



# Financial Performance and Trends in the Telecom Industry

Applied Value

Q4 2022

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## Applied Value Telecommunications Practice

Telecommunication has been a core practice area for Applied Value since our inception in 1997. Over the last 20+ years, we have supported a wide range of clients across the telecommunications value chain and across continents.

We generate client value and provide tangible results by applying an unbiased perspective, having a hands-on approach, and recognizing the importance of delivering value fast.

### About this report

This report tracks the financial performance of major players in the telecommunications industry ranging from operators to infrastructure OEMs and mobile device makers.

We hope that you find this report insightful, and we welcome feedback or opportunities for further discussions.

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# Applied Value's telecom report tracks the financial performance of major players in the industry.

## Operators

## Infrastructure OEMs

## Device OEMs



NOKIA



ZTE



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## Executive Summary

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  2. Infrastructure OEMs
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# Executive summary.

## Key takeaways per segment

### Operators

1. The operator segment revenue in Q4'22 decreased by 4% YoY when compared to Q4'21, resulting in a ~3% YoY decline for the year 2022.
2. Average yearly NOPAT and EBITDA margin for selected operators ended at 13% and 36% respectively for 2022 as telcos continued with high investments in digital transformation and automation to maintain high profitability.
3. ROIC for selected operators averaged at ~8% in 2022, KDDI lead the peer group with ROIC equal to ~20%.

### Infrastructure OEMs

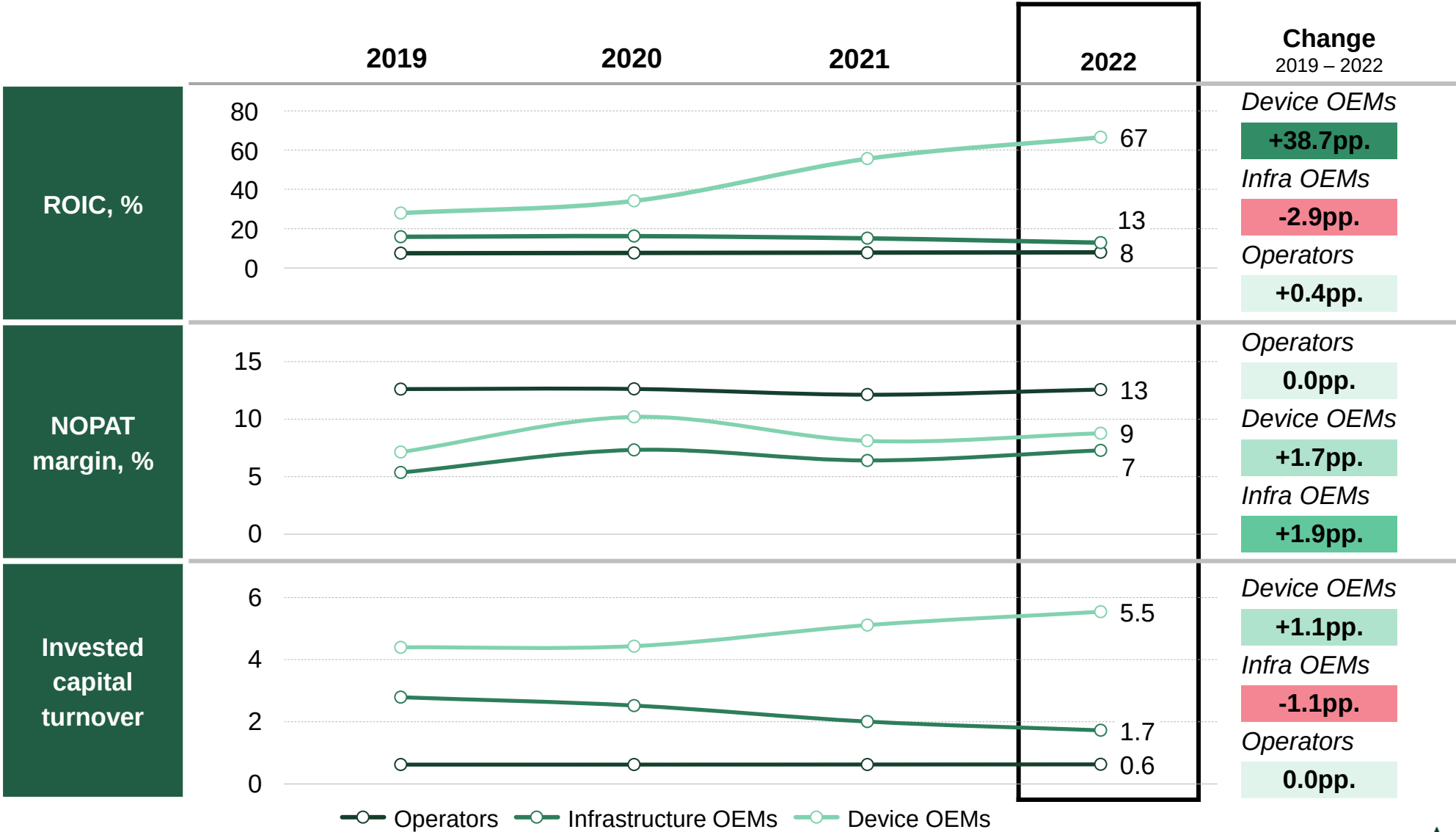
1. Infrastructure OEMs yearly revenue declined by ~7% YoY in 2022, ending at \$158B due to fragile economy and sanctions on ZTE and Huawei. Both Ericsson and Nokia achieved steady growth in Q4 revenue, with 5% and 9% YoY, respectively.
2. Average NOPAT in 2022 for selected infrastructure OEMs was ~7%, led by Ericsson and Nokia.
3. Nokia and Ericsson obtained high ROIC of ~15% in 2022. Market expects infrastructure OEMs to continue with heavy investments in the coming year, especially investing in underlying traffic development and R&D.

### Device OEMs

1. Device OEMs revenues closed at \$829B in 2022. Apple had a weak ending of the year with its first quarterly revenue decline since 2019 driven by lower Mac sales.
2. Global shipments for smartphones and PCs were pressured by -18% and -28% YoY decline in the reported quarter due to weakened demand as inflation pressure and recession fear rises, and consumption sentiment remained bearish.
3. Apple stood out from the peer group in terms of ROIC – ended at 262%, driven by 21% NOPAT margin and high capital turnover ratio of 12.2.



# Financial overview (1/2): Yearly performance.



Notes: ROIC (Return on Invested Capital), NOPAT (Net Operating Profit After Tax); Deviations due to different selection of operators and restated company financials. Telecom report data is based on fiscal years and calendar quarters.



## Financial overview (2/2): Quarterly performance.

|                                               | Segment             | Q4 '22   | Q3 '22   | Q2 '22   | Q1 '22   |
|-----------------------------------------------|---------------------|----------|----------|----------|----------|
| <b>Sales</b><br><b>Y-o-Y</b><br>(% change)    | Operators           | -8.6%    | -4.3%    | -3.3%    | -1.7%    |
|                                               | Infrastructure OEMs | -17.1%   | -3.5%    | -1.0%    | -5.2%    |
|                                               | Device OEMs         | -12.3%   | -3.1%    | 0.6%     | 6.1%     |
| <b>NOPAT</b><br><b>Y-o-Y</b><br>(pp. change)  | Operators           | 1.5 pp.  | 0.3 pp.  | -0.7 pp. | 0.7 pp.  |
|                                               | Infrastructure OEMs | 3.6 pp.  | -2.2 pp. | -1.0 pp. | -1.0 pp. |
|                                               | Device OEMs         | -2.1 pp. | -2.5 pp. | -1.7 pp. | -1.2 pp. |
| <b>EBITDA</b><br><b>Y-o-Y</b><br>(pp. change) | Operators           | 0.8 pp.  | -1.3 pp. | -1.3 pp. | -1.1 pp. |
|                                               | Infrastructure OEMs | 6.1 pp.  | -2.9 pp. | -1.8 pp. | -1.0 pp. |
|                                               | Device OEMs         | -2.6 pp. | -3.3 pp. | -2.1 pp. | -1.0 pp. |

Notes: Telecom report data is based on fiscal years and calendar quarters; NOPAT: Net Operating Profit After Tax

Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.





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# Operators market trends – growing CAPEX & soaring energy prices are key challenges, with more M&A deals expected as a potential solution.

## Market Consolidation

- European telecom operating market is highly fragmented and competitive, leading to lower average revenue per user than other developed markets.
- In 2022, EMEA M&A deals made up to more than 50% of global deal value, and the market is expecting more M&A deals in the future.

## Growing CAPEX

- EU telecom operators have maintained CAPEX growth at 5% in the last two years, driven by 5G and fiber infrastructure rollouts.
- With 5G and fiber coverage lagging global peers, Europe operators will likely keep heavy investments to catch up.

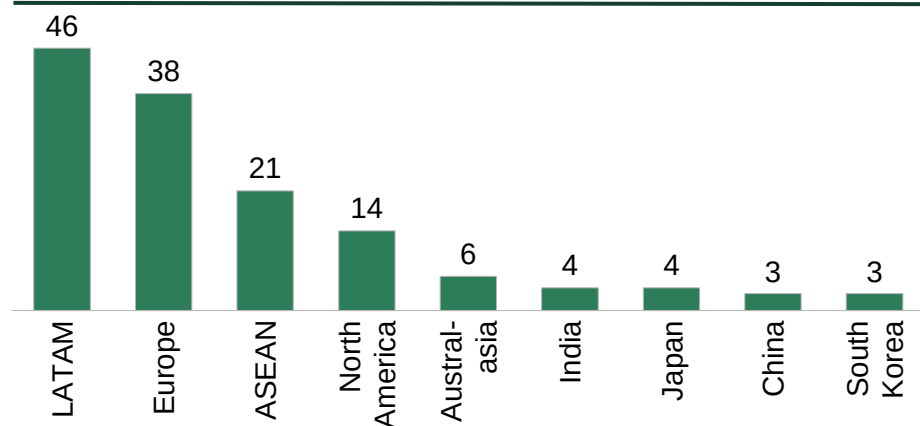
## Energy Hedging

- With soaring energy prices, energy costs remain the most significant source of cost inflation, many European operators have hedged energy in recent years.
- The average degree of energy hedging among selected operators is expected to be ~71% in 2023.
- Co-location of behind-the-meter batteries participating in load shifting and peak shaving can generate potential cost reductions



## Highly fragmented market, EU operators have been facing strong competition and suffering lower revenue; more M&A is expected in 2023.

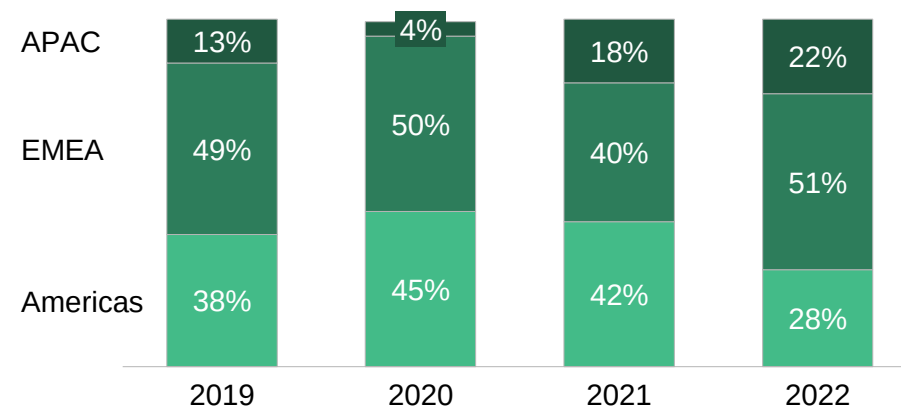
Number of telecom operator by region, 2022



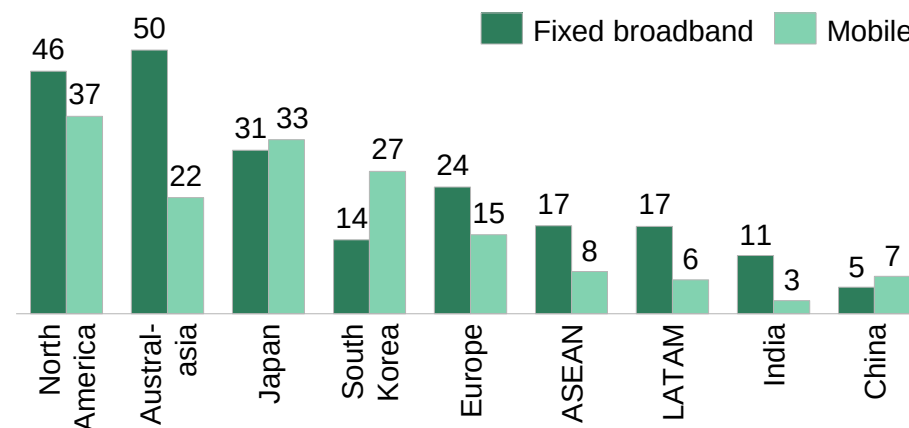
### Key Takeaways

- European telecom operating market is highly fragmented compared with other developed markets.
- European operators' average revenue per user (ARPU) is relatively lower than peer regions. The EU ARPU for both fixed broadband and mobile is less than half of North America's ARPU.
- EMEA M&A deals make up more than 50% of global telecom deal value, mainly driven by high competition.

Telecom M&A deal value, share by region



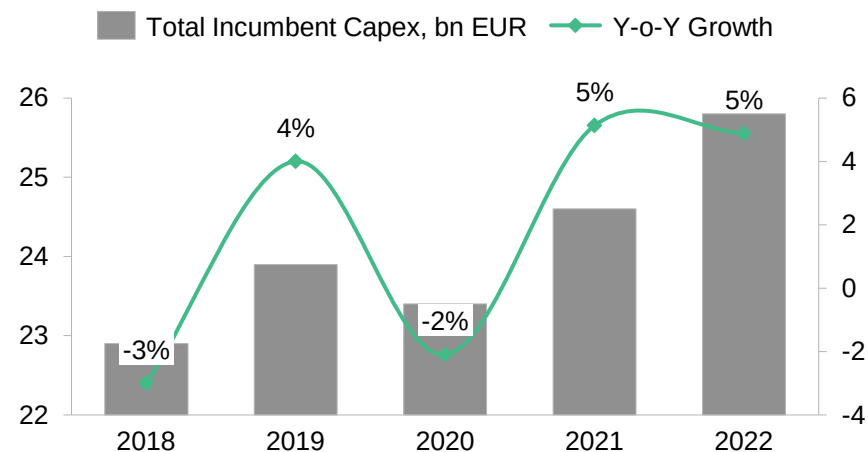
Average revenue per user, USD/month





# European telecom operators' CAPEX is likely to remain elevated in the near future, mainly driven by expenditure on fiber and 5G rollouts.

## Western Europe CAPEX and CAPEX growth

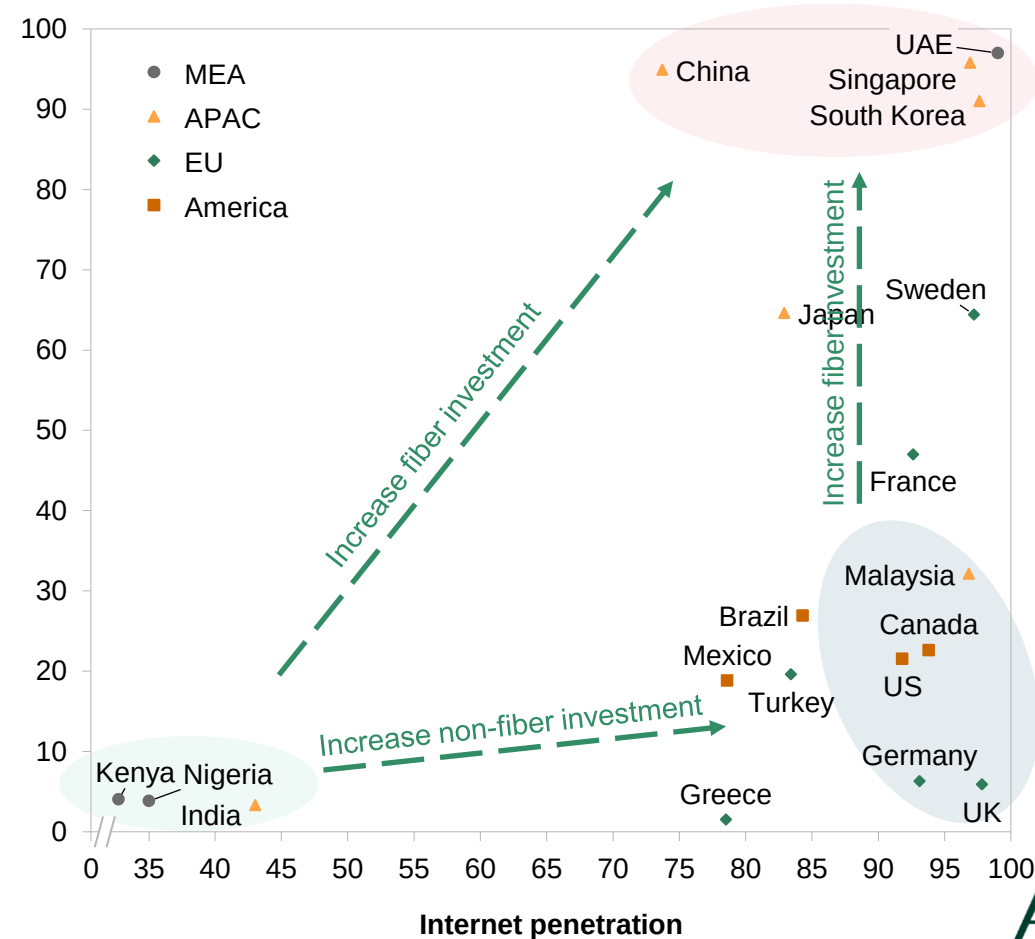


### Key Takeaways

- EU telecom operators have maintained CAPEX growth at 5% in the last two years, and this trend is expected to remain to narrow regional gaps in 5G and fiber coverage.
- It would be likely to see heavy investment in countries like Austria, UK, Germany, and Belgium, as many of them aim to have all households access a gigabit network by 2030.
- 5G coverage in Europe reached 73% in 2022, an increase of 11% since 2021, but still behind global peers.

