

# **Broadband fest and famine in Asia**

**ESCAP Sub-Regional Workshop on  
Internet Traffic Management for the  
Asia-Pacific Information Superhighway (AP-IS)  
Thimphu, Bhutan  
December 7, 2016**

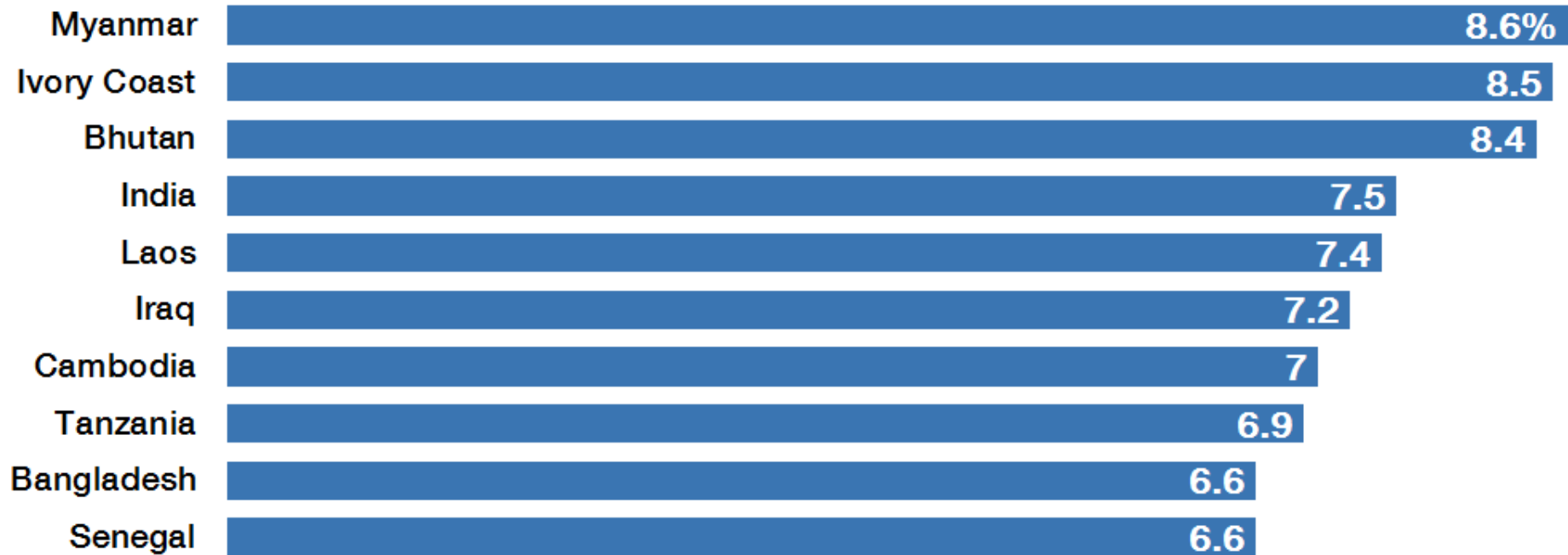
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# These are the world's fastest growing economies

Projected percentage real GDP growth, 2016



Source: IMF World Economic Outlook April 2016

**But poor ICT Development Index (IDI) is  
barrier to achieve SDG in Asia-Pacific**





# **SDG #9: The clock is ticking!**

- Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.
- Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.

# SDG #9: The clock is ticking!

- Develop quality, reliable, sustainable and resilient infrastructure, **including regional and transborder infrastructure**, to support economic development and human well-being, with a focus on affordable and equitable access for all.
- **Significantly increase** access to information and communications technology and strive to provide **universal and affordable access to the Internet** in least developed countries **by 2020**.

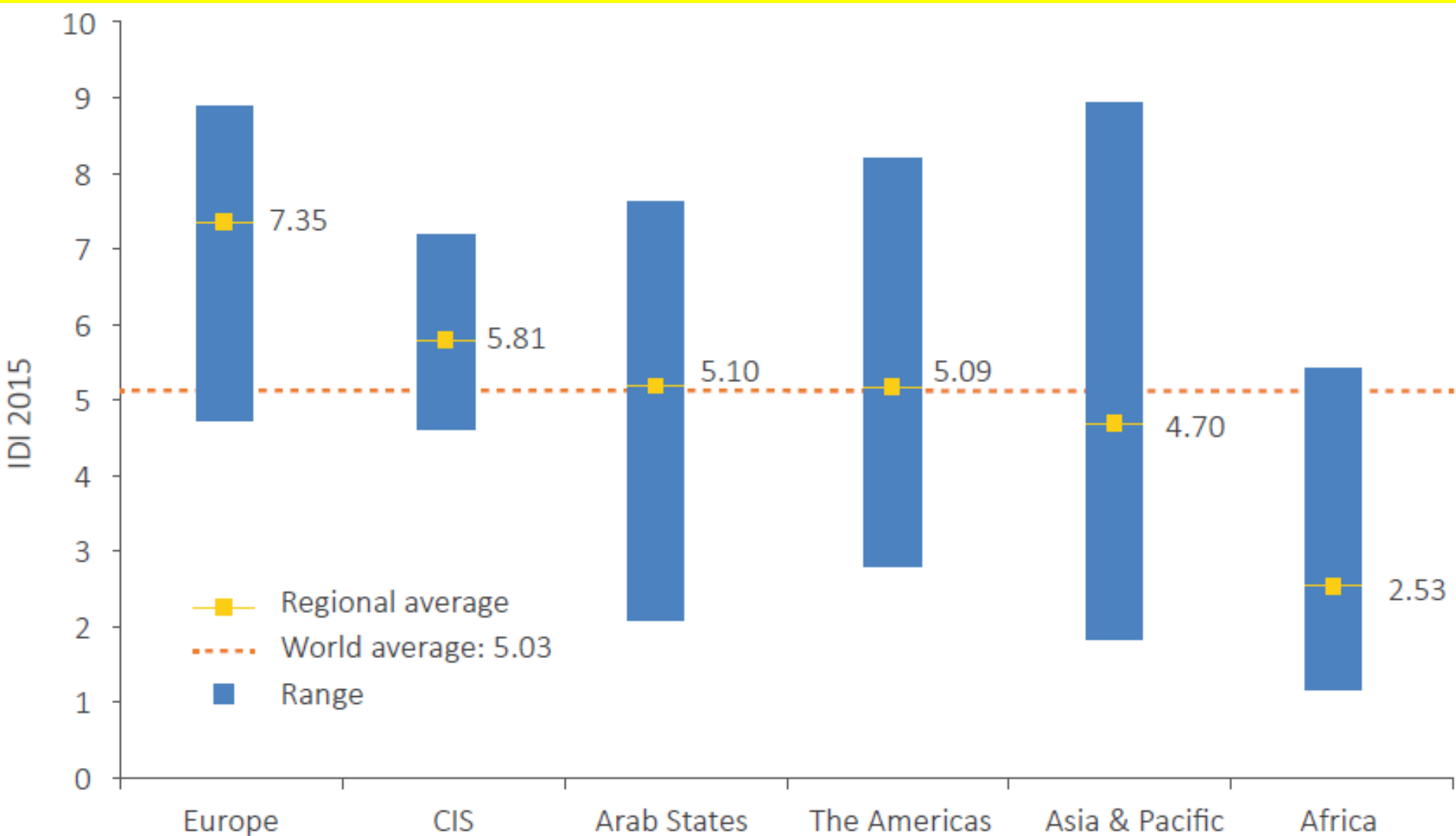
# ICT Development Index: indicators, reference values and weights

ICT access	Reference value	(%)			ICT Development Index
1. Fixed-telephone subscriptions per 100 inhabitants	60	20			
2. Mobile-cellular telephone subscriptions per 100 inhabitants	120	20			
3. International Internet bandwidth (bit/s) per internet user	962'216*	20			
4. Percentage of households with a computer	100	20			
5. Percentage of households with Internet access	100	20			
ICT use	Reference value	(%)			
6. Percentage of Individuals using the Internet	100	33			
7. Fixed-broadband subscriptions per 100 inhabitants	60	33			
8. Active mobile-broadband subscriptions per 100 inhabitants	100	33			
ICT skills	Reference value	(%)			
9. Adult literacy rate	100	33			
10. Secondary gross enrolment ratio	100	33			
11. Tertiary gross enrolment ratio	100	33			

Note: \*This corresponds to a log value of 5.98, which was used in the normalization step.

