Digital Infrastructure Update

Infratil

Managed by **MORRISON.**

Will Smales

Chief Investment Officer

Lewis Bailey

Executive Director: Strategy
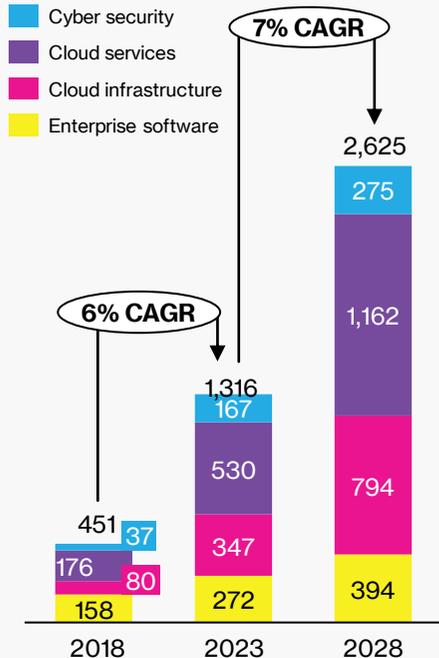
Four Engines Driving Digital Demand

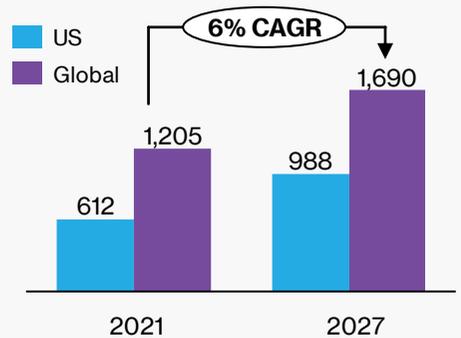## Cloud migration and consumer video not yet out of fuel, while AI and automation are starting to fire

Enterprise cloud migration and SaaS
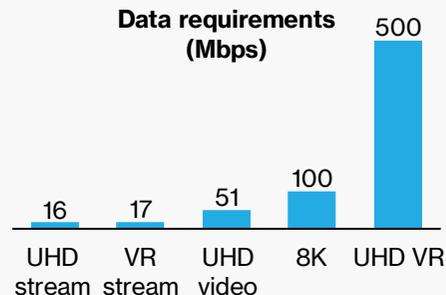
Market size, 2023-2028, $bn

- Cyber security
- Cloud services
- Cloud infrastructure
- Enterprise software

7% CAGR
6% CAGR

2018: 451 (37 Cyber security, 176 Cloud services, 80 Cloud infrastructure, 158 Enterprise software)

2023: 1,316 (167 Cyber security, 530 Cloud services, 347 Cloud infrastructure, 272 Enterprise software)

2028: 2,625 (275 Cyber security, 1,162 Cloud services, 794 Cloud infrastructure, 394 Enterprise software)

Consumer video

SVOD subscribers US vs Global, million

- US
- Global

6% CAGR

2021: US 612, Global 1,205
2027: US 988, Global 1,690

Data requirements (Mbps)

- UHD stream: 16
- VR stream: 17
- UHD video: 51
- 8K: 100
- UHD VR: 500

Artificial intelligence

GenAI revenue forecast

42% CAGR

- % total tech spend
- GenAI revenue, $bn

Year	GenAI revenue, $bn	% total tech spend
2022	40	2%
2024	137	4%
2026	304	6%
2028	548	7%
2030	897	10%
2032	1,304	12%
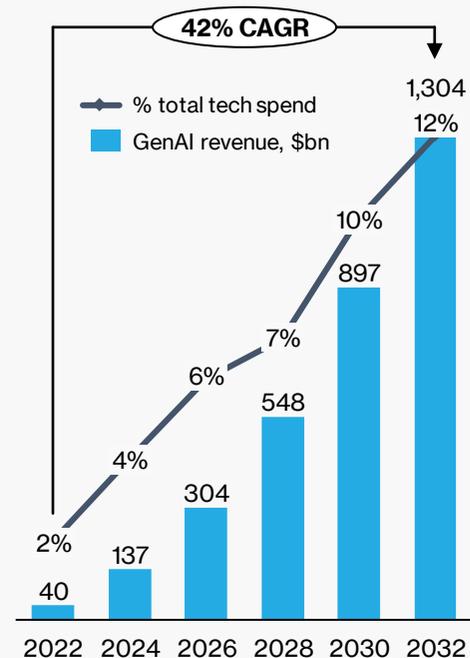
Robotics and IoT

