

311 INSTITUTE · INTELLIGENCE UNIT



THE STATE OF GLOBAL ICT INFRASTRUCTURE

An independent assessment of the
physical layer of the digital economy

REPORT

Foresight & intelligence

BY

Matthew Griffin · London

DATE

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ABOUT THE 311 INSTITUTE

The 311 Institute, a London-based global leader in Futures, Deep Futures and Dynastic Futures advisory, exists to serve and help leaders anticipate, explore and shape every future.

History has repeatedly shown that organisations are made or broken by disruption — made by the shifts they saw and acted on in time, and broken by those they missed, misunderstood or met too late.

The VUCA-MAX world runs on accelerating, complex change — hard to anticipate, harder to answer. Almost half the world's CEOs believe their companies will not be economically viable within a decade without reinvention. That widening gap — seeing the future, understanding it, acting in time — is the one we exist to close.

With a track record of trust and excellence built advising the world's largest organisations, we close that gap in a way no one else can. Where others offer opinion we offer a record, where others see slices of the future we see the whole horizon, and where others offer partial solutions we offer everything.

Used by the world's most consequential organisations — among them Walmart, the world's largest employer, alongside ABB, Accenture, Adidas, Allianz, AON, ARM, AT&T, Auchan, BCG, BlackRock, Citigroup, Coca-Cola, DP World, Emirates Airlines, EY, the FAA, Google, HP, Huawei, KPMG, LGT, Nokia, Novartis, PepsiCo, PwC, Roche, RWE, Samsung, Siemens AG, Standard Chartered, T-Mobile, UBS, Visa, Workday, Worldpay and the United Nations, together with royal households and G7, G20 and G77 leaders. We advise boards, governments and investors across every industry and at every scale, helping countries grow and enterprises become Centennial companies built to endure beyond a hundred years.

In a world that punishes the unprepared, the gap between seeing the future and shaping it is all too often the one that determines who thrives and survives, and who doesn't. We close that gap.

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Matthew Griffin is a multi-award-winning futurist and expert in disruption and innovation, geopolitics, leadership and technology, described as a "walking encyclopaedia of the future" and a "futurist polymath." A 15-time best-selling author of the "Codex of the Future" series, he is the Founder and Futurist in Chief of the 311 Institute — a global Futures and Deep Futures advisory firm working with royal households, world leaders, G7, G20 and G77 governments, NGOs and multinational mid- and mega-cap firms to help them explore, shape and lead the next 50 years of business and society.

An award-winning YouTube creator with over a million followers and unrivalled global reach, Matthew is a highly sought-after international keynote speaker, lecturer and mentor. He collaborates with global leaders through the United Nations Alliance of Civilizations (UNAOC) and the United Nations General Assembly (UNGA) to shape initiatives such as the UN's AI for Humanity programme, the UN Conference of the Parties (COP) and the World Economic Forum in Davos.

As the former Global Head of Cloud, National Security and Enterprise Sales for companies including Atos, Dell-EMC and IBM, Matthew has a proven track record of building multi-billion-dollar business units and turning failing divisions into market leaders. His ability to identify, analyse and communicate the implications of hundreds of emerging technologies and trends is unparalleled, and his insights are trusted by many of the world's most respected organisations.

Regularly featured in the global media — including the AP, BBC, Bloomberg, CNBC, Discovery, Forbes, Khaleej Times, the Telegraph, TIME, ViacomCBS, WIRED and the WSJ — Matthew's mission is to help organisations create a fair and sustainable future whose benefits are shared by everyone, irrespective of ability, background or circumstance.

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THE 311 INSTITUTE READ

IN BRIEF

An independent, outside-in read of the physical ICT infrastructure market. Sized one domain at a time, split apart to avoid double-counting, shared across 120 separately-sized countries, and given as ranges with a confidence grade.

THE OBVIOUS READ

The easy read is that this is an AI data-centre story, with one big headline number.

THE FULLER PICTURE

Treating this as a single market is misleading, because it's actually three: computing hardware, connectivity and the specialist trade that installs and maintains both. Most published figures combine all three, which overstates the addressable segment by 3x to 20x. Break the numbers down and the one layer that cannot be substituted is the certified workforce that performs the installation work.

EXECUTIVE SUMMARY

In 2026 the whole ICT infrastructure market is worth about \$735bn, within a range of \$560bn to \$960bn. It grows to roughly \$1.45 trillion by 2035, at about 8% a year, but that headline figure doesn't include a further \$175bn of mobile-network equipment. The wide range turns on two swing factors: how fast power and permitting ease, and whether AI capital spending normalises from its current peak.

Within that headline is a \$320bn segment with two parts: the physical equipment, and the specialist services that design, install and maintain it. The segment is smaller and grows more slowly, at about 7% a year, and its two parts behave very differently. The equipment is a commodity — it can be bought from many suppliers and competes mainly on price. The certified workforce that installs and maintains it cannot be bought off a shelf, switched between suppliers, or automated away. So the part of the market that is hardest to replace is not the segment as a whole, but that workforce. (Note on the totals: the \$735bn headline is the whole market. The country model sizes about \$715bn of it to individual markets, and holds a further ~\$20bn of under-counted emerging demand at the aggregate level.)

Three findings shape the rest of the report. First, most of the errors in the published market figures come from what gets counted, not from forecasting. Second, the limit on how much new data-centre and network capacity actually gets built is set by power and permits, not by demand. Third, nothing new gets built without the certified installer. You can choose not to build, but every project that goes ahead needs them.

Choosing which countries and which opportunities to expand into follows a logic of its own. On geography, a few like-minded anchor markets — the US, Canada, the UK, Australia and Ireland — open almost automatically for a standards-based organisation. The small countries where subsea cables come ashore are cheap footholds into whole regions. On opportunity, the value sits in the fast-growing physical work — cooling, power and building controls — and in the certified, repeat-service layers that rivals find hardest to copy.

01

CHAPTER ONE

THE FORCES RESHAPING ICT INFRASTRUCTURE

Five macro forces, and the three constraints they create.

01

2026

What actually drives the build, and what limits it?

Demand is close to unlimited. What governs the market is three limits: power, permits and people.

SCOPE

Macro drivers

The binding constraints

What it means

The physical kit that carries the world's data sits under the biggest build the digital economy has tried. Five big forces shape it. It is how they work together, not any one trend, that sets demand out to 2035.^[1]

Society keeps pushing up data use, fastest in poorer markets where a billion people are still offline. Technology is led by the AI compute boom. Racks now draw far more power, climbing from 8–15kW toward 80–130kW, which forces a switch to liquid cooling. Around 2027, running AI models day to day (inference) overtakes training them.^[2]

On economics, the big cloud firms are spending record amounts, and investors are buying up the install trade to build large, repeat-income businesses. On the environment, power and sustainability are now hard limits, which favours places with clean power. On politics, data-localisation laws force building inside each country, so grid policy often decides what is possible.

THE THREE BINDING CONSTRAINTS

CONSTRAINT	WHAT IS HAPPENING IN THE MARKET
Power	Grid capacity pricing rose roughly eleven-fold in PJM, from \$30 to \$330 per MW-day, in two years, with over 2,500GW of large-load projects queued. ^[7]
Permitting	Flagship metros now quote grid energisation in 2037–38, turning process into timeline risk.
People	Installation labour is 64–72% of installation cost, and certified trades are scarce in every geography. ^[3]

IN ROUGH ORDER OF HOW HARD EACH IS TO MOVE · PJM / IEA / JLL

These three, not demand, set the pace of the build, and which one binds first differs by market. That is why the chapters that follow read every region against all three at once.

THE DEMAND ENGINE, IN NUMBERS

The size of the demand is not in doubt. About a billion people are still offline, and data use per person keeps rising by double digits. So the connectivity build has a decade of growth ahead of it, with or without the AI story. On top sits the AI boom. The four biggest cloud firms alone spent more than \$300bn on kit in 2025, much of it on buildings. Around 2027, running

AI models overtakes training them as the main workload. That pushes demand out of a few huge campuses toward many smaller sites.^{[9][10]}

FORCE	WHAT IT DOES	EVIDENCE IN THE MARKET
Society	Compounds data use, connects the next billion	~1bn still unconnected , double-digit growth
Technology	Drives the AI density super-cycle	Racks 8–15kW to 80–130kW , inference leads ~2027
Economics	Fuels capex and consolidates the trade	Big-four hyperscaler capex \$300bn+ in 2025
Environment	Makes power and water binding	Efficiency and water mandates , power-clean geographies win
Politics	Forces in-country build	Data-residency laws across the Gulf, SE Asia, Africa

The three limits are what turn this demand into a delivery problem. Each gets its own chapter later. The point here is that they act together. A market can have plenty of power but slow permits, or fast permits but too few workers. The limit that bites first changes from place to place. So one global plan fails, and you have to read the market country by country.

Set against these limits, one thing follows. Choosing sites, securing power and planning the workforce now matter more to delivery than winning demand does. The scarce things are on the supply side, not the demand side, which flips the usual question. A firm that can lock in power, move a permit and put a crew on site will out-deliver one that can only sell capacity. And the gap between them widens as the limits tighten through the decade.

That is why this report treats power, permits and people as the backbone, not just one theme among many. Every later chapter comes back to them, because they decide whether a headline number ever becomes a real building. A plan that does not say which of the three bites first, and where, is not yet a plan.

Each limit also moves at its own speed. Power is the slowest to fix, because building grids and generation takes years. Permits can move with political will, but rarely fast. Labour grows only as fast as training can fill the pipeline. A firm that understands these speeds can plan in the right order: start early on the limits that take longest to move, and leave the faster ones until the picture is clearer.

WHY THE CONSTRAINTS INTERACT

The three constraints do not act in isolation, and it is their interaction that converts abundant demand into a delivery problem. A market can be power-rich but permit-slow, as several US states now are, or permit-fast but labour-short, as parts of the Gulf are discovering. The binding constraint therefore differs by geography and by year, which is why a single global build plan fails and a market-by-market read is essential. The practical consequence for any participant is that capacity does not land where demand is highest. It lands where all three constraints clear at once, and those windows open and close on different clocks in every territory.

The deeper point for strategy is that demand certainty and delivery certainty are not the same thing. The demand for AI and connectivity infrastructure is close to guaranteed for the decade. The delivery of it is not, because each constraint has a multi-year lead time that no amount of capital can compress below a floor set by grid build, planning law and the training of skilled trades. Value therefore accrues not to whoever can forecast demand, which everyone now can, but to whoever can actually deliver against the constraints. That reframes the whole market from a demand story into a delivery-capability story, and it is the delivery-capability layer that this report argues is both the scarcest and the most defensible.

It also reshapes where the build happens. As the binding constraint tightens in the established hubs, demand disperses toward secondary metros and new geographies where power and permitting still clear, and inference workloads, which are latency-sensitive and distributed, accelerate that dispersal. The result is a wider distribution of smaller sites rather than a handful of mega-campus, which multiplies the number of projects, the number of jurisdictions, and the number of certified practitioners the build requires. Each of those multipliers raises the value of the standards and credential layer that makes distributed delivery repeatable.

CHAPTER SUMMARY

Demand for ICT infrastructure is effectively unlimited for the decade, driven by the AI build and a billion people still to connect. The chapter's finding is that this demand is not the

constraint. Delivery is. Three limits govern the build, power, permitting and skilled people, and it is these, not appetite, that decide where and when new capacity actually lands.

Which of the three binds first differs by market. A country can be power-rich but permit-slow, or permit-fast but labour-short, so a single global plan fails, and the scarce inputs sit on the supply side, which means site selection, grid strategy and workforce planning now matter more to delivery than generating demand does.

The value goes to whoever can deliver against the limits, not to whoever can sell capacity.

CHAPTER CLOSE

WHAT NEXT?

The forces reshaping ICT infrastructure

PREDICTIONS

PREDICTION

80% CONFIDENCE • BY 2030

Power availability, not demand, will be the single most-cited constraint on data-centre delivery through 2030.

BASIS

grid-queue backlogs, PJM pricing, and energisation timelines already slipping past 2035

TRIPWIRE

grid-capacity prices falling for a sustained period, or connection queues clearing faster than new demand is added

QUESTIONS TO ASK

- 1 Which constraint binds first in your priority markets — power, permitting or people?
- 2 Where does the AI-density shift change your facility assumptions?
- 3 How exposed is your plan to grid timelines slipping to 2037–38?

02

CHAPTER TWO

WHERE THE MARKET SPENDS

Eleven domains, decomposed for scope, with ranges.

02

2026

How big is the market really, once the scope traps are removed?

Published numbers overstate the part you can sell to by 3 to 20 times. Broken down, the whole market is ~\$735bn, and the physical slice is ~\$320bn.

