

Introducing MTN Consulting and the GNI Tracker

MTN Consulting's GNI Subscription: Forecasting the future of global communications network infrastructure markets

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About MTN Consulting



Who we are

- Market research and advisory firm focused on communications network infrastructure.
- Founded in Sep 2017 by Matt Walker, a telecom analyst with >25 years of industry experience.
- Small but seasoned team with three full-time analysts, and currently expanding.
- US-based company with global perspective and pool of several freelance contributing analysts.



Our goal

- Mission: Forecasting the future of communications network infrastructure markets.
- We aim to provide clear, credible and holistic insights into the direction of network infrastructure markets. These insights are grounded on the firm's expertise and a comprehensive financial tracking of the industry's key operator segments, in line with our "Measuring markets" tagline.
- Providing stellar customer support is crucial to the value we provide to subscription clients.



How we are different

- Independence is central to our mission. We don't accept webinar, white paper, or similar work. This lets us focus on providing unbiased, opinionated research.
- We have no research silos; our size lets us be consistent in coverage and deliver fast. We have built our research from the ground up with a focus on ease of use and simplicity.
- Network spending is a theme which cuts across all of our research. We track spending and revenues, not hype and marketing fluff. We believe we are better at connecting the dots between the supply and demand sides of the network operator business than any other firm.

A sample of MTN Consulting's recent press coverage

The logo for 'capacity' is displayed in white lowercase letters on a solid magenta rectangular background.

“Edge computing investments are rising to support new business models which are generating new traffic for the network – and some of these new services most definitely require international connectivity,” says Walker. ([Ebbs and flows: Subsea versus edge](#))

The logo for 'telecomlead' is displayed in a bold, dark red, sans-serif font.

“The telecom industry entered 2020 with high hopes for 5G: telcos hoped for revenue upside from faster speeds and new services, while vendors hoped for an increase in network capex. MTN Consulting said 5G is going to be a long slog. Marketing and device subsidies may encourage rapid 5G adoption but doesn't create profitability.” ([Winners and losers in telecom network market in 2020](#))

The logo for 'sdxcentral' is displayed in a dark grey, sans-serif font, with 'sdx' in orange and 'central' in dark grey.

“While many observers, including more than a few telco executives, look at the webscale sector with trepidation, the smart ones are now pursuing collaboration,” Walker explained. “We expect this activity to accelerate in 2021 as telcos search for cost savings.”([Cloud Eats Telco in Small, Quick Bites](#))

The logo for 'FIERCE Telecom' features the word 'FIERCE' in a bold, red, sans-serif font, with 'Telecom' in a smaller, red, sans-serif font below it. To the left is a stylized red and white graphic element.

“With M&A, MTN Consulting noted that integration and achieving synergies would continue to be challenges for telcos, as well as managing the increases in debt load. A&T is an example of a telco that has had to manage its debt after Elliott Management came forward with a list of demands last year.”([Tighter margins, more grief this year for telcos—report](#))

The logo for 'DCD' is displayed in white, bold, uppercase letters inside a white rectangular frame with a double-line border, set against a dark grey background.

“Figures from MTN Consulting estimate that telcos already spend around six percent of their operating expenditure (excluding depreciation and amortization) for 4G networks on energy costs.”([Power to the 5G people](#))

Global Network Infrastructure (GNI): Tracking network operators

MTN Consulting's GNI subscription service is focused on network operators & their technology supply chains. GNI aims to track the economics of the network operator business and assess the big shifts that impact technology spending trends.

GNI covers over 170 operators across three segments*: TNO/telco, WNO/webscale, and CNNO/carrier-neutral.

Telecom network operators (TNOs)	Webscale network operators (WNOs)	Carrier-neutral network operators (CNNOs)

TNOs, aka telcos, provide access-based services directly to end users, based on the ownership of spectrum or regulator-issued operating licenses. Includes fixed, mobile, cable TV, and satellite-based providers.

WNOs are web-centric companies who own and operate large multi-country communications networks based upon hyperscale data centers and submarine cables. Webscale operators may also own access networks, typically using fixed satellite or fiber.

CNNOs sell independent, carrier-neutral access to network infrastructure, including fiber, data center and tower/small cell assets. (Carrier-neutral)

*See Appendix for size of each segment

Tech & market themes for GNI's 2021 research calendar

For all themes, our research is concerned with network spending directions

<p>Shift to 5G</p> <ul style="list-style-type: none"> • Who will deploy 5G and where? • How will they afford the networks? • What must regulators do to facilitate adoption? • How will 5G's rise affect supply chain dynamics? 	<p>Rise of automation</p> <ul style="list-style-type: none"> • How will automation affect network operator operations and labor markets? How will it affect telco opex trends? • What are the most promising tools for automation? • Which network operators are leaders in this space?
<p>Move to software & open networking</p> <ul style="list-style-type: none"> • How does the emergence of software-based tools and features affect network spending patterns? • Who are the most promising software-centric vendors in the network operator space? • How will open networking (e.g. ORAN) affect operations and vendor market power? 	<p>Data centers of the future</p> <ul style="list-style-type: none"> • How is the role of the data center evolving in networks? • What are the key developments at the chip and component levels that enable progress, and who is driving this? • How is data center investment trending across different market segments and what is the role of private equity?
<p>Connected cars (CC)</p> <ul style="list-style-type: none"> • What new standards, industry bodies and regulations are key to rapid deployment? • How can operators play a part in CC markets? • What will be the adoption trends across the globe? What partnerships are needed to spur adoption? 	<p>Satellite</p> <ul style="list-style-type: none"> • Which of the emerging satellite-based telecom platforms have the most potential, & for what apps? • What do regulators need to do to ensure feasibility? • How will new satellite operators manage & grow their networks?

Recently published research*

Type	Segment	Title	Subtitle	Date	Format
Market Review	CNNO	Carrier-Neutral Network Operators: 4Q20 Market Review	Revenues grow 6% in 2020 to \$75.5B; CNNO assets include 788 data centers, 2.7M cell towers, and ~800K route miles of fiber	17-Jul-21	Excel
Forecast	All	Tomorrow's carrier-neutral operators to integrate tower, fiber and data center assets	A new breed of integrated owners of infrastructure network assets will emerge over the next 2-3 years, converging towers, data centers, and fiber networks	16-Jul-21	Word/PDF
Market Share	TNO	Telecom's biggest vendors: 1Q21 edition	Telco NI revenues surge 10% YoY; Cloud push and US supply chain policies drive share changes; Ericsson on the march	30-Jun-21	Excel
Market Review	WNO	Webscale Network Operators: 1Q21 Market Review	Webscale revenues surge 37% YoY in 1Q21, sector now same size as telecom; annualized capex hits \$142 billion	29-Jun-21	Excel
Market Review	TNO	Telecom Network Operators: 1Q21 Market Review	Telcos remain cautious on spending despite topline spurt in 1Q21	28-Jun-21	Excel
Commentary	TNO	Telco capex in 1Q21: trends and outlook	Revenues surge 7.3% YoY in 1Q21 but industry capital intensity trends slightly downwards; investment trends favor cloud, virtualization, and automation	19-Jun-21	Word/PDF
Commentary	WNO	Webscale capex in 1Q21: trends & outlook	Annualized capex surges 29% YoY to reach \$141.5 billion in 1Q21; Network/IT capex in line with forecast but ecommerce-related capex outperforming	9-Jun-21	Word/PDF
NSP	TNO	Network Spending Profile: Etisalat	Etisalat spent \$1.7B on capex and \$1.2B on network operations opex in 2020 to support its 154 million subscribers; capital intensity to rise in 2021	25-May-21	PPT/PDF
NSP	Telco	Network Spending Profile: Orange	Orange spent \$15.9 billion on capex, network operations and R&D in 2020	15-Apr-21	Excel
Forecast	All	Biden aims to revamp US chip & telecom prowess amid China conflict	Activist approach aims at communications network supply chains and semiconductor development; bipartisanship appears feasible	19-Mar-21	Word/PDF
Tech Insight	Vendors	LEO satellite boom: Will the 'second coming' endure?	New low-Earth orbit (LEO) satellite networks to play key support role in 5G, IoT, and cloud markets	3-Mar-21	Word/PDF
NSP	TNO	Network Spending Profile: Comcast	Cable TV giant spent \$9.6B on capex, \$7.9B on network operations opex, and \$800M on R&D in 2020	2-Mar-21	Excel
NSP	TNO	Network Spending Profile: Axiata	Southeast Asian mobile group's annualized network spending includes \$558M of network operations opex, \$1.12B of equipment capex and \$137M of software capex	12-Feb-21	Excel
Forecast	All Operators	Network operator capex to hit \$520B in 2025	Telecom industry will continue to shrink despite 5G's emergence but webscale and carrier-neutral sector will rescue telco margins and lift industry capex	30-Dec-20	Word & Excel
Commentary	WNO	Intel's Road to Redemption	Production outsourcing path is vital, but rejuvenating R&D holds key	6-Oct-20	Word