Robotics market size, US$bn
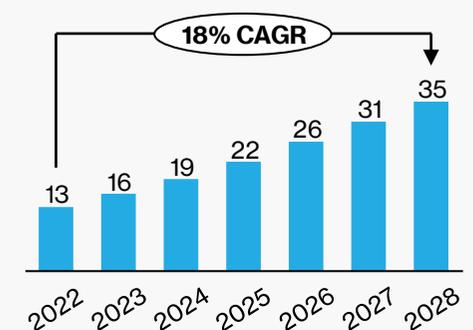
23% CAGR

- 2022: 42
- 2024: 63
- 2026: 95
- 2028: 143
- 2030: 215

# of IoT devices, billion

18% CAGR

- 2022: 13
- 2023: 16
- 2024: 19
- 2025: 22
- 2026: 26
- 2027: 31
- 2028: 35

An Eye On AI

Today, 'promise' is greater than 'practice' …

Reported use of GenAI, currently use vs should use
% of respondents at leading commercial organisations

Legend:
- Almost always
- Often
- Sometimes
- Rarely
- Almost never

Currently use:
- Often: 20%
- Sometimes: 20%
- Rarely: 55%
- Almost never: 5%

Should use:
- Almost always: 25%
- Often: 65%
- Sometimes: 10%
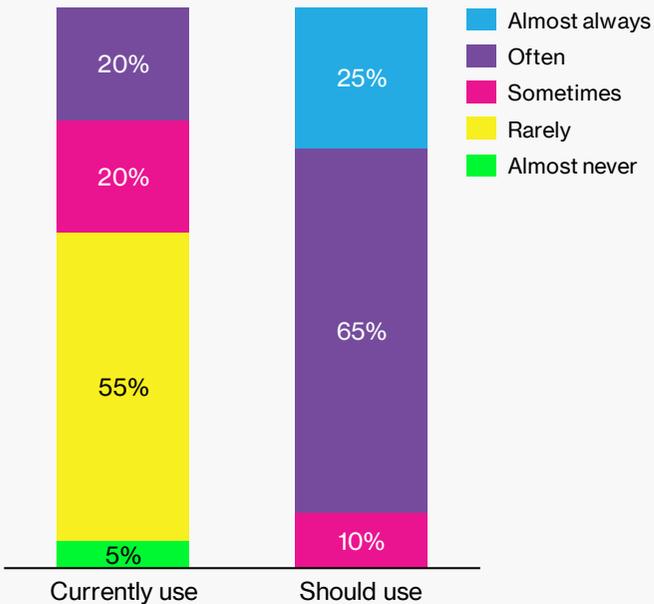
… but massive investment in product development in '23…

US$50bn total investments into AI startups

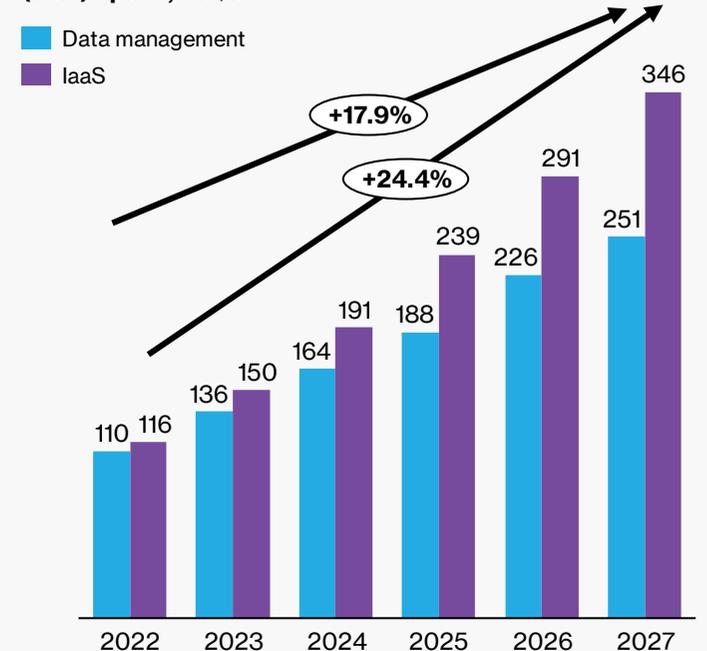More than **70 rounds of $100 million or more** went to startups creating models