SCOPE

The eleven domains

The scope trap

The trajectory

We define the market as eleven domains, size each one worldwide, then slice the total five ways. Sizing the whole cake first, then cutting it, avoids the double-counting you get when you add up overlapping category reports.^[1]

The eleven domains and their 2026 central values, largest first: compute \$300bn, professional and lifecycle services \$110bn, active network \$100bn, outside plant and fibre \$60bn, power \$40bn, cooling \$30bn, electronic safety and security \$25bn, wireless and in-building \$20.7bn, structured cabling \$15bn, DCIM and building management \$10bn, and data-centre white space \$4bn. That is a whole of about \$715bn on the core basis, and about \$735bn once the emerging-market connectivity tail is properly counted.^{[5][18]}

I THE SCOPE TRAP

The single largest source of error is scope, not forecasting. The same trap recurred in five categories: data-centre infrastructure figures ran about fifteen times the ICT-relevant slice, fibre three times, physical security twenty times, data-centre construction eight times, and low-voltage cabling ten times. Every figure here is decomposed to its addressable slice before use, and stated as a range where sources diverge.

THE NUMBERS

The market in six numbers

735 \$bn

WHOLE ICT MARKET, 2026 (560–960)

COMPOSITE · CORROBORATED

320 \$bn

PHYSICAL INFRA + SERVICES SEGMENT

COMPOSITE · CORROBORATED

1.45 \$tn

WHOLE MARKET BY 2035 (~8%/YR)

COMPOSITE · CORROBORATED

64-72 %

OF INSTALLATION COST IS LABOUR

JLL · CORROBORATED

175 \$bn

MACRO MOBILE, HELD ADJACENT

GSMA/DELL'ORO · CORROBORATED

Growth is not evenly spread. Applying sourced driver-forecast rates to the 2026 base takes the whole market to about \$1.45 trillion by 2035. The domains that drive that total are the density-linked ones — compute, cooling, DCIM and power. The passive and outside-plant domains grow far more slowly. The modelled build, reconciled to the whole, is:^{[12][13][14][15]}

DOMAIN	2026 \$BN	CAGR	2035 \$BN
Compute	300	9.7%	692
Services & lifecycle	110	5.8%	182
Active network	100	5.8%	166
Power	40	10.7%	100
Cooling	30	11.7%	81
Outside plant / fibre	60	2.8%	77
Safety & security	25	4.8%	38
DCIM & BMS	10	12.7%	29
Wireless & in-building	20.7	3.8%	29
Structured cabling	15	2.8%	19
Data-centre white space	4	7.7%	8
Whole market	715	7.9%	1,421

DOMAIN TRAJECTORY, SOURCED DRIVER FORECAST RECONCILED TO THE \$715BN CONTROL · 311 · 2026

For anyone in the physical trade, the rows that matter are the physical domains, not the compute line at the top. Cooling at ~12% and DCIM at ~13% are the fastest physical domains.

Power at ~11% is the biggest physical growth pool in raw dollars. Outside plant at ~3% is the slow, steady base. A plan tilted toward the fast physical domains, rather than the compute headline, catches the growth the trade can actually win.

For a firm, that shifts investment toward the density-driven cooling and controls layers, and away from the cheap, standard ones. Cooling and building controls are where density turns straight into spend, and where the work is hard enough to protect margins. The standard layers still grow, but as commodities. The cooling and controls layers grow as specialisms, with a rising pay premium for the skill.

It follows that price competition gets fiercer in the standard layers, while skill protects the specialist ones. Firms with no way into the cooling, power or controls work will watch their pricing power fade as the density story plays out around them. The safest ground is the work that gets harder as facilities get denser.

Timing matters as much as direction. Cooling and controls spend trails the compute build by about a year, as buildings designed for air get refitted for liquid and wired up for density. That lag is a planning signal. The cooling and DCIM demand of 2027 and 2028 is already mostly set by the compute being ordered now, which makes it one of the easier parts of the market to forecast.

WHERE THE SPEND CONCENTRATES

Growth is not spread evenly across the eleven domains, and the reweighting matters more than the headline. The density-linked domains, compute, cooling, power and building intelligence, grow two to four times faster than the passive and outside-plant layers, which means the addressable mix a physical-trade participant sees in 2030 looks materially different from today. Cooling at around twelve percent and DCIM at around thirteen percent are the fastest physical domains, and power at around eleven percent is the largest physical growth pool in absolute terms. Outside plant at around three percent is the slow, dependable base. A strategy weighted to the fast physical domains rather than the compute headline captures the growth that is actually addressable by the trade.

The reweighting carries a defensibility dividend as well as a growth one. The passive layers commoditise as they scale, so pricing power there erodes even as volumes rise. The thermal, power and management layers move in the opposite direction, because technical difficulty rises with density and difficulty protects margin. Firms with a route into those layers find their skill premium widening while the density story plays out, and firms without one find

themselves competing on price in the commodity layers even as the market around them grows. The safest ground is the work that gets harder as facilities get denser, not the work that gets more routine.

Timing is the third dimension, and it is unusually forecastable in this market. Cooling and management spend lags the compute build by roughly a year, as facilities specified for air are retrofitted for liquid and instrumented for density. That lag is a planning signal rather than a risk. The thermal and DCIM demand of 2027 and 2028 is already largely determined by the compute being ordered now, which makes it one of the more predictable pockets of the whole market and one a participant can staff and tool for in advance.

CHAPTER SUMMARY

Sized honestly, the whole market is about \$735bn in 2026, within a range of \$560bn to \$960bn, and the physical-and-services layer the trade serves is about \$320bn of it. Most published figures overstate that serviceable slice three to twenty times, because they bundle compute, connectivity and the physical trade into one number. Broken down, the reweighting matters more than the headline: the fast-growing physical work is in cooling, power and building intelligence, while the passive layers commoditise, so difficulty is what protects margin as facilities get denser.

Narrow, product-based domains agree. Broad market bundles differ by 3 to 20 times on definition alone.

CHAPTER CLOSE

WHAT NEXT?

Where the market spends

PREDICTIONS

PREDICTION

70% CONFIDENCE • BY 2035

Cooling and DCIM will be the fastest-growing physical domains through 2035, on AI density.

BASIS

rack densities climbing to 80–130kW and liquid cooling moving mainstream

TRIPWIRE

AI training spend dropping sharply, or rack density levelling off below 60kW

QUESTIONS TO ASK

- 1 Which of your planning figures are bundles that need decomposing?
- 2 How does the compute-versus-physical split change your addressable market?
- 3 Which fast-growing domains (cooling, DCIM) matter most to your position?

03

CHAPTER THREE

THE GLOBAL ATLAS OF DEMAND

120 markets ranked on three ICT-native drivers, with regional and country detail.

03

2026

Where in the world is the market, once GDP is removed as a proxy?

It is three maps, not one. Compute is US-led. Outside plant (the cabling and fibre outside buildings) is Asia-Pacific-led. Wireless is North-America-led. And the poorer, fast-growing tail is bigger than a data-centre view shows.

SCOPE

[The method and the ranking](#)[The regions in detail](#)[The emerging-tail undercount](#)

This report sizes the market from the top down, then places it country by country. We do not add up separate country reports, because their categories overlap and double-count. Instead we size the whole market first, as eleven domains measured globally, then cut that single total into countries, regions and layers. Sizing the whole cake before slicing it is what keeps the parts adding back to the whole.

I HOW THE MARKET IS MAPPED

The headline whole market is about \$735bn on the 2026 base, once mobile-network equipment is set aside. The country model sizes about \$715bn of that directly to individual markets. It holds the remaining roughly \$20bn, an emerging-tail uplift that the deep-sourcing pass shows is under-counted, at the aggregate level rather than forcing it onto country rows. Nigeria is the clearest case: the model put it at about \$2bn, but once operator spending is added, with MTN alone running some 43,000km of fibre, it comes out nearer \$3.5 to \$3.9bn. So every country, region and domain figure in this report is a slice of the \$715bn distributed total and reconciles to it exactly, while the \$735bn headline adds the aggregate tail on top. A number that does not fit the \$715bn control is wrong by construction, which is a deliberate discipline against the drift that creeps in when figures are built up from many separate sources. On the same basis the distributed model reaches about \$1.42tn by 2035, and the headline about \$1.45tn with the tail.^[16]

To place the total across countries we use three ICT-native drivers, not the size of an economy. The first is a country's share of world data-centre capacity, which drives the compute, power and cooling domains. The second is its share of world telecom capital spending, which drives the connectivity and outside-plant domains. The third is its share of world construction output, which drives the in-building cabling that goes into what is built.^{[6][5][4]} GDP is deliberately not used, because it over-weights service economies and hides construction- and connectivity-heavy ones.

Each driver is weighted to the size of the domain pools it governs, and the three are combined for each country. Weighted and combined this way, the drivers add back exactly to the \$715bn control, and they lift economies, such as India and much of the emerging tail, that a GDP proxy would suppress. The result is a market that is construction- and connectivity-shaped, not GDP-shaped.

Every figure carries a confidence grade. The thirty largest markets are sourced directly, from operator capital-spending filings, national data-centre briefs and telecom-regulator data, and graded Medium. The next ninety or so are closed on the driver gradient and graded Low, flagged as modelled. The world's smallest economies are grouped into a single rest-of-world block rather than sized one by one. Market-research houses are used only to cross-check, never as the primary source, because they lag and they diverge.

The model was then tested against reality. A deep pass hand-sourced eight or nine of the eleven domains for eighteen markets and compared the result to the model. It confirmed the majors are sound and revealed a systematic undercount in the emerging tail, which the undercount section sets out in full. Two limits are worth naming here: structured cabling and DCIM had no country-level primary source anywhere, so both are modelled down from global totals, and a small tail uplift is held at the aggregate level rather than pushed onto country rows. The shape that falls out is a market split into two near-equal blocs, with a long, real tail:

REGION	TOTAL \$BN	% WORLD	COUNTRIES
North America	239	33.5%	2
Asia-Pacific	230	32.3%	23
Europe	173	24.2%	32
Middle East & Africa	34	4.8%	40
Latin America	24	3.3%	23
Cross-border & rest of world	14	2.0%	—

ICT INFRASTRUCTURE MARKET BY REGION, 2026, ON THE \$715BN DISTRIBUTED CONTROL (THE \$735BN HEADLINE ADDS A \$20BN AGGREGATE TAIL) · 311 COUNTRY MODEL

The global market



THE LARGEST MARKETS

1 United States	\$226bn	2 China	\$117bn
3 Germany	\$46bn	4 Japan	\$24bn
5 India	\$22bn	6 United Kingdom	\$21bn
7 France	\$18bn	8 Canada	\$13bn

TOTAL**\$735bn**

market 2026

85%

in the top 20

120

countries

~\$1.45tn

by 2035

I THE GLOBAL RANKING

The full ranking places 120 named countries on the three-driver basis, from the United States at the top down to the smallest sized economies. Each is shown for 2026 and on its sourced 2035 forecast. The top three carry medals. The market is very concentrated: the top twenty countries hold about 85% of the world total, and the US and China together are close to half. But the fight for position runs the whole length of the table. Below the top five, entry is genuinely open.^[16]

THE GLOBAL RANKING — TOP 30 MARKETS

RANK	COUNTRY	REGION	2026 \$BN	2035 \$BN	CAGR
1	United States	N.Am	225.9	490.9	9%
2	China	APAC	117.4	212.7	7%
3	Germany	Europe	46.2	96.2	8%
4	Japan	APAC	23.8	39.9	6%
5	India	APAC	22.1	51.3	10%
6	United Kingdom	Europe	21.0	44.9	9%
7	France	Europe	18.3	35.9	8%
8	Canada	N.Am	13.2	26.2	8%
9	Australia	APAC	13.0	28.6	9%
10	South Korea	APAC	12.6	23.0	7%
11	Netherlands	Europe	11.8	24.3	8%
12	Singapore	APAC	10.5	18.7	7%
13	Brazil	LatAm	9.5	17.1	7%
14	Ireland	Europe	9.4	20.6	9%
15	Italy	Europe	8.9	17.4	8%
16	Spain	Europe	7.8	16.5	9%
17	Russia	Europe	7.7	11.4	5%
18	Saudi Arabia	MEA	6.2	14.2	10%
19	Indonesia	APAC	6.2	12.6	8%
20	Switzerland	Europe	6.1	12.3	8%

