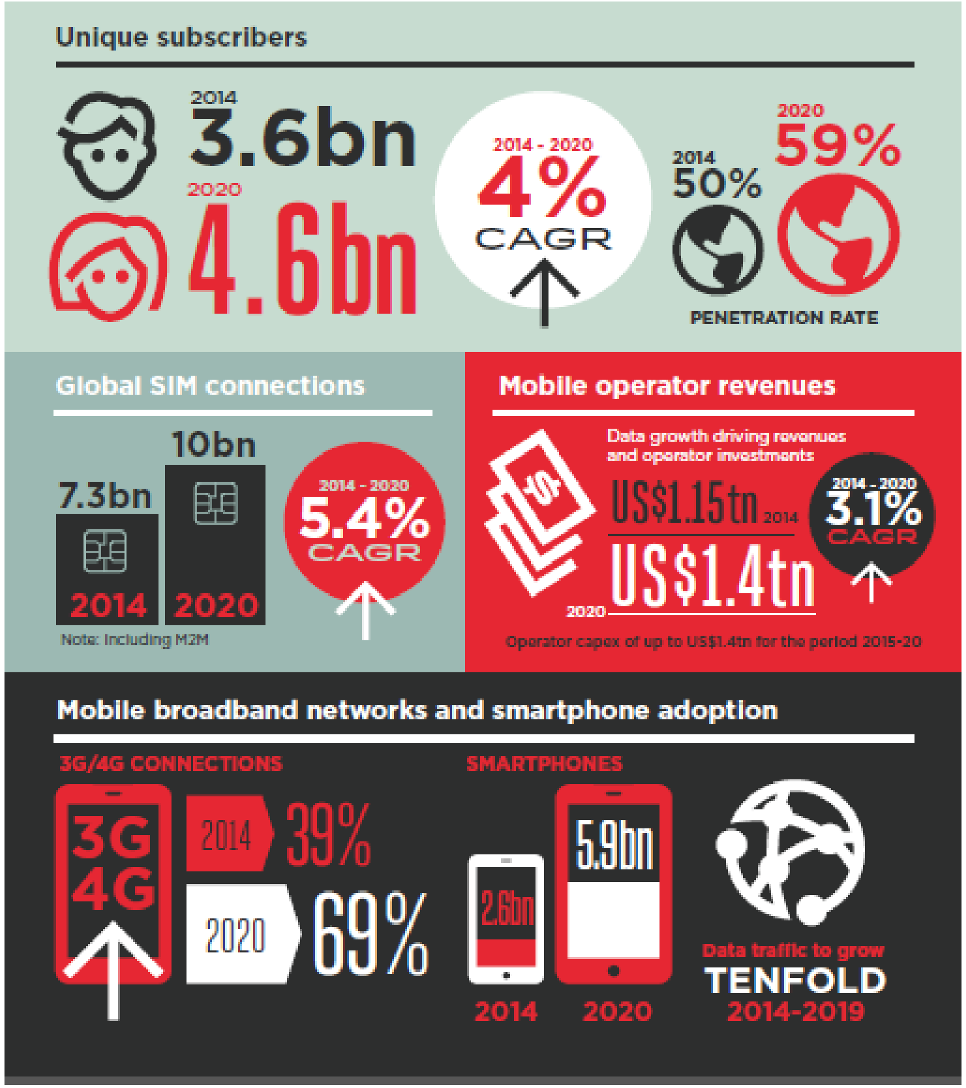
Indonesia rank 36th across the world and rank 5th in ASEAN

EoY 2014

Source: http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

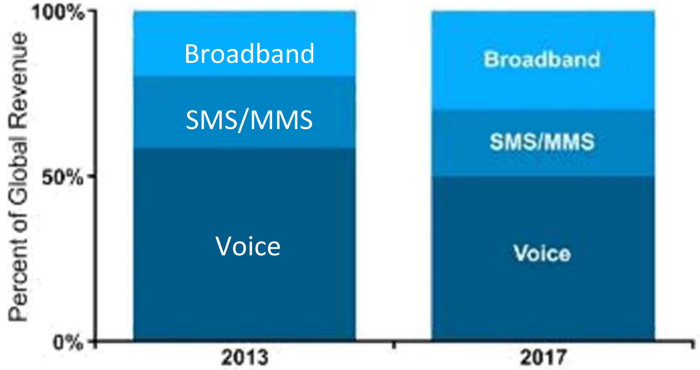
Global Mobile Broadband Industry

The global mobile industry continues to scale rapidly with a total of 3.6 Billion <u>unique mobile subscriber</u> at the end of 2014



Source : The Mobile Economy 2015, GSMA

Mobile broadband is the driving force of the mobile services market, with revenue growing the fastest



© Infonetics Research, 2G, 3G, 4G Mobile Services and Subscribers: Voice, SMS/MMS, and Broadband Biannual Market Size and Forecasts, June 2013

Mobile Celullar subscriptions by country (Millions)

