

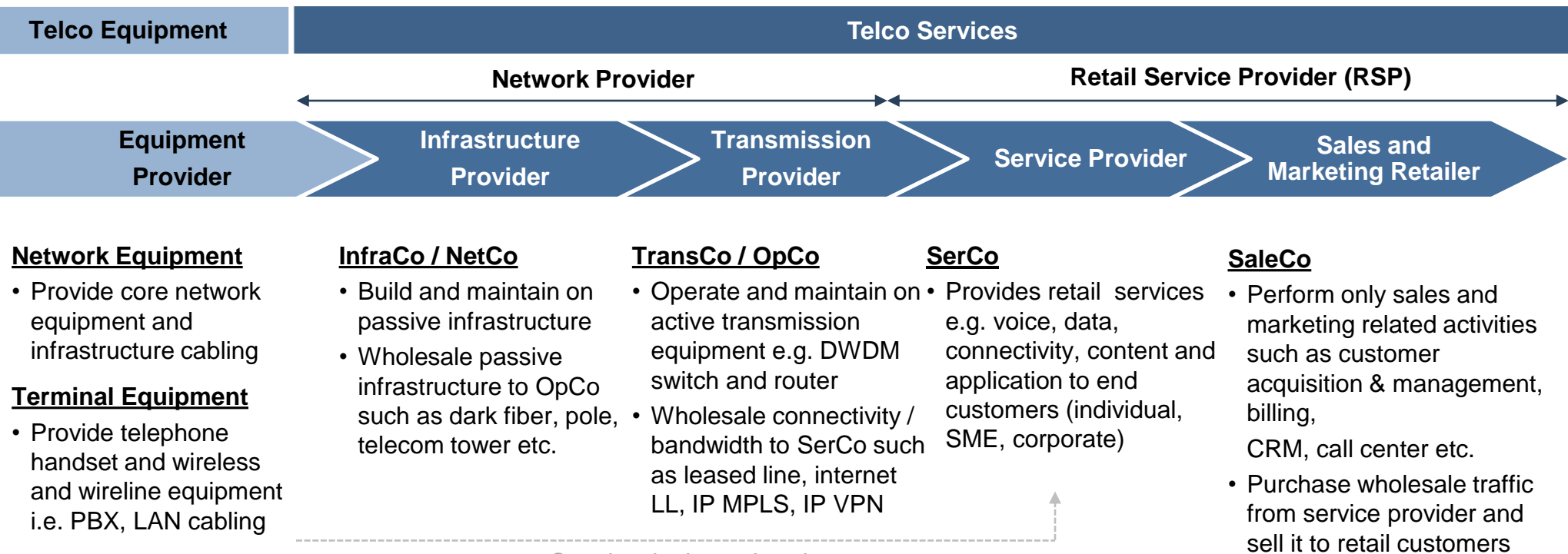
- **Overview of Thailand Telecom market**

- Mobile market
- Data communication
- International phone service
- Broadband market
- ICT service
- Fixed line

Thailand Telecom:

The value chain of a telecom sector can be mainly classified as Telecom equipment and service

Telecom Industry Value Chain



- Network Equipment**

 - Provide core network equipment and infrastructure cabling
- Terminal Equipment**

 - Provide telephone handset and wireless and wireline equipment i.e. PBX, LAN cabling
- InfraCo / NetCo**

 - Build and maintain on passive infrastructure
 - Wholesale passive infrastructure to OpCo such as dark fiber, pole, telecom tower etc.
- TransCo / OpCo**

 - Operate and maintain on active transmission equipment e.g. DWDM switch and router
 - Wholesale connectivity / bandwidth to SerCo such as leased line, internet LL, IP MPLS, IP VPN
- SerCo**

 - Provides retail services e.g. voice, data, connectivity, content and application to end customers (individual, SME, corporate)
- SaleCo**

 - Perform only sales and marketing related activities such as customer acquisition & management, billing, CRM, call center etc.
 - Purchase wholesale traffic from service provider and sell it to retail customers

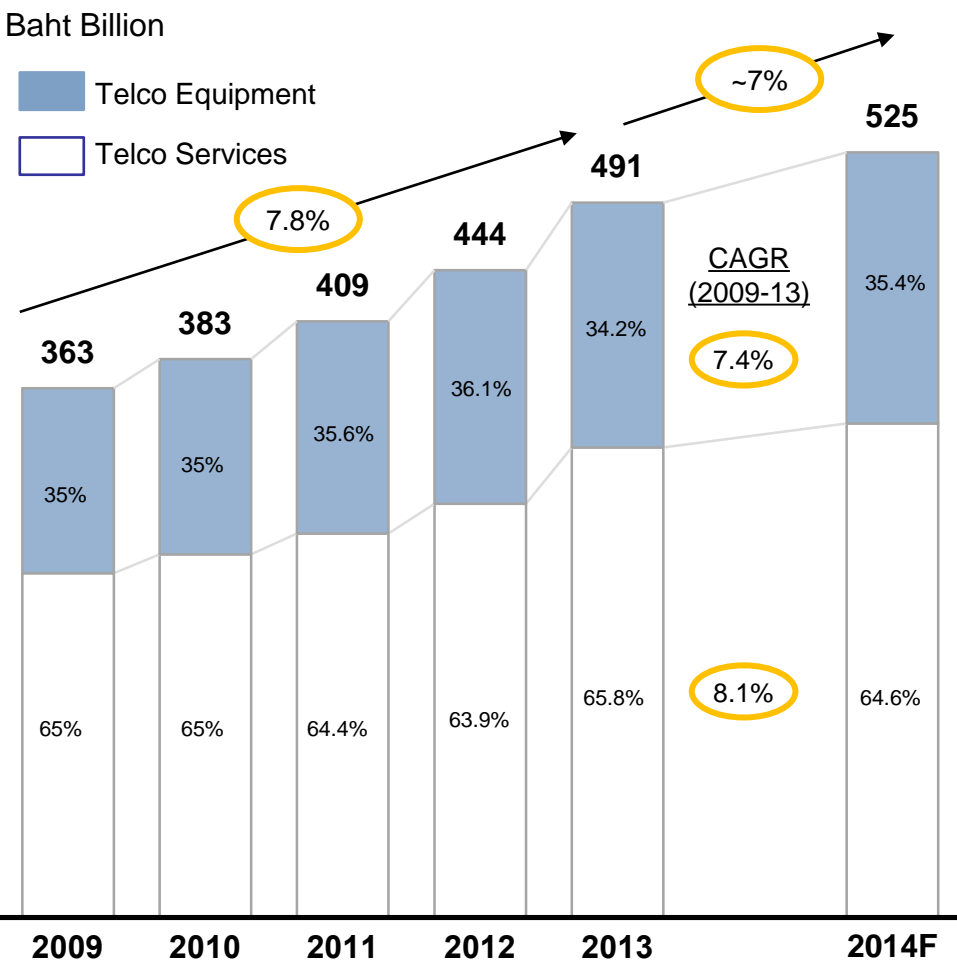
Key providers^{1/}

Supply telephone handset

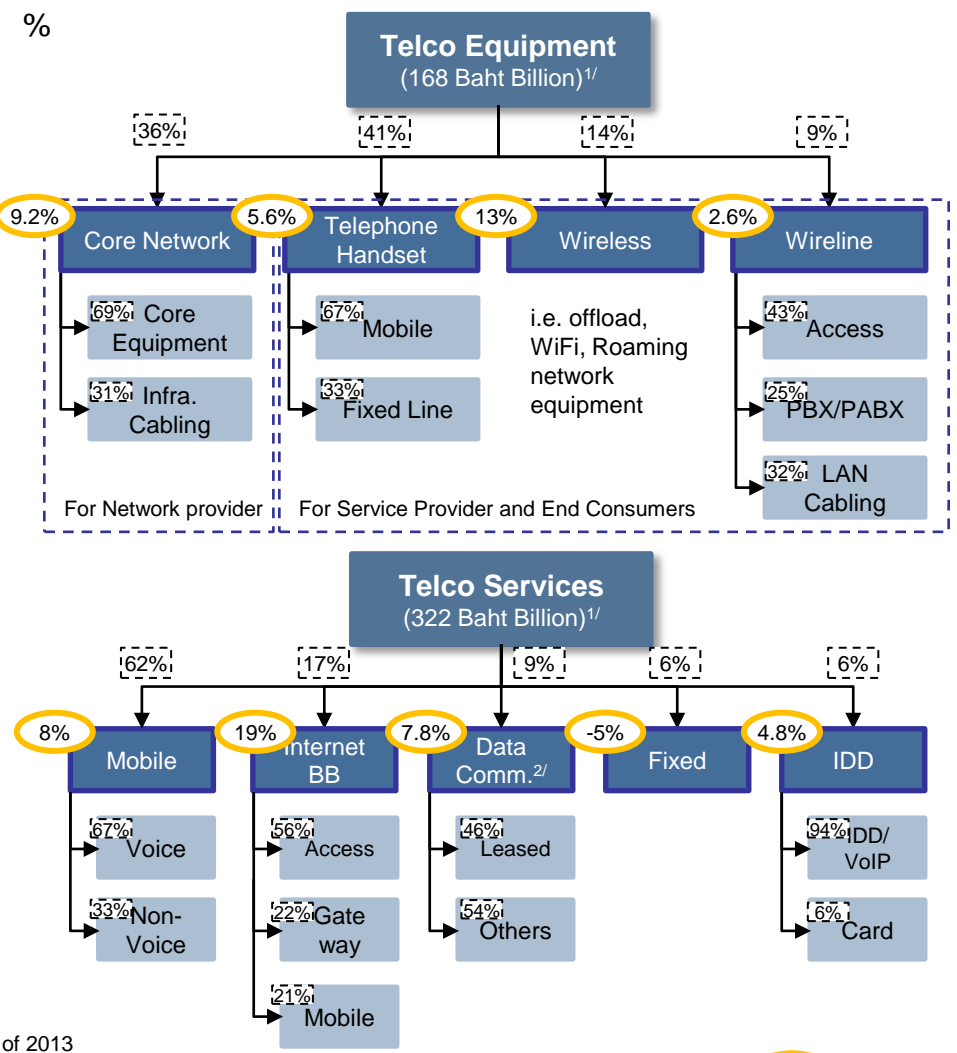
Thailand Telecom:

Total market size is likely to reach 0.5 trillion this year, mainly driven by handset, core network equipment and mobile & internet services revenue

Thailand Telco market value development (09-2014F)



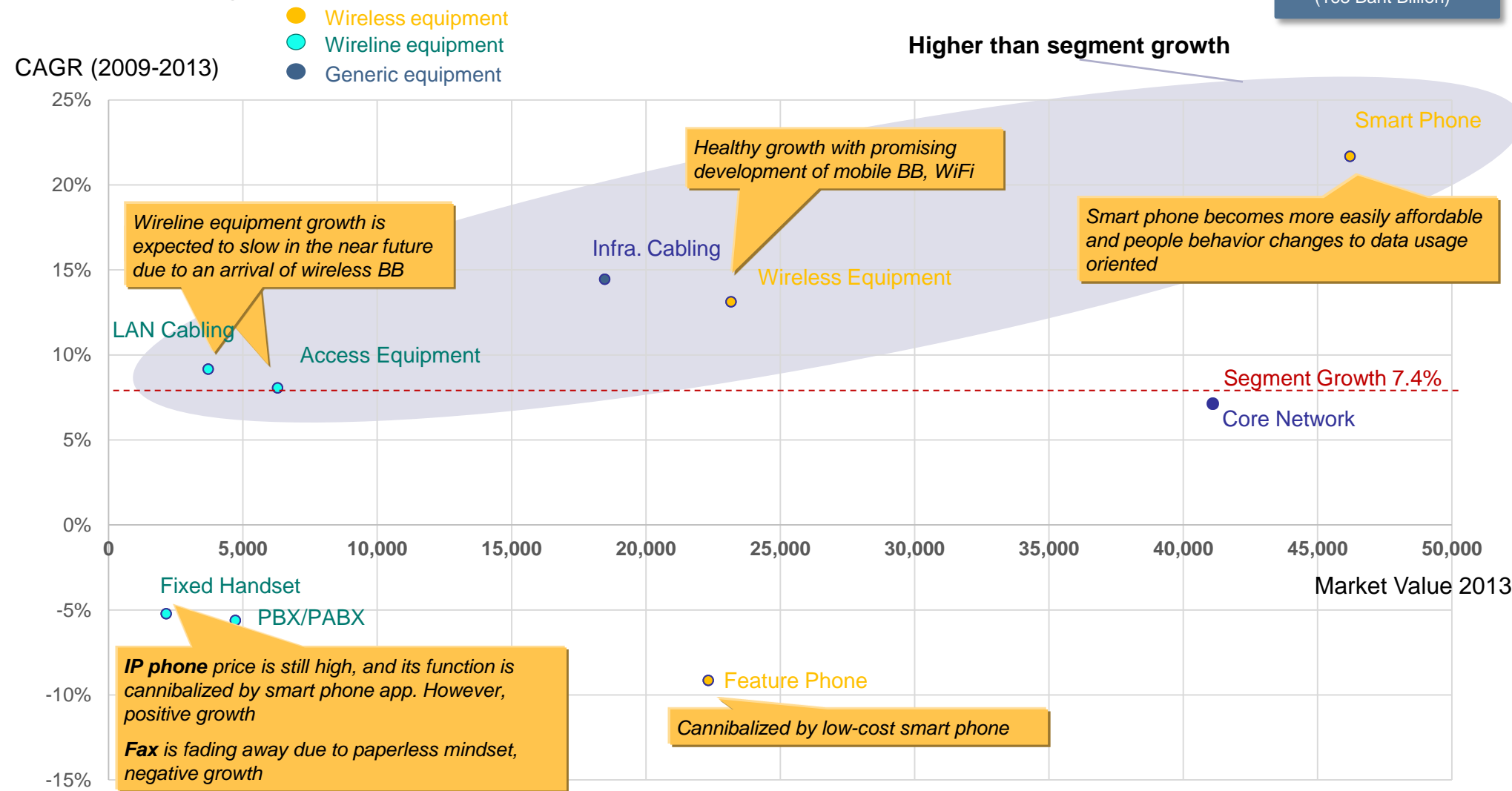
Market revenue cascaded by sub sectors



Thailand Telecom:

Wireless equipment has grown at faster pace, while those of wireline are set to be stagnant

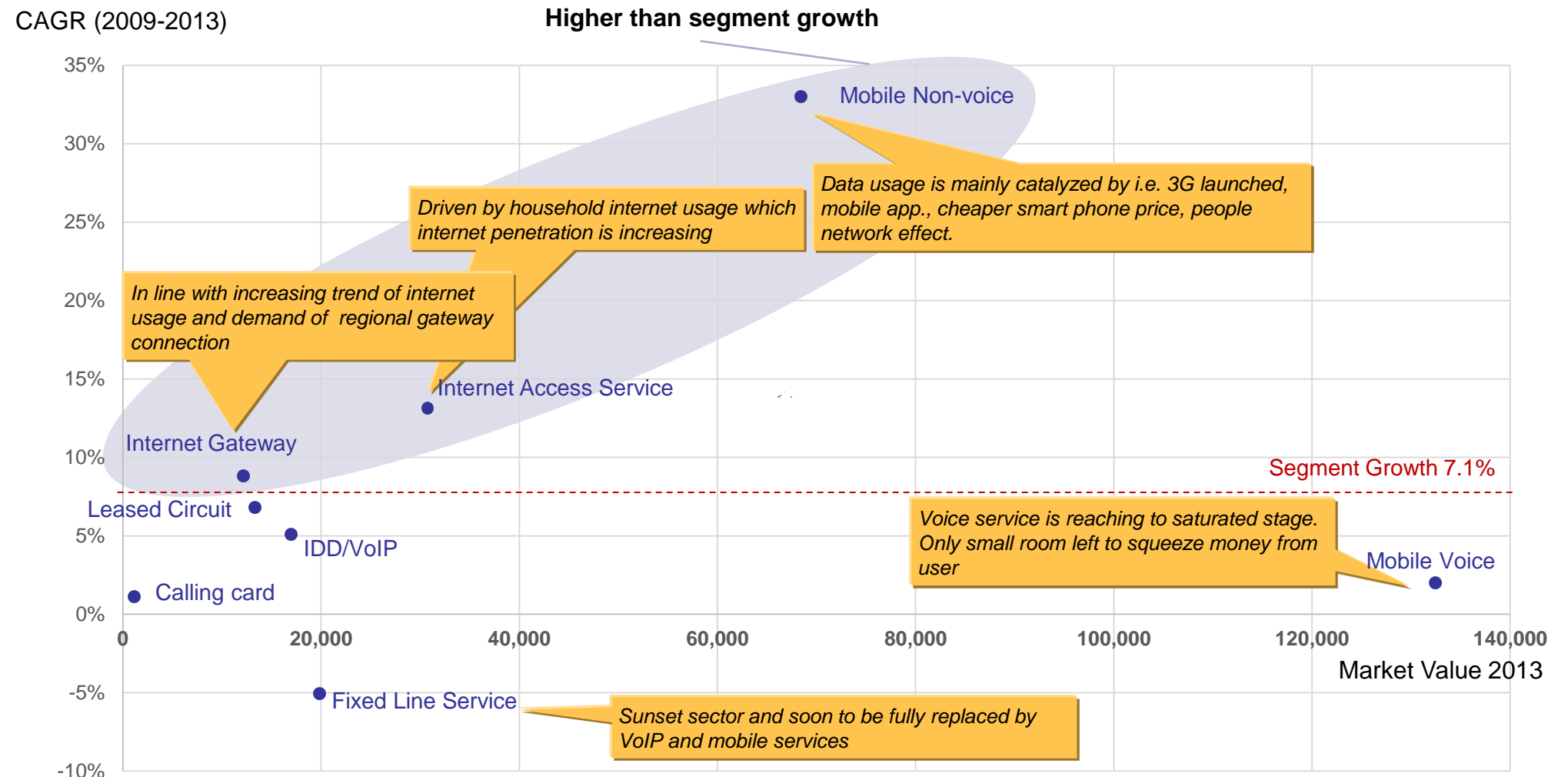
Selected sub-segments market value, Baht Million



Thailand Telecom: Mobile non-voice performs impressively majorly due to the transition of 2G to 3G, affordable price of smart devices and people data-consumed behavior

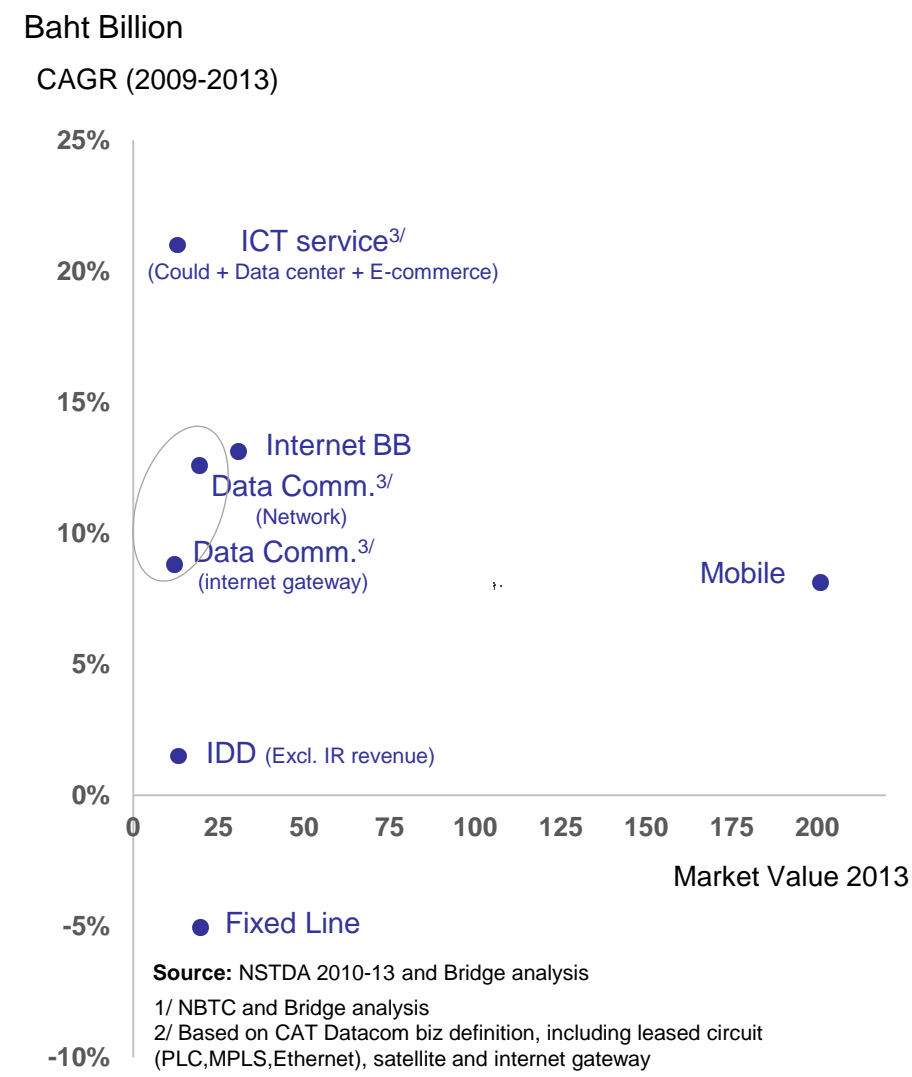
Selected sub-segments market value, Baht Million

Telco Services
(322 Baht Billion)^{1/}



Thailand Telecom: CAT exposes several playing fields with competitive challenges. Despite doing well in IDD business, market size is relatively small and on-going stable

Addressable market value based on CAT's classification



Assessment of CAT's playing field

Core businesses	Market Environment	Key Players	CAT's Share ^{1/}
1 Mobile	<ul style="list-style-type: none"> Intent competition since 3G launched and upcoming 4G auction this year M2M market is attractively growing 		
2 Internet BB	<ul style="list-style-type: none"> Players still enjoy penetrating market due to the low level of BB penetration 		
3 Data Comm. ^{2/}	<ul style="list-style-type: none"> On-going growth with moderate pace of ~12%^{2/} while ARPU is in the decreasing trend 		
4 IDD (excl. IR)	<ul style="list-style-type: none"> TDM is reaching saturated point and has been soon replaced by VoIP system 		
5 ICT Service	<ul style="list-style-type: none"> ICT service market will be largely driven by cloud competing, data center service and E-commerce with growth of 20-22% over the last 3 years 		
6 Fixed Line	<ul style="list-style-type: none"> The number of fixed lines continued to decline at -5% since 2007 and market decreases from 23bn in 2009 to 19bn last year 		

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Content

- Mobile market
 - Market structure and performance
 - Competitive landscape
 - 4G bidding competition and key trends

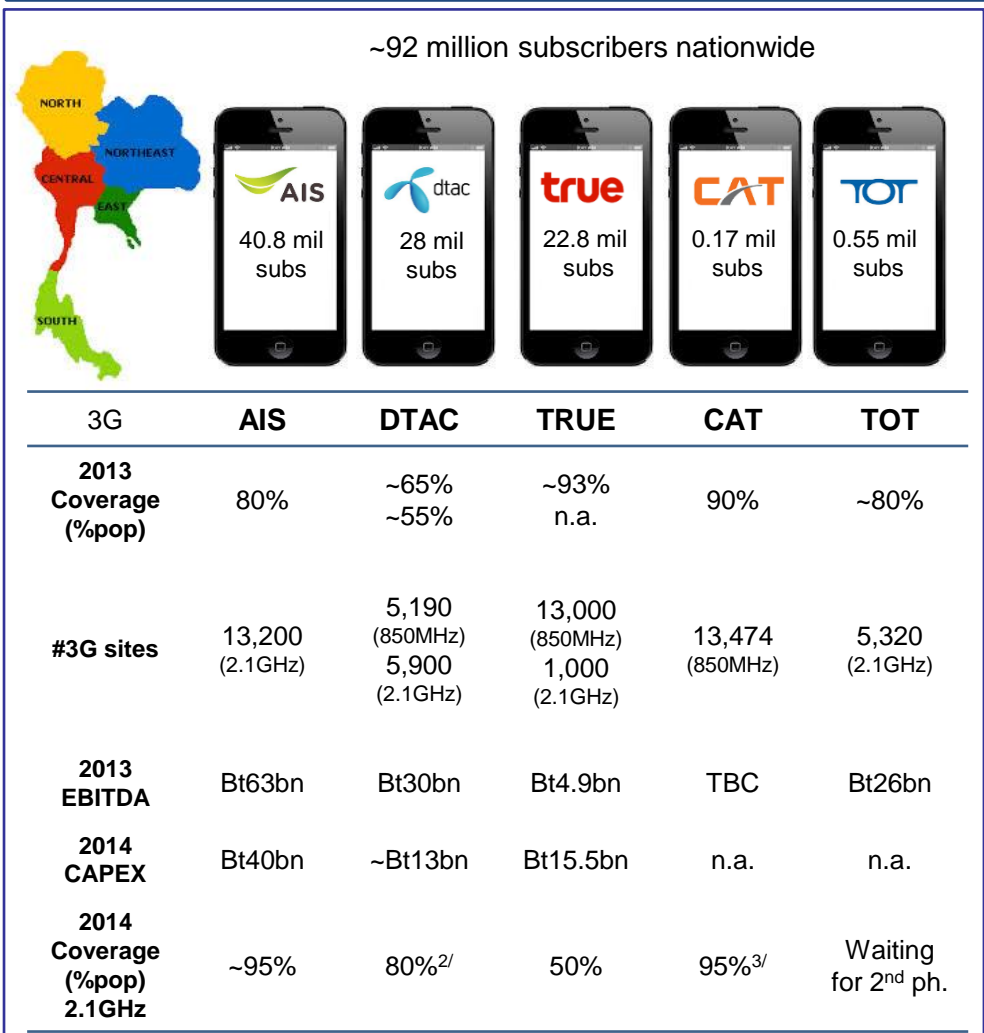
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1 Mobile:

The industry has been consistently dominated by big 3 players in which AIS is the largest in terms of number of subscribers and service revenue^{1/}

of subscribers nationwide end 2013

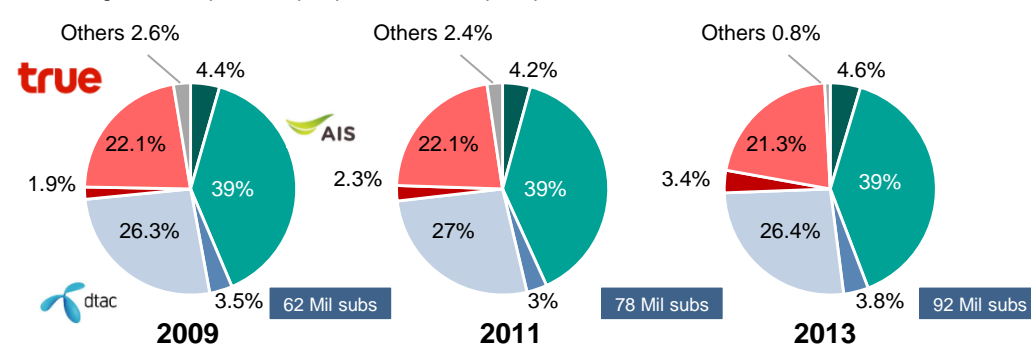


Source: NBTC, AIS, DTAC, TRUE annual report and Bridge analysis

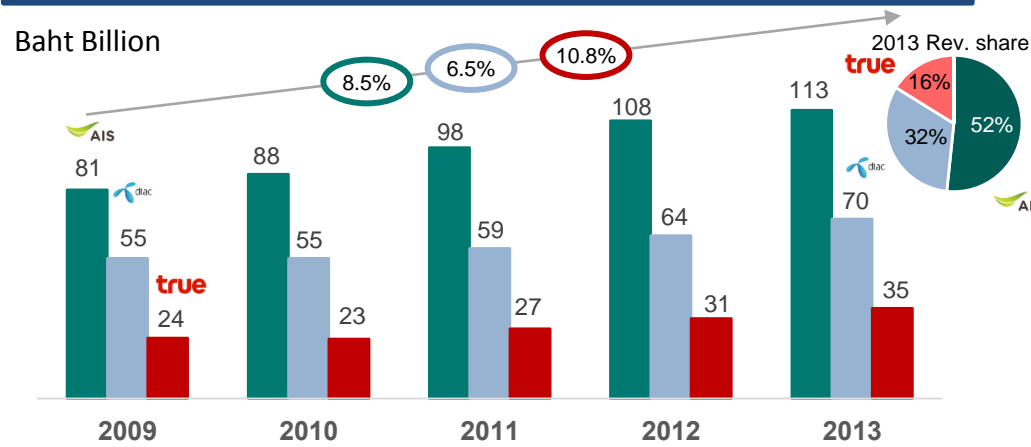
Market share by subscribers

- AIS's share has been eroded over the past 10 years (~60% in 2003)
- DTAC has done well in maintaining its share
- TRUE continues penetrating the market with convergent strategy and did well in post-paid segment

Note: Bright color represents pre-paid, otherwise post-paid



Operators service revenue development^{1/}



1/ Excl. IC and device sale revenue

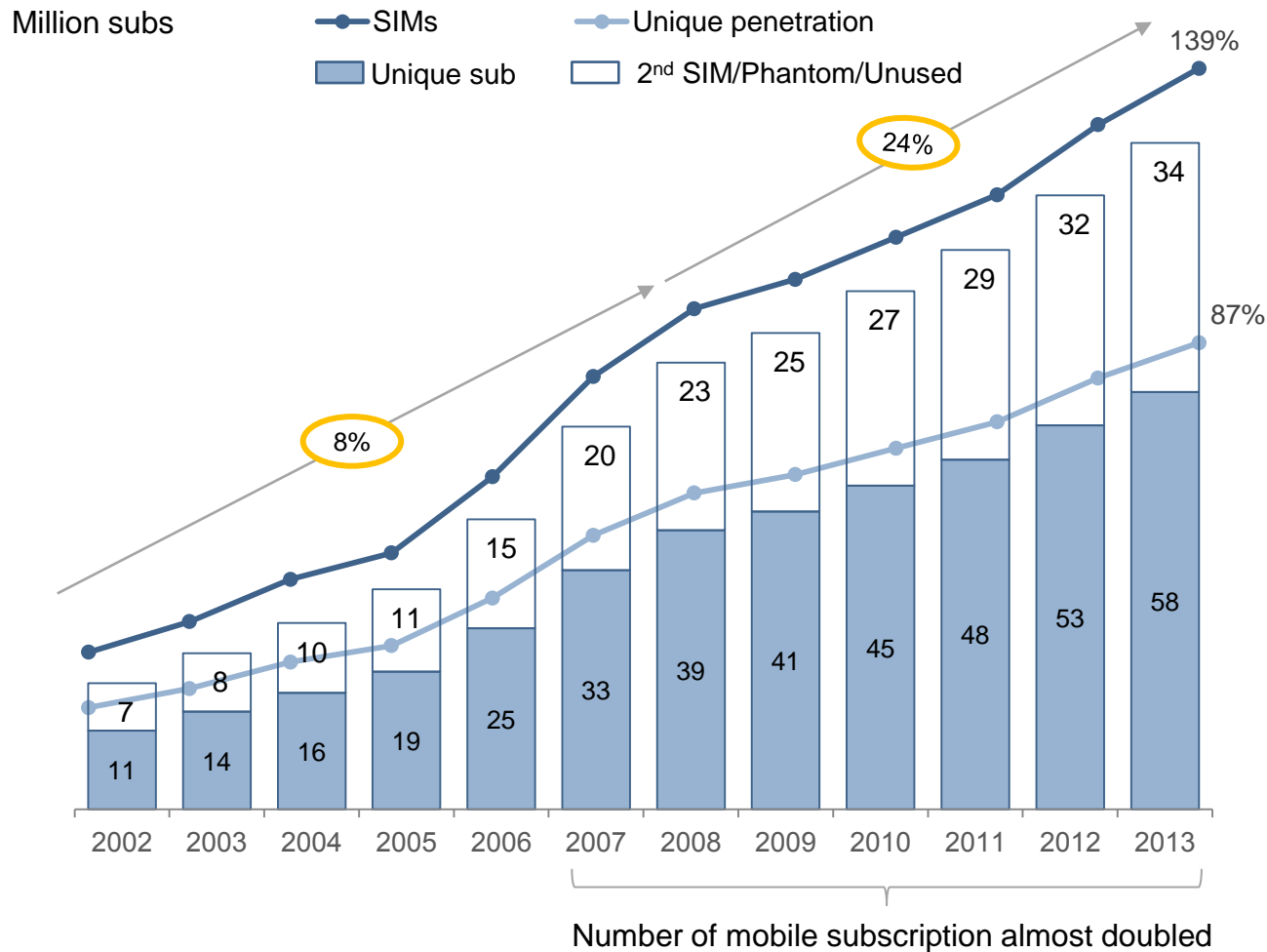
2/ In 2015-2.1GHz 3/ data from CAT wireless network team

x% CAGR (2009-13)

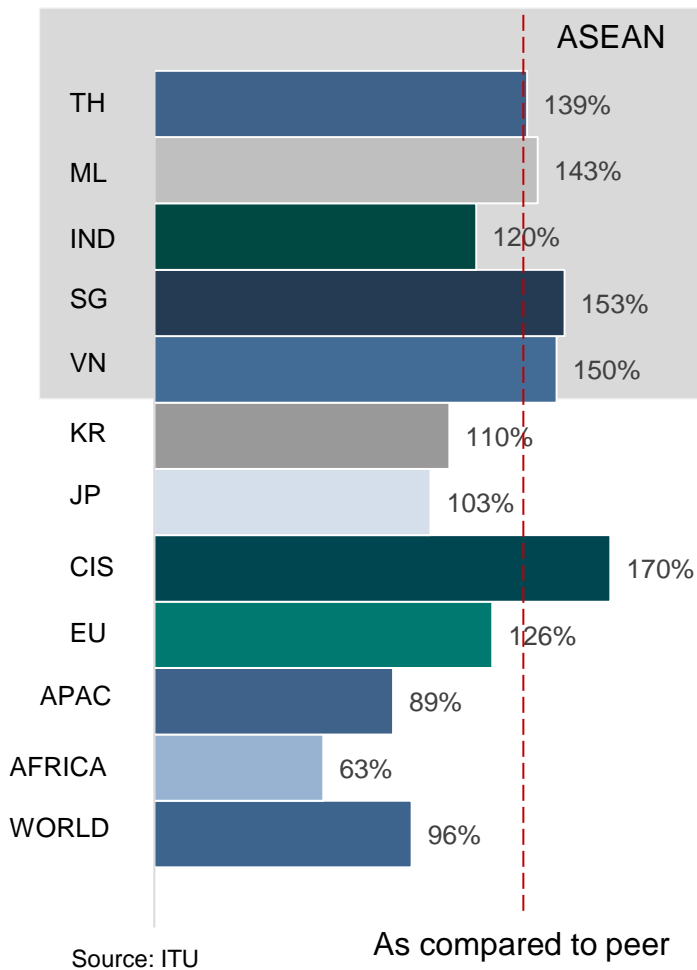
1 Mobile:

Thailand mobile subscription had almost doubled over the past 6 years with recent penetration of 139%, while limited room to grow further

Mobile subscription and penetration



Regional comparison (as of 2013)