Source: ITU.

# IDI by region compared with global average



# Highly polarized APAC

Regional IDI rank	Country	IDI	Global IDI rank
<b>Asia &amp; Pacific</b>		Source: Measuring the Information Society Report, ITU, November 2016.	
1	Korea (Rep.)	8.93	1
2	Hong Kong, China	8.52	9
3	Japan	8.47	11
4	Australia	8.29	13
5	New Zealand	8.14	16
28	Solomon Islands	2.42	139
29	Myanmar	2.27	142
30	Pakistan	2.24	143
31	Bangladesh	2.22	144
32	Afghanistan	1.83	156

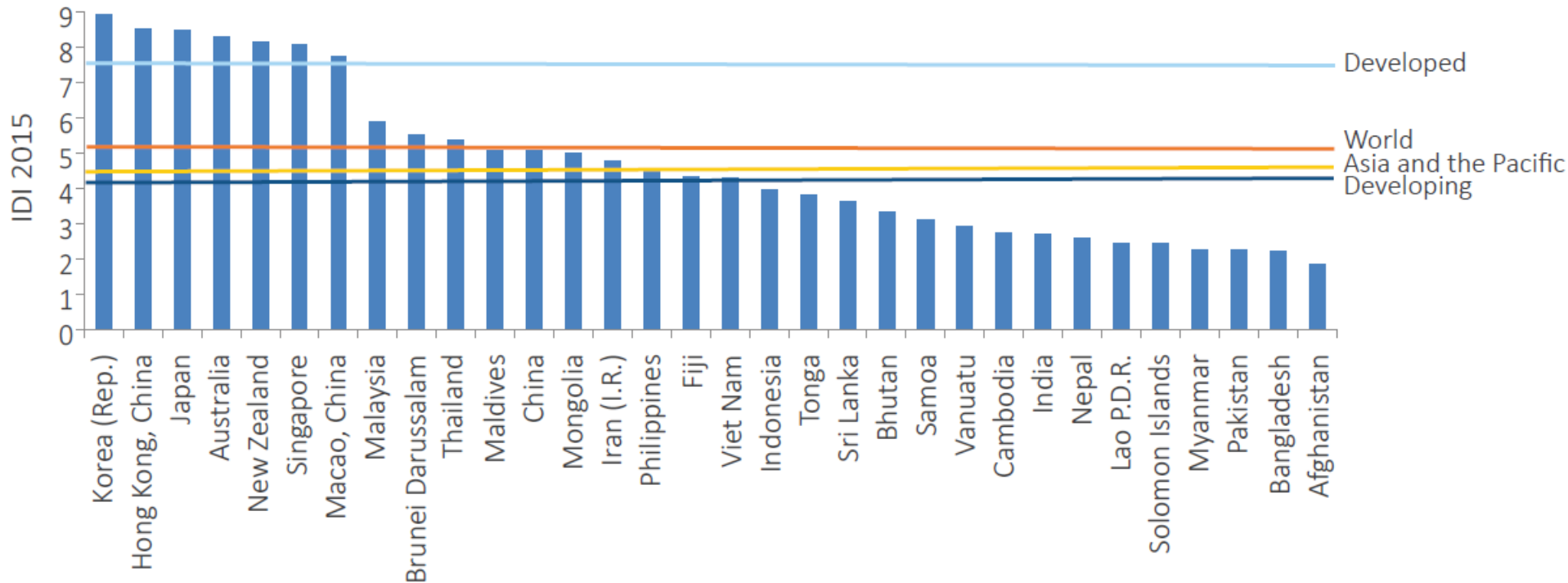
# IDI rankings, APAC, 2015

Economy	Regional rank 2015	Global rank 2015	IDI 2015	Global rank 2010	IDI 2010	Global rank change 2015-2010
Korea (Rep.)	1	1	8.93	1	8.64	0
Hong Kong, China	2	9	8.52	13	7.41	4
Japan	3	11	8.47	9	7.73	-2
Australia	4	13	8.29	15	7.32	2
New Zealand	5	16	8.14	19	7.17	3
Singapore	6	19	8.08	11	7.62	-8
Macao, China	7	24	7.73	14	7.38	-10
Malaysia	8	64	5.90	61	4.85	-3
Brunei Darussalam	9	71	5.53	53	5.05	-18
Thailand	10	74	5.36	92	3.62	18
Maldives	11	81	5.08	82	3.92	1
China	12	82	5.05	87	3.69	5
Mongolia	13	84	5.00	97	3.52	13
Iran (I.R.)	14	91	4.79	99	3.48	8
Philippines	15	98	4.57	105	3.16	7
Fiji	16	101	4.33	102	3.28	1
Viet Nam	17	102	4.28	94	3.61	-8
Indonesia	18	108	3.94	109	3.11	1
Tonga	19	110	3.82	111	3.08	1
Sri Lanka	20	115	3.64	115	2.97	0
Bhutan	21	119	3.35	128	2.02	9
Samoa	22	122	3.11	121	2.43	-1
Vanuatu	23	125	2.93	124	2.19	-1
Cambodia	24	130	2.74	131	1.98	1
India	25	131	2.69	125	2.14	-6
Nepal	26	136	2.59	140	1.75	4
Lao P.D.R.	27	138	2.45	135	1.92	-3
Solomon Islands	28	139	2.42	139	1.78	0
Myanmar	29	142	2.27	150	1.58	8
Pakistan	30	143	2.24	138	1.79	-5
Bangladesh	31	144	2.22	148	1.61	4
Afghanistan	32	156	1.83	156	1.37	0