1. China: 1286
2. India: 944
3. Indonesia: 319
4. USA: 317
5. Brazil: 281

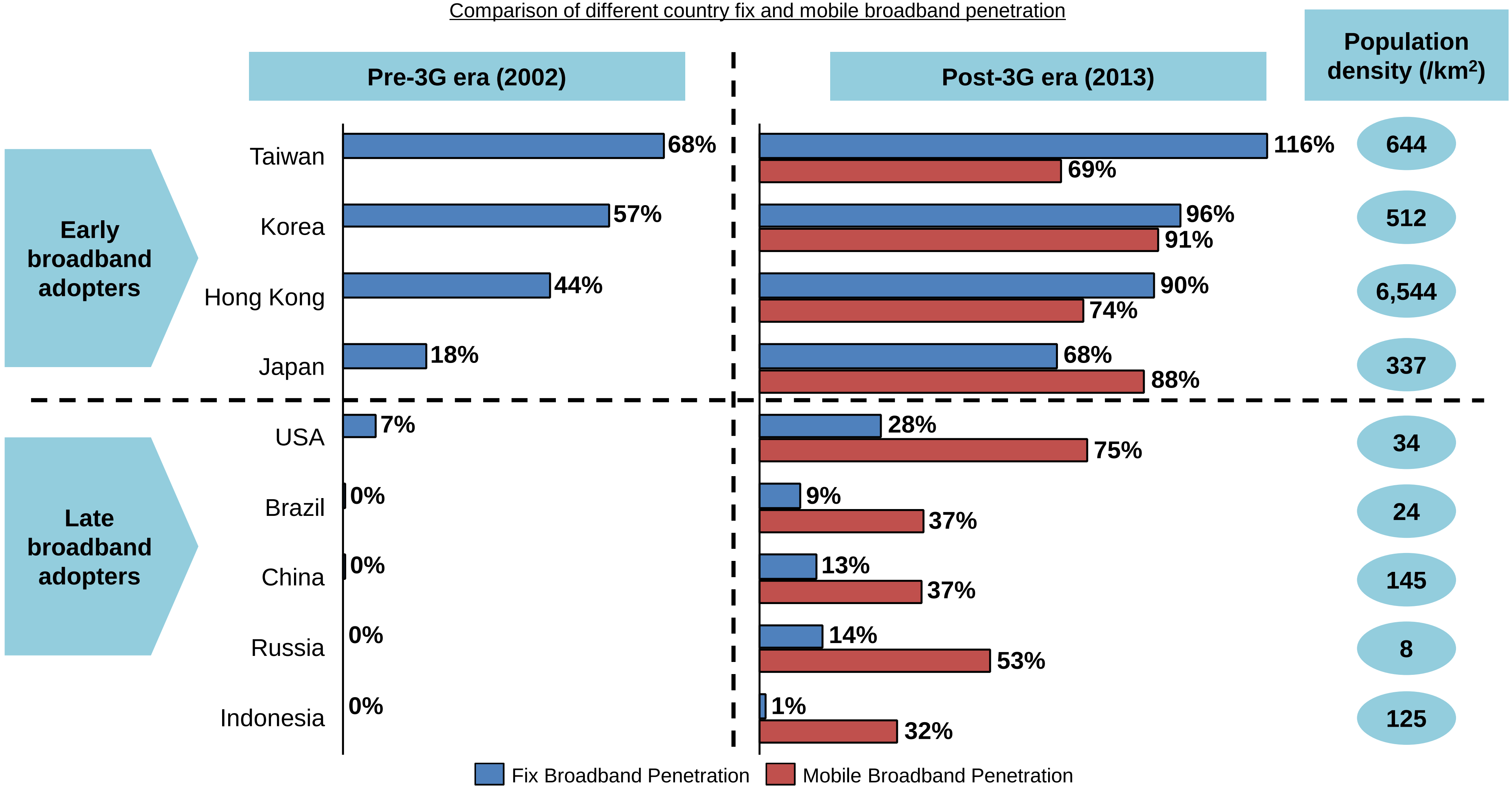
Indonesia rank 3rd across the world

EoY 2014

Source: http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

Fixed vs Mobile Broadband

Countries with high fixed broadband penetration started to deploy their broadband in 1990s (pre-3G era), where fiber is the only option – they are also very densely populated, making fiber deployments a lot more cost-effective and viable



Source: Orange Business Service, RPI 2014 – 2019, ITU 2013, World Bank, Nomura, internal analysis