*Full list available at: <https://www.mtnconsulting.biz/our-latest-research/>

Key offerings in 2021 – GNI service

Deliverable type	Description	# per year
Network spending forecast	Annual forecast of network operator spending, for all three segments, is issued in 4Q; PDF analysis supplemented by Excel file with detailed results	1
Capex commentaries	Quarterly analysis of network spending trends in the telecom and webscale market segments (1 each per quarter, except 4Q)	6
Telecommunications Market Review	Excel analysis of over 130 telcos and overall financial development of telco sector, with benchmarking capabilities	4
Webscale Market Review	Excel analysis of over 20 webscale providers and the overall financial and infrastructure development of the sector	4
Carrier-neutral Market Review	Excel analysis of over 35 CNNOs across tower, bandwidth/fiber, and data center market segments	1
Vendor market share in telco sector	Excel analysis of market share, with HW/SW and services breakout, of over 100 vendors in the telecom market segment	4
Competitive intelligence review of technology segment	PPT study of competitive dynamics in key technology segments of NI, including DC chips, IP/optical infra, Open RAN, etc.	6
Trend forecasts	Predictive reports assessing outlook for key NI-related questions such as: Biden's China policy; Chinese cloud providers' global prospects, etc.	5
Network spending profiles	Analysis of network spending (opex & capex) trends for key network operators, covering infrastructure, tech strategy, and vendor relationships	12-15

GNI's value proposition

GNI service meets needs of multiple end user types for market intelligence

Vendors

Track your customers' financial positioning and network investment trends



Assess your position in telco and webscale markets, identify new competitors and partners, track market growth



Identify where to invest incremental sales efforts



Network operators

Benchmark your workforce, capital investment, and profitability against peers



Gauge market power of suppliers, monitor your supply chain risk and identify new vendors



Understand how the landscape of vendors and network operators will evolve over the next 5 years



How to work with MTN Consulting

We sell annual subscriptions, individual reports, and consulting engagements. [Contact](#) us for pricing information.

Product	Description	# of reports
GNI Premium	Annual subscription with 10 hours of inquiry	>45
GNI Standard	Annual subscription without inquiry included	>45
Individual reports	Published reports on our website	Sold individually
Consulting	Scenario planning; market sizing, forecasting, and analysis; organizational strategy; marketing support; competitive benchmarking; and, due diligence support for M&A and PE transactions. Leverages our experience and independence, and access to GNI's proprietary databases.	n/a

We also publish blogs on unconventional topics and distribute a client newsletter about once per week. The newsletter contains industry analysis and commentary, as well as brief summaries of recently published reports.

To keep in touch with MTN Consulting and receive alerts to new research, blogs and newsletters, sign up [here](#).

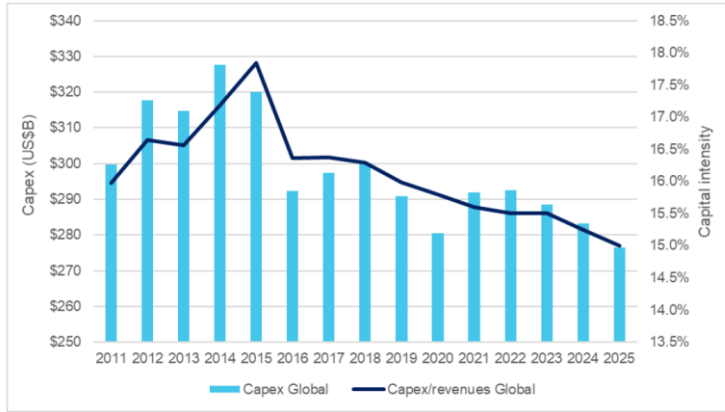
Deliverables

Including excerpts from recently published reports

Network spending forecast: excerpts from Dec. 2020 edition

Forecast findings accompanied by guidance on what to watch going forward; for instance:

Figure 11: Telco capex from 2011-25 (US\$B) and capex/revenue ratio

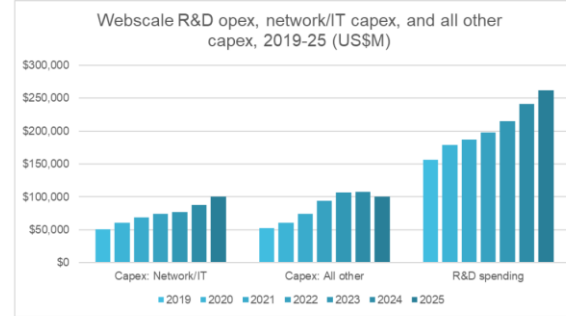


Source: MTN Consulting

Trends to watch:

- Spectrum costs
- Chinese vendors' next move
- Open RAN
- Connected car networks
- Webscale-telco collaboration
- Owning the network
- Effectiveness of automation

Figure 24: Webscale sector R&D opex, network/IT capex, and all other capex, 2019-25 (US\$M)

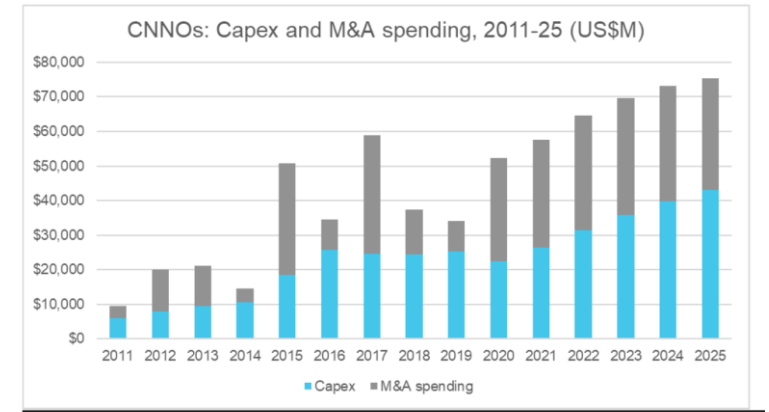


Source: MTN Consulting

Trends to watch:

- Chinese expansion
- Regulatory backlash
- Pushing closer to the end user
- Chip innovation
- COVID-19 backlash

Figure 32: CNNOs: Capex and M&A spending, 2011-25 (US\$M)



Source: MTN Consulting

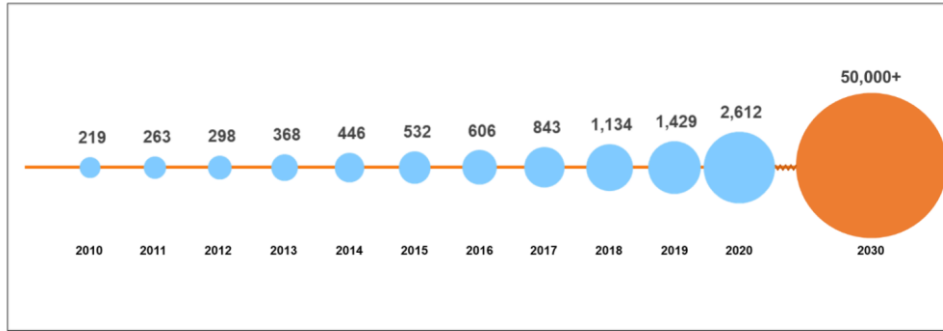
Trends to watch:

- Carrier-neutral models in China
- PE financial engineering
- Telco uncertainty about value of owning passive network assets
- Non-telecom opportunities for existing real estate footprint

Analytic report: Outlook for LEO satellites in communications industry

March 2021 report delves into drivers for the LEO boom, network trends, market landscape, leaders and laggards, and apps

Figure 2: LEO satellite deployment timeline – 2010-2030



Source: Union of Concerned Scientists Satellite Database; MTN Consulting

Figure 5: List of key active and upcoming LEO satellite constellations

LEO Constellation	Operator & key stakeholders	Number of satellites	Estimated costs
Project Kuiper	Amazon	3,236 LEO satellites – half of the launch by mid-2026 and rest by mid-2029	\$10B
OneWeb	The UK Government (\$500M) Bharti Global (\$500M) SoftBank (\$350M) Hughes (\$50M)	110 LEO satellites currently in orbit; plan for a total of 648 satellites by 2022 - they have approval for 2,000 satellites out of which 1,280 will be MEO satellites	\$5.5B – \$7B (for 648 satellites)
Starlink	SpaceX Google (\$900M); Fidelity	1,000+ active LEO satellites; 12,000 total satellites by 2027, expanding to 42,000 satellites in the long term	\$10B
Eutelsat LEO for Objects (ELO)	Eutelsat	25 nano satellites by 2022	\$30M (~EUR1M per satellite)
Iridium NEXT	Iridium	75 active LEO satellites	\$2.9B
GlobalStar	GlobalStar	24 active second-generation LEO satellites	\$1.2B
Lightspeed	Telesat Government of Quebec (\$462M)	298 LEO satellites – 78 by 2022, rest by 2023	\$5B
GW-A59; GW-2	GW (China)	Proposed constellation of 12,992 LEO satellites	NA
Hongyun	China Aerospace Science and Industry Corporation (CASIC)	Proposed constellation of 864 LEO satellites	NA
Hongyan	China Aerospace Science and Technology Corporation (CASC)	Proposed constellation of 320 LEO satellites by 2025	NA
Yinhe-1	Galaxy Space	Proposed constellation of 144 LEO satellites by 2023	NA

Source: MTN Consulting

Highlights

“The unprecedented push for LEO constellations will see a growth explosion of 20x the current active satellites by the end of this decade – that’s more than 50,000 LEO satellites encircling the planet by 2030”

“New-generation LEO satellite constellations are moving away from the traditional “bent pipe” network architecture to follow ‘Intersatellite Links’ (ISL), under which the system becomes a switching network”

“The established frontrunners for LEO satellite broadband are Starlink (SpaceX) and OneWeb, but many others aim to make similar systems that include the likes of Kuiper (Amazon), IridiumNext, and Lightspeed (Telesat). China is the latest entrant to the space rush...”