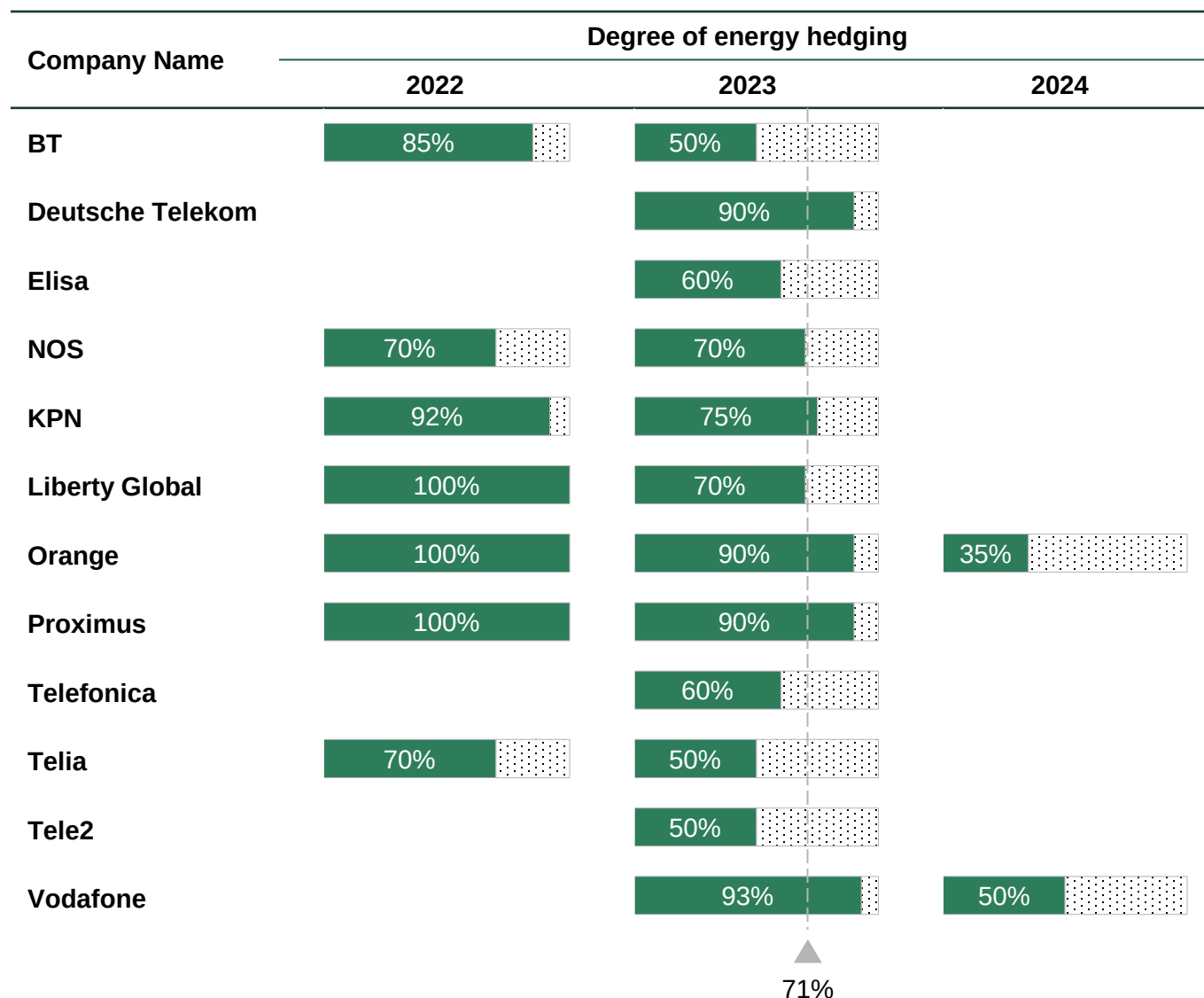
## FTTH/B penetration vs. Internet penetration, by selected countries

### FTTH/B penetration





## Inflated energy prices are still a challenge to European operators, more companies have hedging plans in 2023, with 71% avg. degree of hedging.



### Key Takeaways

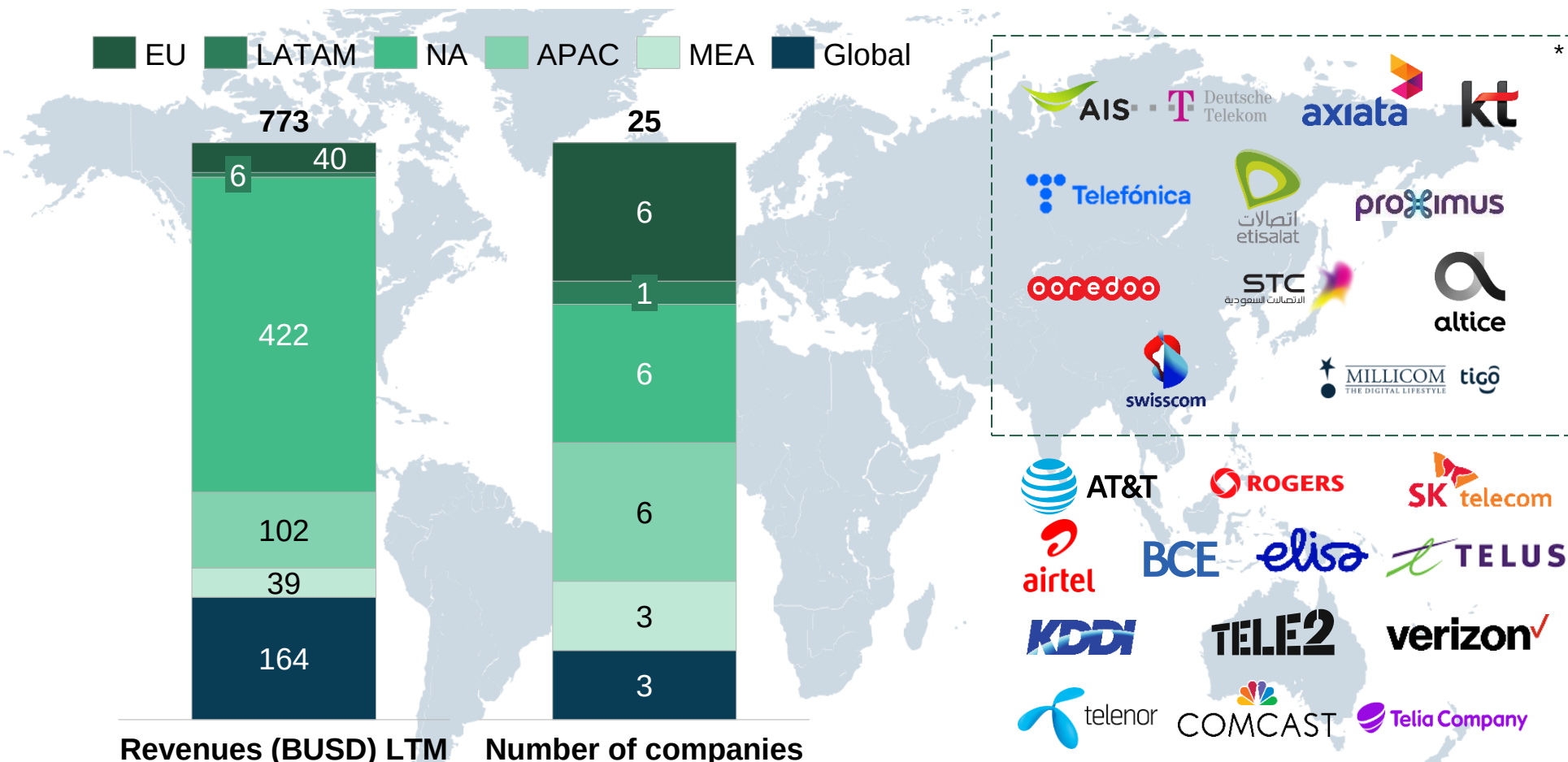
- EU natural gas prices increased more than **3x in 2022**, causing energy crisis across many industries
- Energy costs remain the most significant source of **cost inflation**, many European operators have hedged energy in recent years
- The average degree of energy hedging among selected operators is **~71%** in 2023
- Co-location of behind-the-meter batteries participating in **load shifting** and **peak shaving** can generate energy cost savings of 20-30% depending on market conditions



# The Q4'22 report covers 25 of the largest operators globally, total LTM revenue summed up to ~\$773B.

## Report overview

Revenue in BUSD, and company breakdown by regions



Note: Global operator refers to those with transregional business establishments. \* due to data availability, FY2022 data for these companies in this report are calculated by assuming Q4'22 data is the same as Q3'22

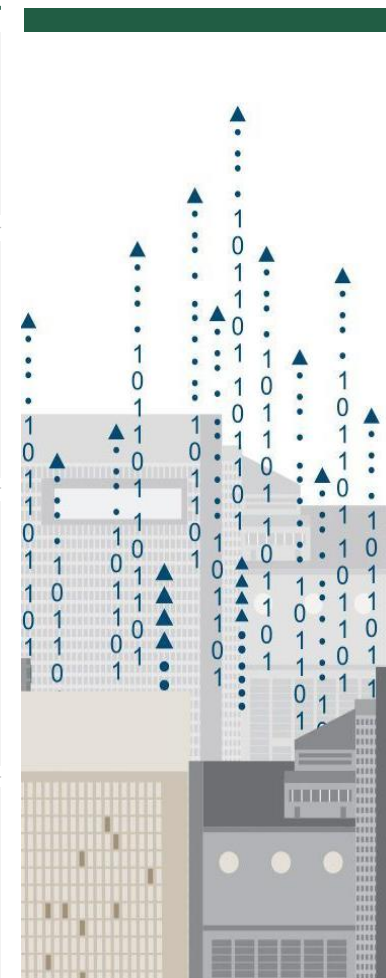
Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.



# Key takeaways from the Operators segment.

## Key takeaways

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Creating Shareholder Value</b> | <ol style="list-style-type: none"> <li>1. The ROIC for selected operators increased by 0.2pp. YoY to 7.8% during 2022, driven by 2pp. Increase in average NOPAT margin.</li> <li>2. KDDI recorded the highest ROIC of ~20% in 2022 with nearly 4pp. increase from 2021, the company's high efficiency in utilizing capital employed ensures solid revenue streams.</li> </ol>                                                                                 |
| <b>Revenue Performance</b>        | <ol style="list-style-type: none"> <li>1. The overall revenue performance for selected operators fell by ~4% in 2022 compared with 2019.</li> <li>2. Bharti Airtel outperformed peers with ~20% YoY growth in revenue during Q4'22 driven by 30% and 21% YoY growth in Homes Service and Mobile segment, respectively; Ooredoo experienced the worst annualized telco growth among selected operators.</li> </ol>                                             |
| <b>Margin Performance</b>         | <ol style="list-style-type: none"> <li>1. Telcos continued investments in digital transformation and automation to maintain high profitability. During 2022, telcos sustained stable EBITDA and NOPAT profit margins at high levels by ~36% and ~13%, respectively.</li> <li>2. STC achieved the highest NOPAT margin in the peer group of ~22% in Q4'22 and Deutsche Telekom obtained the highest EBITDA margin development of ~10% YoY in Q4'22.</li> </ol> |
| <b>Capital Expenditure</b>        | <ol style="list-style-type: none"> <li>1. Although slowed-down revenue growth and macroeconomic pressures had limited CAPEX spending for some telcos, the capital intensity for telcos is still at all-time high.</li> <li>2. CAPEX over sales in 2022 averaged at ~17%. Axiata performed the highest CAPEX over sales of 36% due to acquisition of Link Net, while Tele2 attained the largest positive development of 22%.</li> </ol>                        |



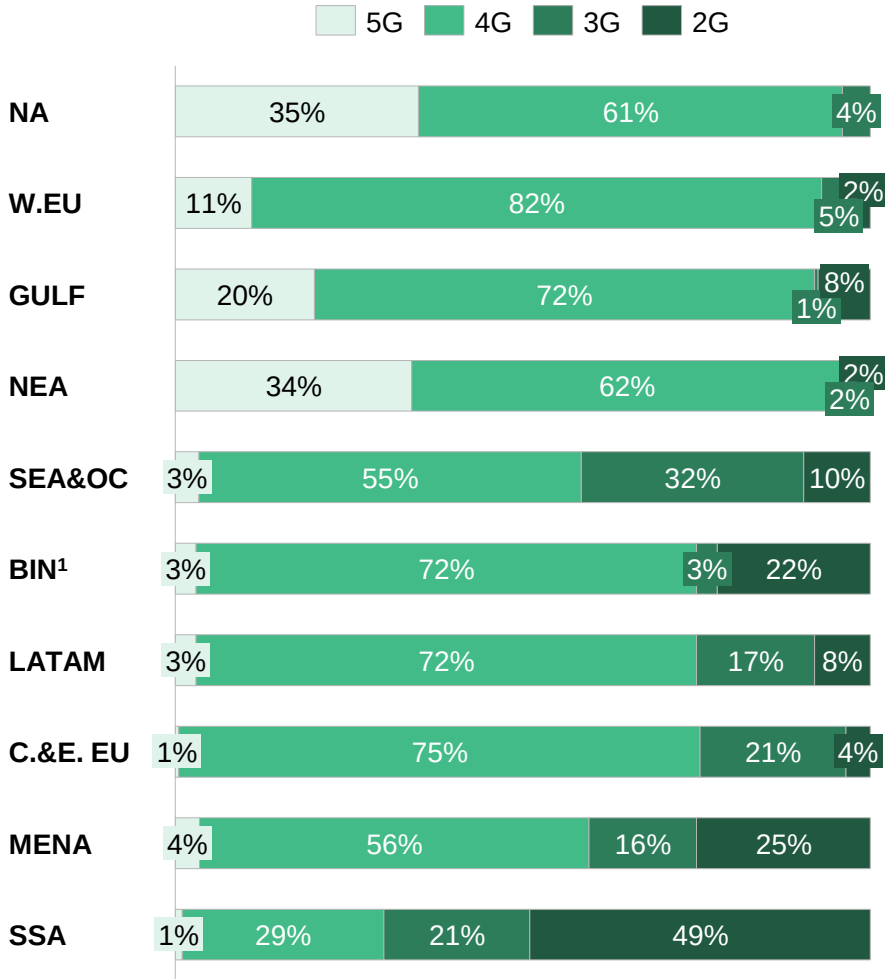


# Events across the Operators segment from the fourth quarter.

## Industry News

|                       |                                                                                                                                                                                                                                                                                  |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Emphasis on data      | Many telcos like <b>T-Mobile</b> , <b>Globe Telecom</b> and <b>Telia</b> started to leverage data and use AI to evaluate customer behavior to enrich relationships with customers.                                                                                               |
| Sustainability        | The telecom industry had generated over <b>1.6% of world total carbon emission</b> in 2021; energy consumption accounts for ~15-40% of telcos’ operating expenses and is continuously rising due to spiked energy price, telcos in turn have increasing focus on sustainability. |
| 5G ecosystem building | There will be more cross-industry and cross-functional partnerships in 2023 to accelerate 5G ecosystem maturity, e.g., <b>Verizon</b> , <b>Vodafone</b> , <b>SK Telecom</b> and <b>KDDI</b> ’s edge computing partnership with AWS.                                              |
| Nov-2022              | <b>SK Telecom</b> reorganized itself as an AI company which has transformed from connectivity provider to digital service provider.                                                                                                                                              |
| Nov-2022              | <b>Elisa</b> has utilized its AI and machine learning to improve telecommunication operations, and started to implement those advantages to other industries, e.g., providing machine learning to the precision-based semiconductor manufacturing industry.                      |
| Dec-2022              | Telcos are setting strategies toward low-carbon emissions. <b>Orange</b> has announced plans for construction of its own solar energy farm near Paris which will save over 100 tones of CO <sub>2</sub> per annum                                                                |
| Dec-2022              | As 5G investment cycle is coming to an end, <b>Verizon</b> plans to cut CAPEX budget massively from 2024 after years of significant investment in 5G network rollout.                                                                                                            |

## Mobile subscriptions by region and technology, 2022



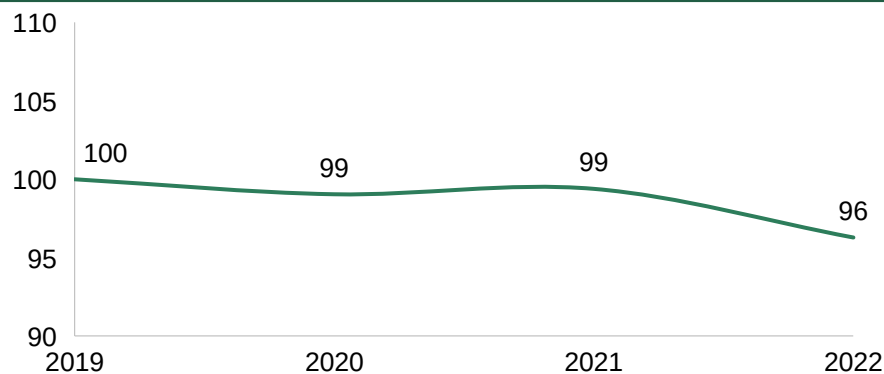
Note: BIN refers to Bhutan, India and Nepal  
Source: Press & News, Ericsson Mobility Report, Applied Value Analysis.



## Selected operators' revenues were down by 4% in 2022 comparing with 2019; Yearly EBITDA margin rose to 4-year high at ~36% in 2022.

