WHAT'S NEXT FOR DATA CENTRES?

CUSHMAN & WAKEFIELD

ASIA PACIFIC



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AGENDA

- Key global and regional industry trends
- Asia Pacific key markets: **Sydney, Singapore, Hong Kong and Tokyo**
- Asia Pacific secondary markets & trends: **Greater China, Osaka, Jakarta**
- Q&A

WITH YOU TODAY



TODD OLSON
Managing Director, Japan & Korea,
Head of Asia Pacific
Data Centre Practice Group



KEVIN IMBODEN
Senior Research Manager,
Data Centre Insights,
Global Research



HIDEAKI SUZUKI
Director, Research,
Head of Business Development Services,
Japan



SUMMER CHEN
Senior Associate Director,
Valuation & Advisory Services,
Greater China

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01

KEY INDUSTRY TRENDS

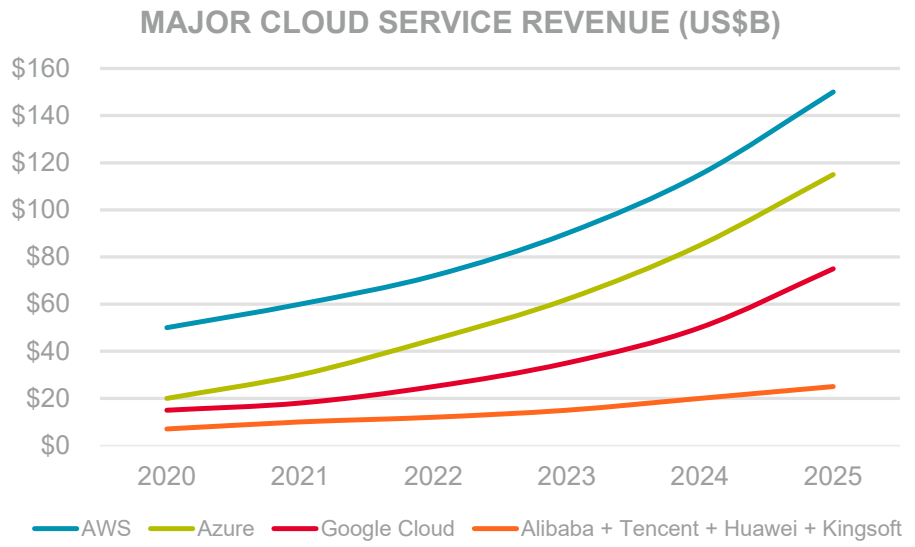


Kevin Imboden
Senior Research Manager, Data Centre Insights,
Global Research

MAJOR CLOUD SERVICES LEAD THE WAY

CORPORATIONS AND GOVERNMENT AGENCIES ALIKE ARE MAKING THE MOVE

- Events of the past year accelerated certain existing trends as organizations rapidly adjusted to a more flexible and scalable IT structure. Many began or continued their move to off-premises IT and discovered both positives and negatives from doing so.
- Cloud services are often drivers of profit for their larger companies and are focal points of growth; Q1 saw AWS revenue up 32%, Azure up 50%, Google Cloud up 46%.
- Appeals for corporate and government contracts alike by these services often involve additional skilling programs and/or community benefits.



AWS- 230%	G Cloud- 584%	Azure- 421%	Others- 545%

Source: Structure Research

REGIONAL CAPITAL RAISES-COMPANY FORMATION

NEW OPERATORS BEING CREATED TO TARGET PRIMARY-SECONDARY MARKETS

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Gaw Capital launching

$1.3B

Fund for data centres across China, with backing from ADIA among others

OneAsia has received a new investor with APG taking

20%

In the operator for growth throughout China, Japan, Korea, and Thailand

Adani and **EdgeConneX** have formed a joint venture to construct

1GW Of new data centres over 10 years in Chennai, Mumbai, Noida, Vizag, and Hyderabad

