

Investment-Friendly Regulation & Policies

CANTO 33rd Annual Conference

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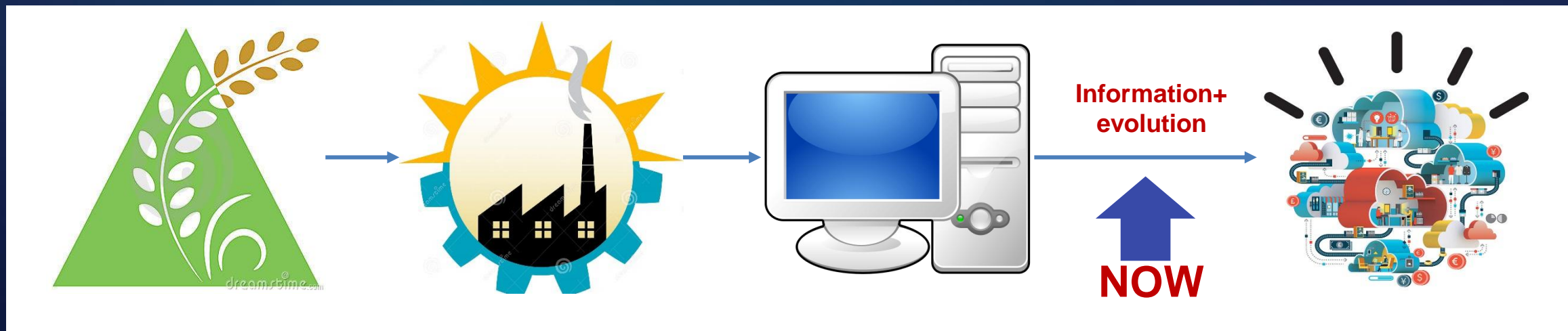
Age of Information+ Evolution to **Digital Society**