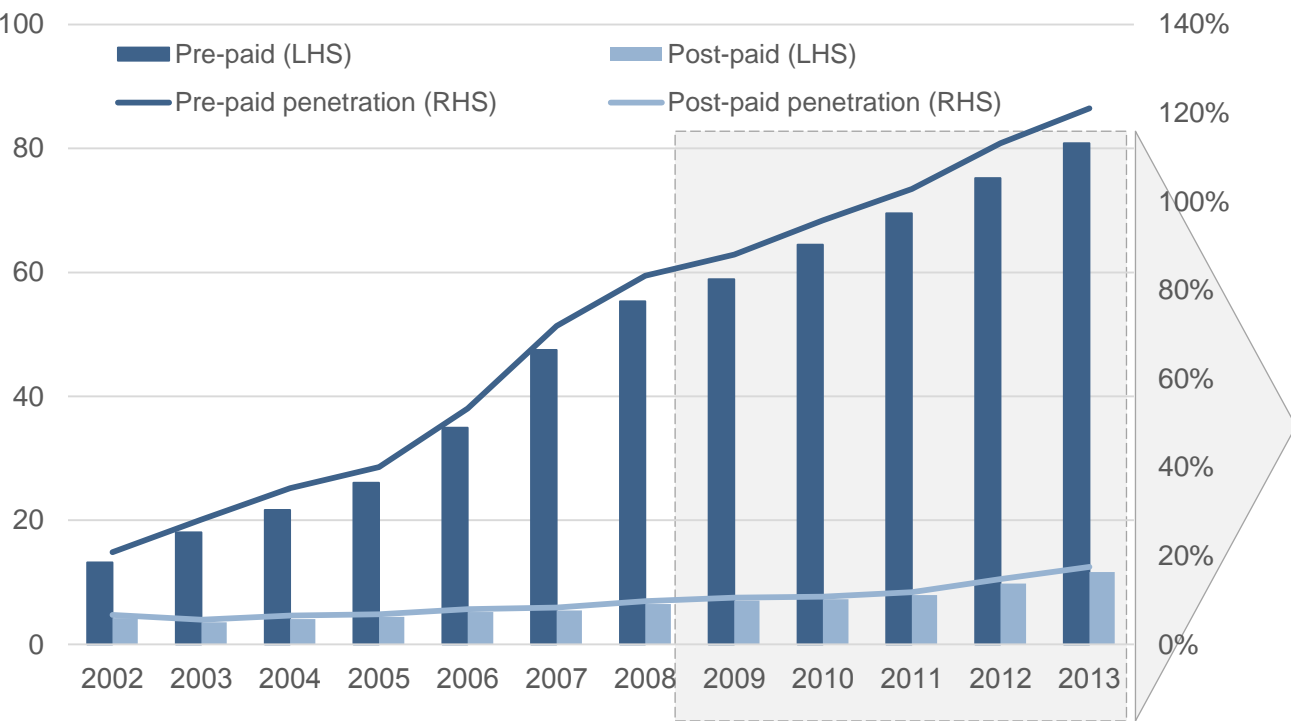
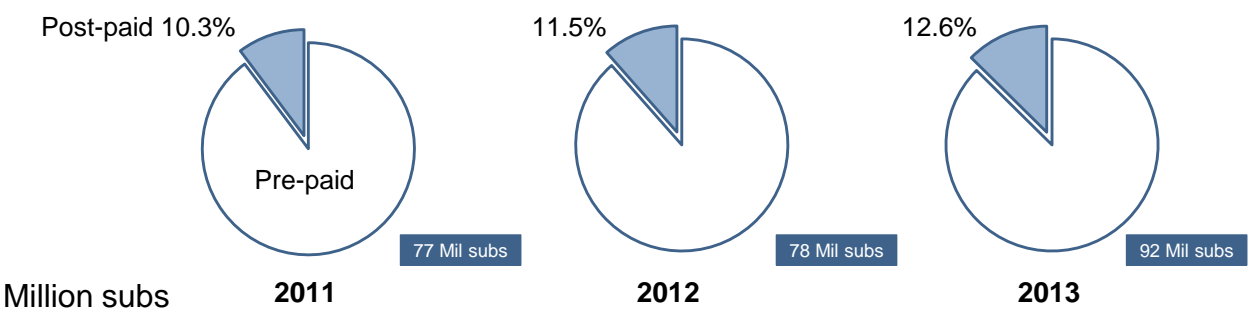


As compared to peer countries in ASEAN, it implies TH has room to penetrate but limited

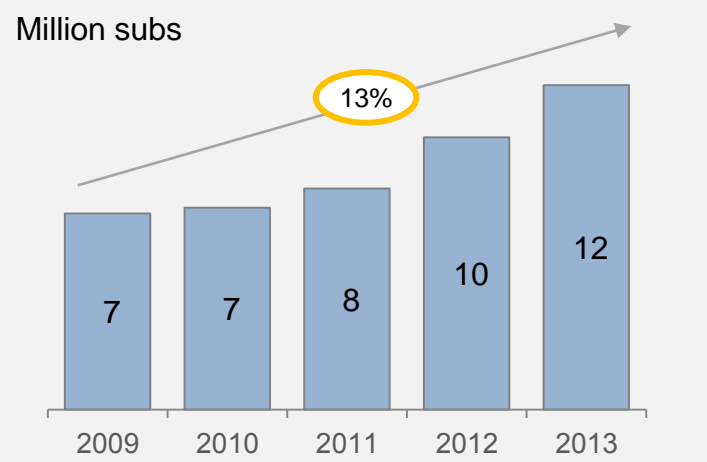
1 Mobile:

Of which total subscriptions, pre-paid is majority however, the arrival of data usage behavior is expediting post-paid penetration

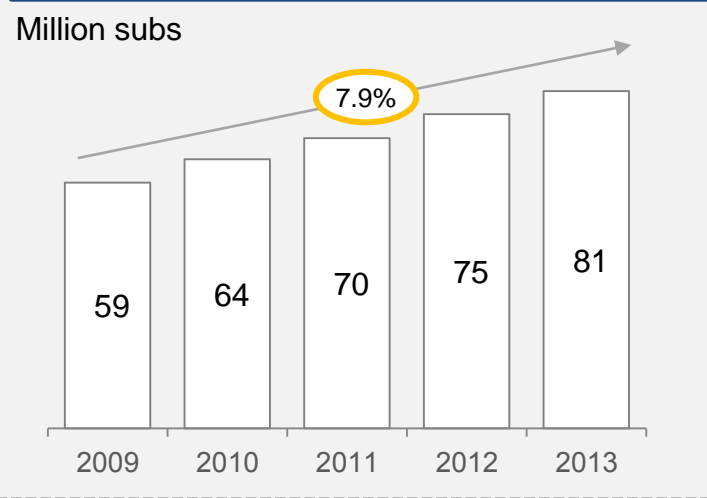
Mobile subscription breakdown and pre/post-paid penetration



Post-paid subs development

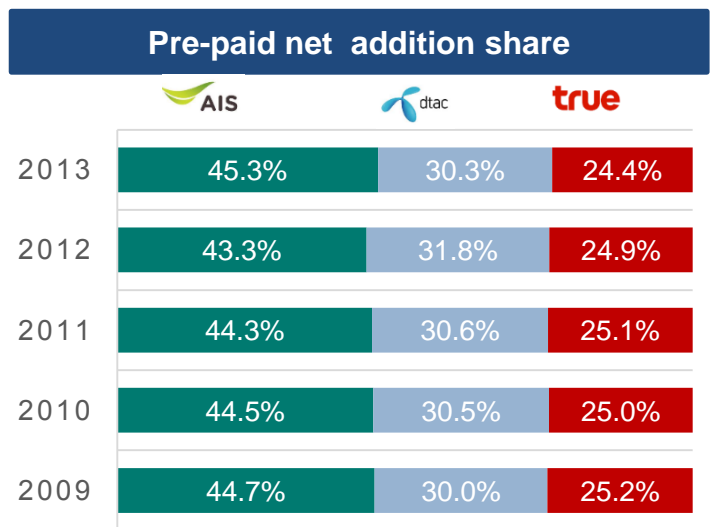
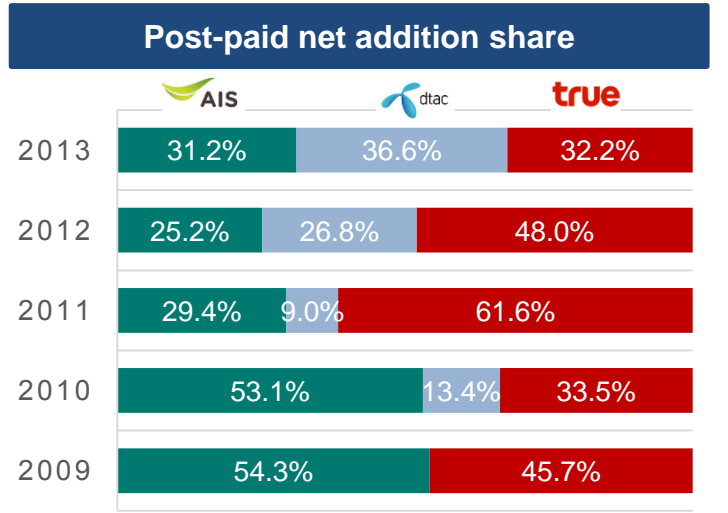
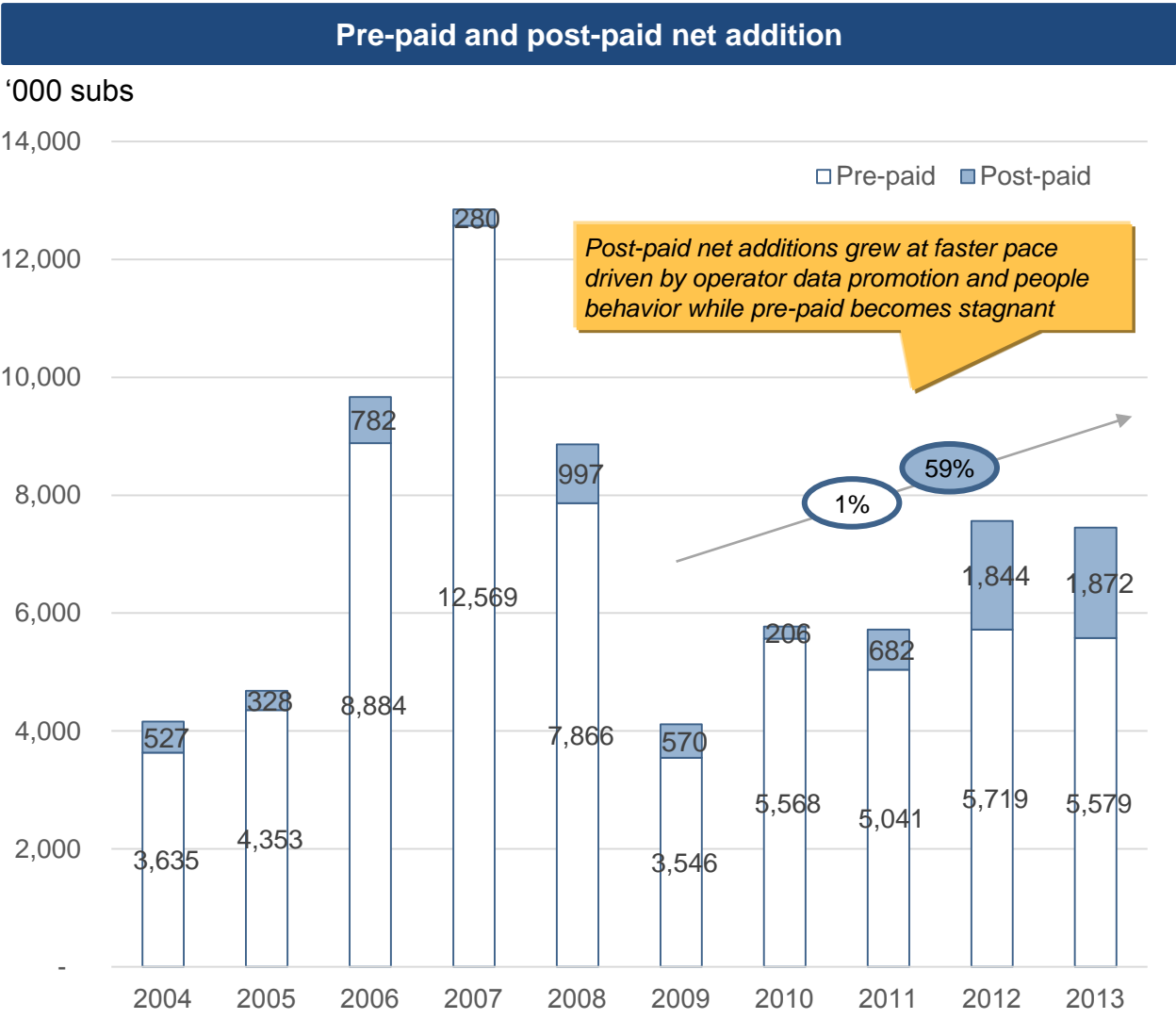


Pre-paid subs development



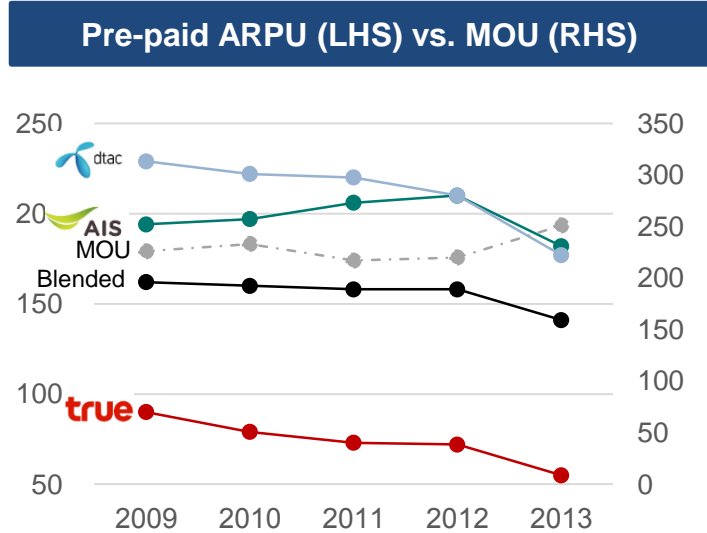
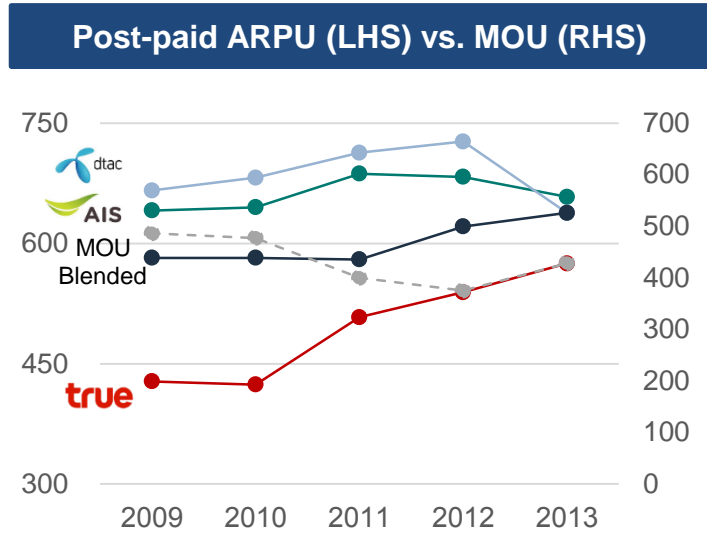
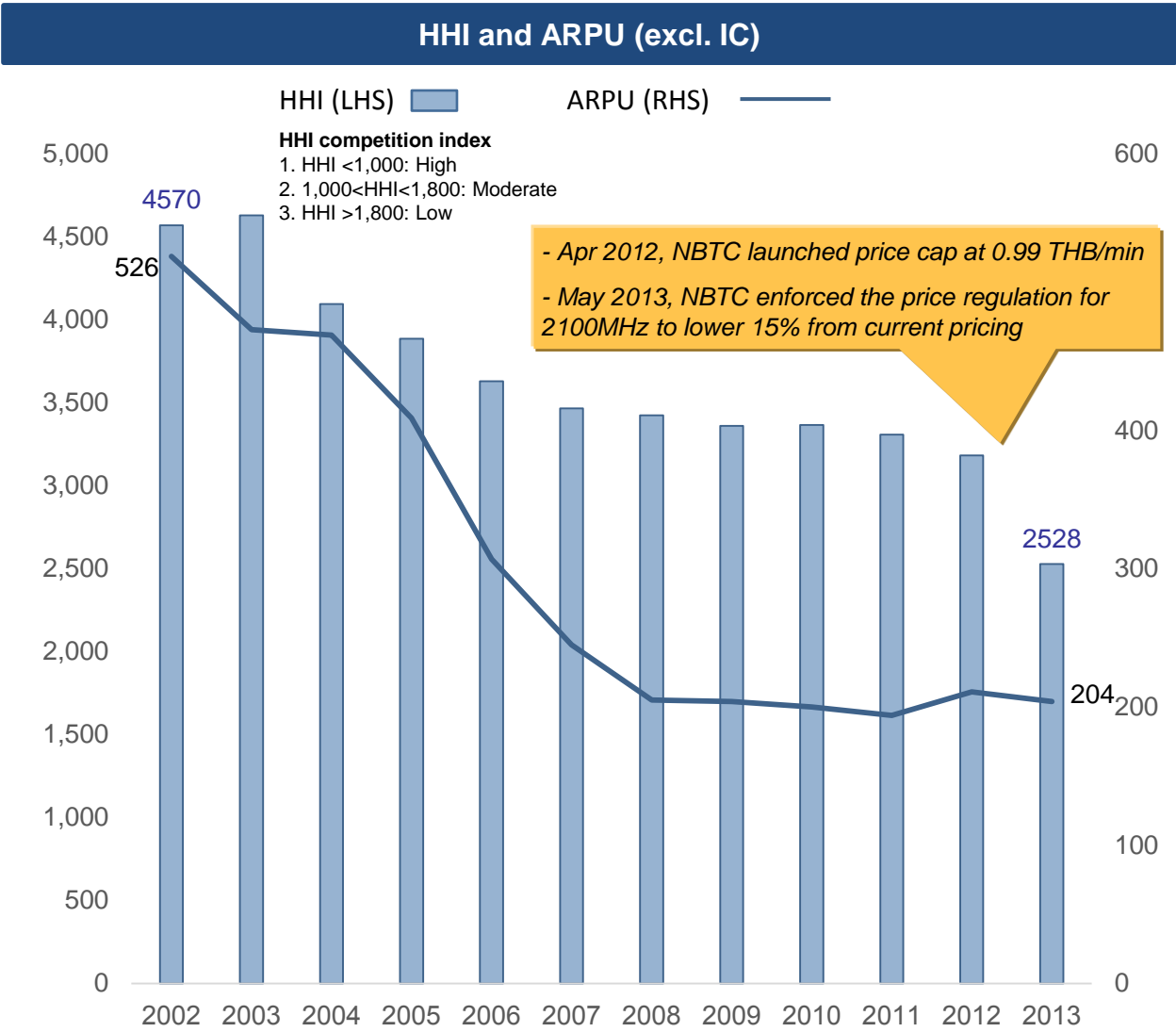
1 Mobile:

Post-paid market is increasingly fascinating and TRUE has done well in client acquisition while pre-paid growth seems to be limited



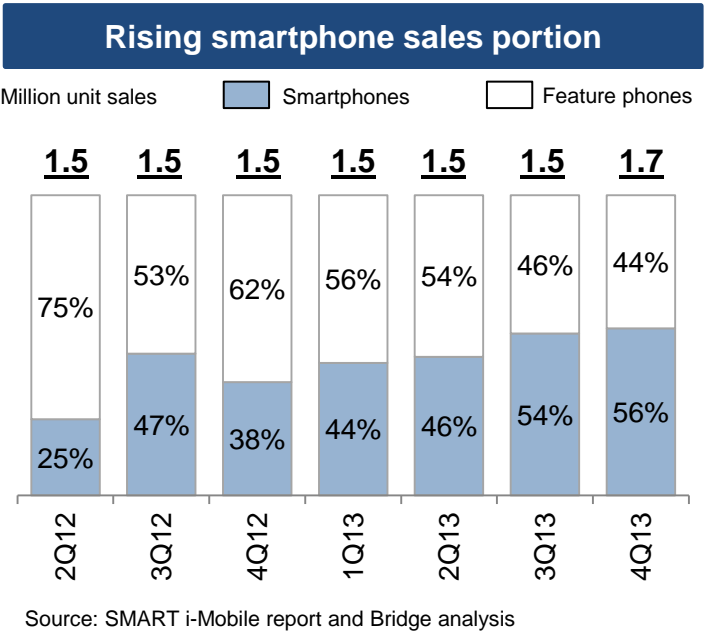
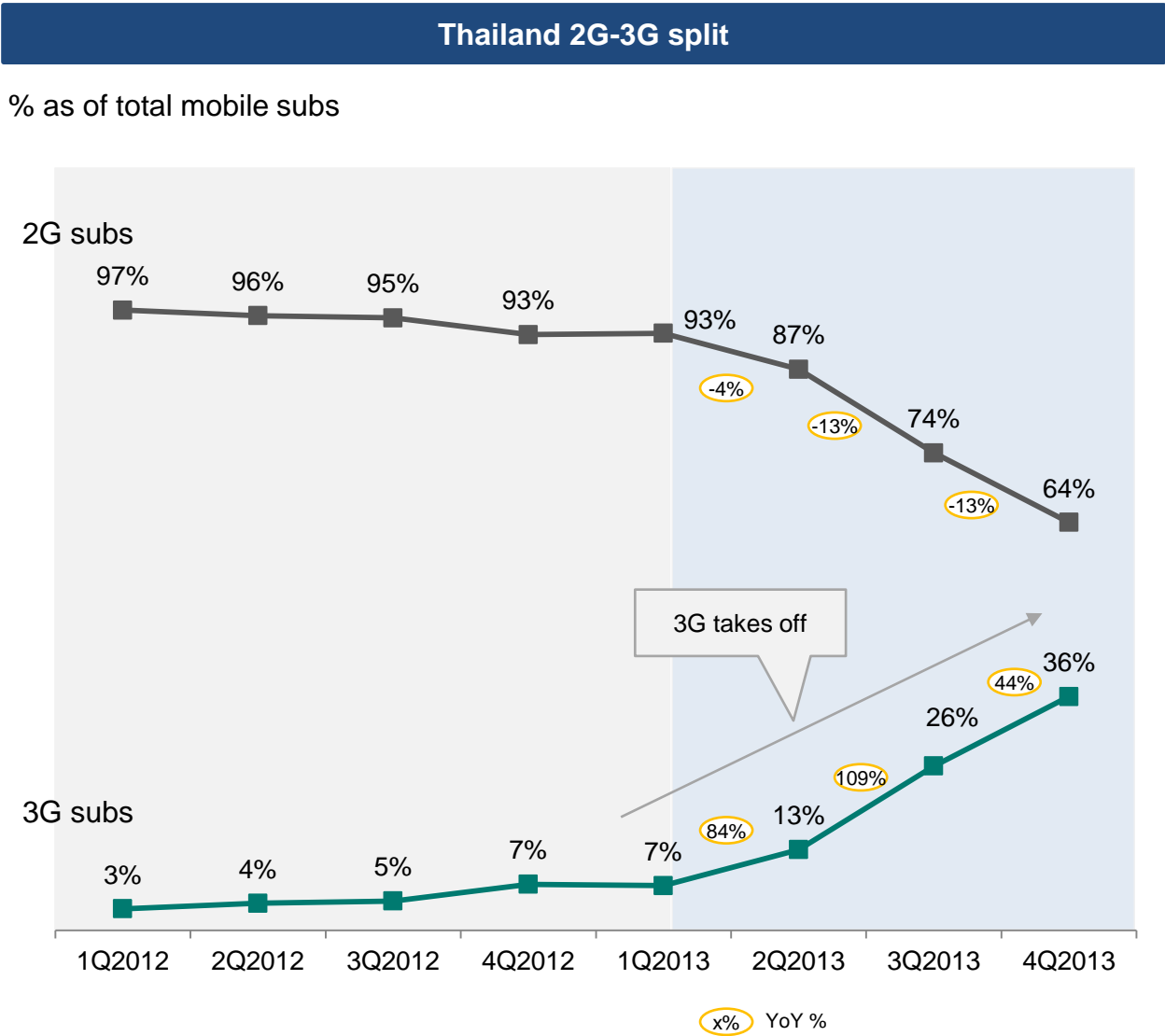
1 Mobile:

Increasingly intent competition and price cap regulation put pressure on pre-paid ARPU, while post-paid is less affected due to data revenue offset



1 Mobile:

We believe Thailand is still in the early stages of data growth. The country is among the last to have deployed 3G

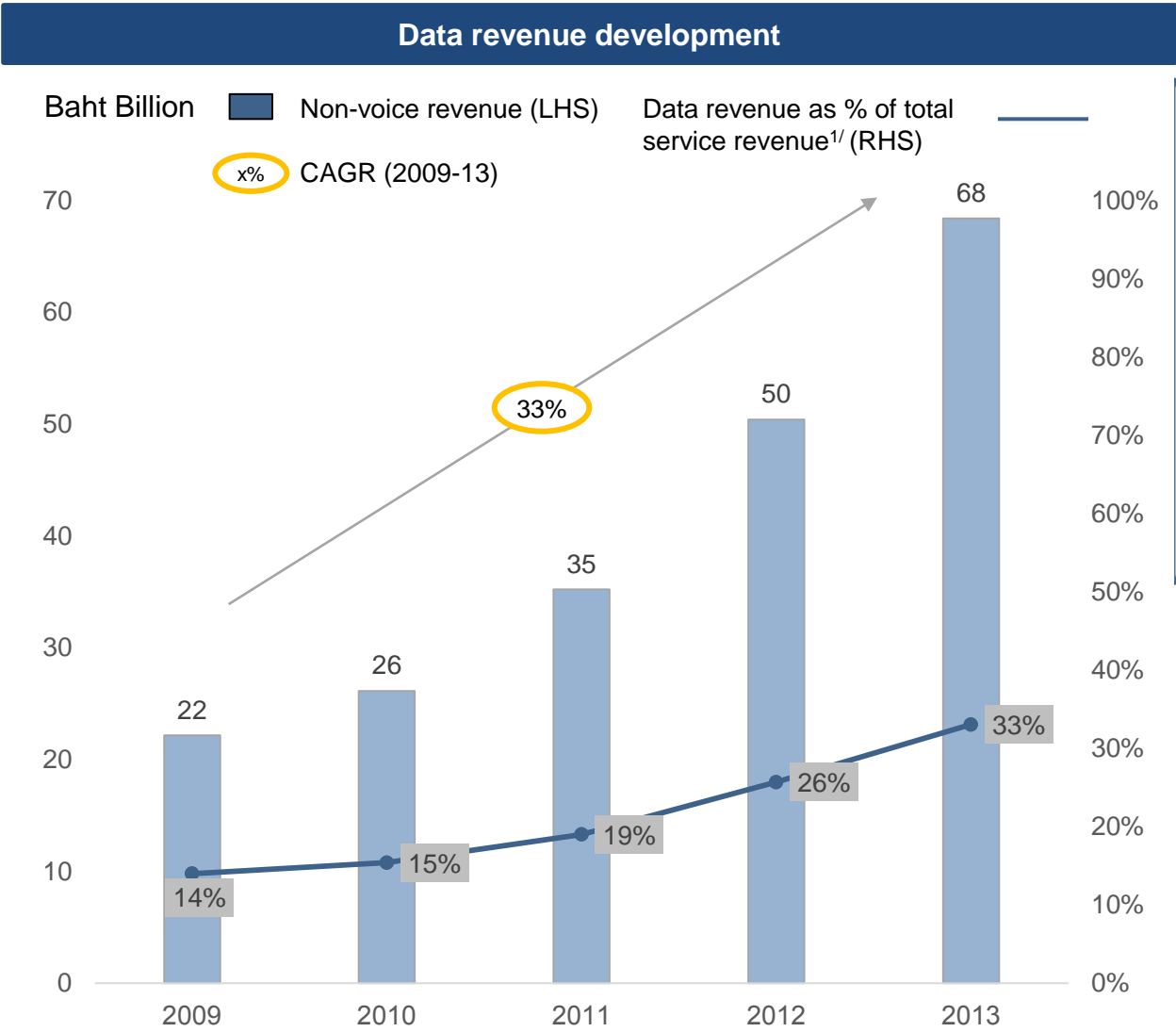


Regional comparison		
Country	3G launch	Data revenue as % of total revenue
APAC	-	42%
Philippines	2006	55%
Indonesia	2006	45%
Malaysia	2005	44%
Singapore	2004	40%
Thailand	2012	33%

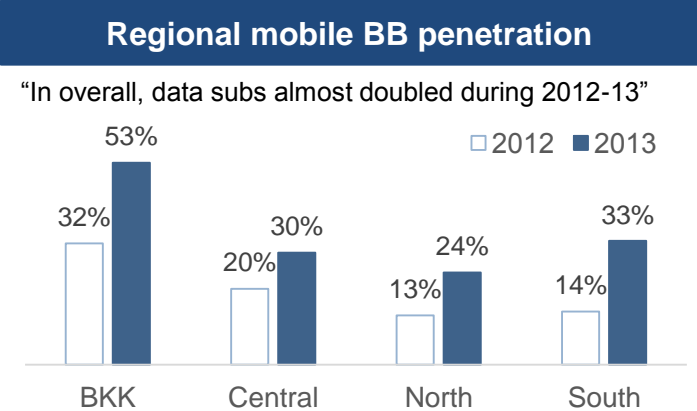
Source: OVUM and Bridge analysis

1 Mobile:

Data revenue experienced healthy growth due to the operators, technology and users behavior push factors



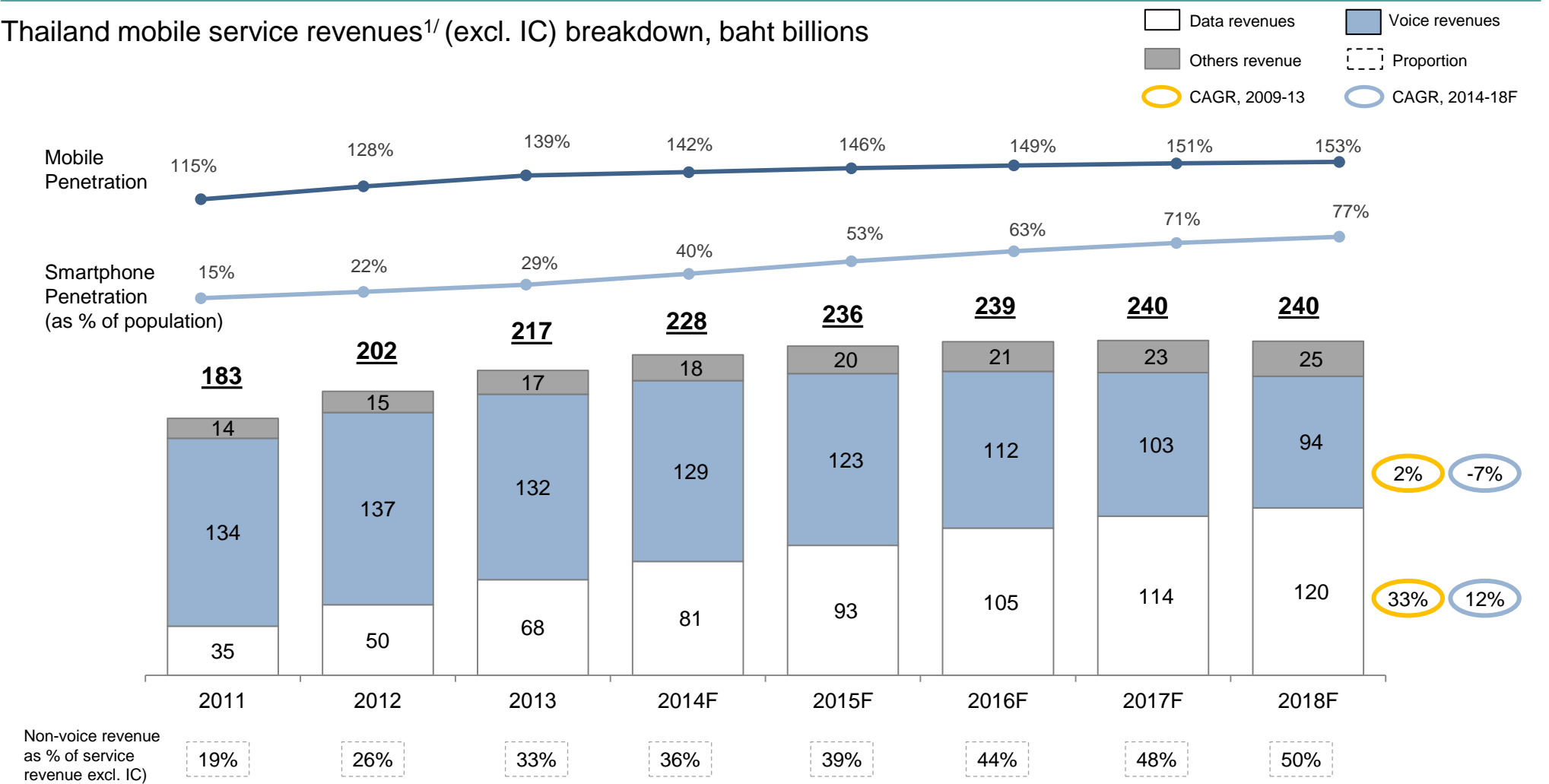
- ### Key drivers
- Key drivers of data usage:**
- On-going expansion of 3G network after the issuance of 3G license
 - More offering of high bandwidth services
 - People data-oriented behavior and network effect
 - Proliferation of smart devices especially smartphone and tablet with affordable price
 - OTTs data functionality (i.e. Line call)
 - Limited fixed line infrastructure and development



1 Mobile:

...and mobile data will continue driving the industry with CAGR of 12%, while voice is likely to experience sluggish growth

Thailand mobile service revenues^{1/} (excl. IC) breakdown, baht billions



Source: NBTC, DTAC, AIS, TRUE annual report, OVUM and Bridge analysis 1/ Service revenue (excl. IC) gathering from AIS,DTAC and TRUE representing 98% of total market revenue