Microsoft invested $10bn into OpenAI in Feb 2023

Google's $2bn[1] and Amazon's $4bn announced investment into Anthropic

Sam Altman raises $7tn?
Some projections look optimistic, despite the boom

… and as new AI products are adopted, complementary services and adjacent business models flourish

Global data management and Infrastructure as a Service (IaaS) spend, US$bn

Legend:
- Data management
- IaaS

+17.9%
+24.4%

Year	Data management	IaaS
2022	110	116
2023	136	150
2024	164	191
2025	188	239
2026	226	291
2027	251	346

Physical Infrastructure Implications: Chips

Gen-AI will shape demand for physical infrastructure

Massive production need

Fabrication capacity needed, US only, million WSPM
WSPM: measurement of output of a semiconductor plant (fab)

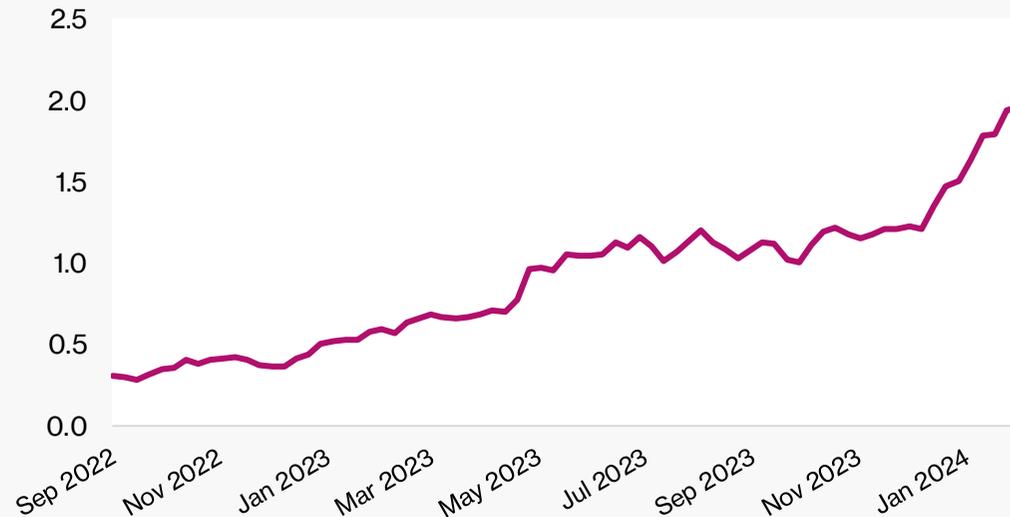| 2022 | Announced fab capacity | Additional needed | 2030 |

2.6 → 0.5 → 2.2 → 5.3
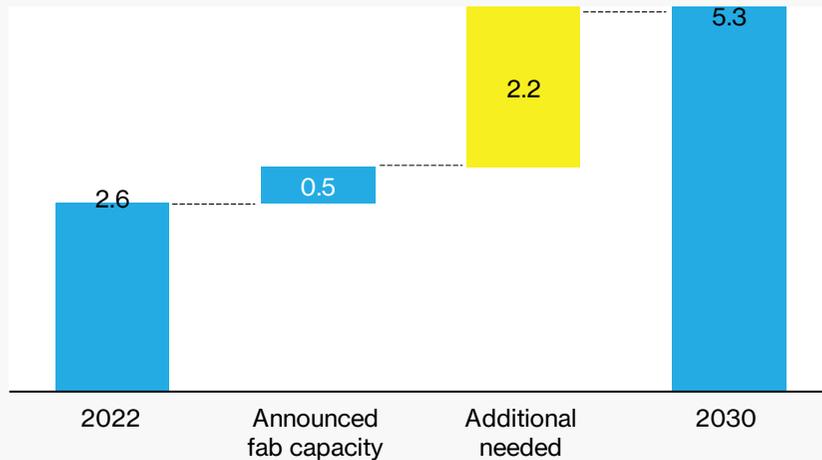
AI chips shortage is expected to persist for ~18 months
Hyperscalers stockpiling AI chips, e.g. Meta will own 340,000 H100 chips by end of 2024

