

## National Broadband Network A Better Connected World

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### The Future

### To see the future, we first look at the past...





Source: Cisco VNI 2013-2018



### Connectivity and communications is key to survival in the Digital Economy era





9%

Source: WEF 2015

Tanzania: 2010



Only 2 criteria improved



### It is time to get Digital





## But number of challenges need to be tackled

#### "bandwidth has not reached a large part of the country especially in **rural areas**"



*"Last mile* connectivity is a challenges, poor FBB penetration

*"lack of digital content and applications that have local relevance is a major hindrance to broadband up take"* 



#### **NBN 2020**

#### **A Better Connected Nation for All Citizens**



#### Set Up Regulation

#### Competition

Govt. Lead



Policy Funding Te

g Technology

### **Broadband Redefinition**



ensure timely broadband definition so as to facilitate national ICT transformation and service innovation

Govt. Lead

#### Govt. Lead Stimulus measures to enhance broadband utilization **Internet Penetration Rate Start with low hanging fruits**





### **Cost Reduction** Releasing rights of way, promotes broadband deployment



#### 1<sup>st</sup> in FBB penetration

Holland

2007, legislation was updated:

- municipalities must provide access of their infrastructure to operators for free.
- Concerned municipality must promote • sharing and co-ordinate upcoming civil works in order to minimize civil disruption.
- Works on private land requires formal notice 4 weeks in advance, if no dispute within 6 weeks, work is permitted implicitly.
- compensation for access for No private and public land, but operators are obliged to ensure bringing back to its original condition

### **Cost Reduction** Infrastructure Sharing to reduce CAPEX investment on broadband construction

**Backbone layer construction synergy** 

#### Power transmission network, oil pipeline, super highway and railway slopes





Nordic governments made policy to facilitate cooperation between Telco and utility companies



Phase 3 Telecom cooperate with power company and deploy fiber optic cable along high voltage power lines

Many governments ask utility company open slopes or deploy ducts or optical cables for Telcos

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Aggregation layer construction synergy

Power line, gas pipe, water ducting, sidewalk and municipal construction











200+ municipal governments in Nordic region have deployed fiber optical cables for leasing or self operation,

UAE government asked municipality water supply company to share its underground water conduit to ET

Haya Water deploy fiber optic network along its sewage duct and wholesale to operators

Access layer construction synergy

Funding

New building/house must deploy optical cable and share to Telco/Tower sharing





China Government set up a TowerCo to manage all tower sources

Government amended Construction Law in which new housing should deploy optical fiber & share to all Telco



Tower merge and acquisition are accelerating in Africa. TowerCo, e.g., IHS, HTA, Eaton have own 47% (85,000) towers by 2015



### Cost Reduction Reusing existing copper, achieves investment efficiency



**Green Field & Business Area** 

#### **Reusing existing copper achieves investment efficiency**





#### **Brown Field**

 $56k \rightarrow ADSL (20Mbps) \rightarrow VDSL (50Mbps) \rightarrow Vectoring (100Mbps) \rightarrow g.fast (1Gbps)$ 

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#### PPP model, a better investment model for NBN



- Government invested RM2.4 Billion
- Reusing TM infrastructure 43% investment saved
- 1.4 million households were connected in 2 years
- Internet Penetration rate climbed to 67.1%
- GDP grew 64% in 2014 compare to 2009
- TM invested RM8.9 Billion
- Cash flow optimized, Take up rate was benefited from government's policies
- 2009 to 2014, broadband revenue increased 30.5%

#### **Revenue Sharing : TM to Government**

2014 to 2017 RM50 million per year starting
 2018 to 2025 based on the TM's subscription



### Fund & Financing Supporting broadband development with **USF/Government-backed loan**

Funding is the prominent factor

affecting

development

broadband



ERDF, EAFRD fund (7 billion Euros) for member state's broadband network infrastructure construction.



Levy 50 pence/month from subscribers. Million 170 pounds for per vear broadband development.



National Information fund, 780 million (1993-2002) for broadband development.



Universal Service Fund, provides 400 Million USD for NOFN project for rural population.

Establishing universal service broadband fund makes sustainable

Cameroon government mandates **Camtel** to build national broadband network.

Funding

Technology

Policv

Government provides sovereign guarantee to help Camtel acquire preferential loan (xxx Million USD) from China.

- Sufficient funding support for wide range network deployment including sub marine cable, fixed and wireless broadband network
- Phase 1 is being delivered, phase 2 has been launched, Cameroon will be constructed as a shinning start at West Africa.



### Technologi Hybrid access technologies realize universal coverage

#### FTTX

- Preferred choice in dense urban and urban areas
- Huge bandwidth, no limitations on service realization

60-80%

5-10%

• High CAPEX, low OPEX

#### LTE/4G

- Secondary option where fiber is cost prohibitive, as complementation in rural area
- Limited scope for high bandwidth services
- Low CAPEX, medium OPEX

**20-30%** 60-80%

#### Satellite

- Last resort to achieve digital inclusion in low dense rural area
- Basic Internet only
- Medium CAPEX, high OPEX



0-5%

#### 10-20%

**Population** 

Coverage

Geography

Coverage



Policy Technology Funding

#### Technology Selection **Decide technology upon Geographical population** distribution and bandwidth demand

Low density Rural	✓ Satellite
Rural	✓ Wireless technologies at low frequency bands (eg HSPA_ITE_EVDO)
Sub Urban	✓ FTTC + DSL
Urban	✓ FBB - FTTx/DSL ✓ MBB - 4G LTE
Dense Urban	High Speed WiFi
	100M ~ 20M ~ 20M ~ 4M ~ 1M

LTE for fixed access is ideal solution for bandwidth requirement less than 5Mbps



### This is the future...





### **6 KSFs to Promote NBN Development**





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# Thank You