Content

- Mobile market

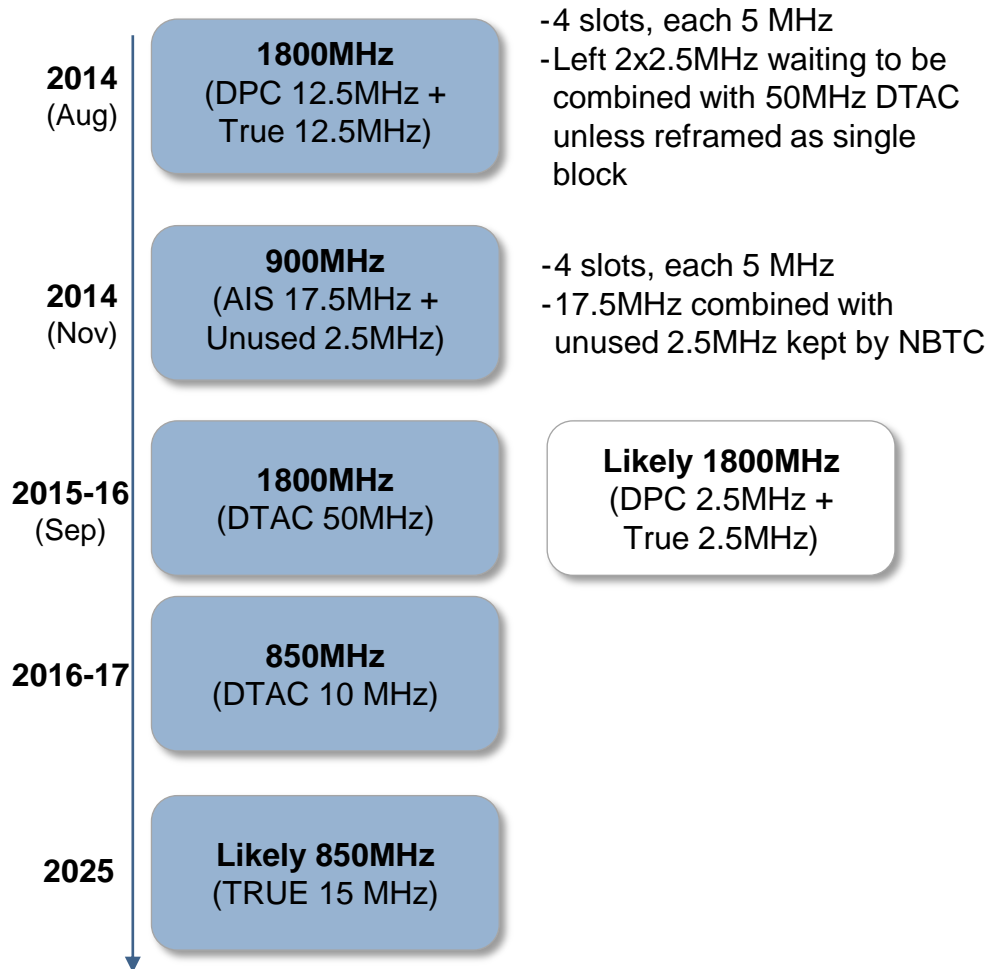
- Market structure and performance

- Competitive landscape

- 4G bidding competition and key trends

1 **Mobile:** We believe it will be hard for a brand new player as a MNO to come in and compete with the others, who have already secured network coverage and market share, while high possibility for MVNO

Window of opportunities for new comers



Entry barrier

Huge initial CAPEX

- Bidding value ~5 Baht billion per 5MHz slots

Nearly market maturity

- Thailand mobile phone market here is almost saturated with the penetration rate of subscribers at 139%

High rivalry degree

- Market structure is considerably consolidated with big 3 players and they have existed the market for more than 10 years

Fierce bidding competition (License to entry)

- Existing players would like to secure their competitive edge to acquire bandwidth as lengthy as possible to service 4G data intensive while issuance of license seems to be limited

Others

- Shareholding issue for foreigner (49%:51%)
- Market know-how and expertise challenges
- Customer and key stakeholders relationship in Thailand

Expected to see the similar players with possible large new comers as MVNO

MNOs



MVNOs

















Small

Large

1 Mobile:

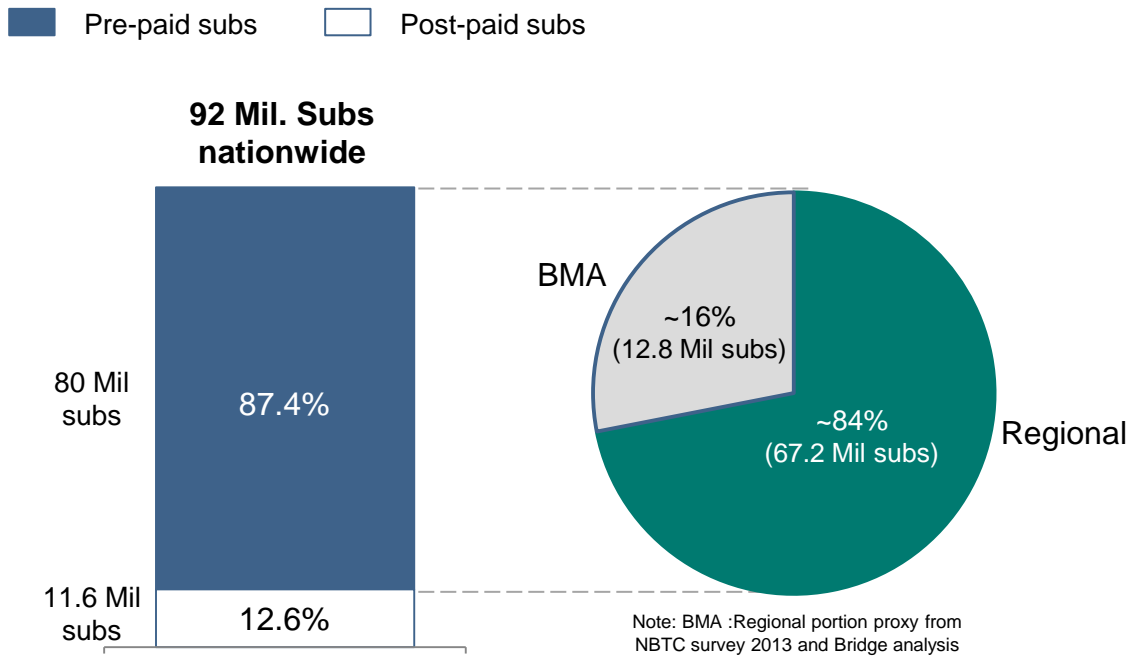
Each players have their own strengths and strategy which are crucial to compete in nowadays competitive and changing environment

	Strengths	Weakness	Strategic Tie-up	Key strategic direction in 2014
	<ul style="list-style-type: none"> Large subscription base Brand recognition Excess liquidity Low regulatory cost Strategic shareholder strengths 	<ul style="list-style-type: none"> Expensive pricing perception Political issues 	<ul style="list-style-type: none"> Shareholder  SingTel Offshore network  12 countries 470 Million users 	<ul style="list-style-type: none"> Revenue target to increase 6-7% Strengthen 3G-2.1GHz network Zero handset margin strategy: push 3G device adoption among medium to low tier customers Improved cost competitiveness Enhance sales and distribution channels
	<ul style="list-style-type: none"> The most advanced network equipment Number of bandwidth holding Strategic shareholder strengths 	<ul style="list-style-type: none"> Low consumer confidence from several times of network shutdown Slow development of 3G coverage 	<ul style="list-style-type: none"> Shareholder  telenor Offshore network  7 countries 52 Million users Asia Mobility Initiative. Building cross-border relationships. 	<ul style="list-style-type: none"> Revenue target to increase 3-5% Internet for All strategy: enable all Thai people to access the internet within 3 years Loved by Customers strategy: invest Bt0.8bn to expand 300 DTAC centers & 200,000 refill retailers Efficient Operations strategy
	<ul style="list-style-type: none"> Mobile broadband leader Convergence network 4G LTE first mover recognition 	<ul style="list-style-type: none"> Liquidity problem Poor aftersales service 	<ul style="list-style-type: none"> Shareholder  C.P. GROUP Offshore network  12 countries 470 Million users 	<ul style="list-style-type: none"> Secure financial investor (recapitalization) Focus on network and service quality Create value from Convergence Expanded distribution channels, and competitive device-bundling promotions Migrate 2G customers to 3G (or continue 2G)
	<ul style="list-style-type: none"> Comprehensive backbone network Technical know-how and expertise 3G coverage 	<ul style="list-style-type: none"> Retail business expertise Outlet coverage Brand recognition and image PR and communication Organization structure 	<ul style="list-style-type: none"> Shareholder: 100% held by MOF MVNO  	<ul style="list-style-type: none"> Bt27.5Bn target revenue Retail Bt2.5bn: niche market strategy and penetrate M2M MVNO Bt25bn: provide full range of services to MVNO JV with SKT to join 4G bidding
 To be the 4 th outstanding player	<ul style="list-style-type: none"> Comprehensive backbone network Technical know-how and expertise 	<ul style="list-style-type: none"> Retail business expertise Outlet coverage Brand recognition and image PR and communication Organization structure 	<ul style="list-style-type: none"> Shareholder: 100% held by MOF MVNO   	<ul style="list-style-type: none"> Bt3Bn target revenue (achieved <10% in 2013) Retail Bt1.2bn: focus on bundling services i.e. ADSL, FTTx, TOT iptv, Fixed line and TOT WiFi across broad range of customer segments MVNO Bt1.8bn: improve wholesale portion to 80% of network cap. used ACT as biz vehicle to offer services campaign i.e. unlimited LINE, FB, multi SIM and M2M

1 Mobile:

3G network enhancement will not have significant revenue impact unless operators encourage rural clients to switch to use data

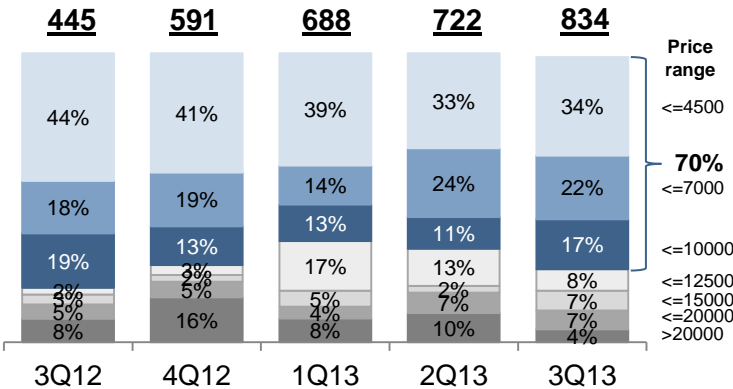
Pre-paid subscribers distribution: A big chunk of wallet opportunities



- In total of 80 mil. pre-paid subscriptions, ~67mil. subs are scattered around regional areas (non-BMA) which is a big chunk of untapped opportunity for voice to data-converted revenue
- Pre-paid ARPU^{1/} is considerably low at 141 baht/sub/month in 2013 with majority of voice ARPU contribution, and it is likely to decline unless revenue boost-up services are bundled
- Mobile BB penetration is still low and certain room to improve especially in regional areas across Thailand

Smartphone sales price portion

70% of smartphone were priced below 10K baht '000' unit



Availability of affordable smartphone allows majority of people in rural areas who has limited revenue could more easily buy

Implication

- We could expect to see fierce competition among key operators in competing and launching attractive 3G/4G pre-paid data package to build data demand in rural areas to squeeze and deepen clients wallet
- Operators having the comprehensive 3G/4G coverage over regional arrears will take competitive edge

Source: SMART i-mobie report and Bridge analysis

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1 Mobile:

Spectrum is one of the most valuable asset of Telco business. Operators have to plan effectively

Need for Effective Spectrum Planning

Growth of Mobile Data

- Growth of mobile data puts significant **pressure on the economics of Telcos**
 - Data absorbs a dominant and increasing share of the capacity of the networks, but the growth of data revenues is substantially slower and operating **margins are squeezed** (primarily due to prevalence of **unlimited data plans**)
 - **Broadcasting and telecoms services are converging**, and network capacity must be managed accordingly;
 - Multiple **new devices** that rely on **mobile broadband are being launched**, **enhancing customer expectations** on when, how and where to use voice, data and new media services.

Limitations of Existing Spectrum Regimes and Technologies

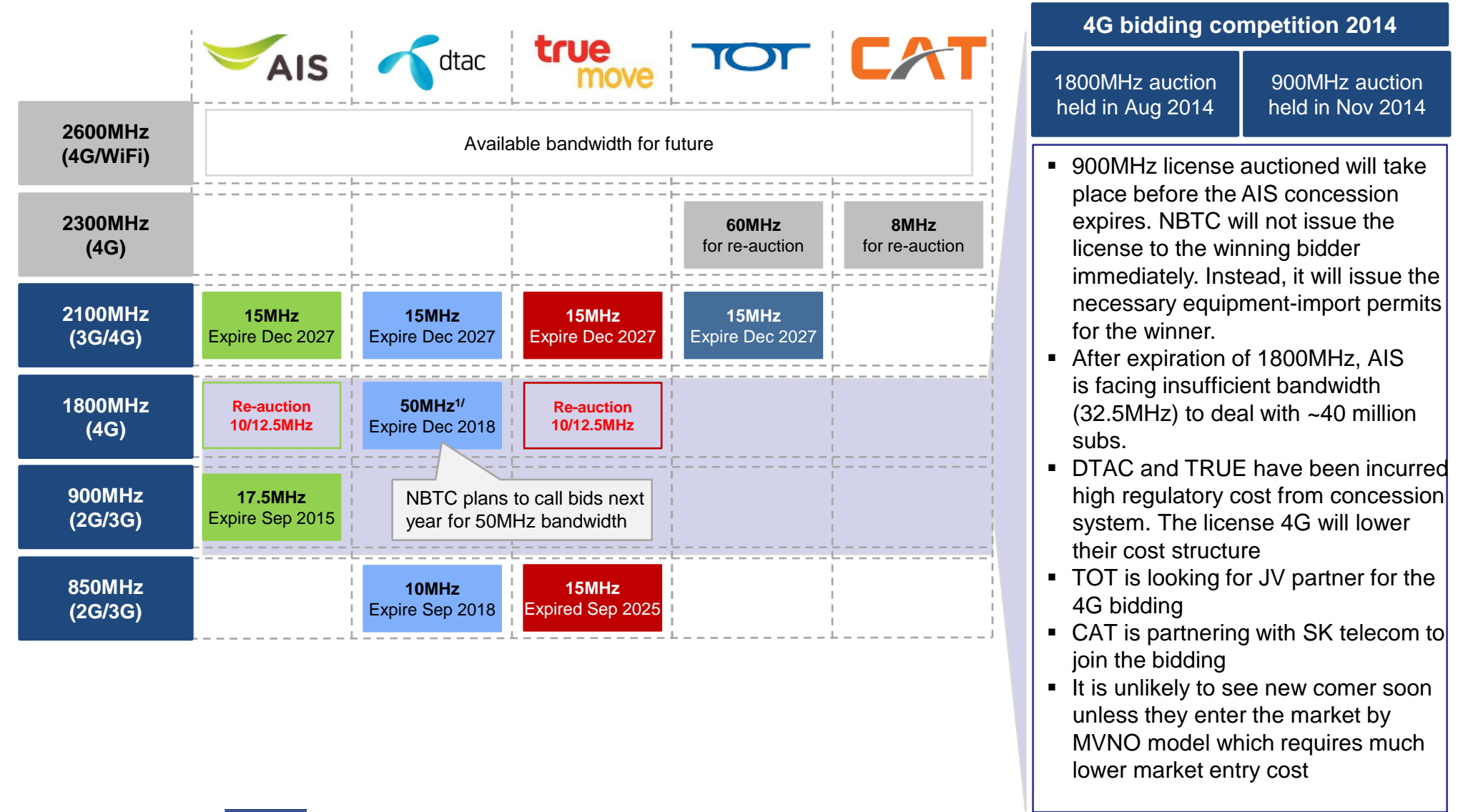
- Currently available spectrum and technologies **cannot easily sustain the evolution** in traffic and customer demands
 - Legacy spectrum licenses are frequently restrictive and bring significant financial burdens (e.g. concessions, revenue shares, licence taxes, ...)
 - There are options for spectrum and technology re-farming, but they carry risks regarding timing and technical solutions (e.g. in terms of 2G switch off, device compatibility, ...)

Massive Investment Requirements

- Investments in spectrum licenses are crucial both for **economic sustainability** of the operators and for the **competitive effectiveness** of the markets
 - Spectrum licenses are by far the largest investments that the mobile operators will have to make in the next 5 to 10 years
 - They will radically affect the viability and competitive structure of the mobile markets
 - They will require a careful and long-term oriented planning effort on the part of both operators and regulatory authorities

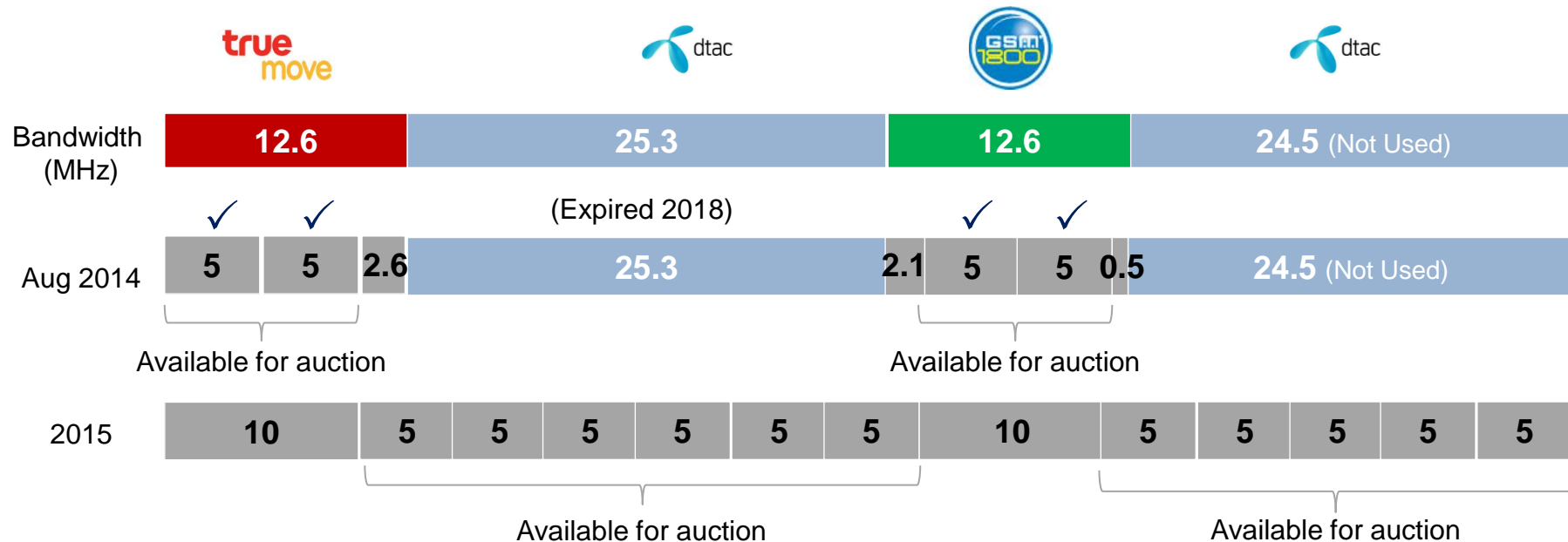
1 Mobile:

The upcoming 4G auction held this year will definitely bring fierce competition due to competitive advantage of bandwidth ownership



1 **Mobile:** Bandwidth allocation for the upcoming 1800MHz auction will be 2 slots, 10MHz each while unused 2.5MHz-900MHz kept by NBTC will be granted to make bandwidth available for 20MHz

1800MHz bandwidth allocation scenario: Two spectrum bands stand either side of the 1,800MHz concession of DTAC. This means the bid winners would each be able to use only 10MHz out of their current 12.5MHz bandwidth. As the remaining 2.5MHz apiece are technically insufficient to provide service



900MHz bandwidth allocation scenario: The 900MHz band is currently being used by AIS, whose concession under TOT will expire next year. There is a total of 20MHz bandwidth available on the 900MHz spectrum but only 17.5MHz was granted to AIS, while the rest was kept by the NBTC and might consider making 2 licenses available at the 900MHz auction.

1 Mobile:

Competition outlook in 2014 is expected to be driven by operators push factors, technology & behavior advancement and regulatory unit activities

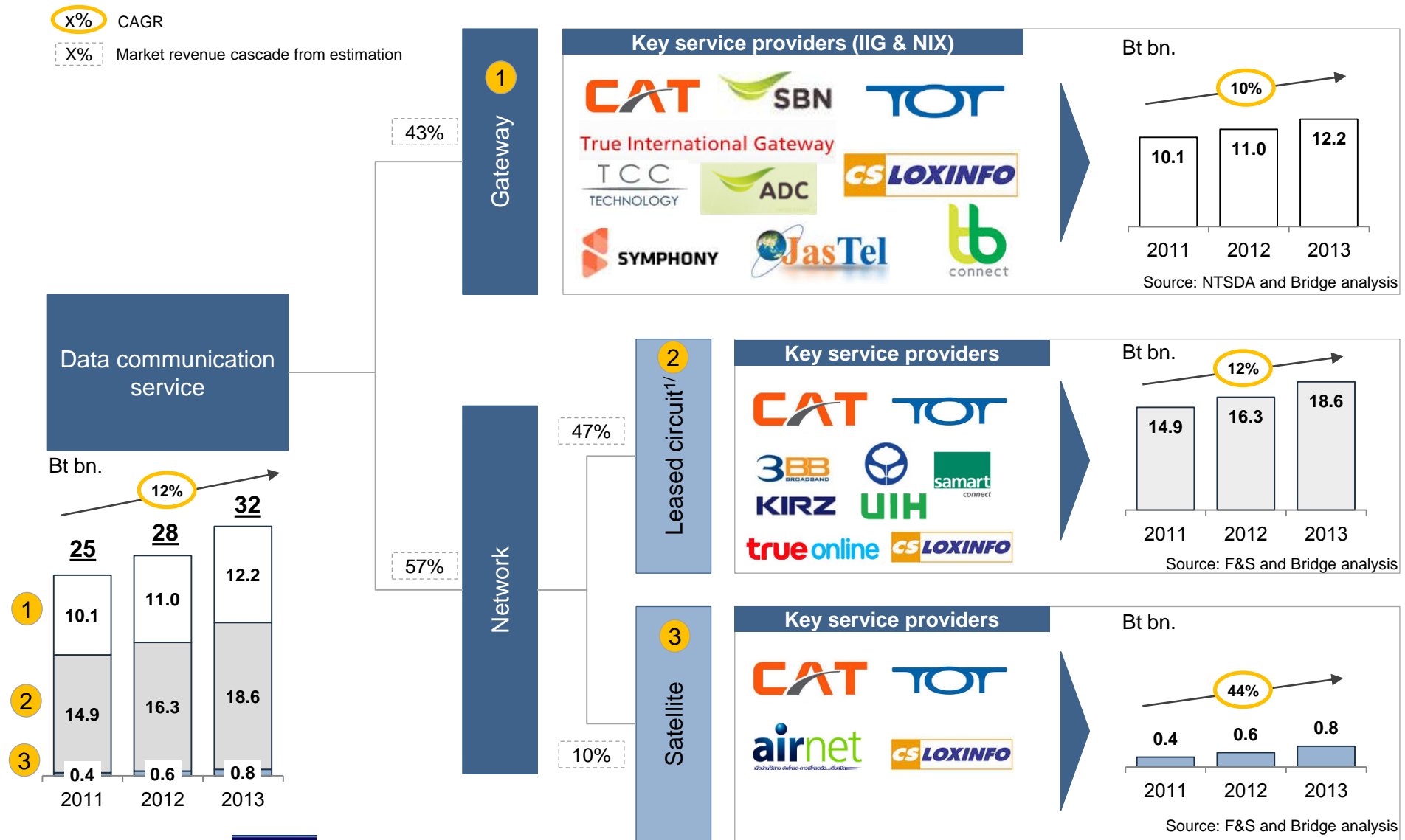
Operator's push factors	Technology & behavior advancement	Regulatory impact
<p>Rising 3G subscriptions</p>  <ul style="list-style-type: none"> Operators will continue encouraging their clients to relocate from BTO network to 2.1GHz license to lower regulatory cost and improve EBITDA margin 	<p>Social network effect</p>  <ul style="list-style-type: none"> People behavior has been daily influenced by social media and obviously consume more and more data 64% of social network users access by mobile 	<p>4G auction (900 & 1800MHz)</p>  <ul style="list-style-type: none"> Upcoming 4G auction will be a real transition from voice to data era. Bidding competition will be fierce
<p>Smartphone price declines to tap mid-low tier</p>  <ul style="list-style-type: none"> Smartphone adoption strategy will be continually employed with flat margin and marketing spending on this regard will significantly increase 	<p>Mobile transaction</p>  <p>Mobile NFC JustPay (Mobile wallet)  mPay rabbit sim (NFC) </p> <p>Mobile Banking -1.2 Million mobile account -Bt752bn in trans. value with growth of 70% from last year</p>	<p>Price cap</p>  <ul style="list-style-type: none"> On-going impact of lowering operators 2G and 3G tariffs by 15 percent, as required by NBTC which will directly impact on ARPU
<p>CAPEX intensive to enhance 3G coverage</p>  <p> AIS ■ Bt40bn to achieve 20k base station and 95% population coverage</p> <p> dtac ■ Bt13bn to achieve 80% population coverage</p> <p> true ■ Bt15.5bn to enhance population coverage</p>	<p>Enterprise M2M solution</p>  <ul style="list-style-type: none"> The market for enterprise M2M solutions is growing, supported by rapid global adoption of mobile broadband needed for wireless M2M applications. 	<p>Lower IC charge</p>  <ul style="list-style-type: none"> The NBTC is scheduled to hold a public hearing on new call-termination rate on April 10 and the rates are expected to be lower from 0.45 to 0.34 THB/minute in July

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2 Data communication:

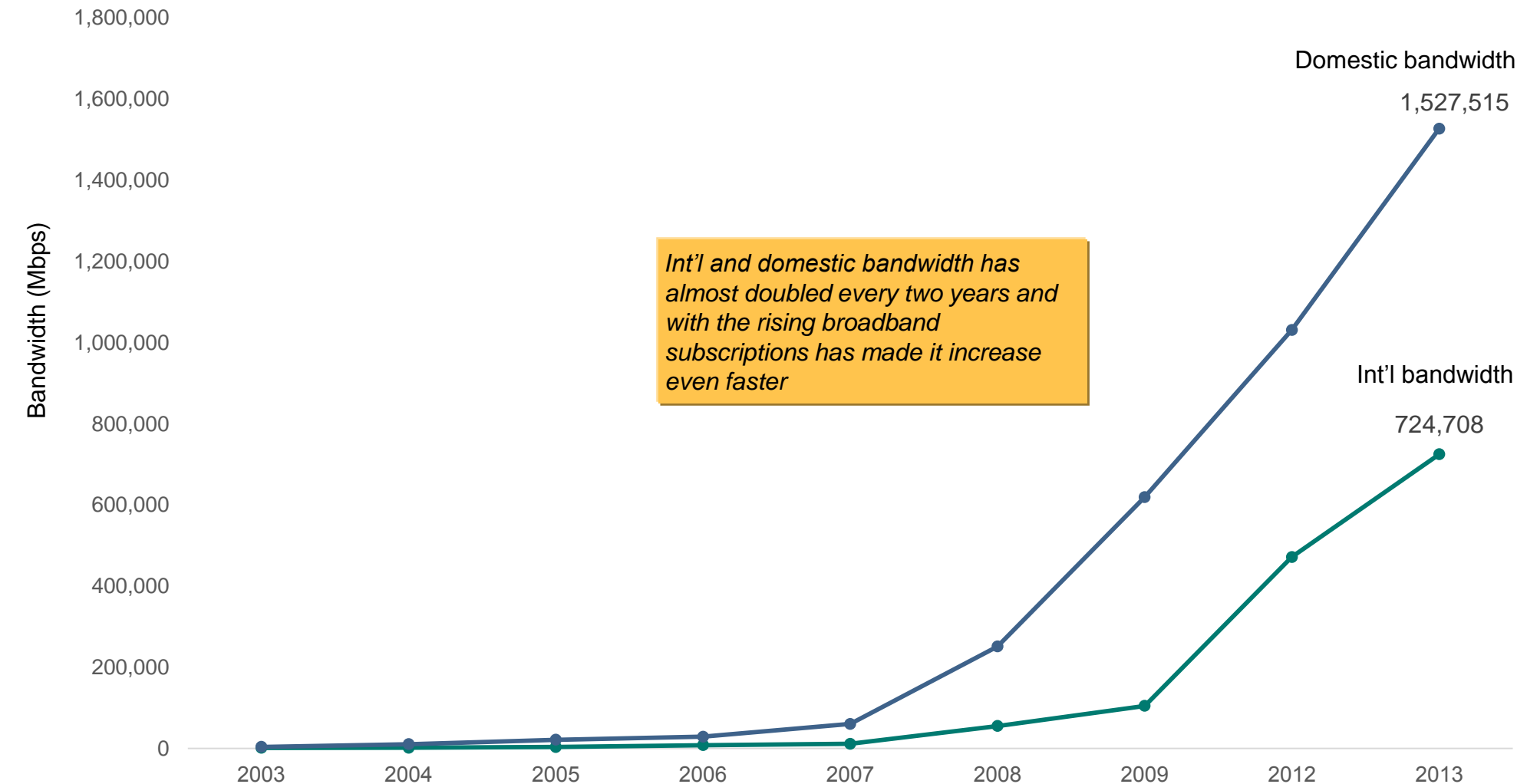
Data communication market has performed well with growth of 12% p.a. over the last 3 years



2 Data communication:

Int'l bandwidth for the whole country is 0.7Tbps while domestic is close to 1.55Tbps which both of them grew 50% last year

NIX and IIG bandwidth monitor 2008-2013

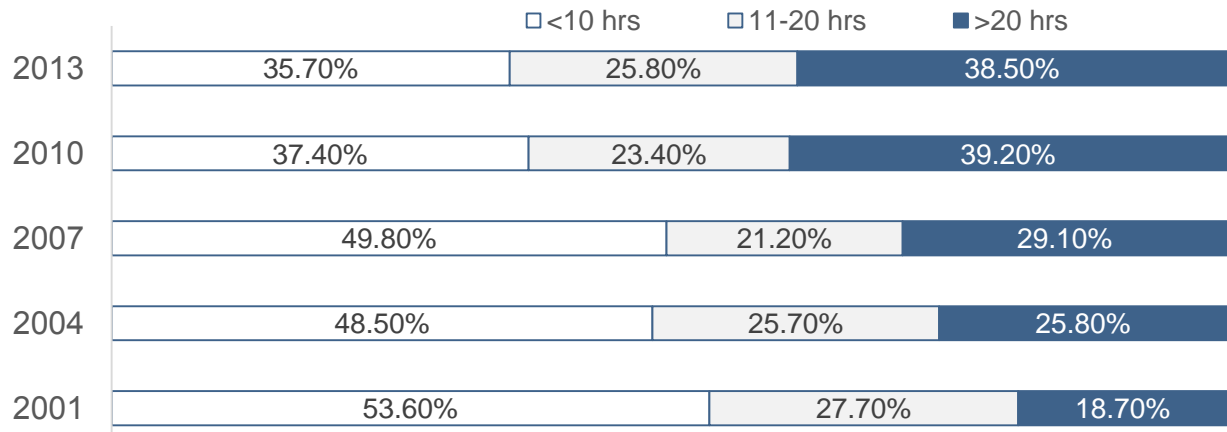


2 Data communication:

...majorly driven by internet usage behavior, the rising internet BB subscriptions, and baht/kbps competition offering from ISPs

Internet usage behavior

Thai people average online spending time per week is increasing with content heavy usage in social media site/apps



Source: Thailand Internet Profile, MICT



18.5 Million

- Thailand is world 6th Facebook users with growth of 28% last year while BKK becomes the world 1st Facebook city



18 Million

- Thailand has second most Line users in the world following Japan



5.3 Million Videos

- Great growth in Thailand, and is now up to 630,000 channels within the nation, adding up to 5.3 million videos uploaded by Thai users.

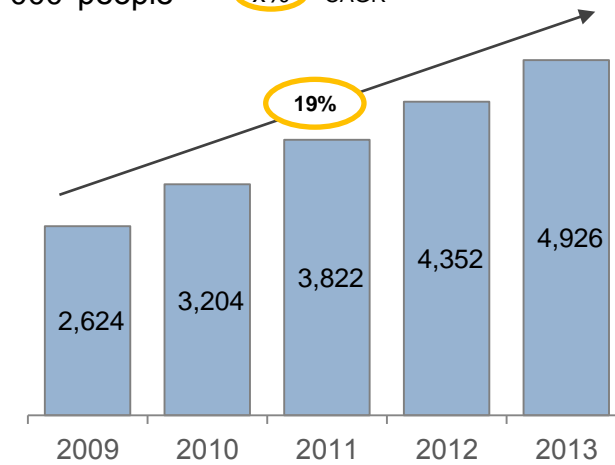


- With the most stellar growth in Thailand in the past year, Instagram is now up to 600,000 users in the country, up from 150,000 this time last year

Thailand Broadband Internet Subscribers

'000' people

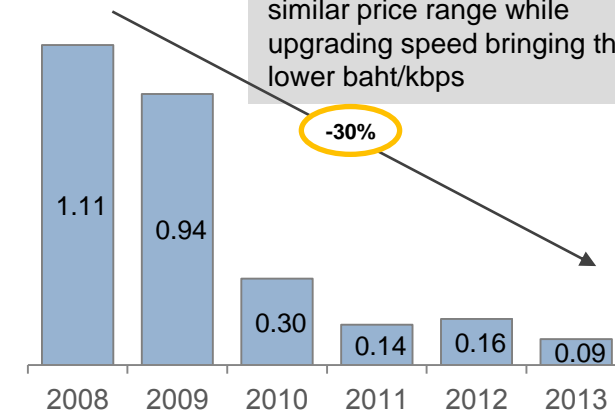
x% CAGR



Source: NBTC NECTEC and Bridge analysis

Baht/Kbps

Pricing competition by keeping similar price range while upgrading speed bringing the lower baht/kbps



Source: NBTC NECTEC and Bridge analysis

2 Data communication:

...and will continue going with supply push factors through technology advancement and operators cable expansion

Operators

Heavy internet bandwidth consumption platform preparation



- Targeted to **increase its FTTx customer base from 1% toward 50%** in 3 years financed from IFF (33.3-46.7 THB bn*) to expand FTTx network



- TOT adds THB2.3bn to budget request for FTTx acceleration. The extra THB2.3 billion is required to move forward with a plan to **deploy 120,000 broadband** access ports on its fibre-to-the-home (FTTH/FTTx) network this year



- True is spending 20 million baht to build international internet gateway (IIG) infrastructure in Myanmar.