“For a constellation to succeed, two major factors are crucial: constant capital flow, and a services ecosystem”

“LEO networks will provide backhaul support to terrestrial infrastructure operators in remote terrains”

“LEO constellations also have their own share of hurdles as large number of small satellites orbiting Earth pose space junk and debris risks. In addition, pricing of broadband service offerings appears to be expensive for direct-to-consumer markets, as evidenced by Starlink’s beta offering. Regulatory ambiguity related to multi-country operations/coverage of LEO constellations also create a headache...”

Market Review Trackers: Overview

Excel deliverables provide deep dives into each network operator market segment

Telecom

Scope of Report

- Telco revenues, capex, opex, and workforce
- Global coverage with company-level drilldowns
- Network spending at market- and company-level
- January 2011 – March 2021 (updated quarterly)

Datapoints included

All 138 operators: Subset of 50+ large telcos includes:

- Revenue
- Opex
- Labor costs
- Spectrum capex
- Capex
- D&A
- Debt
- M&A spend
- Employees
- EBIT
- Cash
- Software capex

Companies included

- Quarterly study of 138 telcos in all key countries
- Companies included total to >95% of global market
- Dynamic charts allow for single company and group drilldowns across key financial metrics
- Subset of 50 companies tracked more closely

Value to Client

- **For vendors:** track your customers' financial positioning and network investment trends
- **For network operators:** benchmark your workforce, capital investment, and profitability against peers

Webscale

Scope of Report

- Webscale revenues, profitability, tech investment
- Global coverage with company-level drilldowns
- Network spending at market- and company-level
- January 2011 – March 2021 (updated quarterly)

Datapoints included

- Revenue
- R&D
- Capex
- Net PP&E
- Net Profit
- Capital Intensity
- R&D/revenues
- Net Debt
- Free Cash Flow
- Total Debt
- Employee metrics
- Cash from operations
- Cash & STI
- Network/IT capex

Companies included

- Alibaba
- Facebook
- Cognizant
- JD.com
- Alphabet
- Microsoft
- eBay
- LinkedIn
- Amazon
- Tencent
- Fujitsu
- Oracle
- Apple
- Altaba
- HPE
- SAP
- Baidu
- ChinaCache
- IBM
- Yandex

Value to Client

- **For vendors:** help in understanding and planning for the needs of customers
- **For network operators:** help in deploying technology budgets wisely

Carrier-Neutral

Scope of Report

- Global coverage with drilldowns for three segments (towers, data center, bandwidth) and 37 companies.
- Company-level annualized and quarterly trends
- Network spending at market- and company-level

Datapoints included

- Revenue
- Net profit
- Capex; M&A
- Debt
- Net PP&E
- Cash from ops
- FCF
- Cash & STI
- Employee metrics
- Operational metrics: towers, fiber km, DCs by company

Companies included

- Bandwidth: Chorus, Cogent, Internap, Level 3, Lumos, NBN, Superloop, Uniti, GTT, and Zayo
- Data centers: CoreSite, CyrusOne, DRT, DuPont Fabros, Equinix, Interxion, QTS Realty, Switch, GDS DC
- Towers: Arqiva, ATC, Bharti, Cellnex, China Tower, CC, El Towers, GTL Infrastructure, Inwit, Balitower, IBS, SMN, STP, TBI, SBA, TDF/Arcus, Telesites, Telxius

Value to Client

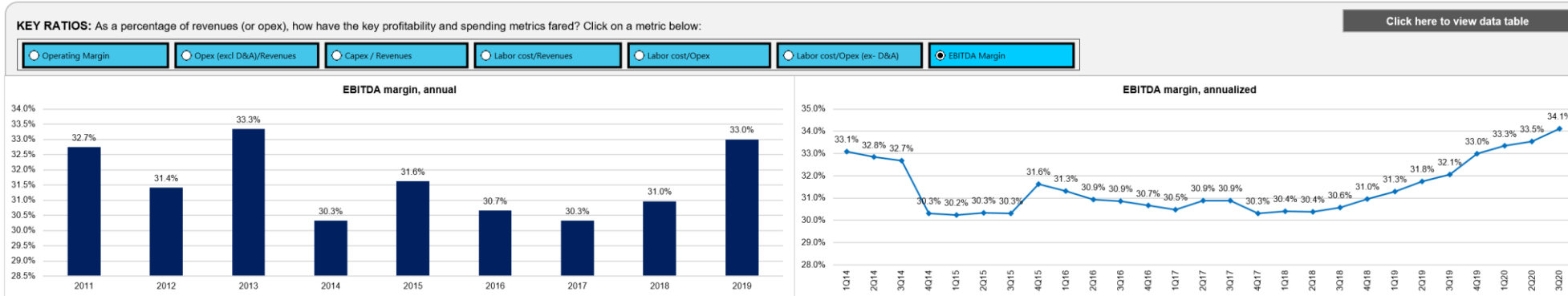
- **For vendors:** understand evolving role in networks played by CNNOs and how they are growing
- **For network operators:** assess CNNOs as partners for asset spinoffs, and suppliers of network infra

Telecom Market Review: Global excerpts

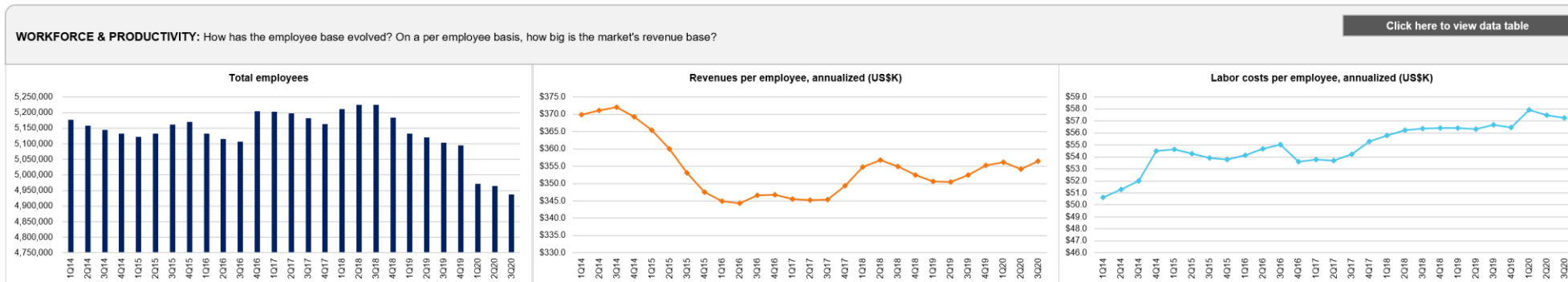


The telco MR allows a user to see the key operators by region for each quarter & latest CY, based on both revenues and capex.

In all regions, at least a few of the major players are based elsewhere and are operating out of region via acquisition and partnership. Buying decisions for technology are often driven by headquarters, or at least heavily influenced.



Users can assess the overall telco market's direction based on a number of useful financial metrics, including operating and EBITDA margin, opex/revenues ratio, and labor costs as a percentage of total opex.



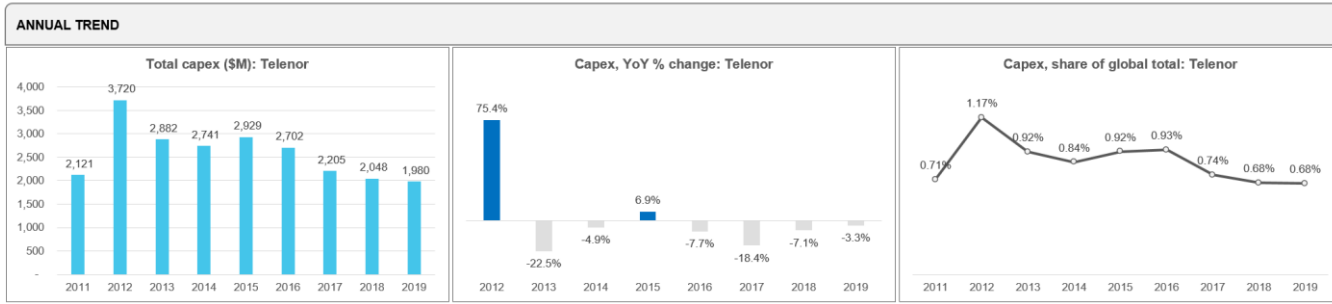
Telco industry headcount is also tracked, allowing users to track revenues and labor cost per employee over time.