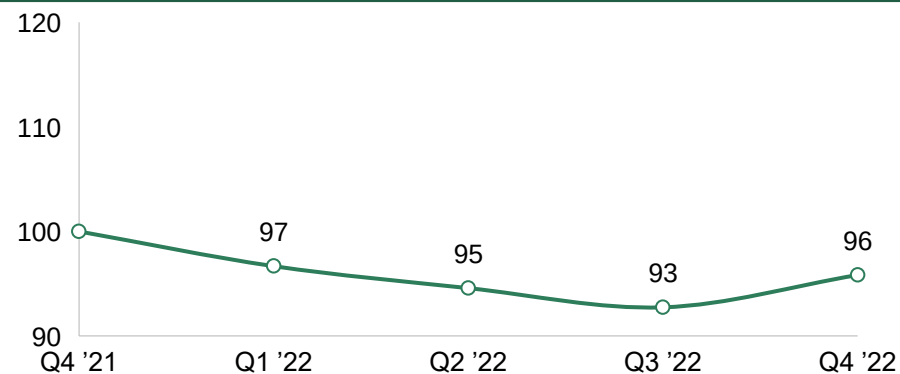
### Indexed Yearly revenues

2019 - 2022 (index 2019=100)



### Indexed Quarterly revenues

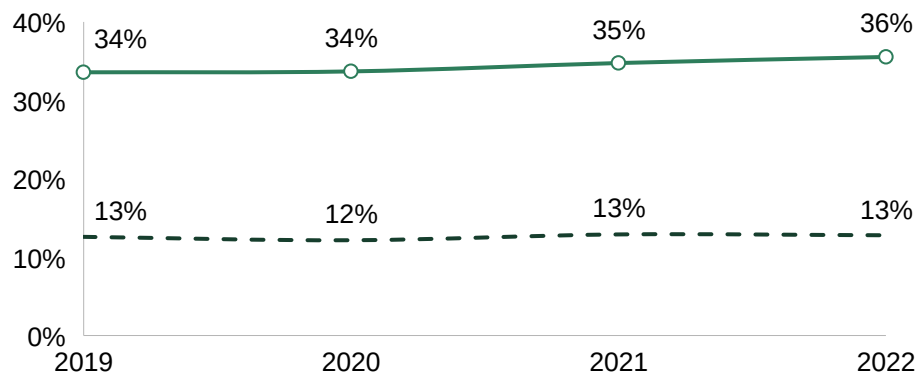
Q4'21 – Q4'22 (index Q4'21=100)



### Yearly profitability development

2019 - 2022, %

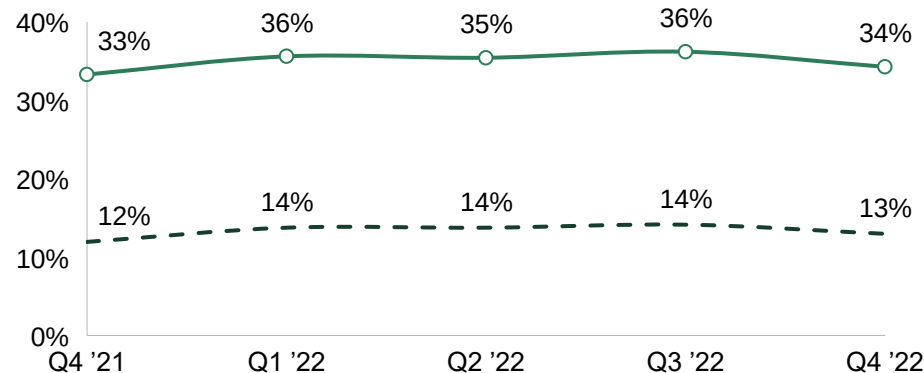
—○— EBITDA margin    - - - NOPAT margin



### Quarterly profitability development

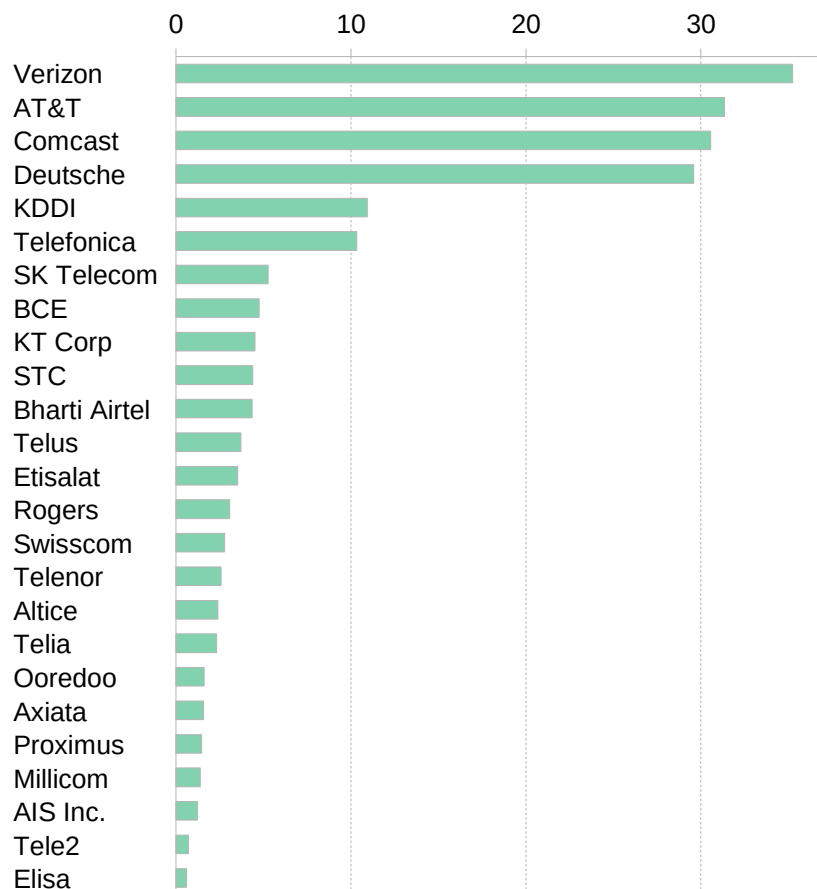
Q4'21 – Q4'22, %

- - - NOPAT    —○— EBITDA

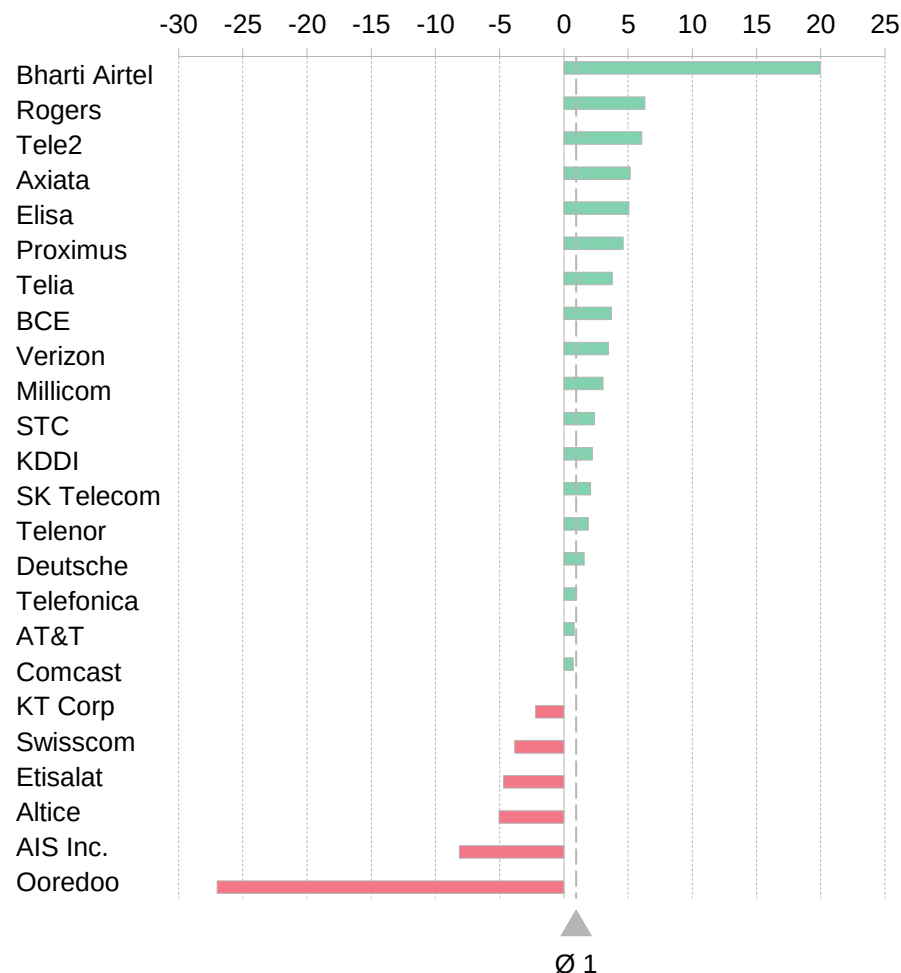


# Bharti Airtel achieved the largest revenue improvement in Q4'22 compared with Q4'21, driven by 18% rise in ARPU and 30% growth in Homes Service.

Revenue by operator  
Q4'22 BUSD



Revenue development by operator  
Delta (Q4'22 vs. Q4'21), %, filing currency



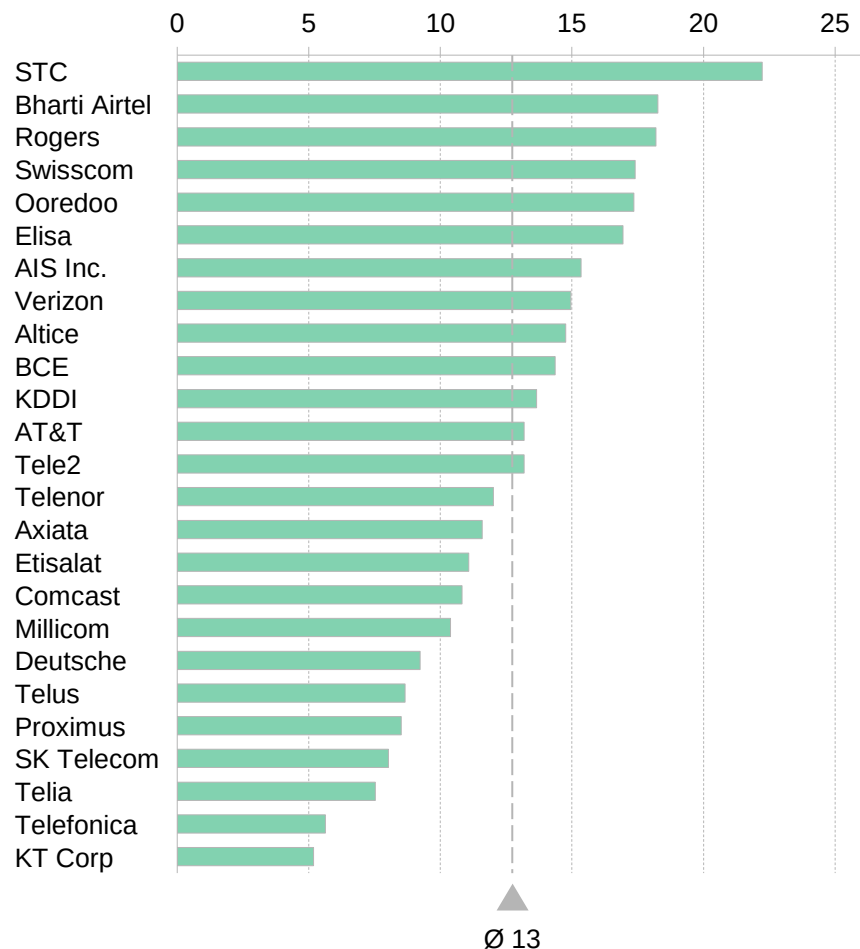
Note: Telenor adjusted for M&A activities in Malaysia and Myanmar

Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.

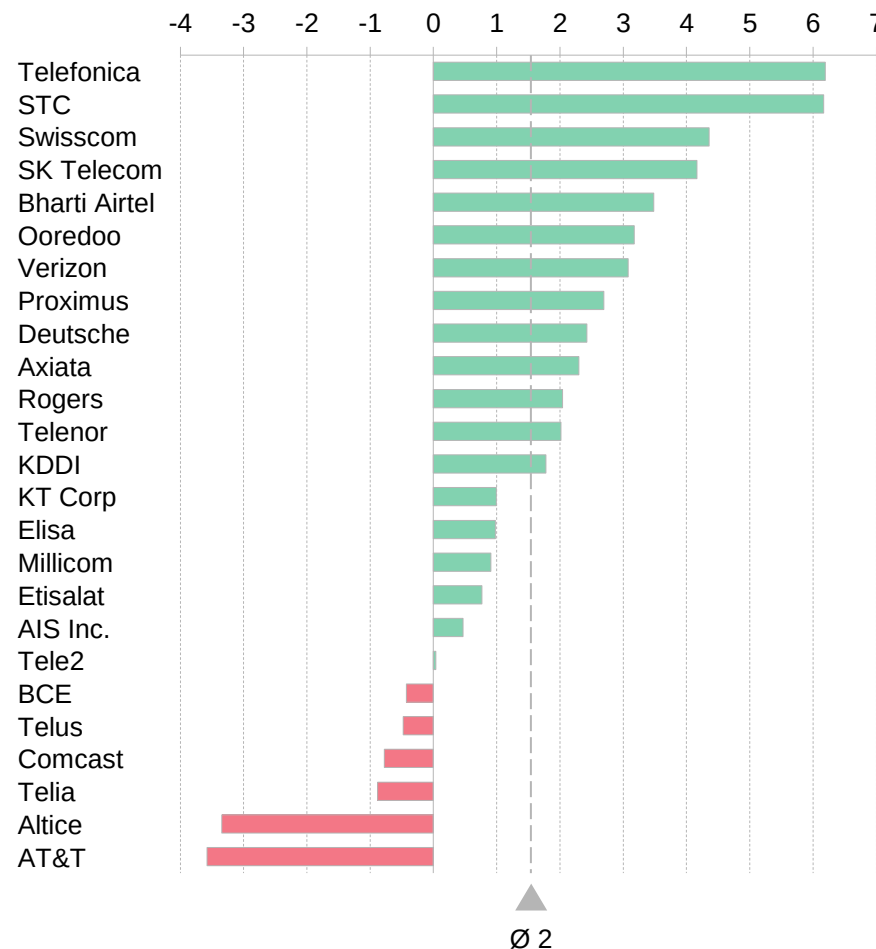


## Selected operators' NOPAT% averaged at ~13% in Q4'22 which was an average increase by ~2pp. compared to Q4'21.

**NOPAT margin by operator**  
Q4'22, %



**NOPAT margin development by operator**  
Delta (Q4'22 vs. Q4'21), pp.



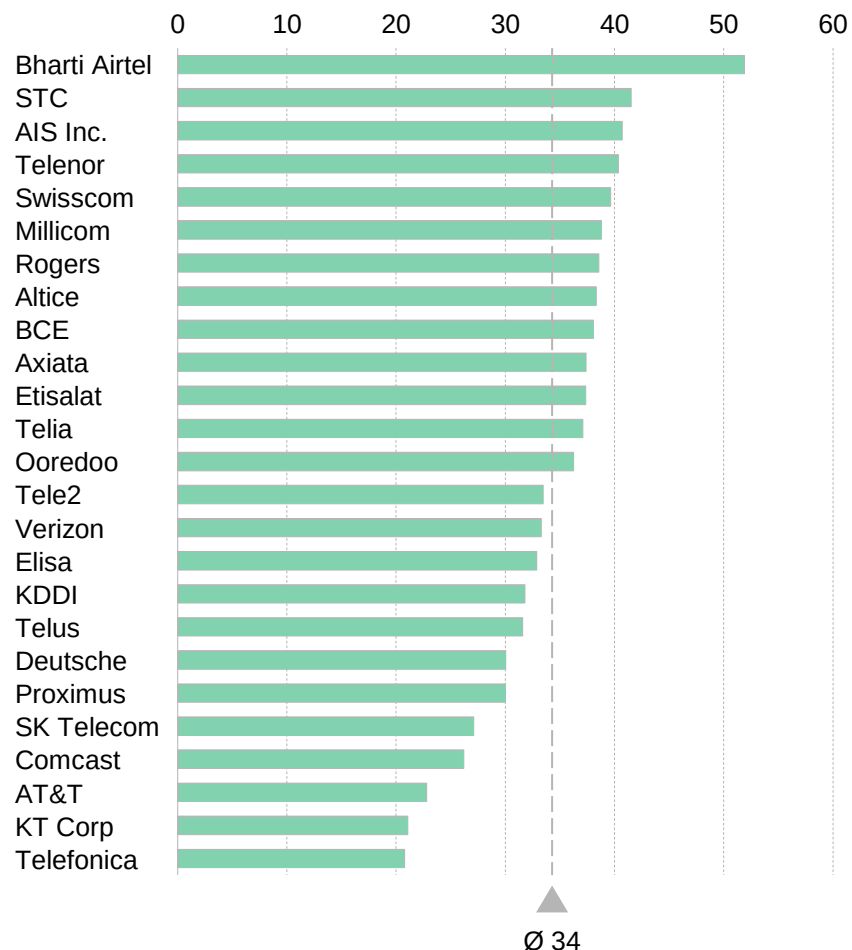
Note: Telia adjusted for one-time impairments on goodwill; Telenor adjusted for M&A activities in Malaysia and Myanmar

Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.

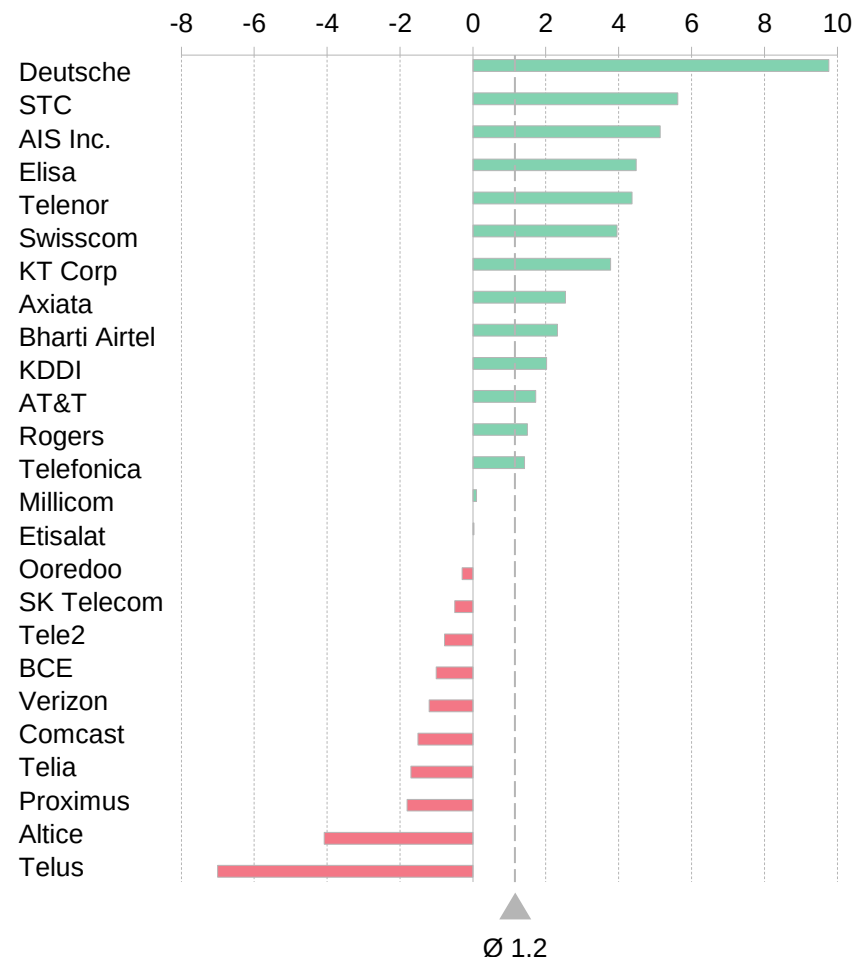


# Average EBITDA margin recorded at ~34% for selected operators in Q4'22; Deutsche EBITDA% grew by 10% driven by strong sales growth in the US.