Princeton Digital Group has refinanced

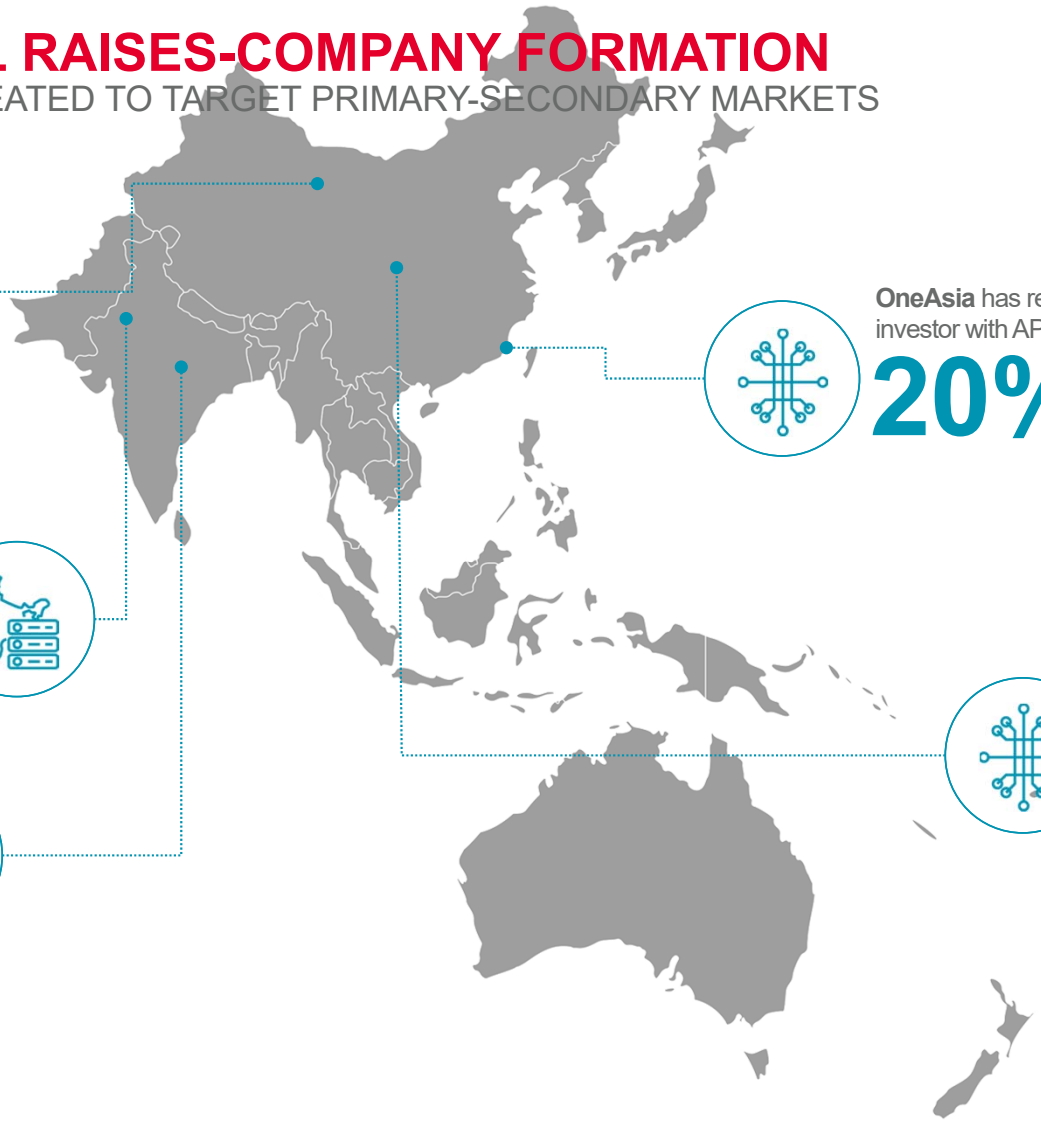
$230M

For further expansion across China into Nanjing and Nantong; further markets planned for 300 MW in total after earlier $360M equity raise

Iron Mountain contributing

$150M

To new joint venture with Web Werks, with data centres coming in Mumbai, Pune, Delhi, Bangalore, Hyderabad, and Chennai



BUILDING A REGIONAL PORTFOLIO IS DIFFICULT

FEW HAVE ACHIEVED CONSIDERABLE SCALE AS YET

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OPERATOR HQ	AUS	CAMB	CHINA	HK	INDIA	INDO	JPN	LAOS	MALA	MYAN	NZ	PHIL	SGP	KOR	TAIW	THAI	VIET
AirTrunk *(Australia)*	■			■			■						■				
Bridge Data Centres *(Singapore)*					■				■								
China Telecom *(China)*	■		■	■		■	■		■				■	■	■	■	■
CITIC *(China)*			■	■													
Colt Data Centres *(UK)*				■	■		■						■				
Digital Realty *(US)*	■			■			■						■	■			
Equinix *(US)*	■		■	■	■	■	■						■	■			
GDS *(China)*			■	■													
Global Switch *(UK)*	■			■									■				
KDDI *(Japan)*			■	■			■						■				■
Keppel *(Singapore)*	■								■				■				
NTT *(Japan)*	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Princeton Digital Group			■		■	■							■				
STT *(Singapore)*			■		■								■			■	
SUNeVision *(HK)*				■													