Telecom Market Review: Company-level excerpts

SINGLE COMPANY DEEPIVE

Select Company: Telenor Select Metric: Capex [Click here to view data table](#)

Company Name	Telenor
HQ Country	Norway
HQ Region	Europe
Share of Global Capex, 2019 (%)	0.68%

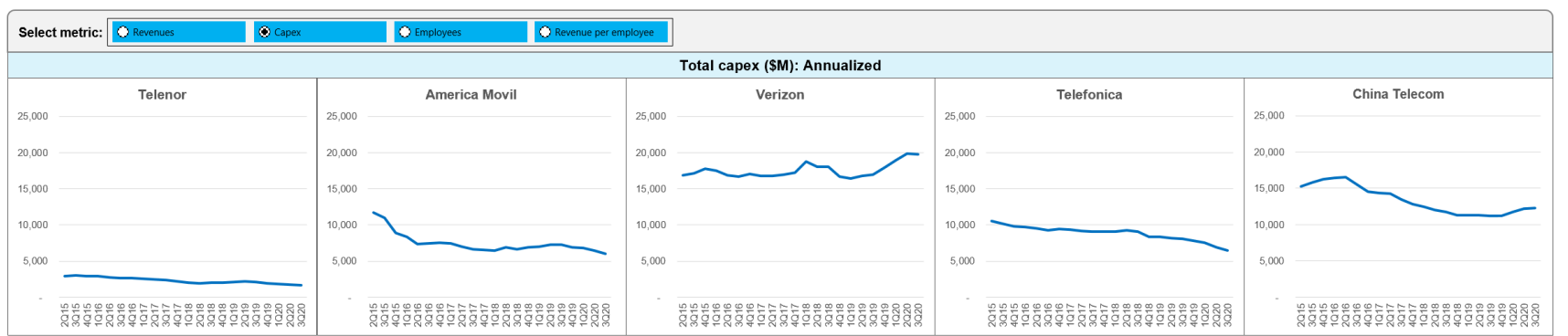


The telco MR allows a user to drill down into revenue, capex and employee trends for each of the 138 telcos included in our coverage.

Charts are created according to the user's preference, and are not locked, so can be modified by user and exported for other purposes.

TELENOR: PEER BENCHMARKING

Benchmark Telenor with four other operator peers: 1. America Movil 2. Verizon 3. Telefonica 4. China Telecom [Click here to view data table](#)

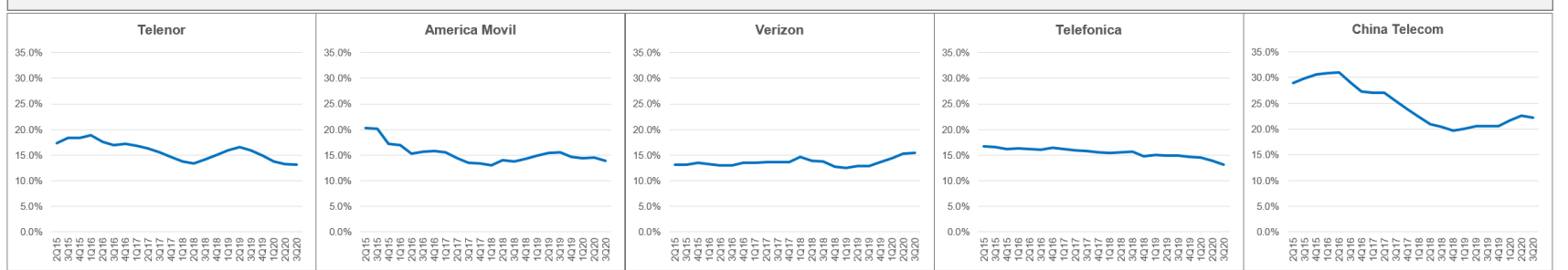


For all 138 telcos, users can create charts which compare 5 pre-selected telcos based on a number of high-level metrics: revenues, capex, employees, and revenue per employees.

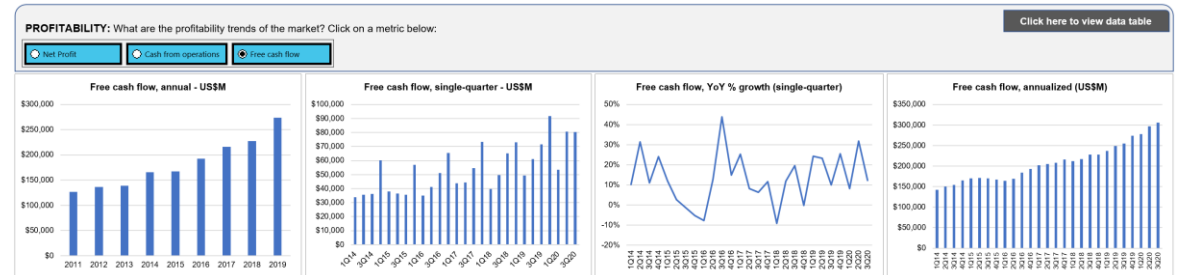
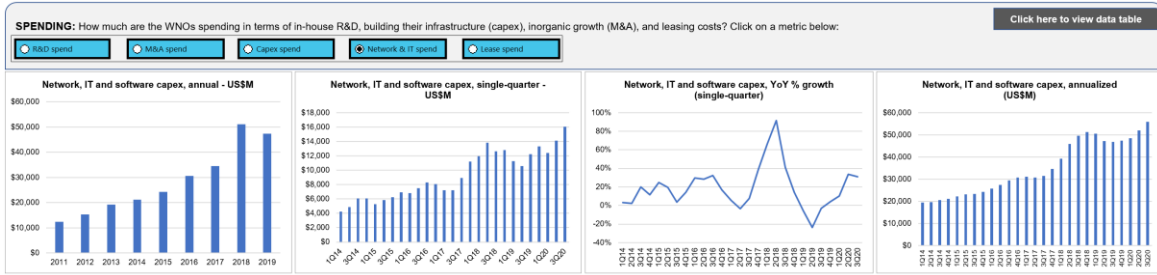
For a subset of 50 of the more significant telcos ("Top 50"), the telco MR allows the user to do a deeper analysis into profitability, financial strength and cost trends. For instance, a user might choose to chart China Mobile, Telefonica, Orange, Verizon, and AT&T to evaluate variations in labor and capital costs, profit margins, and debt/cash levels. (not shown, but available on request)

As always, charts can be modified and exported for integration into other formats.