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1 Global Broadband Facts

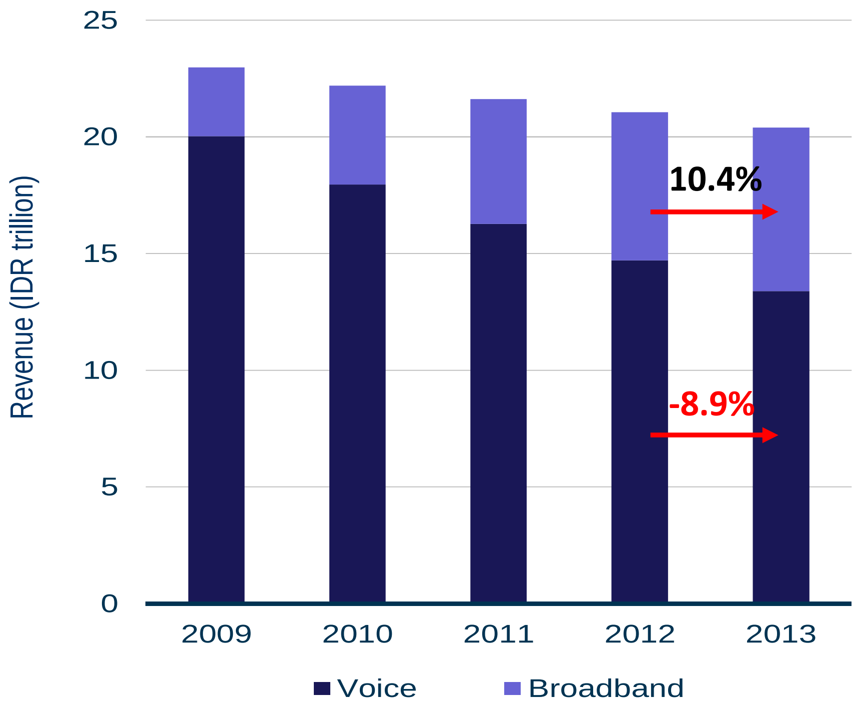
2 Indonesia's Broadband Facts

3 Broadband Roll Out Challenges

Indonesia Fixed and Mobile Market Revenue

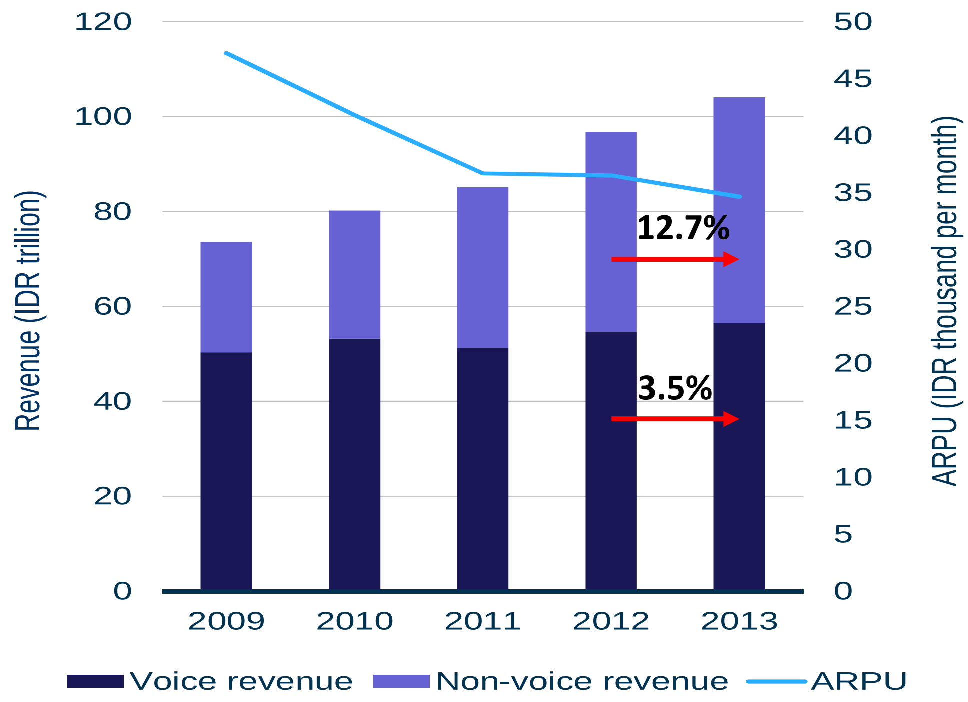
Indonesia's fixed voice revenue experience negative growth but fixed broadband and also mobile voice & non-voice revenue still experience positive growth

Fixed retail revenue by service, Indonesia, 2009–2013 [Source: Analysys Mason, 2014]



1. *Fixed voice penetration of population reached 11.6% in 2013, down from 14.5% in 2009. Fixed voice revenue declined from IDR14.705 trillion (USD1.58 billion) in 2012 to IDR 13.398 trillion (USD1.27 billion) in 2013 at a rate of –8.9%.*
2. *Fixed broadband population penetration grew from 1.5% in 2012 to 1.9% in 2013. Revenue increased from IDR6.342 trillion (USD0.68 billion) in 2012 to IDR7.000 trillion (USD0.66 billion) in 2013 at a growth rate of 10.4%.*

Mobile voice and non-voice service revenue, and ARPU, Indonesia, 2009–2013 [Source: Analysys Mason, 2014]



Mobile data growth is flourishing and voice growth is diminishing. The contribution of voice to total mobile revenue declined from 68.3% in 2009 to 54.3% in 2013.

1. *Mobile voice revenue increased from IDR54.601 trillion (USD5.9 billion) in 2012 to IDR56.511 trillion (USD5.4 billion) in 2013, at a growth rate of 3.5%.*
2. *Non-voice revenue increased from IDR42.161 trillion (USD4.53 billion) in 2012 to IDR47.520 trillion (USD4.51 billion), at a growth rate of 12.7%.*

Indonesia Broadband Plan [Perpres No.96/2014]

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Strengthen national connectivity through national ICT regulation

2013

Population: 249 Million

2019

Population: 269 Million

Infrastructure:
Fixed Broadband:
15% households (1Mbps) &
5% population;
Mobile Broadband:
12% population (512kbps)

Urban Infrastructure:
Fixed Broadband:
71% households (20Mbps) &
30% population;
Mobile Broadband:
100% population (1Mbps)

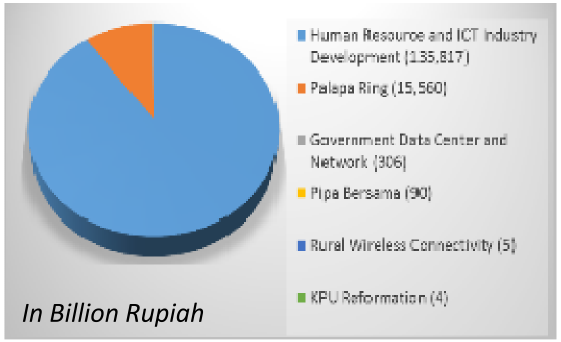
Rural Infrastructure:
Fixed Broadband:
49% households (10Mbps) &
6% population;
Mobile Broadband:
52% population (1Mbps)