EBITDA margin by operator  
Q4'22, %



EBITDA margin development by operator  
Delta (Q4'22 vs. Q4'21), pp.

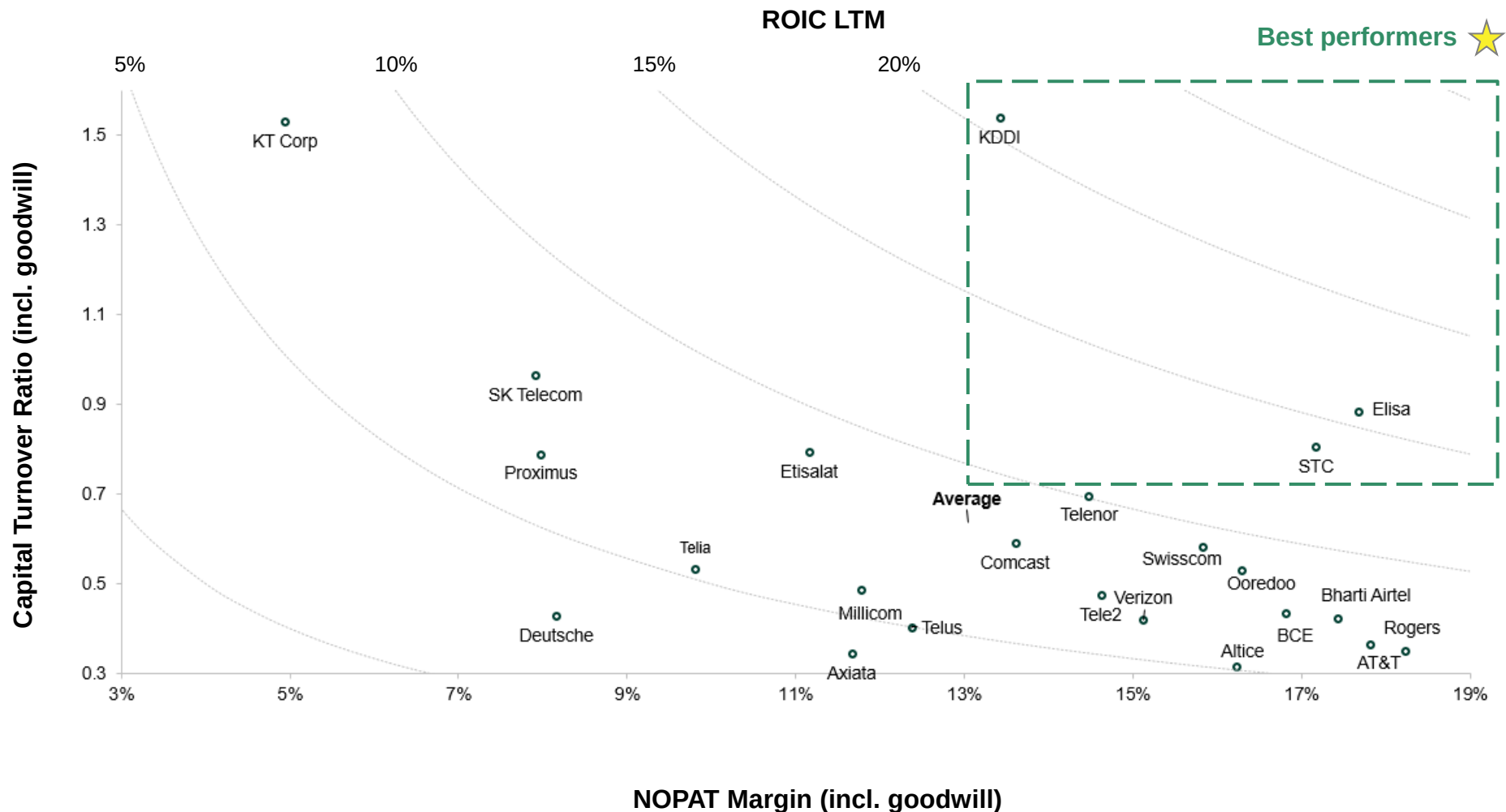


Note: Telenor adjusted for M&A activities in Malaysia and Myanmar

Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.



**Selected operators ROIC was averaged at ~8% in 2022, KDDI was the top performer of ~21% as it obtained highest capital turnover ratio of 1.54.**



Note: ROIC = Return on Invested Capital (actual return that the company has generated after tax); Telia adjusted for one-time impairments on goodwill; Telenor adjusted for M&A activities in Malaysia and Myanmar

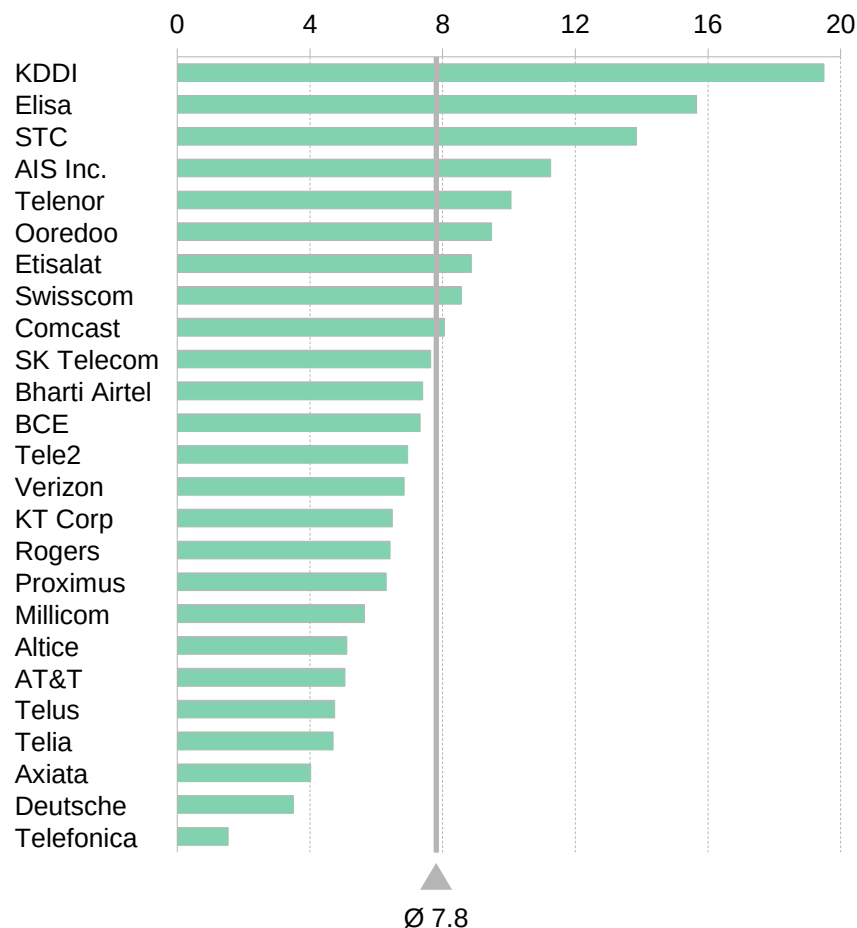
Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.



# Segment's average ROIC increased by 0.2pp in LTM compared to LTM-1. KDDI outperformed peers with a 3.9pp growth in ROIC

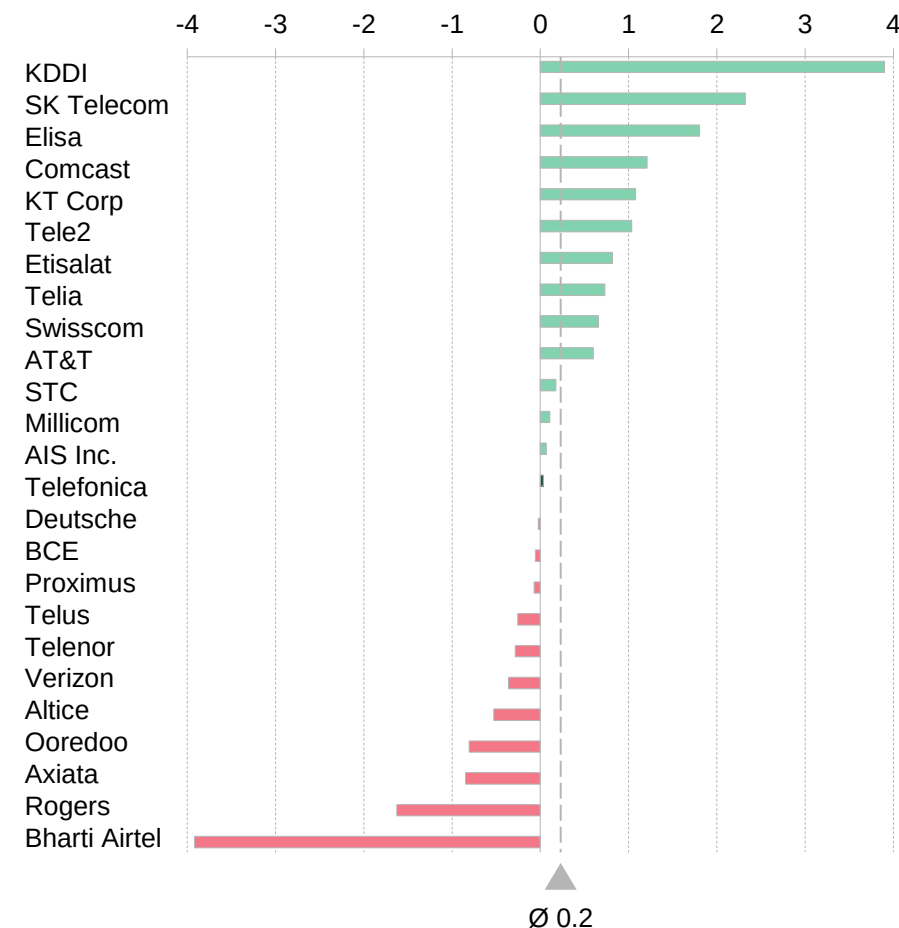
## ROIC by operator

LTM (Q4' 21 – Q4' 22), %



## ROIC development by operator

Delta (LTM vs. LTM-1), pp.



Note: Telia adjusted for one-time impairments on goodwill; Telenor adjusted for M&A activities in Malaysia and Myanmar

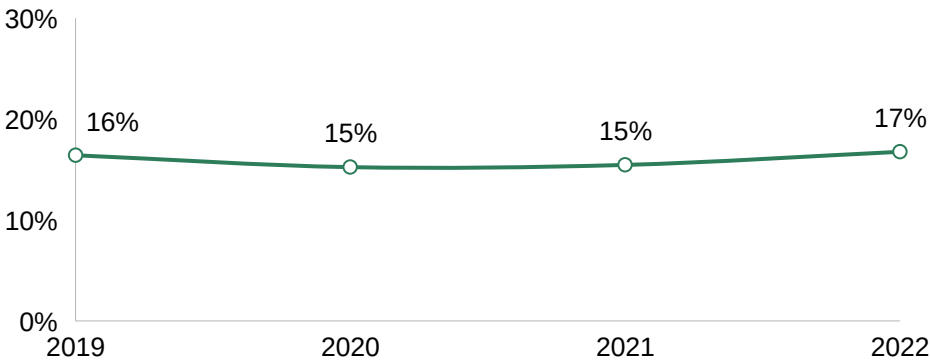
Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.



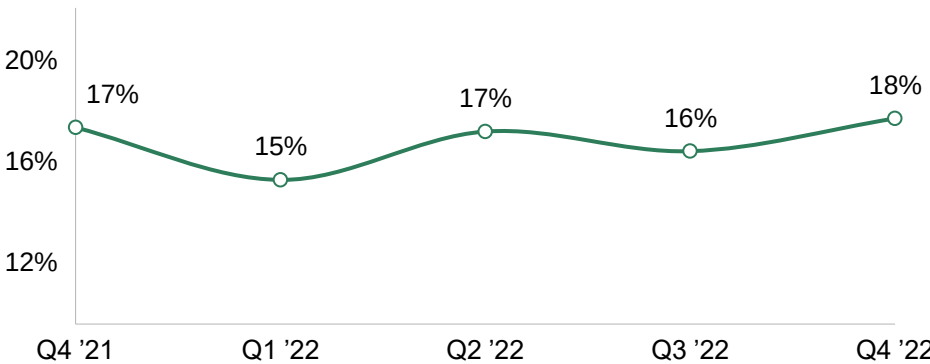


# 2022 yearly CAPEX over sales ended at 17%; EU was the only region that achieved positive development in 2022 compared to 2019.

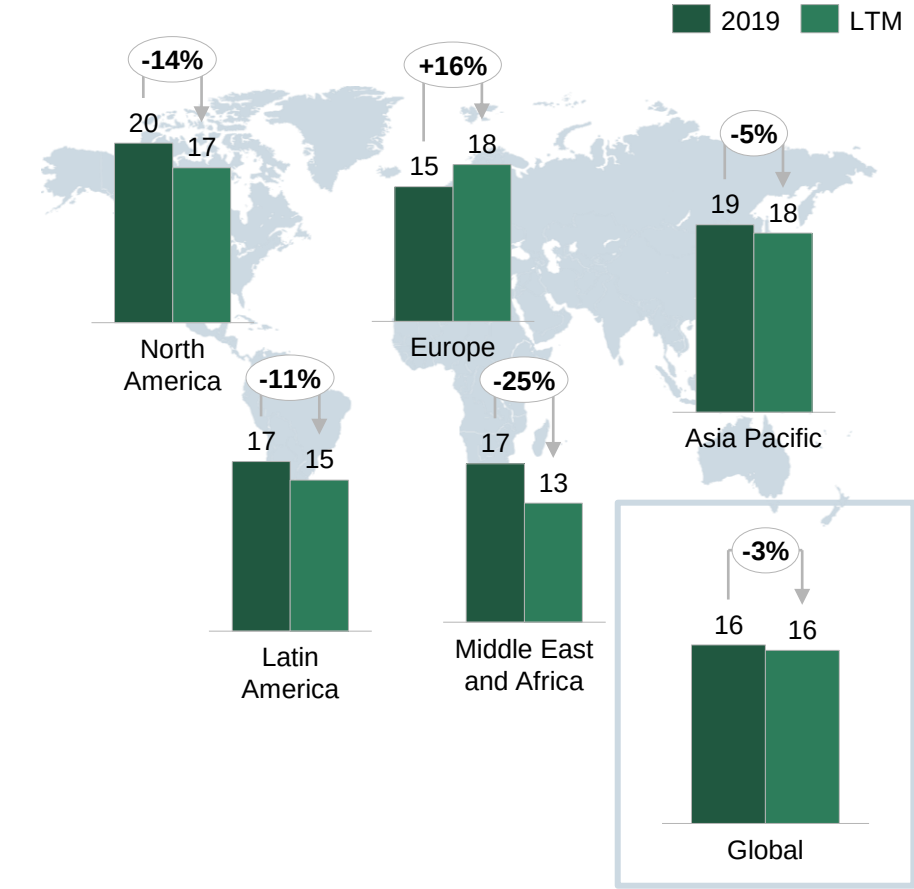
Yearly CAPEX over sales  
2019 – 2022, %



