



KEMENTERIAN KOMUNIKASI DAN INFORMATIKA  
REPUBLIK INDONESIA  
*Mempu Masyarakat Informasi Indonesia*



# **Konektifitas Broadband Nasional**

Inisiasi TELKOM Mewujudkan Rencana Pita Lebar Indonesia

**PT. Telekomunikasi Indonesia, Tbk**

**2014**



# Outline

- **Executive Summary**
- Rencana Strategis Nasional & Indonesia Digital Network
- Persembahan Telkom untuk Indonesia: Penguatan Konektivitas ICT Nasional

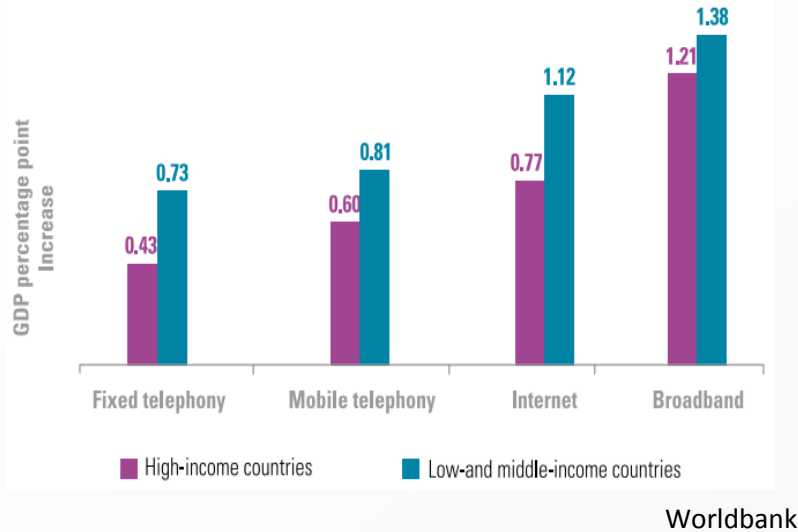
# Executive Summary

1. Telkom berupaya memenuhi **komitmen pembangunan dan regulasi pemerintah** dengan tujuan men-sukseskan implementasi ICT ke seluruh masyarakat Indonesia melalui program **Indonesia Digital Network (IDN)**:
  - mendorong seluruh stakeholder ICT mengambil tanggung jawab yang setara untuk kesejahteraan seluruh rakyat Indonesia tanpa terkecuali
2. **Spektrum contiguous yang cukup**, terutama di frekuensi bawah menjadi sangat penting untuk menjamin availability dan accessibility internet access.
  - mendorong penataan spektrum radio terutama LTE yang memberikan benefit kepada perluasan coverage dan customer experience pengguna layanan mobile broadband
3. Alokasi **slot orbit satelit baru** juga menjadi penting untuk dapat menjangkau sejumlah remote area di Indonesia.
  - Mempertahankan alokasi slot orbit satelit yang terbatas di Lembaga Internasional
4. Perlakuan khusus untuk **penggelaran akses di remote area** mengingat tantangannya lebih besar daripada urban area
  - Insentif khusus di area scattered dan topografi yang sulit serta bantuan untuk community issue dalam proses site acquisition (SITAC)
5. Sejalan dengan tumbuhnya ICT sebagai kebutuhan dasar masyarakat, maka pemerintah baik pusat maupun daerah diharapkan mendorong **pemenuhan Right of Way (RoW)** untuk penggelaran jaringan backbone dan akses

# Outline

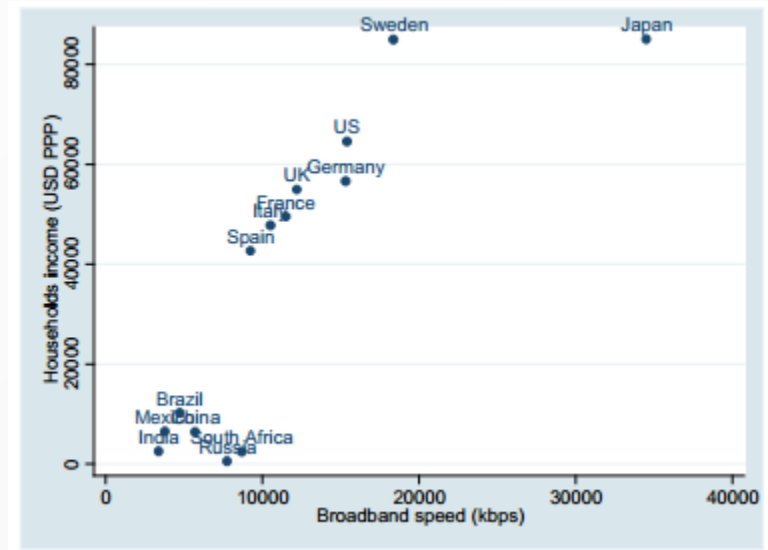
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## GDP percentage point increase due to a 10 percentage-point increase in penetration



**Increment of broadband penetration by 10% has impact to GDP growth 1,38%**

## Broadband Quality Impact to Income



Chalmers University of Technology, 2013



**Better broadband quality have impact to better house hold income**

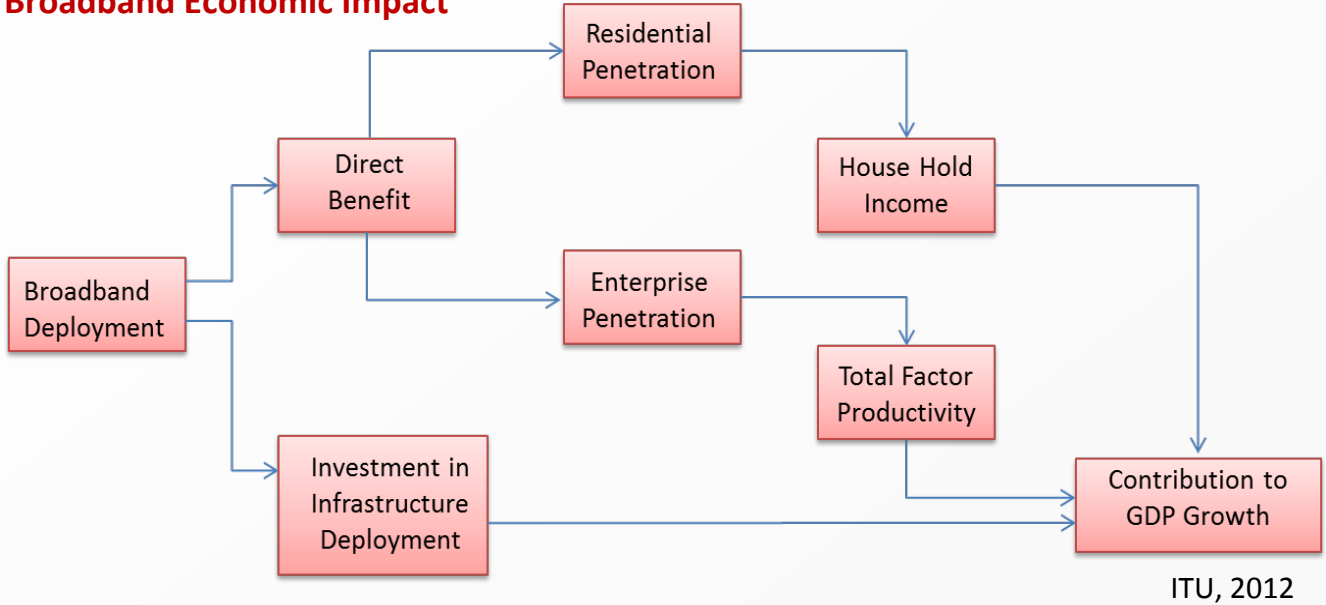
# GDP Growth Broadband Quality

RANK	ECONOMY	FIXED BROADBAND PENETRATION 2013
99	Antigua & Barbuda	4.5
100	El Salvador	4.5
101	Cape Verde	4.3
102	Bahamas	4.1
103	Algeria	3.3
104	Egypt	3.3
105	Belize	3.1
106	South Africa	3.1
107	Jordan	2.8
108	Bhutan	2.7
109	Oman	2.6
110	Philippines	2.6
111	Morocco	2.5
112	Nicaragua	2.2
113	Djibouti	2.0
114	Micronesia	2.0
115	Sri Lanka	2.0
116	Guatemala	1.8
117	Tonga	1.6
118	Paraguay	1.6
119	Syria	1.6
120	Kuwait	1.4
121	Bolivia	1.3
122	Indonesia	1.3
123	Namibia	1.3