**Indonesia (108), India (131), Pakistan (143)  
and Bangladesh (144) poor in Global ranking**



# IDI values, Asia and the Pacific, 2015

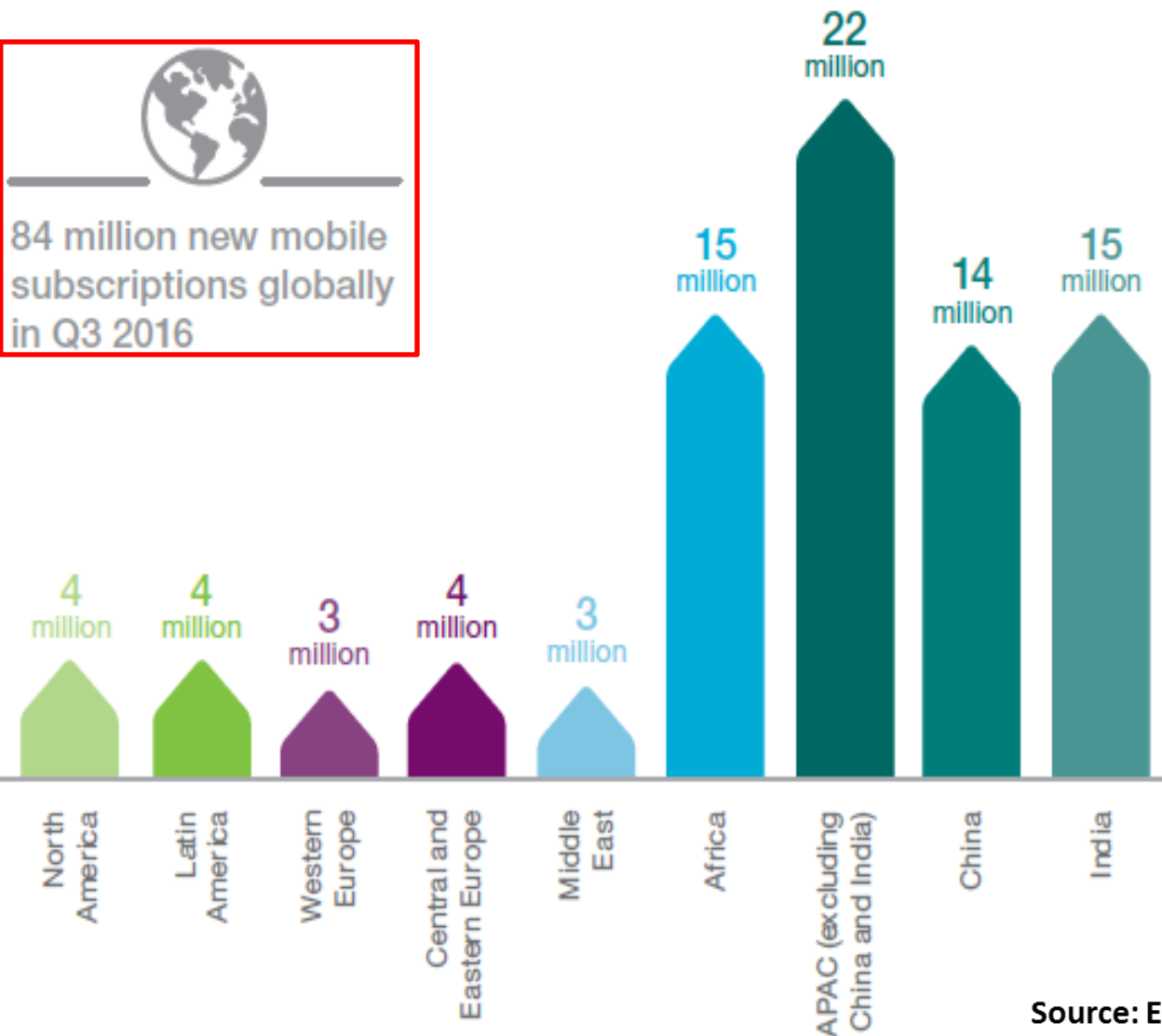


# APAC still drives global mobile growth

New mobile subscriptions Q3 2016



84 million new mobile subscriptions globally in Q3 2016



5.1 BILLION subscribers

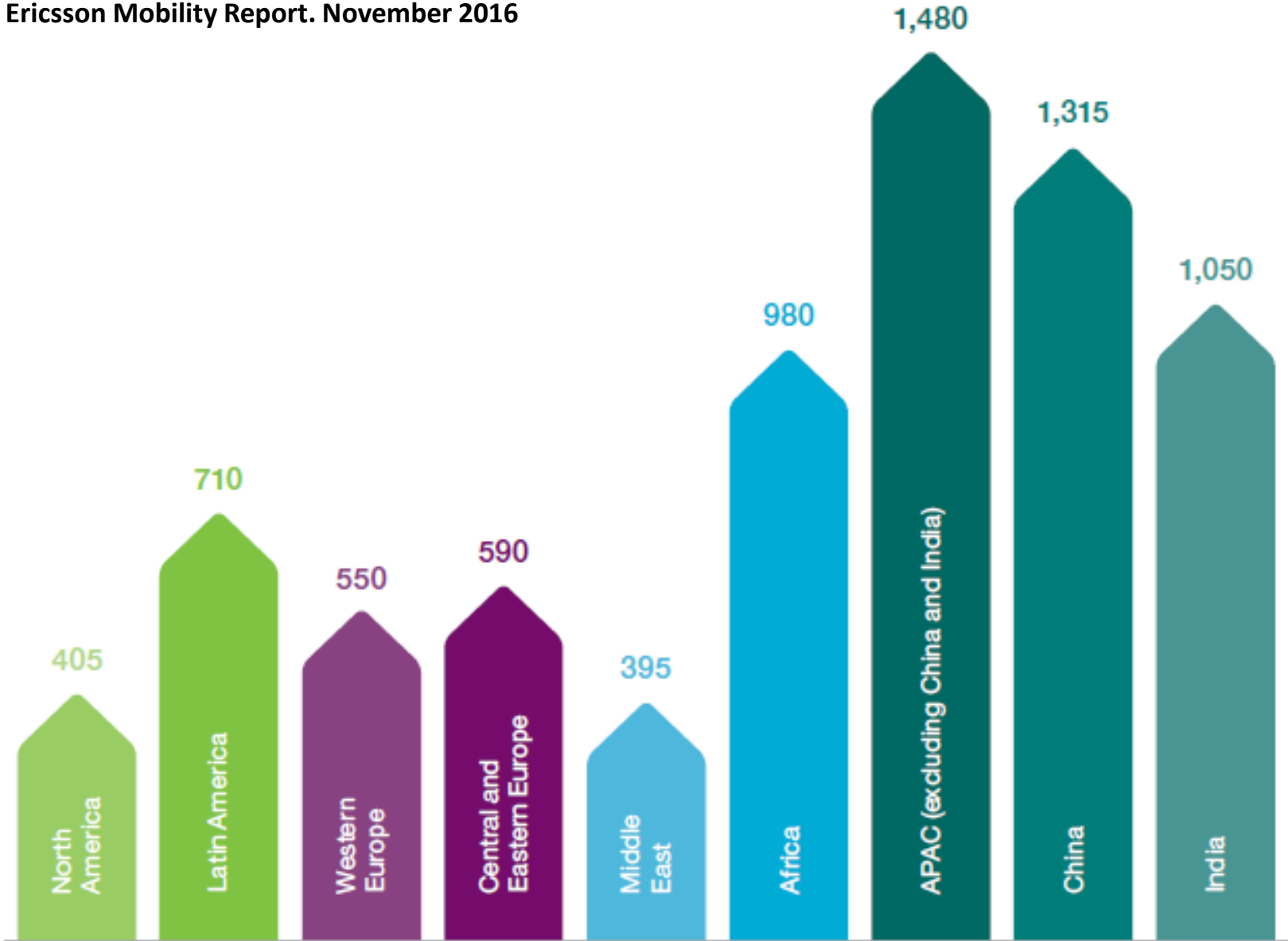
Top 5 countries by net additions Q3 2016