- AIS has drafted a **THB 50 billion investment plan to expand fibre optic and 3G networks** this year and part of the budget will be used to revive AIS' dormant fixed broadband service. The company aims to have 500,000 fixed broadband customers by 2015



- CTH revealed plans to roll out fibre-to-the-home (FTTH) connections in selected areas, introduce interactive TV features and begin reselling mobile services, although to date none of the mooted telephony or internet services have been launched
- Plan to **borrow 11 THB bn to invest in its fiber network and provide a triple play services in 2015** but little progress has been achieved
- Already invested 3 THB bn in FTTx and partner with INET to provide internet at 50Mbps for 599 THB/Month in BMA region in early 2014

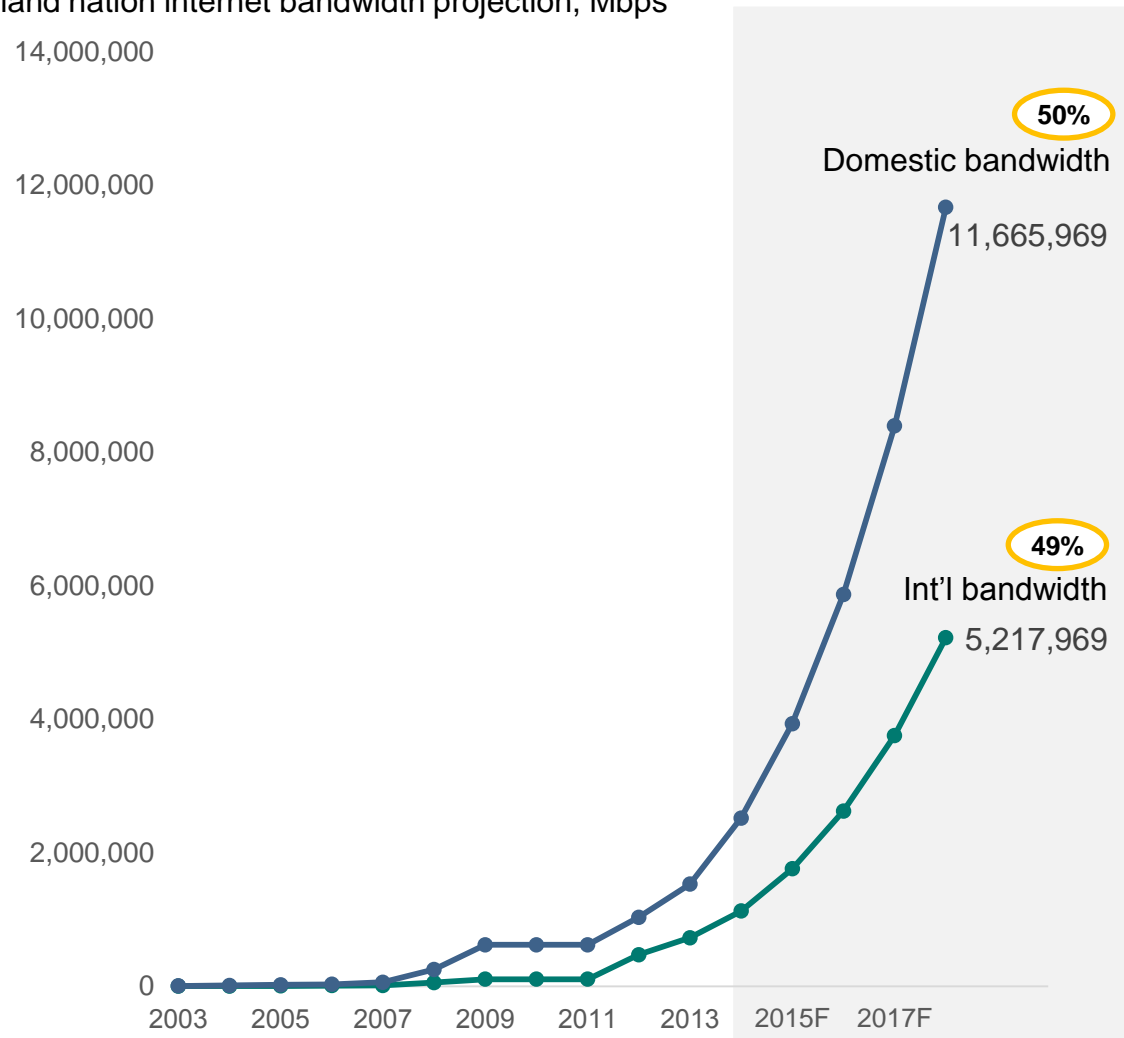


- Expand FTTx coverage across Koh Samui

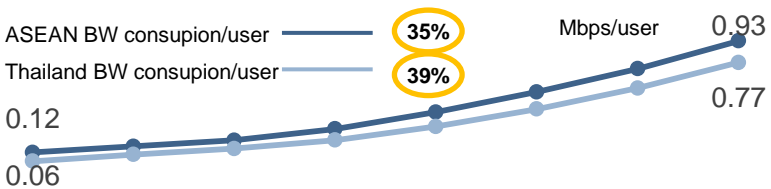
2 Data communication:

Therefore, we believe bandwidth will reach 5Tbps and 11Tbps for Int'l and domestic respectively in 2018

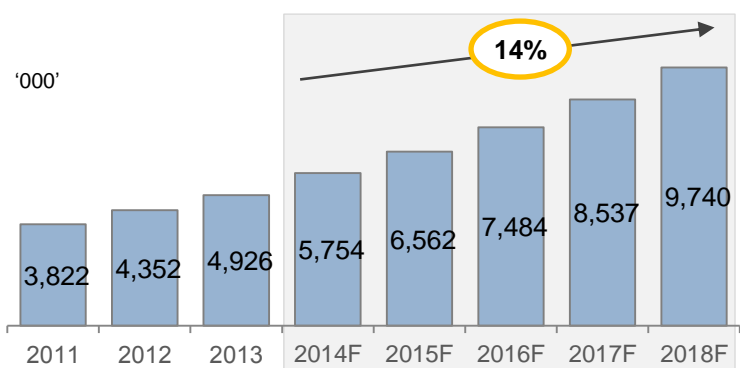
Thailand nation internet bandwidth projection, Mbps



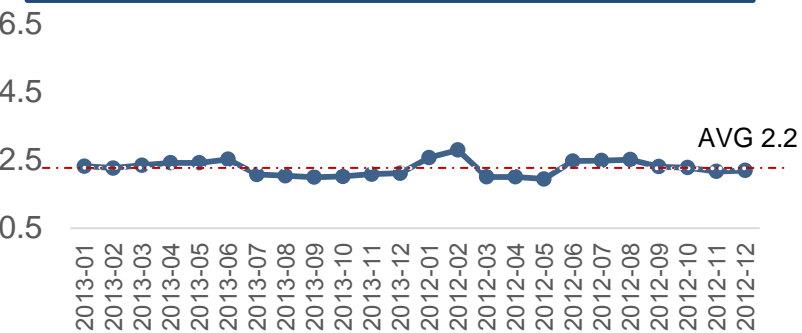
ASEAN-Thailand Int'l BW consumption



Thailand BB users



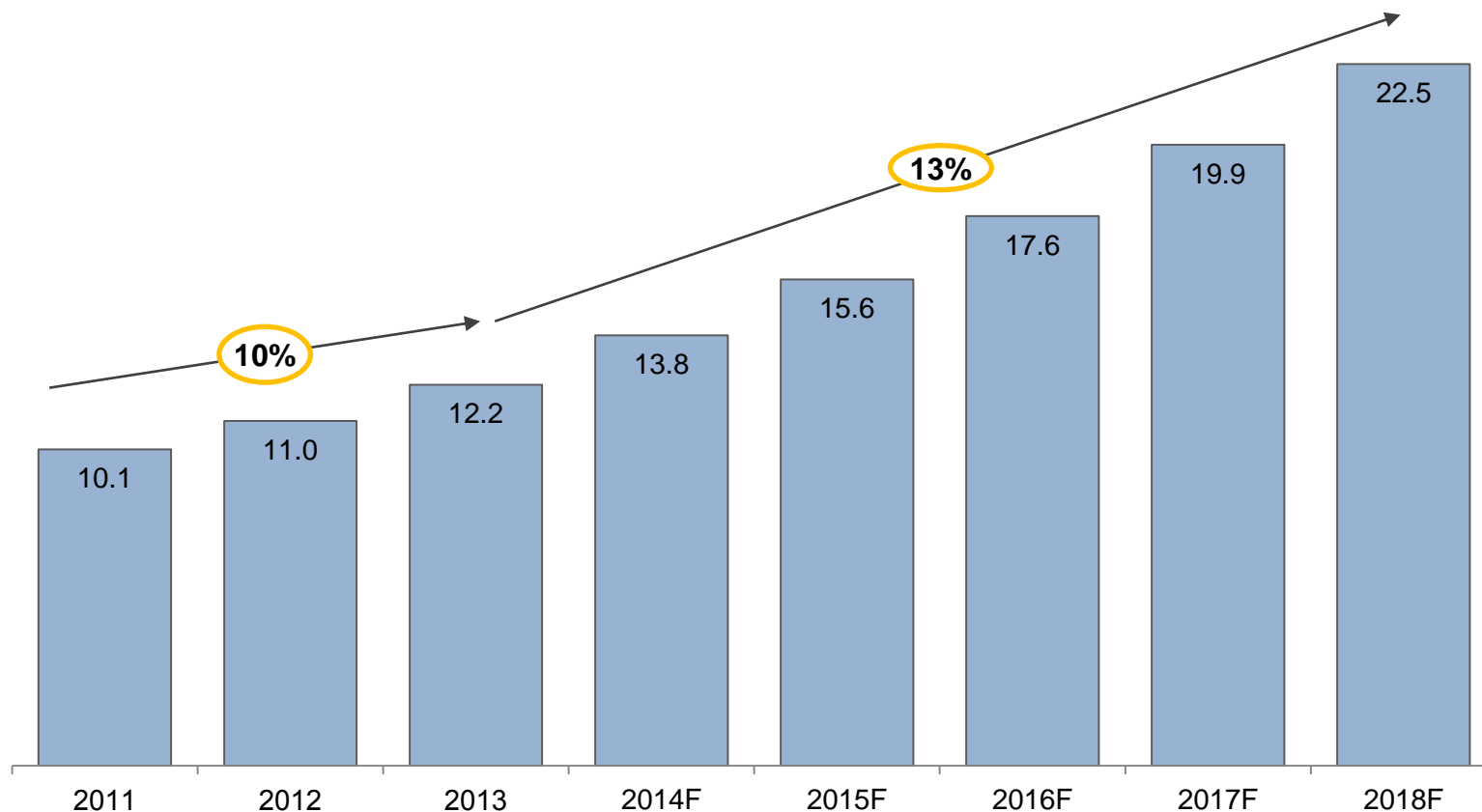
Thailand Dom/Int'l BW ratio



2 Data communication:

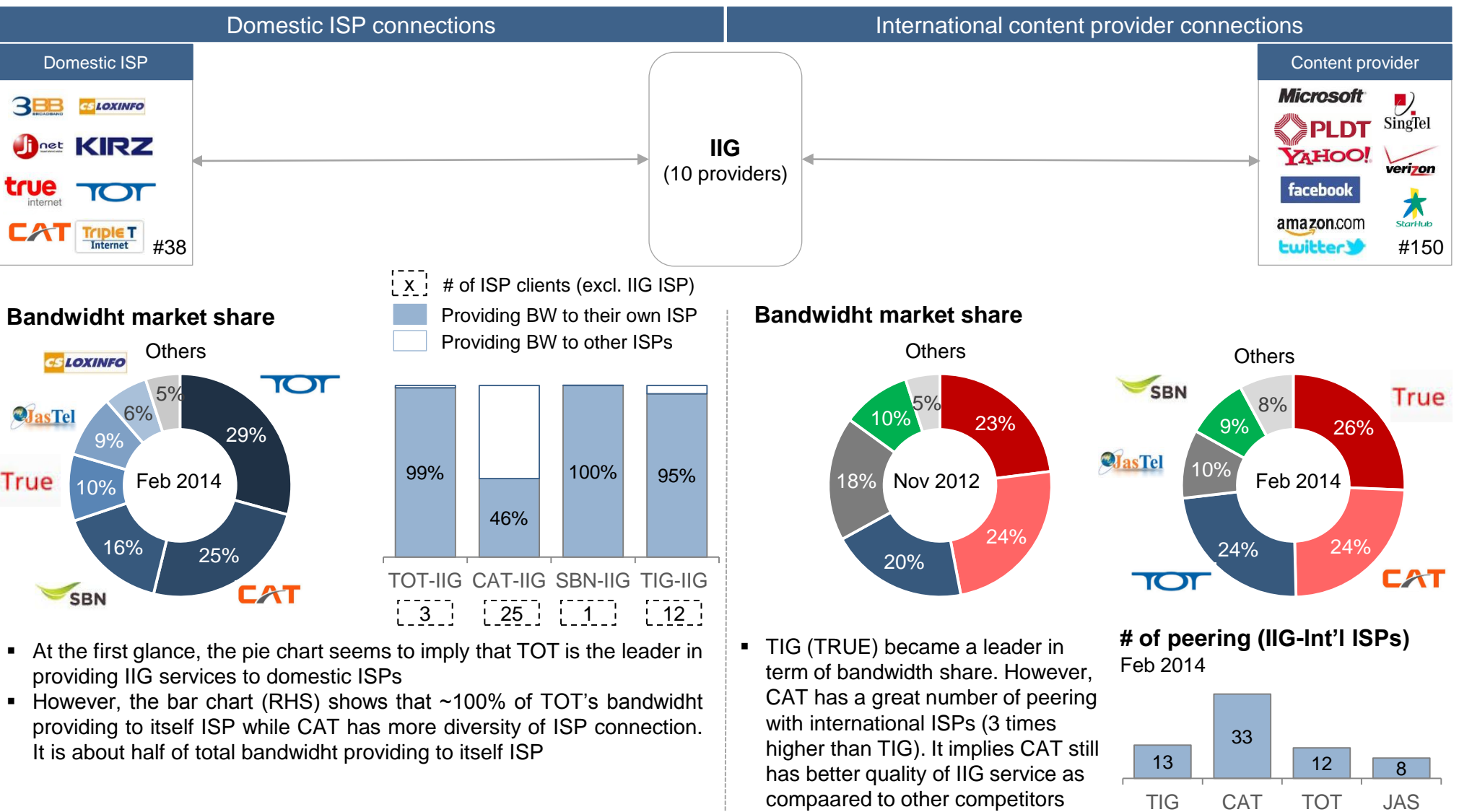
... and market revenue will continue rising with growth of ~13% p.a. to reach 22.5 billion baht in 2018

Gateway market revenue development, billion baht



2 Data communication:

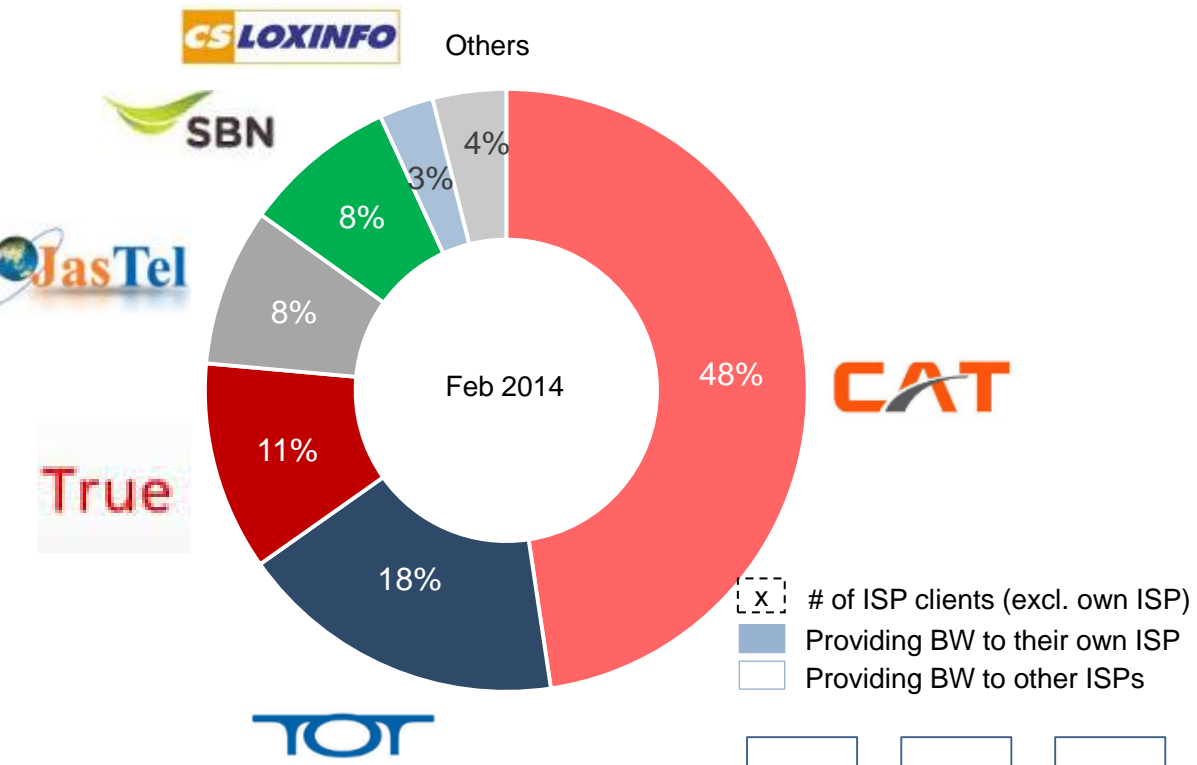
IIG service: CAT is the second largest in term of bandwidth share while being a leader in term of great number of peering connections with ISPs



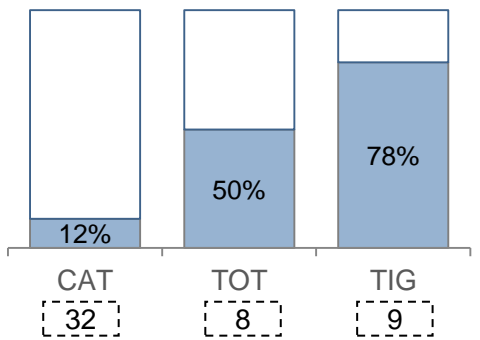
2 Data communication:

NIX service: CAT is holding the largest bandwidth, which almost all domestic ISP connecting with CAT NIX

Domestic exchange bandwidth share (as of Feb 2014)



- There are 38 local ISPs and 32 are connecting with CAT NIX
- While TOT is the second largest, they provide service to their ISP about half and for TIG is similar case but higher

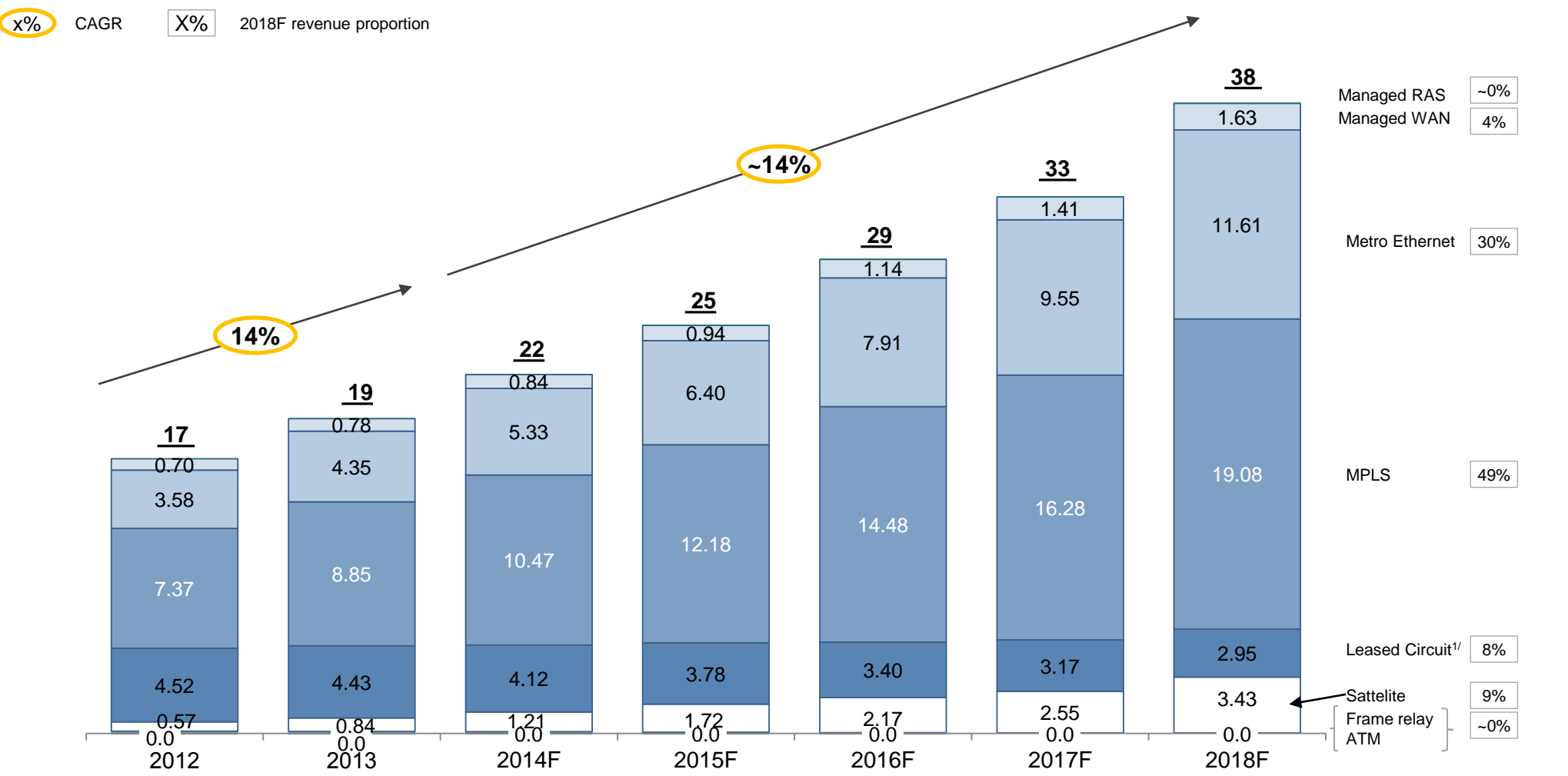


38 ISPs	CAT-IX	TOT-IX	JasTel-IX	TIG-IX (TRUE)
101 Global	Y			
2S1N			Y	
ADC	Y			
A-Net	Y			Y
BeeNet	Y			
CAT ON Net	Y			
CAT-ISP	Y			
CS Loxinfo	Y			
CTH	Y			
DTAC Network	Y	Y		
FTTH	Y			
INET	Y	Y	Y	Y
ISPIO (NIPA)	Y	Y		Y
ISSP	Y			Y
Ji-NET	Y		Y	
KIRZ	Y	Y		Y
KSC	Y	Y		Y
Loxley	Y			Y
MILCOM	Y			
My Telecom	Y			
NetTree	Y			
NTT (TH)	Y			Y
OTARO	Y	Y		
PACNET	Y			
PROEN Internet	Y	Y		Y
SAMART Infonet	Y			
SBN-ISP				
ServeNET	Y			
SIAMDATA	Y	Y		
Symphony-ISP				
TCCT-ISP	Y			
Telstra	Y			
TOT ISP	Y	Y		
Triple T Internet	Y		Y	
True Internet	Y			Y
TSIC				
TT&T	Y			
VPLUSNET	Y			

2 Data communication:

The market has healthy growth driven by MPLS and Metro Ethernet and expected to reach bt38bn in 2018

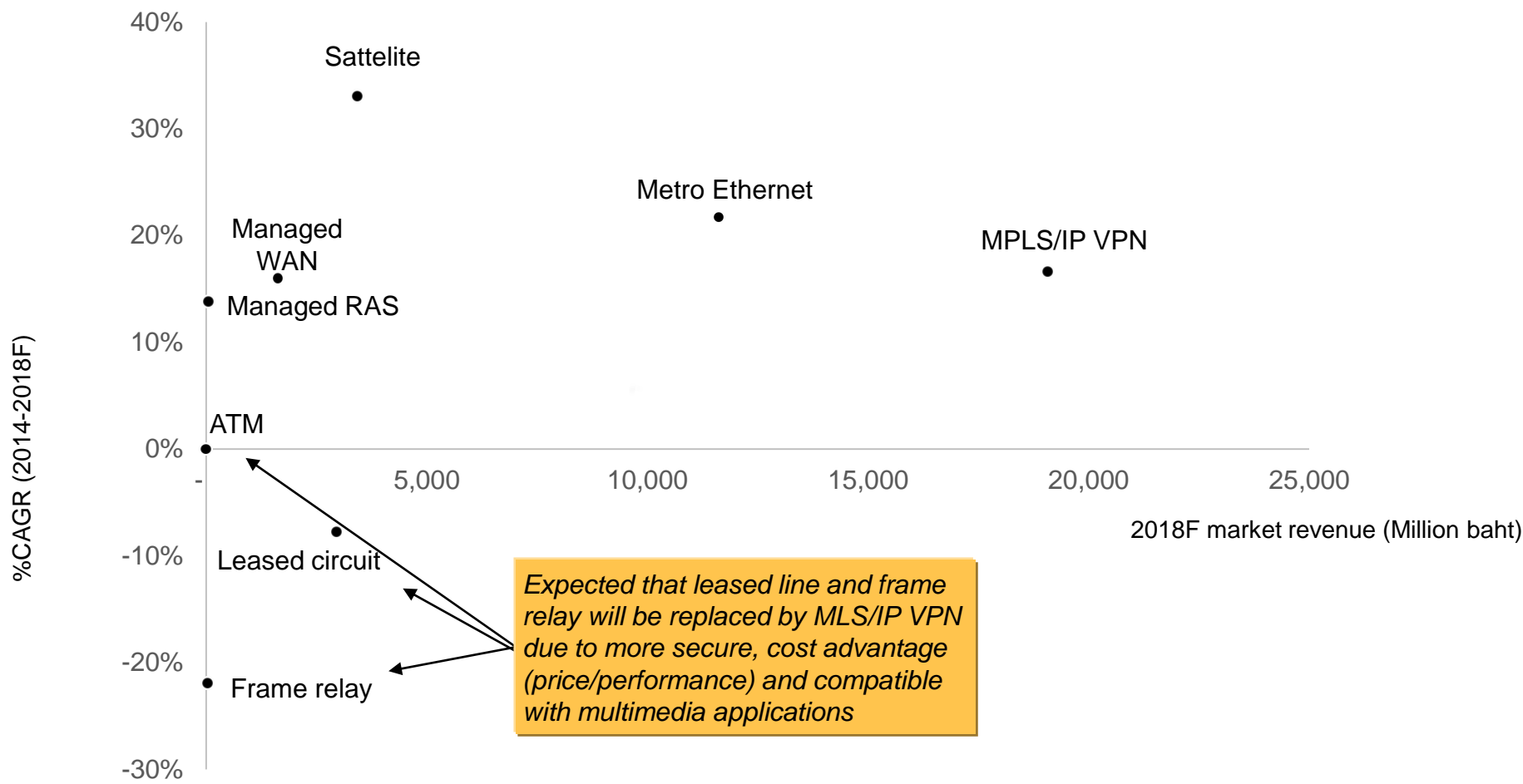
Market revenue development classified by sub market, Billion baht



2 Data communication:

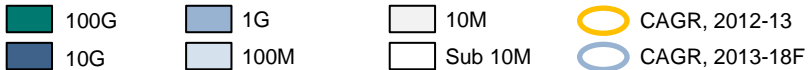
MPLS and Metro Ethernet segments will have promising growth in the next 5 years due to technology migration from leased line, frame relay and ATM

Market revenue vs CAGR (2014-2018F)

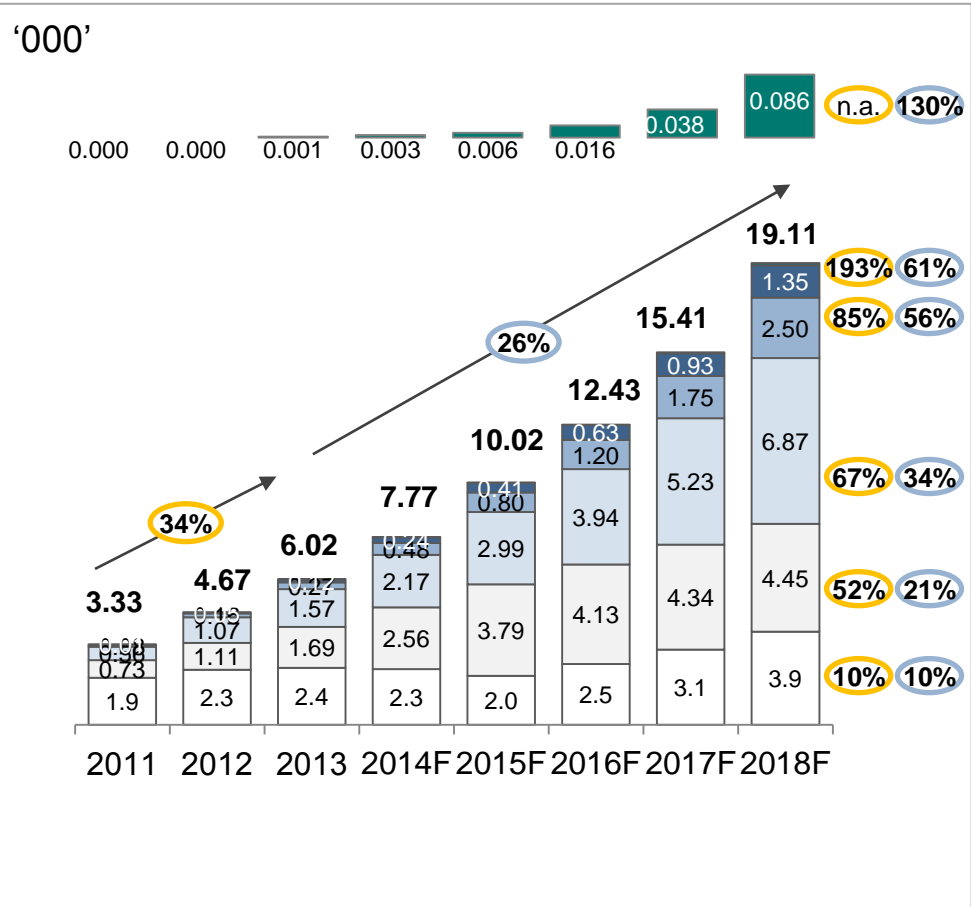


Expected that leased line and frame relay will be replaced by MLS/IP VPN due to more secure, cost advantage (price/performance) and compatible with multimedia applications

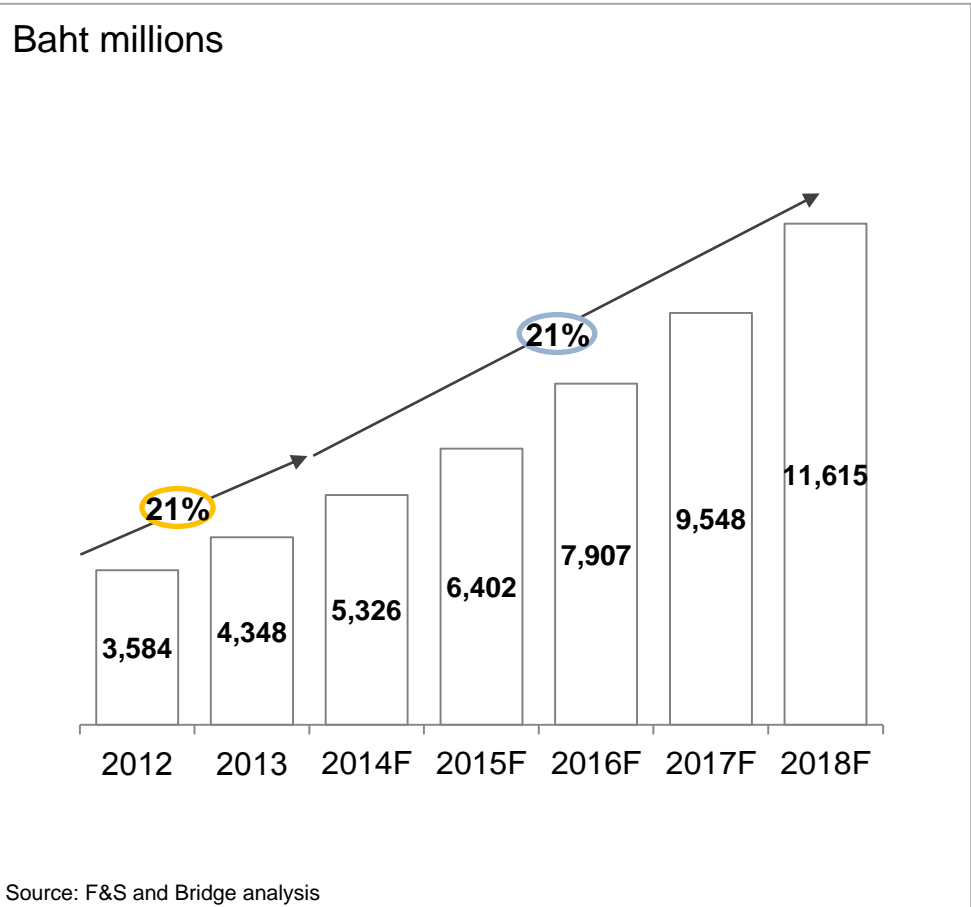
Higher capacity endpoint will drive the Ethernet revenue further



Endpoints by capacity



Ethernet service revenues

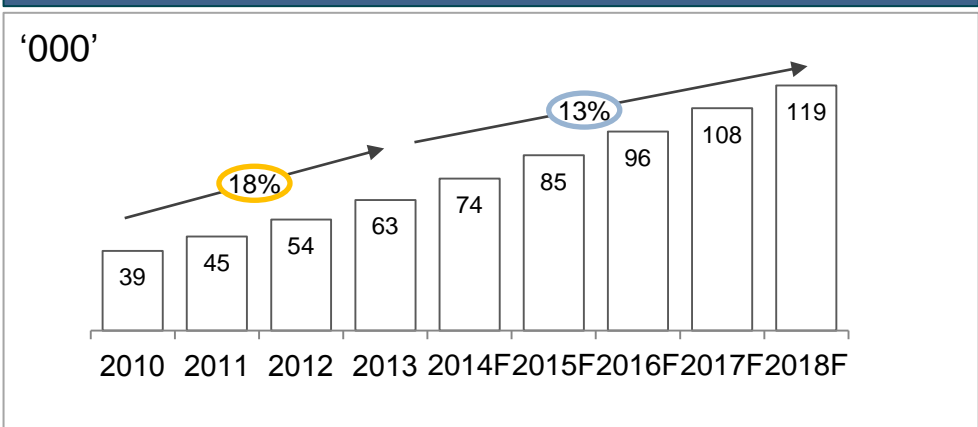


2 Data communication:

High growth in MPLS revenues is due to the increased need for enhanced support for business applications and convergence with MPLS