RANK	ECONOMY	FIXED BROADBAND PENETRATION 2013
148	Cambodia	0.2
149	Mauritania	0.2
150	Myanmar	0.2
151	Comoros	0.2
152	Papua New Guinea	0.2
153	Lao P.D.R.	0.1
154	Kenya	0.1
155	Vanuatu	0.1
156	Sudan	0.1
157	Chad	0.1
158	Uganda	0.1
159	Lesotho	0.1
160	Tanzania	0.1
161	Samoa	0.1
162	Togo	0.1
163	Burkina Faso	0.1
164	Cameroon	0.1
165	Zambia	0.1
166	Tajikistan	0.1
167	Mozambique	0.1
168	Timor-Leste	0.1
169	Madagascar	0.1
170	Cuba	0.0
171	Benin	0.0
172	Niger	0.0

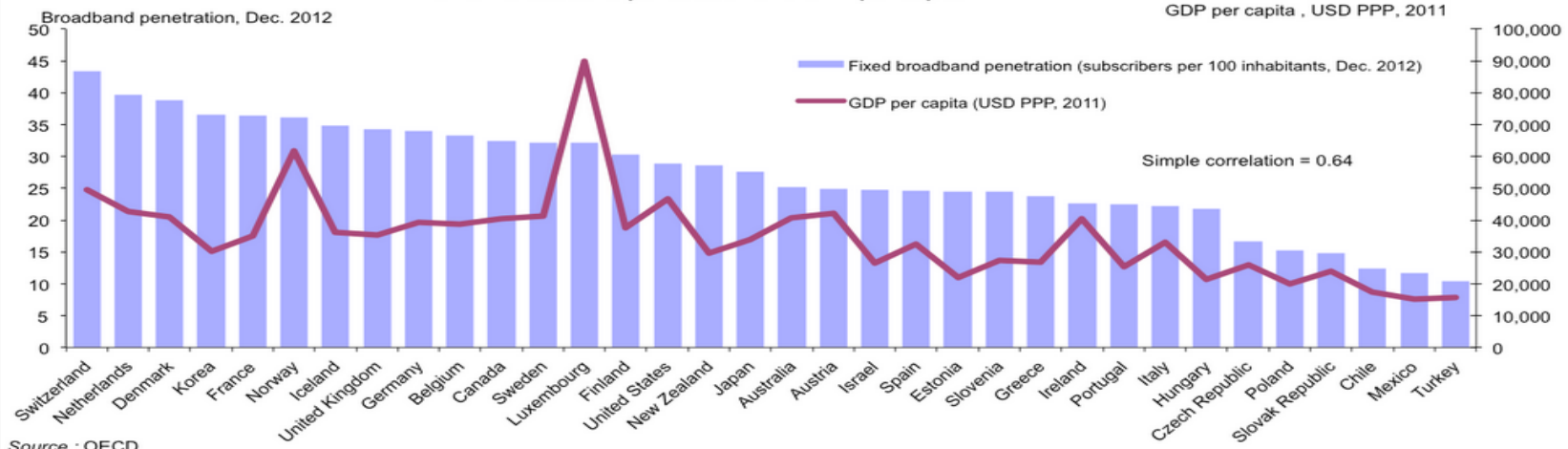
# Broadband Economic Impact

## Broadband Economic Impact

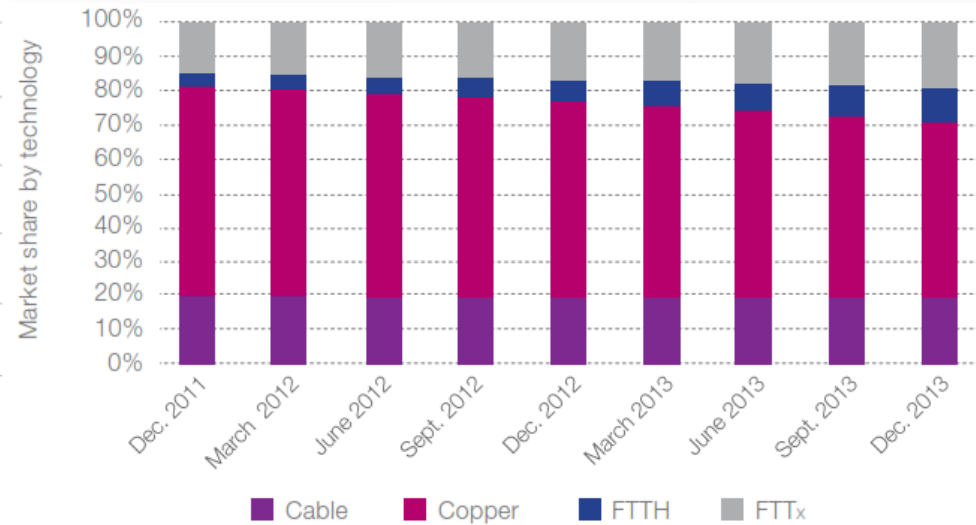
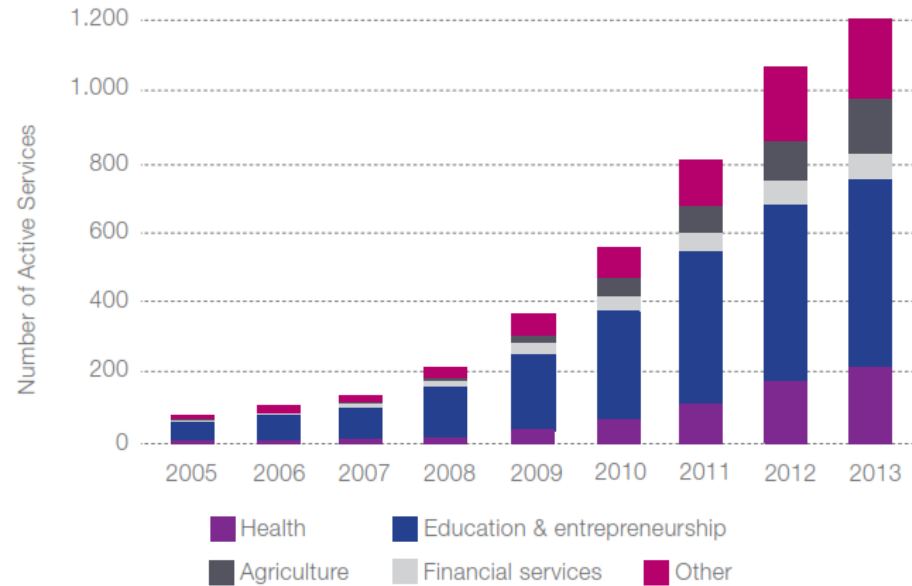


- Direct Benefit :**
- Business Process efficiency
  - Service & Business models innovation
  - Increasing Productivity
  - Supply Chain & Inventory optimization

OECD broadband penetration and GDP per capita



# Broadband Economic Impact



**Implement FTTH network access in new buildings. The Ministry of housing and urban China** has issued several regulations to boost broadband deployment and application. “residential and residential Building FTTH Communications facilities Construction engineering design Specifications” and “Residential and Residential Building FTTH Communications facilities Construction and acceptance norms” aim to solve the difficulty of residential wiring projects. FTTH Communications for new building demand encourages carriers to share network access and optical fiber resources.