1	India	+15 million
2	China	+14 million
3	Indonesia	+6 million
4	Myanmar	+4 million
5	Philippines	+4 million

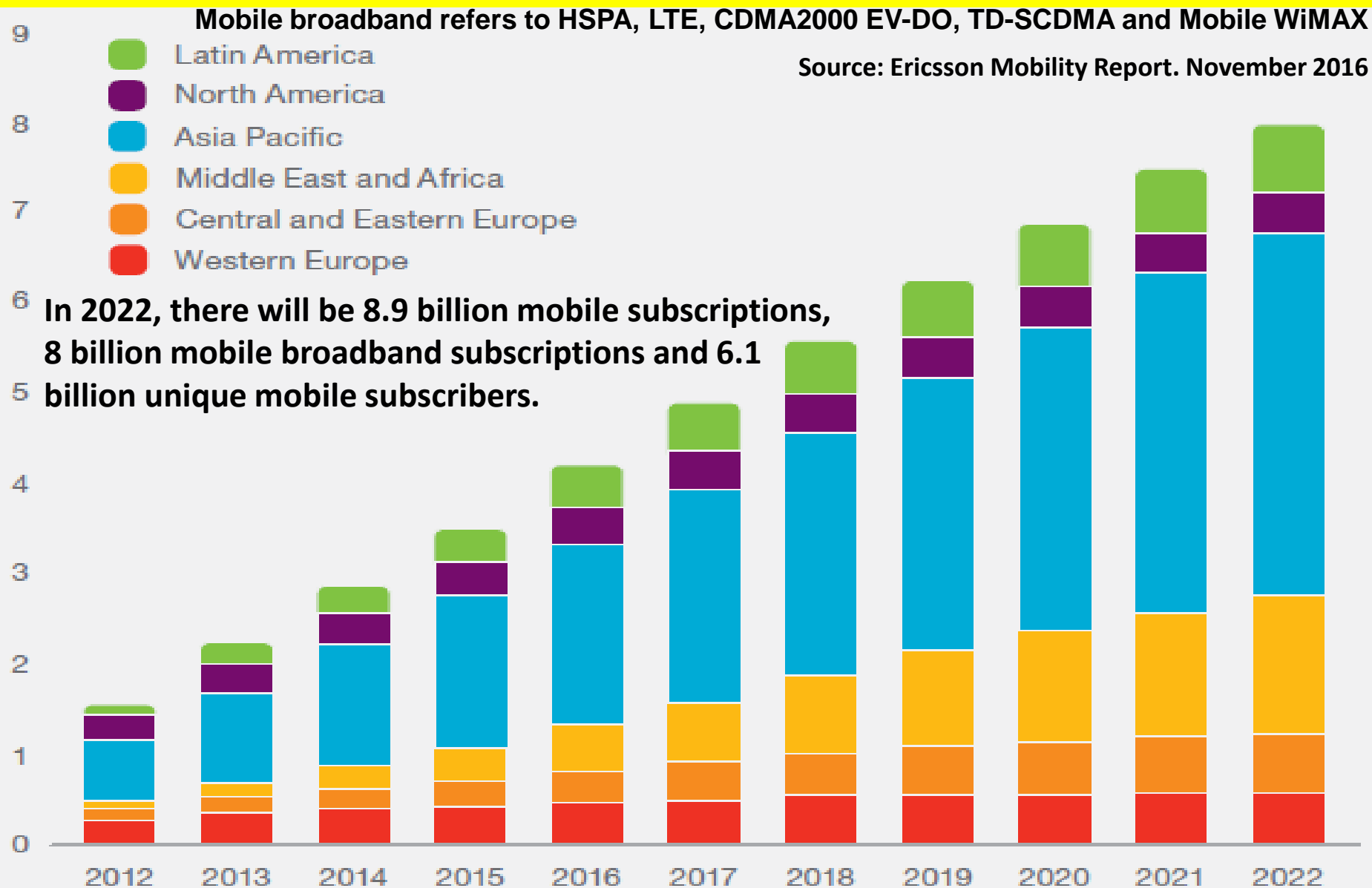
Added 51%

# Mobile subscriptions 7.5 bn in Q3 2016

Source: Ericsson Mobility Report. November 2016

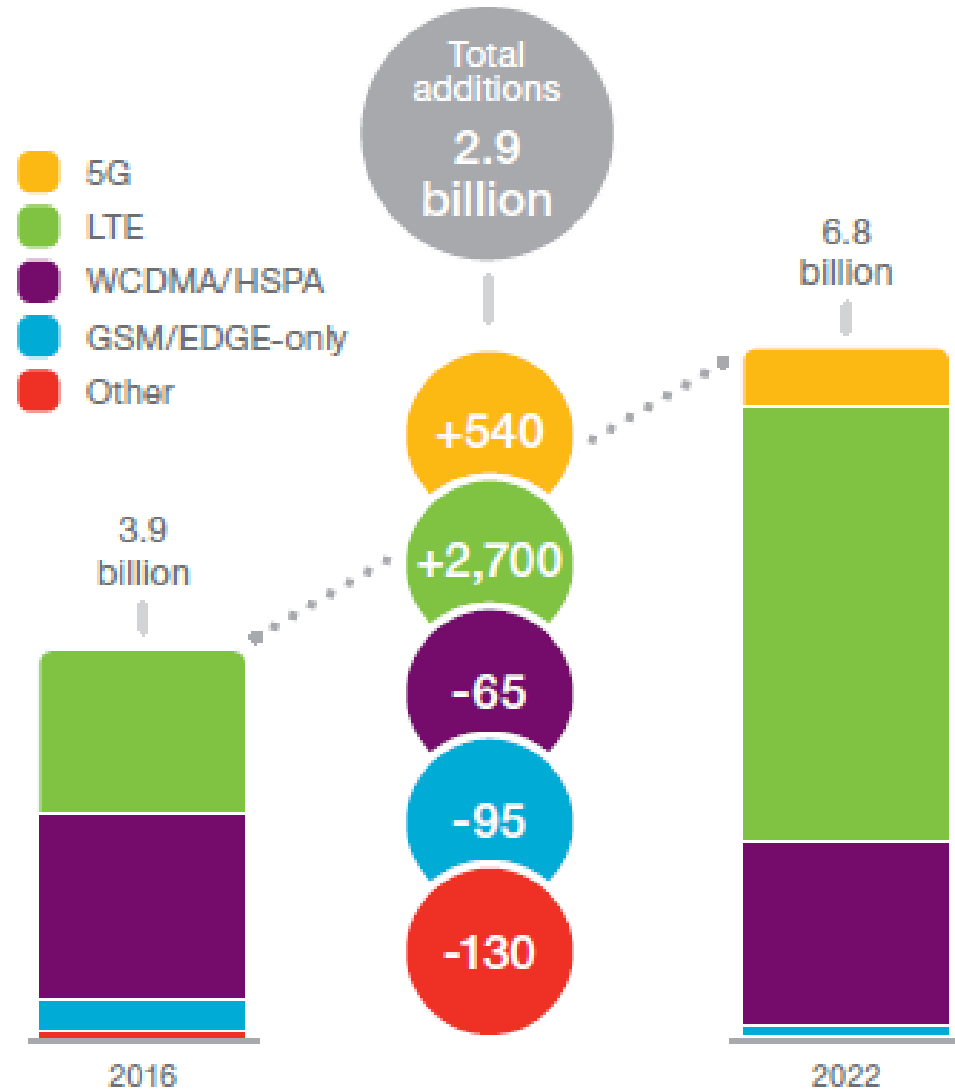


# Mobile subscriptions outlook (billion)



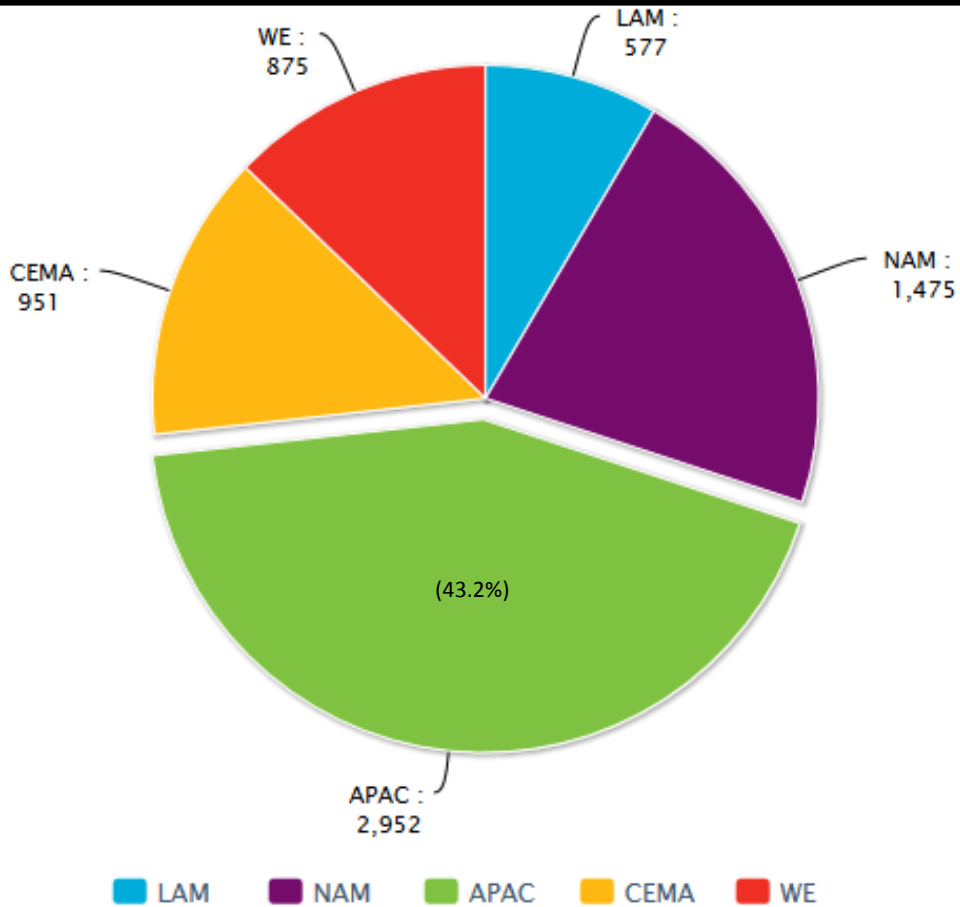
# Smartphone subscription by technology

- Almost 90% of smartphones are on 3G and 4G networks today (Q3 2016).
- By the end of 2016, there will be 3.9 billion smartphone subscriptions.