CAGR, 2012-13
CAGR, 2013-18F

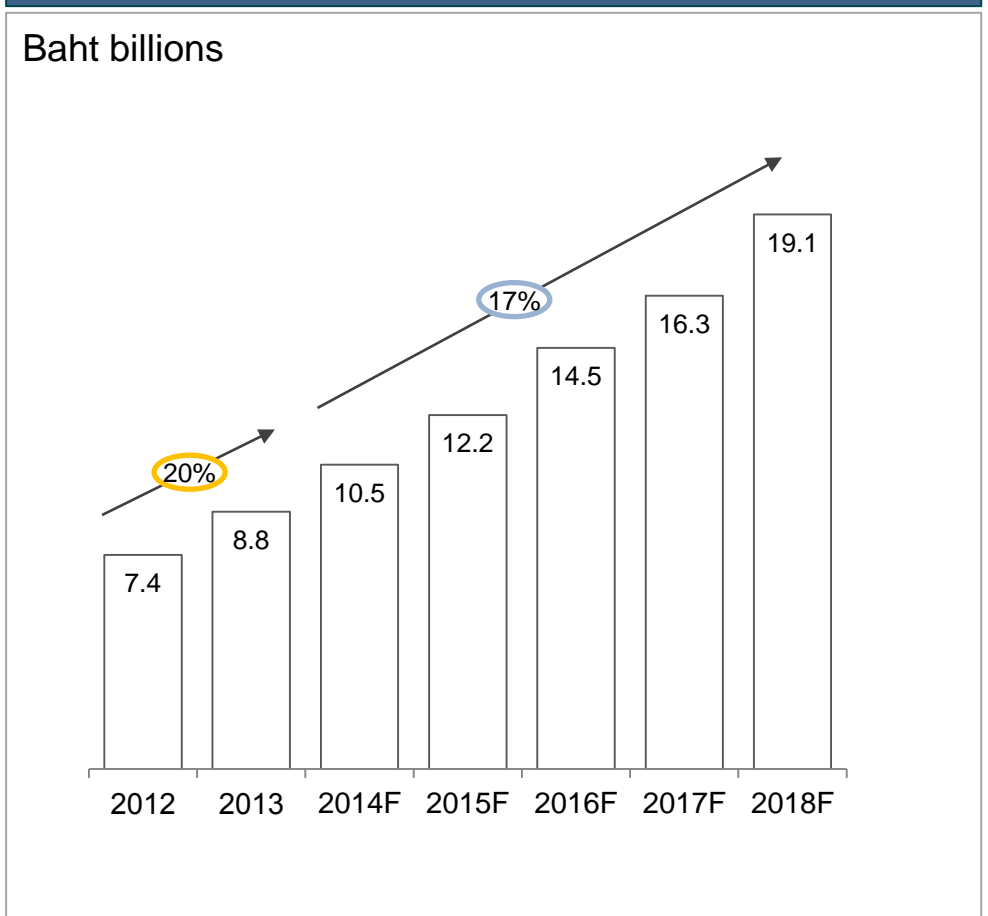
MPLS Connections



Drivers of MPLS

- MPLS is the preferred choice to support business critical operations and convergence
- More cost-effective network that supports voice, video and data
- Class of Service (CoS): provides ability to prioritize applications, such as VoIP
- Automatic redundancy/disaster recovery: create and improve disaster recovery infrastructures

MPLS Revenues



Content

- Overview of Thailand Telecom market
 - Mobile market
 - Data communication
 - International phone service
 - Broadband market
 - ICT service
 - Fixed line

Content

- Int'l phone service
- Market performance and outlook
- Competitive landscape

3 Int'l phone service:

Understanding and foreseeing key market drivers help operators act properly



3 Int'l phone service:
Overall market experienced limited growth of 1.5% and calling card showed poor performance

92%

GDP growth rate

Year	GDP growth rate (%)
2011	11.6
2012	11.8
2013	12.1

Trend line: 2.4%

Calling card

Baht billion

Year	Number of tourists (billion Baht)
2009	1.1
2010	1.2
2011	1.2
2012	1.2
2013	1.1

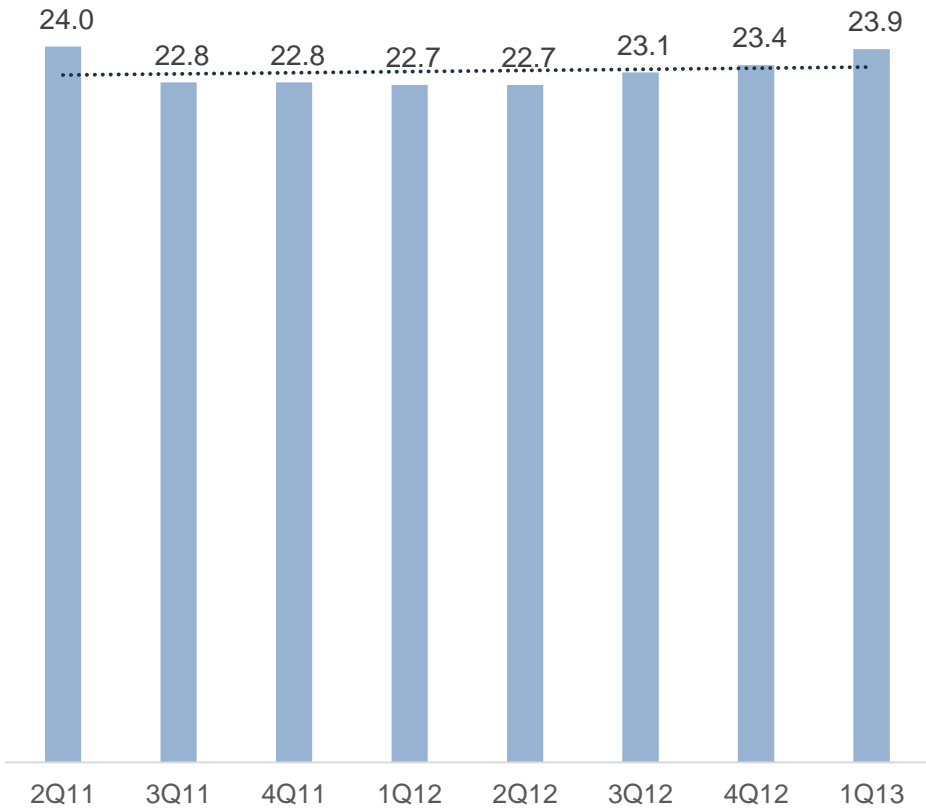
x%	CAGR	x%	2013 revenue cascade (%)
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3 Int'l phone service:

In overall average minute price has been more stable after the price competition in the past

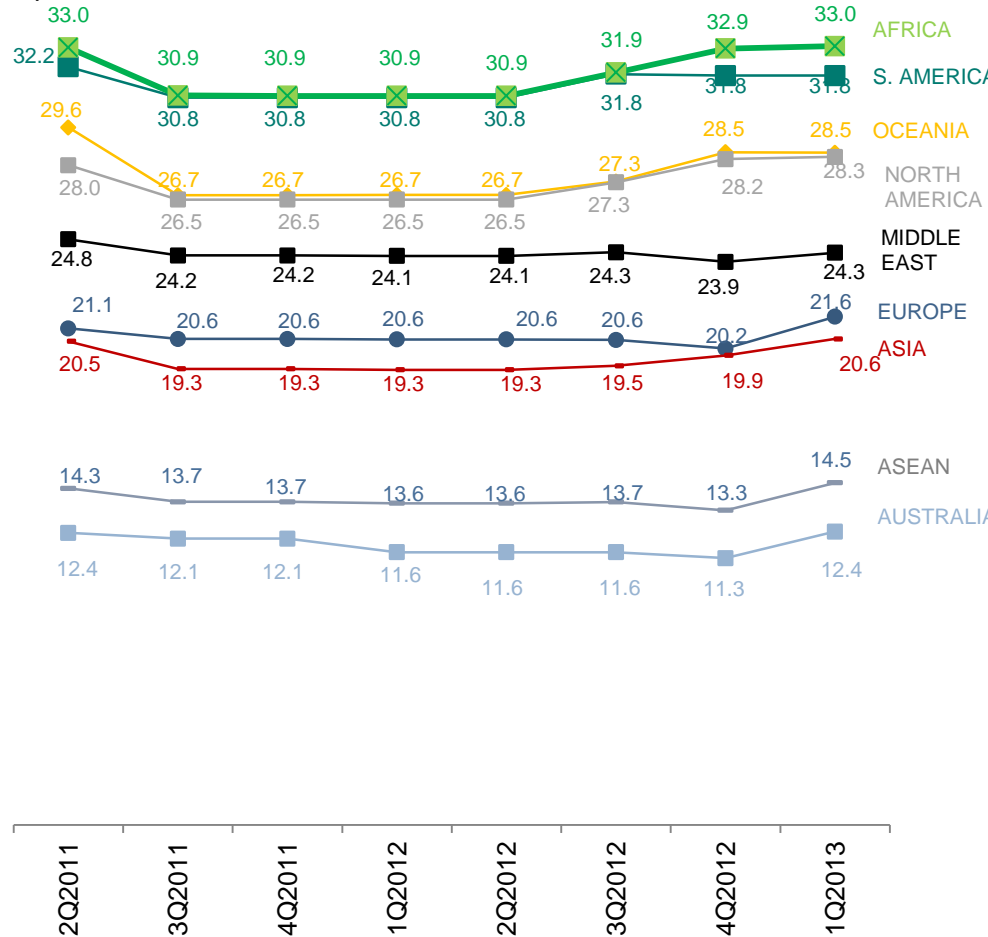
Average minute price

Baht per minute



Average minute price classified by destination

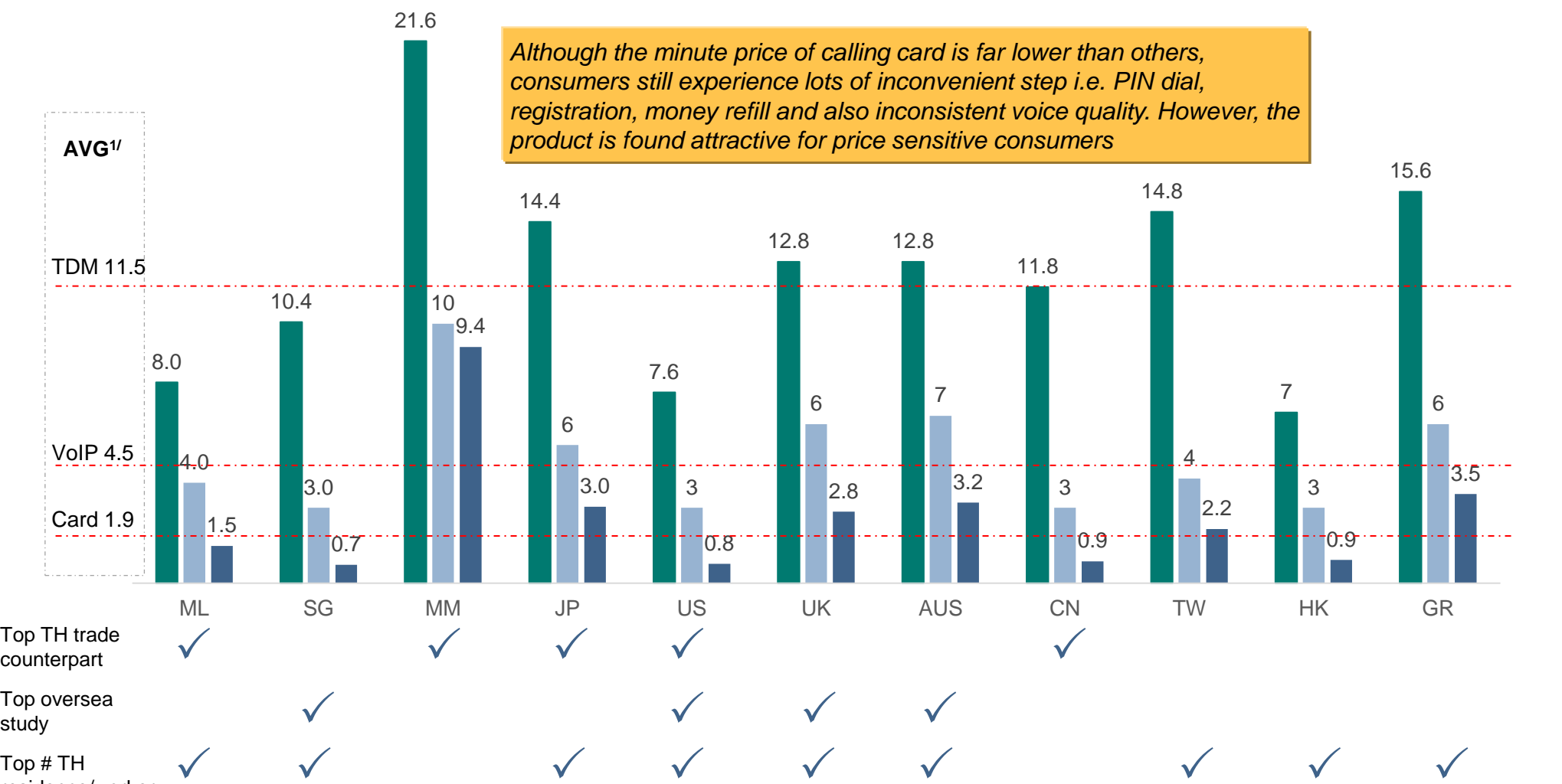
Baht per minute



3 Int'l phone service:

Comparing minute charge across top calling destinations, one of key advantages of calling card is relatively lower minute price followed by VoIP

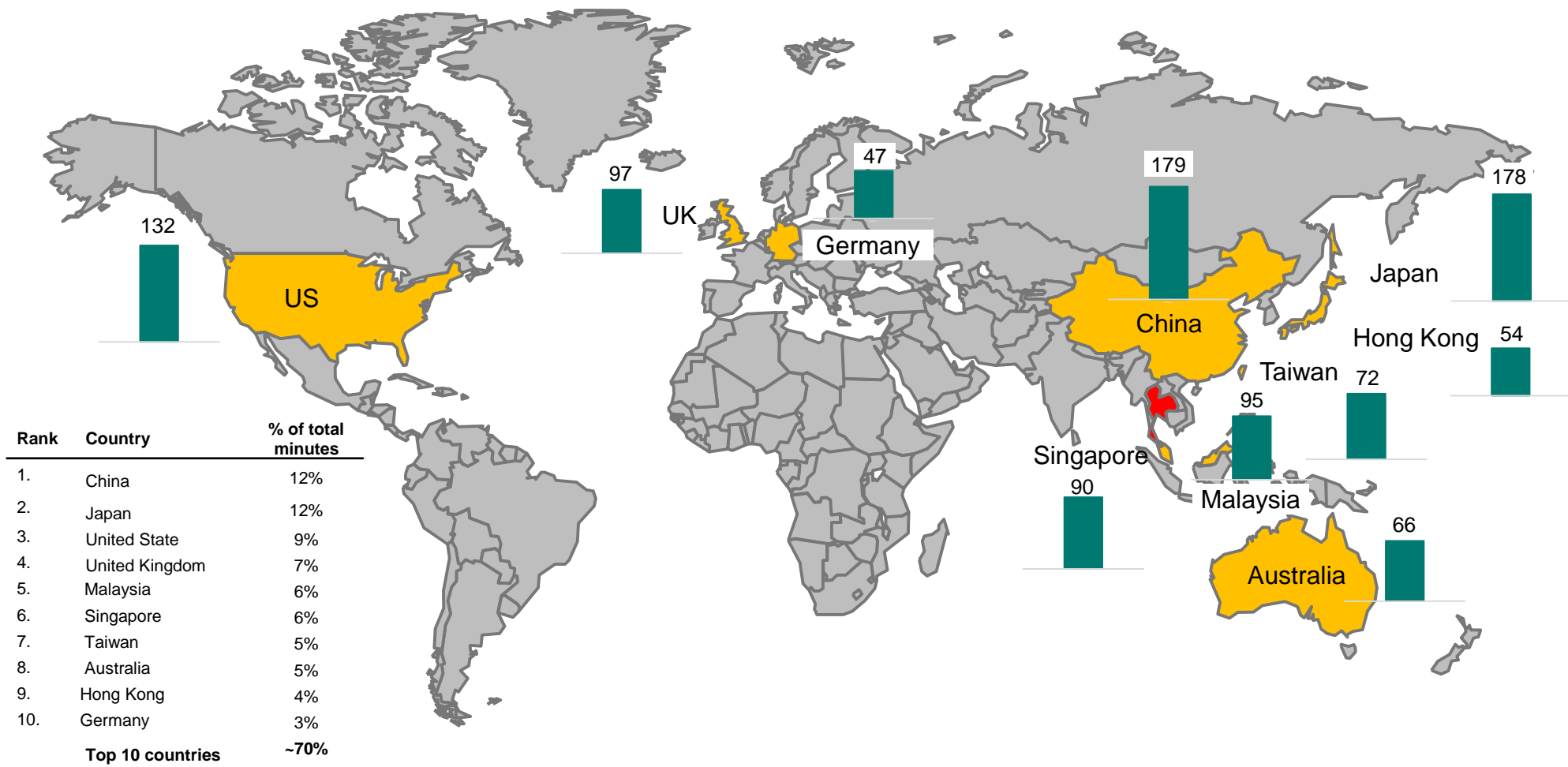
AVG. minute charge comparison across key Thailand calling destinations, baht per minute (excl. VAT basis) TDM VoIP Card^{2/}



3 Int'l phone service:

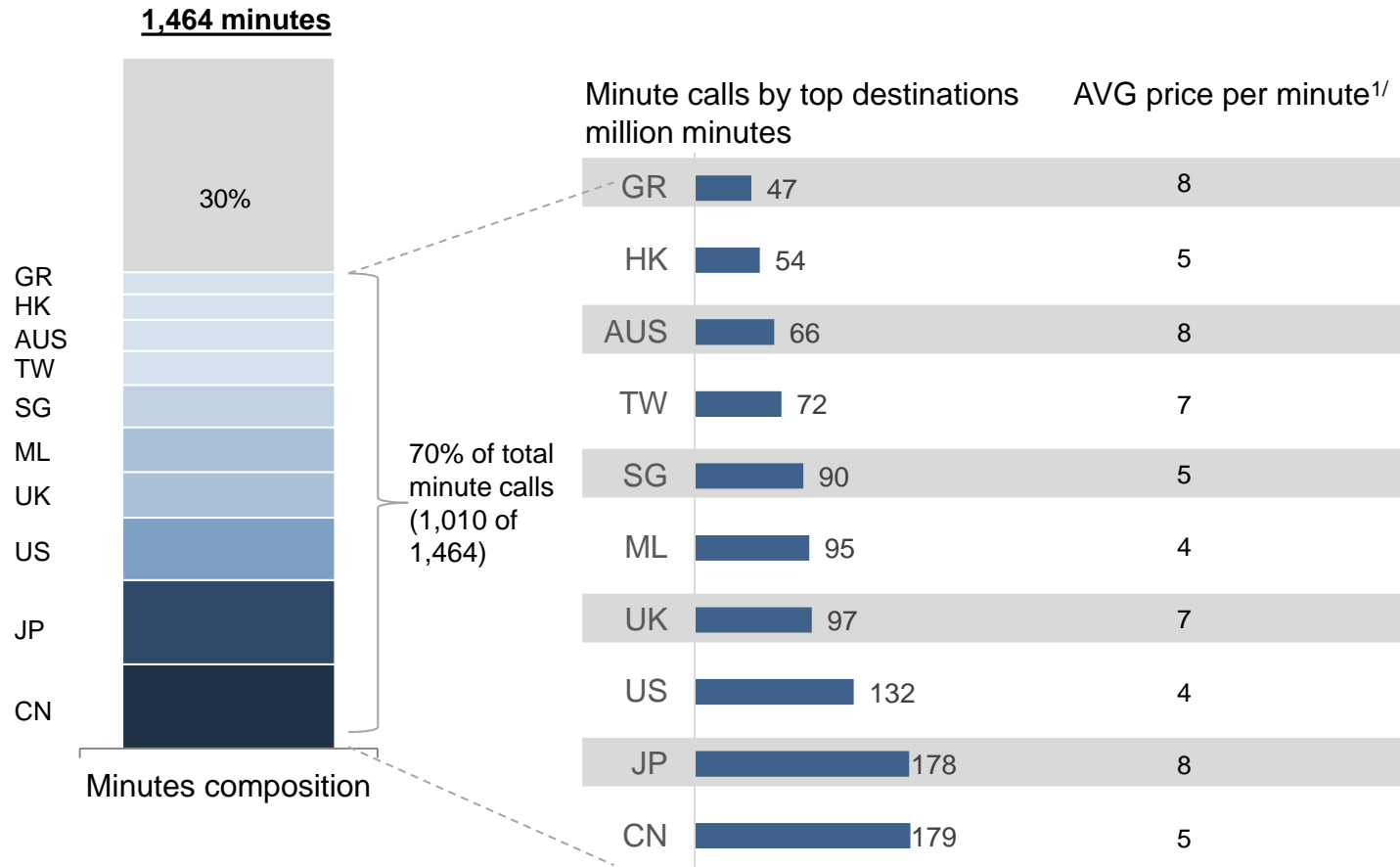
Thailand calling destinations scatters around the world, and ~70% of total 1,464 million minutes concentrated upon top 10 countries

2013 Thailand international out-going minutes by top 10 destinations, million minutes

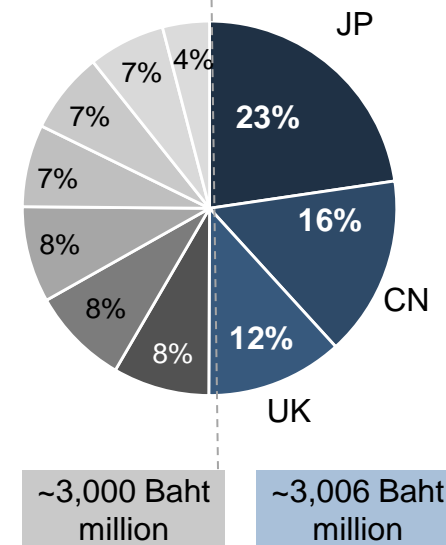


3 **Int'l phone service:** If we convert the calling minutes to revenue, we found the biggest chunk of revenue comes from Japan, China and UK accounting for 50% of top 10 countries or ~25-30% of market revenue

2013 Thailand revenue size by top 10 destinations, baht million



About half of top 10 destinations revenue comes from only 3 countries, JP, CN and UK



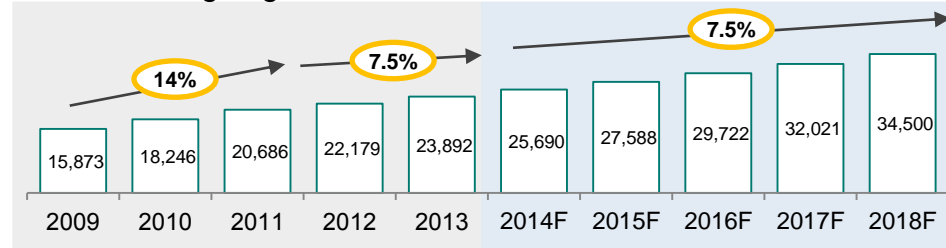
3 Int'l phone service:

The market has cooled down in the last couple years and expected to grow similar pace over the next 5 years, which is in line with ASEAN

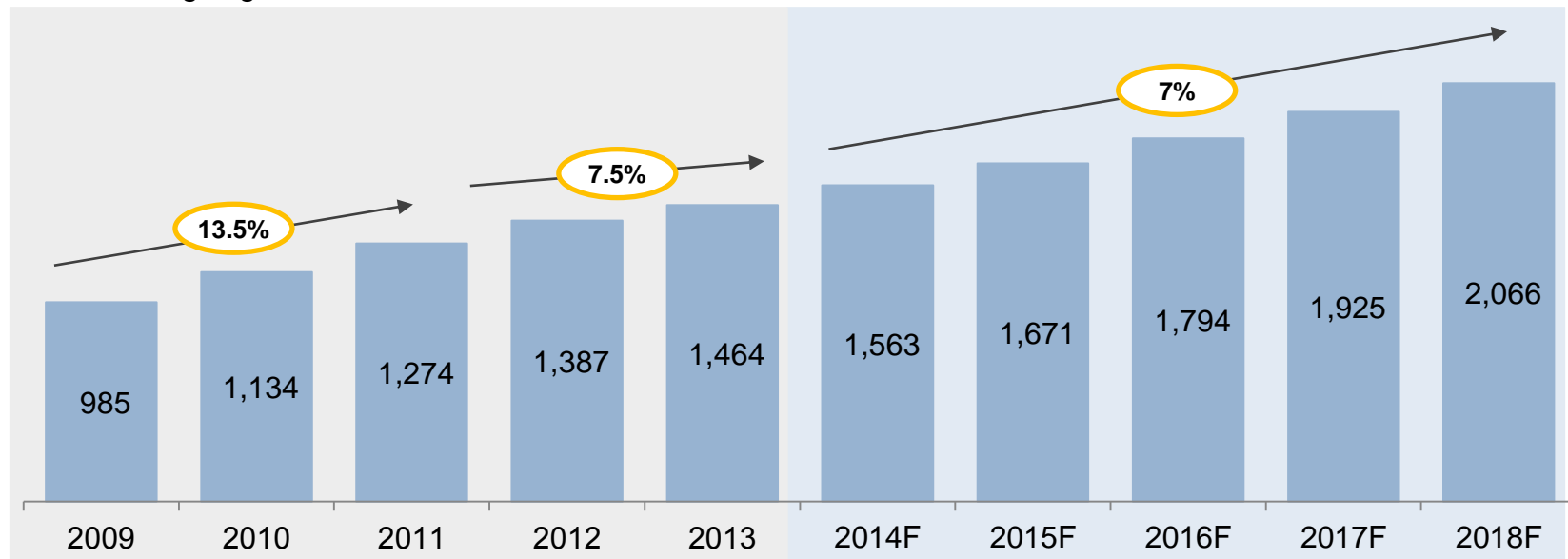
International minute Thailand vs ASEAN market

x% CAGR

ASEAN out-going minutes, million minutes



Thailand out-going minutes, million minutes



Mobile originated mins as % of total mins

N.A.

N.A.

93%

92%

92%

91%

91%

90%

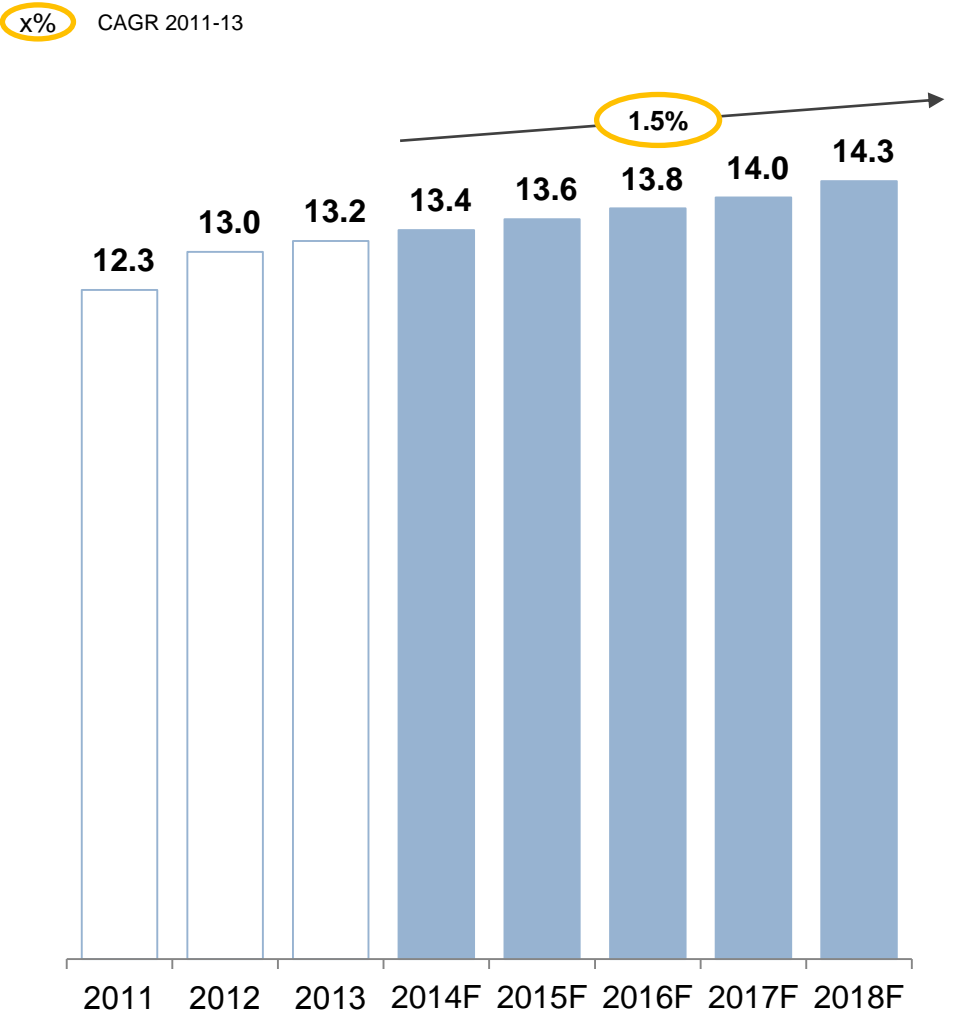
90%

90%

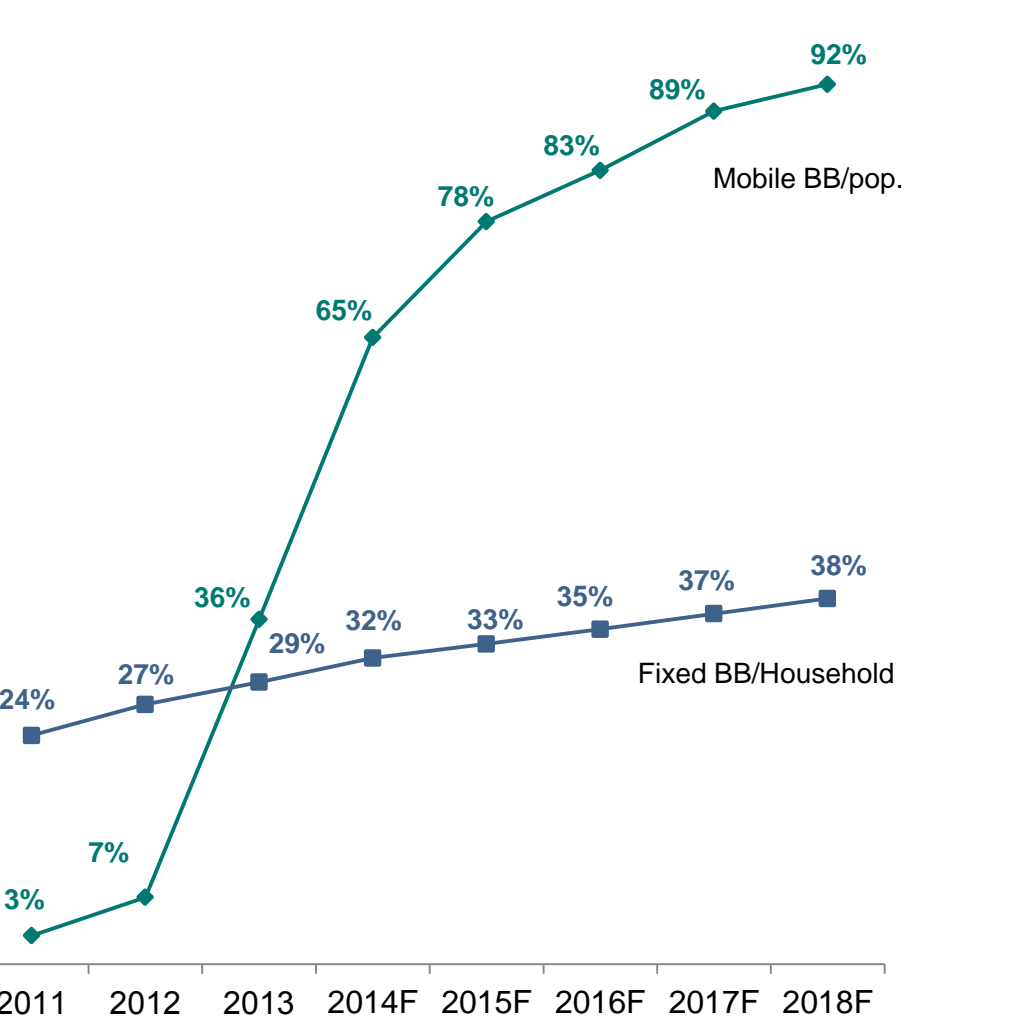
3 Int'l phone service:

Market tends to have limited growth due to the arrival of substitute service which we would see further price cut in traffic calling destinations

Thailand international phone service revenue forecast



Thailand fixed BB and mobile BB penetration



3 Int'l phone service:

Multiple key drivers triggered the shift to OTT calling applications which those OTT allow users to make a free/low-cost call directly

Drives	Key leading indicators
A Technology readiness	<ul style="list-style-type: none">▪ 3G or better broadband network which enables accessibility and speed of OTT communication▪ Smartphone penetration at high enough level to allow wide distribution if OTT apps
B Cost incentive to adopt OTT	<ul style="list-style-type: none">▪ Certain cost of international phone service▪ Almost zero cost of the switch to OTT application
C Social propensity to adopt OTT	<ul style="list-style-type: none">▪ Social network effect
D Strength of OTT alternatives	<ul style="list-style-type: none">▪ Significant market penetration by a given OTT app▪ Features advantage such as Webex screen sharing, recorder



Content

- Int'l phone service

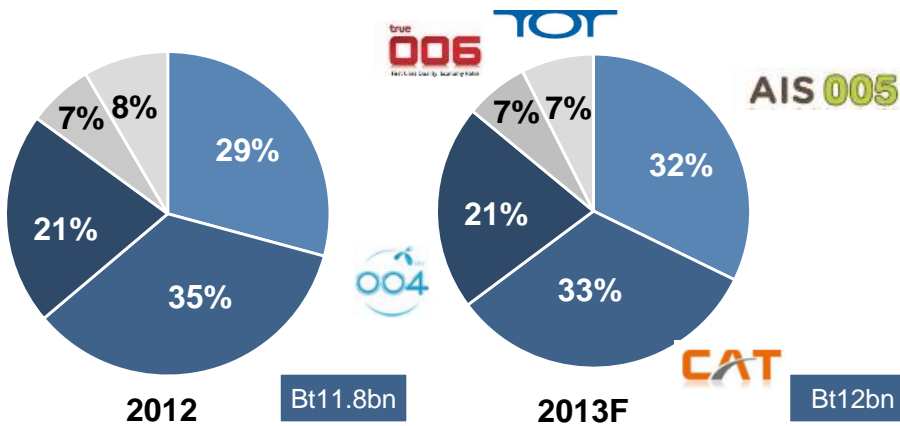
- Market performance and outlook

- Competitive landscape

3 Int'l phone service:

Market structure is quite consolidated with 3 dominant players in which CAT is the market leader followed by AIS

Market share by revenue (TDM+VoIP)