INVESTMENT CAPITAL FLOWING AROUND THE WORLD

INVESTORS LOOKING FOR BUILT ASSETS FIND DEALS IN OTHER MARKETS

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Mapletree acquired a

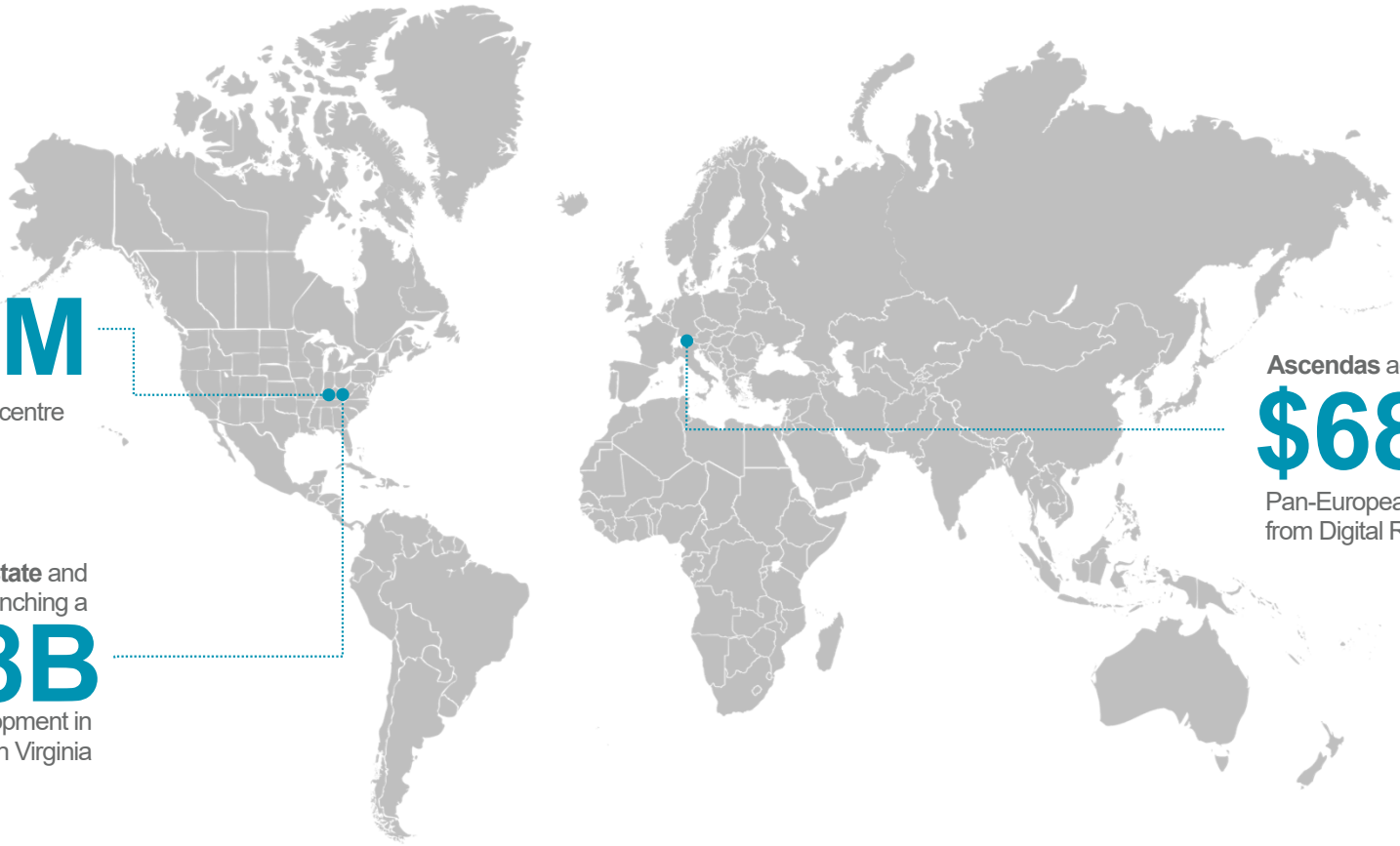
$207M

Bank of America data centre campus in Richmond

Mitsubishi Estate and **TA Realty** launching a

$1.8B

Development in Northern Virginia



Ascendas acquired a

$680M

Pan-European portfolio from Digital Realty

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02

KEY MARKETS ASIA PACIFIC

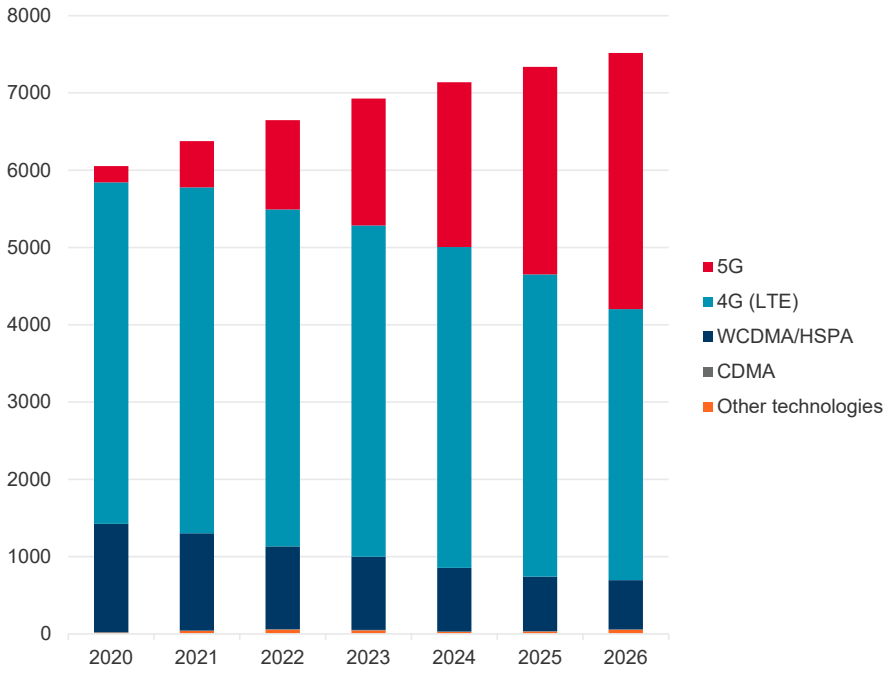


Hideaki Suzuki
Director, Research, Japan
Head of Business Development Services
Japan