- Most of these subscriptions (90%) will be registered on WCDMA/HSPA and LTE networks.
- It is despite the fact that GSM/EDGE-only subscriptions is still the largest subscription category.
- By 2022, the number of smartphone subscriptions is forecast to reach 6.8 billion while >95% will be registered on WCDMA/HSPA, LTE and 5G networks

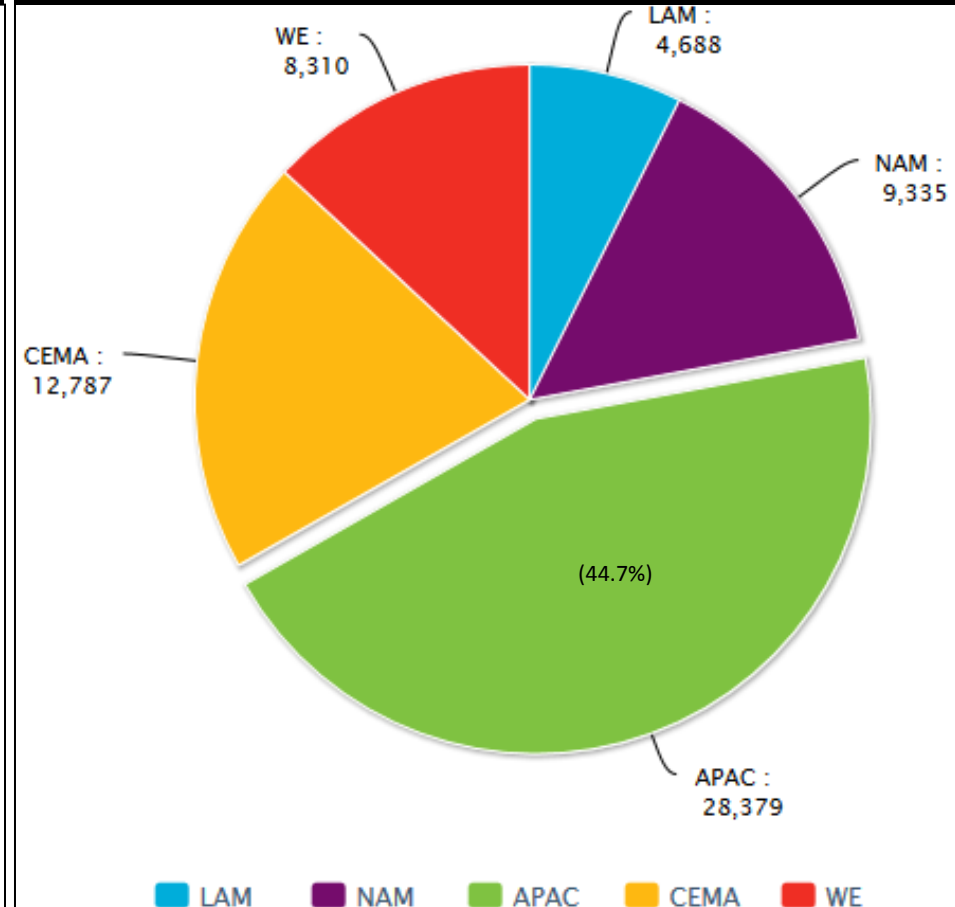


# 10X growth of Smartphone data in APAC (APAC and NAM entered Exabyte era)

**Data Traffic (PB/month)  
of Smartphone 2016**



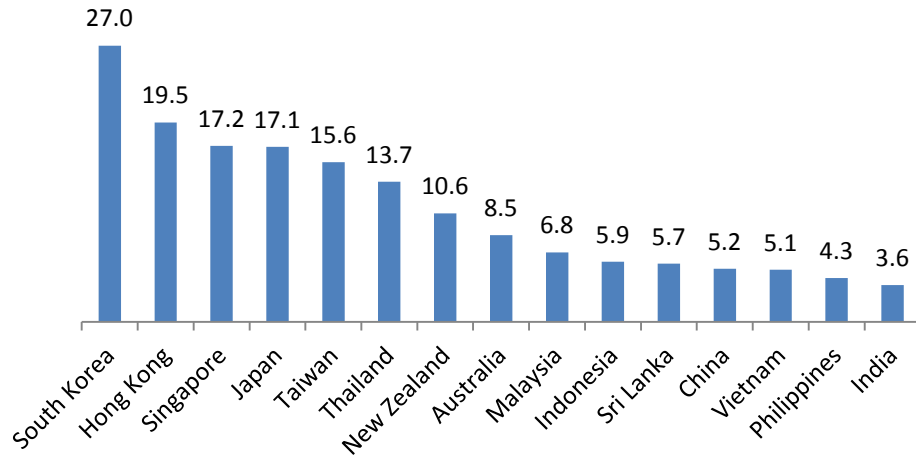
**Data Traffic (PB/month)  
of Smartphone 2022**



