



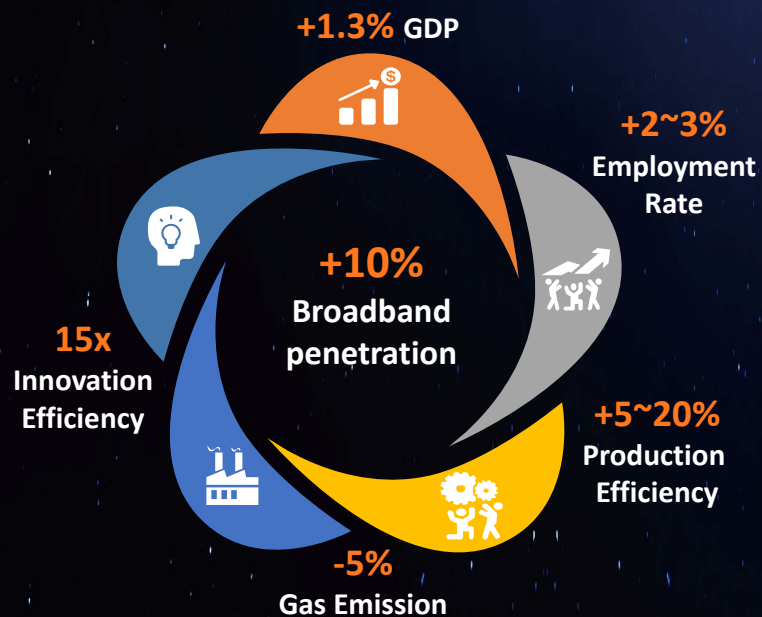
# **Industry Collaboration Enables Smart City**

*Broadband Industry Insight and Global Best Practices*

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# Broadband is bringing great socioeconomic benefits



**35%** of global economic output



**2.7-2.9** of benefit to cost ratio



**\$5** return for every \$1 investment



**+\$322** monthly income (OECD)

**+\$46** monthly income (BRICS)

Source: *Impacts of Broadband on the Economy*, ITU, 2012

# Broadband has become national competitiveness

## ITU Broadband Target 2020



**55%** HH Internet access  
**60%** Internet individuals  
**90%** BB coverage in rural  
**<5%** of average monthly income

## Korea: 1G Broadband by 2020



### Giga Korea 2020

**10Gbps** (SKT)

**1Gbps** (100%)

## USA Redefine Broadband to +25M



### Gigabit City (2015)

*"I believe America should lead the world in broadband penetration"*

**100Mbps** (developed)

**25Mbps** (universal)

## EU promote 100M by 2025



### Digital Agenda

#### DAE 2020

Fast BB @**30M** (100%)

Ultra BB @**50M** (50%)

#### DSM 2025

Ultra BB @**100M** (100%)

## UK: 500M Super Fast Broadband



### Digital Britain

*"Universal Broadband Access is crucial for Britain's economy"*

NGA1.0: FTTC @**40/80M**

NGA2.0: G.fast @**500M**

## China: 100M Fiber City



### China NBN 2020

**1Gbps** (developed cities)

**100Mbps** (all cities)

**20Mbps** (universal)

# Broadband empowers country's pillar industries



	3yr Global CAGR	New Zealand	Thailand	Chile
<b>Broadband Coverage</b>	109%	0.7 x	2.3 x	1.8 x
<b>Broadband Download Speed</b>	26%	1.7 x	1.4 x	1.1 x
<b>Broadband Affordability</b>	10%	4.0 x	3.6 x	2.2 x
<b>Tourism Revenue / GDP (2012-2015)</b>		10.53%	21.64%	12.87%

- **Network coverage** and **quality** are enablers to attract tourists
- Tourists share photo, video and travel experience on web **promoting local tourism**
- Heavily invested in broadband network will have great **benefit to national economy**



	3yr Global CAGR	Philippines	Global IT-BPO
<b>Int'l Internet Bandwidth</b>	18%	1.6 x	<b>\$22 billion</b> Contribution
<b>Broadband Download Speed</b>	26%	2.0 x	<b>1.2 million</b> knowledge-based jobs creation
<b>Cloud Investment</b>	19%	1.6 x	

