Investment-Friendly Regulation & Policies

CANTO 33rd Annual Conference

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Age of Information+ Evolution to Digital Society

To catch up with the information+ evolution challenges → decide on national strategic positioning and competitiveness
Digital Society: **Power to Shape the Future** for all citizens

### Economy Growth
- Efficient business
- Magnet for business
- Creating new jobs
- Opportunities for start-ups

### Public Safety
- Surveillance network platforms for transport, police, etc...
- High-definition CCTV
- Video conferencing

### Convenient Service
- E-gov, e-edu, e-health...
- Transforming the ways citizens access and pay for services
- Lowering operating costs

### Quality Life
- Faster and better network
- UHD video and entertainment
- Support a revolutionary new era of home-based services

### Green Environment
- Less energy consumption
- Reduce GHG emission
- Less paper consumption

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**The City Hefei, China**
- Merged **three** CCTV networks onto **one pure fiber network** enabling **HD video capture**
- Crime Rate **30% ↓**
- Case Closing Rate **65% → 95+%**

**The average cost of one interaction between public administration citizens is:**
- **£8.62 for face to face**, **£2.83 over the phone**, **15 pence when use website (99%+ Saving)**

**Google Fiber, just in 10 days got more than 8700 gigabit service subscriptions in Kansas.**
- **1 Million BB subscribers upgrade to 4K subscribers one year in Sichuan, China**

**The use of broadband can reduce 75% Green House Gas emission**
- Has the potential to **save up to 7.8 gigatons of CO2 emission in 2020**
  (Source: Broadband Commission)
Digital Society: **Gigaband infrastructure is the key**

### Digital Society

*A Better Connected World, A Better Connected Life*

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**Gigaband: Building A Better Connected World**
Investment-Friendly Regulation & Policy @Gigaband

Redefine Broadband
- From 25Mbps to Gigaband

Encourage Investment
- Deregulation
- Grant new license
- Infrastructure synergy
- Fiber-to-the-Home

Subsidies for Digital Divide
- Subsidies/USO fund for rural and remote area

Create Reference & Competition
- Demo cities
- Monitoring and ranking

Promote Digital Innovation
- 4K & Home IoT
- Industry digitalization (eGov, eEdu, eHealth…)

Gigaband
Redefine Broadband Benchmark and Targets
Redefine Broadband Benchmark From 25Mbps

4 Mb/s is yesterday's broadband

Tom Wheeler, ex FCC Chairman

Online video grows rapidly with CAGR 25.5%

Over 60% of U.S. population watch online video content.
Setting **New Targets** for Gigaband

Infonetics: **40%** of the respondents plan to offer 1-Gbps broadband by 2017
Greenfield Development with Latest Innovations

Deploy fiber and latest solutions for ultra-broadband (No legacy burden)

Utilize latest tools and methods for rapid deployment

- 1Gbps
- 100Mbps
- 10G PON
- 40G TWPON
- 100G TWPON
- 10G Wifi
- 802.11n
- 802.11ac
- ADSL2+
- DOCSIS3.0
- DOCSIS3.1
- G.fast
- GPON
- 5GBB
- 10G PON
- 100G PON
- 40G TWPON
- 100Mbps
- 1G
- 10M
- 100M
- 802.11n
- Vectoring
- SuperVectoring
- Traditional Digging
  - 10m/day
- Micro Trencher
  - 500m/day
ITU recommends 300 MHz spectrum per operator by 2020

Source: Rep. ITU-R M.2078
Encourage Investments in Broadband Infrastructure
Shifting Regulations/Deregulation to Encourage Investment

Open Access: Unbundled Local Loop

- **DSL:** 384K~8Mbps
- **FTTx:** 30Mbps+

Regulatory exemptions for well served areas

Use of existing passive infrastructure became a key success factor

- **Poland:** Open access in 76 municipalities
- **Spain:** 5 Provinces in 2014, ready for countrywide coverage from 2015

Deregulating FTTx Deployment
Egypt: Granting a New Fixed License to Stimulate Investment

Before 2014

Stagnant market

No investment in 5 years

2014. 09

Grant new fixed license

Invest 200 million $ in FBB with 4 million ports newly added

Users without broadband or even telephones got connected!
Infrastructure Synergy: Save Cost and Improve Efficiency

**Croatia**
- Motorway
- Electricity
- Natural gas
- Road

- **30 Years Contract**
- **~8000KM Fiber Network**

**Abu Dhabi**
- Motorway
- Electricity
- Natural gas
- Waste water

- **500KM Fiber** inside **waste water network**

- **101** Total
- **69** Deployment
- **26** Materials
- **2** Splicing

- Cost saving with existing poles: **20~40%**

Source: FCC
Fiber-to-the-Home to facilitate in-building access

**China**

"Last mile of fiber deployment must be completed before the sale of new residential buildings."

----- Ministry of Housing, China

23% ODN CAPEX saved; 80 million FTTH HP @ 2015

**USA**

The City building code requires all new commercial and residential developments (or re-models involving greater than 50% of the structure) to equip the new structures with a fiber-optics interface and copper cabling throughout.