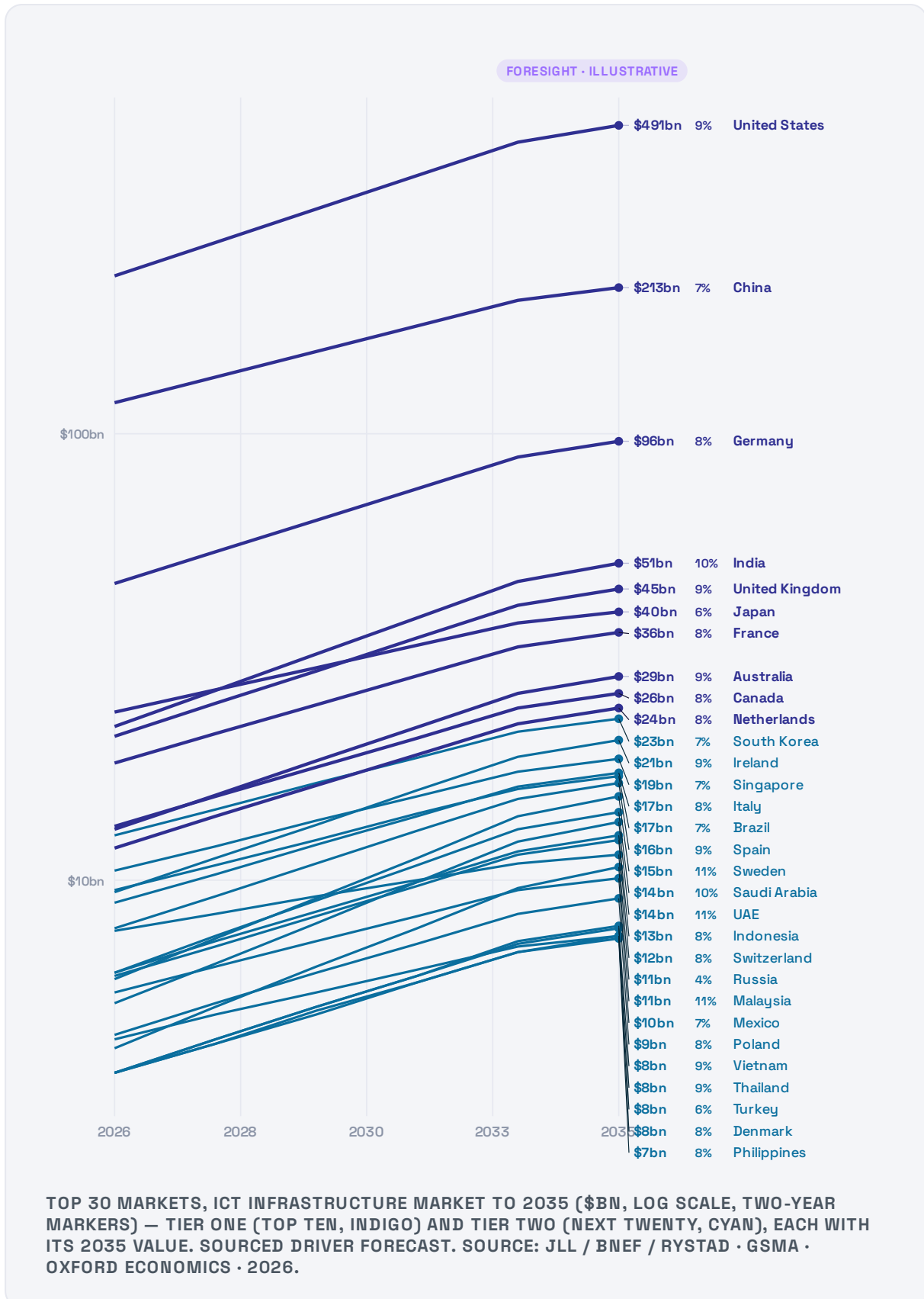
RANK	COUNTRY	REGION	2026 \$BN	2035 \$BN	CAGR
21	Sweden	Europe	6.0	15.4	11%
22	Mexico	LatAm	5.6	10.1	7%
23	UAE	MEA	5.3	13.5	11%
24	Poland	Europe	4.5	9.1	8%
25	Turkey	Europe	4.4	7.5	6%
26	Malaysia	APAC	4.2	10.7	11%
27	Philippines	APAC	3.7	7.4	8%
28	Denmark	Europe	3.7	7.5	8%
29	Thailand	APAC	3.7	7.8	9%
30	Vietnam	APAC	3.7	7.9	9%

ICT INFRASTRUCTURE MARKET, TOP 30 OF 120 NAMED MARKETS, 2026 AND SOURCED 2035 FORECAST • THE TOP 30 SHOWN ARE SOURCED AND GRADED MEDIUM CONFIDENCE, THE REMAINING 90 ARE MODELLED AND GRADED LOW • MEDALS MARK THE TOP THREE • 311 COUNTRY MODEL

Below the top thirty, the field runs the length of the table to the smallest individually-sized economies. The full 120-market ranking is carried in the companion data.

The tail is not a rounding error. The hundred countries below the top twenty still add up to about a tenth of the world. And it is there — in the poorer markets of Africa, South and South-East Asia, and Latin America — that our deep-sourcing work found the model most cautious, as the undercount section below explains.

TOP-MARKET TRAJECTORY TO 2035



THE GLOBAL ATLAS

North America



RANKED BY MARKET SIZE

1 United States

\$225.9bn

2 Canada

\$13.2bn

TOTAL

\$239bn
market 2026

33.5%
of world

2
countries

~\$440bn
by 2035

I NORTH AMERICA

North America is the largest bloc at about \$239bn, and it is mostly the United States. At \$226bn and 31.6% of the world, the US leads on every measure: the deepest data-centre market (about 40% of world capacity), the largest base of installed enterprise cabling, the most developed services and monitoring layer, and the fastest AI-density build. It is also where power and permits bite hardest — the high grid prices and the huge connection queues are a US problem first. Canada, at about \$13bn, is smaller but power-rich. Its hydro-heavy provinces attract capacity moving away from crowded US cities, and its matching standards make it a natural extension of any US position.

THE GLOBAL ATLAS

Asia-Pacific

1

5

2

3

8

7

RANKED BY MARKET SIZE

1 China

\$117.4bn

2 Japan

\$23.8bn

3 India

\$22.1bn

4 Australia

\$13bn

5 South Korea

\$12.6bn

6 Singapore

\$10.5bn

7 Indonesia

\$6.2bn

8 Malaysia

\$4.2bn

TOTAL

\$230bn

market 2026

32.3%

of world

23

countries

~\$430bn

by 2035

ASIA-PACIFIC

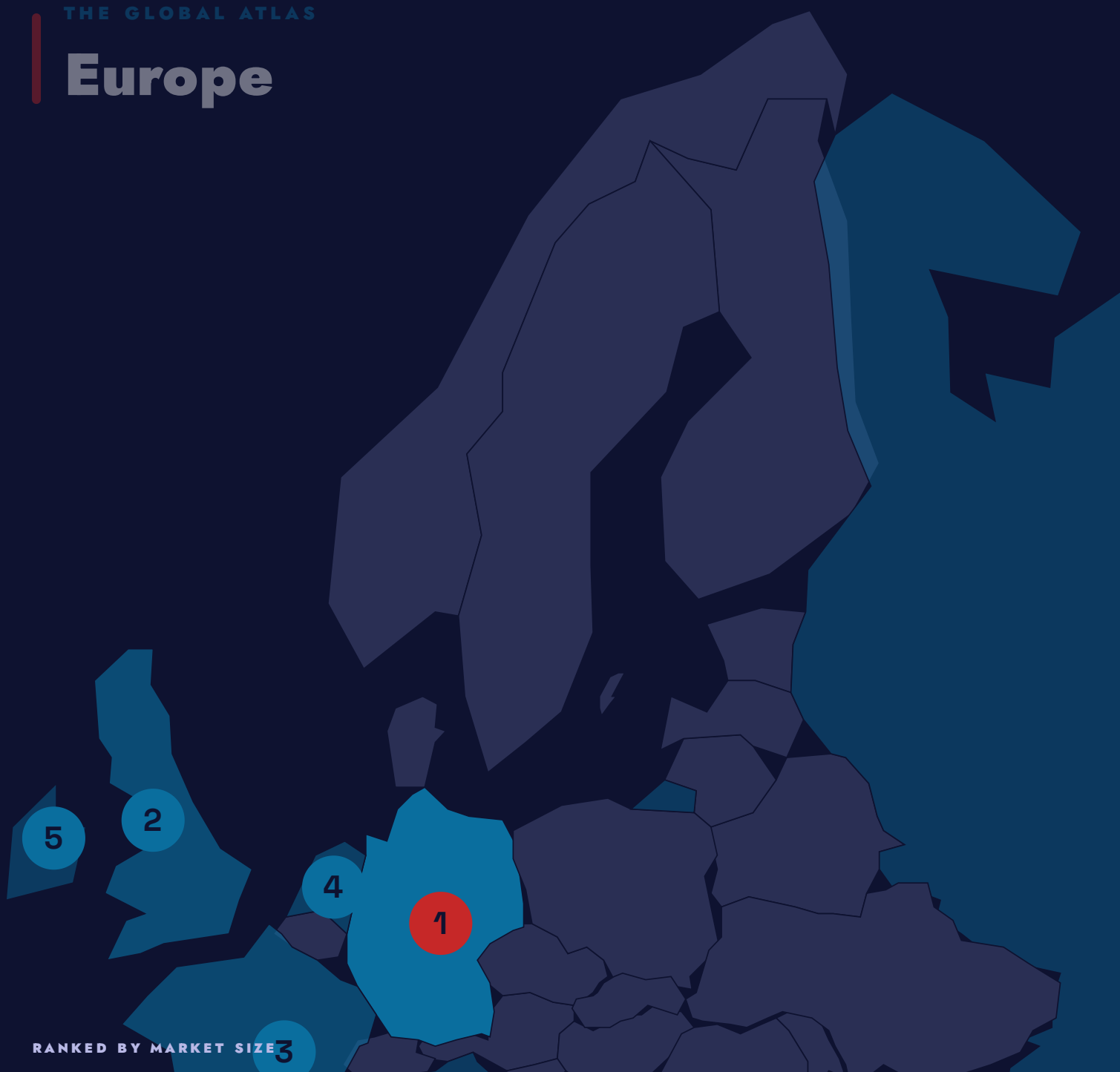
Asia-Pacific is the second bloc. At about \$230bn it is almost level with North America, but it is spread across twenty-three countries — a very different, more scattered opportunity. It leads the world in outside plant and construction-driven cabling. Inside the region, it runs from rich, mature markets to the fastest-growing poorer markets on earth.^[16]

COUNTRY	REGION	TOTAL \$BN	% WORLD
China	APAC	117.4	16.4%
Japan	APAC	24.6	3.4%
India	APAC	23.2	3.2%
Australia	APAC	13.1	1.8%
South Korea	APAC	13.0	1.8%
Singapore	APAC	10.5	1.5%
Indonesia	APAC	6.5	0.9%
Malaysia	APAC	4.3	0.6%

China, at about \$117bn, is the world's number two. That rests on the largest construction market on earth (about 27% of world output) and heavy telecom spending, not on data centres, where it sits below the US. Its different standards and high entry friction make it the lowest-scoring anchor despite its size. Japan and South Korea are dense, high-standard, tech-forward markets, where in-building and precision work earn a premium. India, at about \$23bn and the fastest-rising of the big markets, is a telecom- and construction-led build. Here the country model and the hand-sourced figure line up closely, which confirms the big markets are sound.

Australia is power-rich and standards-aligned, and behaves like an anchor market. Singapore is small but a regional gateway. A cap on new data centres there pushes build into Malaysia's Johor corridor next door — the clearest live example of capacity moving to where power and permits are solved. Indonesia and Vietnam anchor the poorer end of the region. Both are mobile-first, and both are badly under-counted by a data-centre view, as our sourcing work confirmed.

Europe



RANKED BY MARKET SIZE

1	Germany	\$46.2bn	2	United Kingdom	\$21bn
3	France	\$18.3bn	4	Netherlands	\$11.8bn
5	Ireland	\$9.4bn	6	Italy	\$8.9bn
7	Spain	\$7.8bn	8	Russia	\$7.7bn

TOTAL

\$173bn
market 2026**24.2%**
of world**32**
countries**~\$320bn**
by 2035

I EUROPE

Europe is a quarter of the world at about \$173bn, spread across thirty-two countries. It is the most standards-aligned bloc, and for a standards-led entrant the easiest to work in. Its demand is shaped by rules: sustainability reporting, data-residency and public-safety codes set a floor of certified-delivery demand earlier here than anywhere else.^[16]