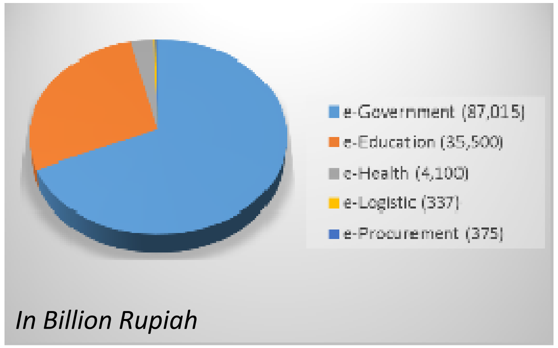
Utilization / Adoption:
Service tariff should be less then the average of monthly income
Prioritized Segments: e-Gov, e-Health, e-Logistic, e-Procurement

Benefit Stakeholders: Indonesian People/Society
Captive Market 4.5 million Government Employees, 50 million students, 3 million educator, 60 million households with the Internet

Investment Plan

Total investment 2014 – 2019 =
IDR 278 Tn or 0.46% GDP





Top 3 IBP Investment Priorities:

1. HR & ICT Industry Dev : **49%**
2. e-Government : **31%**
3. e-Education : **13%**

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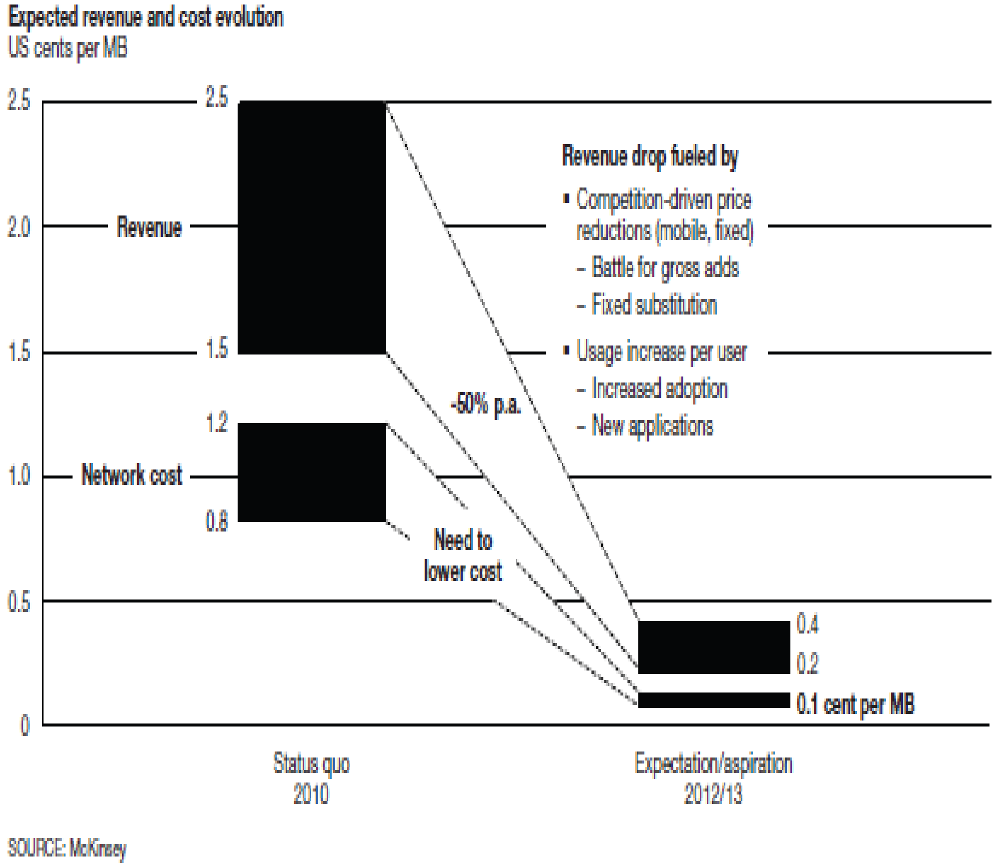
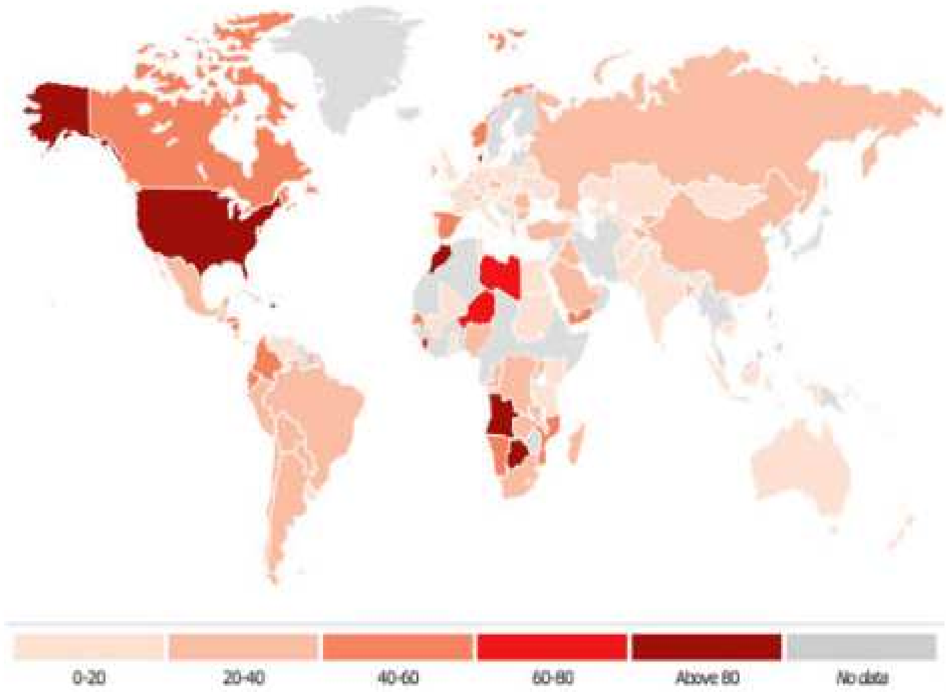
Business Challenges: High Cost versus Low Price