Quarterly CAPEX over sales  
Q4'21 – Q4'22, %

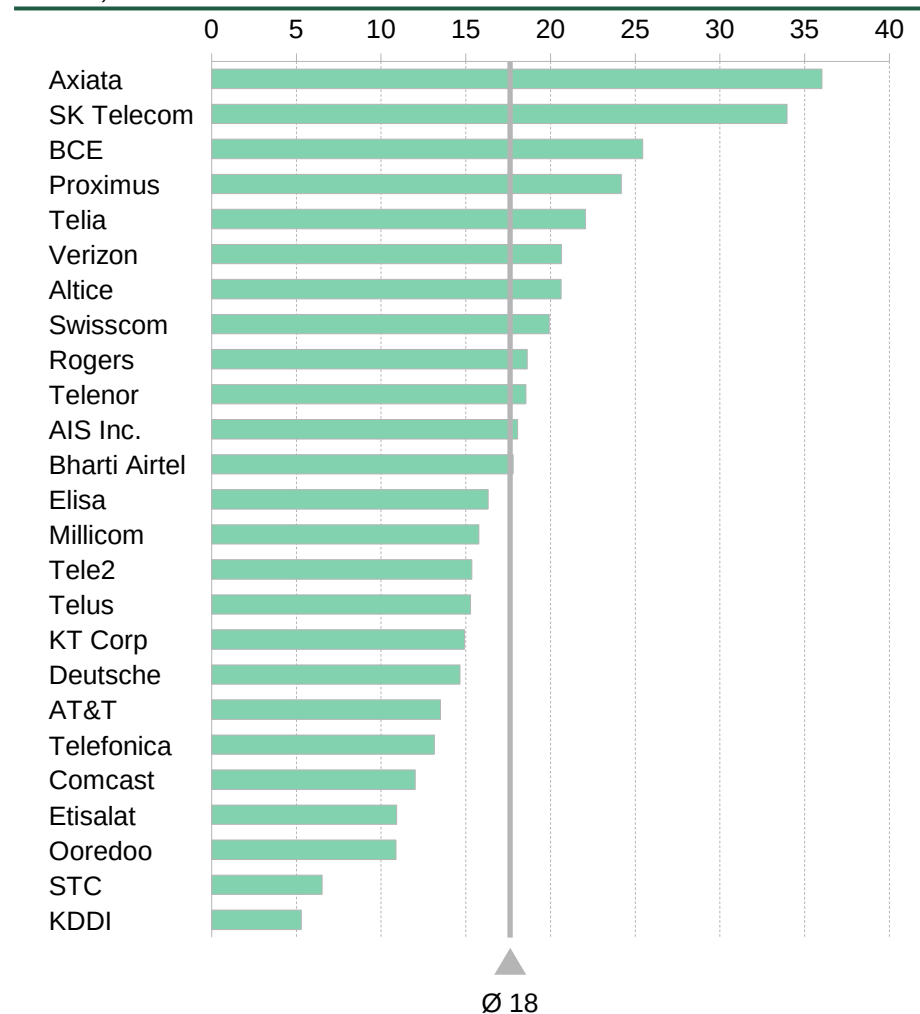


CAPEX over sales by region  
2019 vs. LTM, %

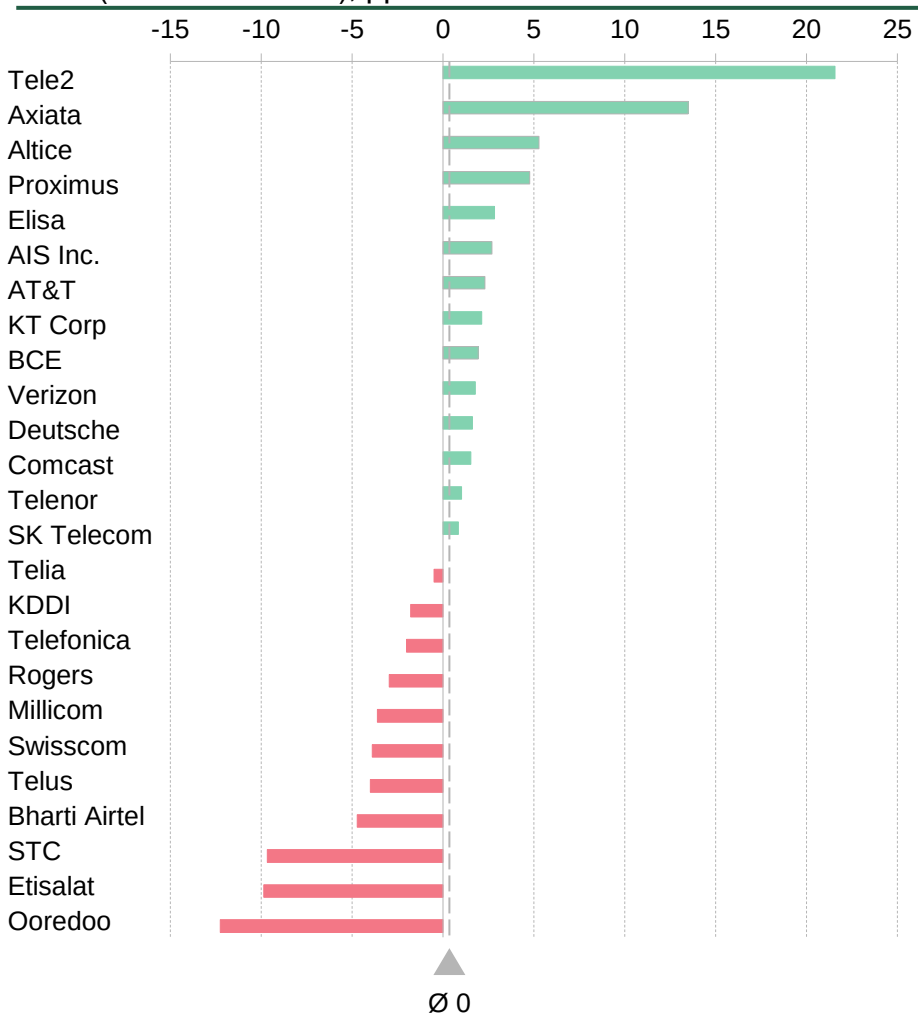


# CAPEX/sales for selected operators averaged at ~18% in Q4'22, leading by Axiata (~36%); Tele2's improvement was due to higher network investments.

**CAPEX over sales by operator**  
Q4'22, %



**CAPEX over sales development by operator**  
Delta (Q4'22 vs. Q4'21), pp.



Note: Telenor adjusted for M&A activities in Malaysia and Myanmar

Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.



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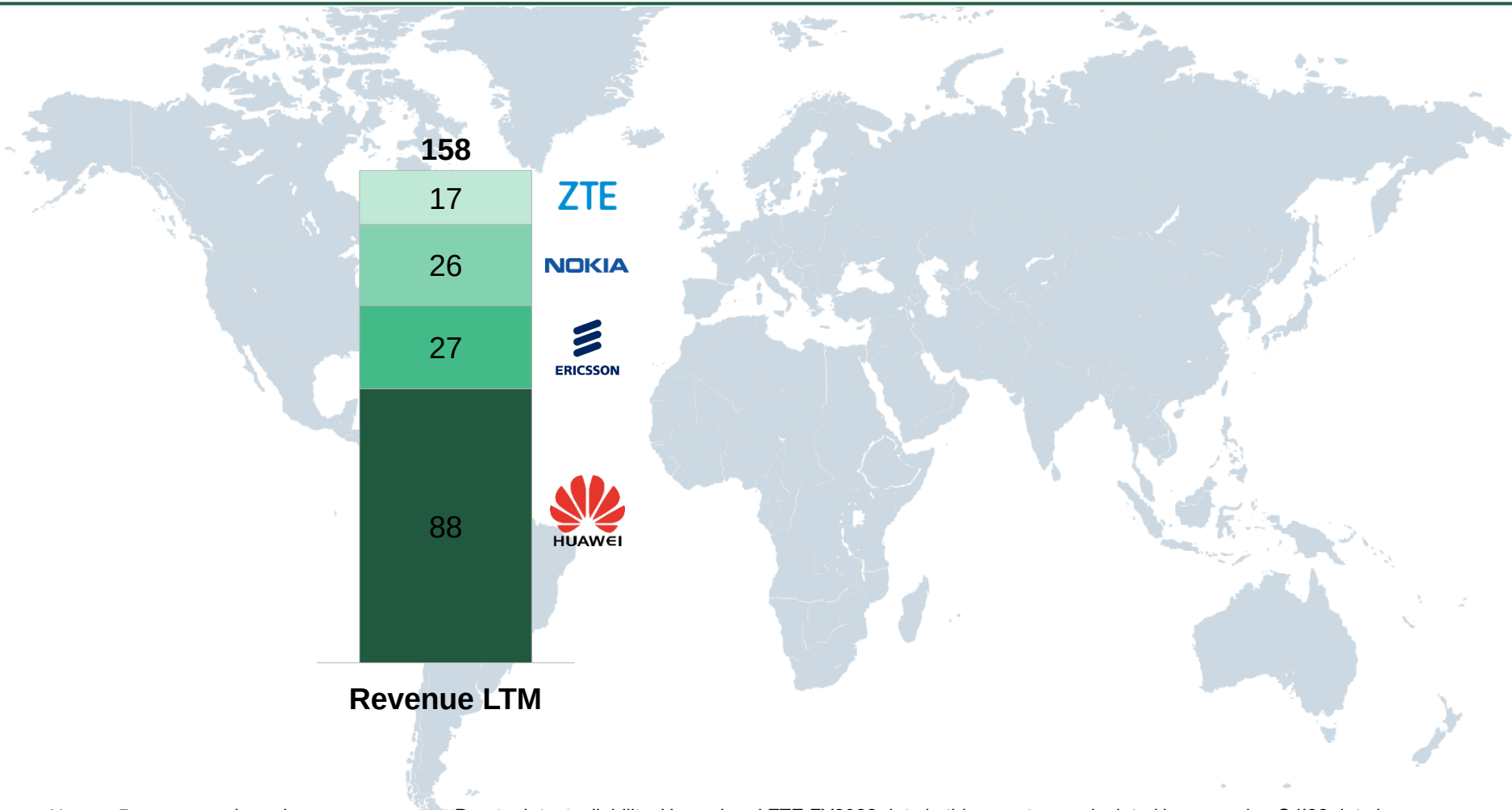
3. Device OEMs

About Applied Value



The Q4 2022 Report includes four major infrastructure players – Huawei, Ericsson, Nokia, and ZTE, revenue summed up to \$158B in LTM.

Report overview  
Revenue in BUSD



Notes: Revenue are based on group revenue. Due to data availability, Huawei and ZTE FY2022 data in this report are calculated by assuming Q4'22 data is the same as Q3'22  
Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.



# Key takeaways from the Infrastructure OEM segment.

## Key takeaways

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Creating Shareholder Value</b> | <ol style="list-style-type: none"> <li>1. Among all selected OEMs, Nokia and Ericsson achieved the highest ROIC of ~15% over LTM.</li> <li>2. Huawei's ROIC fell for the third consecutive year, ended at ~8% due to lowered profitability as a result of weakened demand and continued US technology restrictions.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Revenue Performance</b>        | <ol style="list-style-type: none"> <li>1. Total revenue for selected infrastructure OEMs in Q4'22 summed to \$158B, representing ~7% decline comparing with FY2021. Both Ericsson and Nokia achieved steady growth in group revenues in Q4'22, by 5% and 9% YoY, respectively.</li> <li>2. ZTE continued to outperform peers in 2022 with revenue improvements of ~41% comparing with 2019, while Huawei's revenue remained far below the 2019 record of \$122B as it is still bearing with the imposed restrictions and sanctions</li> </ol>                                                                                                                                                                            |
| <b>Margin Performance</b>         | <ol style="list-style-type: none"> <li>1. 2022 NOPAT margin for selected infrastructure OEMs averaged at ~7%, leading by Ericsson and Nokia. ZTE and Nokia achieved higher NOPAT margin in 2022 comparing with 2021.</li> <li>2. Though Ericsson obtained highest NOPAT margin within the peer group, it had suffered lowered net income due to increased operating expenses and higher SG&amp;A expenses, especially in the Enterprise segment.</li> </ol>                                                                                                                                                                                                                                                              |
| <b>Capital Efficiency</b>         | <ol style="list-style-type: none"> <li>1. The long-term investments for infrastructure OEMs are expected to be driven by continuous underlying traffic development, however, macroeconomic uncertainties may drag CAPEX growth rate down.</li> <li>2. Huawei had cut its capital investments in the past three years, coupled with lowered fixed asset turnover, long inventory and receivables days, which resulted in dramatic drop in CTR, ended at 1.5 in 2022.</li> <li>3. Nokia was the only OEM that obtained increased CTR in 2022 comparing to 2021, it had invested heavily in private wireless and Software-as-a-Service which optimized Nokia's portfolio and contributed to steady sales growth.</li> </ol> |

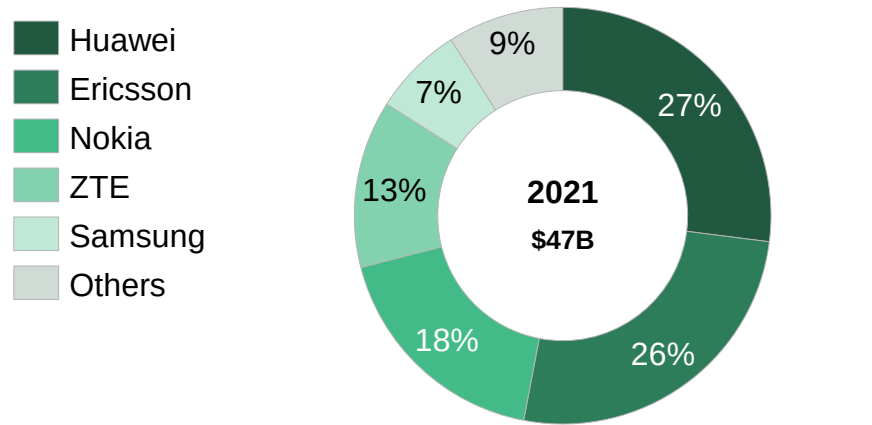


# Events across the Infrastructure OEMs sector from the fourth quarter.

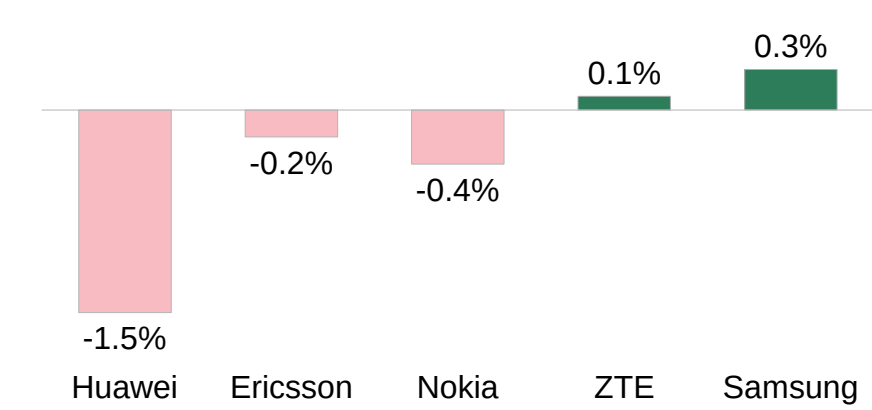
## News and happenings for Infrastructure OEMs

|          |                                                                                                                                                                                                                                                                                                                                                   |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oct-2022 | <b>Nokia</b> will upgrade Ottawa's facility to a world-leading sustainable R&D hub. The tech center will significantly expand Nokia Canada's capacity in next-generation information and communications technology (ICT) and cyber security innovation.                                                                                           |
| Nov-2022 | <b>Ericsson</b> announced a new research unit in the UK as part of a multi-million-pound investment to boost the country's future wireless connectivity capabilities and develop 6G mobile.                                                                                                                                                       |
| Nov-2022 | <b>Huawei</b> Technologies and <b>ZTE</b> have been on a roster of companies listed as a threat by the Federal Communications Commission, and the new rules ban future authorizations of their equipment; This led US government spend \$1.5 billion on alternative 5G telecom gear.                                                              |
| Dec-2022 | <b>Ericsson</b> and <b>Elisa</b> announced that the operator has selected Ericsson cloud-native dual-mode 5G Core to support its upgrade to 5G Standalone in Estonia.                                                                                                                                                                             |
| Dec-2022 | <b>Nokia</b> announced that it has extended its collaboration with French operator <b>Orange</b> to upgrade its microwave backhaul network. Nokia will also provide Orange France with a range of products and services from its AirScale 5G radio access portfolio, as well as network management solution and associated professional services. |

## Infrastructure OEMs market share, 2021

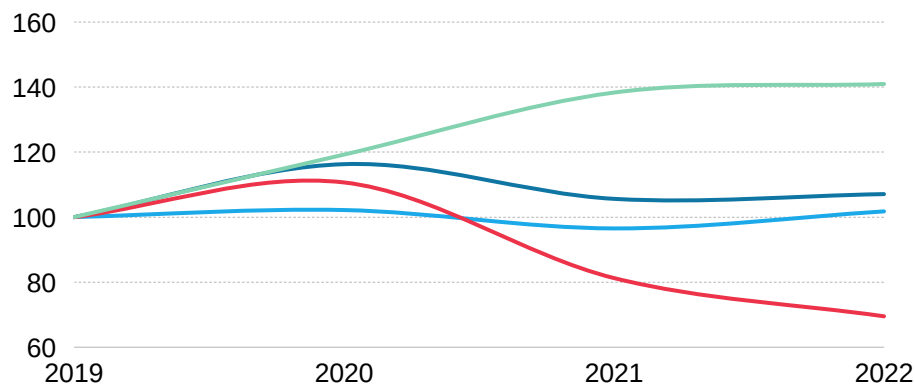


## Market Share Changes of Infra OEMs, 2021 vs. 2020

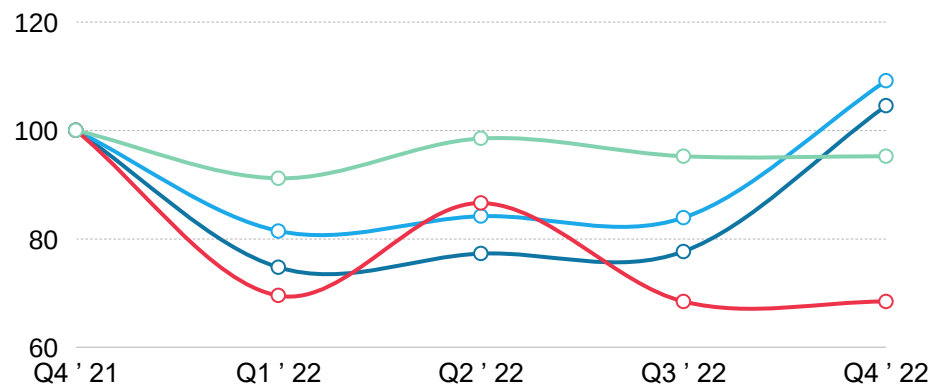


## Except for CN infrastructures Huawei and ZTE, others had positive YoY revenue improvement in Q4'22 as 5G momentum continues in EU and NA.