Digital gold

Nvidia market capitalisation, US$tn

$2tn market cap ... the 4th most valuable company
One day gain of $277bn on 22 February post Q4 results announcement ... adding more to market cap than the value of Coca-Cola or Bank of America
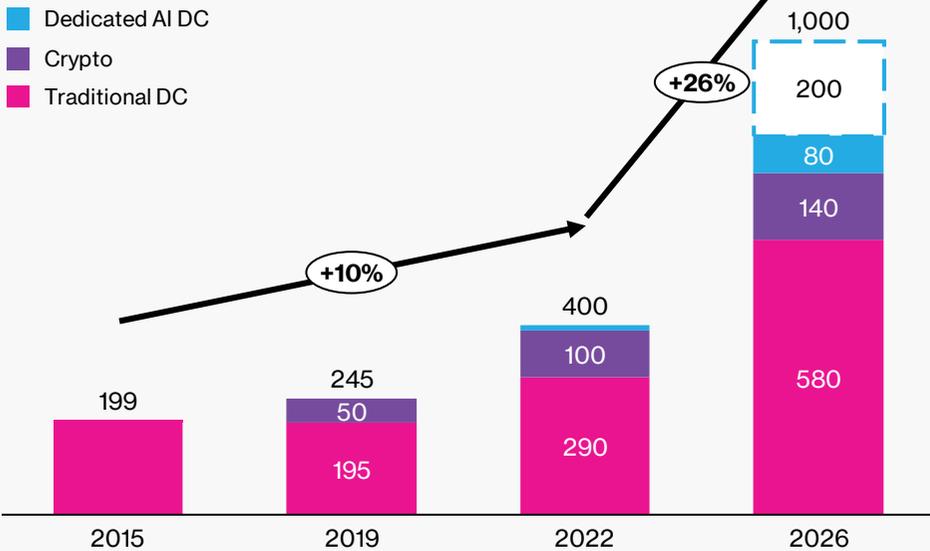
Physical Infrastructure Implications: Energy

Digital and Energy infrastructure increasingly entwined

Energy efficiency improvements slowing, DC energy consumption to double in the next 5 years
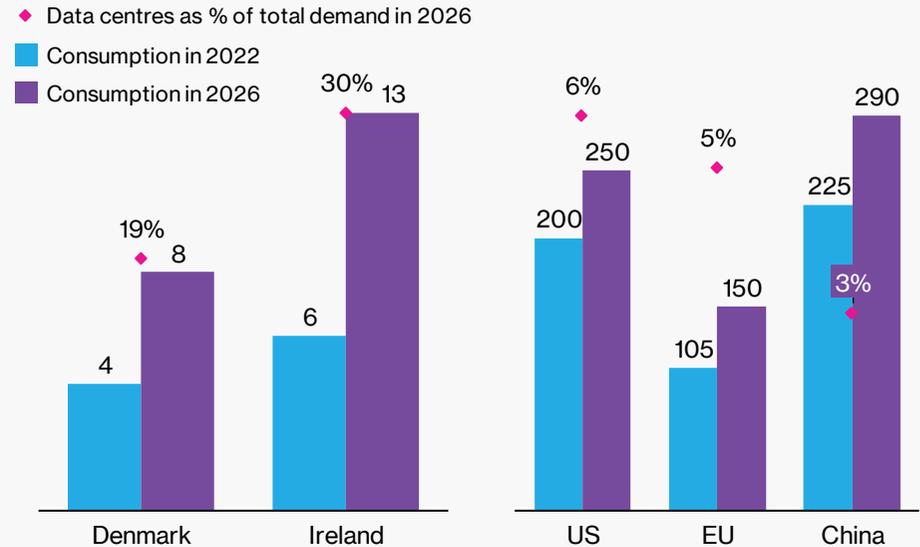
Electricity demand from data centres, base case, TWh*