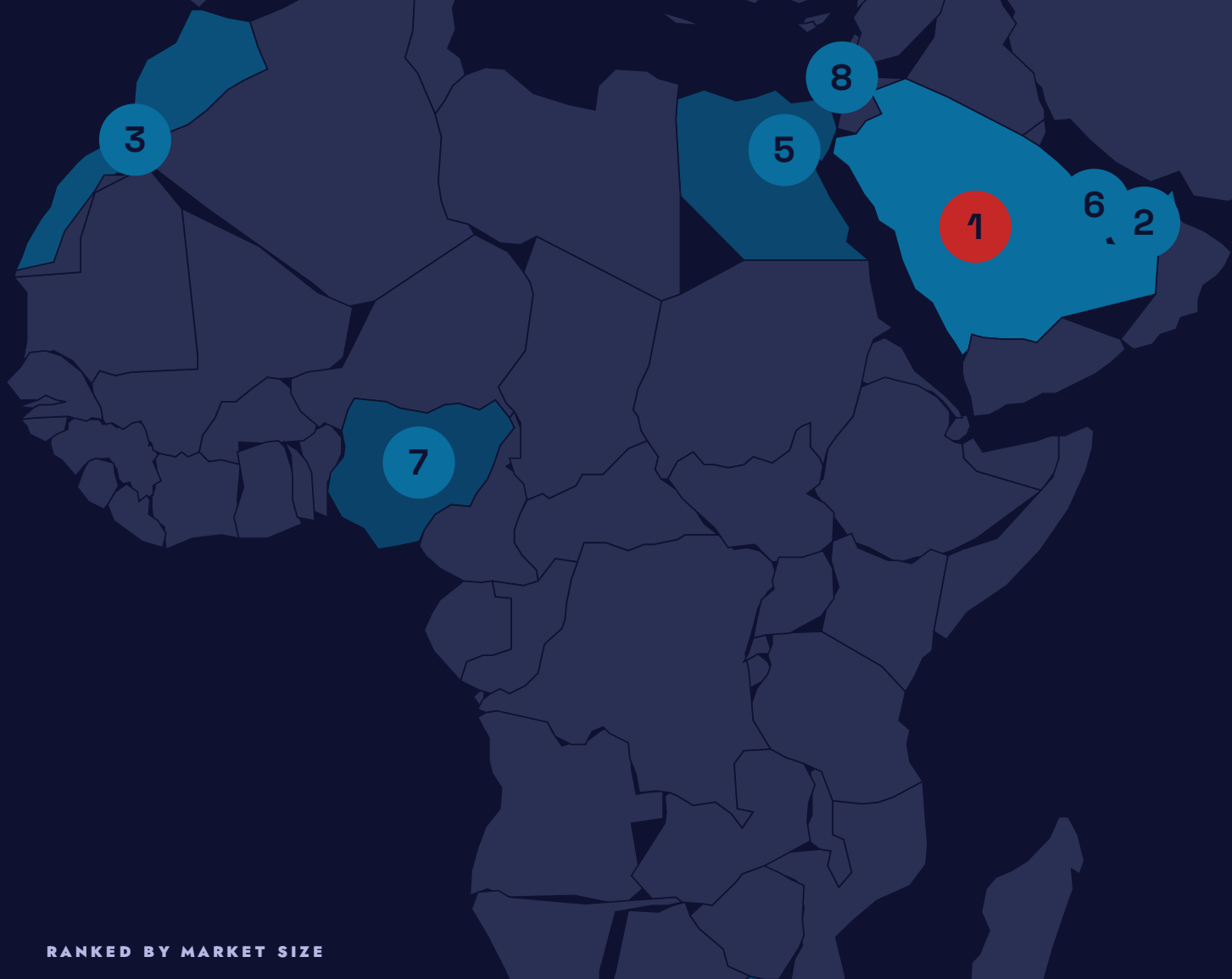
COUNTRY	REGION	TOTAL \$BN	% WORLD
Germany	Europe	46.3	6.5%
United Kingdom	Europe	21.3	3.0%
France	Europe	18.6	2.6%
Netherlands	Europe	11.9	1.7%
Ireland	Europe	9.3	1.3%
Italy	Europe	9.3	1.3%
Spain	Europe	8.1	1.1%
Switzerland	Europe	6.1	0.9%

Germany is Europe's largest at about \$46bn — the Frankfurt data-centre cluster, a deep industrial cabling base, and a strong services layer. The United Kingdom and France come next, centred on London and Paris, with mature business and public-sector demand. The Netherlands and Ireland punch well above their size: Amsterdam and Dublin are gateways for the big cloud firms, and Ireland's weight is bigger than its data-centre-to-economy ratio suggests. The Nordics — Sweden, Norway, Finland — are the clean-power destinations capacity is moving toward, with cheap hydro power and a cold climate making them natural

cooling hubs. Southern Europe, led by Italy and Spain, is the growth edge as Mediterranean cable landings and new clusters mature.

THE GLOBAL ATLAS

Middle East & Africa



RANKED BY MARKET SIZE

1 Saudi Arabia	\$6.2bn	2 UAE	\$5.3bn
3 Morocco	\$3.4bn	4 South Africa	\$2.5bn
5 Egypt	\$2.5bn	6 Qatar	\$2.5bn
7 Nigeria	\$2bn	8 Israel	\$1.7bn

TOTAL

\$34bn

market 2026

4.8%

of world

40

countries

~\$63bn

by 2035

I THE MIDDLE EAST AND AFRICA

The Middle East and Africa is small on paper — about \$34bn across forty-one countries — but it is the region the model most understates, and the one where hand-sourcing changed the picture most. The Gulf builds on state money and data-localisation laws. Africa builds on mobile-first connectivity that a data-centre view barely sees.^[16]

COUNTRY	REGION	TOTAL \$BN	% WORLD
Saudi Arabia	MEA	6.5	0.9%
UAE	MEA	5.5	0.8%
Morocco	MEA	3.4	0.5%
South Africa	MEA	2.5	0.4%
Egypt	MEA	2.5	0.4%
Qatar	MEA	2.5	0.3%
Nigeria (model)	MEA	2.0	0.3%
Israel	MEA	1.7	0.2%

Saudi Arabia and the UAE lead on state-funded, localisation-driven build — NEOM, giga-projects and rules that data be kept in-country. Qatar and Bahrain do the same at smaller scale. But the region's real story is the African tail. Nigeria, counted at about \$2bn in the model, came out at \$3.5-3.9bn once operator spending was added — MTN alone runs about 43,000km of fibre.^[8] Egypt, Kenya, Morocco, Ghana and Ethiopia all showed the same thing: telecom-led demand that data-centre reports miss. Ghana and Ethiopia are the extreme cases, about thirty to fifty times a data-centre-only estimate once the mobile build is counted.

THE GLOBAL ATLAS

Latin America



RANKED BY MARKET SIZE

1	Brazil	\$9.5bn	2	Mexico	\$5.6bn
3	Colombia	\$2.3bn	4	Chile	\$1.7bn
5	Argentina	\$1.7bn	6	Peru	\$0.9bn
7	Panama	\$0.2bn	8	Puerto Rico	\$0.2bn

TOTAL

\$24bn

market 2026

3.3%

of world

23

countries

~\$44bn

by 2035

LATIN AMERICA

Latin America is about \$24bn across twenty-three countries. It is a telecom- and construction-led region, with a thin data-centre layer and a fast-growing connectivity build. The undercount pattern holds here too, strongest in the Andean markets.^[16]

COUNTRY	REGION	TOTAL \$BN	% WORLD
Brazil	LatAm	9.9	1.4%
Mexico	LatAm	5.8	0.8%
Colombia	LatAm	2.3	0.3%
Chile	LatAm	1.7	0.2%
Argentina	LatAm	1.7	0.2%
Peru	LatAm	0.9	0.1%

Brazil is the regional anchor at about \$10bn. São Paulo is the continent's data-centre and cabling hub, and the market is deep enough to support a full services layer. Mexico gains from nearshoring and from sitting next to the US, with its northern industrial belt pulling in business and factory infrastructure. Chile is the region's power-rich, standards-aligned market — its Atacama solar and cool coast attract capacity. Colombia and Peru are earlier-stage, mobile-first builds, where our sourcing found demand well above the model.

THE DOMAIN DECOMPOSITION

Under the totals, each big market has a different mix of domains. The total tells you where the market is. The mix tells you what kind of market each country is. The full eleven-domain estimate for the top ten markets shows how compute-heavy the top of the table is, and how the physical-and-services layer — cabling, outside plant, power, cooling, security and services — sits under it in every country:^[16]

COUNTRY	OSP	POWER	COOLING	COMPUTE	NETWORK	SERVICES
United States	16.4	10.9	8.2	105.2	35.1	30.0
China	11.4	7.6	5.7	46.7	15.6	20.9
Germany	3.9	2.6	1.9	19.5	6.5	7.1
Japan	2.2	1.4	1.1	10.0	3.3	4.0
India	2.7	1.8	1.3	7.0	2.3	4.9
United Kingdom	1.8	1.2	0.9	8.8	2.9	3.4
France	1.6	1.1	0.8	7.6	2.5	3.0
Canada	1.2	0.8	0.6	5.4	1.8	2.2
Australia	1.2	0.8	0.6	5.3	1.8	2.1
South Korea	1.2	0.8	0.6	5.2	1.7	2.1

DOMAIN DECOMPOSITION OF THE TOP MARKETS, 2026 (\$BN) · 311 COUNTRY MODEL

India is the clearest example. Its compute share is far lower than its rank, and its services and outside-plant shares far higher. It is a build-led, connectivity-led market, not a compute-led one. Reading India through a US-shaped compute lens would send money away from the demand that is actually there.

THE EMERGING TAIL AND THE UNDERCOUNT

The most important finding of the country work is simple. A data-centre-first reading always under-counts the poorer world. We ran a deep, country-by-country sourcing pass across eighteen markets, using operator spending filings, national data-centre briefs and telecom-regulator data rather than bundled market reports. It filled eight or nine of the eleven domains per country, then compared the result to the model:^[17]

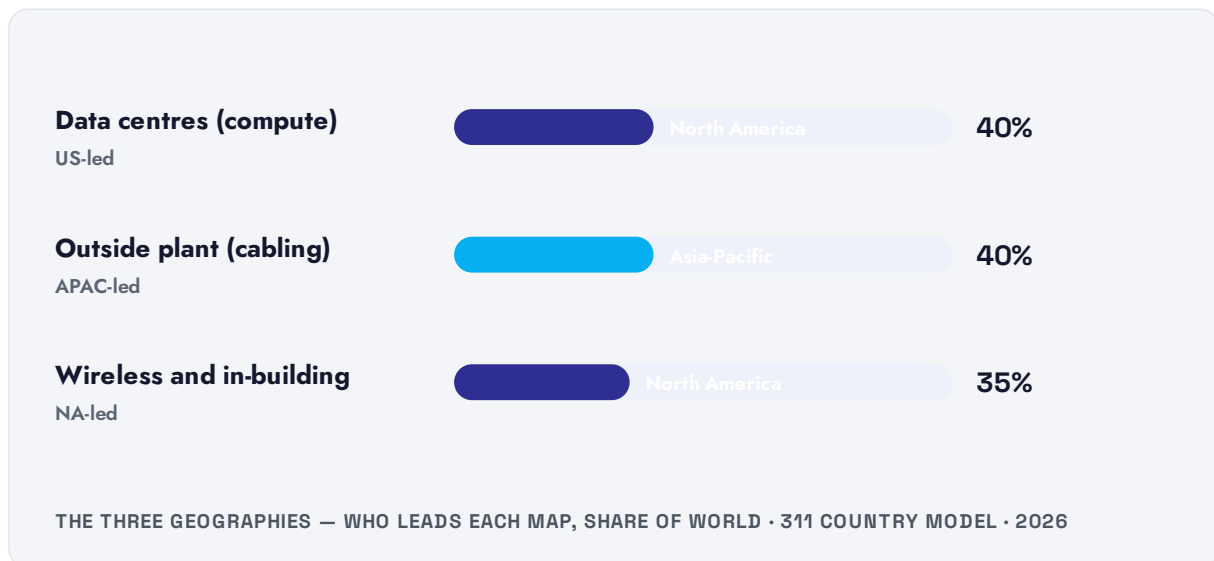
COUNTRY	REGION	SOURCED \$BN	UNDERCOUNT
India	S-Asia	23.0	1.0x (major, confirmed)
Indonesia	SE-Asia	9.5	2.4x
Vietnam	SE-Asia	4.8	1.7x
Nigeria	Africa	3.7	1.9x
Egypt	Africa	3.3	1.6x
Pakistan	S-Asia	2.1	2.1x
Colombia	LatAm	1.9	1.2x
Bangladesh	S-Asia	1.8	1.8x
Morocco	Africa	1.7	higher
Kenya	Africa	1.3	1.9x
Peru	LatAm	1.1	1.8x
Ghana	Africa	0.78	~30x (vs DC-only)
Ethiopia	Africa	0.87	~50x (vs DC-only)

DEEP-SOURCED MARKETS VS THE MODEL — THE EMERGING-TAIL UNDERCOUNT · 311 DEEP-SOURCING PASS

The pattern is a gradient. The big markets are sound (India matches almost exactly). The European tail runs 1.0 to 1.4 times the model. The African and South-Asian deep-tail runs closer to 2 times — telecom-led, mobile-first demand that bundled data-centre reports do not see. Two domains, structured cabling and DCIM, had no country-level source anywhere in the eighteen, and are estimated down from global totals throughout. The practical lesson for anyone sizing an entry is to build the country model from telecom and construction drivers, not from data-centre announcements alone.

THREE GEOGRAPHIES, NOT ONE

The deepest point of the atlas is that there is no single world map of this market. There are three, and they point in different directions. Data-centre spend is US-led, with North America at about 40% of world capacity. Outside plant is Asia-Pacific-led, with the region at about 40% and the US only about 20%. Wireless and in-building is North-America-led at about 35%. A business that sets its geography by one domain's map will be wrong about the other two.



It means the map a connectivity-led business can sell to is much bigger than a data-centre-first reading suggests, and it sits in the poorer tail. Our deep sourcing found the gap widening exactly where the published reports are thinnest, in Africa and South and South-East Asia. A business that plans only around the compute headline will under-invest in the very markets where connectivity demand is growing fastest.

For anyone sizing an entry, the rule is to build the country model from telecom and construction drivers, not from data-centre announcements alone. The data-centre view is right for the compute markets and misleading almost everywhere else. The tail is not noise. It is an under-counted majority of the world's connections.

CHAPTER SUMMARY

The market is not one geography but three. Data-centre spend is US-led, outside plant is Asia-Pacific-led, and wireless is North-America-led, so a business calibrated to one domain's map will misjudge the other two. Sized country by country on three ICT-native drivers rather than GDP, it concentrates heavily: North America and Asia-Pacific are near-equal blocs at about a third each, Europe a quarter, and the top twenty markets hold about 85% of the world.