Annualized Capital Intensity

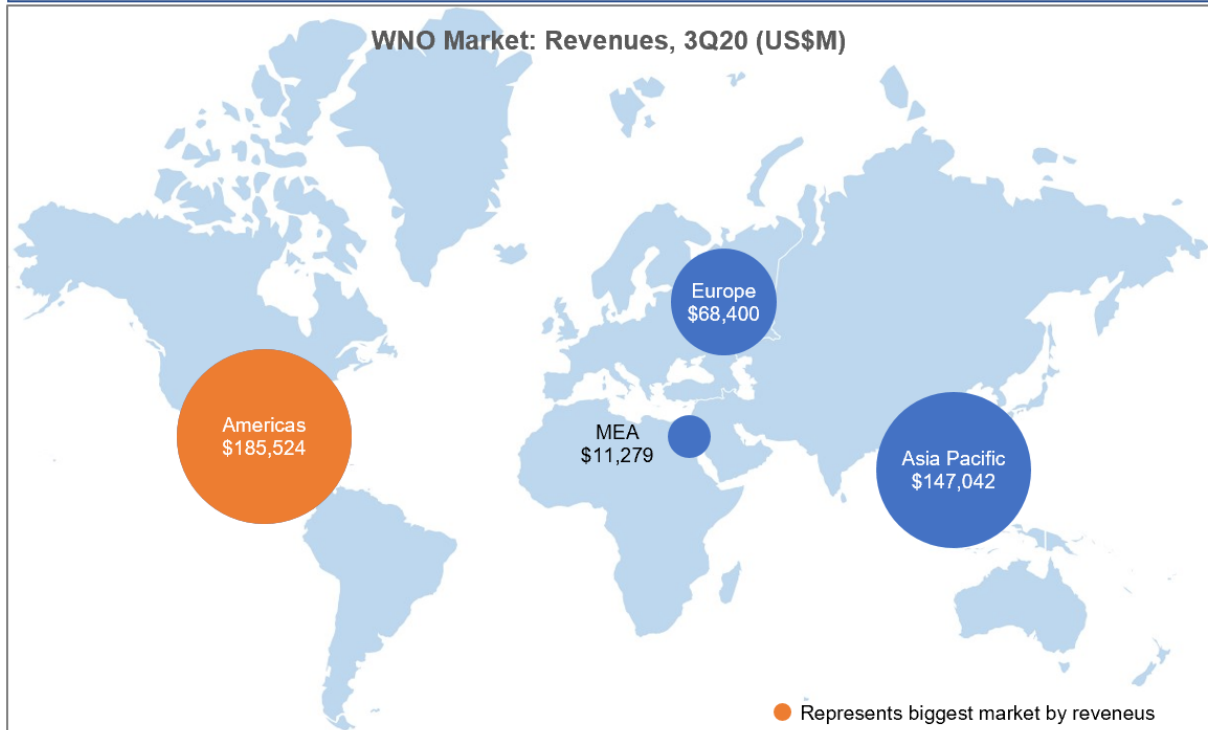


Webscale Market Review: Global excerpts

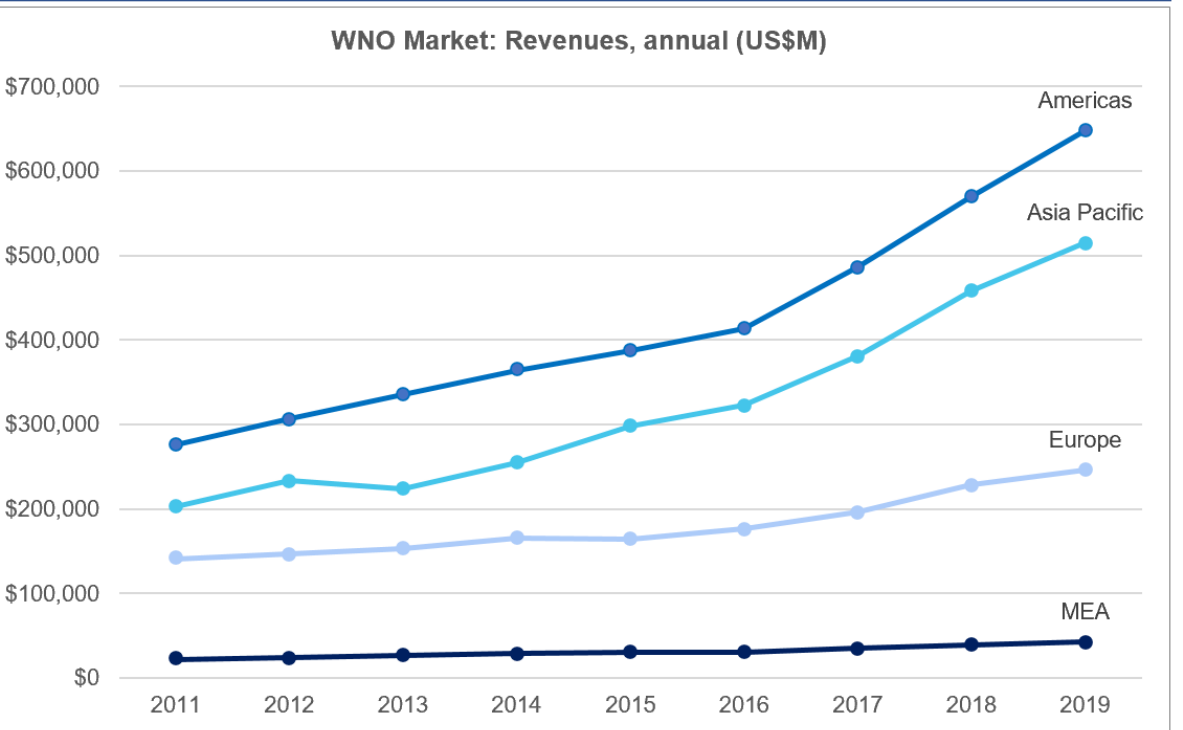


Total WNO Market: Revenues [Click here to view data table](#)

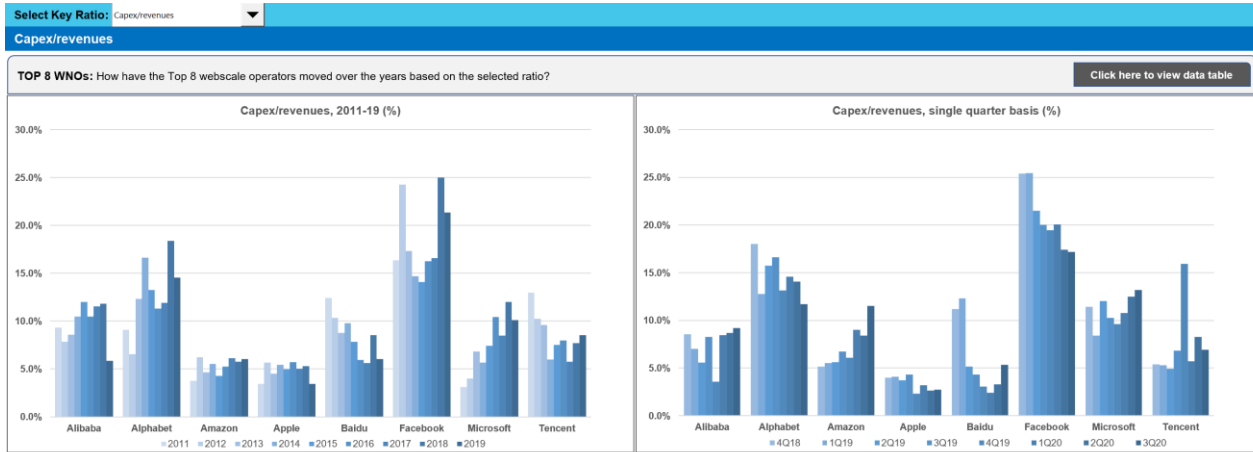
Latest period snapshot: Select timeframe Latest CY Latest Quarter



Annual trend: How have regional markets trended on an annual basis?



Webscale Market Review: Company-level excerpts



The webscale market review allows the user to compare the key operators' relative size over time (revenues, capex, R&D spending), as well as their profitability (FCF, net margin), debt, cash reserves, and value of installed networks (net PP&E).

Select Company: Apple

APPLE

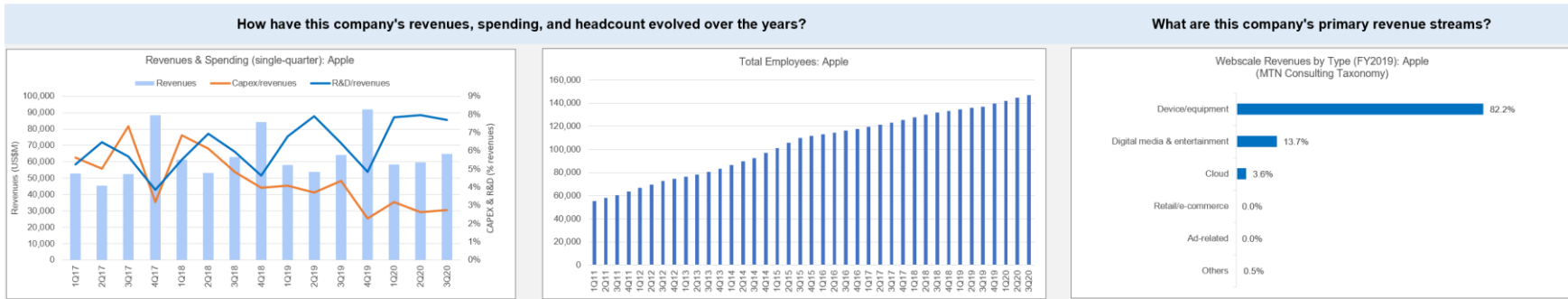
Apple	
Founded	1977
Headquarters	USA
Stock Exchange Ticker	AAPL (NASDAQ)
3Q20 Revenues (US\$M)	\$64,698
3Q20 CAPEX (US\$M)	\$1,784
3Q20 R&D (US\$M)	\$4,978
Employees (3Q20)	147,000
Market Cap (US\$B) as of 7 Dec. 2020	\$2,106



Operational Scale Metrics	
6 Operational data center locations (as of Jan 2020)	1,565 kWh mn Total energy use at Apple's data centers & co-location facilities (Apple's 2020 Progress Report)
~68 million Apple Music paid subscribers (as of April 2020)	~33 million Estimated Apple TV+ subscribers (as of Jan 2020)

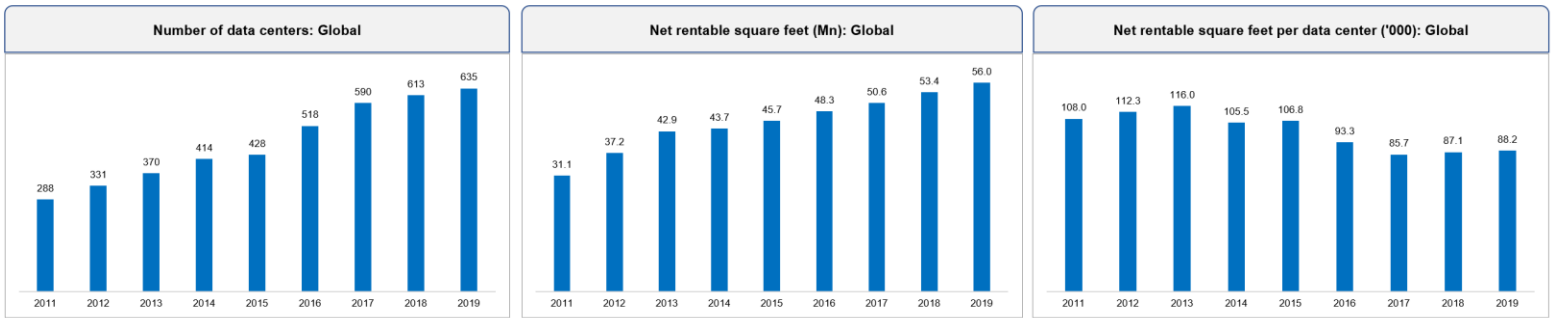
**Note: Metrics without dates are end-of-period estimates based upon publicly reported figures*

For a subset of the 20 webscale operators we track, the "Top 8", the MR includes a drill down of the company's operations, data center footprint, revenue split (using standardized categories), and key acquisitions and investments.