## Urban Needs

### Indonesia Data & Facts:

- #4 world mobile user subscribers (source: IDC)
- #3 highest growth internet users with CAGR 58% (source: Internet World Stats)
- #4 world largest facebook users (source: Bappenas)
- #5 world largest twitter users (source: Bappenas)



## Rural Needs

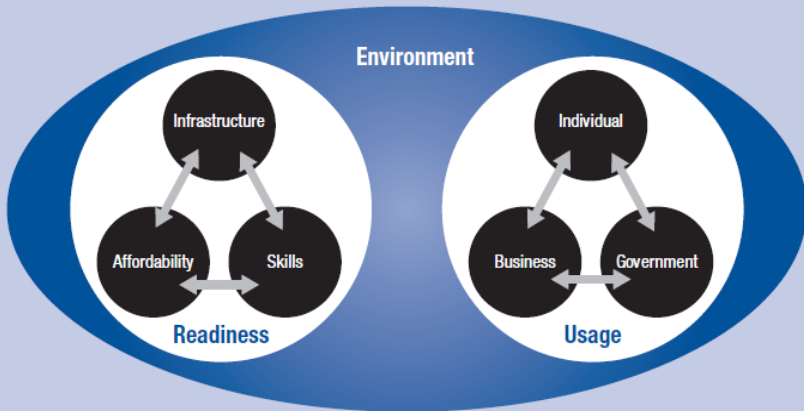
- 1 Need for Speed**
  - Mobile user growth of 3G will exceed 2G's in 2017
  - In ASPAC region, FTTH will be the major growth segment and exceeds DSL in 2017
- 2 Need for Digital Content**
  - 90% internet traffic is going outside
  - 8 out of Top 9 internet Indonesia rely on User Generated contents (Google, Facebook, Blogger, YouTube, Yahoo!, etc..)
- 3 Need for Internet of Things**

Lifestyle, higher needs of security

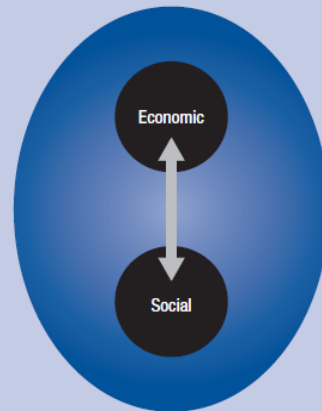
- 1 Need for Better Coverage**
  - Scattered islands
  - Hard geographical topography
- 2 Need for Information Access**
  - Limited educational institutions
  - Digital divide between east & west of Indonesia
- 3 Need for Internet of Things**
  - Lack of physical resources
  - Limited public infrastructures

# Global Perception for Indonesia's Broadband

## DRIVERS



## IMPACTS



WORLD ECONOMIC FORUM (2014)

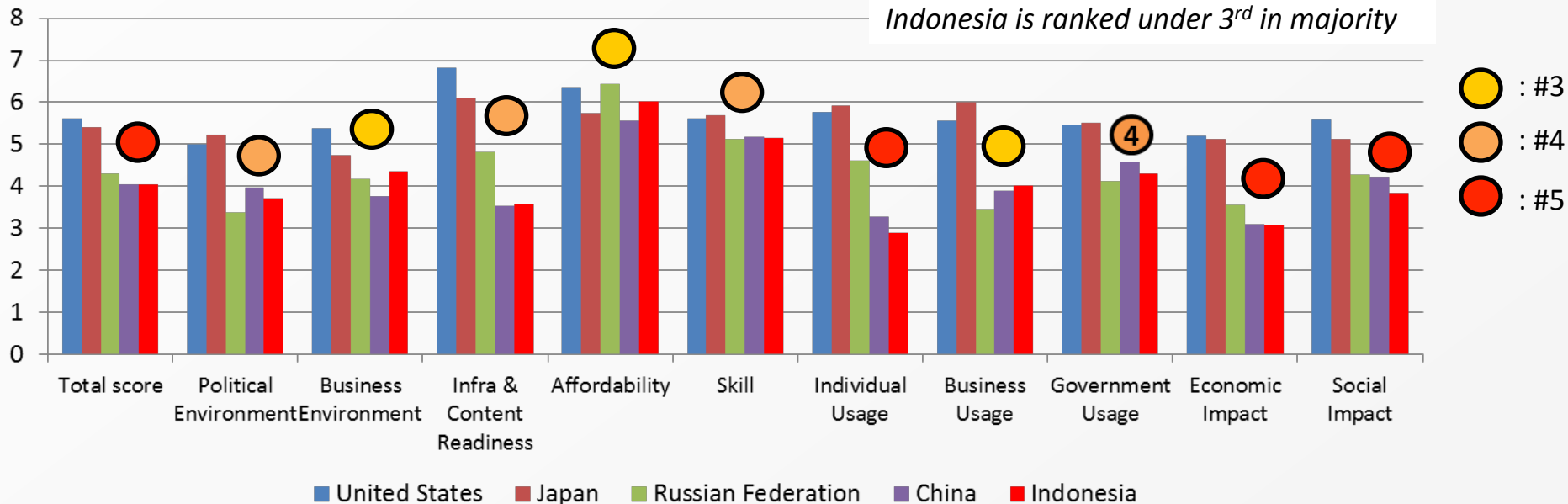
Rank 64

Rank 5

≥ 100 million Population Countries

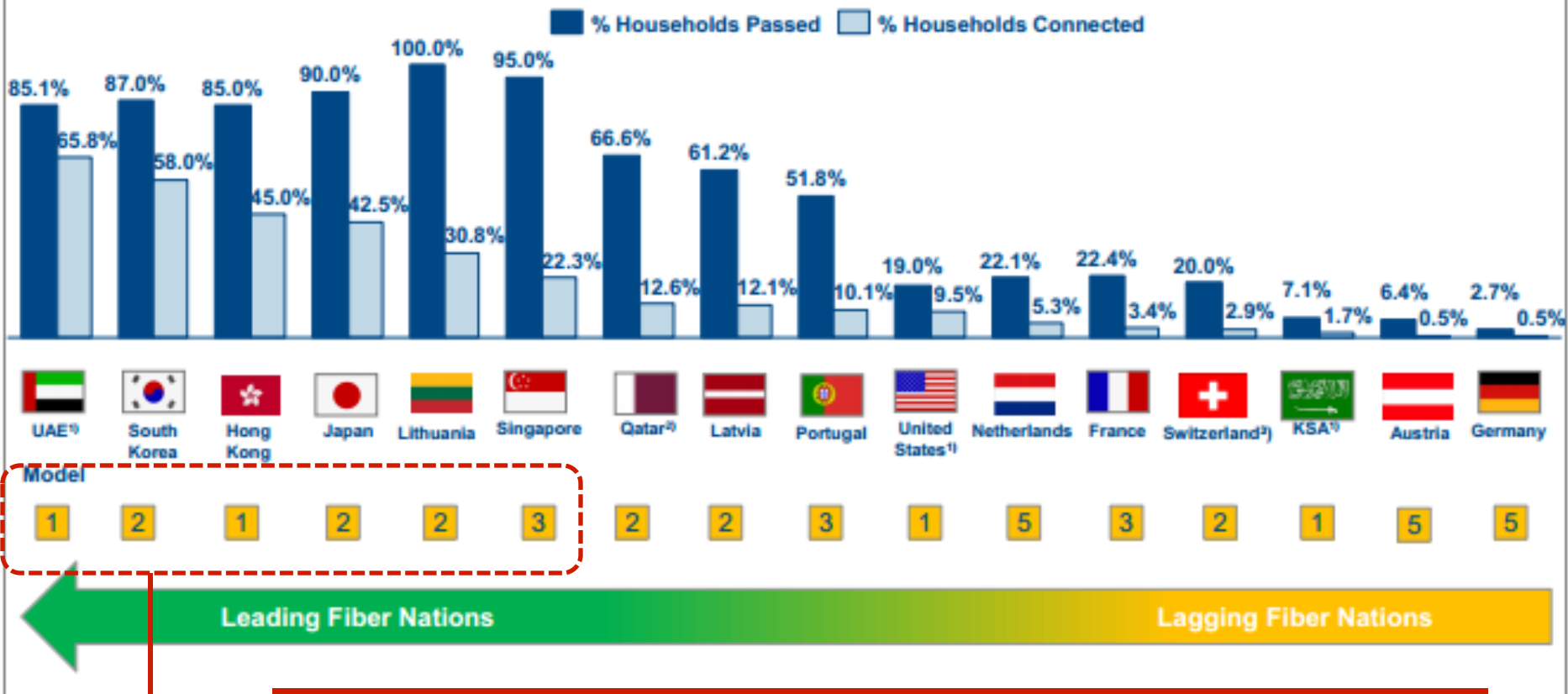
Rank	Value (out of 148)
Networked Readiness Index 2014	64.. 4.0
Networked Readiness Index 2013 (out of 144)	76.....3.8