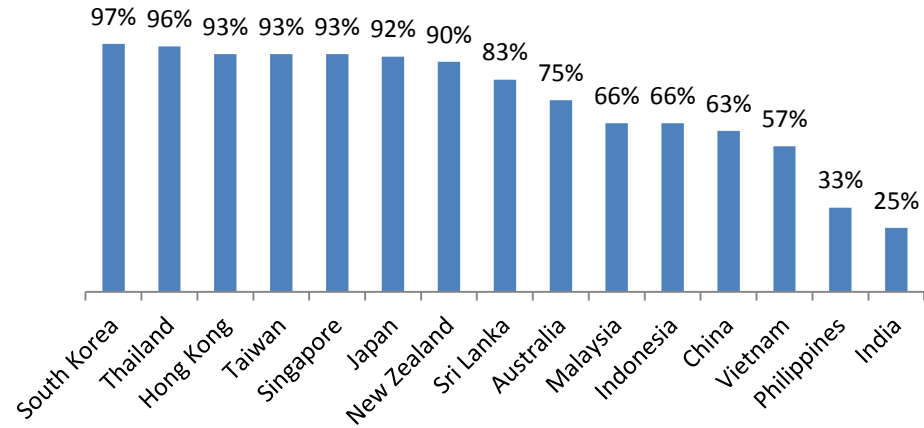
# “Akamai state of the Internet Q2 2016”

## Broadband inequality across Asia Pacific

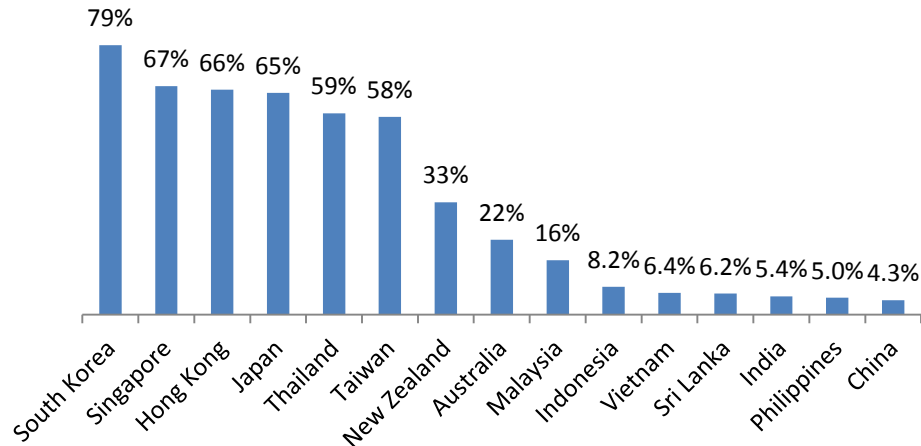
Average speed (Mbps)