Carrier-neutral Market Review: Global excerpts

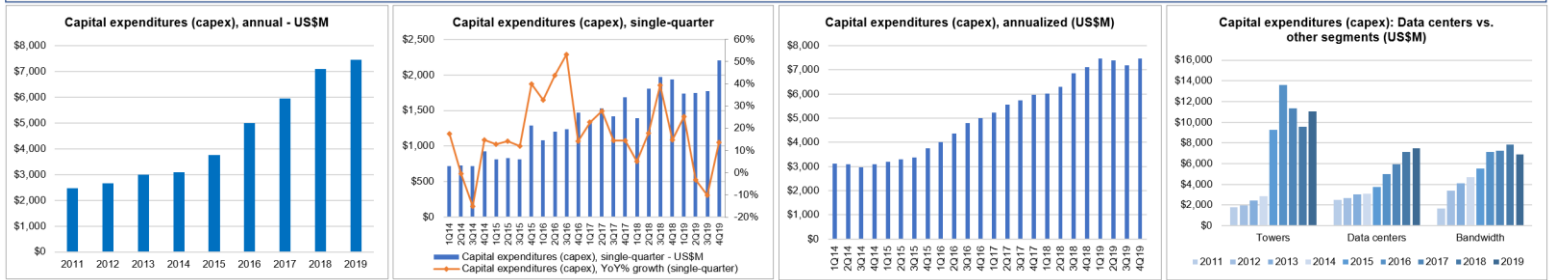
CNNO OPERATING METRICS Index



The carrier-neutral market of operators cuts across several different types of infrastructure: cell towers, data centers, and wholesale fiber/bandwidth-focused companies. The CNNO market review tracks the growth of each of the three segment's installed networks and their growing importance in the overall communications industry.

SPENDING: How much are the sub-segments spending in terms of building their infrastructure (capex), and inorganic growth (M&A)? Click on a metric below:

M&A spend Capex spend [Click here to view data table](#)

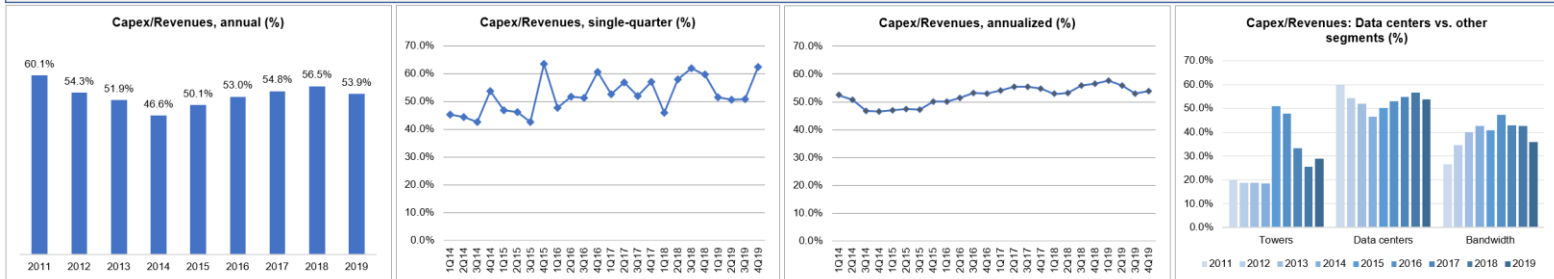


For the CNNO market as a whole, the MR also presents revenue, capex, profitability, and other key stats useful for understanding and predicting the market's development.

M&A spending is a big part of this sector's development, so is presented alongside capex in order to understand the relative importance. Stats are broken out for each of the three segments and presented in chart form.

KEY RATIOS: As a percentage of revenues, how have the key profitability and spending metrics fared? Click on a metric below:

Net Margin Capex / Revenues Free Cash Flow / Revenues M&A / Revenues [Click here to view data table](#)



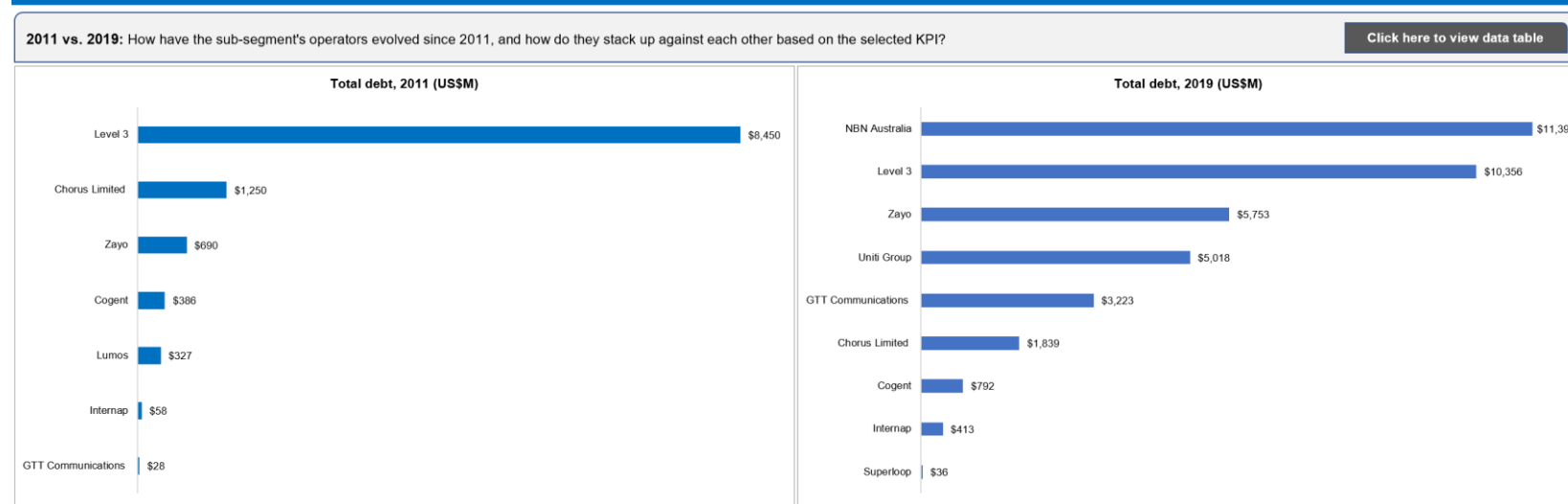
As with other MR reports, the CNNO charts can be easily customized and exported.

Carrier-neutral Market Review: Company-level excerpts

COMPANY BENCHMARKING Index

Select Segment: Bandwidth Select KPI: Total debt

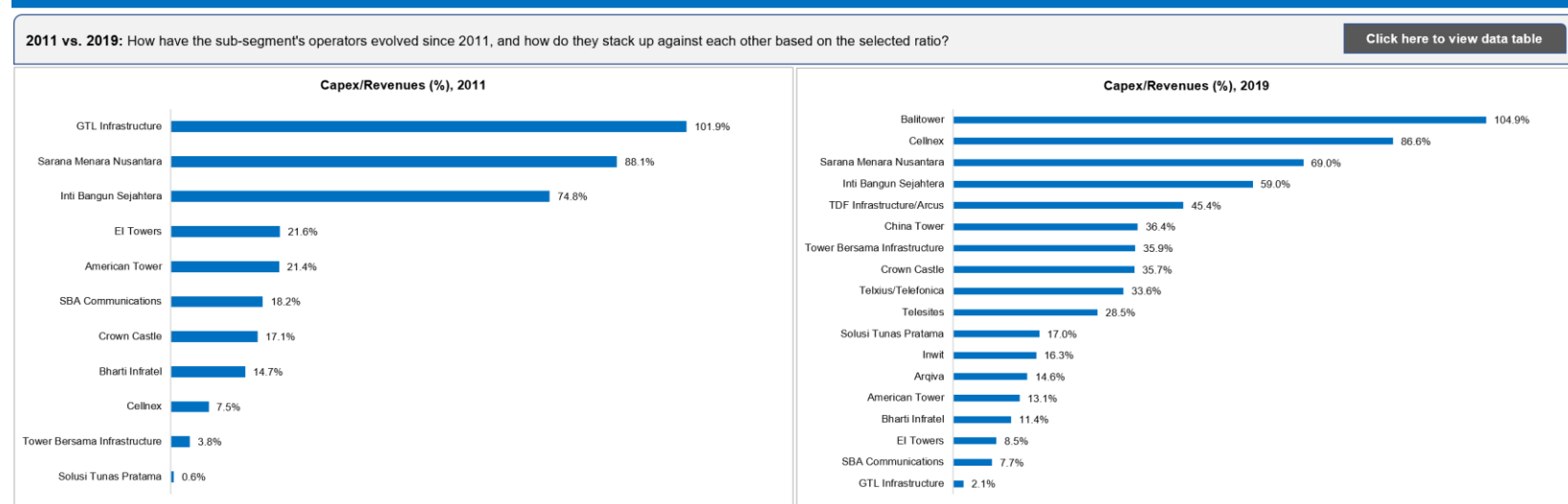
Bandwidth segment: Total debt



The CNNO MR presents stats for each of the three major segments. This allows a user to track the development of each segment's key providers over time, and also assess the relative financial strength of the different providers with stats like debt, cash, and free cash flow.

Select Segment: Towers Select Ratio: Capex/Revenues

Towers segment: Capex/Revenues



On this slide, the key players in the Bandwidth (wholesale fiber) segment are presented based on their total debt, which makes clear the huge investments undertaken by NBN in Australia over the last several years.

Also shown are the key players in the Towers segment, ranked by capex/revenues for both 2011 and 2019. One finding: Cellnex was not an important player in 2011 but has grown to become perhaps the most aggressive investor among all cell tower specialists, especially if you count acquisition spending (available in the MR, though not shown here).