Comparison of Indonesia Networked Readiness Index 2014 and other >100 million population countries:



The success of broadband development is depend on the National Broadband Strategy

## FTTH/B Households Passed and Households Connected – HHc ranking\*



**Model 2 : Graded Government Support, Incumbent Led**  
 ▪ Give Impact to Broadband Penetration



## Indonesia Broadband Plan (RPI) (Perpres no 96/2014) Strengthen national connectivity through national ICT regulation

2013

### Infrastruktur

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



2019

### 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)

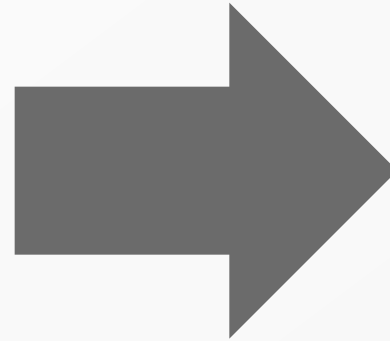
### Utilization / Adoption:

Service tariff should be less than 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

# Framework Rencana Induk ICT IDN 2020

Indonesia ICT Master Plan is consist of IBP “bone and flash”, a master plan to ensure true broadband infrastructure and experience, and NRI improvement “skin” to ensure great impact of ICT. Telkom is ready with **IDN to lead the transformation** ...



Prestigious World Rank  
WORLD ECONOMIC FORUM  
2014 2020  
64<sup>th</sup> 40<sup>th</sup>

- High ICT impact on social & economical
- True national broadband experience & productivity

*Boosting Indonesia's competitiveness and well-being*



**Indonesia Digital Network** is a manifestation of Telkom’s vision for true broadband infrastructure development in end-to-end user manner (user terminal, access, transport, and service) which emerged from a noble intention to provide strong foundation for national growth, especially in enhancing quality and capacity improvement as well as equal distribution of broadband infrastructure for the people of Indonesia. (Telkom CEO Message)

## World Economic Forum Framework

### Indonesia Toward



### Top 60 in 2015

- 100% Internet access penetration in school
- Nurturing digital creative community
- Improving 100% Government (E-Gov)

- Cloud computing for Government & Business use
- ISP Cyber Security System
- 100K sqm Data Center

- 100% broadband kota/kabupaten
- signal mobile: 60% desa
- 75.000Km Fiber Optic

- 20 juta household fixed BB
- 30 kota mobile broadband

### Top 40 in 2020

- Smart City (ibukota provinsi)
- Accelerating digital creative Comm
- Nationwide ecosystem-based apps (e-logistic, e-education, e-health, e-tourism)

- Nationwide Cloud computing for Gov, Business & individual use
- Nationwide Cyber Security System
- 500K sqm Data Center

- 100% broadband Kecamatan
- signal mobile: 100% desa
- 100.000Km Fiber Optic

- 30 juta household fixed BB
- 200 kota mobile broadband

Top 3 among >100M pop countries

## AVAILABILITY

**Stipulate** *limited resources* usage to provide availability of high-speed broadband to all segments of the population.

Allocation of LTE Spectrum

Allocation of New Satellite  
Orbital

Authorization of **Right of way**  
for Backbone and Access

## ACCESSIBILITY

**Stimulate** on sustaining *infrastructure investment* to provide high-speed broadband more accessible. Government ICT Policy CAPEX to OPEX

Assuring Investment on ICT  
Infrastructure rollout in less  
economic area

Adoption on e-Education, e-  
Health and e-Logistic  
platform for Nationwide

Advancement on Electronic  
Transaction Regulation  
(PP82/2012) and  
Establishment of National  
Cyber Security

## AFFORDABILITY

**Support** reasonable regulatory *charges* to encourage high-speed broadband more affordable and provide ICT Fund for national content to utilize high-speed broadband.

Applying ICT Fund for  
Infrastructure rollout  
purpose

Accelerating the use of ICT  
Fund for ICT Public Service  
Infrastructure

Applying Incentives and  
protecting IPR on Digital  
Creativity Industry



# Outline

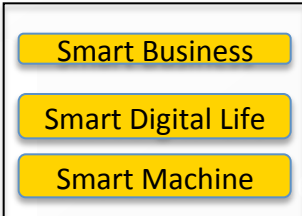
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# Creating Broadband Ecosystem

## DEVICE

Smart Devices, 3 Play 3 Screen & Cloud

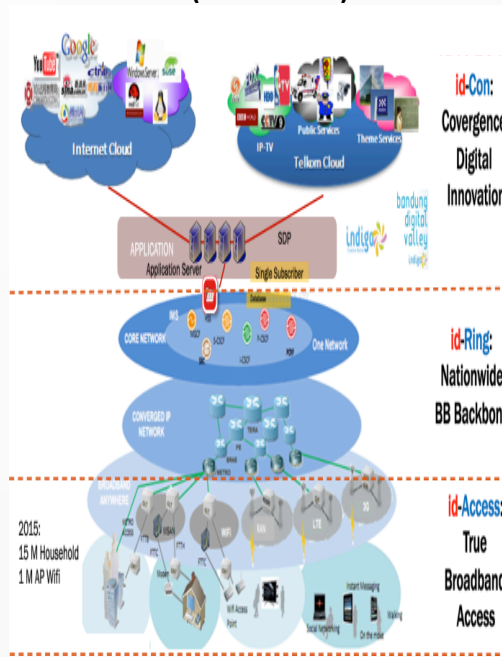
### 3 Smart Devices



Digital Ecosystem (Virtual Network)

## NETWORK

Indonesia Digital Network 2020 (IDN 2020)



## APPLICATION

TIME Service & Product Innovation

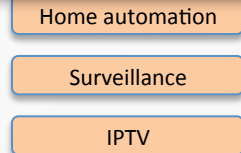
### 1 Smart Digital Life



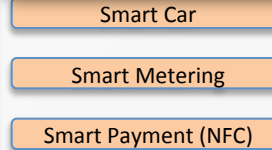
### Smart Business



### Smart Home



### Smart Machine



### 2 Smart Platform



### 4 Smart Digital Planet

Nurturing Digital Creative Community



Physical Ecosystem (People Network)

# Indonesia Digital Network (IDN) 2020

Telkom Master Plan to Realize Broadband Network Digital Ecosystem

## Indonesia Networked Readiness

Index is still ranked 5<sup>th</sup> of >100 million pop. Countries

(source: World Economic Forum 2013)

## IDN 2020

Towards  
Top 3 among  
>100M pop  
countries

Build  
Ecosystem

Services

- Smart City (ibukota provinsi)
- Accelerating digital creative community
- Nationwide ecosystem-based apps (e-health, e-tourism etc)