Mobile data price in Indonesia cannot compensate its mobile data cost

Mobile data cost in Indonesia $30 / 500 MB or $ 0.6 cent / MB



Mobile data price in Indonesia $15 / 500 MB



Source : Asley Feinberg, http://gizmodo.com/the-price-of-500mb-of-mobile-data-across-the-world-1442047579

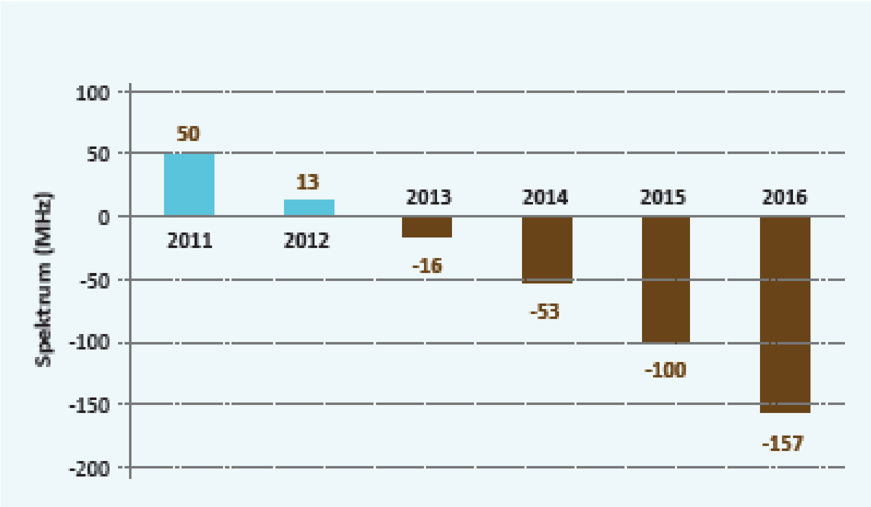
Initiative:

1. New technology (Heterogeneous Network, NFV/SDN)
2. Selected infrastructure sharing

Business Challenges: Spectrum Scarcity

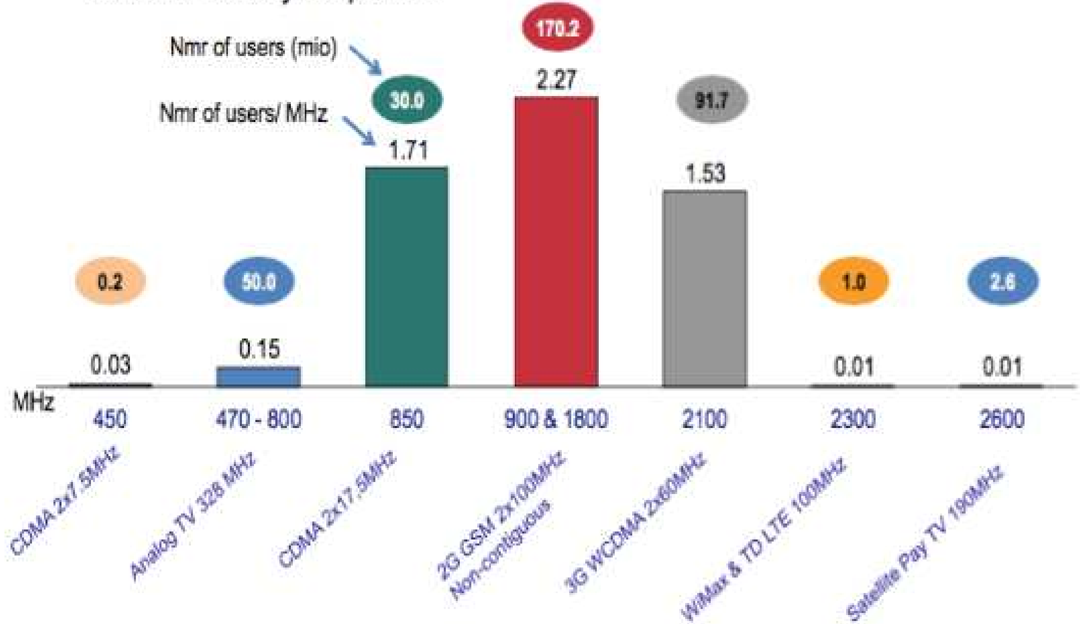
Spectrum is limited resources, allocation and utilization should be efficient and effective

Indonesia is experiencing 'scarcity' of spectrum: 16 MHz in 2013 and estimated 157 MHz in 2016



Source: Indonesia Broadband Plan

- *Spectrum for mobile (2G and 3G) reaches highest subscriber/ MHz*
- *Allocation of other band for mobile can solve the 'scarcity' of spectrum*
- *Transform to contiguous spectrum for each operator gives higher efficiency and also solve the 'scarcity' of spectrum*



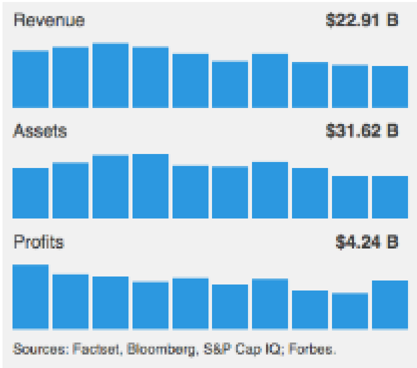
Source : Company Info Memo, Company Annual Report, BRTI, Internal Analysis

Business Challenges: Revenue Declining

Almost all largest global telco operators experience negative annual trends on their revenue, assets, and net income. Business model & market readiness becoming significant challenges.