Legend:
- Dedicated AI DC
- Crypto
- Traditional DC

Bar chart data:
- 2015: 199 (Traditional DC 199)
- 2019: 245 (Traditional DC 195, Crypto 50)
- 2022: 400 (Traditional DC 290, Crypto 100)
- 2026: 1,000 (Traditional DC 580, Crypto 140, Dedicated AI DC 80, +200)

Arrows: +10%, +26%

PUE improvements, Koomey's law and cloud migration have partially offset surging demand to moderate DC energy usage. Going forward, **these efficiency factors face headwinds**

Data centers are becoming the largest electricity consumers in some countries

DC electricity consumption (TWh); share of total electricity demand

Legend:
- Data centres as % of total demand in 2026
- Consumption in 2022
- Consumption in 2026

Bar chart data:
- Denmark: 2022 = 4, 2026 = 8 (19%)
- Ireland: 2022 = 6, 2026 = 13 (30%)
- US: 2022 = 200, 2026 = 250 (6%)
- EU: 2022 = 105, 2026 = 150 (5%)
- China: 2022 = 225, 2026 = 290 (3%)

Hyperscalers are already the biggest renewable energy off-takers, e.g. in 2010-2022, total PPAs from **Amazon is 20,000+ MW**

Source: IEA Jan '24. * Note '22 energy figures assume mid-point of IEA estimate of 240-340 TWh. 2026 shows mid and high case for IEA

5

Digital Infrastructure Ecosystem

A network of physical, defensive infrastructure assets underpin the delivery of the essential connectivity services that power the modern economy and our societies
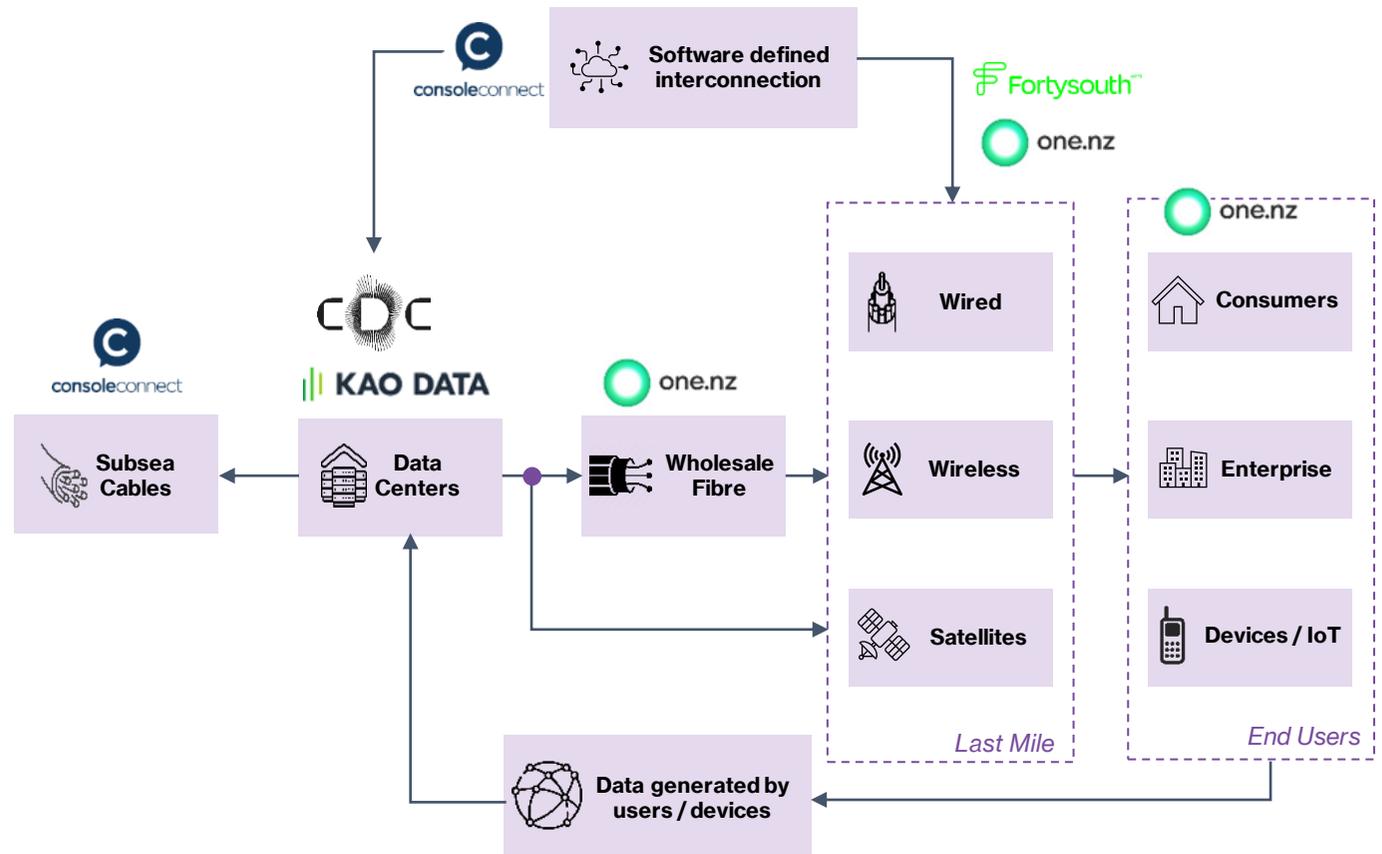
Notes: (1) At various stages (especially in backbone networks and near data centers), data may pass through Internet Exchange Points (IXP's) where different networks exchange traffic