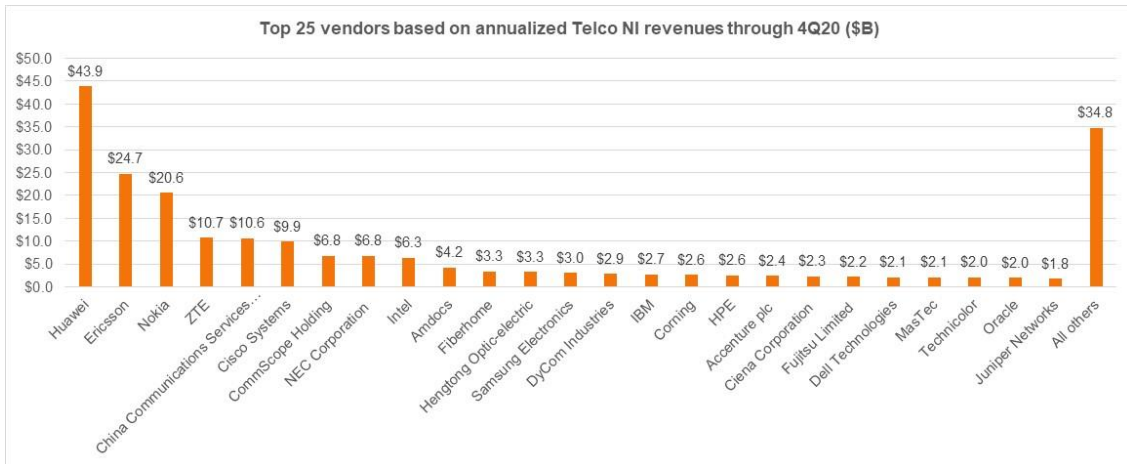
“Telecom’s biggest vendors” market share series* (1 of 2)

Overview of primary tabs in report

Telecom's biggest vendors: 4Q20 edition
 Telco NI vendor revenues stabilize at \$216B in 2020; Ericsson, ZTE, Intel, NEC and Dell/VMWare the big winners as Samsung and Nokia dip

INDEX

- [ABSTRACT - Results commentary](#)
- [INTRODUCTION](#)
- [4Q20 Telco NI Market Results](#)
- [TOP 25 VENDORS - Printable tearsheets](#)
- [CHARTS - Single vendor snapshot](#)
- [CHARTS - 5 vendor comparisons](#)
- [DATA - revenue estimates by company](#)
- [ABOUT - MTN Consulting and report methodology](#)

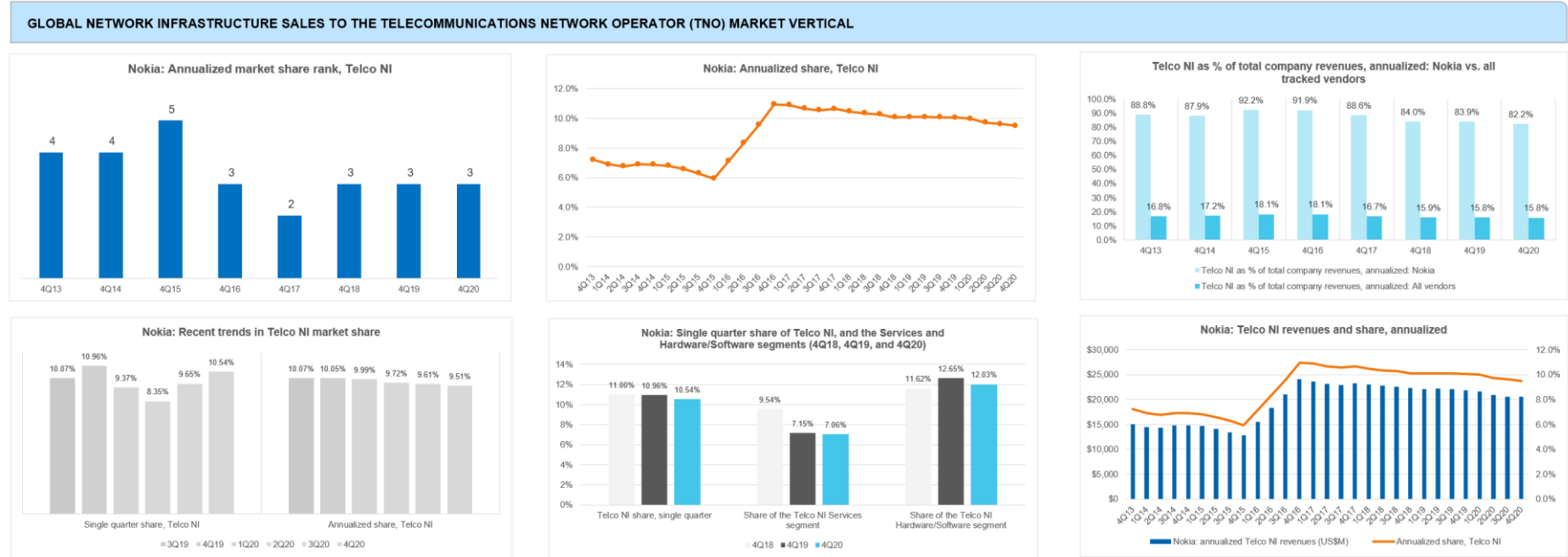


- **ABSTRACT**
 - Analytic summary of results for that quarter
- **INTRODUCTION**
 - Objective; Scope; Segmentation; telco vs. non-telco; discussion of vendor revenues & connection to capex/opex; data tables
- **4Q20 results**
 - Top-line summary of results; stats on Top 25; for Top 25, quarterly highlights, and outlook; sales by HQ, type; top vendors by segment; Services market share.
- **Top 25**
 - Corporate and telco vertical analysis of each of the top 25, designed to be printed out as single page PDF; includes latest quarter view & outlook, plus M&A/customer/competitor summary
- **Charts – 1 company**
 - Drop-down selector allows time series view of specific vendor (any of the 126* included) with comparative charts
- **Charts – 5 company**
 - Drop-down selector allows chart & data table comparison of any 5 vendors in the database
- **Data**
 - For each of 126* vendors, tables show total corporate revenues and telco vertical revenues

*Now includes 130: we added Airspan, Alphabet/GCP, Amazon/AWS, and Microsoft/Azure in 1Q21

“Telecom’s biggest vendors” market share series (2 of 2)

Deep dives into Top 25 vendors with easy export option; e.g. for Nokia:



Source: MTN Consulting

M&A, KEY CUSTOMERS, & KEY COMPETITORS

Relevant M&A Activity
 Acquired: Elenion Technologies in 1Q20; Comptel in 2Q17; Alcatel-Lucent in 1Q16; Motorola Solutions' Networks assets in 2Q11.

Customers
 AT&T, Verizon, BT, Orange, Telefonica, Telenor, STC, Sky, Chinese operators. More than 400 customers in 4G/LTE. Approx 1,000 customers outside telco segment. Claims 260 customers for private wireless networks.

Competitors
 Mobile networks: Huawei, Ericsson and Samsung; ZTE, Fujitsu, NEC, AltioStar, Mavenir, Parallel Wireless, JMA Wireless, KMW, Commscope, MTI, and Airspan. Microwave, Huawei and Ericsson, plus Ceragon, NEC and Aviat. Services: NEPs like Ericsson and Huawei, and for cognitive, IoT and enterprise services, Cisco, HPE, and IBM. Fixed networks: Huawei and ZTE; Calix and Adtran in NA, and Fiberhome in China. IP/Optical: Cisco, Juniper, Huawei, and Ciena. Software: ISV - Amdocs, Netcracker and Oracle. NEP - Huawei and Ericsson. Webscale players like AWS, GCP and Microsoft Azure are emerging. Enterprise: Networking - Cisco, Juniper, Ciena, Ericsson, and sometimes Huawei. Motorola, Calix, Adtran, Kontron, Arista, Athonet and Celona in specific verticals.

Note
 Telco NI revenue estimate for Nokia: As reported CSP vertical revenues

Our vendor market share series tracks 126* vendors’ total and telco NI revenues, and NI by segment (HW/SW and services)

For the top 25 (based on latest single quarter share), the report also includes a mini-profile of each company providing some additional financials on the company, background information on M&A, key customers, and competitors, and the most recent product and technology developments relevant to the vendor’s prospects. (note, that last item is not shown here, but available on request).

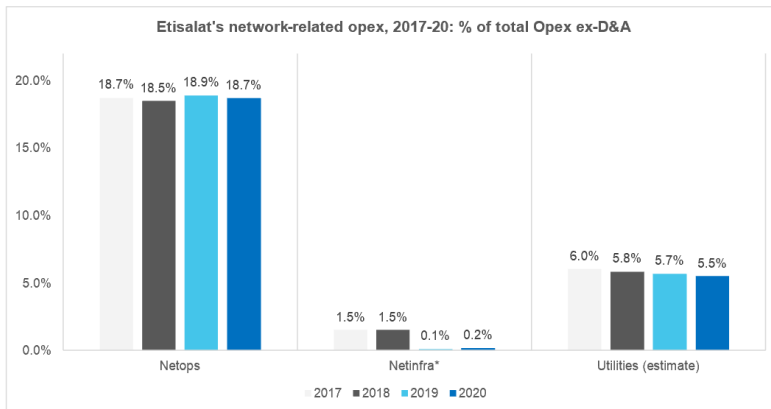
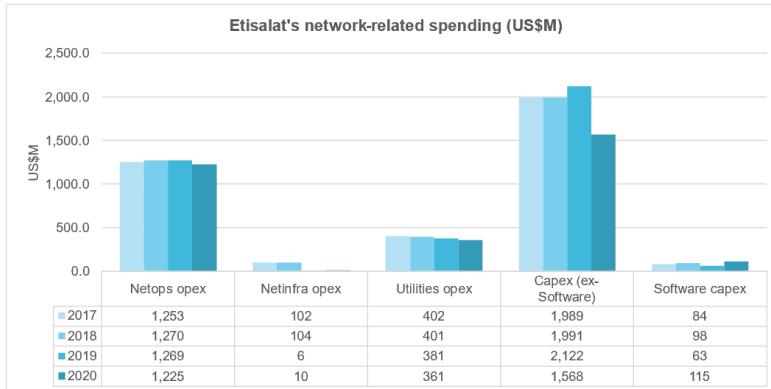
These mini-profiles are formatted as exportable “tearsheets”, serving as a handy 1-page summary of the top 25 suppliers in the market.