The most important finding is what the concentration hides. A data-centre-first reading systematically under-counts the emerging world, by up to two times in the African and South-Asian tail, where telecom- and

construction-led demand does not show up in data-centre reports. The addressable map for a connectivity-led business is therefore larger, and further from the compute headline, than it first appears.

A plan built only on the compute map gets two-thirds of the world's build wrong.

CHAPTER CLOSE

WHAT NEXT?

The global atlas of demand

PREDICTIONS

PREDICTION

75% CONFIDENCE • TO 2030

Emerging-market ICT infrastructure will be persistently under-counted by data-centre-first analyses through the decade.

BASIS

eighteen-country deep sourcing showing a 1.6–2.4x undercount in the African and South-Asian tail

TRIPWIRE

aggregators adopting operator-capex-based country models

QUESTIONS TO ASK

- 1 Do your priority markets match the compute map or the connectivity map?
- 2 Which regions and countries are you over- or under-weighting on a data-centre-only lens?
- 3 Where does the emerging-tail undercount change your addressable market?

04

CHAPTER FOUR

THE CONNECTIVITY GATEWAYS

The small states where the world's subsea cables come ashore.

04

2026

Which small states carry the world's data, and what do their ICT markets look like?

A few small states matter far more to global connectivity than their size suggests, because the subsea cables that link the continents come ashore there. This chapter profiles them as markets, not as targets.

SCOPE

Why small states carry big traffic

The gateways, ocean by ocean

What their markets look like

The internet is physical. Data crosses the oceans through subsea fibre-optic cables, and every cable has to come ashore somewhere. Because of geography, a small number of small states sit directly on the routes between continents. So a large share of the world's data passes through them, far more than their size or economy would suggest.^[22]

WHY SMALL STATES CARRY BIG TRAFFIC

Their ICT markets are small in dollar terms but dense in a particular way. The value sits in three things: the cable landing stations where the fibre comes ashore, the carrier-neutral data centres those cables feed, and the power and cooling that run both. A data-centre-only market read misses these states almost entirely, because their importance is in connectivity, not compute. Read them by the traffic that passes through, not by the size of the local economy.

THE GATEWAYS, OCEAN BY OCEAN

In the Red Sea, Djibouti is the gateway. It sits on the Bab-al-Mandab strait at the mouth of the Red Sea, on the corridor between Europe, the Middle East, Asia and East Africa. Around ten subsea cables land there, including 2Africa, the world's longest at about 45,000km, along with EASSy, SeaMeWe-5, EIG and PEACE. A carrier-neutral data centre, opened in 2013, hosts the national internet exchange and links the landing stations. Internet use in Djibouti rose from about 7% of people in 2010 to about 59% in 2020, and the state operator serves around fifty carriers reaching about ninety countries. The market is small, but it is East Africa's main digital gateway.^[22]

In the Indian Ocean, Mauritius is the hub. The SAFE, LION, MARS, T3 and METISS cables land there, with partnerships across EIG, PEACE, SeaMeWe-5, WACS and EQUIANO, linking Africa, Europe and Asia by way of Reunion, Madagascar and South Africa. Mauritius hosts a pan-African wholesale carrier and Tier-3 data centres. Two smaller island states sit on the same ocean: the Seychelles and the Maldives each have a modern cable landing, the PEACE system among them, that replaced an earlier dependence on satellite.

In the North Atlantic, Iceland is the bridge between North America and Europe. Four subsea cables land there: FARICE-1 to Scotland and the Faroe Islands, DANICE to Denmark, and IRIS to Ireland, the last carrying up to 132 terabits a second. Iceland's ICT market is shaped by power. Its electricity is almost entirely renewable, roughly 70% hydro and 30% geothermal, among the cheapest in Europe, and its cool climate lets data centres run at very low energy overhead. That has made it a green data centre destination, and it trades inside the European single market through the EEA.

In the Mediterranean, one of the world's busiest cable corridors, three small states are landing points. Cyprus links Europe, the Middle East and the Egyptian cable corridor. Malta connects to

Italy and North Africa. Gibraltar sits on the strait between the Atlantic and the Mediterranean, a natural chokepoint. Each carries transit traffic far above its own domestic demand.

In the Pacific, Fiji is the central hub. Systems such as Southern Cross and the newer, Google-backed Tabua cable, which links Australia, Fiji, Hawaii and the United States, come ashore there. Fiji is the connection point for many smaller Pacific island states that would otherwise depend on satellite.

In the Caribbean and on the West African Atlantic coast, several small states are landings. Puerto Rico is a Caribbean cable hub and, as a US territory, sits inside US standards and connectivity. Barbados is an eastern-Caribbean landing. On the African side, Cape Verde and Mauritania sit on the West Africa cable systems, WACS, SAT-3 and the newer EQUIANO, that run between Europe and West Africa.

STATE	OCEAN / ROLE	KEY CABLES	NOTE
Djibouti	Red Sea — East Africa gateway	2Africa, EASSy, SeaMeWe-5, EIG, PEACE	~10 cables, with a carrier-neutral data centre and exchange
Mauritius	Indian Ocean hub	SAFE, LION, MARS, T3, METISS	Wholesale carrier base, with Tier-3 data centres
Iceland	North Atlantic bridge	FARICE-1, DANICE, IRIS	~100% renewable power, a green data centre hub
Cyprus	East Mediterranean	Mediterranean systems	Europe, Middle East and Egypt corridor
Fiji	South Pacific hub	Southern Cross, Tabua	Gateway for Pacific island states
Puerto Rico	Caribbean	Caribbean systems	US territory, on US standards
Cape Verde / Mauritania	West Atlantic	WACS, SAT-3, EQUIANO	Europe to West Africa route
Seychelles / Maldives	Indian Ocean	PEACE, regional systems	Island landings, formerly satellite

WHAT THEIR MARKETS LOOK LIKE

These states share a market shape. Domestic ICT demand is small, but the connectivity infrastructure is large relative to the economy, because it serves transit traffic and neighbouring countries rather than just the local population. The value concentrates in the landing stations, the carrier-neutral data centres the cables feed, and the power and cooling that run them.

Two things decide how far each market grows beyond a landing station. The first is power: where it is cheap and clean, as in Iceland, a data centre layer grows on top of the cables. The second is position: where the location sits on a major route, as with Djibouti and Mauritius, the market is built around being a regional gateway. Read for a market, these states are measured by the traffic that passes through them, not by their population or the size of their economy.

The pattern across all of these states is the same. A small number of small countries carry a share of the world's data far larger than their economies, because the cables between continents come ashore there. Djibouti anchors the Red Sea, Mauritius the Indian Ocean, Iceland the North Atlantic, Cyprus the Mediterranean and Fiji the Pacific, each hosting several cables and the data centres they feed. Their ICT value sits in that connectivity layer, the landing stations, the carrier-neutral data centres, and the power and cooling behind them, rather than in domestic compute. A market read built on data-centre announcements alone will miss them, which is exactly why they are worth setting out as markets in their own right.

CHAPTER SUMMARY

A small number of small states carry a share of the world's data far larger than their economies, because the subsea cables between continents come ashore there. Djibouti anchors the Red Sea, Mauritius the Indian Ocean, Iceland the North Atlantic, Cyprus the Mediterranean and Fiji the Pacific, each hosting several cables and the data centres they feed. Their ICT value sits in that connectivity layer, the landing stations, carrier-neutral data centres, power and cooling, rather than in domestic compute, which is why a data-centre-only read misses them almost entirely.

The physical internet has to come ashore somewhere, and often that somewhere is a very small country.

CHAPTER CLOSE

WHAT NEXT?

The connectivity gateways

QUESTIONS TO ASK

- 1 Which cables land in the markets you serve?
- 2 Where does traffic concentrate on the routes you depend on?
- 3 Which gateway states sit on your regional connectivity paths?

05

CHAPTER FIVE

HOW THE DISCIPLINES ARE CONVERGING

Four zones where separate trades are fusing into new disciplines.

05

2026

Where are the trades merging, and who will own the merged discipline?

As trades merge, they create new certificate markets, with no leader to unseat.

SCOPE

The four zones

Why they are contested

The open ground

Trades that used to be separate are merging. Physical security is becoming a network job on the cabling backbone. DCIM and building management are merging. Power, cooling and compute are now designed together at AI density. And in-building wireless is merging with structured cabling.

Each zone shares a pattern: two settled trades, each with its own standards, pushed together by technology, and no one yet owns the merged skill. That gap is the single biggest opening, because whoever sets the standard and certificate for a merging zone takes a skill that did not exist before.^[19]

The cause is the same in every case. As compute density rises and every device joins the network, the clean lines that once split the trades — power here, cooling there, security on its own network — stop holding. The work now crosses those lines out of physical necessity, and the certificate has not caught up. That gap, between how the work is done and how it is certified, is the opening.

THE FOUR ZONES

Each zone is a place where two settled trades, each with its own standards and certificates, are being pushed together by technology — and in each the merged skill has no clear owner.

ZONE	TRADES MERGING	EMERGING DISCIPLINE	STANDARD
Secure network	Physical security + IP networking	Networked security on the cabling backbone	Unsettled
Facility intelligence	DCIM + building management	Unified facility intelligence	Fragmented
Thermal- electrical	Power + cooling + compute	Co-engineered high-density facility	Vendor-led
Wireless- cabling	In-building wireless + structured cabling	Converged in- building infrastructure	Partly codified

The secure-network zone is furthest along — cameras, access control and sensors are now network devices on the cabling backbone, pulling physical security into the network trade. The thermal-electrical zone is the most fought over and the most valuable, because AI density

makes power, cooling and compute one designed-together system that no old trade fully owns. Whoever writes the reference certificate for one of these zones takes a skill that did not exist a decade ago.

The reward goes to whoever helps write the certificate for a merged skill before a rival or a maker's own system closes it off. Setting the standard is a lasting advantage precisely because it is so hard to undo once adopted. The window is open now, while the merged skills are still contested and no single certificate has become the one that buyers and insurers require.

Not one of the four zones has a clear owner today, which is unusual and will not last. As density, security and intelligence keep merging, the skills will set into named certificates with reference standards, and the firms in the room at that moment will shape them. Being absent is a choice to accept whatever standard others write.

For a board, the practical question is narrow and answerable. In which single merging zone does the organisation already have the most credibility? And what would it take to set the reference standard there before a rival or a big cloud firm does? That is a smaller, sharper bet than trying to own all four, and it is the one most likely to pay off.

I WHERE THE SEAMS ARE

This merging is not abstract. It is happening at four clear seams, and each seam is where a new skill, and a new standard, is forming. Power and IT are merging as racks draw what a small building once did, so the line between electrical work and data-centre design is dissolving. Cooling and mechanical are merging as liquid cooling goes mainstream. Building controls and network are merging as facilities get wired up at the density AI demands. And physical security and IT security are merging as the building itself becomes a cyber target. At each seam, work that used to belong to two separate trades now belongs to neither cleanly.

Those seams are the opportunity, because whoever certifies the merged skill first sets the terms for everyone after. By definition the seams have no existing standard, since they were not skills a decade ago, which makes them open ground for an independent, cross-vendor certificate body in a way the settled skills are not. The body that writes the competency standard for liquid-cooling design, or for the power-plus-IT join, owns a floor of demand that compounds as the merged work grows.

There is a pay premium at every seam, and it grows as density rises. A worker who can span the merged boundary — the designer who understands both the power side and the cooling

side — is scarce and getting scarcer. That is exactly when a certificate proving the crossover skill earns a premium. The standard trades on either side of each seam lose pricing power, while the crossover skill at the seam becomes the defensible, high-margin specialism.

CHAPTER SUMMARY

Historically separate trades are fusing into new disciplines at four seams: power and IT, thermal and mechanical, building intelligence and network, and physical and IT security. Each seam is a place where two established trades are forced together by AI density and no incumbent yet owns the merged skill. That gap is the opening, because whoever defines the standard and credential for a converged discipline captures work that did not exist a decade ago, and the crossover competence at each seam becomes the defensible, high-margin specialism while the trades on either side commoditise.

Merging trades create new certificate markets, not just contested ones.

CHAPTER CLOSE

WHAT NEXT?

How the disciplines are converging

PREDICTIONS

PREDICTION

60% CONFIDENCE • BY 2032

At least one convergence zone will produce a dominant new credential standard before 2032.

BASIS

the pace of AI-density co-engineering and security-network fusion

TRIPWIRE

hyperscaler proprietary stacks foreclosing an open standard first

QUESTIONS TO ASK

- 1 Which convergence zone is closest to your existing capability?
- 2 Where could you define the standard for a discipline that does not yet exist?
- 3 Which of your trades is most exposed to a neighbouring one merging in?

06

CHAPTER SIX

PROFIT POOLS AND DISRUPTION

Where the durable margin sits, and what could bypass the trade.

06

2026

Which stage of the chain holds the most durable margin, and what threatens it?

The profit deepens toward the repeat-income layers, and every threat still runs into the on-site installer.