Lower Cost Construction Community-wide FTTH network (LLCCP)
Power Company for FTTH Deployment 1: Co-construction

Poland

Cost-share
14% ODN CAPEX Saved
12 Months TTM Ahead

Kenya

Benefit-share
50% Cost Saving
12000 home Coverage

Ireland

Joint-venture
450M Eur
100% FTTH Cover
Power Company for FTTH Deployment 2: Wholesale

30-40% cheaper with power infrastructure
2.5 Billion € for national fiber network
("Open Fiber - OF")
Wholesale accessible for all operators

NBN plan:
cover 85% population
12 Billion € investment

OF is breaking the traditional incumbent vs alternative operator’s competition paradigm, helping to leapfrog the Italian UFBB market
Germany: More Spectrum and Obligations for Improved MBB Coverage

From Single to Multi Bands Auction

From Many to Top Quality Player

From Loose to Tight Obligation

2000

1 Band
2100Mhz

7 Eligible Bidders
Over Competition - Too high price - slow 3G development

Obligation Free

2010

3 Bands
800/1800/2600Mhz

4 Eligible Bidders
Raise price floor to reduce bidder

3 Bands

2015

4 Bands
700/900/1500/1800Mhz

3 Eligible Bidders
Only top 3, not reserve for new player

4 Bands

Over Competition - Too high price - slow 3G development

Eligible Bidders

Free

800Mhz winner: Start from villages <5k citizen, 90% villages in 6 years, min. 1Mbps MBB exp

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700Mhz winner: 98% nationwide household, 100% highway & railroad in 3 years, min. 10Mbps MBB exp

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Unleashing Site Potential to Provide Better Service

Open Municipal Resources to Speed Up Network Rollout and Develop a Public ICT Ecosystem

- Batch application to get government owned site approval more efficiently
- Shortened site approval procedure

Free Site location
Government
High Quality Network
Operator

- Street light poles
- Camera network for a safer city
- Improved network quality for General Public
- Develop public ICT ecosystem

- Better Coverage
- Better Service
- More Revenues

Reference Case: Personal Argentina

Road
Park
Garage
Subsidies to Bridge The Digital Divide
Different Strategies for Urban and Rural Areas

2/3 of population in dense area

- **Next Gen Access (NGA)**
  - Profitable
  - BT invested £2.5B
  - Sharable via Bitstream

1/3 of population in rural area

- **Broadband Delivery UK (BDUK)**
  - Non-Profitable
  - 2Mbps+ Universal Service
  - Gov. Subsidies (1:1:2)

NGA 2.0

- Hybrid Bonding
  - 500Mbps
  - LTE+Fttx (100Mbps)
Universal Service Obligation Fund for Rural/Remote Areas

- Provides $77 million low-interest loans to KT for rural broadband
- Provides interest-free loans and subsidies 1/3 deployment cost in rural areas
- Invests $9 bn subsidies for rural areas in 5 years, priority subsidies AT&T and Verizon
Create Reference & Stimulate Competition
Setup Broadband **Demo Cities** for Reference and Competition

Suzhou: The First China Demo City (All Fiber Giga City):

- **FTTH Coverage**: 100%
- **All Subscriber**: 1G Ready
- **Avg. Speed**: 50M
- **FBB**: 3Million
- **House Penetration**: 60%+
- **iTV**: 800K

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**Improve City Competitiveness**
- Smart city enabler

**Win City Reputation**
- Top/leading city in China

**Well Realized NBN**
- 78 demo cities so far
Monitoring and Ranking Broadband Development Status

**FCC: Broadband Speed Report**
- Ranking by upload speed, download speed, webpage loading speed, etc.
- Third party monitoring system
- Volunteers application
- Test hardware
- Test Software
- Test Analysis Tool

**FCC: Broadband Progress Map**
- Broadband Development Map (by Region) [URL]
- Connect America Fund – Accepted Areas Map [URL]

Open and transparent fund application and usage
- Indicate fund applicant area and broadband progress,
- supervise by society
- consumer can comment, discuss and complaint online
Promote Digital Service Innovation and Consumption
4K & VR Innovation Improve Quality of Life and Experience

4K / VR as a New Growth Engine

- The industry trend of SD->HD->FHD->UHD/4K (200+ 4K Movie, 1 Million 4K subscribers/one year, Sichuan China)
- Accelerate prevalence of FHD video, bandwidth 50M
- Have Immersive experience while most people view at home

Explore Virtual Reality Services

- Virtual Reality applications: Entertainment Practice performing surgery, Manufacturing
- VR bandwidth 1G
- Annual Growth in 2016 10X↑
Digitalize Industries Towards a Smart City/Nation Model

Pervasive Connectivity

- 95%+ of homes and businesses connected with the Next Generation NBN
- 85% of households have access to broadband
- All newly built homes will be fibre-ready
- Free Wi-Fi with access speed of up to 2Mbps
- In-building mobile coverage to be enhanced to more than 85%
- 86% of resident households have a computer; 97% of households with school-going children own a computer

Digital-enabled Industries

- eGov: 98% public services are available online, over 400 government e-services
- Healthcare: 36 healthcare centers have deployed Telehealth which enables remotely monitor chronic disease patients
- Education: All schools implement Infocomm Competency Training, 50 applications rolled out from Futureschools programme
- SMEs: iSPRINT has helped 5,000+ SMEs use infocomm solutions in their business
- Finance: Launch of nationwide NFC payment, accepted at over 30,000 payment points

Source: Infocom Development Authority of Singapore
Government Services on Cloud
G-cloud improve the governmental public service efficiency

Simplify Administration
- Government OA
- Mobile Government
- Land Management

Benefiting Livelihoods
- Government Service Websites
- Government Service Centers
- Information Sharing

Promoting Industries
- Public Resource Transactions
- Macroeconomic Operations

Intensification @ 2014
National Development and Reform Commission
Organize national cloud strategy planning

Data Sharing @ 2015
China State Council No.5 Doc
Government invest on Cloud Services

Innovation @ 2016
China State Council No. 2 Doc
Internet + public service to benefits the livelihood

Chinese Telco operators win 46% @ government cloud market share in 257+ G-cloud
Next Action Points

1. National ICT plan, implementation structure and updates
2. Demo Giga City and provide broadband availability map
3. Promotion of UHD Video (4K) local content and services
4. Fiber-to-the-Home promotion
Thank you