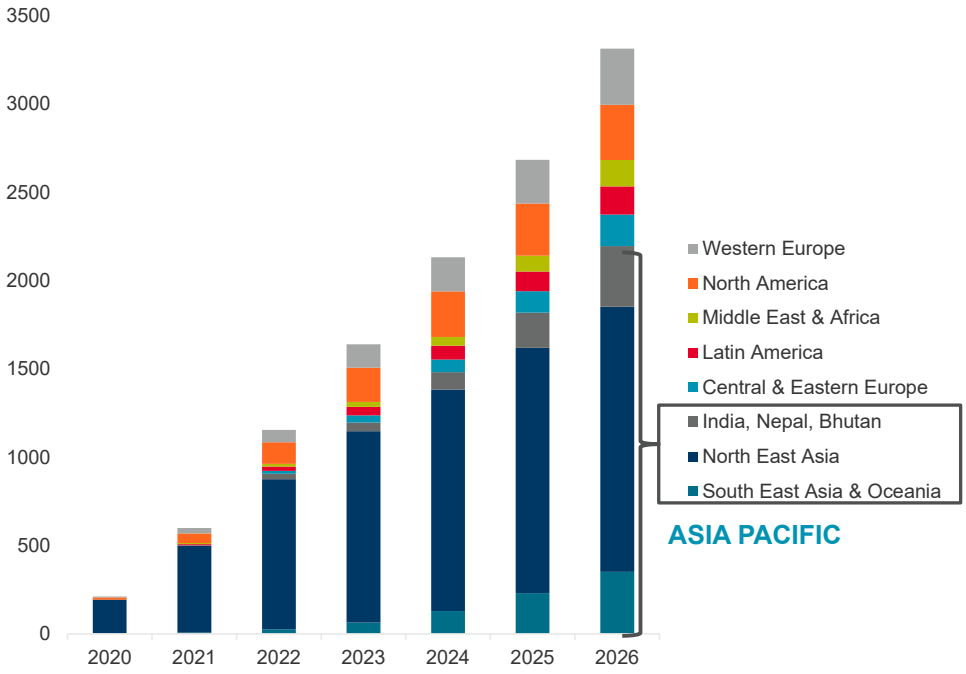
ASIA PACIFIC WILL LEAD 5G DEMAND, *SIGNIFICANTLY*

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MOBILE SUBSCRIPTION FORECAST BY TECHNOLOGIES



5G MOBILE SUBSCRIPTION FORECAST BY REGION

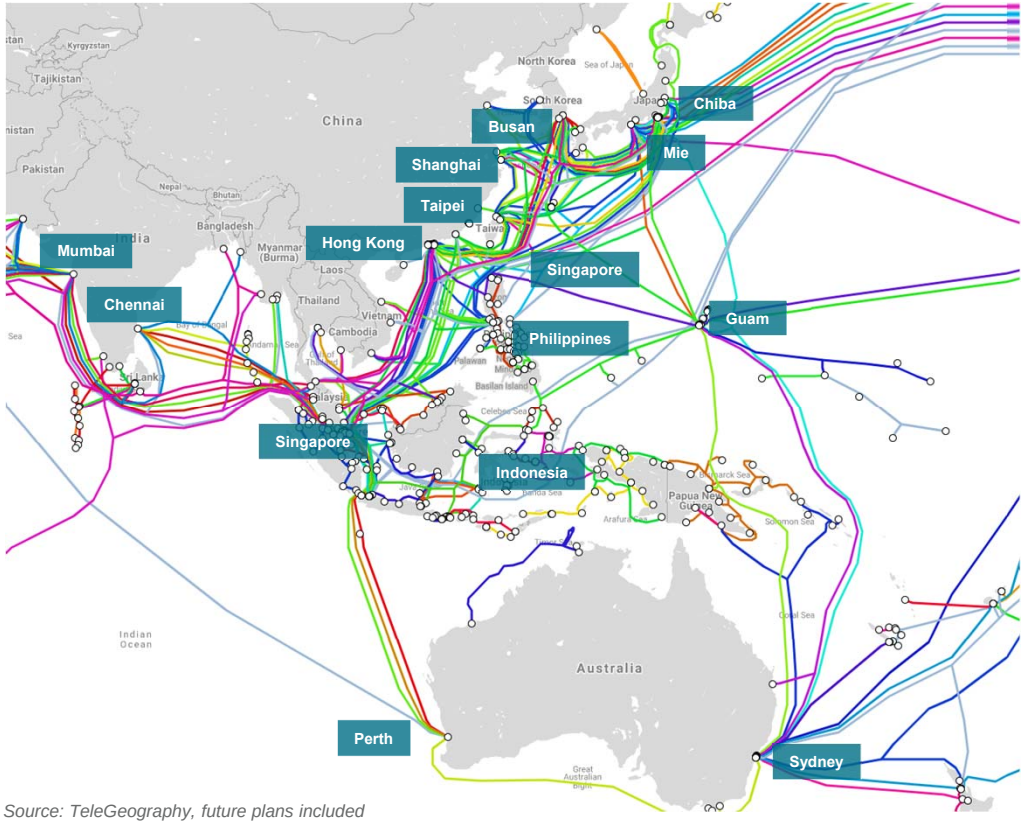


Source: Ericsson Mobility Report 2020

DATA CENTRE DEMAND FOLLOWS INFRASTRUCTURE

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ASIA PACIFIC SUBMARINE CABLES