**Indexed Yearly Group Revenues**  
2019 – 2022 (index 2019=100)



**Indexed Quarterly Group revenues**  
Q4'21– Q4'22 (index Q4'21=100)



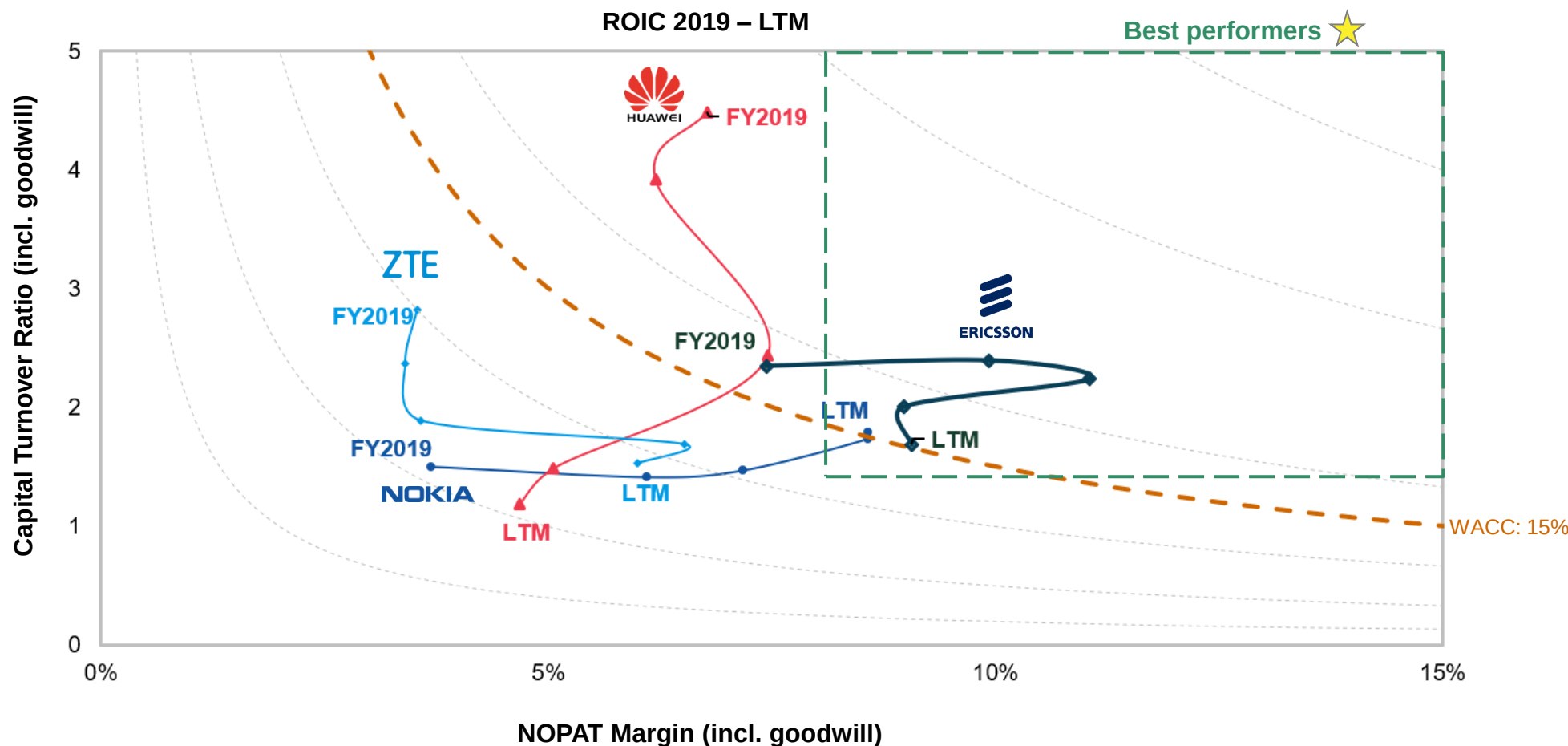
— Ericsson — Nokia — Huawei — ZTE

- ZTE outperformed peers in 2022 with revenue improvements of ~41% comparing with 2019 though quarterly revenue declined by ~5% YoY. Besides the large-scale 5G constructions in China, ZTE had also seized opportunities to develop New Infrastructure to accelerate digital transformations in other industries, domestic sales accounts for nearly 70% of ZTE's overall annual sales.
- Huawei's revenue in 2022 remained far below the 2019 record of \$122B as it is still bearing with the imposed restrictions and sanctions, ~15% drop in 2022 comparing to 2021. The ICT infrastructure segment had maintained steady growth during the year, while the shrink in device business had abated.
- Nokia continued with steady growth in revenue during 2022, net sales in 2022 climbed by 6% while Q4'22 revenues escalated by 9% YoY with Network Infrastructure business being the key driver, which grew by ~14% YoY in net sales. Regionally, Nokia started to deploy 5G in India in Q4'22 which resulted 116% YoY rise, and EU sales skyrocketed with double-digit growth in Network Infrastructure and Mobile Network businesses.
- Ericsson revenue grew steadily by 7% in 2022, driven by 4% rise in Networks segment together with 16% increase in Enterprise segment. By region, Indian 5G market share gain contributed to Ericsson's 21% increase in revenue in SEA, Oceania and India, while this advantage was offset by -16%, and -7% YoY decline in Northeast Asia and NA.



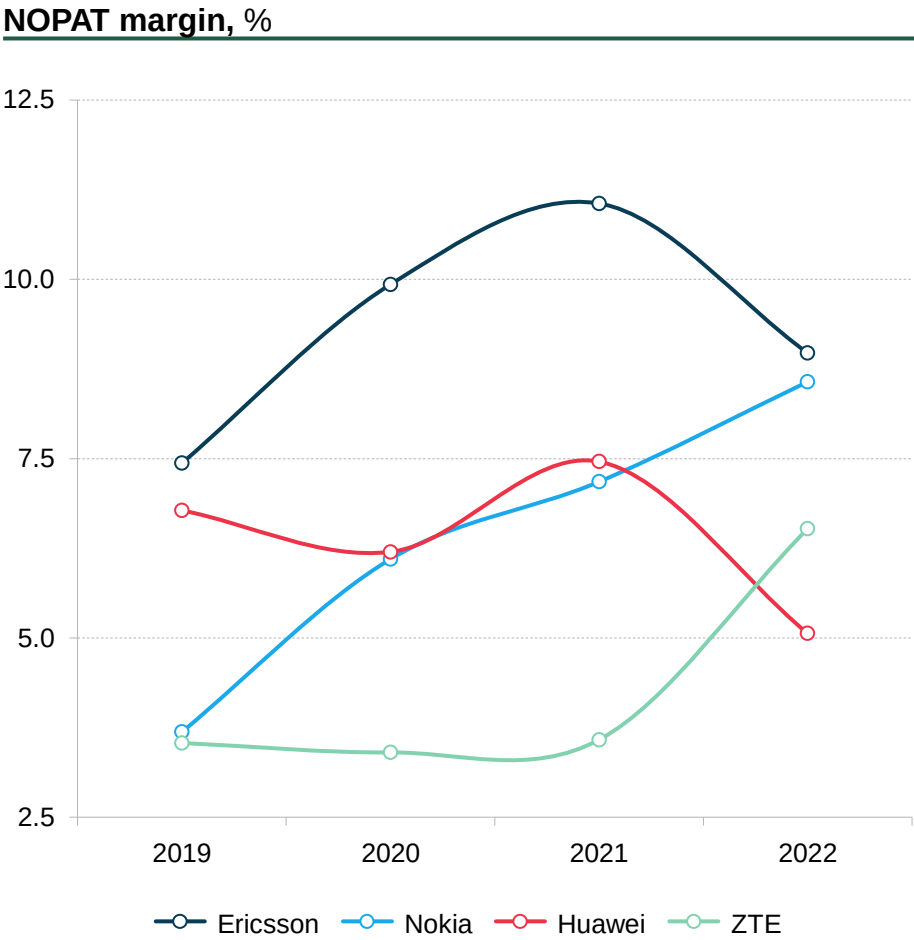


**Nokia and Ericsson managed to achieve higher-than-WACC ROIC of 15.4% and 15.3%, respectively in LTM as NOPAT margin rose.**

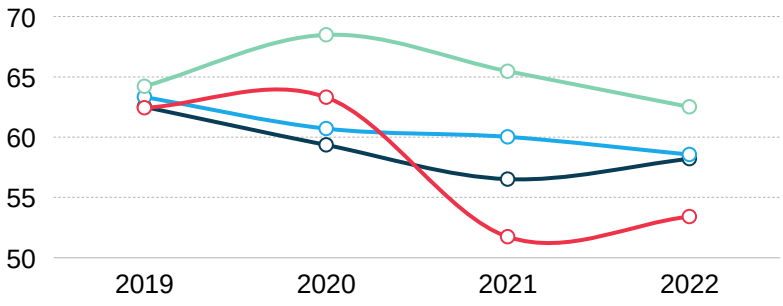




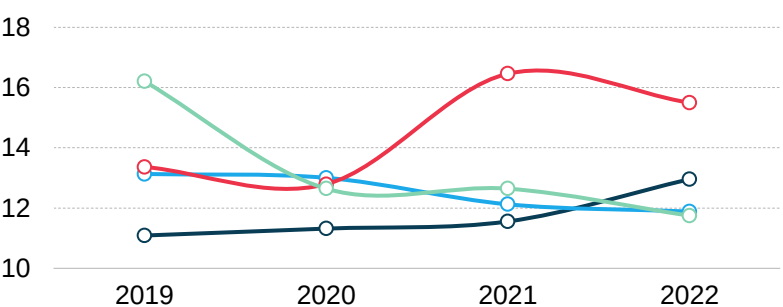
**Ericsson retained highest NOPAT margin in the peer group during 2022, ended at ~9%, driven by low cost of sales and SG&A expenses.**



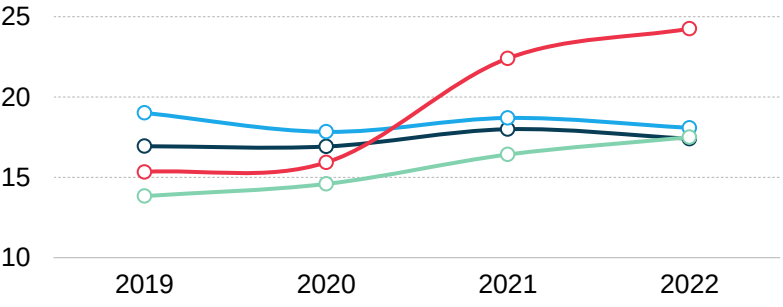
**COGS % sales**



**SG&A % sales**



**R&D % sales**

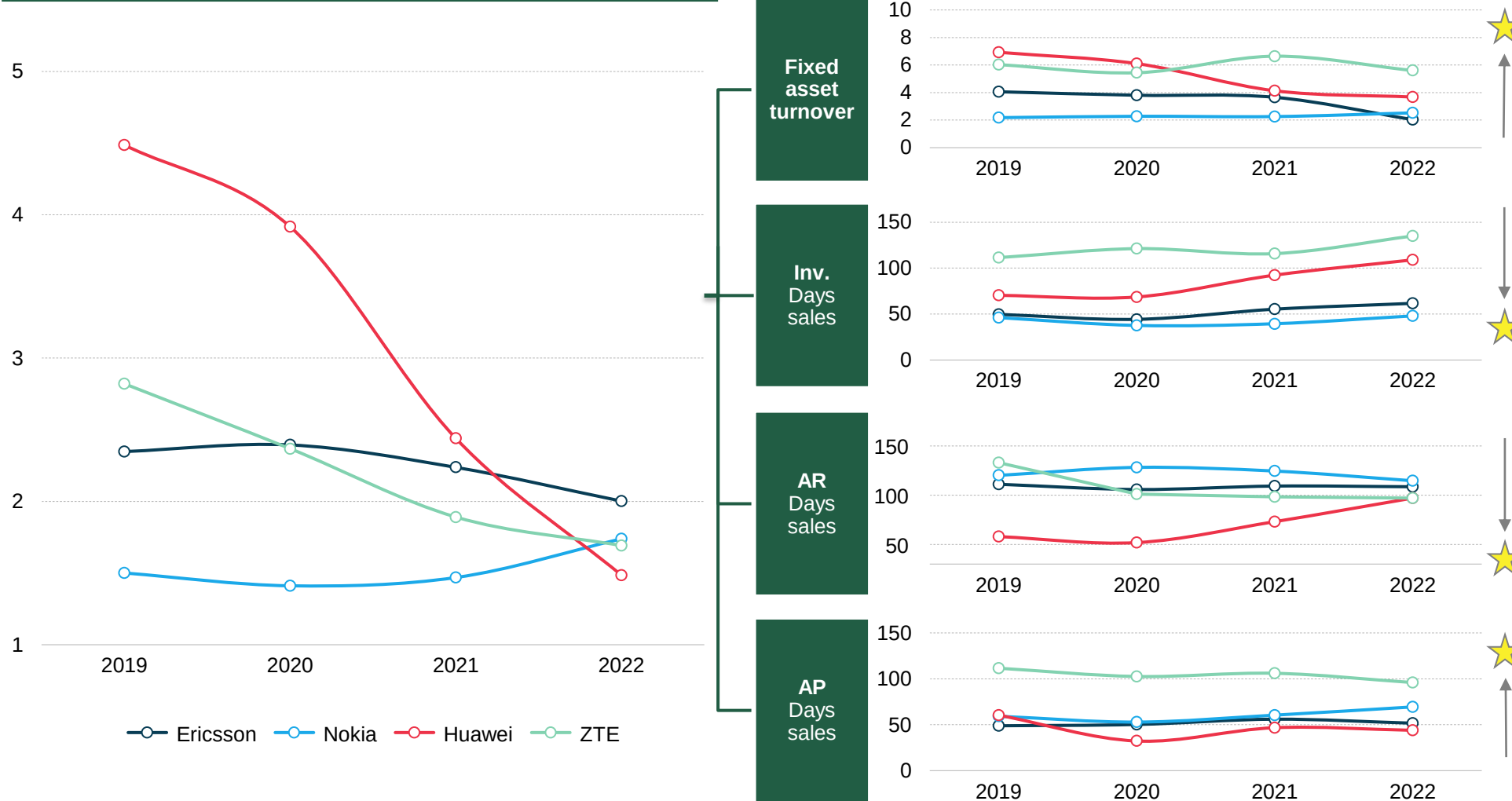


Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.



**Huawei, ZTE and Ericsson’s CTR ratio declined in 2022 due to decreased fixed asset turnover and longer inventory days, while Nokia CTR rose to 1.8.**

**Capital turnover ratio (CTR)**



Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.



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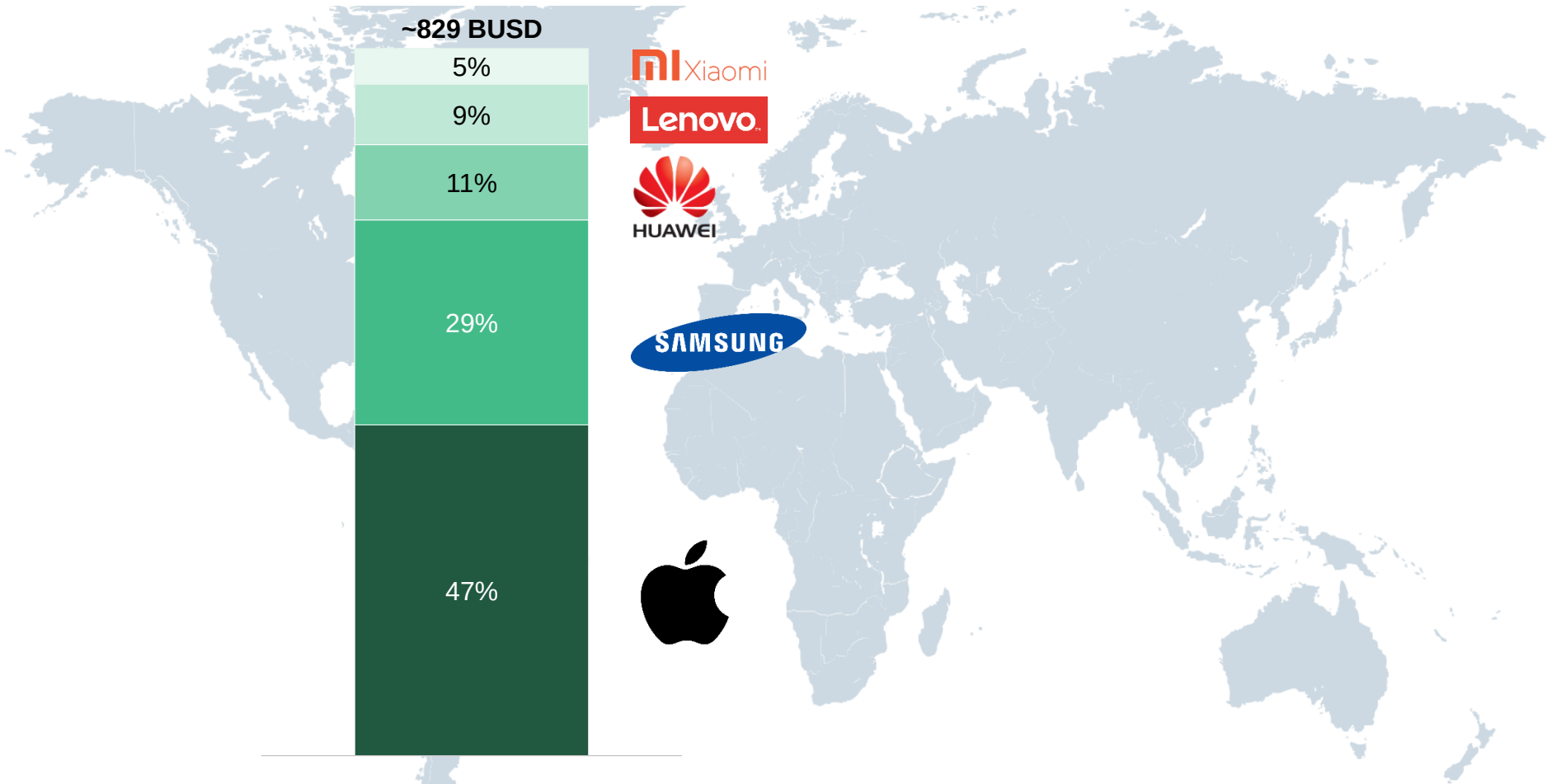
**3. Device OEMs**

About Applied Value



The Q4 2022 report includes five major device manufacturers – Xiaomi, Lenovo, Huawei, Samsung, and Apple; total LTM revenue of \$829B.

Report overview  
Revenue in BUSD, LTM



Note: Revenue based on group revenue. Due to data availability, Huawei, Lenovo and Xiaomi FY2022 data in this report are calculated by assuming Q4'22 data is the same as Q3'22

Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.