Agricultural Society

Industrial Society

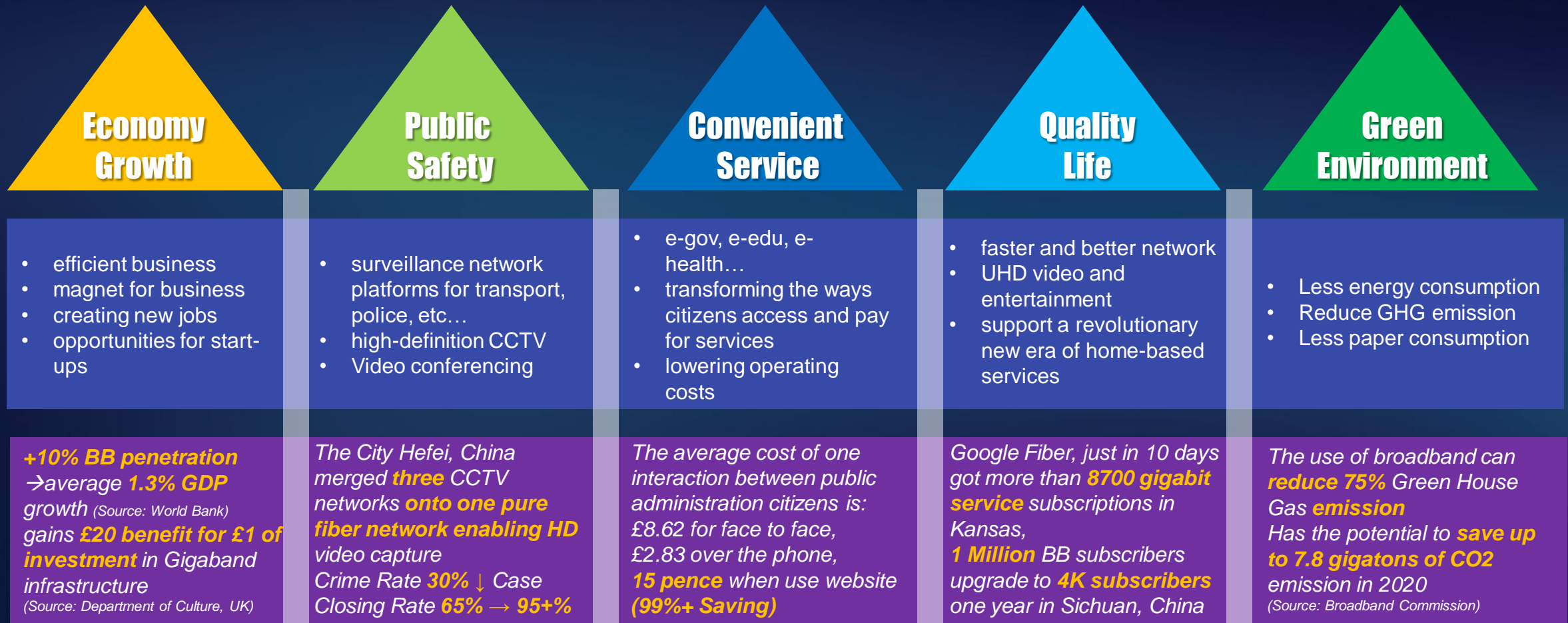
Information Society

Digital Society

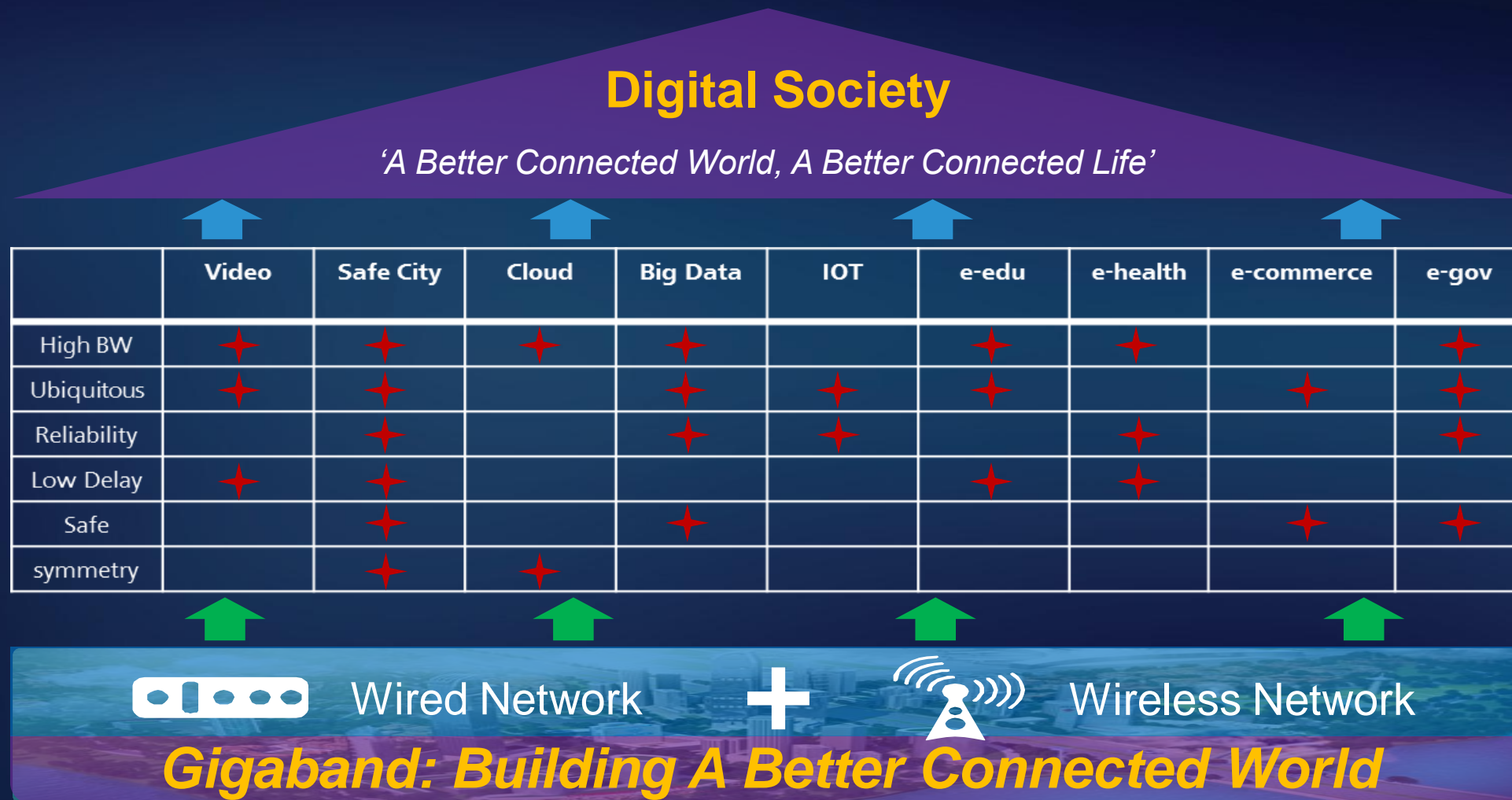


To catch up with the information+ evolution challenges
→ decide on national strategic positioning and competitiveness