Source: TeleGeography, future plans included

APAC DATA CENTRE RANKING 2021

1. SYDNEY
2. SINGAPORE
3. HONG KONG
4. TOKYO

SYDNEY IS SEEING DATA CENTRE SURGE

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Key Indicators

Under Construction

79 MW

Submarine Cables



Source: TeleGeography, future plans included

- Several government agencies join major cloud services as top-level tenants for local operators.
- Major cloud services bullish on Sydney: Microsoft, Amazon, OVH etc. Availabilities for land and power are still favorable, particularly throughout the Greater Western Sydney suburbs.
- Perth, Darwin and Dampier, along with an 8,000-kilometre undersea cable linking these areas to Indonesia, Singapore and Malaysia. This will further accelerate growth of these secondary and tertiary markets in Australia.

Construction update

OPERATOR	PROJECT	SIZE (SQM)	POWER (MW)	STAGE / EST. DELIVERY
Macquarie	Intellicentre 3 East	13,400	11	Under Construction / Q2 2021
Alpha DC Fund	KDC Sydney 1	5,300	7 (est)	Under Construction / Q2 2021
Equinix	SY5 Phase 2	2,894	6 (est)	Under Construction / Q3 2021
Digital Realty	Erskine Park III	6,279	7.2	Under Construction / Q4 2021
NextDC	S3	20,000	12	Under Construction / Q2 2022
DCI	SYD02	35,000	36	Under Construction / Q4 2022
AirTrunk	SYD1 (Phase 2)	12,000 (est)	40	In Planning

SINGAPORE AS AN INDUSTRY EPICENTRE

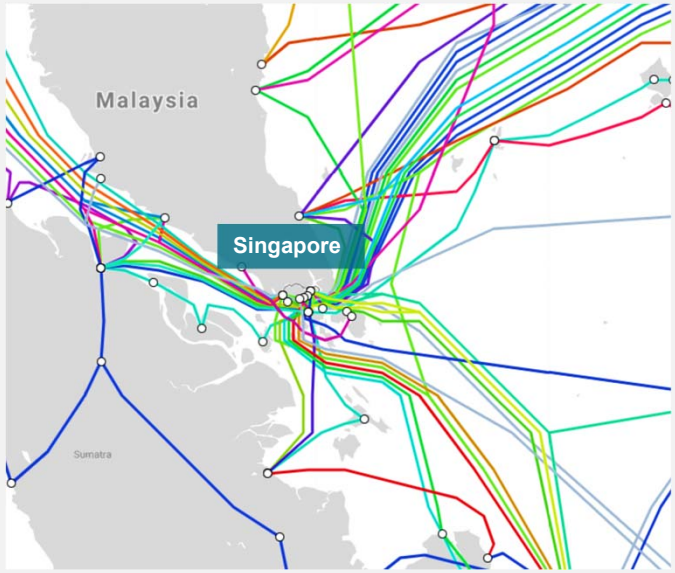
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Key Indicators

Under Construction

173 MW

Submarine Cables



Source: TeleGeography, future plans included

- Major cloud services differentiating their offerings, including Google, Oracle, Alibaba; continued recognition that Singapore serves as regional hub for out-of-market companies
- Does being a mega-connectivity hub offset high costs? Will local workloads get more specific?
- Continued focus on renewable research to benefit the entire industry, including cooling, carbon capture, and floating data centres; important to allow further local development

Construction update

OPERATOR	LOCATION	GFA SIZE (SQM)	TOTAL POWER (MW)	STAGE / EST. DELIVERY
Equinix	SG5 (Phase 1)	1,710	3 (est)	Under Construction / Q2 2021
	SG1 (Phase 15)	879	1 (est)	Under Construction / Q3 2021
	SG5 (Phase 2)	2,000	4 (est)	Under Construction / Q4 2021
Facebook	Tanjong Kling	170,000	150	Under Construction / Q2 2022
STT	Defu 3	14,500	15	Under Construction / Q3 2022

HONG KONG AS CURRENT AND FUTURE FINANCIAL HUB

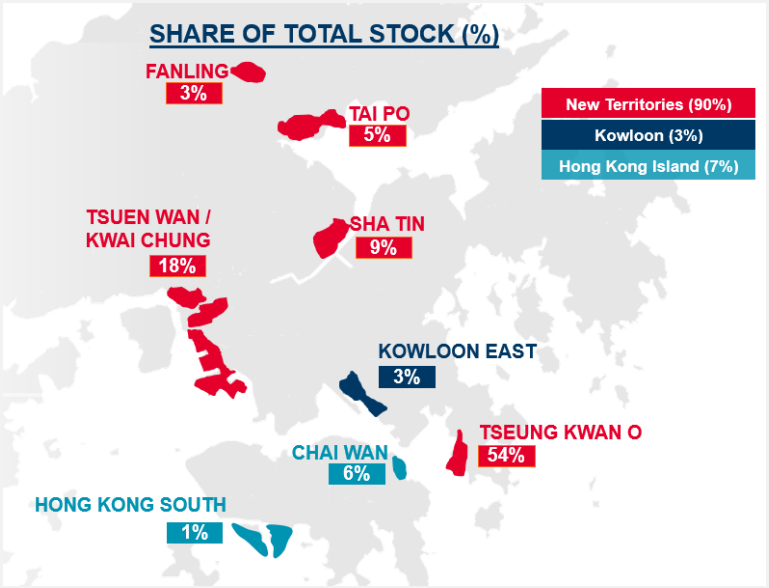
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Key Indicators