Key findings

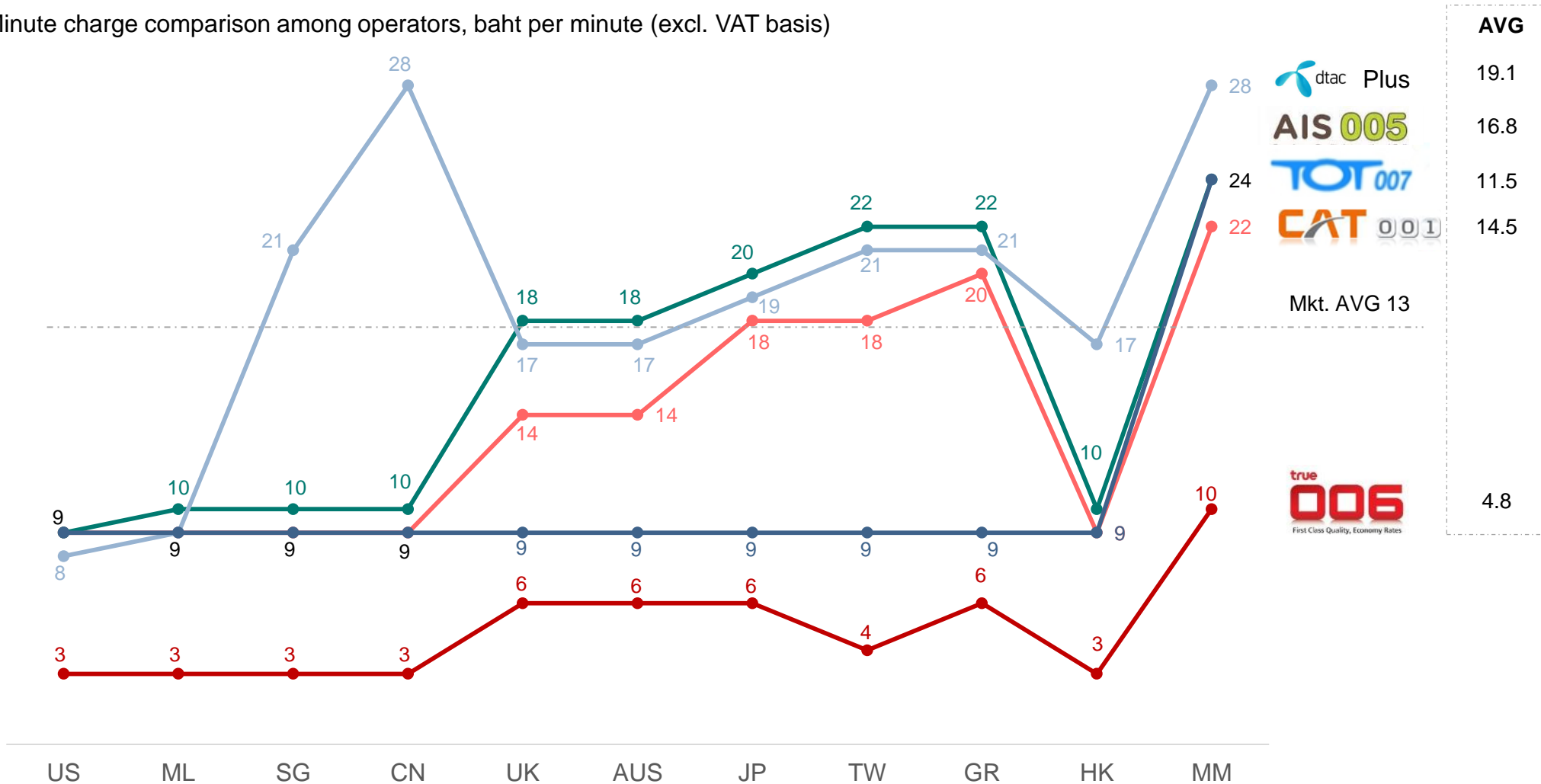
- CAT is the market leader providing full range of services. However, its share has deteriorated while AIN put more aggressive strategy and leverage its large mobile customer base to acquire more share
- TRUE 006 obviously deploy pricing strategy to penetrate market as its average price of top calling destinations is almost 3 times lower than market average. Also, they capture the trend by launching OTT (Net talk)/ However, it is not-well recognized
- TOT seems to maintain its share which we have not seen the strong commitment to penetrate market

Products line-up across service providers

	TDM		VoIP (access code)		Calling card	Others
	Fixed	Mobile	Fixed	Mobile		
	X	9/240 *	X	3/230 *	0.75/230 *	X
	8/240 *		3/240 *	3/240 *	X	X
	3/240 *	3/240 *	X	X	1/200 *	OTT
	9/232	9/232	3/232	3/232	9/232	
	9/213	9/213	3/153	3/153	X	

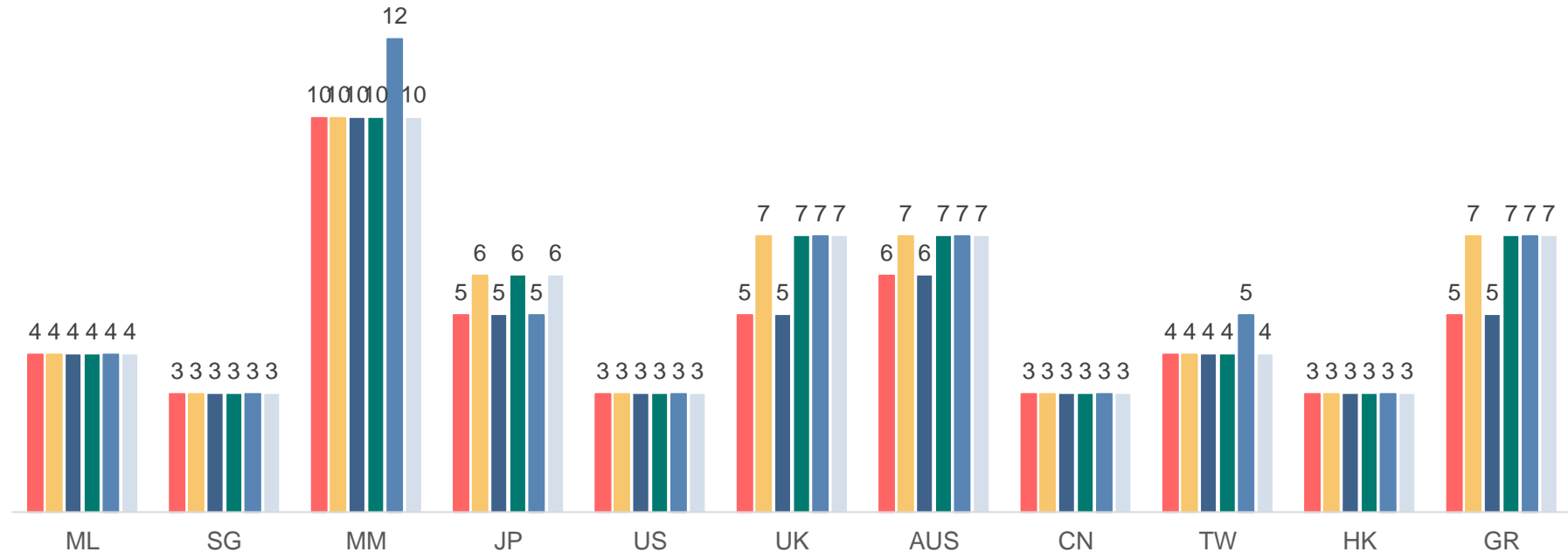
3 Int'l phone service: TDM operators set different pricing across key calling destinations in which TRUE 006 employs economy price strategy while CAT is in the middle range

Minute charge comparison among operators, baht per minute (excl. VAT basis)



3 *Int'l phone service:* Every operators use VoIP based service as a fighting brand to compete one another in which CAT and TOT offer the lowest price across key destinations

Minute charge comparison among operators, baht per minute (excl. VAT basis)



Baht per min		ML	SG	MM	JP	US	UK	AUS	CN	TW	HK	GR
CAT 009 fixed		4	3	10	5	3	5	6	3	4	3	5
CAT 009 mobile		4	3	10	6	3	7	7	3	4	3	7
TOT 008 (Single rate)		4	3	12	5	3	7	7	3	5	3	7
AIS00500 (Mobile only)		4	3	10	6	3	7	7	3	4	3	7
DTAC 004 fixed		4	3	12	5	3	7	3	5	5	3	7
DTAC 004 mobile		4	3	10	6	3	7	7	3	4	3	7

Source: Operators sites and Bridge analysis

3 Int'l phone service:

The product becomes a commodity which players should avoid price competition and find the way to add value to as-is plain vanilla services

Key trends and ideas for operators to adopt themselves to cope with today's market

Product

- Bundle with relevant company products i.e. fixed broadband or local mobile package
- Product discrimination: Offer different rate of service i.e. off-peak/on-peak hours (only AIS does it currently)

Partnership

- Partner with financial institutions who have large customer base doing overseas business transactions with offshore counterparts
- Partner with overseas education agents i.e. give special rate

Royalty campaign

- Minute collection campaign to build royalty and increase customer switching cost i.e. customer can redeem their international minutes to local minutes

SIM for Tourist

- Low-cost/free SIM for tourist which can call domestically and internationally to steal a share from their home country IR service provider

Content

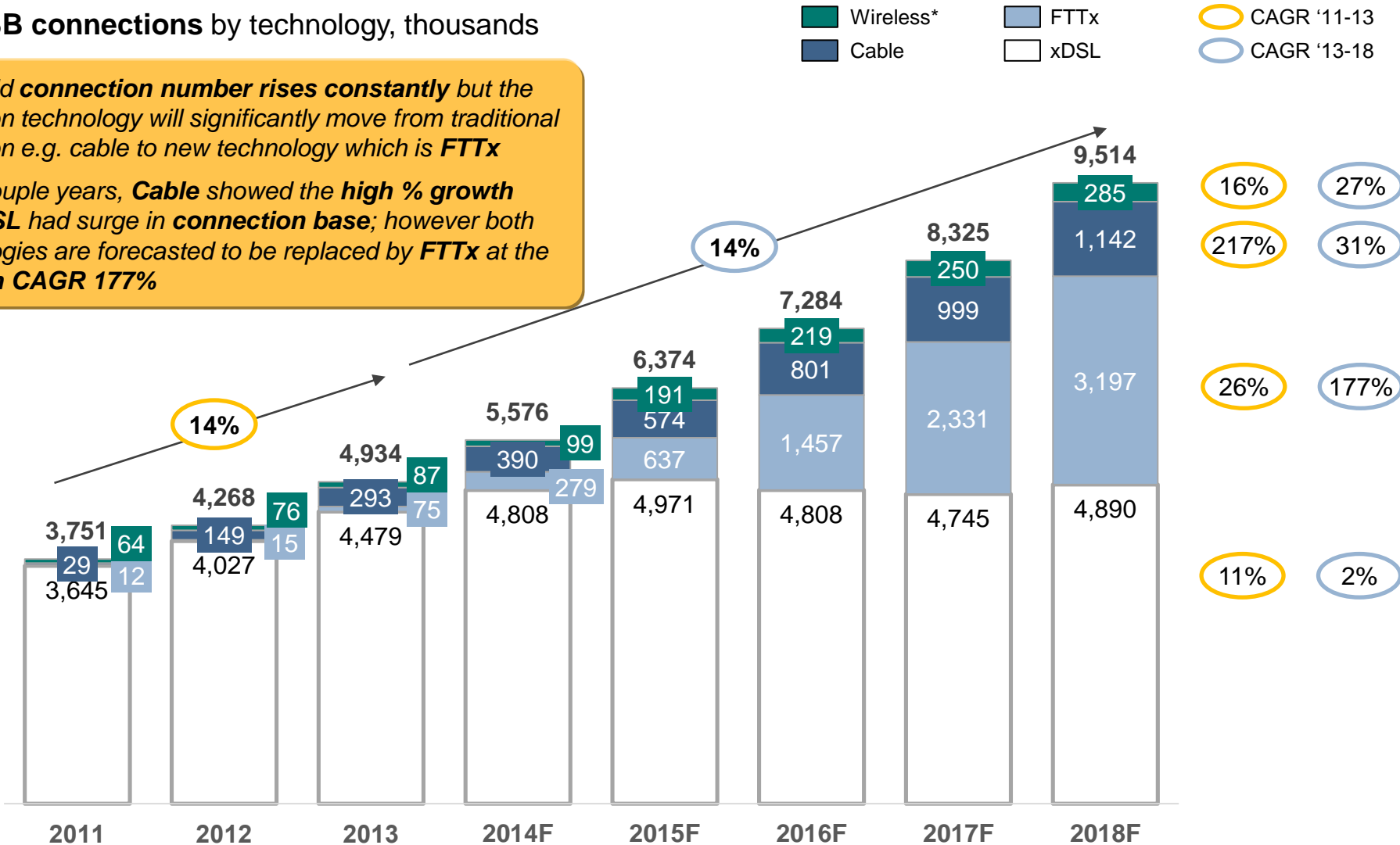
- Overview of Thailand Telecom market
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 - Fixed line

2 Broadband:

FTTx will replace cable and xDSL technologies at projected ~3.2 mill connections in 2018

Household BB connections by technology, thousands

- Household **connection number rises constantly** but the connection technology will significantly move from traditional connection e.g. cable to new technology which is **FTTx**
- In past couple years, **Cable** showed the **high % growth** while **xDSL** had surge in **connection base**; however both techonologies are forecasted to be replaced by **FTTx** at the very high CAGR 177%



4 Broadband:

... in relation to subscriber number, household dominates the largest portion of retail BB market size

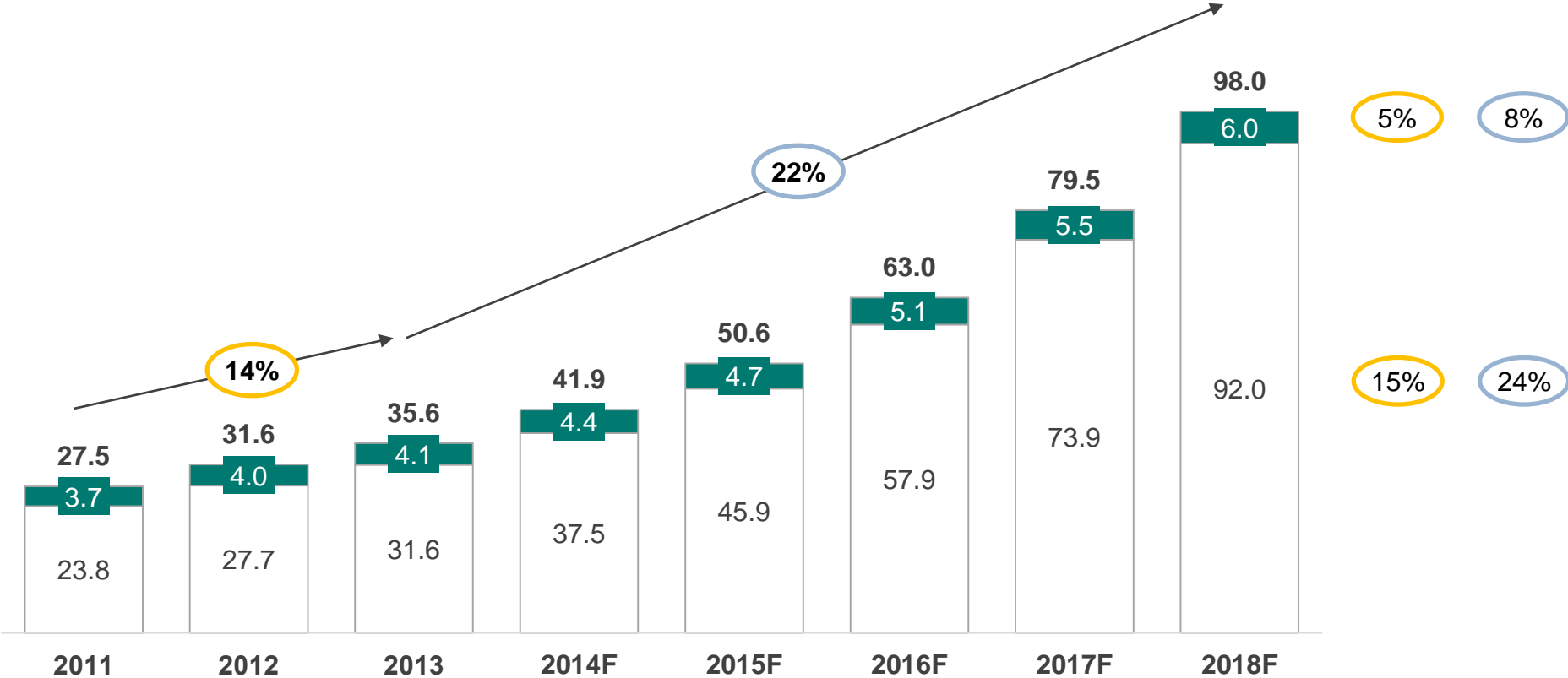
Retail Broadband market size, THB billions

Enterprise Household

CAGR '11-13

CAGR '13-18

Retail BB market size continually increases and **Household segment** is still the **majority** of market value in accordance with a great number of household subscribers even **HH ARPU** is **the lowest** among all 3 segments

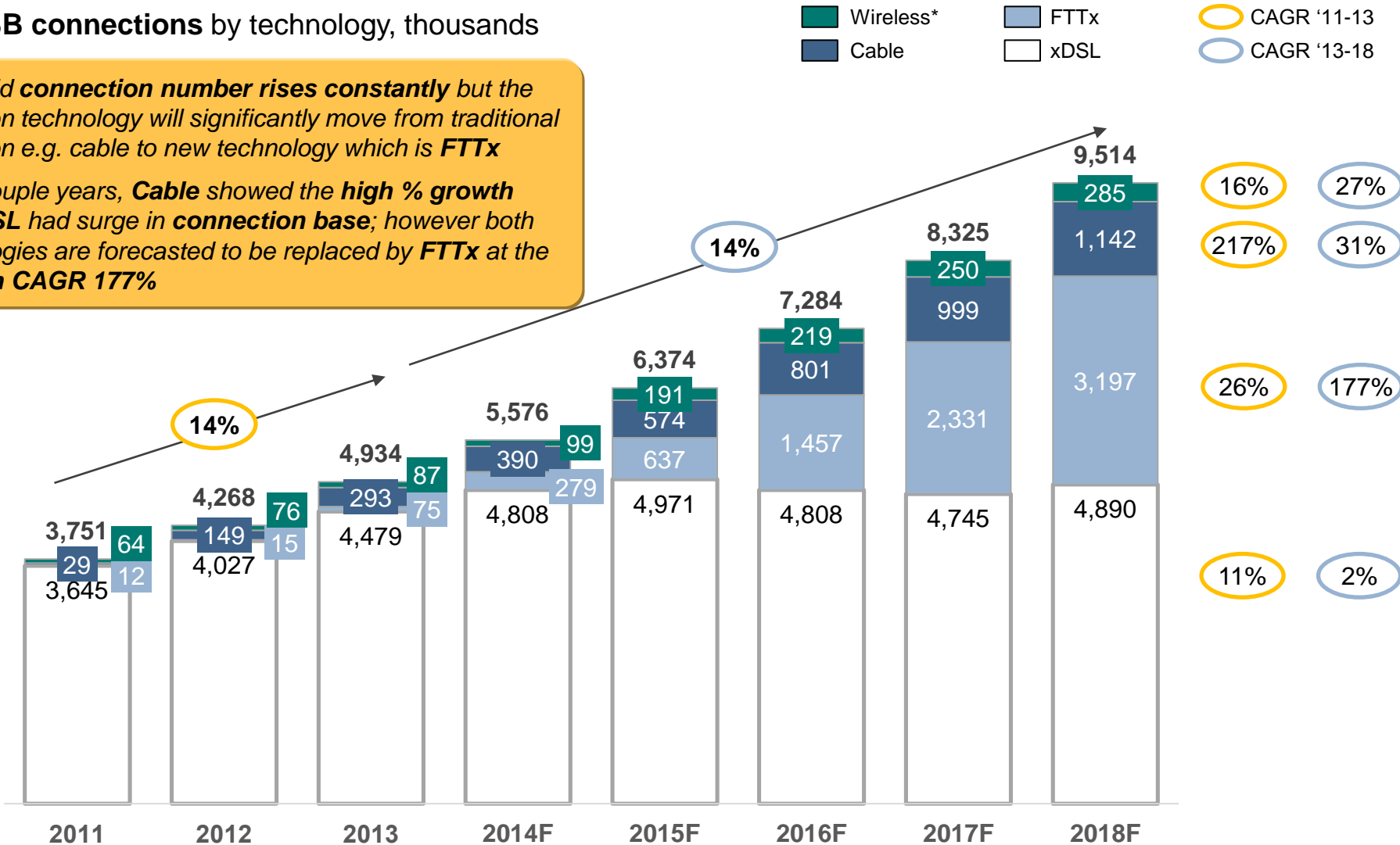


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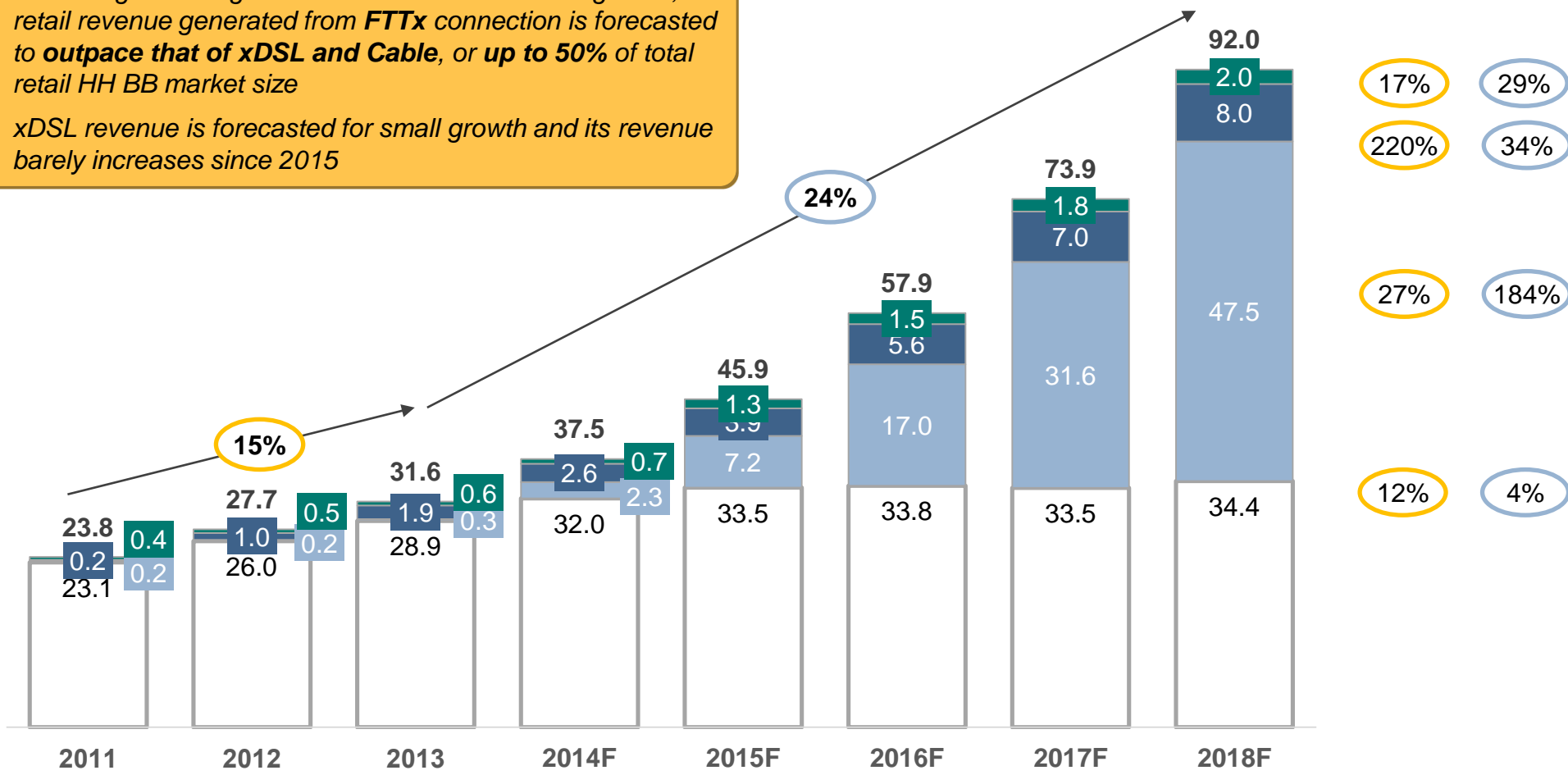
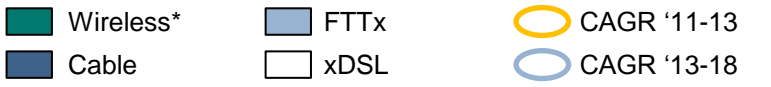


4 Broadband:

FTTX shows upsurge in revenue at CAGR 184% and shall account for ~50% of total retail household BB market size in 2018

Retail Household BB market size by technology, THB billions

- According to the high FTTx ARPU and subscriber growth, retail revenue generated from **FTTx** connection is forecasted to **outpace that of xDSL and Cable**, or **up to 50%** of total retail HH BB market size
- xDSL revenue is forecasted for small growth and its revenue barely increases since 2015



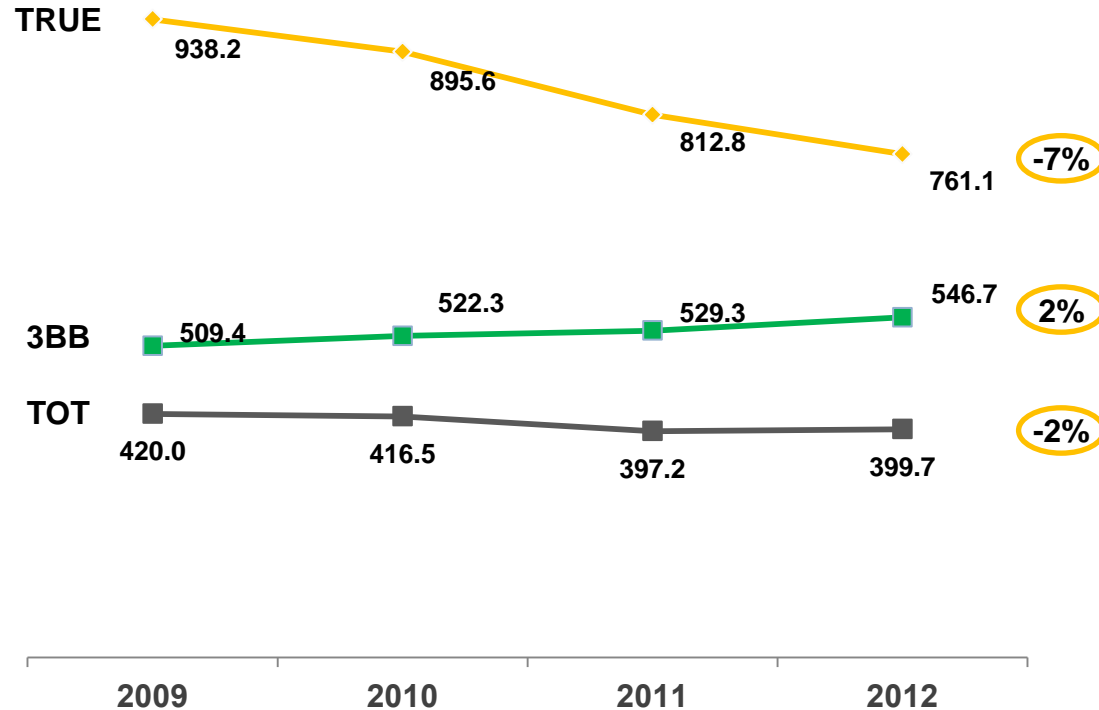
4 Broadband:

Price competition is highly assertive; operators are focusing on convergence solutions to increase revenue per subscriber instead

Retail BB ARPU* by key operators

THB/month

CAGR, 2009-12



- The **price competition** in Fixed Broadband market is **highly aggressive**
- The operators **respond** to the competitor's **pricing strategy/promotion promptly**, resulting in the **price gap** among operators is **narrower**
- TRUE gains benefits of convergence by bundling broadband with its other services e.g. TRUE Visions and Mobile
- Currently, operators have offer free minutes fixed line call as the promotions of Broadband package rather than discounting base price
- Price of FTTx is expected to be much higher than other connection technologies at the first stage but it will decreases after next few years
- The **BB price** is likely to **remains the same** thus internet speed, coverage area, and after-sales services are key decision making criterion for users

* ARPU by operators include all broadband connection technology of that operators

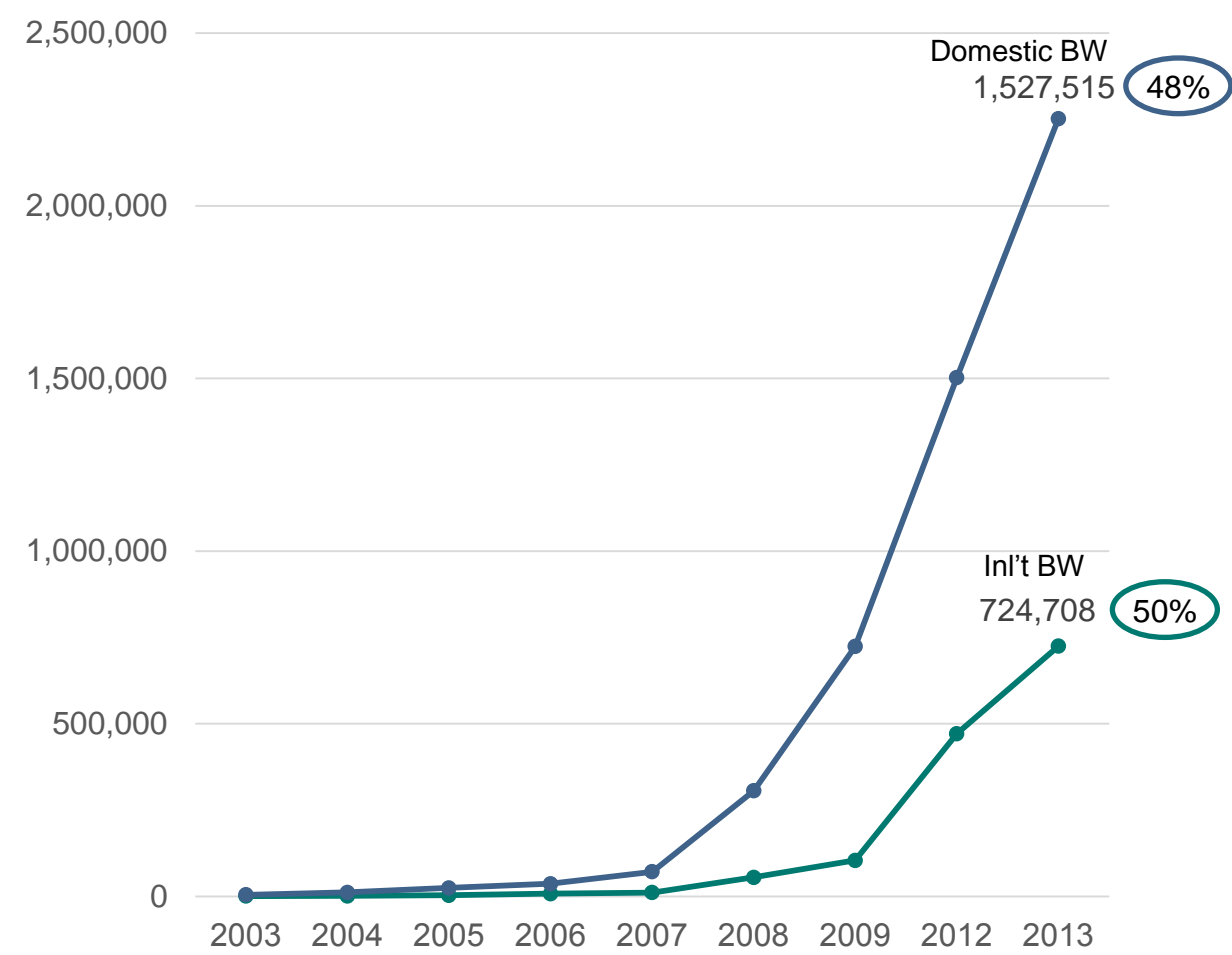
** CAT's ARPU shall be added in Internal analysis

Source: Corporate annual report

4 Broadband:

Demand surges in both domestic and international bandwidth usage while capacity for international is short

Internet Gateway bandwidth usage, Mbit/S



(X%) Growth of 2013

- The **significant increase** in internet gateway bandwidth usage and potentially demonstrate the high growth due to AEC economic expansion
- Likely most network providers are looking for expanding their market into border countries especially Myanmar as the supply is scarce and demand is raising

Key operators

true

CAT

ADC

TOT

3BB
BROADBAND

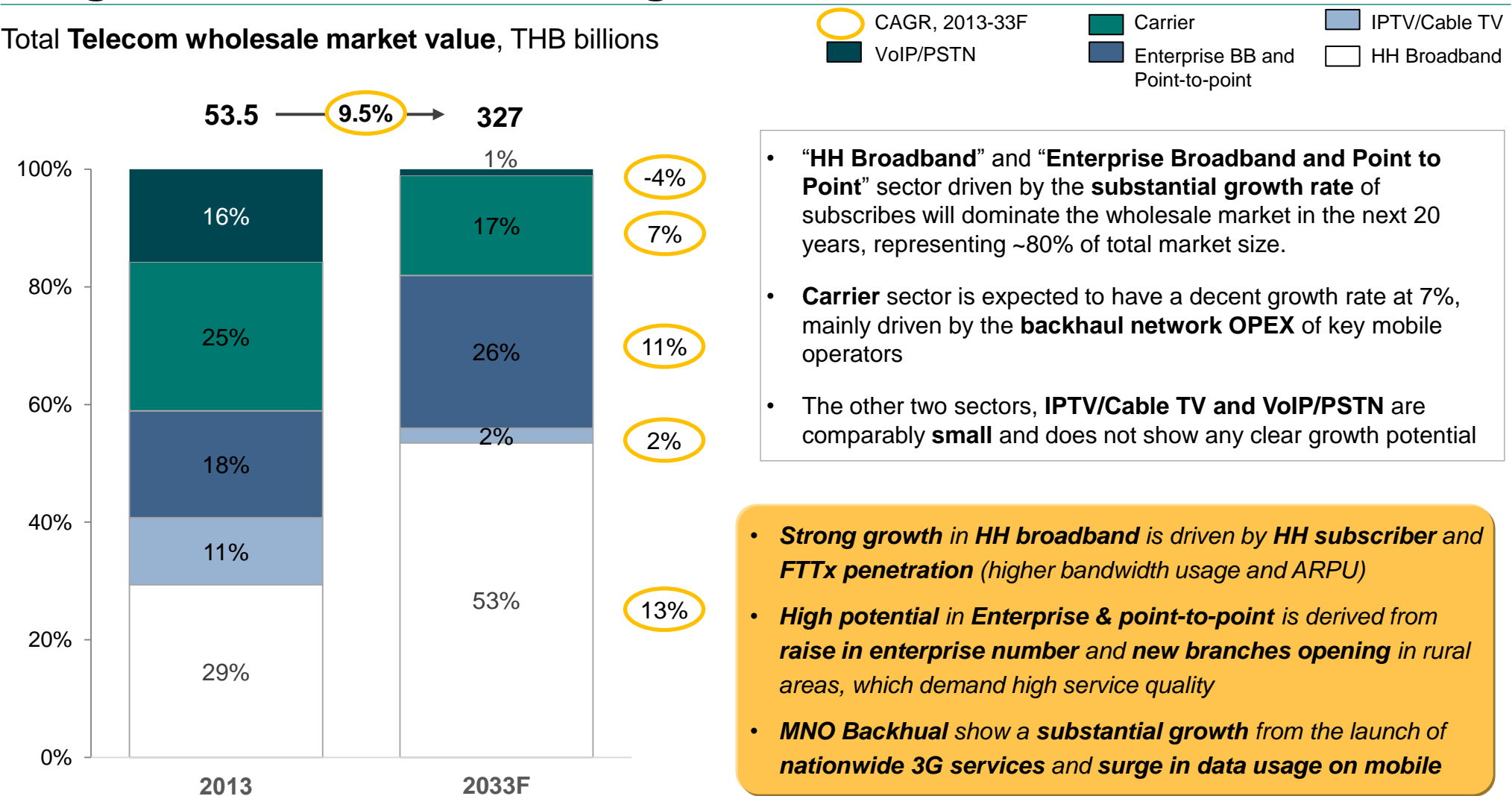
SBN

CS LOXINFO

4 Broadband:

HH Broadband, Enterprise Broadband , and Point-to-Point are main drivers of significant wholesale market growth