SCOPE

The value chain

The profit pools

The disruption scorecard

The value chain runs from making equipment, which is cyclical and getting cheaper, through distribution, design, installing, commissioning, running and maintaining, to monitoring. The profit deepens as you move from product toward service. The deepest pools, running and monitoring, are repeat income that grows with the installed base rather than with new build.^[3]

This is why investors are buying up the services trade. They are buying steady, repeat cash flow protected by scarce labour — in power and cooling firms, in wireless (DAS) consolidation, and through infrastructure funds buying into operators.

THE PROFIT POOLS

Reading the chain by margin and durability, rather than by revenue, shows the profit deepening steadily from product toward service, and deepest at the repeat, installed-base layers.^[19]

STAGE	MARGIN	RECURRING	DURABILITY
Equipment manufacture	Cyclical, compressing	No	Low
Distribution	Thin	Partly	Low-medium
Design	Healthy	Project	Medium (credential-gated)
Installation	Labour-driven	No	Medium (scarcity-protected)
Commissioning	Healthy	No	Medium
Operations & maintenance	Strong	Yes	High
Monitoring	Strong	Yes	High

THE DISRUPTION SCORECARD

Five threats bear on the trade: the big cloud firms bringing work in-house, vendors certifying their own people, investors rolling up the channel, automation and AI tools, and offshore or remote delivery. Set against what pushes back on each, they change who profits without removing the certified on-site layer.^[19]

VECTOR	THE THREAT	THE COUNTER-FORCE
Hyperscaler integration	Proprietary stacks brought in-house	Still need certified trades to build
Vendor self-certification	Bypass the independent credential	Lacks cross-vendor credibility
PE consolidation	Channel roll-up	Concentrates, does not remove the trade
Automation & AI tooling	Fewer hours per job	Raises the skill bar, not removes it
Offshore / remote delivery	Design and monitoring move offshore	Cannot terminate fibre or commission on-site

The lesson is to move on purpose toward the repeat-service layers, where the installed base compounds and the labour moat is deepest. Repeat income is worth more and survives downturns that flatten equipment sales. The same scarce labour that limits new build also protects the running and monitoring income, because the work cannot be done without the very trades that are in short supply.

The threat analysis backs this up rather than complicating it. Read carefully, every threat shifts profit between players without removing the certified on-site layer they all still depend on. The safest place to stand while the trade is disrupted is the place the disruption cannot reach.

For a board, the test for any position in this market is simple. How much of its value is repeat income, and how close is it to the certified on-site layer? A position high on both is safe

against every threat at once. A position low on both — one-off equipment sales into a cheapening channel — is exposed to all five at once, however big its revenue looks today.

WHERE MARGIN IS DEFENSIBLE

Profit does not pool evenly along the chain, and the pattern is the opposite of where volume sits. The one-off layers, the equipment sale and the standard install, carry the volume but the thinnest, least defensible margin, because they cheapen as they scale and buyers can swap suppliers freely. The repeat, certificate-gated layers, required design and operate-and-check, carry less volume but the lasting margin, because they resist cheapening and the switching cost is real. A firm chasing revenue goes for volume. A firm chasing enterprise value goes for the repeat, defensible pools.

Disruption hits the pools unevenly, and reading which is exposed is the heart of the defensibility question. Automation and prefabrication cut the labour in the standard install layers, which is exactly where margin is already thin, so they speed up a cheapening that is already under way. The design and checking layers are far more resistant, because they rely on judgement, accountability and being required by rules, which automation does not easily replace. So the move is not to defend the standard layers, which are losing anyway, but to shift toward the layers that disruption strengthens rather than weakens.

Density is quietly rewriting the map in the specialists' favour. As facilities get denser, the cooling, power and controls work gets harder, and difficulty is what protects margin. New repeat pools — commissioning, cooling checks and DCIM operation — are opening that barely existed a decade ago, and none can be certified neutrally by a vendor whose own products they judge. That mix, rising difficulty plus a need for neutrality, is the most defensible profit pool the build creates, and it is where limited investment compounds.

HOW THE POOLS SIT BY REGION

The profit pools sit in different places by region, and the difference follows how mature each market is. In North America and Europe, where the build is mature and dense, the lasting value has already moved up the chain into design, commissioning and operate-and-check, and the standard install layers are the most cheapened. In the poorer tail across Africa, South and South-East Asia and Latin America, the volume is still in the install and outside-plant layers, because the build is earlier. So the standard pools are larger there, even as the specialist pools are thinner.

That regional pattern has a clear reading. A firm chasing volume finds it in the poorer regions, in the install and connectivity layers, but competes there on price against local labour. A firm chasing defensible margin finds it in the mature regions, in the design and checking layers, where the switching cost and being required by rules are real. The two need different skills and different footprints. Mixing them up, chasing poorer-market volume while expecting rich-market margins, is a common and costly error.

Density is the force that will, over the decade, pull the poorer regions up the same curve the mature ones have already climbed. As facilities in the Gulf, India and South-East Asia get denser to serve AI, the cooling, power and controls pools that are thin there today will open, and the repeat, certificate-gated work will follow. The body that sets the standard and the certificate in those regions before the pools open takes the defensible layer as it forms, rather than arriving after a local rival has set the terms.

CHAPTER SUMMARY

Profit does not pool where volume sits. The one-off transactional layers, the equipment sale and the commodity install, carry the volume but the thinnest margin, while the recurring, credential-gated layers, mandated design and operate-and-assure, carry the durable margin. Five disruption vectors, from hyperscaler integration to automation, reshape who profits, but read carefully each redistributes profit without removing the certified on-site layer they all depend on. Density is opening new recurring pools, commissioning, thermal assurance and DCIM operation, that no vendor can certify neutrally.

Disruption changes who profits from the trade. It does not remove the trade.

CHAPTER CLOSE

WHAT NEXT?

Profit pools and disruption

PREDICTIONS

PREDICTION

75% CONFIDENCE • THROUGH 2035

Recurring services will rise as a share of physical-segment value every year through 2035.

BASIS

installed-base compounding and the private-equity annuity thesis

TRIPWIRE

a durable collapse in operations-and-maintenance pricing from automation

QUESTIONS TO ASK

- 1 Where on the chain does your position sit, and how much is recurring?
- 2 Which disruption vector is most live in your segment?
- 3 How close is your position to the on-site, credentialed layer?

07

CHAPTER SEVEN

THE WORKFORCE THE MARKET RUNS ON

The pivot of the whole market: labour and the career chain.

07

2026

Why is labour the value and the constraint at once?

Install labour is 64–72% of installation cost, and the trades to supply it are scarce everywhere.

SCOPE

The labour economics

The career chain

The deepest moat

Install labour is 64–72% of a typical installation's cost. Most of the value in a build sits in the certified workforce, not the materials.^[3] A shortage of skilled trades is now a named global limit on the build, alongside power. A developed market like Poland reports a gap of about fifty thousand ICT specialists a year, with wages rising 8–12%. Poorer markets report rack-install and cooling-mapping skills in short supply.^[20]

The career chain runs from trade-college entry, through apprentice, certified installer, technician, required designer, project manager and operations lead. The entry stages are both the hardest to build and the hardest to replace. A vendor can certify its own technician, but it cannot quickly build a trade-college pipeline or a required design certificate.

THE CAREER CHAIN

The workforce is best read as a chain. The value sits at the two ends the market cannot quickly build — the entry pipeline that feeds it, and the certified design layer that gates it.^[19]

STAGE	ROLE	SUBSTITUTABILITY
Entry	Trade-college student / apprentice	Very low (pipeline-bound)
Core	Certified installer	Low
Skilled	Technician / commissioning	Low-medium
Design	Mandated designer	Very low (credential-gated)
Lead	Project manager	Medium
Operations	Operations & monitoring lead	Medium

The maths makes the point sharply. With install labour at 64–72% of installation cost, a shortage of trades does not just slow a project — it stops it. Developed markets are already there. Poland alone reports a gap of about fifty thousand ICT specialists a year, wages rising 8–12%, and poaching across borders is now routine. Poorer markets report the specialist skills — rack install, cooling mapping, high-speed fibre — in even shorter supply next to the build they are attempting.

For businesses exposed to the labour limit, the entry pipeline of colleges, apprenticeships and certificates is a strategic asset, not an overhead. Whoever controls the flow of new certified trades controls the limit on everyone else's delivery. In a market where the binding limit is people, the pipeline that produces those people is among the most defensible positions there is, and among the slowest for a rival to copy.

Because the limit is human and slow to fix, the advantage compounds. A pipeline built now produces trades for a decade, and a rival starting later cannot close the gap quickly, whatever it spends. In a labour-bound market the clock, not the cheque book, is the scarce resource — and the clock favours whoever started first.

There is a knock-on effect worth naming for a board. Because the limit is certified people, the bodies that certify and train them hold a quiet market power over everyone who must hire them. In a labour-bound market, the certificate itself — who defines it, who awards it, who is recognised as holding it — is strategic infrastructure, as much as the fibre and the racks it governs.

THE PIPELINE PROBLEM

Labour is the binding limit on the whole build, and the numbers are stark. Install labour is 64–72% of installation cost, and certified trades are scarce in every market without exception. So the ceiling on how fast capacity can land is set not by money, or even by power in many markets, but by the number of people who can do the work to standard. A market can have the money and the megawatts and still stall for want of certified installers, designers and commissioning engineers — which is happening now in the fastest-growing hubs.

The pipeline that feeds the trade is not keeping up, and the gap is built-in, not just a phase of the cycle. The workforce is ageing, new entrants are below replacement in most developed markets, and the merging trades need skills the old training pipelines were not built to produce. That is a problem for the industry and an opening for whoever controls the entry pipeline and the certificate. The scarcer the certified worker gets, the more the certificate is worth, and the more power the body that grants it holds over the whole delivery chain.

Automation covers part of the gap, but not the defensible part. Prefab, robots and AI-assisted design cut the labour in routine work, which relieves some pressure at the cheap end. But they raise, not lower, the demand for the higher skill — the worker who designs the automated system, commissions it and signs it off. So automation moves the labour limit up the skill curve,

toward exactly the certified, judgement-heavy roles that are hardest to fill and most valuable to certify.

I THE GRADUATE SUPPLY SIDE

The chapter so far has counted demand. The other half of the people question is supply: how many new ICT and engineering graduates each region produces a year. A region's real potential is its market size multiplied by its ability to staff the build, and the two do not always line up.^[23]

The supply is heavily concentrated. China produces about 3.6 million STEM graduates a year and India about 2.6 million, together more than the next nine countries combined. The United States produces about 820,000, a smaller number that it tops up by attracting talent from abroad, with roughly 45% of its STEM PhDs foreign-born. Europe is led by Germany, where about a third of graduates are in STEM, though several large European economies sit below a quarter. Russia, Japan and South Korea round out the large producers, with Japan's output plateauing as its population ages.^[23]

REGION / COUNTRY	STEM GRADUATES A YEAR	NOTE
China	~3.6 million	about 40% of all graduates, and ~77k STEM PhDs a year
India	~2.6 million	about 34% STEM share, projected to overtake China by 2030
United States	~820,000	tops up by attracting talent, ~45% of STEM PhDs foreign-born
Japan	~550,000	plateauing with an ageing population
Russia	~520,000	strong training, but a brain-drain problem
Germany (EU lead)	~35% STEM share	highest in the EU, but warns of a skills gap
South Korea	~140,000	high for the size of the country

Reading supply against demand reweights the map. China and India are talent-rich relative to their own markets, so they can staff their build from within. The United States is talent-importing: its market is the world's largest, but it fills the gap by drawing skilled people from abroad, which ties its delivery to immigration policy. The Gulf is capital-rich but structurally talent-importing, with small domestic pipelines. And much of Africa and South Asia has the fastest-growing demand but the thinnest graduate pipeline.

The plain conclusion completes the people thesis. A large market with a shallow graduate pipeline cannot deliver its own build. Market size sets the prize, and graduate supply sets the ceiling on how quickly that prize can be built out. A region read on demand alone will overstate how fast it can actually move.

CHAPTER SUMMARY

This is a labour market wearing an equipment market's clothes. Installation labour is 64 to 72% of installation cost, and certified trades are scarce in every geography, so the ceiling on how fast capacity lands is set by people, not capital. The value sits at the two ends the market cannot quickly build, the entry pipeline that feeds the trade and the credentialed design layer that gates it, and the supply side, graduate output by region, is heavily concentrated in China and India while the fastest-growing demand has the thinnest pipeline. Whoever controls the flow of certified trades controls the constraint on everyone else's delivery.

The certified human installer is the hardest asset in the system to cut out.

CHAPTER CLOSE

WHAT NEXT?

The workforce the market runs on

PREDICTIONS

PREDICTION

70% CONFIDENCE • BY 2030

Wage inflation for certified ICT trades will outpace general construction wages through 2030.

BASIS

documented shortfalls and cross-border poaching in developed markets

TRIPWIRE

a large expansion of trade-college throughput closing the gap

QUESTIONS TO ASK

- 1 Where in the career chain is your position strongest?
- 2 How exposed is your delivery to skilled-trade scarcity?
- 3 Could you own more of the entry stages that feed the chain?

08

CHAPTER EIGHT

STANDARDS, MANDATES AND REGULATION

The rules that create demand floors and reshape the build.

08

2026

Which standards and regulations convert policy into guaranteed, credentialed demand?

Design-certificate and public-safety rules create floors of demand, and the direction of regulation adds to them.