Under Construction
79 MW

Total Stock (End-2Q20)
8.3M sf

Hong Kong Market Map

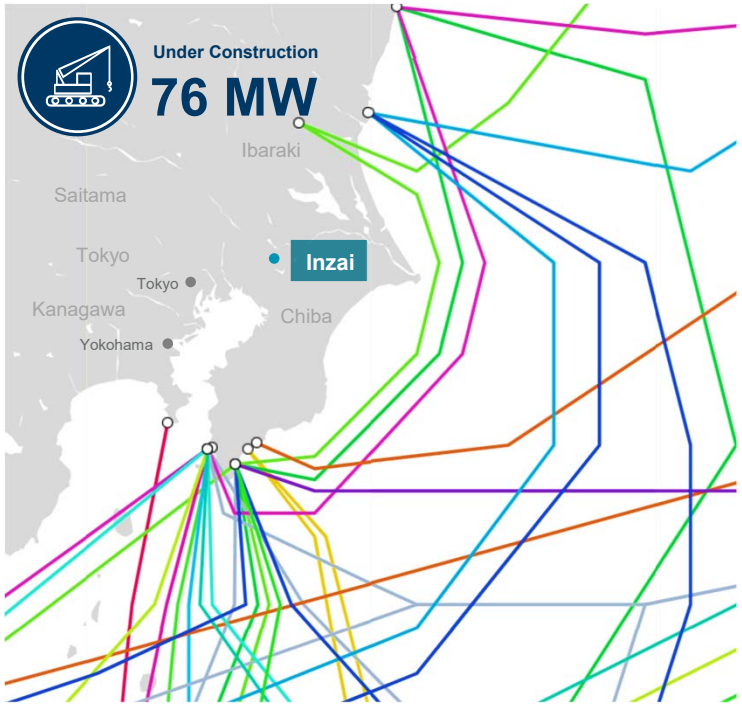


- Phased construction continuing, with Global Switch recently completing a 58 MW addition; CITIC, Equinix, SUNeVision, and new entrants GDS and Mapletree underway
- HK-LA cable no longer in progress… but three others are (Asia Direct, Southeast Asia-Japan Cable 2, Hainan-HK Express) adding further connectivity
- Hong Kong serves as a location for capital raises/company formation; secondary listing for GDS on HKEX, new entrant Turbidite backed by New World

GREATER TOKYO AS HYPERSCALE HUB FOR EAST ASIA

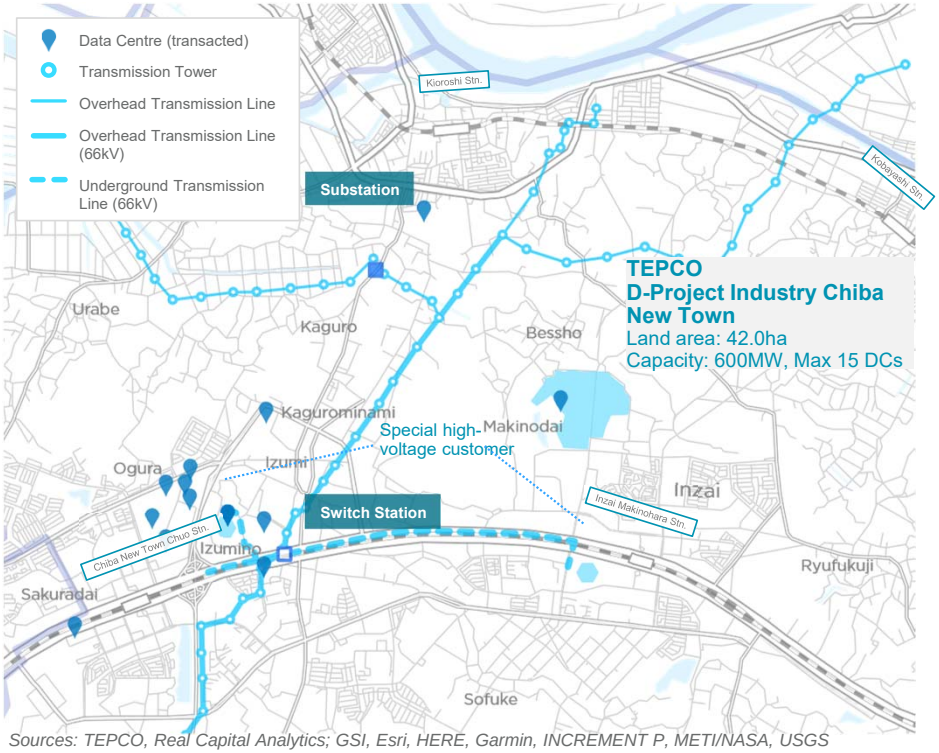
A HYPERSCALE DC CLUSTER IN INZAI

SUBMARINE CABLES



Source: TeleGeography, future plans included

INZAI MAP



Sources: TEPCO, Real Capital Analytics; GSI, Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS

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03

SECONDARY MARKETS



SUMMER CHEN
Senior Associate Director,
Valuation & Advisory Services, Greater China



Kevin Imboden
Snr Research Manager, Data Centre Insights,
Global Research

MAINLAND CHINA

FINANCING FOR DATA CENTRE DEVELOPMENT

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Keppel	KDC Fund II achieved a first close of more than $500M initial capital commitments from various financial institutional investors in 4Q20, focusing on data centre in China and other regional markets in APAC.
PDG	Princeton Digital Group lands $230M in debt refinancing from China Merchants Bank, with new plans for China Data Centre Platform. Its new facility in Shanghai is completely contracted to a single client in 2Q21.
房地產投資信託 REITs	The first batch of 9 public REITs got approved on 17th May 2021. The new tool aims to finance China's next phase of development through digital infrastructures, including 5G and data centres.

MAINLAND CHINA

SUSTAINABILITY LEADS THE FUTURE



Beijing Highlander unveiled China's first underwater data centre project in Zhuhai in 1Q21. It plans to carry out and build more underwater data centre projects over the next five years across the Greater China region.



China Ya'an Big Data Industrial Park received two certifications in 1Q2021 and became the first certified carbon neutral national green data centre in China.

GDS 万国数据

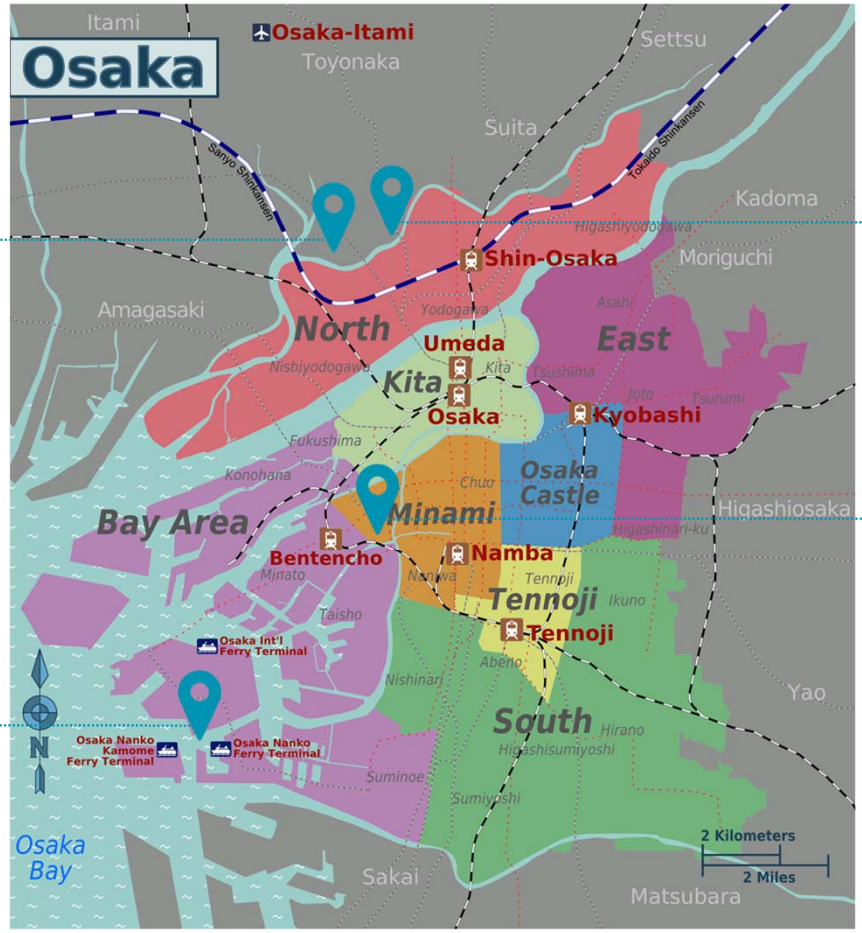
Renewable energy accounted for 20% of GDS' total energy consumption in 2020. GDS plans to issue its first ESG report and revealed its ambition to set carbon-neutral target, time frame and road map in 1Q2021.