# Key takeaways from the Device OEM segment.

## Key takeaways

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Creating Shareholder Value</b> | <ol style="list-style-type: none"> <li>1. Apple's consistently high NOPAT margin of 21% coupled with leading capital turnover ratio of 12.2 led to stable high ROIC of ~262% in 2022.</li> <li>2. Huawei's ROIC fell by 11 pp. in 2022 compared to 2021 driven by both decline in NOPAT margin and 0.9 points drop in CTR, as a result of western countries' continued technology restrictions and sanctions.</li> </ol>                                                                                                                                       |
| <b>Revenue Performance</b>        | <ol style="list-style-type: none"> <li>1. The overall yearly revenue for selected device OEMs closed at \$829B, yet quarterly revenue for all selected OEMs had fallen on YoY basis.</li> <li>2. Apple reported a decline in quarterly revenue for the first time since 2019, with a year-over-year drop of 5%. Sales of Mac and iPhone were particularly affected, with a 30 percent and 8 percent decrease, respectively. Whereas Huawei revenue in Consumer Business fell by 14% YoY in 2022 due to reduced market share in smartphone business.</li> </ol> |
| <b>Margin Performance</b>         | <ol style="list-style-type: none"> <li>1. NOPAT margin for selected operators in 2022 declined by 2pp., averaged at ~9%</li> <li>2. Apple's profitability remains high, despite a decline in year-over-year revenue, with a NOPAT margin of 21%. While Huawei posted sharp drop in profit in 2022 as it could not revive cash cow smartphone businesses and invested heavily in R&amp;D.</li> </ol>                                                                                                                                                            |
| <b>Capital Efficiency</b>         | <ol style="list-style-type: none"> <li>1. CTR for selected companies averaged at 5.5 in 2022 with Apple outperforming peers and reaching 12.2, which further strengthened ROIC at very high levels.</li> <li>2. Samsung, Huawei and Xiaomi all experienced YoY decline in CTR during 2022 as inventory and trade receivable days increased.</li> </ol>                                                                                                                                                                                                         |



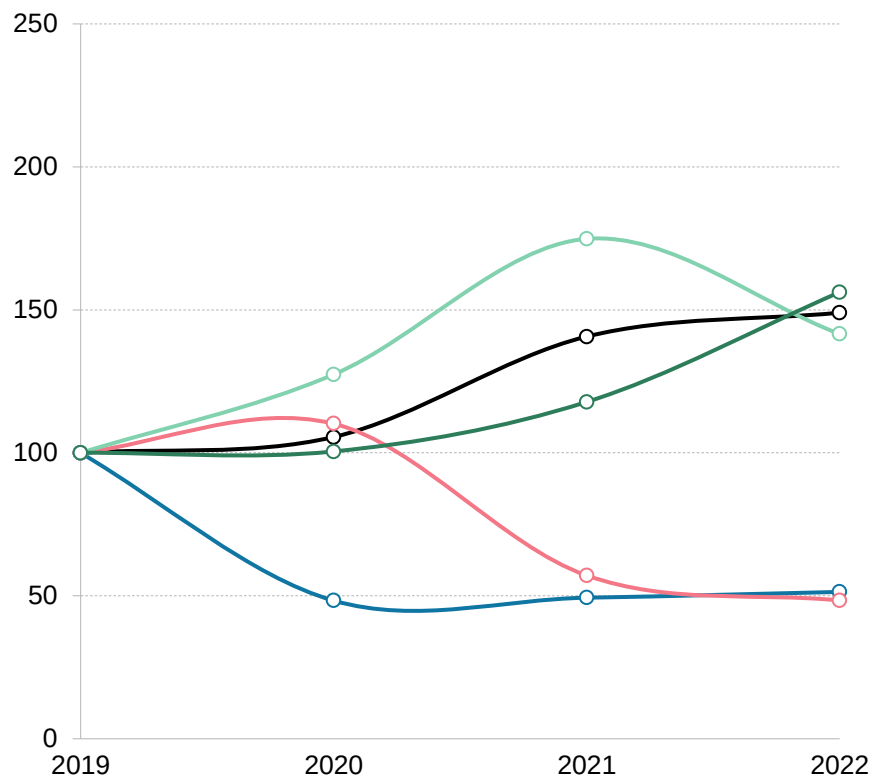
# Business Segments of Device OEMs.

| Company                                                                             | Business segments and revenue shares over LTM, (Q1'22 – Q4'22) %                                                                                                                                                                                                                  | Description                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |  <ul style="list-style-type: none"> <li>iPhone</li> <li>Mac</li> <li>iPad</li> <li>Wearables, Home and Accessories</li> <li>Services</li> </ul>                                                  | <ul style="list-style-type: none"> <li><u>iPhone</u>: Mobile Phones</li> <li><u>Services</u>: iTunes Store, iCloud, Apple Pay, other services</li> <li><u>Mac</u>: Laptops &amp; Personal Computers</li> <li><u>iPad</u>: Tablets</li> <li><u>Wearables, Home and Accessories</u>: Apple Watch, Apple branded accessories for Apple products</li> </ul>                                 |
|    |  <ul style="list-style-type: none"> <li>Device Experience (DX) - VD / DA</li> <li>Device Experience (DX) - Mobile Experience (MX) / Networks</li> <li>DS</li> <li>SDC</li> <li>Harman</li> </ul> | <ul style="list-style-type: none"> <li><u>DX</u>: Mobile and consumer electronics businesses</li> <li><u>Device Solutions</u>: Semiconductor Business and display panels</li> <li><u>Consumer Electronics</u>: TVs, monitors, printers, air conditioners and refrigerators</li> <li><u>Harman</u>: Infotainment, connected solutions for automakers, and consumers</li> </ul>           |
|    |  <ul style="list-style-type: none"> <li>Carrier</li> <li>Enterprise</li> <li>Consumer</li> <li>Other items</li> </ul>                                                                            | <ul style="list-style-type: none"> <li><u>Carrier</u>: Building telecommunications networks and services</li> <li><u>Enterprise</u>: Equipment, software and services to enterprise customers</li> <li><u>Consumer</u>: Manufacturing of electronic communication services (e.g. phones)</li> <li><u>Others</u>: Communication services not applicable to above descriptions</li> </ul> |
|   |  <ul style="list-style-type: none"> <li>Solutions and Services Group (SSG)</li> <li>Intelligent Devices Group (IDG)</li> <li>Infrastructure Solutions Group (ISG)</li> </ul>                    | <ul style="list-style-type: none"> <li><u>IDG</u>: Personal computer and smart devices, and mobile businesses</li> <li><u>DCG</u>: Provide data center solutions</li> <li><u>SSG</u>: Deliver enhanced services capabilities and new solutions</li> </ul>                                                                                                                               |
|  |  <ul style="list-style-type: none"> <li>Smartphones</li> <li>IoT and Lifestyle Products</li> <li>Internet Services</li> <li>Others</li> </ul>                                                  | <ul style="list-style-type: none"> <li><u>Smartphones</u>: Mobile devices, Smartphone, Tablet</li> <li><u>IoT &amp; Lifestyle products</u>: Smart TVs, scooters, vacuum cleaners, cameras, etc.</li> <li><u>Internet Services</u>: Preloaded apps, services and advertisements</li> <li><u>Other</u>: Miscellaneous additional services and products</li> </ul>                         |

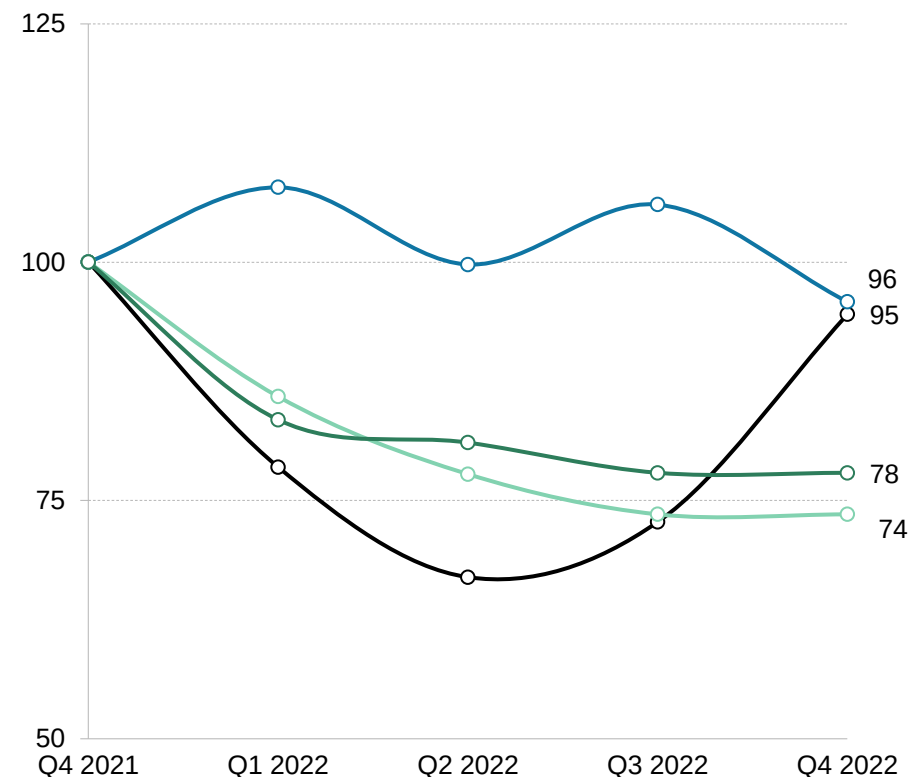


# Lenovo stood out in peer group's 2022 revenue – 56% rise compared with 2019; all device OEMs revenues experienced decline on YoY basis.

**Segment Yearly revenue development**  
2019 - 2022 (index 2019=100)



**Segment quarterly revenue development**  
Q4'21 – Q4'22 (index Q4'21=100)



—○— Apple —○— Samsung —○— Huawei —○— Xiaomi —○— Lenovo

Note: Included segments per company: Samsung (DX); Apple and Xiaomi (All segments); Lenovo (IDG); Huawei (Consumer Business);

Source: S&P Capital IQ, Annual/Quarterly/Half Year Reports.

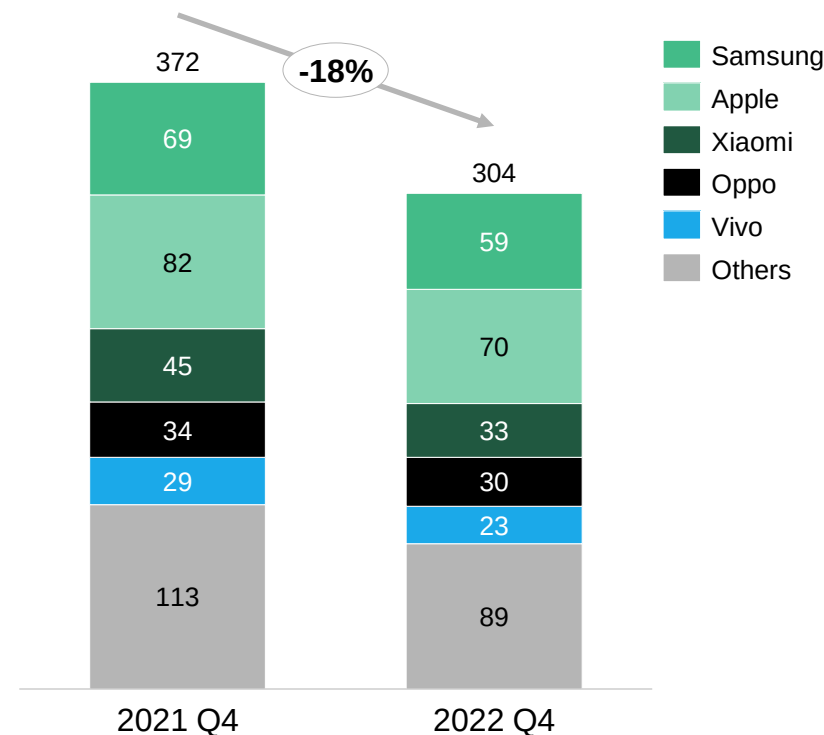


# Events across the Device OEMs sector from the fourth quarter.

## News and happenings for Device OEMs

|          |                                                                                                                                                                                                                                                                        |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oct-2022 | <b>Samsung</b> announced an expanded partnership with Google to take smart home interoperability to the next level. Samsung Galaxy phone and tablet users will be able to easily onboard Matter-compatible devices to both the SmartThings and Google Home ecosystems. |
| Oct-2022 | Global smartphone shipments continue to be impacted by slowed demand and setbacks in China. Chinese manufacturers suffered the hardest hit, as shipments from <b>Xiaomi</b> , <b>Oppo</b> Group and <b>Vivo</b> were all down by double-digit figures.                 |
| Nov-2022 | After the introduction of satellite connectivity by both <b>Apple</b> and <b>Huawei</b> in their latest smartphones, the feature would also be coming to next year's <b>Samsung</b> Galaxy S23 lineup.                                                                 |
| Dec-2022 | <b>Oppo</b> , <b>Vivo</b> and <b>Xiaomi</b> have reportedly agreed to shift some of their production from China to India. It is seen as a move by these companies to get a relief from strict restrictions that the Indian government had put in place.                |
| Dec-2022 | <b>Apple</b> recorded the most shipments of any OEM in Q4'22: 70 million. This is a significant increase of 42% from Q3'22, but still a 14% fall compared to the jump in shipments seen in Q4'21.                                                                      |

## Global smartphone shipments Million units



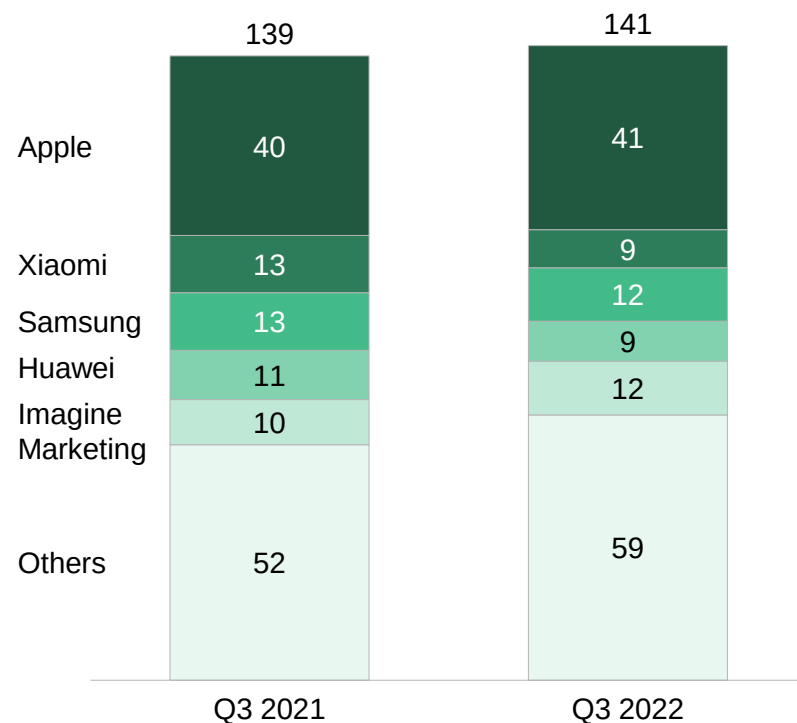
Global smartphone shipments declined by 18% Y-o-Y, ending at 304M units. Russia-Ukraine conflict, inflationary pressures, economic uncertainty, and macroeconomic headwinds kept the consumer sentiment weak, while smartphone users reduced the frequency of their purchases. The smartphone market remained under pressure in Q4'22, as the cost-of-living increased, shortage in the labor market, and consumers' purchasing power declined.





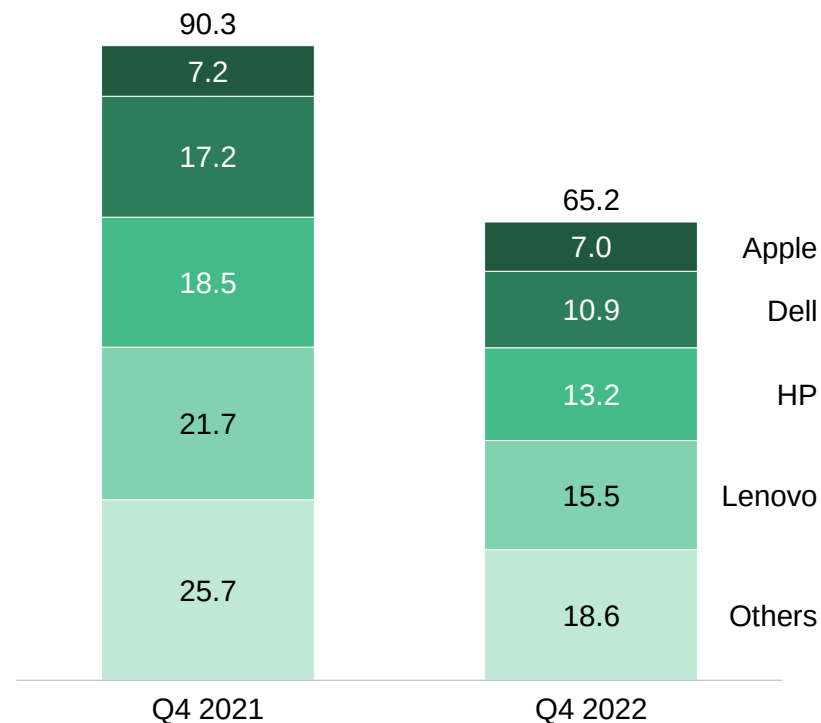
# Global wearables market increased to 141M units of shipments in Q3'22; while PC shipments declined significantly by ~28% due to inflation pressure.

**Global wearables shipments**  
Million units



Global wearables market stabilized in Q3'22 on YoY basis as macroeconomic pressure continues. Shipments increased steadily to 141M units. Indian wearables brands are eroding market share of traditional incumbents like Apple, Samsung, Huawei and Xiaomi. Indian wearables leader Imagine Marketing took over the second place in shipments volume during Q3'22.