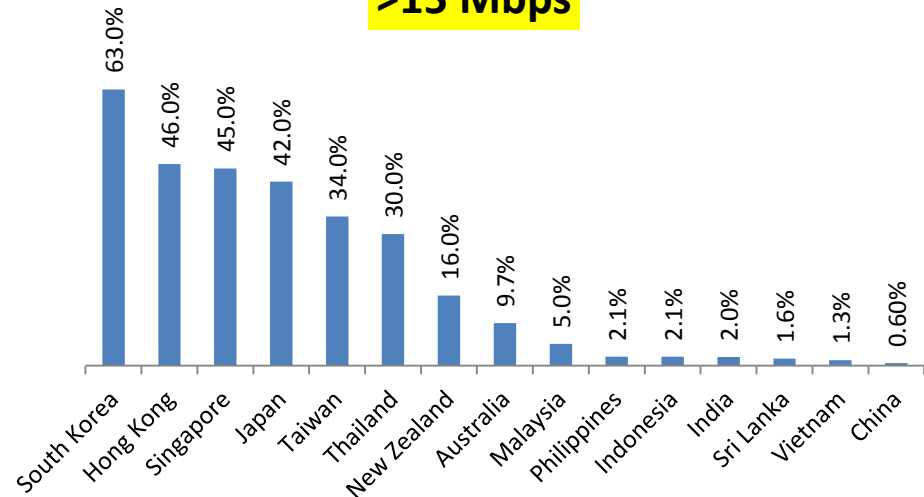
>4 Mbps



>10 Mbps

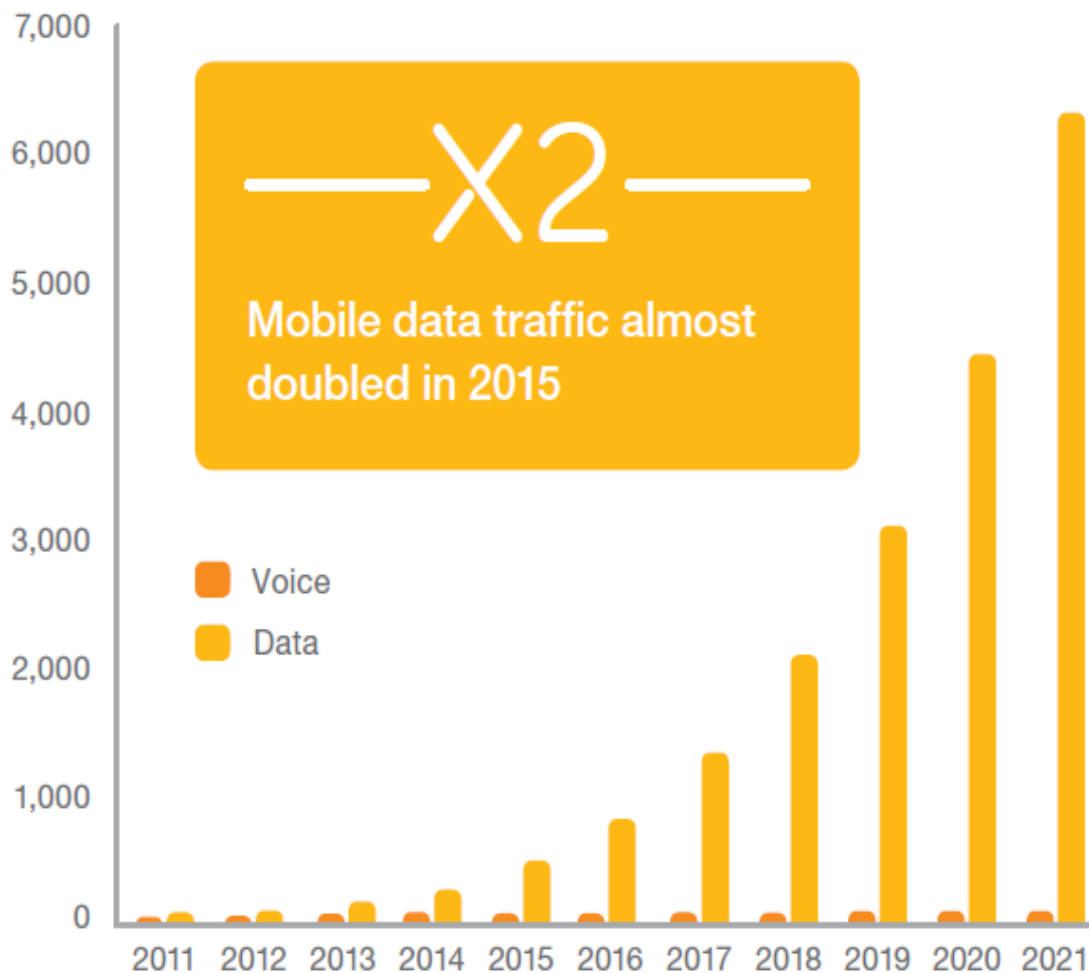


>15 Mbps

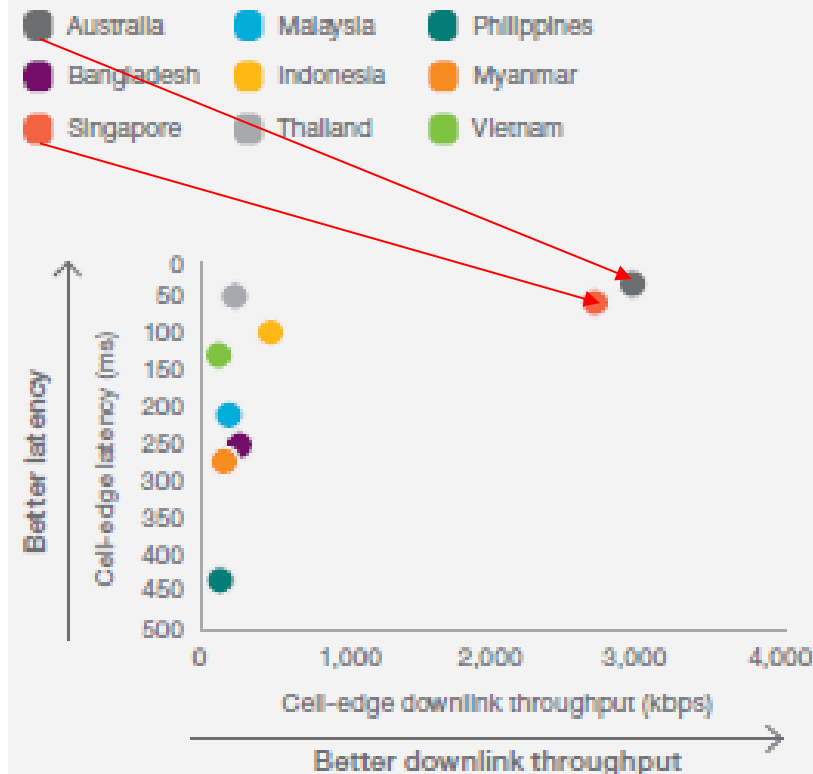


# Latency is the honesty of broadband

Mobile traffic, South East Asia and Oceania  
(monthly PetaBytes)



Cell-edge throughput (kbps) vs. cell-edge latency (ms)



Note: The user experience becomes better the higher the cell-edge downlink throughput and the lower the cell-edge latency

Source: Ericsson analysis on Speedtest Intelligence data from Ookla (Q1 2016)



# Cloud Readiness Index (and warning) 2016

- The gap in cloud readiness between the top eight performers (Hong Kong to Malaysia) and the bottom six (Philippines to Vietnam) is widening, even as the cloud computing becomes a mainstream technology across the region.
- The gap in cloud readiness may be becoming entrenched. The top performers are now reaping the benefits of multi-year national digitization plans, including plans for gCloud, broadband, and other connectivity rollouts.

Rank, Country	CRI#01 International Connectivity	CRI#02 Broadband Quality	CRI#03 Power Grid, Green Policy, and Sustainability	CRI#04 Data Centre Risk	CRI#05 Cybersecurity	CRI#06 Privacy	CRI#07 Government Regulatory Environment and Usage	CRI#08 Intellectual Property Protection	CRI#09 Business Sophistication	CRI#10 Freedom of Information	TOTAL CRI 2016 SCORE	Rank Change
#1 Hong Kong	8.1	9.1	6.7	8.0	6.2	9.5	7.2	8.6	7.4	7.2	<b>78.1</b>	<b>+4</b>
#2 Singapore	6.4	9.4	6.5	7.8	6.8	9.0	8.6	8.9	7.3	6.0	<b>76.7</b>	<b>+2</b>
#3 New Zealand	4.6	8.2	7.6	6.8	7.4	9.0	8.1	8.7	6.9	7.2	<b>74.4</b>	<b>-1</b>
#4 Australia	4.3	8.0	6.6	6.3	7.6	9.5	7.4	8.3	6.7	8.3	<b>73.2</b>	<b>-1</b>
#5 Japan	3.9	8.9	6.7	5.9	7.1	8.0	7.8	8.7	8.3	7.8	<b>73.0</b>	<b>-4</b>
#6 Taiwan	4.1	8.8	6.7	6.4	7.0	9.5	6.7	7.4	7.1	7.2	<b>71.1</b>	<b>+1</b>
#7 South Korea	3.8	9.0	6.3	6.2	7.1	9.0	7.0	6.0	6.9	6.7	<b>68.0</b>	<b>-1</b>
#8 Malaysia	3.3	7.6	5.4	5.9	7.6	8.0	7.4	7.7	7.6	5.8	<b>66.3</b>	<b>-</b>
#9 Philippines	3.3	5.5	6.0	3.5	3.5	7.5	5.5	5.6	6.1	7.3	<b>53.8</b>	<b>+1</b>
#10 Thailand	3.8	8.6	6.0	5.2	4.1	5.0	5.1	4.6	6.3	3.8	<b>52.6</b>	<b>-1</b>
#11 Indonesia	1.8	6.3	5.4	2.7	4.7	6.0	5.6	6.1	6.1	5.8	<b>50.6</b>	<b>+1</b>
#12 India	1.7	5.6	5.1	1.9	7.1	4.5	5.5	6.0	6.0	5.8	<b>49.1</b>	<b>+1</b>
#13 China	1.6	6.6	5.3	2.5	4.4	5.5	6.2	5.7	6.1	1.3	<b>45.4</b>	<b>-2</b>
#14 Vietnam	3.0	6.7	5.4	2.6	3.2	5.0	5.4	5.1	5.1	2.4	<b>44.0</b>	<b>-</b>

Source: Asia Cloud Computing Association.

# Ericsson also paints a gloomy picture

- Despite ongoing deployment of **LTE** in China, which will result in more than 1.2 billion LTE subscriptions in the country by the end of 2022, LTE subscriptions will represent **just 50 percent** of all subscriptions in the region by the end of the same period. **This will be around one quarter of the global total.**
- **5G** subscriptions will account for around **10 percent** of all subscriptions in the region in 2022, with deployments starting in South Korea, Japan and China.
- All three of these countries will host Olympic games in the coming six years, and have stated intentions to launch 5G services in conjunction with the games.

# Competition is critical to transport costs

Median Lease Price, 10 Gbps wavelength, Q4 2015.



# Is APAC resilient enough?

	Repairs per Year	Outage (days/year)
Philippines-Taiwan	2.7	42.8
Singapore-Hong Kong	2.6	45.5
Hong Kong-Tokyo	2.1	37.8
Mumbai-Singapore	1.0	26.6
Tokyo-Los Angeles	0.5	8.4

Source: Palmer-Felgate, A., and Booi, P., How Resilient is the Global Submarine Cable Network? SubOptic 2016 #OralWE2A-5

# Best effort by Asia Africa Europe-1 (AAE-1) cable

**25000 Km**

Submarine cable

**4/5**

Number of Fiber Pair

**100Gbps**

Wavelength Technology

**80  $\lambda$**

Initial Design WL per FP

**40 Tbps**

Initial System Design Capacity

Owners: [China Unicom](#), Telecom Egypt, Etisalat, Omantel, Djibouti Telecom, OTEGLOBE, Pakistan Telecommunications Company Ltd., PCCW, Ooredoo, Mobily, Viettel Corporation, TeleYemen, Chuan Wei, Retelit, Reliance Jio Infocom.