China Mobile

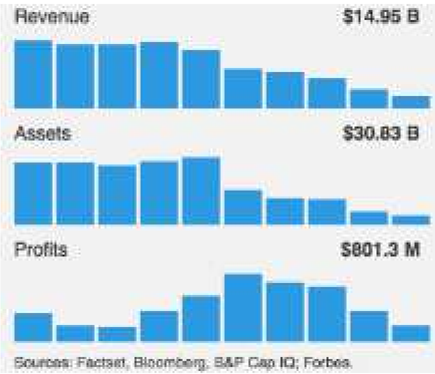
Telstra



AT&T

Verizon

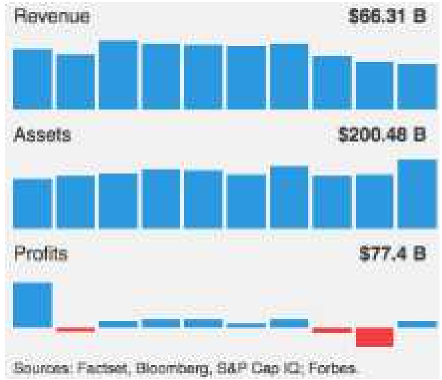
Bharti Airtel



Singtel

SK Telecom

Vodafone

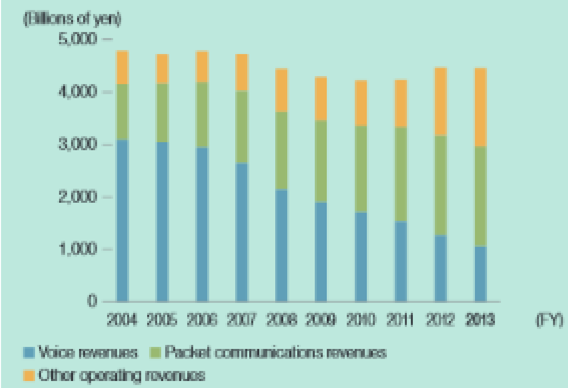


Source: Forbes, http://www.forbes.com/sites/liyanchen/2015/06/01/the-worlds-largest-telecom-companies-china-mobile-beats-verizon-att-again/

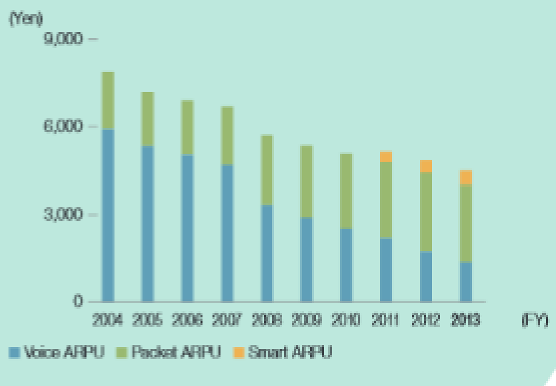
Business Challenges: Digital Services as New Revenue Driver

NTT Docomo's voice revenue proportion only 21% while data and "Smart Life" services revenue takes much bigger portion and it compensated declining of voice revenue and voice ARPU

DOCOMO's Revenue Trend



DOCOMO's ARPU Trend



NTT Docomo is striving to serve customer as a "*Smart Life Partner*" with expanding Digital Commerce Business through "dmarket" and various "Smart Life" services

3000 3rd party content providers & 20 Million monthly users in March 2016

Beyond *dmarket*, Docomo has also deployed other value added services including navigation, local information, NFC-based wallet and information services, credit card and carrier-billing-based payments, translation apps, health and wellness services, insurance, pet and child tracking