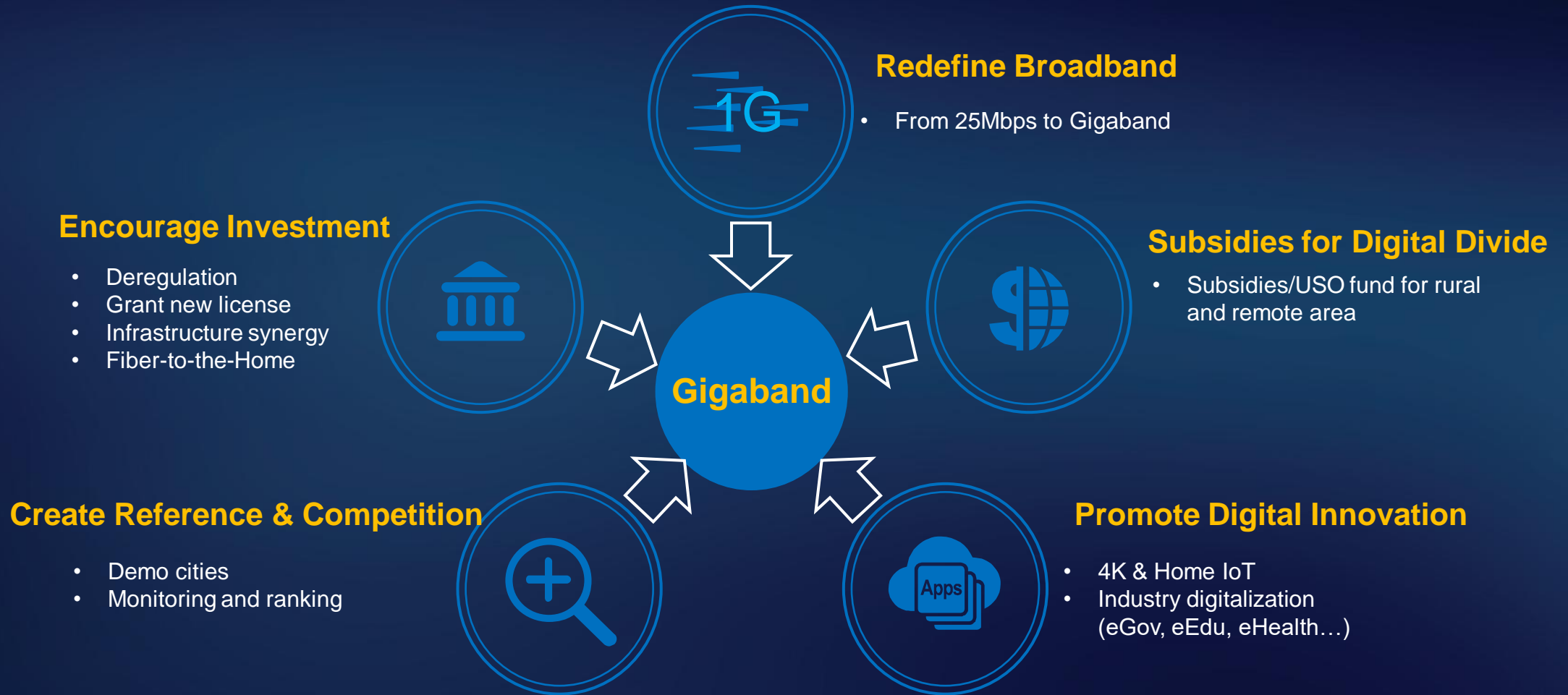
Digital Society: Power to Shape the Future for all citizens