- Broadband and cloud computing enable **economy transformation** from labor-intensive to knowledge-based economy
- The amount of **foreign revenue generated by BPO** will surpass annual remittances from overseas Filipinos workers by 2017

Note: BPO; Business Process Outsourcing

## 3 issues delay broadband construction



- **Hard to access ROW** : Myanmar Yangon City
- **Long approval period** : 8~12 months in Philippines
- **High ROW fee** : \$10K/km in India

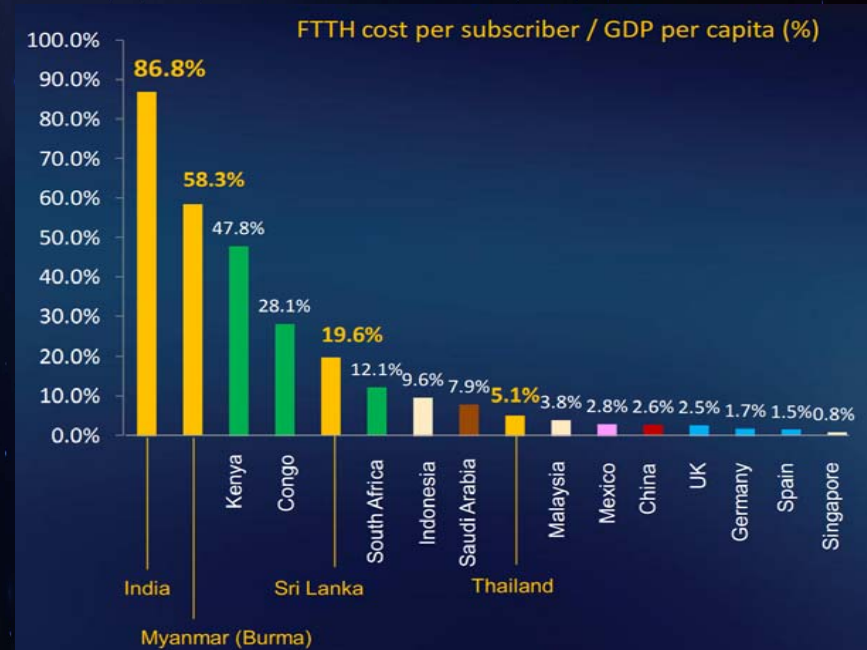
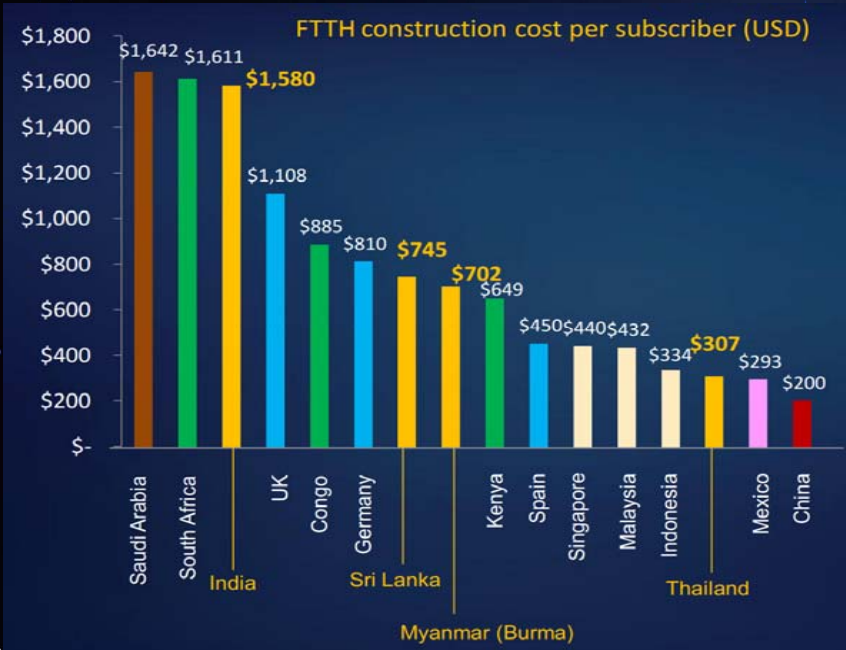