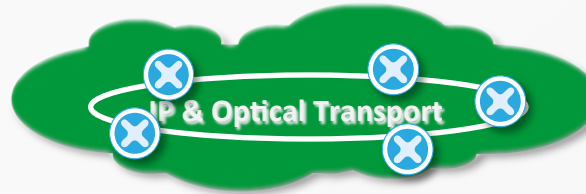
id-Con

Convergence  
Digital  
Innovation

Deploy  
Infra-  
structure

Access

- 100% broadband di kecamatan
- Mobile signal: 100% desa
- 100.000km Fiber Optic



id-Ring

Nationwide  
Broadband  
Backbone

- 30 million household fixed broadband
- 200 mobile broadband cities



id-Access

True Broadband  
Access

# Triple 'A' Approach Towards IDN 2020

Achieving true national broadband experience & productivity

	Existing	IDN 2015	IDN 2020
Availability	<ol style="list-style-type: none"> <li>1. Fixed Broadband access: min. 15% household w/ 1Mbps</li> <li>2. Mobile Broadband access: 64-512 kbps</li> </ol>	<ol style="list-style-type: none"> <li>1. Fixed Broadband access: min. 30% household w/ 10Mbps</li> <li>2. Mobile Broadband access:               <ol style="list-style-type: none"> <li>a. BB Cities: 30 cities (512 kbps - 1 Mbps)</li> <li>b. Urban non BB Cities: 200 cities (256-384 kbps)</li> <li>c. Rural: 64-256 kbps</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Fixed Broadband access: min. 71% household w/ 20Mbps</li> <li>2. Mobile Broadband access:               <ol style="list-style-type: none"> <li>a. BB Cities: 200 Cities (1 Mbps - 2 Mbps)</li> <li>b. Urban: 100% pop. (2 Mbps)</li> <li>c. Rural: 52% pop. (1 Mbps)</li> </ol> </li> </ol>
Accessibility	<ol style="list-style-type: none"> <li>1. Broadband connectivity coverage on 72% of ibu kota Kabupaten</li> </ol>	<ol style="list-style-type: none"> <li>1. Broadband connectivity coverage on 90% of ibu kota Kabupaten</li> <li>2. 60% villages are covered by mobile signal</li> <li>3. 30 Mobile Broadband Cities</li> </ol>	<ol style="list-style-type: none"> <li>1. Broadband connectivity coverage on 100% of ibu kota Kabupaten</li> <li>2. 100% villages are covered by mobile signal</li> <li>3. 200 Mobile Broadband Cities</li> </ol>
Affordability	<ol style="list-style-type: none"> <li>1. Broadband entry level priced at 9.1% (2012) &amp; 6.3% (2014 projected) of the monthly income average (data ITU Measuring ICT Index)</li> </ol>	<ol style="list-style-type: none"> <li>1. Broadband entry level price is not more than 5% of the monthly income average (UN Broadband Commission target)</li> <li>2. 100% ICT adoption on pemda kabupaten (e-Gov)</li> <li>3. 100% school with internet access</li> </ol>	<ol style="list-style-type: none"> <li>1. Broadband entry level price is not more than 3% of the monthly income average</li> <li>2. Smart City Adoption</li> <li>3. Nationwide ecosystem-based apps (e-logistic, e-education, e-health, e-tourism)</li> </ol>

# id-Access Indonesia Digital Access

Answering the Needs of 3'A': FTTH, 4G & WIFI Deployment

## Availability

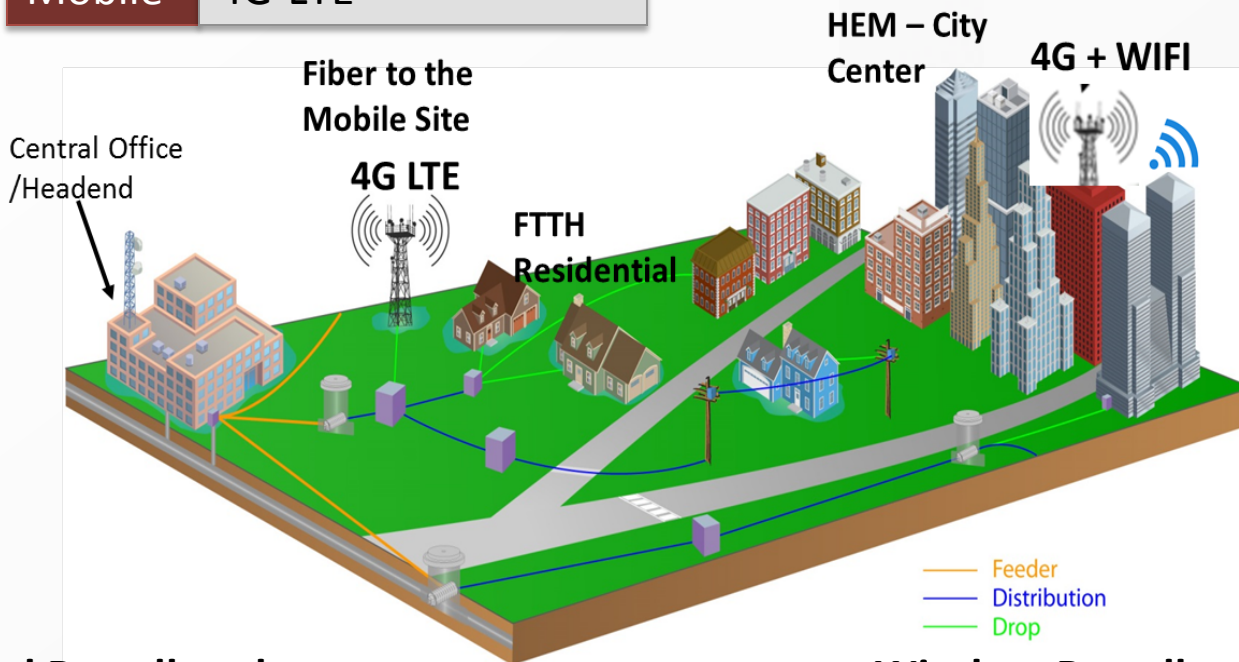
Fixed Fiber to The Home

## Affordability

WiFi Fixed Wireless

## Accessibility

Mobile 4G-LTE



## Problems in field:

- Site acquisition (SITAC)
- Difficulties in some geographical area
- Vendor exclusivity in some residential area

## Fixed Broadband

- Deploying **True broadband access** (up to 100 Mbps)
- **Nation wide coverage**
- Target 2015: **20M Homes Passed**
- Progress Q3 2014: **10.2M Homes Passed (3.2M Homes Connected Broadband)**

## Wireless Broadband

- **Sinergi 4G WIFI** untuk meningkatkan Customer Experience Mobile/wireless BB terkait dengan **keterbatasan Spektrum**
- Target WIFI 2017: **1 juta AP**
- Progress WIFI Q3 2014: **127rb AP**

# id-Access Exploiting 4G-LTE - WiFi

## Convergent Solution for Fixed & Mobility

### Why LTE

- To meet the Need for Speed
- To meet the Need for Coverage

### Main Considerations:

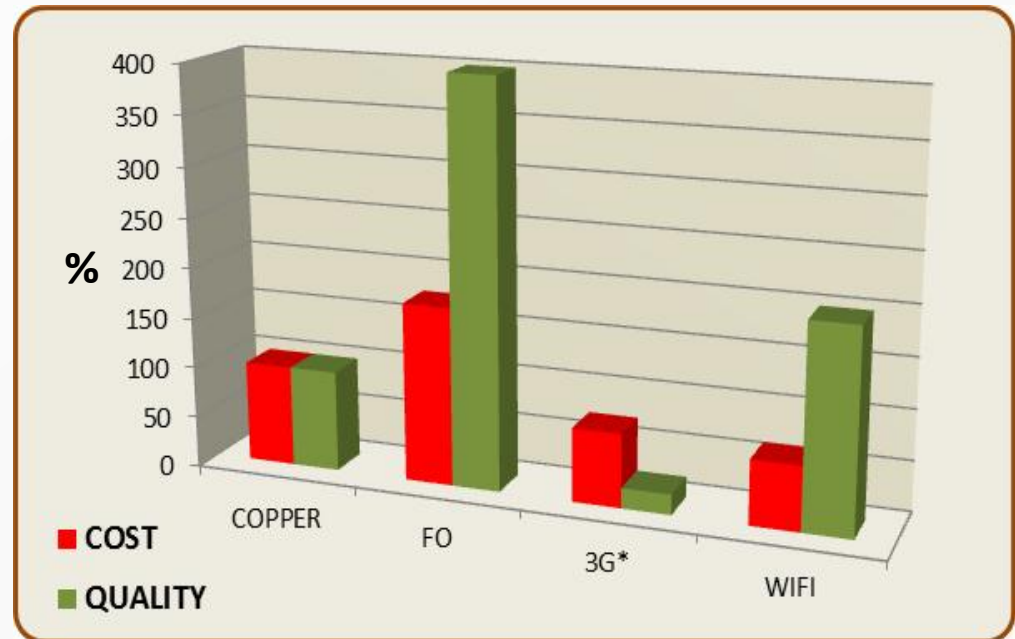
- Limited contiguous spectrum, especially at 850 MHz, 900 MHz, 1800 MHz and 2100 MHz.
- LTE Business case is challenging

### Solution:

- Lower frequency for coverage, combined with Wi-Fi for indoor capacity solution
- Integrated Small Cell with Wi-Fi Offloading