Digital Society: Gigaband infrastructure is the key



Investment-Friendly Regulation & Policy @Gigaband

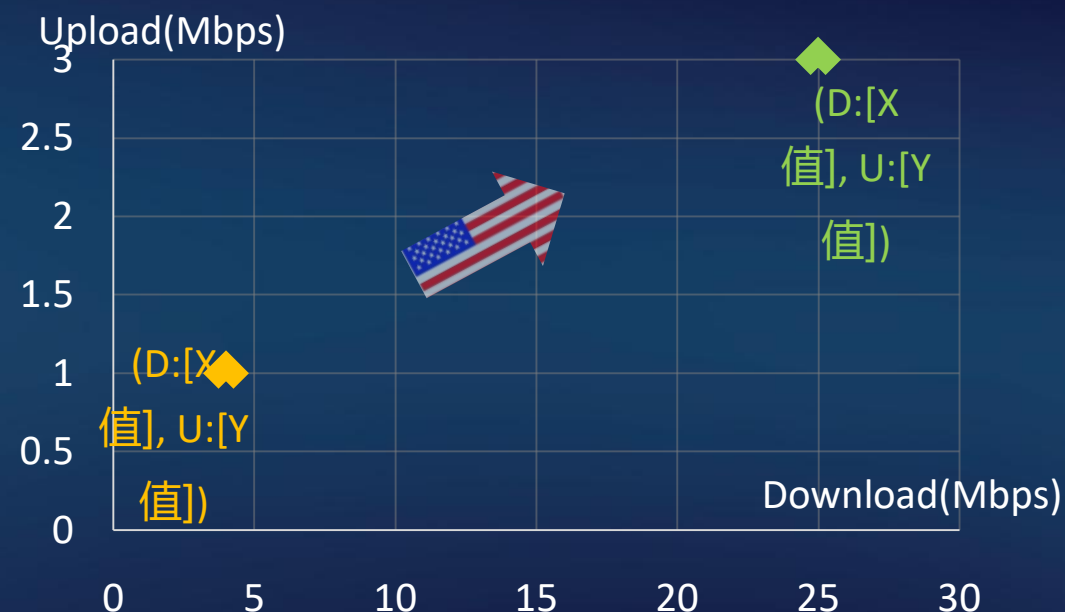


Redefine Broadband Benchmark and Targets

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



Giga Korea (2020)

10Gbps (SKT)

1Gbps (100%)



Gigabit City (2015)

1Gbps (in all 50 states)

25Mbps (threshold)



China NBN (2020)

1Gbps (developed city)

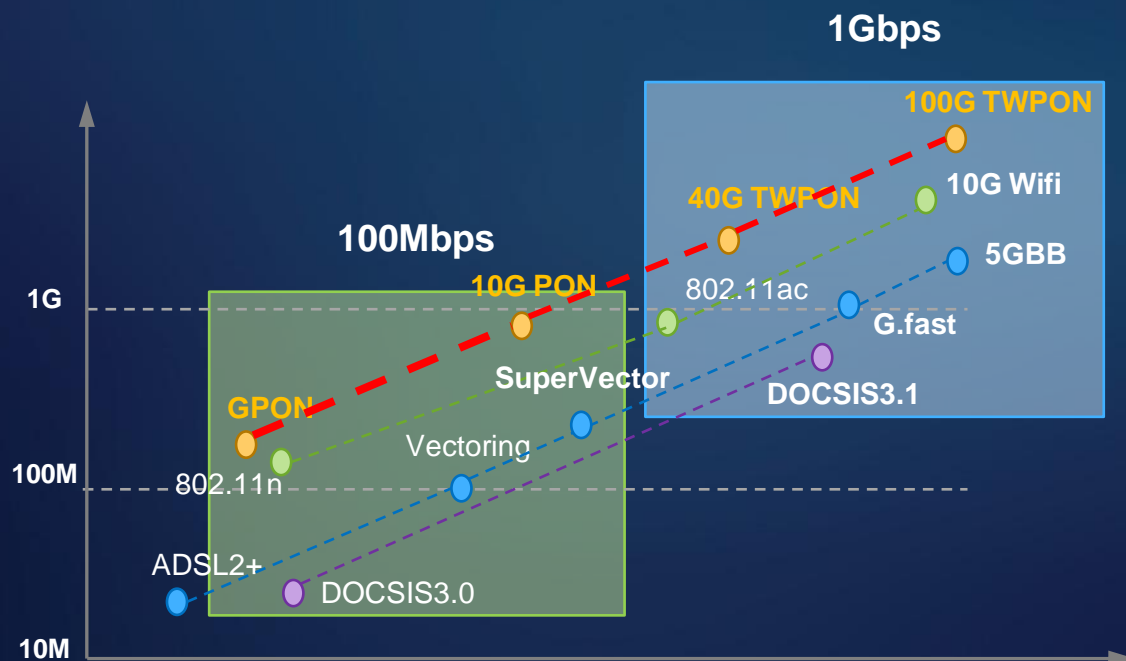
50Mbps (common city)