Total Telecom wholesale market value, THB billions



- “HH Broadband” and “Enterprise Broadband and Point to Point” sector driven by the **substantial growth rate** of subscribes will dominate the wholesale market in the next 20 years, representing ~80% of total market size.
- **Carrier** sector is expected to have a decent growth rate at 7%, mainly driven by the **backhaul network OPEX** of key mobile operators
- The other two sectors, **IPTV/Cable TV** and **VoIP/PSTN** are comparably **small** and does not show any clear growth potential

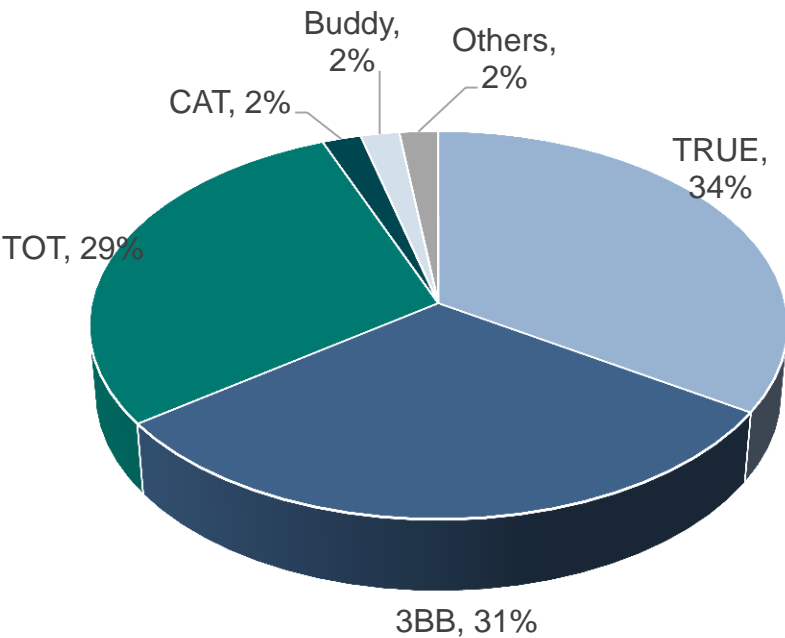
- **Strong growth in HH broadband** is driven by **HH subscriber** and **FTTx penetration** (higher bandwidth usage and ARPU)
- **High potential in Enterprise & point-to-point** is derived from **raise in enterprise number** and **new branches opening** in rural areas, which demand high service quality
- **MNO Backhual** show a **substantial growth** from the launch of **nationwide 3G services** and **surge in data usage on mobile**

4 Broadband:

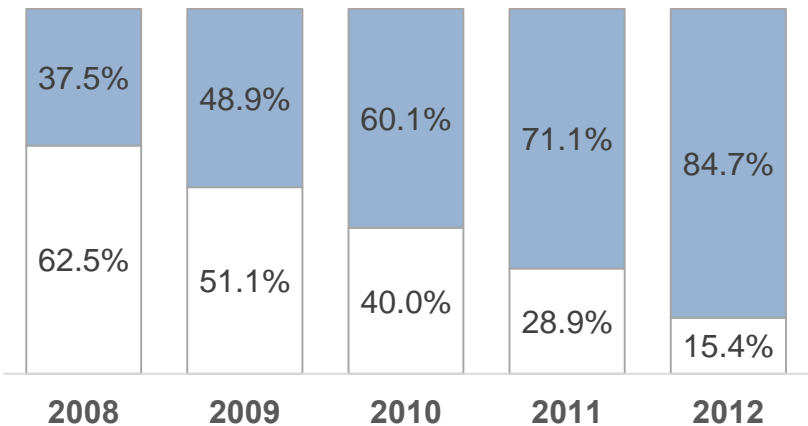
Broadband market is dominated by few players due to its strong infrastructure and possession of fixed line business

Broadband Market Share

THB 29.1 billion in 2012



Fixed line with Broadband
Fixed line (Voice only)

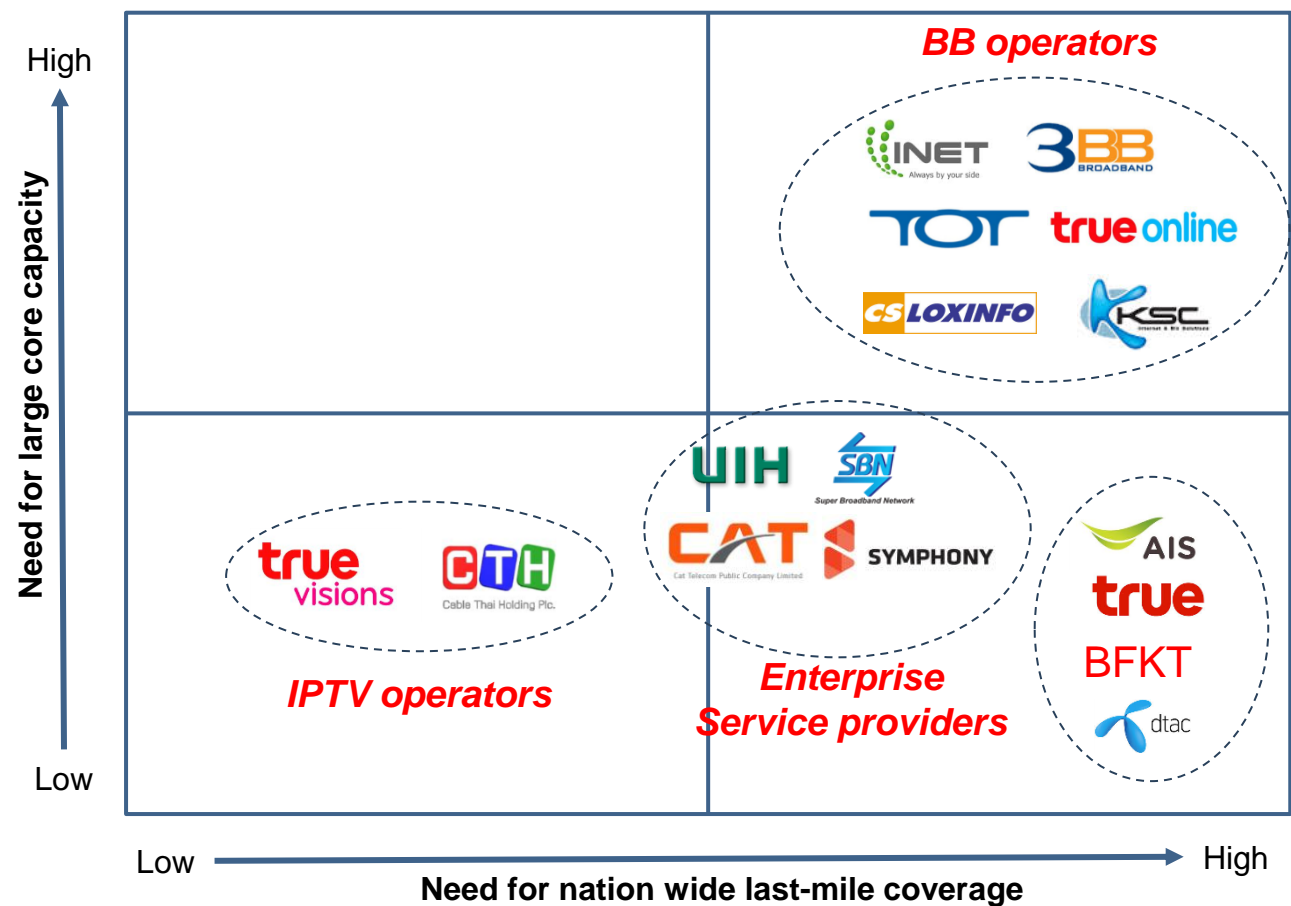


- Broadband market is dominated by only few operators: **TRUE, 3BB, and TOT** in which accounted for **~94%** of total market value
- **Market value growth** in 2013 – 2018 is forecasted to be around **5.8%** which is higher than CAT targets itself at 4.32%
- The proportion of **fixed line with broadband connection** overcomes fixed line (voice only) over the years. This benefits the operators owning fixed line infrastructure to bundle services and gain market share

4 Broadband:

BB operators and enterprise service providers requires large core network capacity and strong coverage of last-mile copper/fiber access

Customer segmentation



- **BB ISP and enterprise service providers** seeks **copper and fiber last-mile coverage** and **demand high bandwidth of core fiber** to serve its broadband customers
- **Carrier/MNO**, on the other hand would only need some adhoc transmission in some remote area to ensure enough capacity at mobile base stations
- **IPTV operators** seek **higher guaranteed bandwidth at last-mile** and therefore, could not really use existing copper network of TOT

4 **Broadband:**

Based on the current asset + AIS future fiber network, TOT has the largest last-mile copper network and significant unutilized core fiber capacity

Asset comparisons

Asset Class	TOT Fiber CO	JAS	True
# of copper last-mile active connections	3.63 mn	1.35 mn	1.63 mn
# of FTTx connections	~ 13,000 subscribers*	~ 20,000 subscribers	Covering only 3 villages using Cable Technology
Length of core fibers (Thousands of Kms)	~ 94,000 km (including AIS Concession Fiber of 64,000 km)	~ 45,000 km**	~ 53,000 km
Transmission and network equipment (THB bn)	~ THB 66 bn (TOT's asset at THB 35 bn + AIS Concession asset at THB 31 bn)	~ THB 10 bn	~ THB 15-20 bn***
Future roll-out plan for core and access	70% of HH with broadband connections by 2019	JAS targets to increase its FTTx customer from 1% toward 50% in 3 years (2016)	By 2016, plan to invest THB 8 – 10 bn for BB coverage at Amphur level and pass through 77 provinces. But TRUE's first priority is in its 4G/LTE business

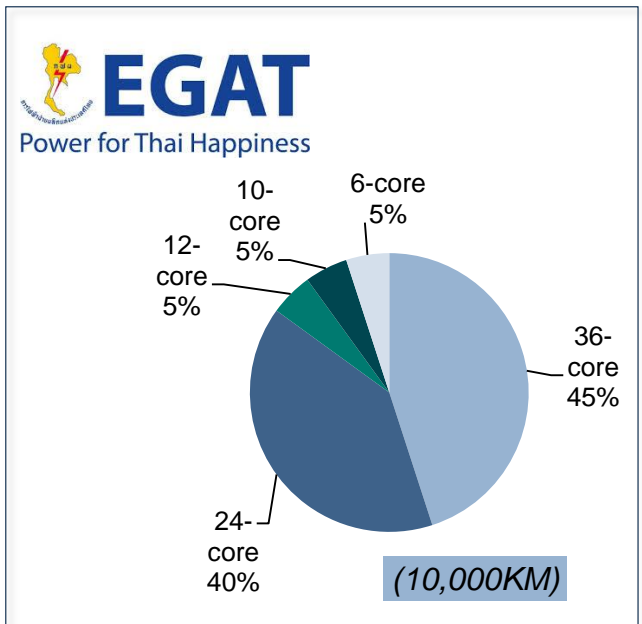
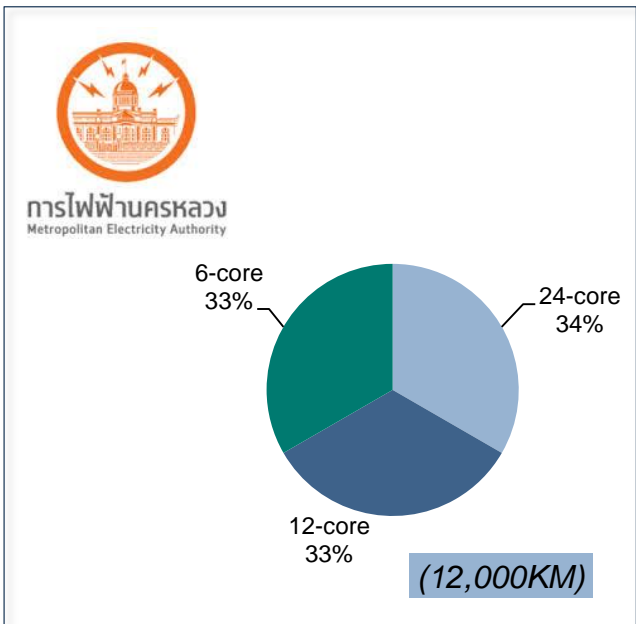
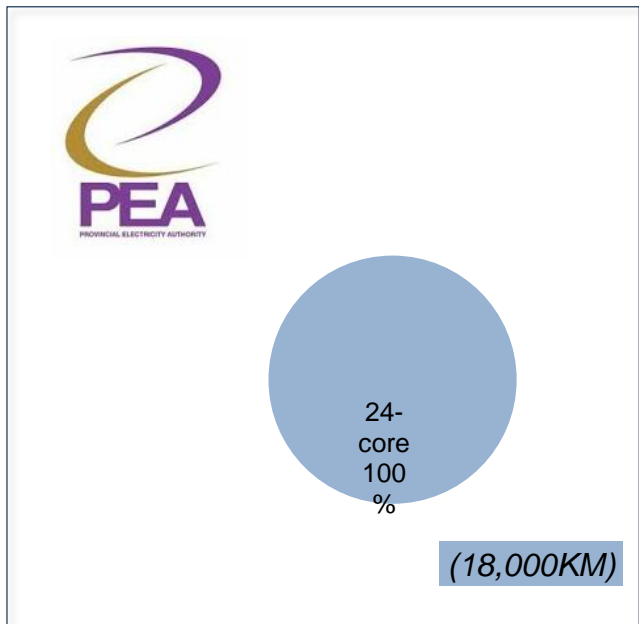
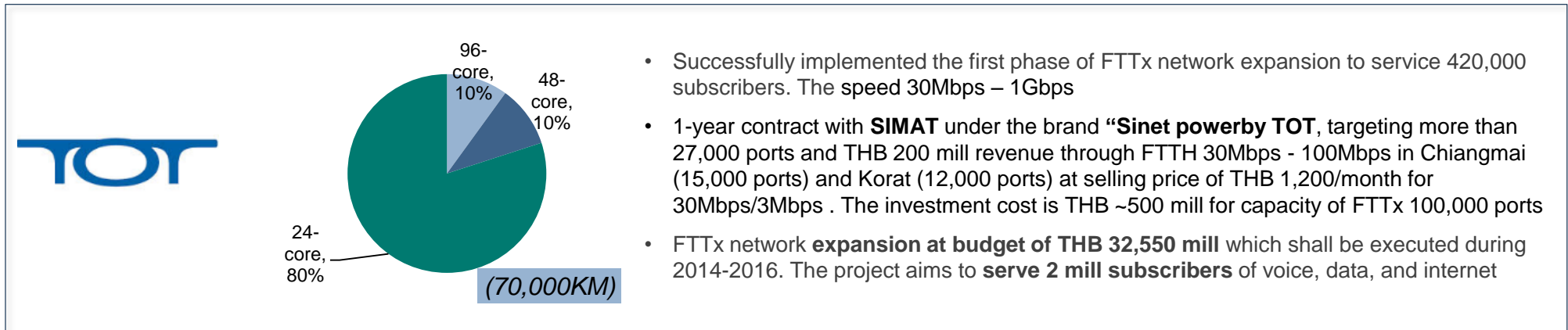
* Estimated from TOT's FTTx revenue at approximately THB 250 mn with ARPU at 1,500 THB/month

** Estimated from JAS OFC network at 817,000 core-km with average 18 cores; *** Estimate from TRUE consolidated net asset value in telephone network equipment, wireless network equipment and multimedia network equipment

Sources: TOT, JAS, TRUE, TRUEGIF

4 Broadband:

TOT is the key player in BB market and have successfully implemented FTTx in many areas



2 Broadband:

Internet service providers are interesting in FTTx market due to the change in user demand



Current Infrastructure

- ~610,000 Core-km Fiber + 16,000 access cable nodes + ADSL to all provinces
- Wi-Fi by fiber optic for 60,000 hotspots
- 3BB broadband network covers 76 provinces except Mae-Hong-Sorn province due to landscape problem

Future expansion plan

- Plan to invest IFF (THB 7 bill) to expand FTTx network, resulting in speed increases from 10 Mbps to 30-40 Mbps
- Targeted to increase its FTTx customer base from 1% toward 50% in 3 years
- problem



Current Infrastructure*

- >300,000 Core-km Fiber Network (>240,000 Core-km in BMA) + ADSL to 53 provinces
- 2G Concessions with CAT ending on Sept 2013
- Fixed line Concessions with TOT ending on Oct 2017

Future expansion plan*

- Plan to use proceeds from IFF (40-65.6 THB bn*) ramp up its 3G/4G network capacity and marketing
- Long-term plan to invest 8 – 10 THB bn for Amphur level and pass through 77 provinces expected to completed in 2016
- Plan to expand ADSL coverage to 61 provinces while FTTx is still in limited area



Current Infrastructure

- The bundle of digital TV via FTTx will provide broadband speed at 1 Gbps, in which CTH claims to be 10-time faster than that of other providers \
- Data network of CTH currently leases from UIH and Symphony Communications

Future expansion plan

- In the pilot process for 3-year alliance with **INET** to service **FTTx 500,000 ports** at **THB 3,000 mill project** (1st phase), covering **BMA** with **min speed 50Mbps** at THB 599/month while that of other competitors can service only at min speed 20 Mbps; MOU is expected to agree in first half of 2014**
- Plan to expand the FTTx network with total project value of **THB 20 bill** including successfully implemented 1st phase
- **seeking partnerships** for wholesale network rental to reach its ambitious subscriber targets and quad-play strategy, due to lack of internal cash flows (subject to new investor)

* **TRUE** has exclusive use of the **TRUEGIF**'s assets until end of 2018 under the rules of the fund

** Reported as of Feb 2014

Source: Corporate reports, Bridge analysis

4 **Broadband:**

... New player in network industry such as Interlink also jumps into the FTTx market



Current Infrastructure

- ~1,118,000 Core-km (~65,000 km) Fiber nationwide (2G Concessions with TOT ending on Sept 2015)
- SBN (Subsidiary of AIS) is currently rolling out its own fiber network following existing concession asset

Future expansion plan

- Initial investment plan of 70 THB bn (2013-15) to install 3G 2100MHz network
- Announce to put an extra 20 THB bn into 3G network expansion that has capacity to support fixed broadband nationwide
- Plan to increase 3G Node B to 20,000 in 2014



Current Infrastructure

- Never own FTTx network before but Interlink has implemented the network for many enterprises such as TOT and AOT

Future expansion plan

- Be granted telecom license type 3 to implement the fiber optic network project, executing 13 years to be completed at project value of THB 3 billions
- 72 province coverage and have terrestrial connection at borders: Malaysia, Cambodia, Myanmar, and Lao PDR
- Interlink Fiber Optic Network can serve clients at Layer 3 (Network Layer)

CAT information shall be analyzed in internal analysis

Content

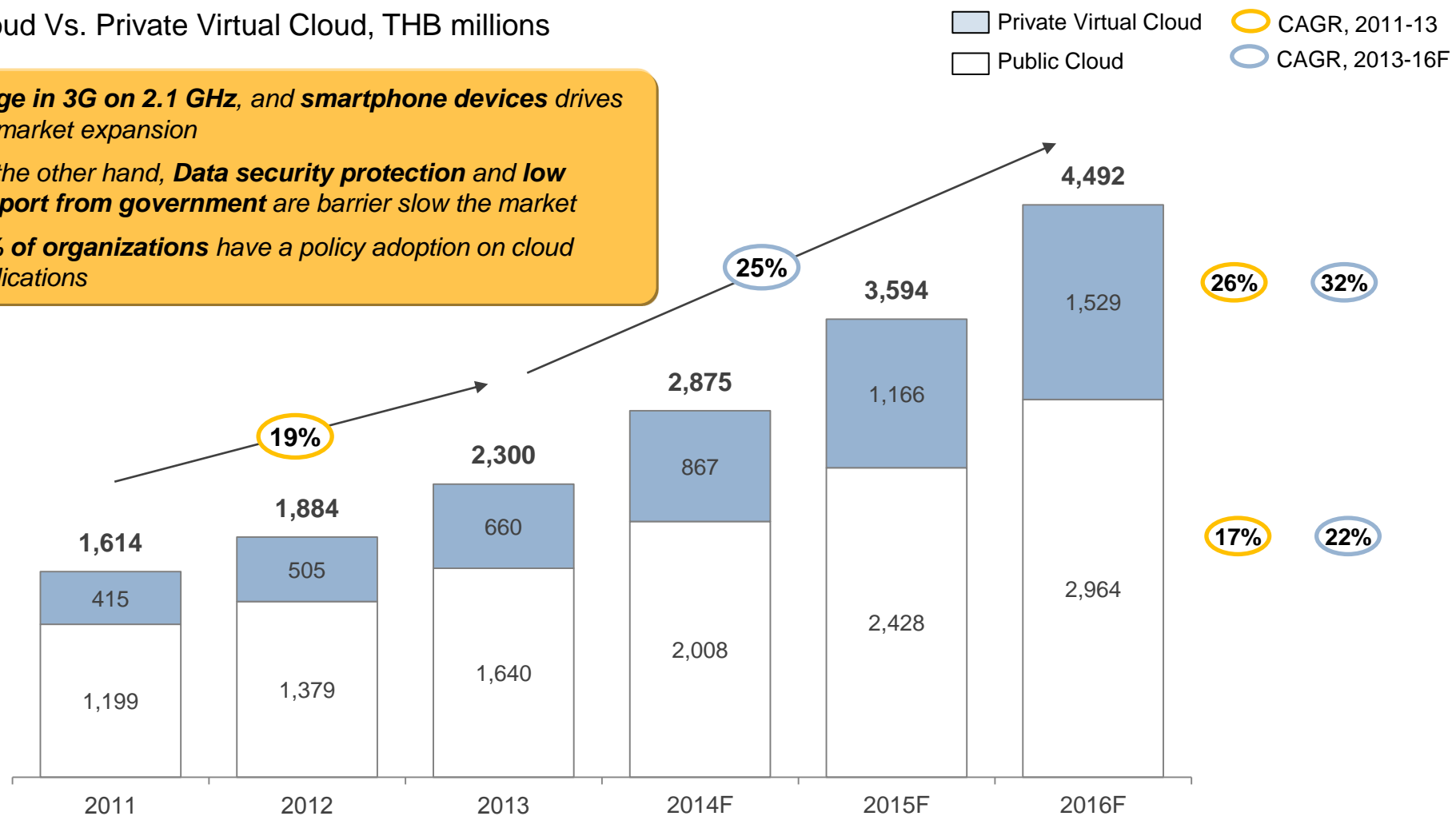
- Overview of Thailand Telecom market
 - Mobile market
 - Data communication
 - International phone service
 - Broadband market
 - **ICT service**
 - Fixed line

5 ICT services: Cloud computing

Cloud computing is likely to grow due to technology adoption by users, and cost reduction

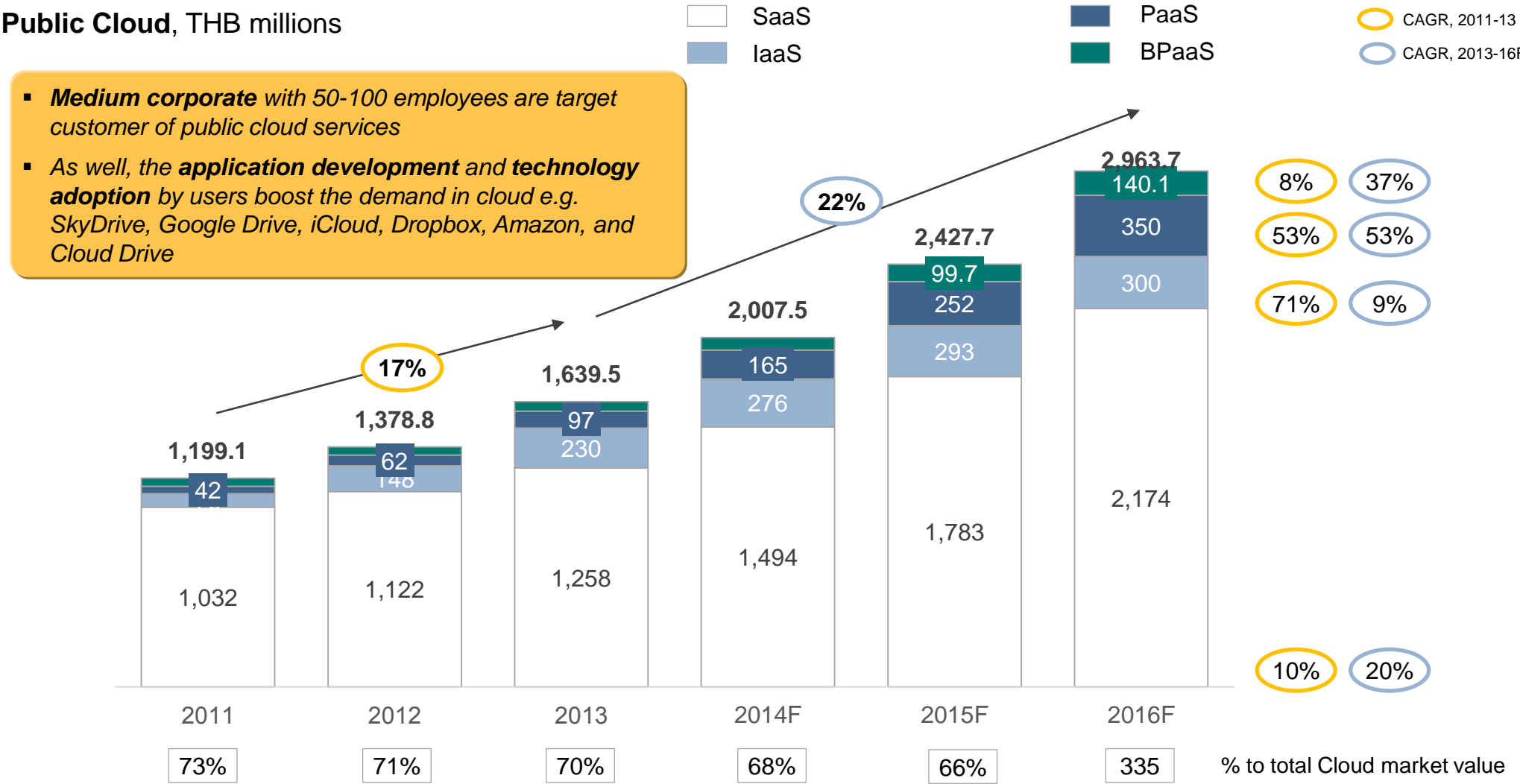
Public Cloud Vs. Private Virtual Cloud, THB millions

- **Surge in 3G on 2.1 GHz, and smartphone devices** drives the market expansion
- On the other hand, **Data security protection and low support from government** are barrier slow the market
- **30% of organizations** have a policy adoption on cloud applications



5 ICT services: Cloud computing

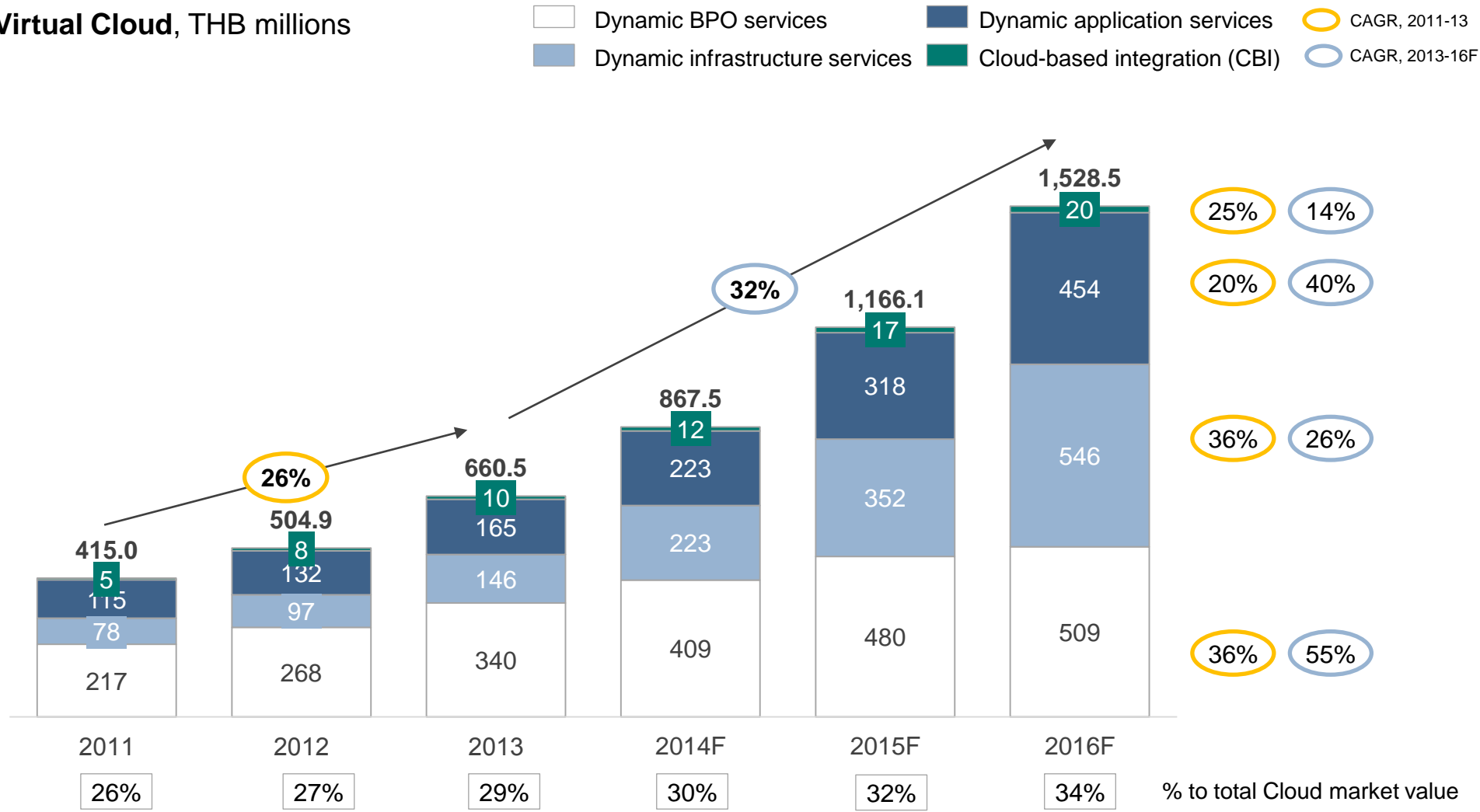
SaaS and IaaS are main services used in Public cloud



5 **ICT services: Cloud computing**

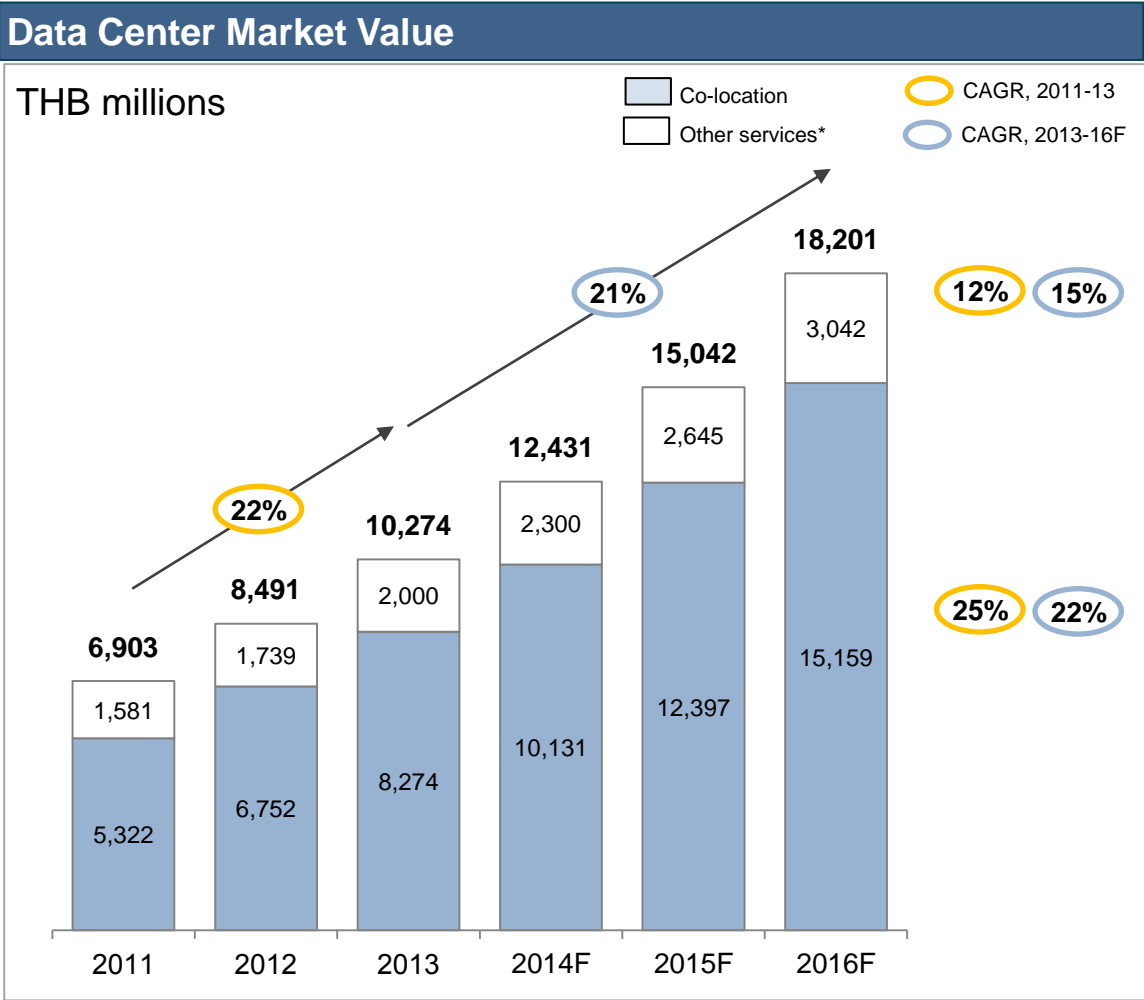
Private Virtual Cloud shows high growth and potentially outpaces Public cloud in the near future ...