- **High civil work cost** : 55%~70% ODN cost
- **Duplicated construction & lack of collaboration** result in high cost and social inconvenience



- **Access network monopoly**
- **Exclusive deal** btw property owner and ISP
- **Low connection rate** : 6% success rate in Indonesia

# High construction cost is the major threshold



# Regulation policy could relief major cost issues

## Ease ROW Accessibility



- **Free public ROW** without authorization
- **Free private ROW** under conditions of no line, line expansion or existing line unable to joint use



- Operators are entitled to use public thoroughfares **free of charge**



- Public ROW open to operators **without usage fee**

- Streamline ROW application procedure and mandate approval time **< 60 days**



- Simplify ROW application process, shorten approval time from 90days to **2 weeks**

## Impose Infra. Sharing Obligation



- Govt. shall specify the common use of **utility infrastructure**
- Traffic works, electricity poles and transmission lines, water supply and drainage pipelines must be **designed and constructed** to ensure the installation of telecom transmission lines



- Municipality must provide operators **free access** to their infrastructures
- **Promote sharing & coordination** in upcoming civil works to minimize civil disruption



- Ofcom mandates **BT open existing poles and ducts** to all operators for new fiber network deployments

## Mandating Fiber from the Home



- All **developers must deploy FTTH** facilities in new constructed or refurbished houses, buildings and communities



- New and refurbished old buildings should equipped **at least 3 fibers** per home and share to operators to **avoid monopolization** of in-building infrastructure by 1<sup>st</sup> operator
- **2<sup>nd</sup>** operator has to pay **50%** of the costs incurred in the installation of shared infrastructure

- **3<sup>rd</sup>** operator pay **33%** of the costs



- Telefonica deploys **outdoor cables** and installs **pre-connector** enabling FAT plug & play and fast deployment

**Broadband development should be the  
social responsibility of all stakeholders...**



# Collaborated construction - **Inter-city fiber network**

## Fiber on Electric Tower



Nigeria Phase 3 Telecom hangs on **fiber on electric towers** to provide transmission network in 4 West African countries

Tower Leasing by  
Electricity Co.

## Fiber along with Road



Indonesia Government deploys thousand miles fiber and power lines in line with **new road construction** in eastern islands

Fiber Leasing by  
Road Agency

## Fiber along with Railway



Thailand MICT plans to deploy 2\*192 core fiber optical cables along slops of **Sino-Thailand Railway**

Fiber Leasing by  
Railway Co.

# Collaborated construction - City fiber network

## Duct Sharing



UAE Government mandates municipal waste water company sharing its 500km **underground conduits** for fiber deployment

Duct Leasing by Utilities

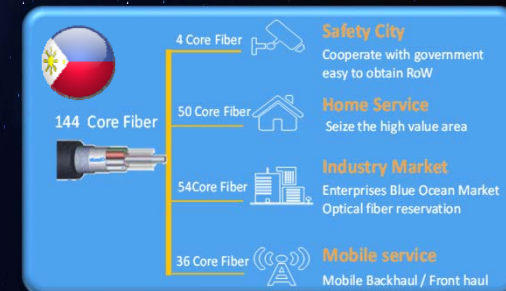
## Pole Sharing



**90%** fibers in Thailand are deployed on poles, saving **80%** cost, **40%** timeline and achieve **36%** broadband penetration

Pole Leasing by Electricity Co.