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



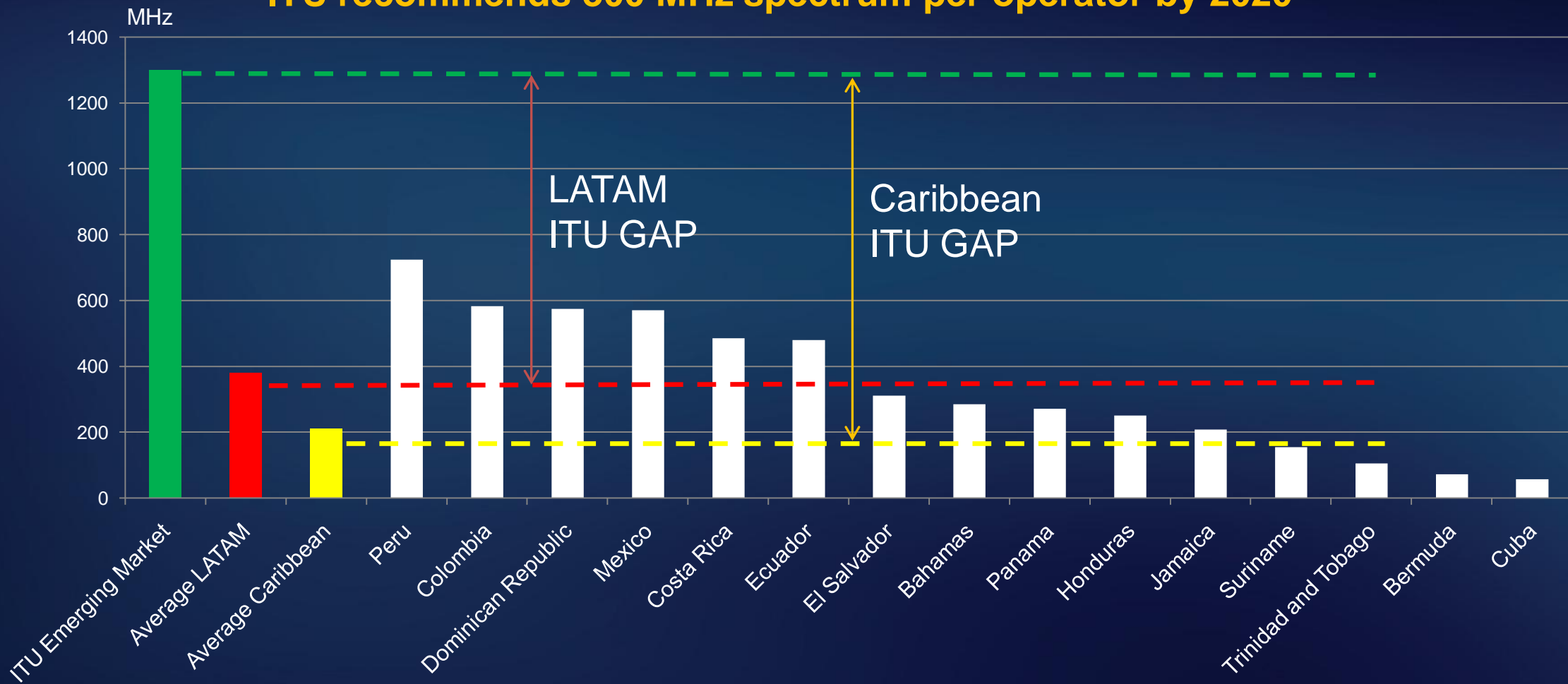
Traditional Digging
10m/day



Micro Trencher
500m/day

Redefine Spectrum Benchmark: 300MHz/Operator

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



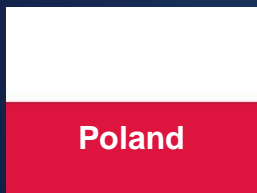
DSL: 384K~8Mbps



FTTx: 30Mbps+

Open Access: Unbundled Local Loop

**Regulatory exemptions
for well served areas**



Open access
In 76 municipalities



5 Provinces in 2014
Ready for countrywide
coverage from 2015

Deregulating

FTTH Deployment

Use of existing passive infrastructure became a key success factor

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

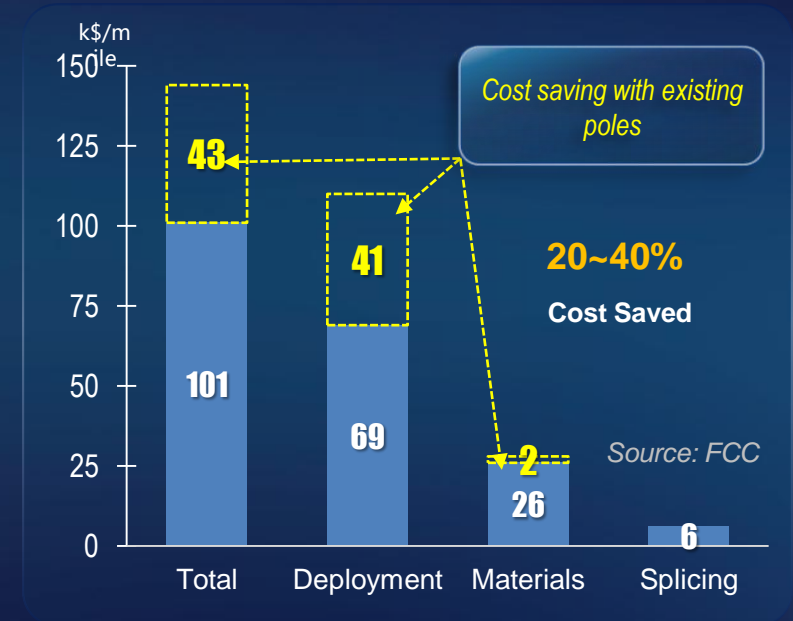


30 Years Contract
~8000KM Fiber Network

Abu Dhabi



500KM fiber
inside **waste water** network



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



Italy



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