### Why using WiFi as the Solution

- Lower cost than copper, FO & 3G
- Higher quality than 3G & Copper



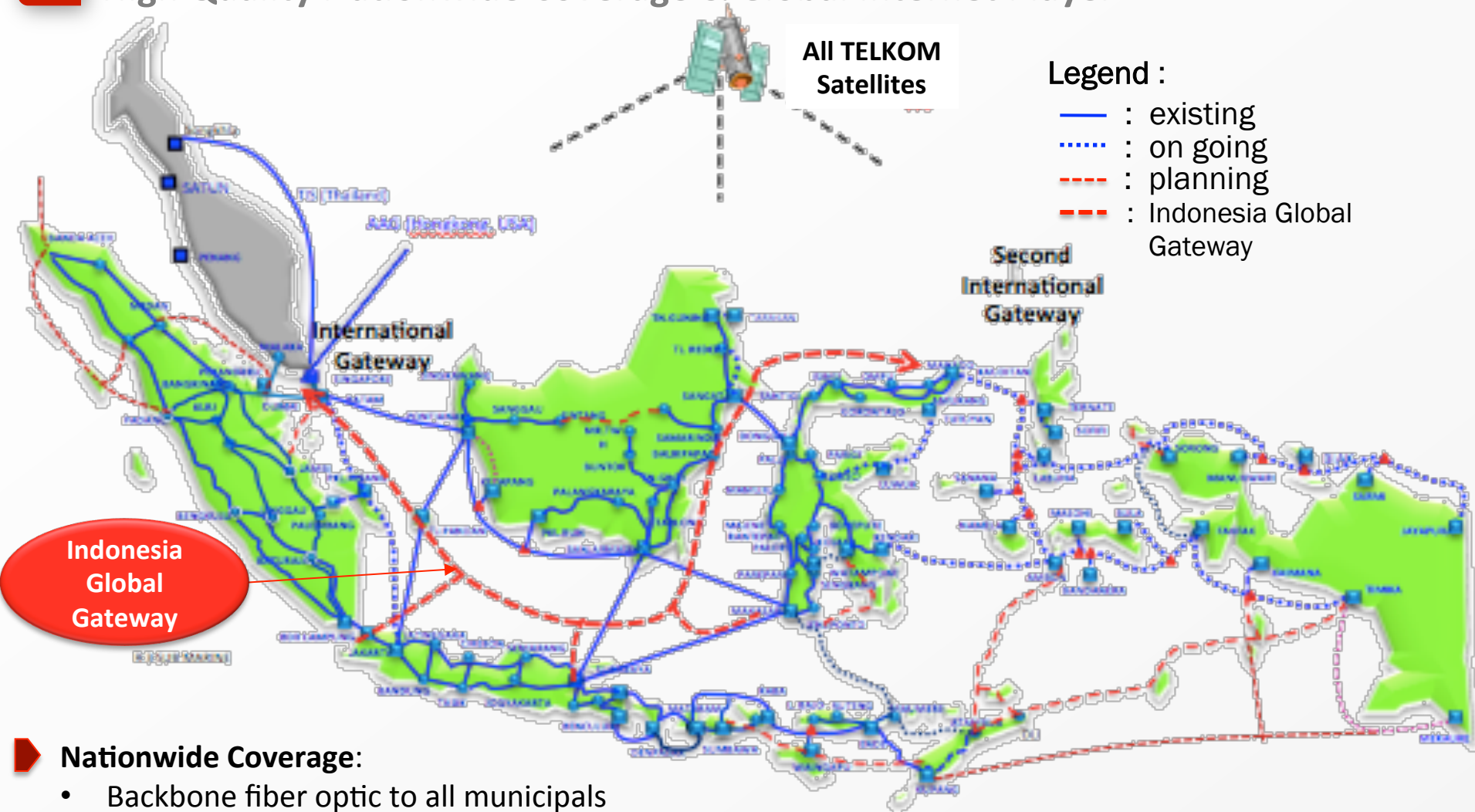
Thus, the solution for Access are...

- **3G/4G** as solution for **Mobility & Coverage**
- **WiFi** as the solution for **Fixed/Stationary & Capacity**



# id-Ring Indonesia Digital Ring

High Quality Nationwide Coverage & Global Internet Player



All TELKOM Satellites

Legend :

- : existing
- ⋯ : on going
- - - : planning
- - - : Indonesia Global Gateway

Indonesia Global Gateway

## Nationwide Coverage:

- Backbone fiber optic to all municipals
- Satellite for remote (rural) communities

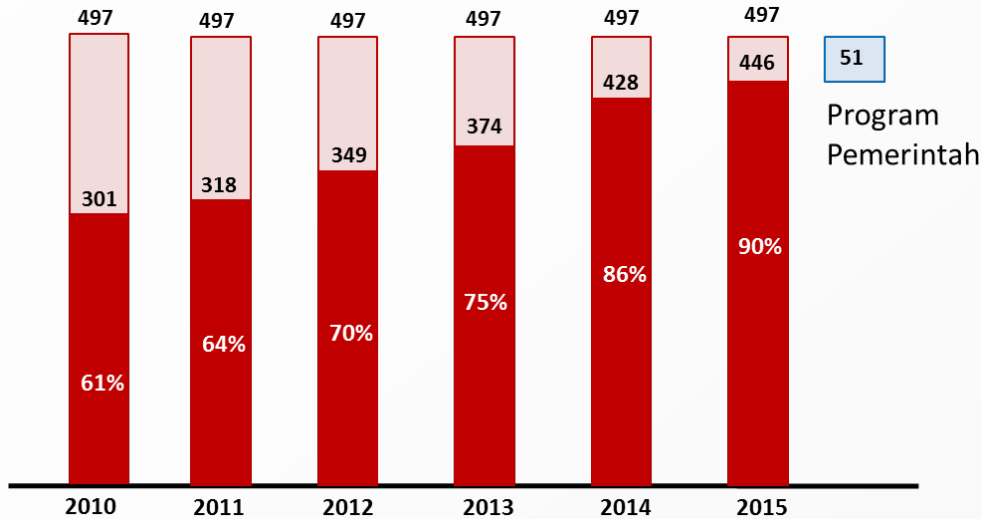
## Leveraging domestic resources & capabilities for Global Player through:

- Indonesia Global Gateway (creating secondary gateway)
- Indonesia Global Network (SMW5, SEA-US)

# id-Ring Indonesia Digital Ring

## Target & Progress Penetrasi Fiber Optik

### Target



- Program Telkom dalam pembangunan Optik akan mengcover 446 IKK (90% IKK) s/d tahun 2015
- Sebanyak 51 IKK diusulkan untuk masuk kedalam program pemerintah (USO)
- Penggelaran Kabel Optik sepanjang 75.000km di 2015

### Progress Achievement September 2014

Progress IKK :  
**372**

Progress FO :  
**73.699 Km**

### Main Constraints :

- Kondisi geologi yg cukup sulit
- Proses Perijinan cukup lama
- Banyak Community Issue



# id-Ring: Indonesia as Global Hub

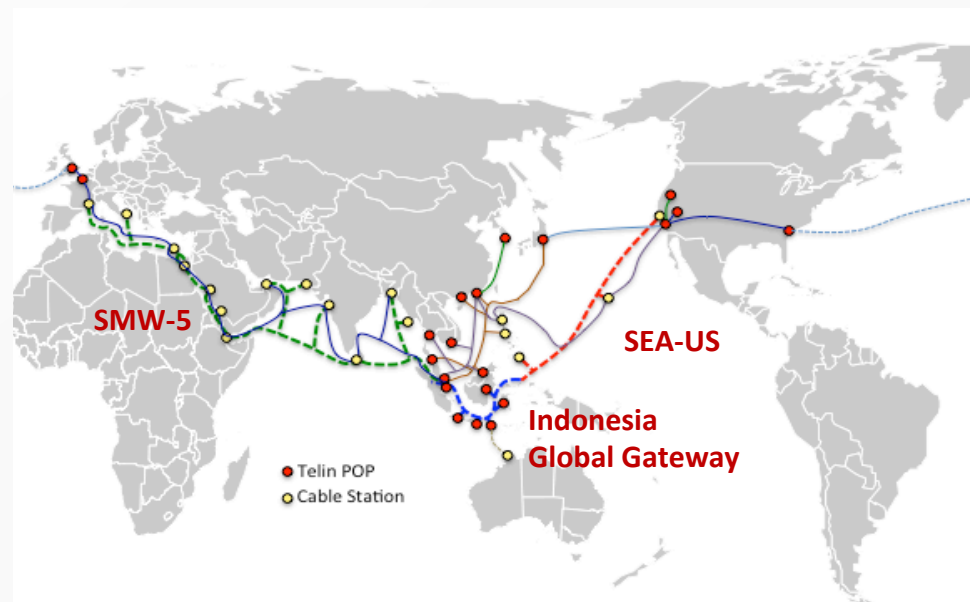
Indonesia Global Gateway (IGG) & Indonesia Global Network (IGN)