SCOPE

[The mandate map](#)[Standards and entry](#)[The regulatory trajectory](#)

Rules create lasting floors of demand. Design-certificate requirements are written into public buying and defence-facility rules. Fire and building codes require in-building wireless for public safety. Data-residency laws force in-country, standards-compliant build. And sustainability rules build efficiency measurement, and so monitoring, into compliance.

Matching standards is also the best predictor of easy entry, and easy entry tracks standards alignment. The contested frontier is the merging zones, where the combined skills have no settled standard yet.

THE REGULATORY TRAJECTORY

Regulation tightens on three fronts, each turning a policy into a physical build requirement. Sustainability, through required efficiency and water reporting. Sovereignty, through data-localisation laws across the Gulf, SE Asia and Africa. And grid and power, through connection rules, deposits and bring-your-own-power requirements. The net effect is to raise the value of standards-compliant, certified delivery.

THE MANDATE MAP

Four kinds of rule turn policy straight into demand for certified delivery, and each is tightening, not loosening. The European Energy Efficiency Directive, for example, is phasing in required energy and water reporting for data centres. That turns efficiency measurement — and so monitoring — into a requirement rather than a choice.^{[1][2]}

MANDATE	WHAT IT FORCES	DEMAND FLOOR IT CREATES
Design credentials	Certified design on public and defence build	Recurring credentialed design work
Public-safety wireless	In-building coverage in fire and building codes	Mandated in-building / DAS work
Data residency	In-country, standards-compliant build	Localised facility demand
Sustainability reporting	Energy and water measurement	Embedded monitoring demand

These floors matter because they do not move with the cycle. A downturn cuts optional build, but it does not repeal a fire code or a data-residency law. The standards-aligned markets are exactly where these rules are clearest and most enforced, which is why matching standards predicts both easy entry and steady demand.

Oddly, tighter regulation is a tailwind for certified delivery, because every rule turns into a floor of compliant, certified work. Sustainability reporting creates monitoring demand, data-residency creates in-country build, and public-safety codes create required design. Each is a policy that becomes a physical, certified requirement, and the direction of travel on all three fronts is toward more regulation, not less.

For a standards-aligned body this is a built-in advantage that deepens over time. As rules multiply, the value of being the certificate those rules point to rises with them. The direction of regulation, so often seen as a cost, is in this market a compounding source of demand for exactly the certified delivery this report identifies as most defensible.

The board-level reading is that regulation and workforce are the same story told twice. Each new rule does not just add compliance cost. It adds a floor of work that only certified people can deliver, which deepens the very labour moat the workforce chapter describes. A body sitting where the two meet — holding the certificates the rules require — sits on the most durable demand in the whole market.

HOW MANDATES CREATE DEMAND

Rules are the most reliable way to create demand in this market, because they turn an optional spend into a required one. A design-certificate rule, a public-safety requirement, or a buying rule that points to a standard creates a floor of demand that does not depend on marketing or on the cycle. Where a specification or a building code points to a skill, the work that skill governs must be done by someone who holds it — the single most durable source of demand a standards body can create for its own certificate.

The direction of regulation adds to the floor and is moving one way. Efficiency and water rules are tightening as the build's environmental cost becomes political. Data-residency laws are spreading across the Gulf, South-East Asia and Africa, forcing in-country build. And clean-power requirements are favouring some places over others. Each is a compliance-driven spend that lands on the physical-and-services layer, and each raises the value of the certificate that proves compliant work. On balance, the direction of regulation is a tailwind for an independent standards body, not a headwind.

The strategic move is to be inside the standard-writing process at the seams where the next rules will land, not to react after they are set. Whoever writes the skill standard that a future code or buying rule points to takes the floor of demand that follows, and the merging skills are exactly where those future references are not yet fixed. A body that treats standards-writing as strategy, not admin, turns the direction of regulation into a compounding source of demand for its certificate.

THE STANDARDS SPLIT

One factor sits underneath every mandate in this chapter and can change how a whole region reads: which standards it runs on. The world's technical standards are starting to split into two blocs. On one side is the long-established Western stack, written through bodies such as ISO and IEC, IEEE, ETSI and 3GPP. On the other is a Chinese push, set out in the China Standards 2035 plan and exported through the Digital Silk Road, to have Chinese standards adopted across the developing world.^[24]

The patents show which way the split is tilting. Standard-essential patents, the patents a product must use to comply with a standard, are the foundation of standard-setting, and China now holds about a third of the world's 5G essential patents. Huawei alone holds about 12% of global 5G patents, ahead of every Western vendor, followed by other Chinese firms such as ZTE and Oppo, alongside Qualcomm, Ericsson, Nokia and Samsung on the Western side. Because patent leadership in one generation tends to shape the standards of the next, this is the leading indicator of who writes tomorrow's rules, and China has already tabled early 6G proposals at the ITU.^[24]

The Digital Silk Road is how the Chinese stack spreads. China has signed dozens of standards-cooperation agreements with Belt and Road countries and often lists its own standards as a condition of infrastructure contracts and aid. So the regions most likely to drift toward Chinese standards are exactly the fast-growing emerging markets of Africa, Central Asia and South-East Asia where that infrastructure is being built with Chinese finance.

DIMENSION	WESTERN STACK	CHINESE STACK
Written through	ISO/IEC, IEEE, ETSI, 3GPP	China Standards 2035, national bodies
Spread by	market adoption, EU and US market-access rules	Digital Silk Road, BRI contracts and aid
5G essential patents	Qualcomm, Ericsson, Nokia, Samsung	about a third of the world, Huawei first
Regions leaning in	North America, Europe, aligned Asia-Pacific	fast-growing Africa, Central and SE Asia

Why this matters for a market read: which bloc a region runs on decides which credential, which equipment and which compliance regime apply there. A large region moving onto Chinese standards is a different market from the same region on Western standards, even though its size is unchanged. There are also region-specific compliance regimes that each create their own certification demand, among them the EU's Cyber Resilience Act, China's MLPS security grading and various national cybersecurity rules. A region's size tells you how big it is. The standards it runs on tell you which market it actually is.

CHAPTER SUMMARY

Mandates are the most reliable demand generator in this market, because they turn a policy into a floor of certified work that does not move with the cycle. Design-credential requirements, public-safety codes, data-residency laws and sustainability reporting each create such a floor, and regulation is tightening on all three fronts. Underneath them sits a deeper shift: the world's technical standards are starting to split into a Western bloc and a Chinese one, and which bloc a region runs on decides which credential applies there, which reframes the addressable market as much as any single mandate.

Every turn of the regulatory screw adds to the floor of certified-delivery demand.

CHAPTER CLOSE

WHAT NEXT?

Standards, mandates and regulation

PREDICTIONS

PREDICTION

70% CONFIDENCE • BY 2030

Data-residency and mandatory efficiency reporting will spread to more markets, forcing in-country credentialed build.

BASIS

the current trajectory across the Gulf, SE Asia and Africa, and the EU framework from 2028

TRIPWIRE

a reversal toward cross-border data liberalisation

QUESTIONS TO ASK

- 1 Which mandates underpin demand in your markets?
- 2 Where does standards alignment ease or block your entry?
- 3 How does localisation change your in-country build needs?

09

CHAPTER NINE

POWER, PERMITTING AND THE CEILING ON BUILD

The constraints that decide where capacity lands.

09

2026

What actually caps how much gets built, and where?

Grid connection, capacity prices and permits, not demand, govern the build.

SCOPE

The power constraint

The permitting constraint

Where capacity migrates

Permits and power, not demand, decide where capacity lands. Grid capacity prices rose from \$30 to \$330 per MW-day in the largest US market. Large-load connection queues top 2,500GW. Flagship cities quote getting power in 2037–38. And connection deposits and bring-your-own-power rules turn process into money and timeline risk.^[7] A data centre now costs about \$11.3m per MW to build, and rising.^[3]

The result is migration. Capacity moves toward clean-power places — the Nordics and hydro-rich markets — just as power becomes the scarce input. How fast a market permits becomes an early sign of where the build appears, often more telling than demand.

THE POWER AND PERMITTING NUMBERS

The constraint is measurable, and the numbers are stark.^[7]

METRIC	VALUE	SOURCE
PJM capacity price	\$30 to \$330 / MW-day in two years	PJM
Large-load connection queue	Over 2,500 GW	IEA / PJM
Flagship-metro energisation	Quoted 2037–38	utility / operator
Build cost	~\$11.3m / MW and rising	JLL

The migration is visible. Capacity is moving to where power and permits are solved: the Nordics for cheap hydro and free cooling, Johor as Singapore's cap pushes build across the strait, and Chile's Atacama for solar and a cool coast. Connection deposits and bring-your-own-power rules add money and timeline risk that favours operators who can bring their own generation — increasingly the big cloud firms, which concentrates the build further.

So the lasting question for any operator is not where demand is highest, but where power and permits are actually solved. Capacity is moving to the places that have answered those two questions, often whatever the headline demand. Reading how a market permits, and its grid position, rather than demand forecasts, is the more reliable way to predict where the next wave of build lands.

The migration already shows in where new capacity is being announced, and it will speed up as the grid limit bites. Firms that read the power-and-permit map early can get ahead of the

wave. Firms that follow demand forecasts alone will keep arriving in cities where the capacity cannot actually be powered for a decade.

This also changes who the customer is. As bring-your-own-power becomes normal, whoever controls the megawatts controls the project — and increasingly that is a big cloud firm or an infrastructure fund, not a colocation landlord. For the trade, the decision-maker on the largest builds is moving upstream toward whoever can solve power, and commercial relationships need to move with it.

THE MITIGATION PLAYBOOK

Power is the hardest limit to move, so it is the one that most rewards planning around it. Grid capacity prices have risen about eleven-fold in the largest US market in two years, from \$30 to \$330 per megawatt-day, with over 2,500GW of large-load projects queued. Those numbers describe a market where the scarce input is not land or money but a grid connection, and where the queue itself has become the ceiling on when capacity can land. Flagship cities now quote getting power in 2037 and 2038, which turns a process into a multi-year timeline risk that reshapes where the build goes.

The playbook for working around it is well understood, even if it is unevenly used. On-site generation cuts reliance on the grid queue. Building in clean-power, fast-permit places trades being close for being deliverable. Flexible demand and on-site storage smooth the load the grid must serve. And bringing a facility online in stages beats waiting for full power. Each is a design-and-engineering answer to a limit, so each raises demand for the specialist skill that can do it, and none is a commodity skill.

Permits are easier to move than power but more political, and they reward local knowledge. Getting power and planning approval takes wildly different times by place, and the firm that knows which markets clear quickly holds a real edge. The reading is that power and permits together decide where capacity actually lands, more than demand does. And a certificate-and-standards layer that travels across places is worth more precisely because the limits it helps navigate are so local.

CHAPTER SUMMARY

Power and permitting, not demand, govern where capacity actually lands. Grid capacity prices have spiked, connection queues exceed 2,500GW, and flagship metros now quote energisation in 2037 and 2038, which turns a process into a multi-year timeline risk. The

consequence is migration: capacity moves to power-clean, permit-fast geographies regardless of where the headline demand originates, so reading a market's permitting posture and grid position predicts the next wave of build more reliably than demand forecasts do.

How fast a market permits is an early sign of where capacity will actually appear.

CHAPTER CLOSE

WHAT NEXT?

Power, permitting and the ceiling on build

PREDICTIONS

PREDICTION

75% CONFIDENCE · THROUGH 2035

Power-advantaged geographies will capture a rising share of new capacity through 2035.

BASIS

binding power constraints and the durable cost edge of clean, cheap power

TRIPWIRE

a breakthrough in on-site generation neutralising grid dependence

QUESTIONS TO ASK

- 1 Which of your markets have solved power and permitting?
- 2 How exposed is your pipeline to connection-queue timelines?
- 3 Where does power-clean geography give a durable cost edge?

10

CHAPTER TEN

TECHNOLOGY INFLECTIONS AND THE OUTLOOK TO 2035

What each inflection demands of the trade, and the scenarios ahead.

10

2035

How do the coming inflections change the work, and what does 2035 hold?

Denser, hotter, faster facilities need more skilled trades, and in every scenario the physical slice grows.

SCOPE

The inflections

The scenarios

The invariant

Rack density climbing to 80–130kW breaks the old air-cooling assumptions, and calls for liquid-ready space and higher-grade cabling. Liquid cooling moves from niche to mainstream, the fastest-growing facility segment. Edge and inference spread demand to smaller sites from around 2027. Optics climb from 400G toward 1.6T, pulling precision fibre work into the hall. AI-assisted tools cut cabling errors by about 40% and install time by about 25% — relief against the labour limit that still raises the skill bar.^[2]

THE SCENARIOS TO 2035

Base case: the whole market reaches about \$1.45tn by 2035, growing about 8% a year, with the physical-and-services slice about \$565bn at about 7%.^{[13][14][15]} Upside: a faster inference build-out and more emerging-market connectivity push the whole toward \$1.7tn. Downside: power and permit bottlenecks and a drop in capex land it nearer \$1.15tn — but the physical slice holds up better than compute, because it is labour-bound, so its share of the smaller whole actually rises.