*Now includes 130: we added Airspan, AWS, Azure, and GCP in 1Q21

Network Spending Profile: Sample slide from Etisalat NSP

Etisalat: Annual capex ~\$2B, netops opex \$1.2-1.3B, high utilities costs

Etisalat group financials include its Mobily (KSA) associate in proportion to its equity stake (28%)



*Netinfra costs fall in 2019-20 due to implementation of IFRS 16 rule on lease accounting

- The Etisalat Group's spending on network includes:
 - Opex: spends 18-19% of opex on network operations, an estimated 5-6% on utilities costs (higher in north Africa). Group's reported spend on tower/fiber leasing is small, but the ratio is far higher for Mobily associate (see below)
 - Capex: Software accounts for average of ~5% of total capex, with some development done internally through subsidiaries and associate entities (e.g., Mobily Infotech). Spectrum would add about 4% to capex in 2017-20, if included.

- Mobily
 - Etisalat influences and often directs Mobily tech strategy and spend patterns. Relies heavily on managed services contracts with vendors, more so than other opcos.
 - Company's capex spend was in the \$700-750M range for each of the last three years (2018-20), 21% of revenues
 - Mobily owns much of its own fiber network, through two acquisitions (in 2008-9) and a 66% stake in the Saudi National Fiber Network. Still, network infrastructure leasing/access costs are high, 15-20% of opex ex-D&A. Tower access a major issue. Currently creating new tower wholesale access company with Zain KSA.

The NSP deliverable is a new one for 2021 driven by customer demand.

For each NSP, we present an overall strategic view of the company, its financial development over time, its cost structure, installed and under development network infrastructure, views on key tech strategy questions, actual network spending (capex, opex and R&D) over the last few years, and a summary of key suppliers across the network.

The NSP format is popular with sales teams within the vendors.



MTN Consulting, LLC

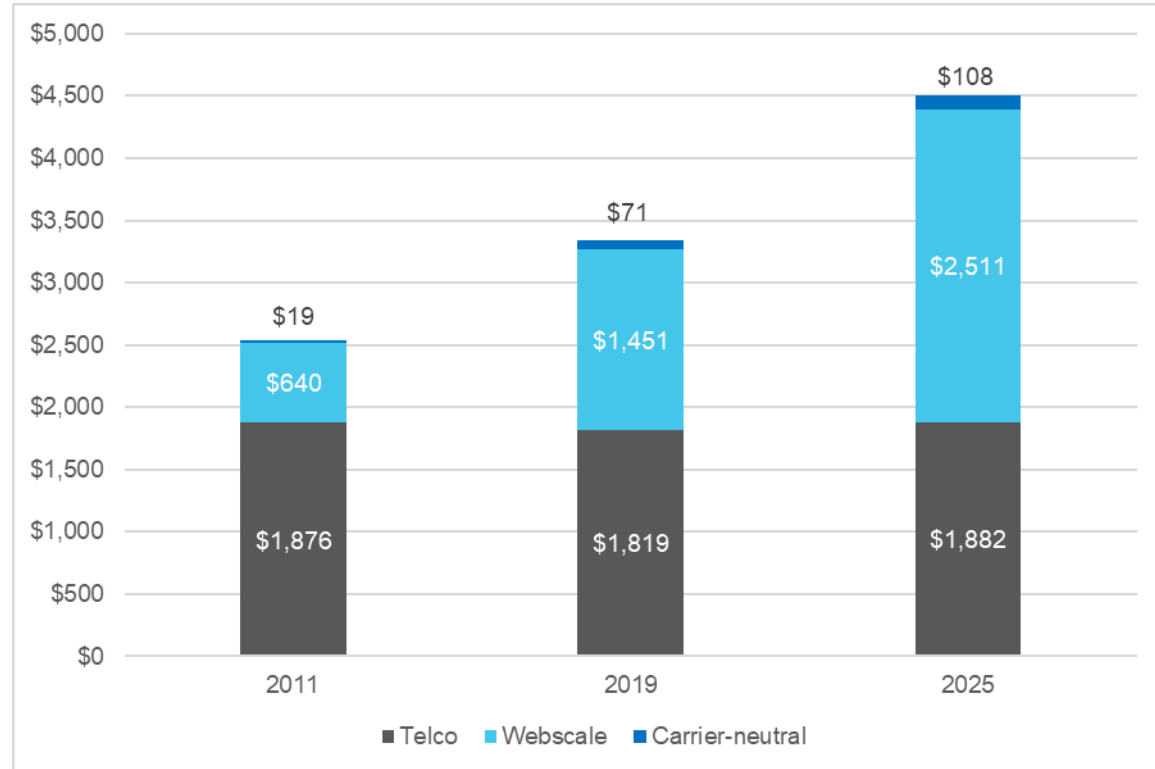
MTN Consulting is an independent analyst firm focused on communications networks. We provide data, insight, and strategic support to the telecommunications and cloud industries. The goal of our research is to provide credible, holistic assessments of where the network infrastructure market currently stands and where it is headed. Our research is sold both a la carte and as part of an annual subscription called Global Network Infrastructure (GNI). We have analysts located in the US, Thailand and India, and associates in Australia, Germany, Italy, Japan and the US.

To inquire about our research or consulting services, or schedule a briefing, please contact: matt@mtnconsulting.biz

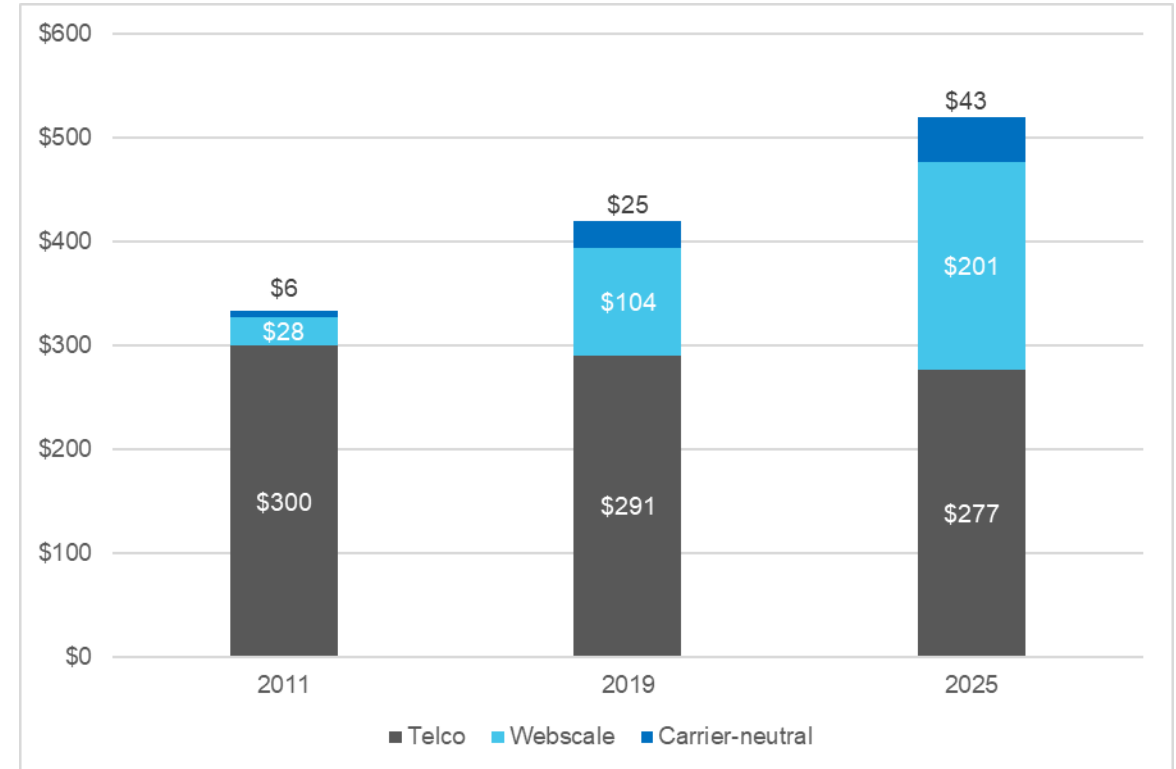
How big is each network operator segment?

Telco growth has stalled but webscale and carrier-neutral sectors remain dynamic; lots of interplay between the three segments

Revenues by sector, US\$B



Capex by sector, US\$B



Source: ["Network operator capex to hit \\$520B in 2025"](#)