OSAKA

A RAPIDLY DEVELOPING SECONDARY MARKET

Digital Realty and Mitsubishi Corp have two campuses in the northern portion of the metro area for hyperscale tenants

ESR Cayman is becoming a data centre player, gaining full control of a site in Osaka to an eventual 78 MW



NTT added their seventh data centre late in 2019 with continued expansion possible

Equinix has one data centre already operational with two more underway, including OS2x with GIC

JAKARTA

FROM MOST UNDERSERVED TO AMONG THE HOTTEST GLOBALLY

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MAJOR CLOUD SERVICES

aws
Alibaba Cloud
Google Cloud
Tencent Cloud
Microsoft Azure

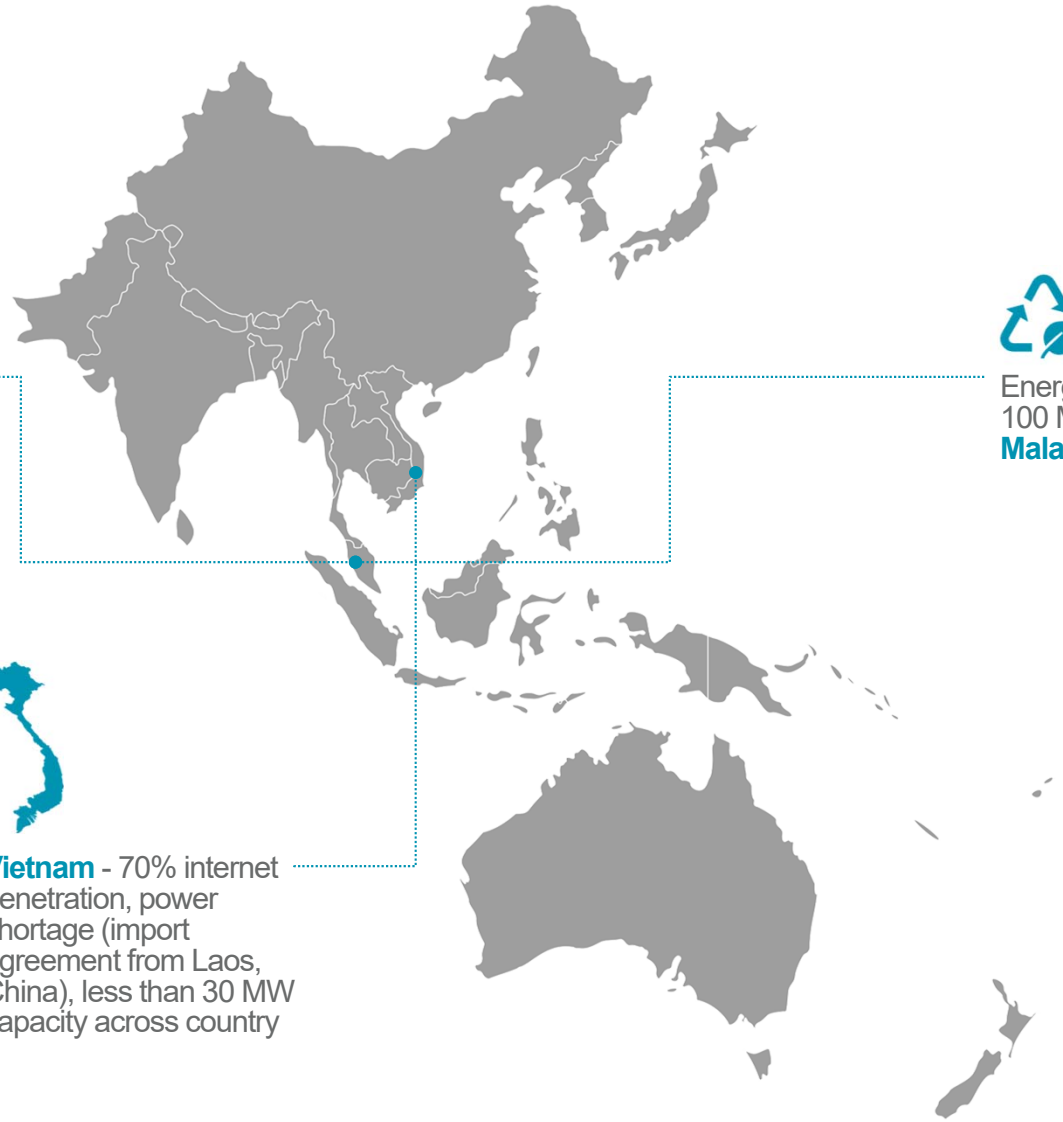
OPERATORS

Princeton Digital Group
Internet Infrastructure
SpaceDC
Keppel Data Centres
indonet
NTT Communications

75% Internet penetration indicates further possible growth

New cables coming funded by major players – Bifrost, Echo

AND MORE…



Kuala Lumpur as a growing market, with many operators already expanding (Chindata, PCCW, NTT, AIMS). Alibaba has operated a local region since 2017; might others come soon?

Energy Market Authority- 100 MW import RFP from **Malaysia** coming shortly

Vietnam - 70% internet penetration, power shortage (import agreement from Laos, China), less than 30 MW capacity across country

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Q&A

PLEASE SUBMIT YOUR QUESTIONS BY CLICKING THE ICON WITH THE QUESTION MARK ON THE TOP RIGHT HAND CORNER OF YOUR SCREEN

TODD OLSON
Managing Director, Japan & Korea,
Head of Asia Pacific
Data Centre Practice Group
Todd.Olson@ap.cushwake.com



KEVIN IMBODEN
Senior Research Manager,
Data Centre Insights, Global Research
Kevin.Imboden@cushwake.com



HIDEAKI SUZUKI
Director, Research,
Head of Business Development
Services, Japan
Hideaki.Suzuki@cushwake.com



SUMMER CHEN
Senior Associate Director,
Valuation Advisory Services,
Greater China
Summer.Chen1@cushwake.com



THANK YOU | END

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