Private Virtual Cloud, THB millions



5 ICT services: Data center

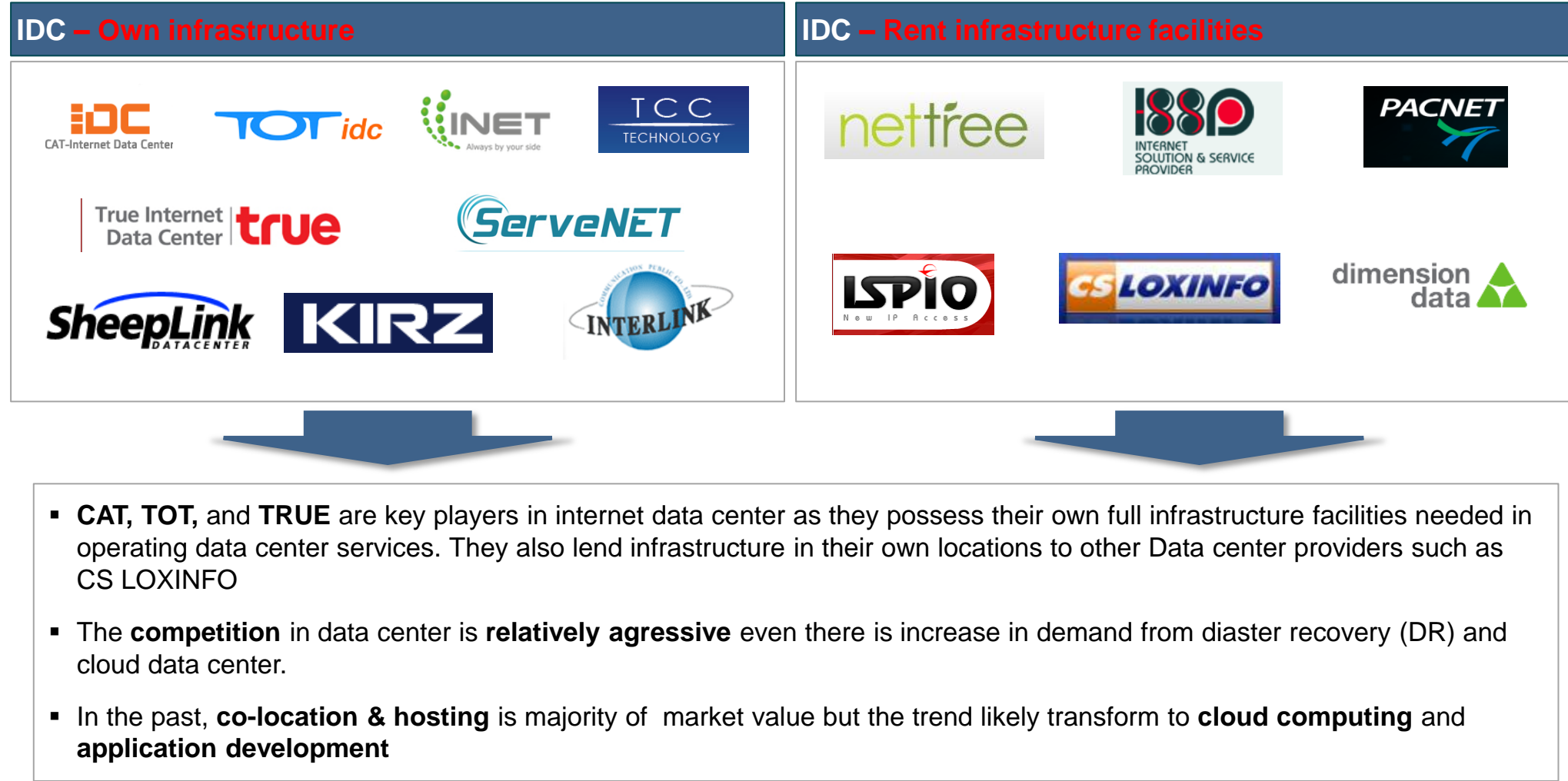
Co-location remains the major service, driving market growth; Cloud data center is likely to be another driver in focus



- **Cloud Data Center** is expected to **doubled grow** compared to **Traditional Data Center**
- **IBM** implements **Green Data Center** with **TCC Group**
- **17% of data center traffic** will be **increased by cloud computing netload** for web surfing, video streaming, internet connection among devices
- New services, including **Diaster Recovery (DR)**, **HD VDO conference**, and **global-standard full Cloud services** are key drivers to market expansion

5 *ICT services: Data center*

Major IDC providers own network infrastructure themselves, thus could gain the advantages from economy of scale and customer base



5 ICT services: E-Commerce

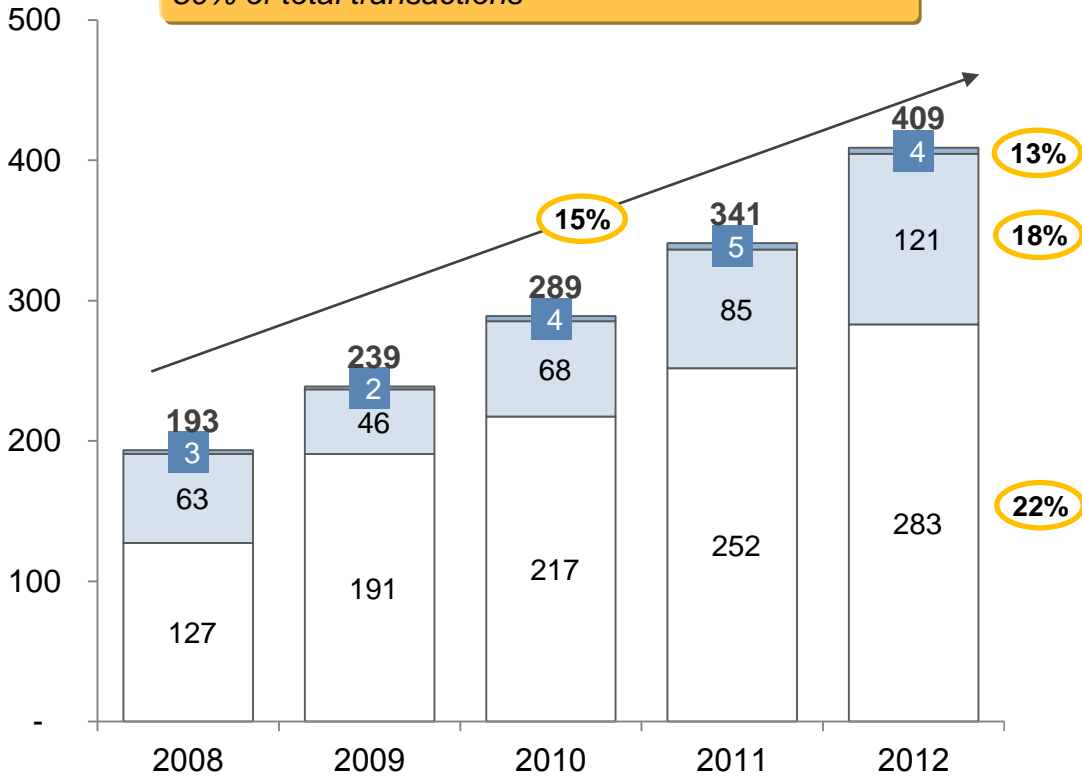
e-Commerce market consistently expands due to 3G services and customer behaviour toward to online transaction

E-Commerce market value by businesses (Excl. E-Auction)

THB billions

B2G Excl. e-Auction
 B2C
 B2B
 CAGR, 2008-12

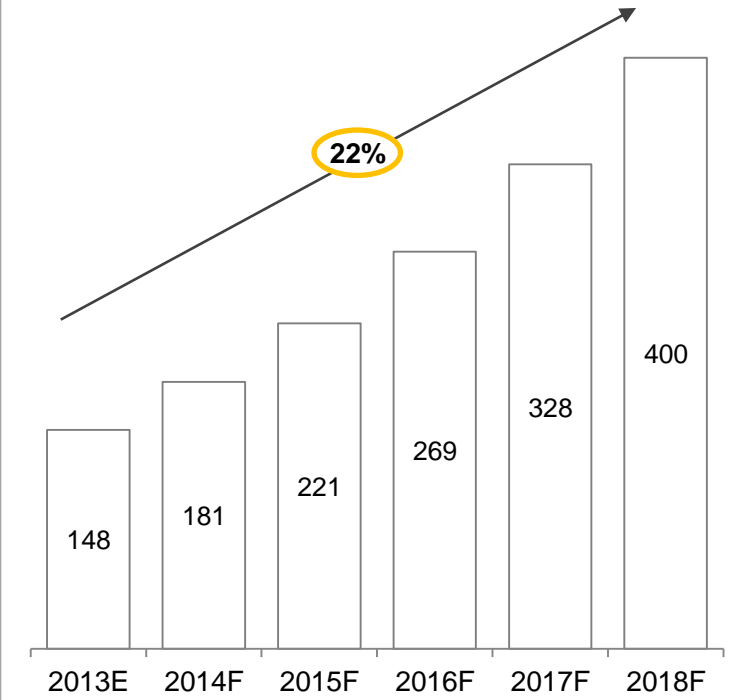
e-Commerce transaction domestically accounts for 80% of total transactions



e-Auction value* 234 289 341 268 335

Retail E-Commerce (B2C)

THB billions

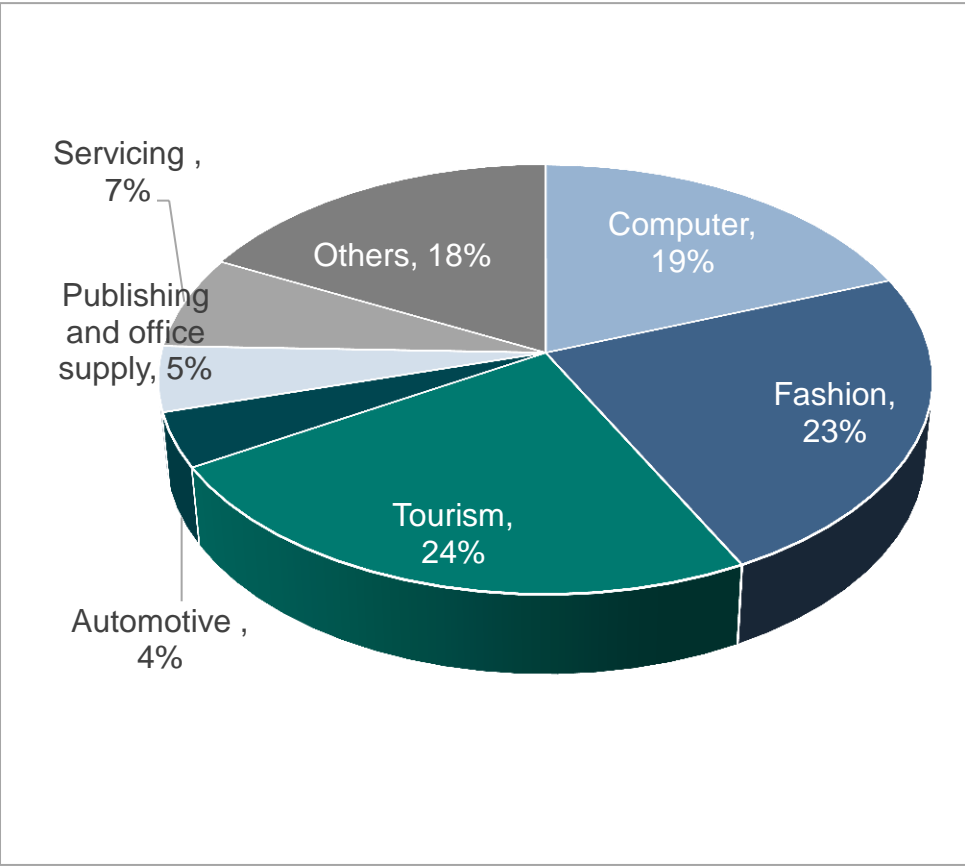


Retail e-Commerce is expected to have strong growth due to smartphone devices and 3G services

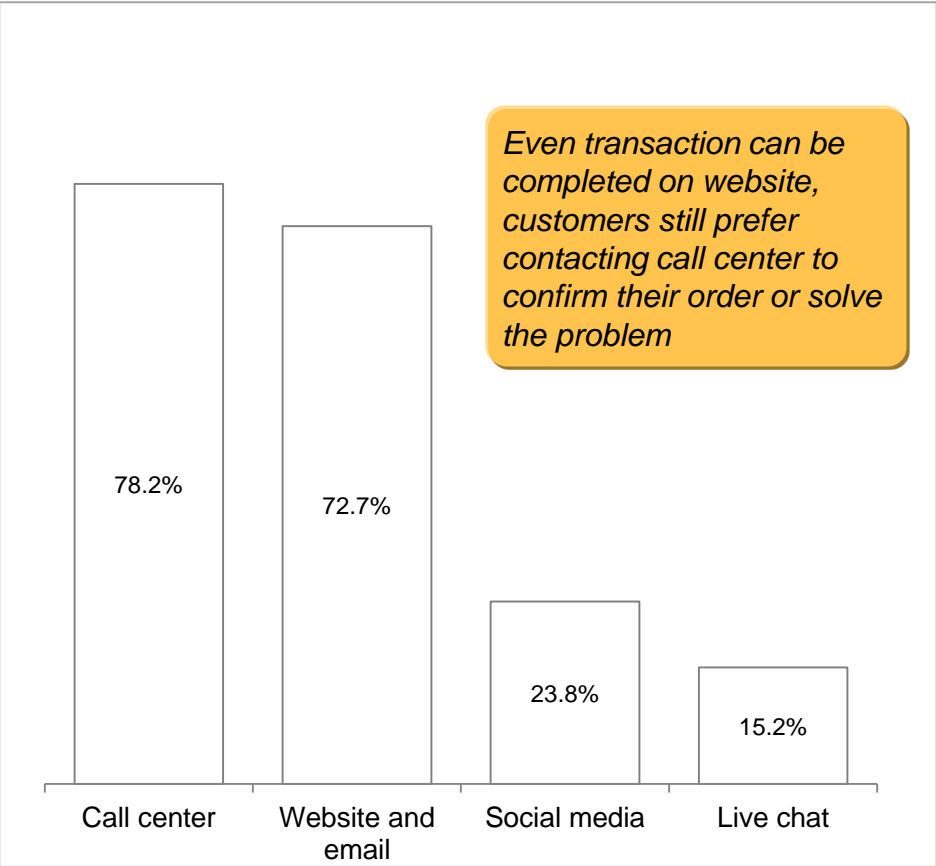
5 ICT services: E-Commerce

Tourism, fashion, and technology products dominate up to 70% of total e-Commerce market

% Product categories in E-Commerce



Consumer contact channels



Content

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 - Fixed line

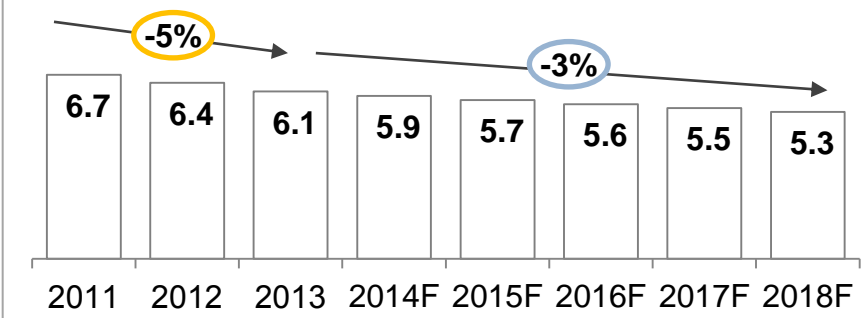
6 Fixed voice:

Fixed voice line market has eroded in both lines and revenue as consumer preference moves to wireless connection

CAGR, 2011-13 CAGR, 2013-18F

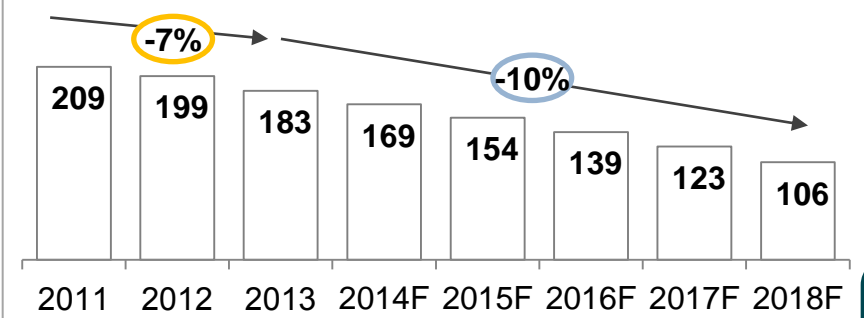
Fixed voice lines

Millions



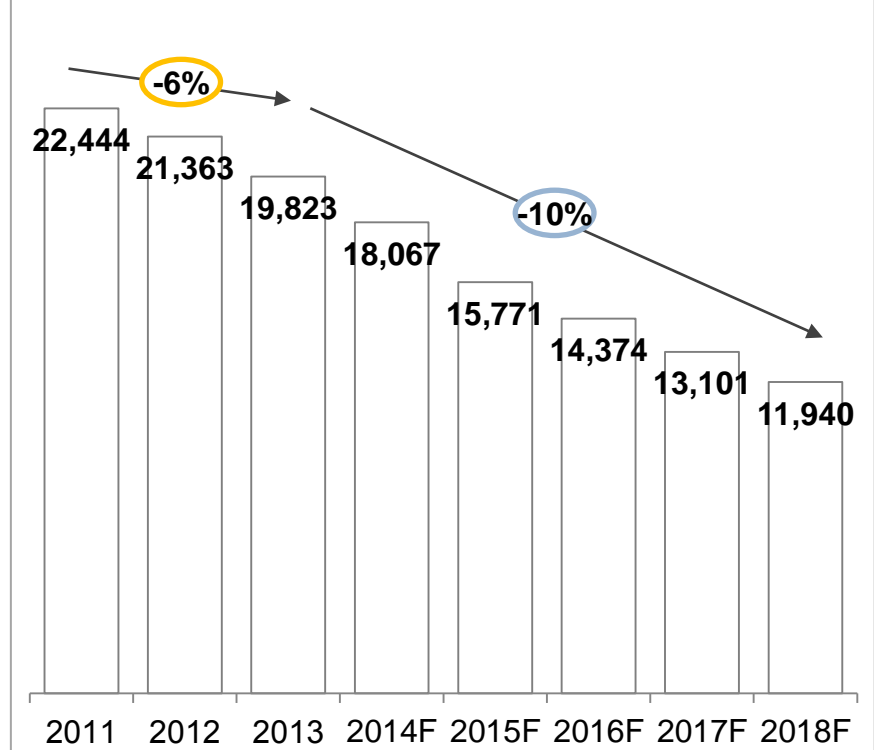
Fixed voice ARPU

THB/month



Fixed voice revenue

THB millions



- Both fixed voice lines and its ARPU have been continually **decreased** as consumer behaviour tends toward to wireless connection
- fixed voice is mostly charged in the **bundle** with other services or as **complementary** product rather than sole service

Source: Ovum, Value Partners' analysis, and Bridge consulting's analysis

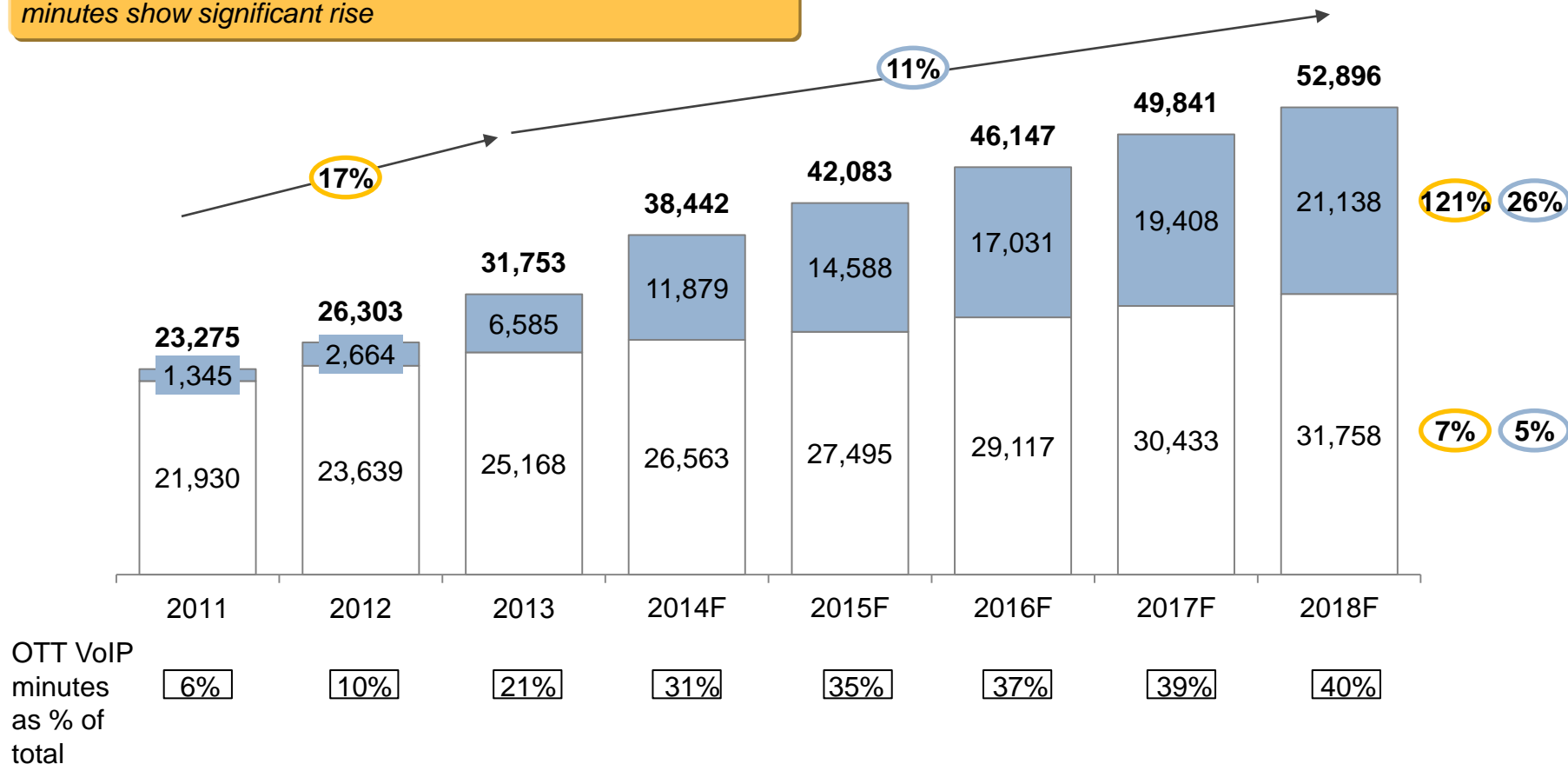
6 Fixed voice:

... minute usages continually increase, mainly driven by OTT VoIP usage

Minute usage, millions

OTT VoIP minutes**
 Traditional voice & VoIP*
○ CAGR, 2011-13 ○ CAGR, 2013-18F

Total minute usages are gradually growing in which traditional voice minutes are driven by enterprise while OTT VoIP minutes show significant rise



* Traditional voice & VoIP means using normal fixed line whether it is traditional TDM or VoIP through IP phone headset or either IP softphone in PC
 ** OTT VoIP means using the OTT applications over the PC such as Skype, and WebEx
 Source: Ovum, Value Partners' analysis, and Bridge consulting's analysis

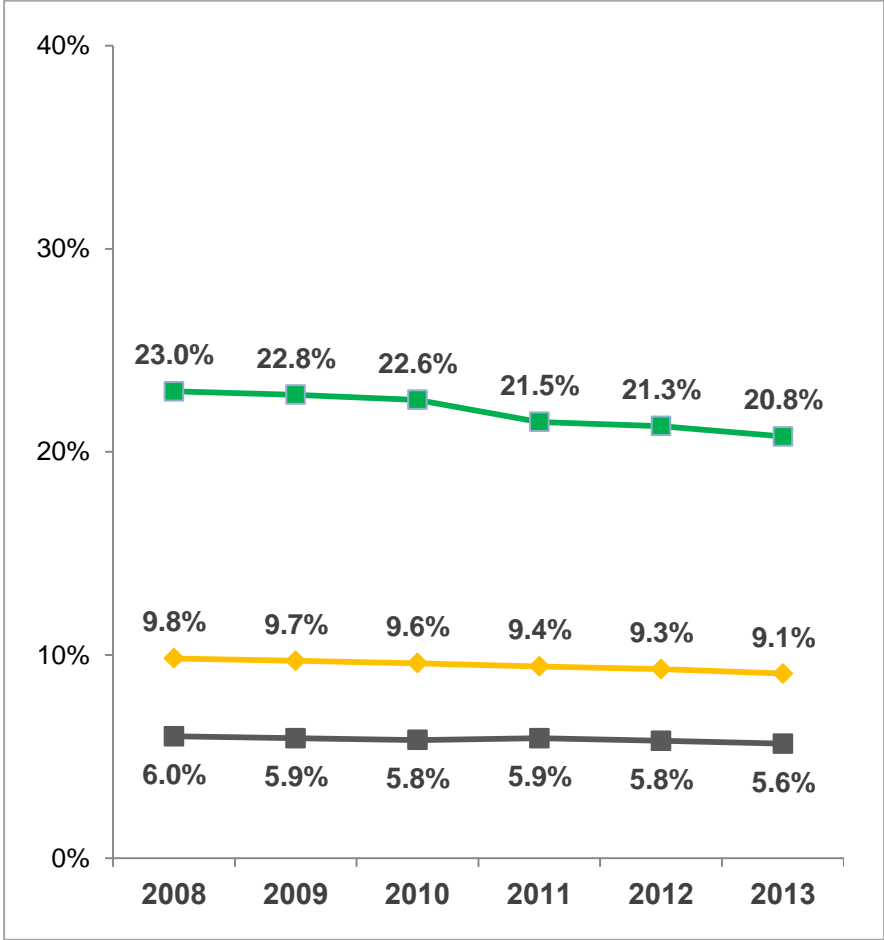
6 Fixed voice:

Penetration rate has gradually declined, in accordance with the lessen demand of fixed voice

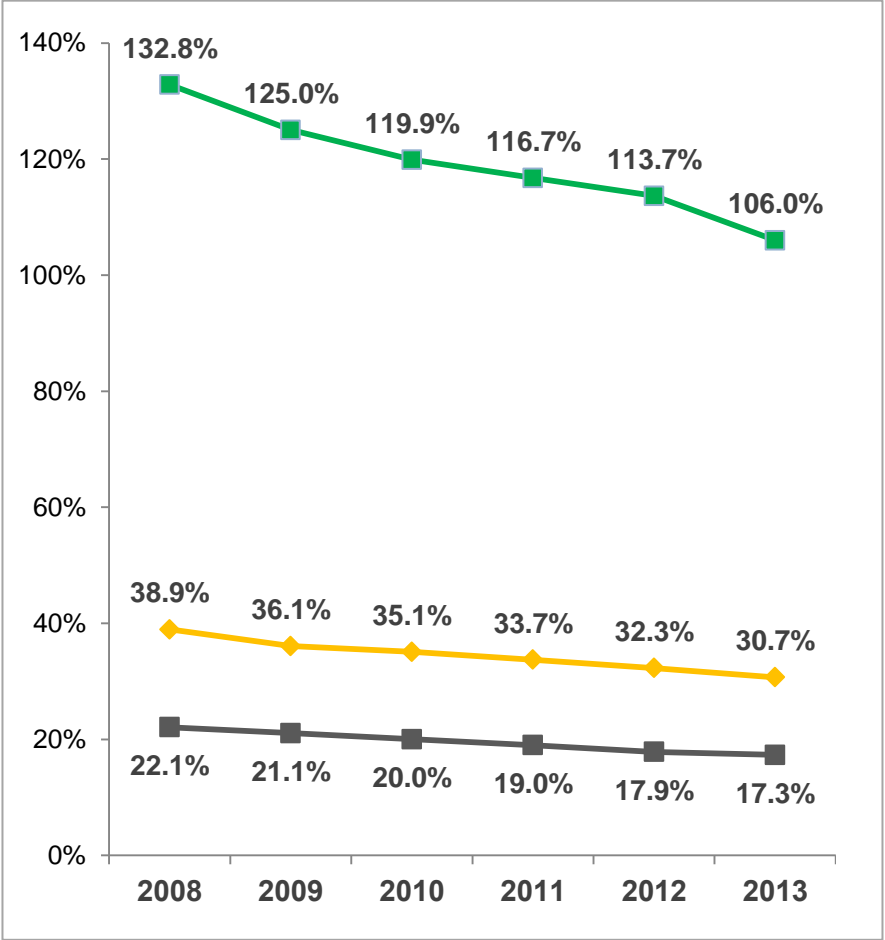
Fixe voice penetration rate

Metropolitan area Blended/Nationwide Provincial area

% of population



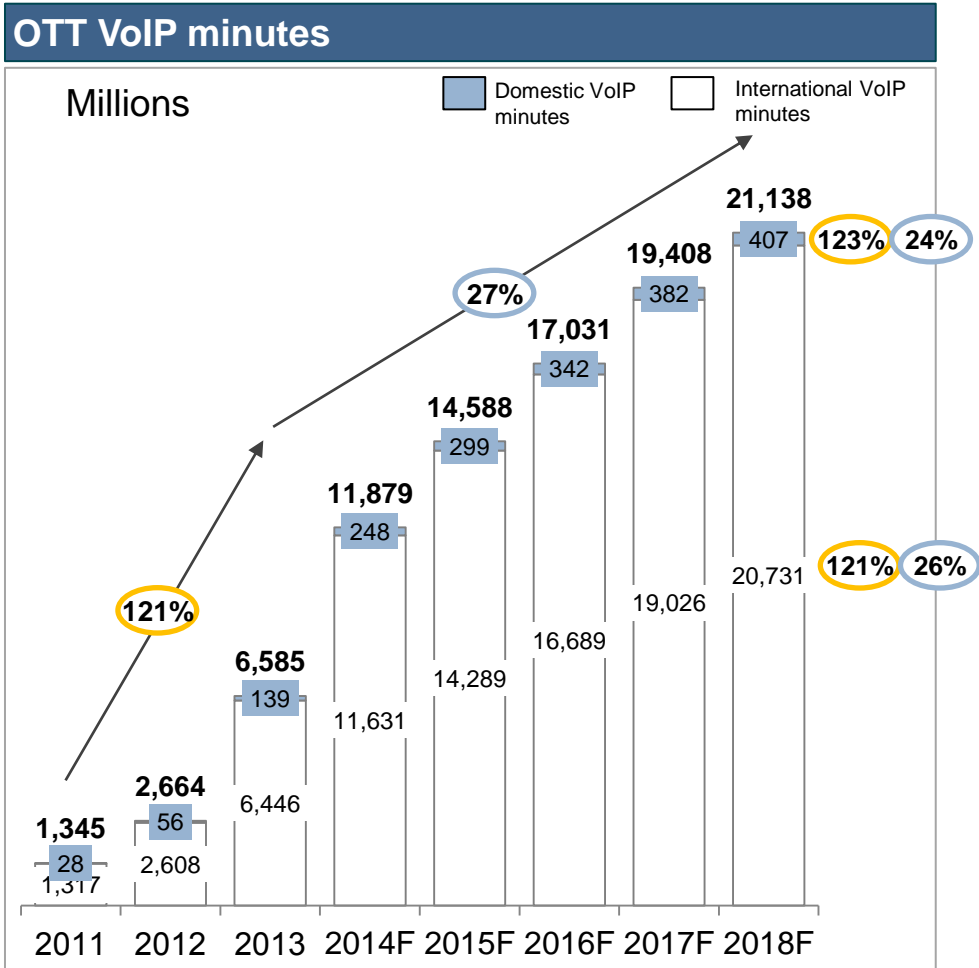
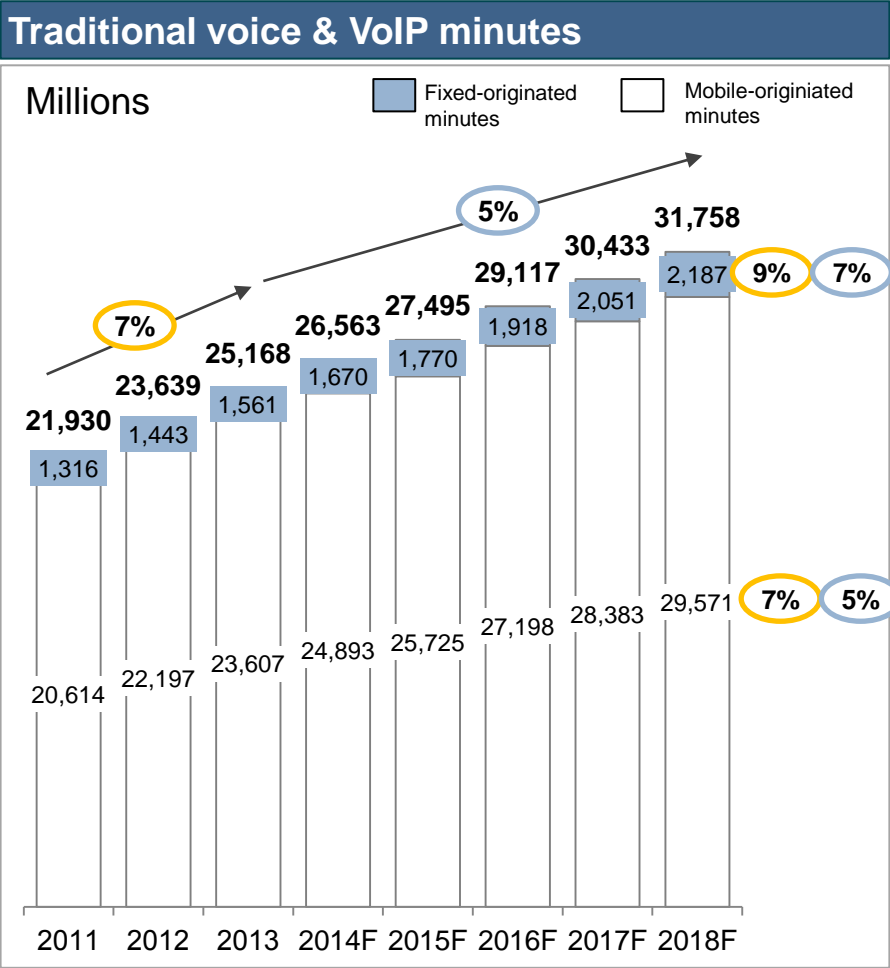
% of households



6 Fixed voice:

Mobile-originated minutes and International VoIP minutes of OTT VoIP are major minute usages of voice

○ CAGR, 2011-13 ○ CAGR, 2013-18F



6 Fixed voice:

TOT is the market leader with nationwide coverage, while TRUE is highly strong in GBKK area

Fixed line existing number

Thousands



- TOT has **worked with other operators** to operate fixed line business e.g. **TRUE and TT&T**. At the present, TOT has partnered with TRUE for 2.6 million lines and with TT&T for 1.6 million lines
- TOT charges fees per usage time but potentially change the fees based on minute usage in the near future as the operator cannot bear the increasing operational cost

- TRUE has competitiveness in **metropolitan areas** with the market share up to 70% in GBKK
- TRUE used to launch the promotion THB 3 nationwide call per time for boosting its revenue but it was unsuccessful

- Broadband market is dominated by only few operators: **TRUE, 3BB, and TOT** in which accounted for **~94%** of total existing number (~2.1 million numbers)
- The proportion of **fixed line with broadband connection** overcomes fixed line (voice only) over the years. This benefits the operators owning fixed line infrastructure to **bundle services** and gain market share
- In March 2014, NBTC has recently agreed on **new fee structure** of network connection; the public hearing is in process and the official announcement shall be **declared in June 2014**
 - ✓ Mobile to Mobile at THB 0.45 per minute
 - ✓ Fixed line to Fixed line at THB 0.45 per minute in first year and reduces to THB 0.34 per minute since 2015