RESULT

Billions of Yen

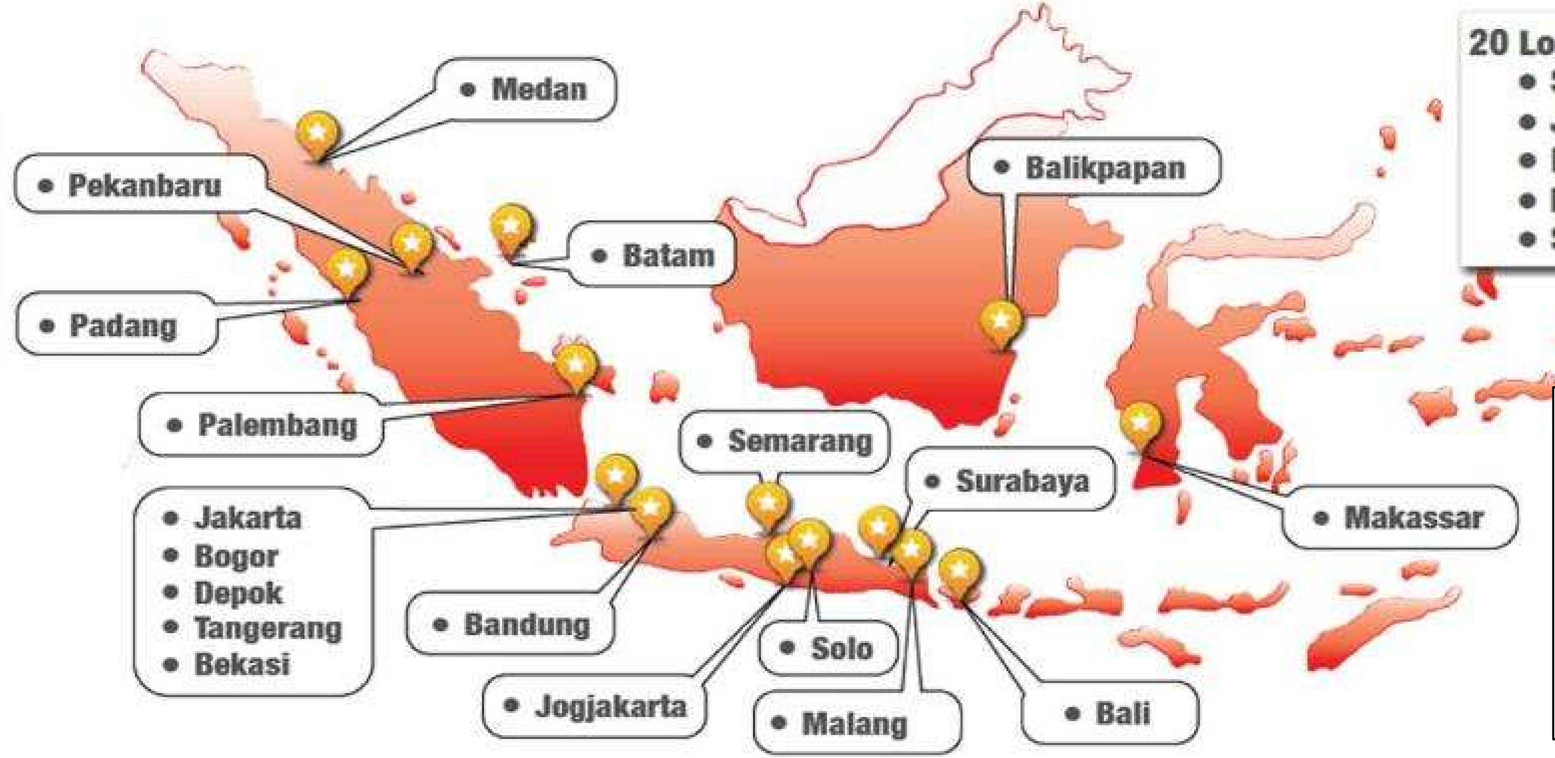
		(Billions of yen)	FY2013 Full year (1)	FY2014 Full year (2)	Changes (2)−(1)
	Telecommunications business	Operating revenues	3,827.3	3,654.6	-172.8
		Operating income	812.7	636.1	-176.7
Smart Life domain	Smart Life business	Operating revenues	356.8	437.0	+80.2
		Operating income	11.8	-3.9	-15.7
	Other businesses	Operating revenues	302.2	319.8	+17.6
		Operating income	-5.3	6.9	+12.2

Revenues from Docomo Smart Life businesses, which provide consumers with advice, information, security, cloud storage and other lifestyle services, grew 22 percent to 437 billion yen (US$3.5 billion) in the FY2014.

Source: https://www.nttdocomo.co.jp ; http://ipcarrier.blogspot.com/2015/07/ntt-docomo-earns-15-of-revenue-from-non.html

Business Challenges: Indonesia Telco Initiative

"CREATIVE CENTER" and "CREATIVE CAMP"



20 Lokasi Creative Center/Camp:

- Sumatera (5 kota)
- Jawa (11 kota/12 Lokasi)
- Bali (1 Lokasi)
- Kalimantan (1 Kota)
- Sulawesi (1 Kota)

The Facilities :

- 1,000++ square meters
- Creative Rooms (10-20)
- Co-working space
- Lounge & Café
- Meeting Rooms
- Servers & Multi-platform Gadgets
- 24/7 Operation
- High Speed Internet