Console Connect and Kao Data

Seeding new platforms to ride the next wave of digital growth

European Data Center platform — KAO DATA

Business model

UK-based colocation datacenters

Development platform, with 3 sites and ~20MW operating

Customers

High performance compute, AI, enterprise and hyperscale

Investment drivers

Market tailwinds

Strong demand and planned capacity expansion. 20MW installed, 60MW current capacity, visibility to grow to 150MW+ with Manchester

Leadership renewal

Douglas Loewe started as CEO January 2024; New COO joining

Global, configurable connectivity — consoleconnect

Business model

Global connectivity platform

Instantly self-provision secure, private connections across a global network and flexibly purchase bandwidth on-demand

Customers

Enterprise connectivity

Investment drivers

Evolving customer needs

Inexpensive, flexible and configurable connectivity as enterprises increasingly adopt multi-cloud and multi-region networks

Powerful network effects

World-leading network of global subsea cables, 900+ enabled DCs, public cloud providers, major SaaS providers and 1000+ mobile networks, enhancing economics and value proposition

Digital Infrastructure: Dynamics Driving Opportunity

Deep understanding of market and technology dynamics translates into...

...opportunities offering attractive risk-adjusted returns

Subsea cables

Data growth

East / West volume shifts as emerging economies become content creation hubs

Route dynamics

Individual route-level supply demand dynamics are critical

Data centers

Volume growth

Hyperscalers seeking rapid deployment to meet AI demand growth

Platform value

Existing platforms provide proven ability to deploy at scale and engender customer trust

Location dynamics

Green energy availability, security and data sovereignty increasingly important buying factors

Evolving network architectures, edge models and cloud zones

Driving deployment in developed and developing markets

Wholesale fibre

Capacity growth

To accommodate AI demand and changes to demand density

Hyperscale dark fibre

Growth in dark fibre market to serve hyperscale inter-DC demand

New cloud zones

Densification in developed markets and new zones in developing markets driving deployment

Wired		Consumers	
Wireless		Enterprise	
Satellites		Connected devices	
Last mile		**End users**	

Capital release

Corporate sell-down of non-core assets e.g. TowerCo and InfraCo spin-offs

FTTP and enterprise rollouts

Government backed FTTP rollout

5G rollout and active sharing

Densification of mobile networks creating active sharing models

Defensive IoT networks

Growth in energy, safety and industrial applications

Data businesses

Defensive data assets

Data assets offering privileged positions growing increasingly defensive as scale, technological complexity and regulatory requirements increase

Financial infrastructure

Critical infrastructure underpinning operation of financial markets

Software defined networking

Ability to abstract physical infrastructures, variabilize bandwidth purchases, offer value-added network services increasingly valuable as multi-cloud architecture become common