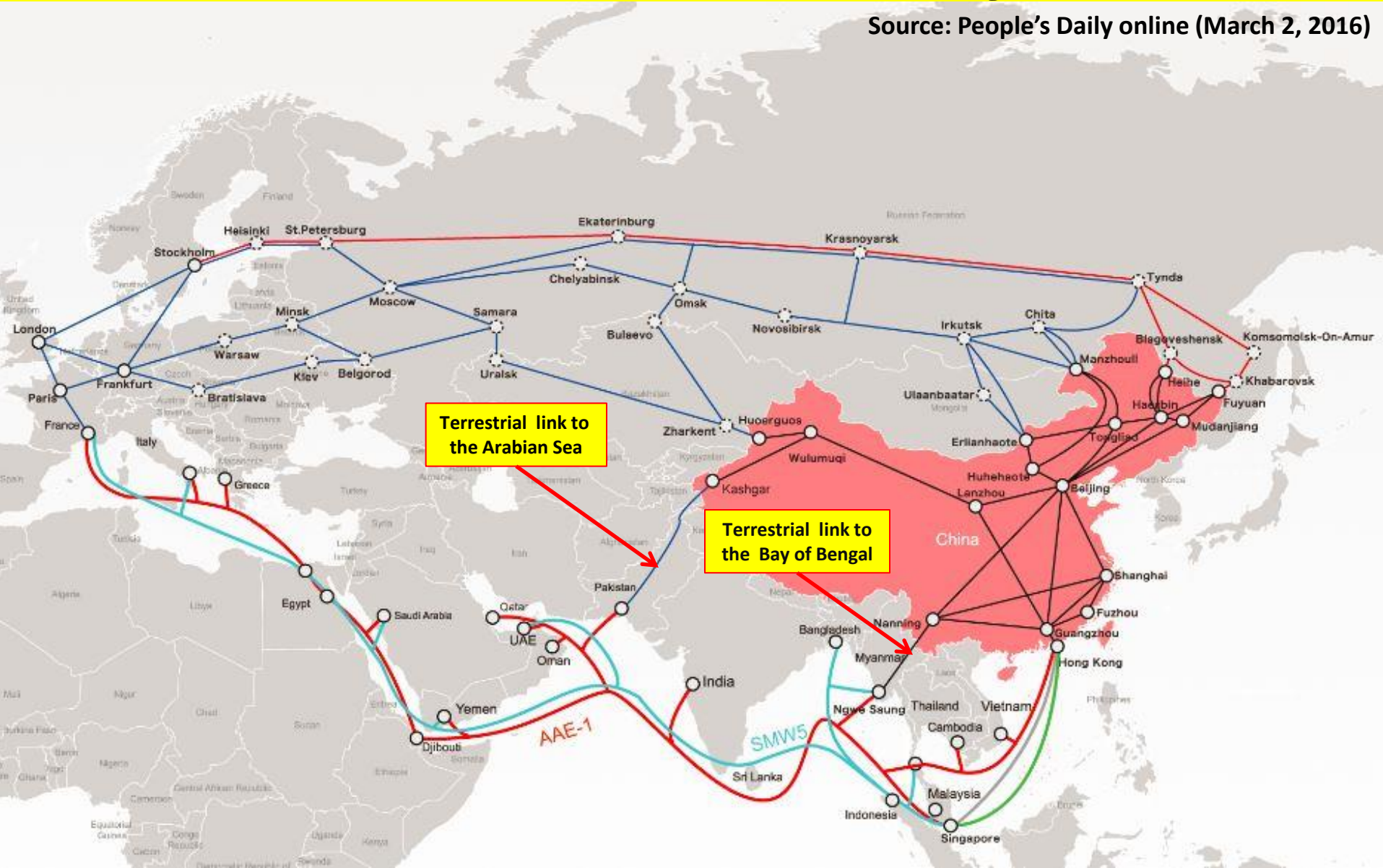




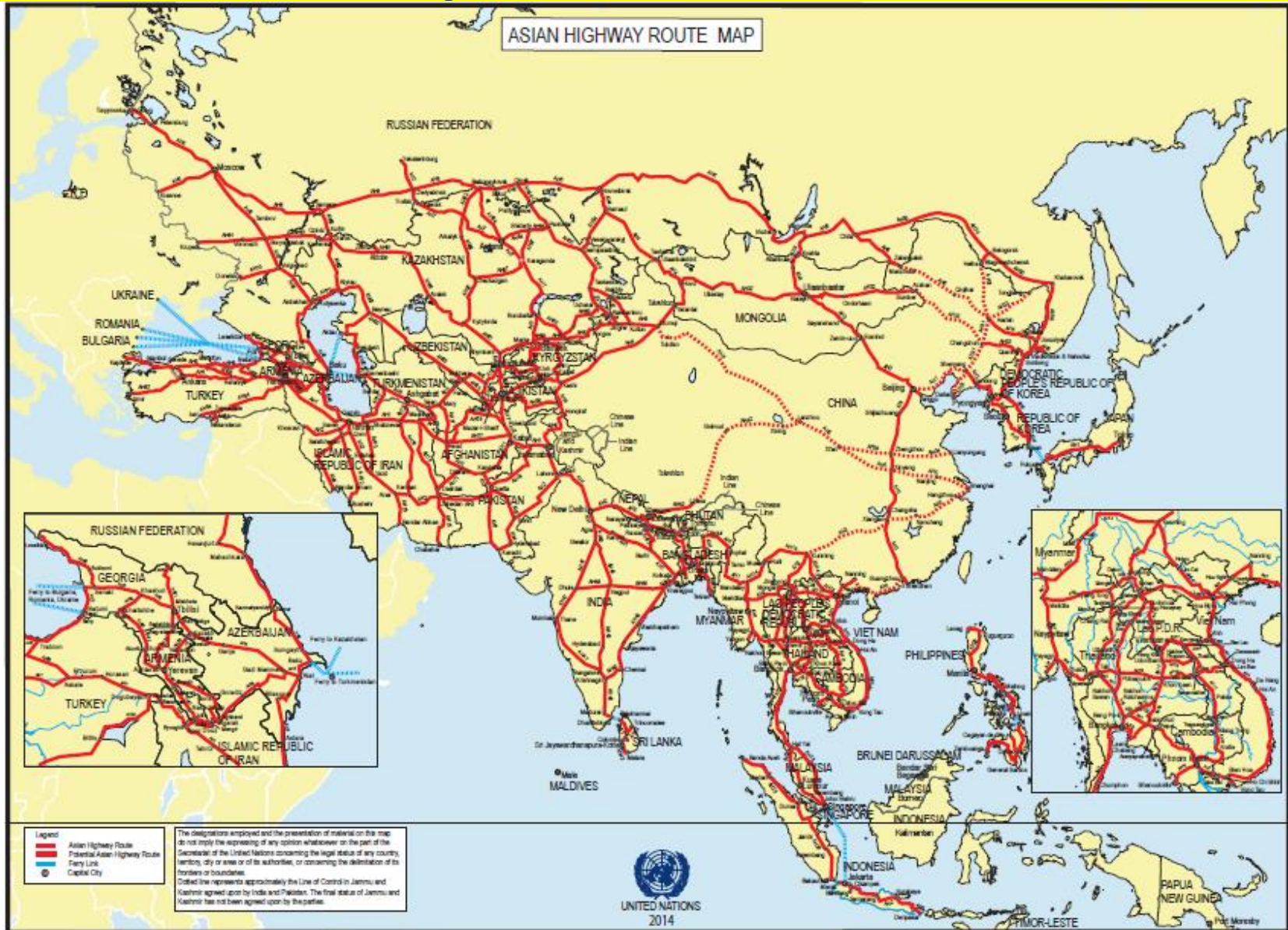
# China Unicom takes a giant leap

## AAE-1 via Pakistan and Myanmar

Source: People's Daily online (March 2, 2016)



# AP-IS offers every carrier equal resilience







**Thank you!**  
**Questions?**