- Unlocking Strategic Position to be the center of regional and global economy
- Leveraging capability and resources to strengthen ICT industry
- Building global competitive advantage

## Towards Indonesia as a Global Hub (2017)

By Indonesia Global Network (SMW-5 & SEA-US) & Indonesia Global Gateway



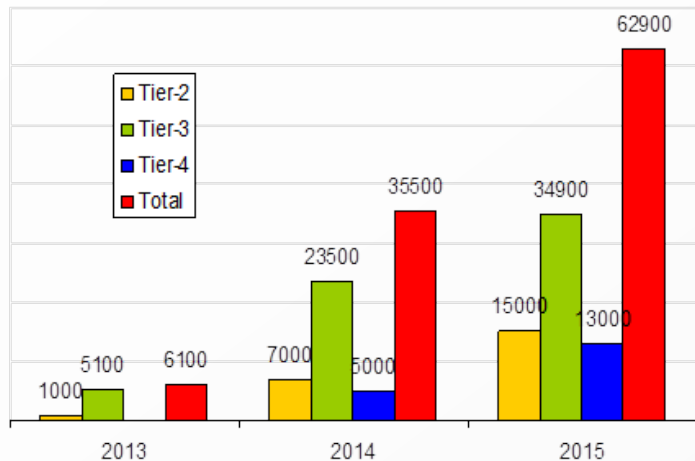
Global PoP : 17 PoP  
Global Cable : 65,000 Km  
Domestic Cable : 75,000 Km

**Will Ready on 2017**

# id-Con Indonesia Digital Convergent

## Data Center Telkom Group Consolidation

**“Toward 100.000 m<sup>2</sup> Data Center at 2015”**



### Development Strategy :

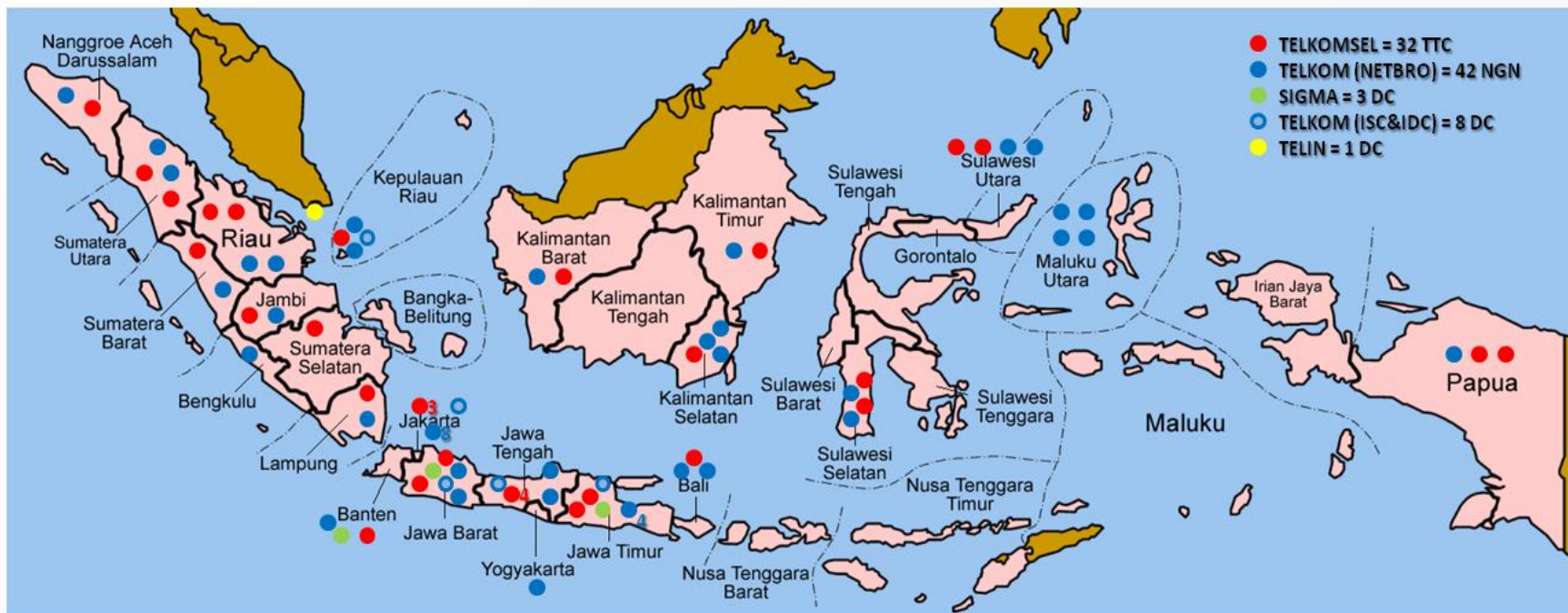
- **Utilized** Telkom STO & NGN Room, ISC Data Center & TTC Telkomsel
- **Build new DC** : Balikpapan & Cikarang

STO - TELKOM TTC - TSEL









BPN-SIGMA

CKR-SIGMA



# Indiso dan Indico

## INDONESIA DIGITAL SOCIETY

<b>Government Sector</b>	<div style="border: 2px solid red; padding: 5px;"> <p>397 Pemkab/Kot Total Bw : 12,2 Gb 30,6 Mb/Kab-Kot</p> </div> <div style="text-align: center;">  <p>Indonesia Digital Government</p> </div> <p>Provides <b>broadband infrastructure &amp; cloud based solution</b> for Government to increase public services</p>
<b>Private Sector</b>	<div style="border: 2px solid red; padding: 5px;"> <p>Jumlah Outlet : 3172</p> </div> <div style="text-align: center;">  <p>Provides easiness for community in doing <b>micro finance transaction at 100K outlet</b></p> </div> <div style="border: 2px solid red; padding: 5px;"> <p>SME Online : 323.502</p> </div> <div style="text-align: center;">  <p>Provides digital platform for Indonesia's 100K UMKM as an enabler for <b>online business</b></p> </div>
<b>Public Sector</b>	<div style="text-align: center;">  <p>Provides <b>broadband infrastructure &amp; Cloud based solution</b> for tourism institution to unlock the value of Indonesia</p> </div> <div style="text-align: center;">  <p>Provides <b>broadband infrastructure &amp; Cloud based solution</b> for health institution to increase health services</p> </div> <div style="border: 2px solid red; padding: 5px;"> <p>16.833 Sekolah Online : 37,569 Access Point</p> </div> <div style="text-align: center;">  <p>Provides <b>internet wifi services</b> for students in 100K schools nationwide</p> </div>
<b>Local Government Initiative</b>	<p>Initiative or local government vision in order to build its territory uniqueness with ICT supports such as Yogyakarta with its Culture, Bandung with its Digital Creative, &amp; Bali with its Tourism.</p>

## INDONESIA DIGITAL ECOSYSTEM



82 bank swasta & gov  
115,2 Gb Total Bw

Provides integrated **e-channel Banking Platform** to increase banking productivity



Provides **Cloud Service & Data Center** to support Corporate Customer business needs



Provides **Machine 2 Machine Connections** to support corporate customer business productivity