Whatever the scenario, then, the safe position is the same: as close to the certified, on-site delivery layer as the business can get. In the upside, that layer is short of capacity and earns a premium. In the downside, it is the part of the market that shrinks least, because it is bound by labour, not by capex. The scenarios move the size of the prize, but not where the safety sits.

That is the report's single most portable conclusion. Whatever your exposure to the compute cycle, the currency, or the region, the certified on-site delivery layer holds value across the widest range of futures. Everything else is more cyclical, easier to replace, or more exposed to a single variable than the trade that physically builds and maintains it.

WHAT TO WATCH

The outlook to 2035 is best held as a few scenarios, not a single line, because the limits that govern delivery could ease or tighten in ways that swing the total a lot. In the base case, the density boom continues, the limits bite but do not break, and the market roughly doubles on the path this report sets out. In the high case, power and permits ease faster than expected and the poorer tail develops, pushing the total above the central path. In the low case, a sharp drop in AI training spend or a lasting power ceiling holds the build below trend. The point is not to predict which happens, but to name the early signs that would tell you which way the decade is turning.

A handful of turning points will decide between the scenarios, and each can be seen coming. Liquid cooling becoming the default is the clearest, because it re-tools the cooling and design layers wholesale. Inference spreading from huge campuses toward many smaller sites is the second, because it multiplies projects and places. And the grid-queue backlog clearing, either way, is the third and the most important, because power is the binding ceiling. Watching these three tells you more about the shape of the decade than any single demand forecast.

The disciplined conclusion is that demand is not the uncertainty, and never was. The uncertainty is delivery. The firm that plans for the delivery limits — power, permits, people and the standards that make a spread-out build repeatable — is ready for every scenario, not betting on one. That is why the forecast here is built from sourced drivers rather than offered as a single prediction, and why the strategy it supports holds across the whole range.

THE REGIONAL OUTLOOK TO 2035

The scenarios play out differently by region, and a single global number hides the differences that matter most. The compute-led surge is in North America and, behind the wall, China, so the high case for those two turns on power and permits easing. Europe grows steadily but is held back by grid and planning friction and by its own split into many markets, so its path is the most base-case-like. Asia-Pacific outside China carries the connectivity build and a fast-densifying data-centre layer, so it is the region where the high case has the most room. And the poorer tail across Africa, South Asia and Latin America is where the model is most cautious and the upside most under-counted, because a data-centre-first view misses the outside-plant and connectivity build that is actually happening.

So the turning points land unevenly. Liquid cooling going mainstream reshapes the mature, dense regions first. Inference spreading to smaller sites most helps the secondary cities and the poorer regions, because it moves demand away from the crowded hubs. And the grid-queue clearing matters most for North America, because that is where the ceiling bites hardest. A firm reading the decade region by region, not as one line, sees where each early sign fires and can get ahead of it in the specific places it affects.

The honest conclusion of a global-regional analysis is that this is not one market but a set of regional builds moving on different clocks, tied together by the same limits and the same demand story. Demand is shared and near-certain everywhere. The delivery limits, and so the opportunity, are local. The firm that holds a certificate and a standard that travel across those regions, and that enters by friction rather than by size, is ready whichever way each region turns — the only robust position in a market this uneven.

CHAPTER SUMMARY

Rack density climbing toward 80 to 130kW, liquid cooling going mainstream, inference distributing to smaller sites and optics climbing toward 1.6T all raise the skill bar through the decade. Held as scenarios rather than a single line, the market roughly doubles in the base case, runs higher if power and the emerging tail develop, and lower if AI capital spending

normalises or the power ceiling holds, but in every case the physical-and-services layer holds up best because it is labour-bound rather than capex-bound. The defensible position is the same across all of them: as close to the certified, on-site delivery layer as a business can get.

The scenarios move the size of the prize, but not where the safety sits.

CHAPTER CLOSE

WHAT NEXT?

Technology inflections and the outlook to 2035

PREDICTIONS

PREDICTION

85% CONFIDENCE • BY 2035

The physical infra + services segment will grow in absolute terms in every plausible 2035 scenario.

BASIS

its position as the least substitutable layer of the build

TRIPWIRE

a wholesale automation of physical install and commissioning

QUESTIONS TO ASK

- 1 Which inflection most changes your delivery model?
- 2 Which scenario is your plan calibrated to?
- 3 Where is your defensibility independent of the scenario?

I STRATEGIC SUMMARY

The global ICT infrastructure market is a \$735bn to ~\$1.45tn boom, led by AI compute, gated by power and permits, and turning on a scarce certified workforce.

Under the compute headline sits a \$320bn physical-and-services slice — the hardest layer to replace, and the one with the most durable service income. The market is three maps, not one. Its published numbers overstate the part you can sell to by 3 to 20 times until you break the scope down. And the best places to enter cluster where subsea cables come ashore.

The single hardest asset in the whole system to cut out is the certified human installer.

ASSUMPTIONS & CAVEATS

What to bear in mind

The judgements that most affect how this report should be read, highest impact first. The full set — significant assumptions, market-boundary decisions, source limitations and areas of uncertainty — is set out in the Annex under Assumptions and Caveats.

HIGH IMPACT

Scope divergence, not forecasting, is the dominant uncertainty

published bundles overstate the addressable slice 3–20x

HIGH IMPACT

Macro-mobile scope is a decision, not a fact

it swings the headline about \$150–200bn

MEDIUM

Two domains lack per-country primary data

cabling and DCIM are modelled down from global totals

311

SECTION

ANNEX

NOTES AND METHOD

How this was done. Sizing follows ten hardened rules: product-XOR-service seams, independent cross-checks, domain-specific geography, bottom-up drivers, source grading, metric-type tagging, 2026 real-USD normalisation, vintage preference, weakest-link confidence, and headline-as-range. Country allocation uses three ICT-native drivers, data-centre capacity, telecom capex and construction output, not GDP. Deep per-country sourcing across eighteen markets validated the majors and set a region- and tier-dependent undercount gradient for the tail. Every headline figure was independently re-derived and reconciled, and ranges reflect definitional divergence between sources, not doubt about the underlying build. This is analysis for decision-makers, not investment or legal advice.

ASSUMPTIONS AND CAVEATS

This section states, in full, the assumptions the findings rest on, where the market lines were drawn, the limits of the evidence base, and where the findings are genuinely unresolved — so the reader can assess the conclusions independently. Any sub-section with nothing material to declare says so.

AREAS OF UNCERTAINTY

- The whole-market range of \$560–960bn is driven by definitional divergence
- The country matrix is on the \$715bn control, and the \$20bn Option-B tail uplift is held at aggregate, not yet redistributed to country rows
- The 2035 trajectory is a sourced driver forecast — data-centre (JLL/BNEF/Rystad), telecom capex (GSMA) and construction (Oxford Economics) grown per driver. The top 30 markets use sourced country rates, the ~90-country tail uses sourced regional rates (flagged). It is a construct, not an empirical time-series prediction

MARKET-BOUNDARY DECISIONS

- In: physical, facility, compute, network and services layers
- Adjacent, shown not added: macro cellular RAN, towers, mobile core
- Out: software, cloud, semiconductors, spectrum, content

SIGNIFICANT ASSUMPTIONS

- 2026 real USD throughout
- Option B scope: macro mobile network held adjacent, not in the headline total

SOURCE LIMITATIONS

- Structured cabling and DCIM have no per-country primary data anywhere, and are sized globally and modelled down
- Emerging-tail telecom and construction beyond the eighteen deep-sourced countries are gradient-estimated

TRUST BANDS**PRIMARY**

Original / authoritative source.

CORROBORATED

Confirmed from 2+ independent sources.

SINGLE-SOURCE

One source, uncorroborated — hold lightly.

UNVERIFIED

Authenticity or accuracy in question — treat with caution.

FORESIGHT

311 projection / inference — labelled, not fact.

SOURCE LEDGER

The report's headline figures, each traced to its origin, dated and tiered, with the full per-claim ledger shipping in the companion data.

#	CLAIM & SOURCE	DATE	TIER
01	Domain sizing cluster across the eleven physical, facility, compute and service domains GMINISIGHTS/GVR/MRFR/MORDOR/FORTUNE/DELL'ORO COMPOSITE	2026-08	CORROBORATED
02	Data-centre physical infrastructure — power and thermal DELL'ORO DCPI	2026-06	PRIMARY
03	Build cost ~\$11.3m/MW, skilled trades a named constraint, labour 64–72% of installation cost JLL / THENETWORKINSTALLERS	2026-05	CORROBORATED
04	Global mobile operator capex ~\$1.5tn 2023–2030 GSMA INTELLIGENCE	2026-04	PRIMARY
05	Global telecom equipment capex ~\$330bn DELL'ORO TELECOM CAPEX	2026-06	PRIMARY
06	Construction output shares (China ~27%, US ~12%, India ~5.5%) OXFORD ECONOMICS / GLOBALDATA	2026-03	CORROBORATED
07	PJM grid capacity price \$30->\$330/MW-day, large-load queue >2,500GW PJM / IEA	2026-02	PRIMARY
08	Nigeria telecom capex NGN2.9tn 2024, MTN 43,000km fibre NCC / OPERATOR FILINGS	2026-06	CORROBORATED
09	Big-four hyperscaler capex ~\$300bn+ in 2025, up sharply year on year COMPANY FILINGS COMPOSITE	2026-02	CORROBORATED

10	Inference overtakes training as the dominant compute workload around 2027 ANALYST COMPOSITE	2026-05	SINGLE-SOURCE
11	EU Energy Efficiency Directive — mandatory data-centre energy and water reporting phasing in EU EED REGULATORY TEXT	2026-01	PRIMARY
12	Trajectory to 2035 — a sourced driver forecast: each demand driver grown at its forecast rate then recombined. Engines: policy-slippage (power/permitting cap) and anchor-veto, reconciled to the whole (311 construct on the sourced driver forecasts) 311 CONSTRUCT ON DRIVER FORECASTS	2026-09	SINGLE-SOURCE
13	Data-centre capacity and market forecasts to 2030/2035 — global ~14% capacity to 200GW, US 194GW by 2035, China 32->60GW, APAC 24->63GW, Europe 24->55GW, India fastest ~20%, Gulf ~15-16% JLL / BLOOMBERGNEF / RYSTAD / ARIZTON / MORDOR / PRECEDENCE	2026-08	CORROBORATED
14	Telecom operator capex forecast — plateauing: global ~\$1.5tn 2023-30, developed ~2-3%, emerging ~5-7%, China \$194bn, APAC \$214bn, Europe EUR270bn to 2035, Africa rising GSMA INTELLIGENCE	2026-08	PRIMARY
15	Construction output forecast to 2030+ — global ~3.5%. N.America ~3-5%, W.Europe ~2%, APAC ~4%, sub-Saharan Africa ~5.7%, US ~5%, China slowing, India ~6% OXFORD ECONOMICS GLOBAL CONSTRUCTION FUTURES	2026-02	CORROBORATED
16	Country allocation model: three ICT-native drivers — data-centre capacity (Dell'Oro DCPI), telecom capex (GSMA/Dell'Oro), construction output (Oxford Economics/GlobalData) — reconciled to the \$715bn control (311 construct) 311 CONSTRUCT ON DELL'ORO / GSMA / OXFORD ECONOMICS	2026-08	CORROBORATED

17	Deep per-country sourcing across eighteen markets: operator capex filings (MTN, IHS, Safaricom, Airtel, Jio, Ethio Telecom), national data-centre briefs, telecom regulator data OPERATOR FILINGS / NATIONAL REGULATORS	2026-08	CORROBORATED
18	Whole-market and physical-segment headline: \$735bn whole (range 560–960), \$320bn segment, ~\$1.45tn by 2035 (sourced driver forecast) GMINSIGHTS/GVR/MRFR/MORDOR/FORTUNE/DELL'ORO COMPOSITE	2026-08	CORROBORATED
19	311 analytical construct: value-chain profit pools, disruption scorecard, convergence zones, and career-chain substitutability 311 ANALYSIS	2026-08	SINGLE-SOURCE
20	Labour economics: installation labour 64–72% of installation cost, Poland ~50,000/yr ICT-specialist shortfall, 8–12% wage inflation JLL / NATIONAL TRADE-BODY REPORTS	2026-05	CORROBORATED
21	Mandate map: design-credential, public-safety in-building wireless, data-residency, and sustainability-reporting requirements REGULATORY TEXTS / BUILDING & FIRE CODES / NATIONAL DATA-RESIDENCY LAW	2026-04	CORROBORATED
22	Subsea cable landings, routes and capacities TELEGEOGRAPHY SUBMARINE CABLE MAP, SUBMARINE NETWORKS AND OPERATOR DISCLOSURES	2026	PRIMARY
23	STEM and ICT graduate output by country UNESCO INSTITUTE FOR STATISTICS, CSET (GEORGETOWN), WEF AND NATIONAL EDUCATION DATA	2026	PRIMARY
24	Technical-standards blocs and 5G standard-essential patents CHINA STANDARDS 2035, CAICT, IPLYTICS, WORLD BANK AND ACADEMIC ANALYSES OF THE DIGITAL SILK ROAD	2026	PRIMARY

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To help humanity build a future where people and planet thrive, and where the benefits of human progress are shared by everyone — not just the few.



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