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



- 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

Market Driven



Next Gen Access (NGA)

- Profitable
- BT invested £2.5B
- Sharable via Bitstream



NGA 2.0

- 500Mbps

1/3 of population in rural area

Subsidy Driven



Broadband Delivery UK (BDUK)

- Non-Profitable
- 2Mbps+ Universal Service
- Gov. Subsidies (1:1:2)



Hybrid Bonding

- 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



Improve City Competitiveness

- Smart city enabler



Win City Reputation

- Top/leading city in China

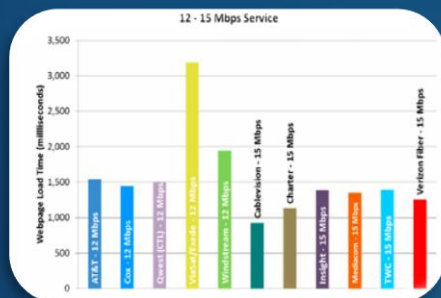


Well Realized NBN

- 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

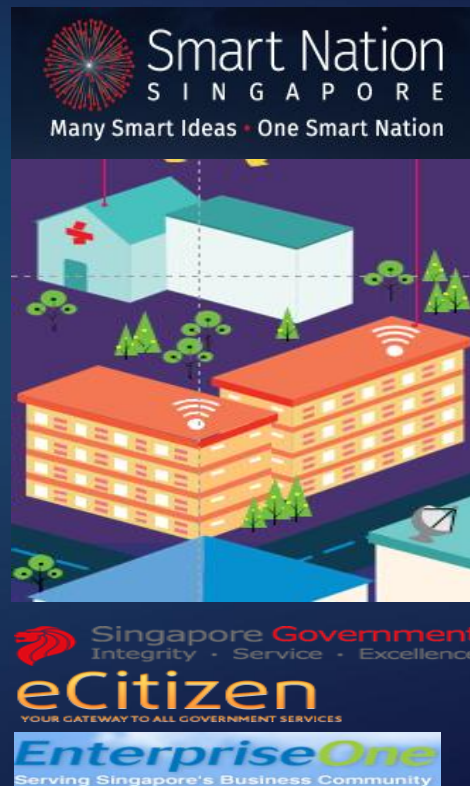
- All newly built homes will be **fibre-ready**
- **Free Wi-Fi** with access speed of up to 2Mbps



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

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