*Terima Kasih*

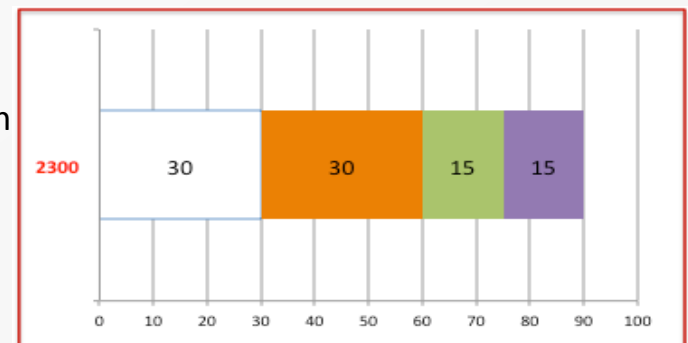
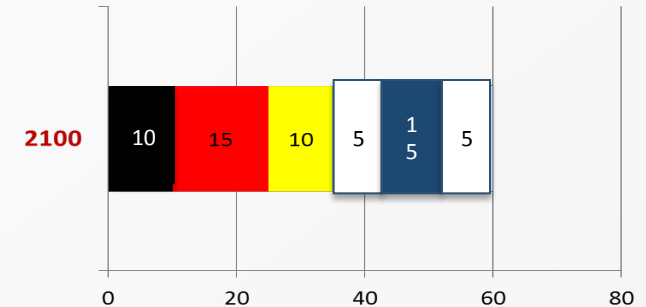
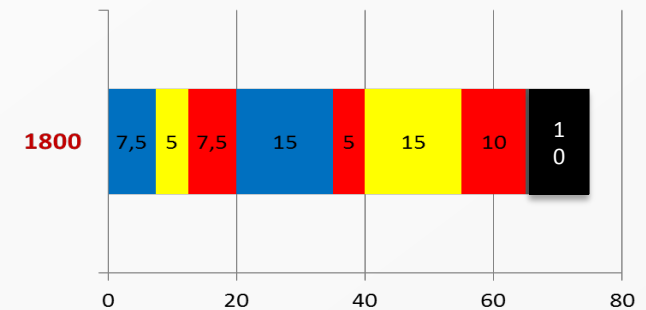
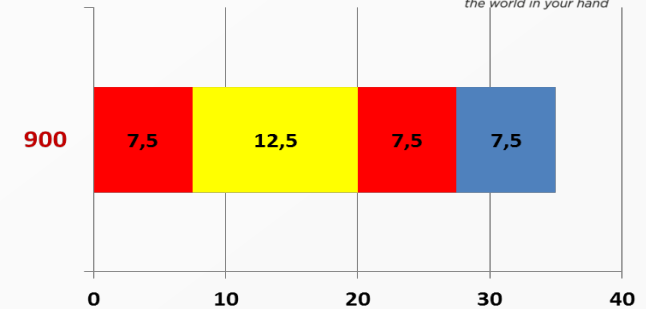


# Govt Support: Allocation LTE Spectrum

## Peta LTE Nasional

Lebar Pita (Mhz)						
LTE Mode	Frekuensi	TSEL	XL	ISAT	Smart Fren	Three (HTC)
FDD	850 Mhz	7.5	7.5	7.5	-	10
	900 Mhz	7.5				
FDD	1800 Mhz	22.5	22.5	20	-	10
FDD	2100 Mhz	15	15	10	-	10
FDD	800Mhz	-	-	-	11	-
TDD	2300 Mhz	-	-	-	30	-

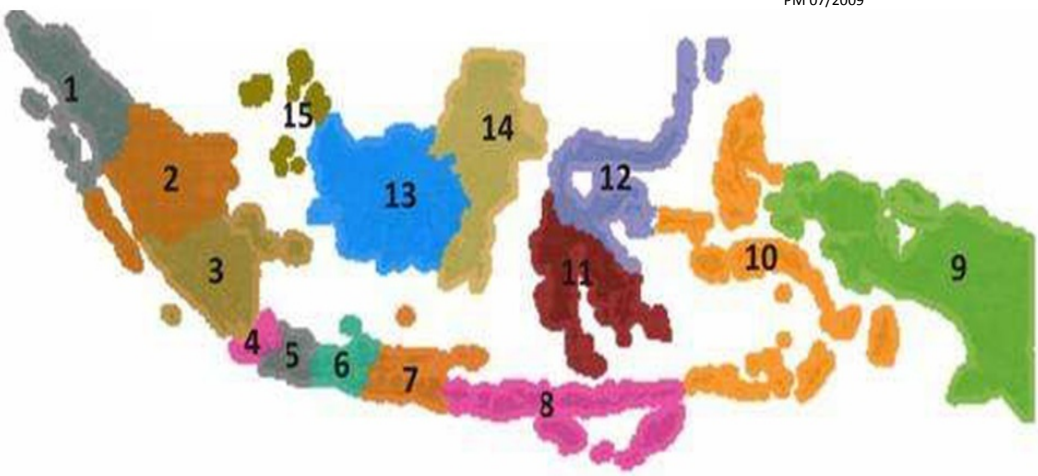
- Pada Frekuensi 2.3 GHz tidak memerlukan migrasi pelanggan existing
- Berbasis Packet Data Switch



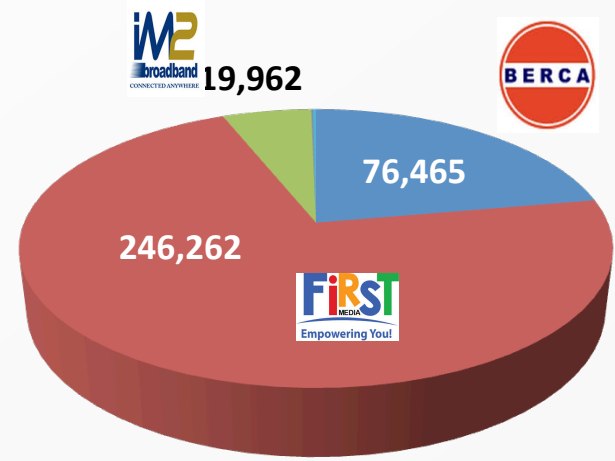


# Govt Support: Data Operator dengan Frekuensi 2.3GHz

PM 07/2009





## BHP Frekuensi BWA



- Berca
- First Media
- IM2
- TELKOM
- Jasnita

2300                      2330                      2360                      2375                      2390

	30 MHz	30 MHz	15 MHz	15 MHz
Zona 1	<b>kosong</b>			
Zona 2				
Zona 3				
Zona 4				
Zona 5				
Zona 6				
Zona 7				
Zona 8				
Zona 9				
Zona 10				
Zona 11				
Zona 12				
Zona 13				
Zona 14				
Zona 15				

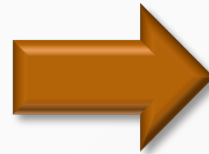
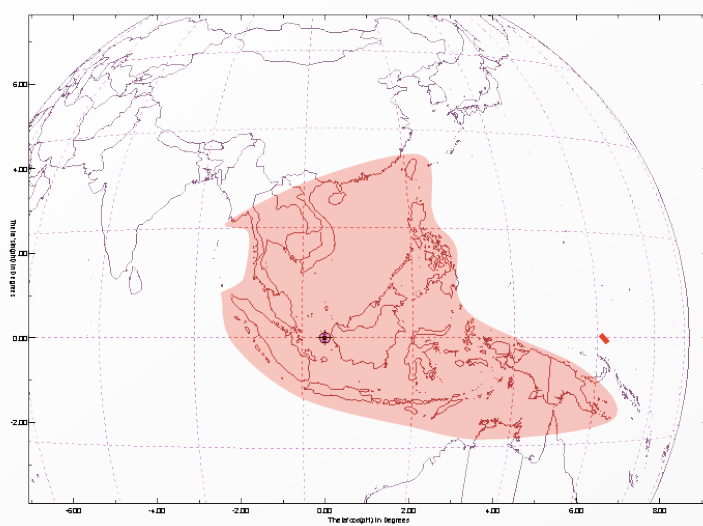
- 2360-2390 MHz: Terdapat 5 Pemain BWA berbasis Zona dg BW 15 MHz
- 2330-2360 MHz: Smartfren, **lisensi seluler nasional** dg BW 30 MHz dg BHP Pita 943M
- 2300-2330 MHz : Masih kosong

# Telkom's Satellite going Global

Replacement of Telkom-1 → Telkom-4 (with International Coverage Expansion)

**As Existing**

Indonesia & part of Southeast Asia



**International coverage expansion**

Indonesia and India/China/Korea