Jakarta digitalvalley

- Area : 1200 M^2
- Capacity : 20 Startups
- Established : 2014

Bandung digitalvalley

- Area : 1200 M^2
- Capacity : 20 Startups
- Established : Dec 2011

Jogja digitalvalley

- Area : 1000 M^2
- Capacity : 10 Startups
- Established : August 2013

Coverage Challenges: Broadband Backbone Readiness

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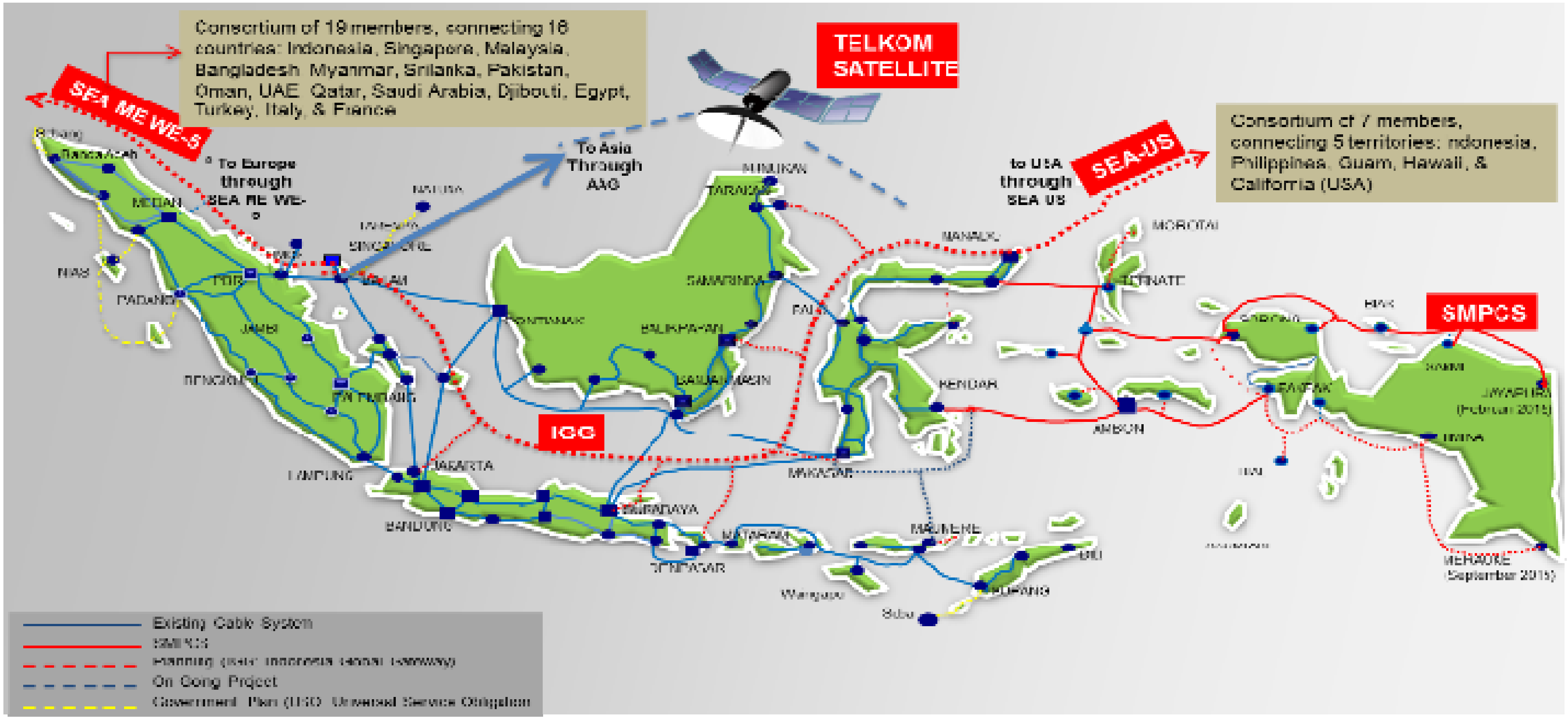
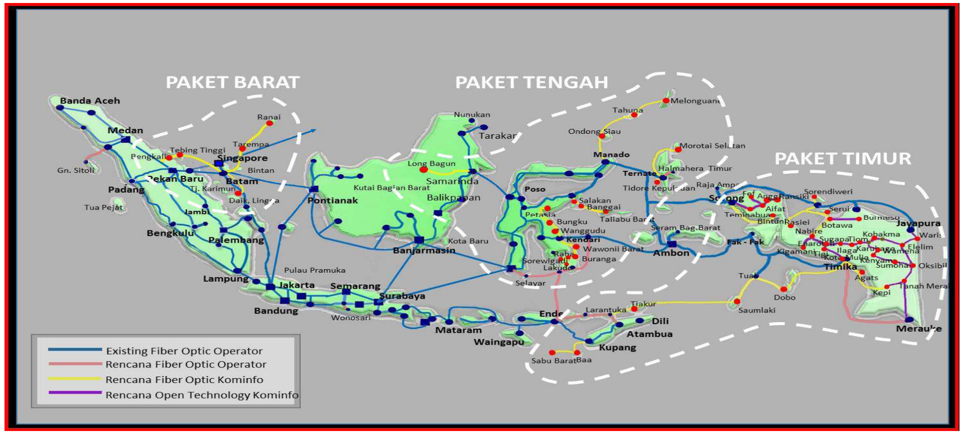
Telkom's FO backbone has been deployed 76.700 Km from Aceh to Papua, also in progress the Indonesia Global Gateway and the launch of Satellite Telkom-3S (2016), Satellite Telkom-4 (2018)



Coverage Challenges: Nationwide Coverage

Indonesia government's USO initiative to expand broadband coverage

Government's USO initiative:



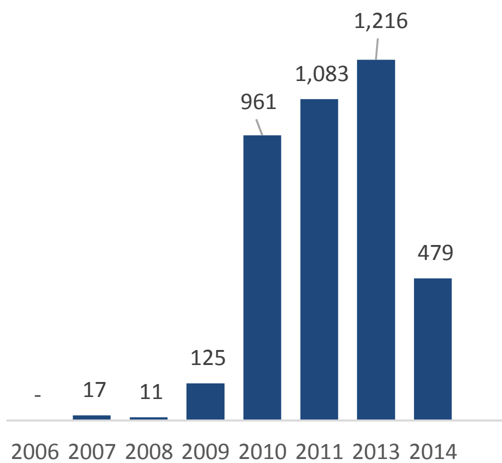
To roll out broadband backbone connecting all Kabupaten all over Indonesia

Telkomsel Merah Putih

Telkomsel invests funds to build broadband in the Rural Areas. Power utility and transmission becoming significant challenges.

1. Maritime services : BTS in the PELNI's ship to provide special cellular services. Total 16 BTS since 2009.
2. Rural Industry/ Corporate Services : BTS Rural Corporate: **37 Sites**, Femto Offshore: **84 sites.**
3. Rural Residential Area : BTS Rural Village, special cellular services for potential villages in the isolated area. Telkomsel provide **186 Sites in** Rural Village.

USO Expense (IDR Bn)



**) 2012: no data*

Source: Mastel &BP3TI

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Thank U