## Fiber Swap ROW



Philippine Government mandate operator granting **4 core fibers** for public use to swap **ROW permission and expenses**

Government got Free Fiber to Swap ROW

# Collaborate construction - In-building fiber network

## Partner with Utilities



Romania RDS saves **50%** fiber deployment cost and increases **12%** market share in 3 years by cooperating with utilities

Revenue Sharing with Utilities

## Digging own Trench



Altibox achieve **30%** cost saving and **68%** FTTH market share by encouraging residents digging trenches to save connection fee

Free Last Mile Access for Tariff Deduction

## Fiber Pre-deployment



Policy on fiber pre-deployment in new constructed building save **23%** ODN cost and enable fast FTTH deployment

Infrastructure Leasing by Property Developer

# Collaboration with PowerCo. achieves great benefits

## Transmission line along HV towers

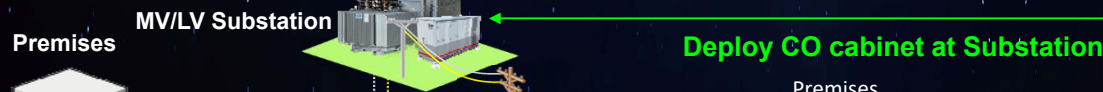
- Apply WDM technology can free dark fibre from existing fibre transmission network
- New build fibre can either enlarge bandwidth or pave the way to do Smart Grid



- ESB BO transmission and distribution networks above 38kv & DBM SIRO's FTTB
- SIRO own and operate FTTB network assets

## Built and Operated by ESB Telecom

- CO cabinet is isolated at substation for safety, and security control
- Cabinet can be deployed and reallocated easily



## Deploy CO cabinet at Substation

Using existing utility ducts can either save deployment costs, time and minimize social disruption

## Underground cabling along utility ducts

- ESB design to ensure specification and standards align with ESB agreed standards and regulation
- ESB personnel build and maintain FTTB networks

## ESB DBM FTTB Network

Using existing utility poles is the most efficient way to lay fiber and easy to maintain

## Aerial cabling along utility poles

## Benefit for SIRO/Vodafone

- **Right to use asset** including ESB's underground ROW, pole attachment, sub-station PoP, and power supply
- **Massive and fast deployment** FTTB for FTTH broadband service
- Cut the FTTB deployment cost down to €900 per premises, **30% cost saving**
- Vodafone as the anchor tenant with **TTM and cost advantages**

## Benefit for ESB

- SIRO pay ESB an **annual access-right fees** for the use of ESB's distribution network
- **Installation and maintenance fee** to ESB for FTTB network design, build and maintenance
- Income from SIRO's **operating profit**

# Lift broadband as key infrastructure of modern digital city

Shenzhen,  
China

## Gigaband City

- Government Strategy of Internetized CITY
- Joint strategy with telecom for broadband infrastructure
- Create fund to sponsor startup ICT companies
- Policy to attract ICT talents

Giga  
Home

Giga  
Campus

Giga  
Office

Giga  
Station

Giga  
Hotel

	Y2016	Y2017	Y2018	Y2019	Y 2020
No.FBB Subscribers	3.24M	3.34M	3.44M	3.54M	3.64M
with 100Mbps	1M	1.5M	1.8M	2M	2M
with 1Gbps	5K	100K	300K	600K	900K



# Recommendations for digital transformation of nation

## INFRASTRUCTURE AREA

- Continuously promote investment in digital infrastructure, especially the **expansion of household broadband network**
- **Cross-ministerial communication and collaboration** on cross-sector infrastructure sharing should be well functioned
- **Infrastructure sharing policy** should be in place and specify the common use of utility infrastructure
- Municipality must promote **collaboration in upcoming civil works** to ensure the installation of telecommunication transmission lines and minimize social inconvenience
- **Infrastructure database** should be set up, timely updates pipe position, capacity, path information for infrastructure search and join construction

## HOUSE-RELATED AREA

- All property developers must deploy and share fiber facilities in new constructed or refurbished houses and buildings to **avoid in-building infrastructure monopolization**

## INDUSTRY-RELATED AREA

- **Digitalize traditional industries and SMEs** by promoting broadband connectivity and cloud platform to improve productivity and efficiency

## PEOPLE-RELATED AREA

- **Digital trainings** in schools, universities and workplaces to improve digital literacy, labor up-skilling and job matching to ensure inclusive employment and reduce labor surplus

# Thank You.

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