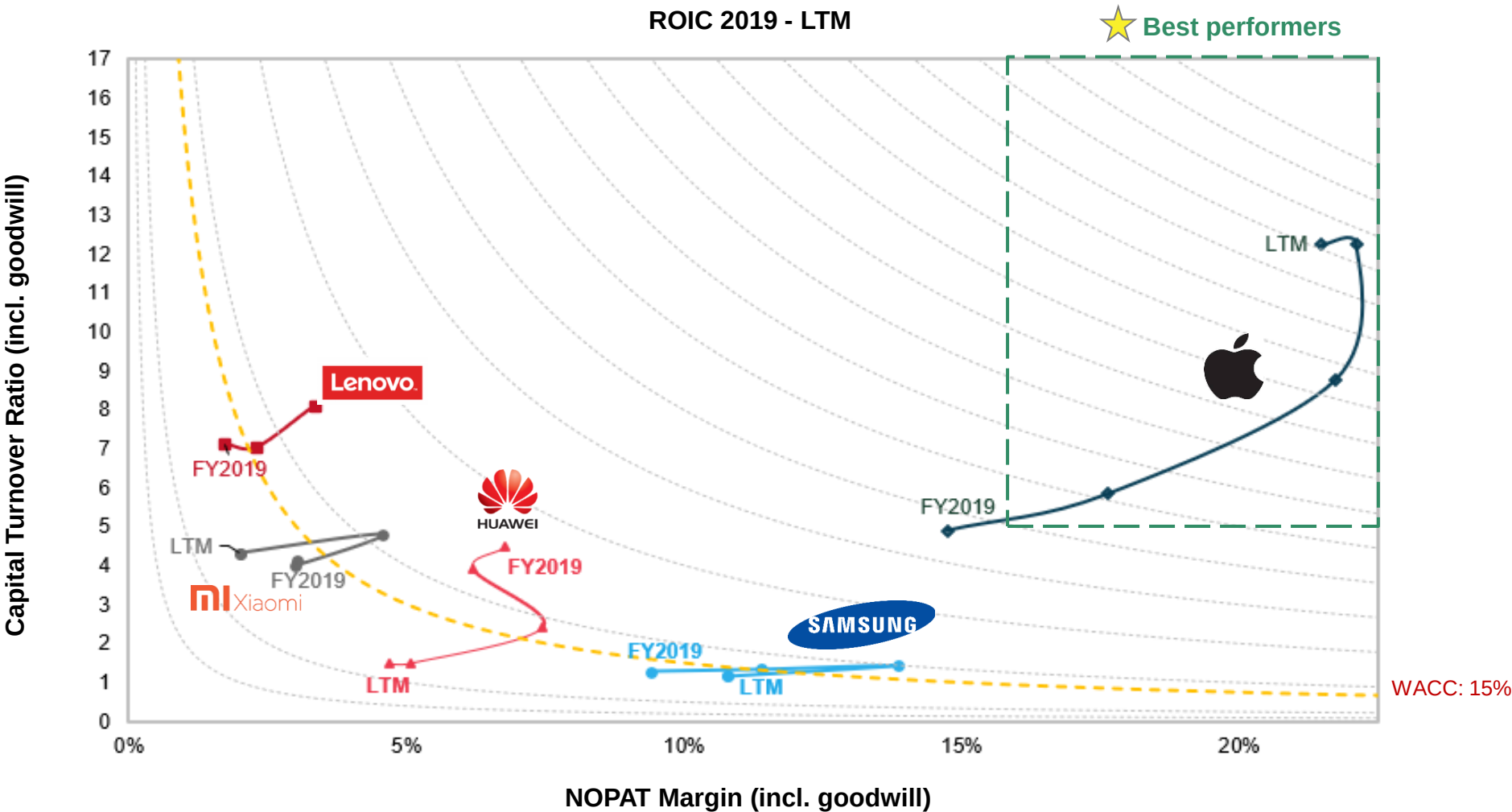
**Global PC shipments**  
Million units



Global PC shipments declined by 28% YoY in Q4'22 to ~65M units as rising inflation pressure froze PC demand, Q4 was the fourth consecutive quarter of YoY PC shipments decline. The slow down in PC demand brought total shipments in 2022 down by 15% comparing with 2021. Thus, market does not expect decent rebound of PC shipments in H1'23.



Apple has maintained its leading position in ROIC during LTM, supported by outperformed NOPAT margin and high capital turnover ratio.

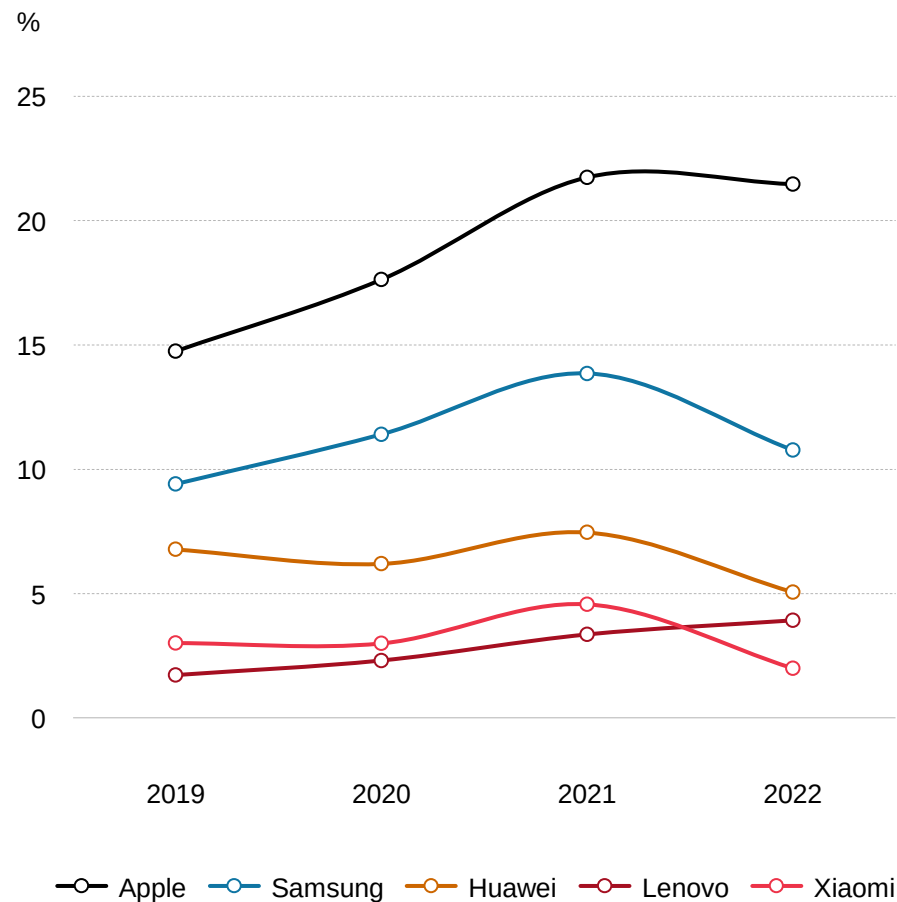


Source: S&P Capital IQ, Annual & quarterly reports, Applied Value Analysis.

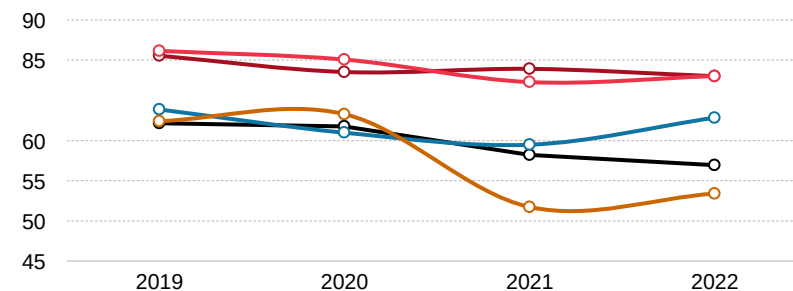


# Apple NOPAT margin was ~21% in 2022, whereas Huawei dropped most notably by 2.4pp. YoY, driven by high SG&A expense.

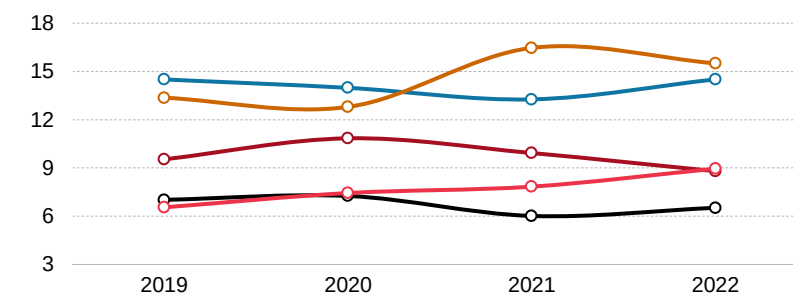
## NOPAT margin, %



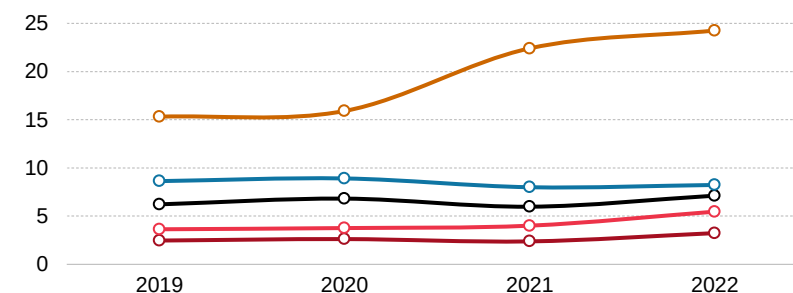
### COGS % sales



### SG&A % sales

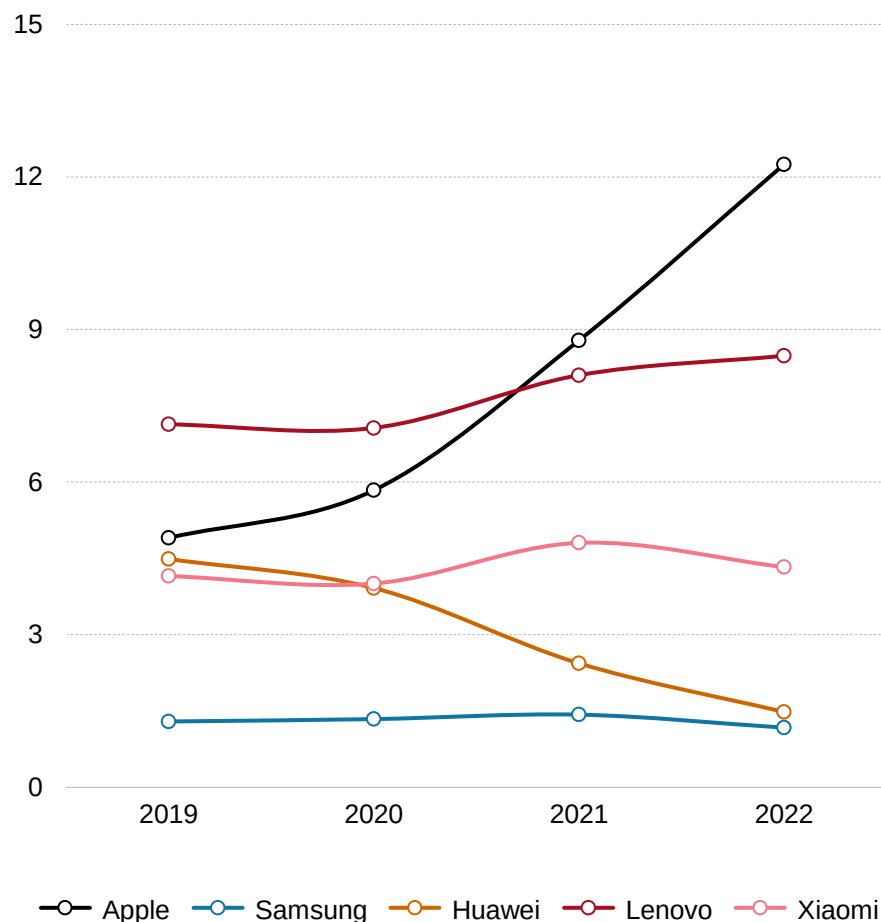


### R&D % sales

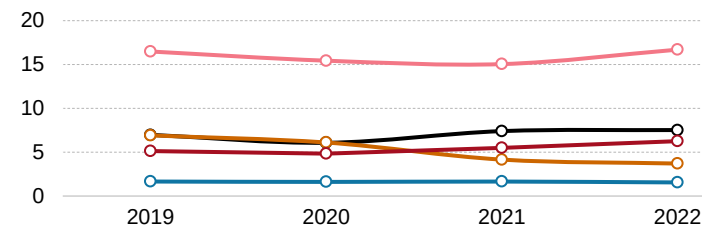


# CTR for Apple skyrocketed to 12.2 in 2022 after three consecutive years of significant growth, leading by short inventory and receivables days.

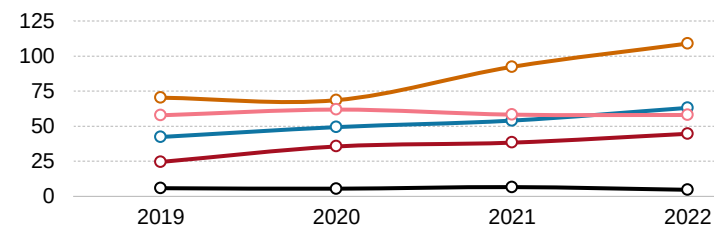
## Capital turnover ratio (CTR)



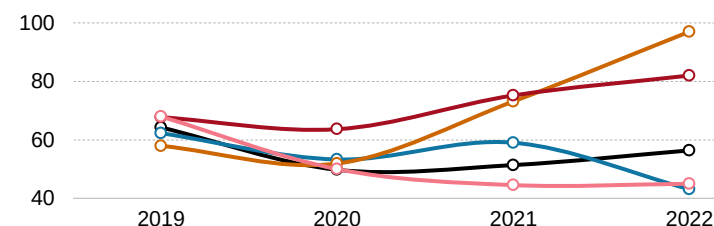
### Fixed asset turnover



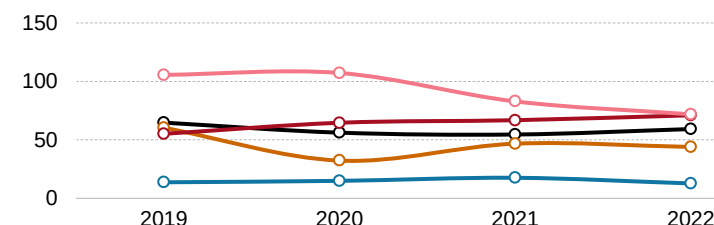
### Inv. Days sales



### AR Days sales



### AP Days sales



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**About Applied Value**



# Applied Value is a management consulting & investment firm founded on the principles of lean growth and entrepreneurship

1997

Background as an internal change agent in the **Kinnevik Group**...



K I N N E V I K

2023

...today, a hands-on consultancy supporting clients **across industries**

## Industries of Expertise

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- Chemicals & Process
- Industrials & Engineering
- Consumer Goods
- Automotive



## Applied Value Group



Investments



Management Consulting



Social Impact

### Selected portfolio companies

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Your Life. Your Way.

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rivermeadow



BAKE MY DAY

Division 5 Inc  
STEEL FABRICATION

KAUNIS IRON

PNP  
STÅLHALLARSOURCING  
VALUESODERFORS  
STEEL

APPLIED VALUE



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Straight Ahead  
MINISTRIES

World Vision



EXODUS

OPPORTUNITY  
International

WINSTON HOUSE



KRIS

CODE FOR LIFE  
What's Your Code?

ROI driven



Fact-based

Practical over  
theoretical

Hands-On

Global  
perspectives

# Our Lean Growth framework is based on Focus, Simplicity, Speed – guiding principles to raise client performance

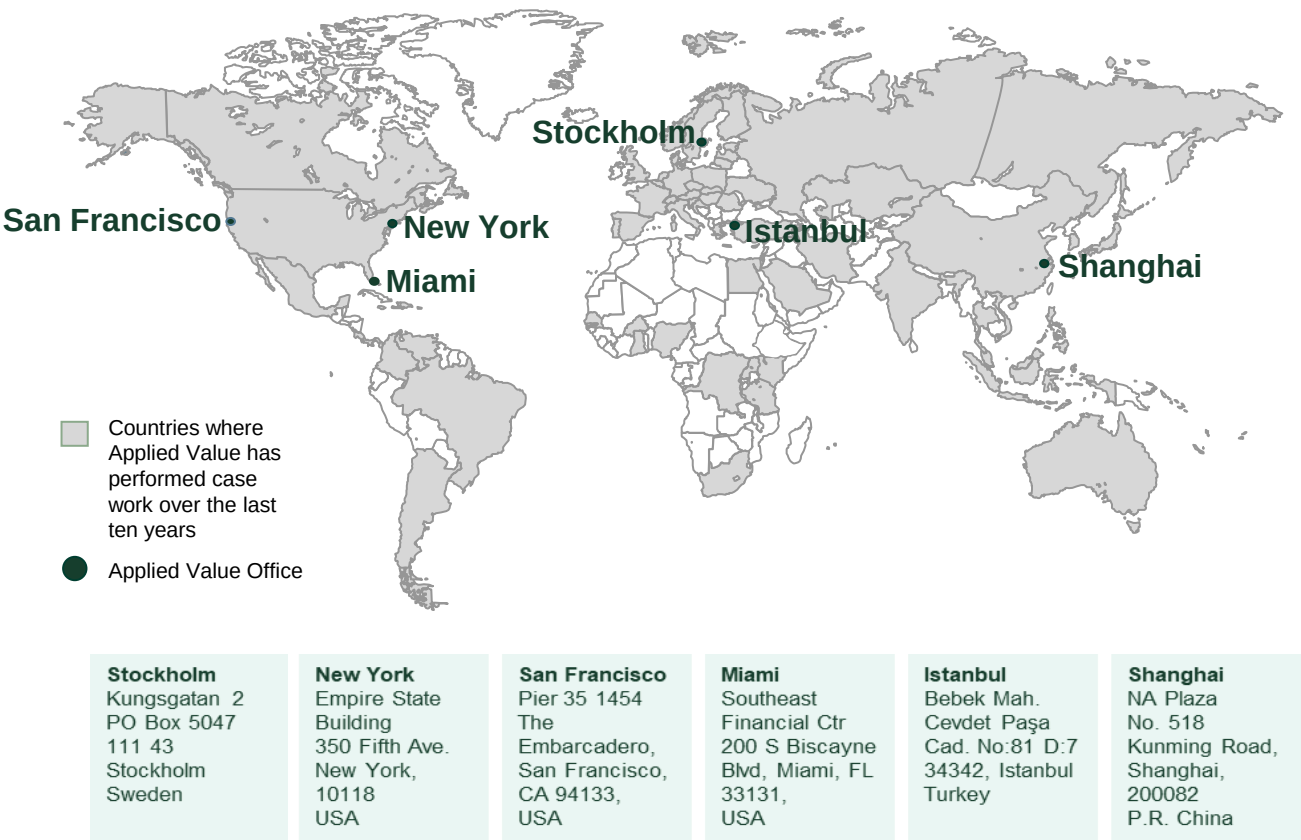


# Applied Value challenges and supports repeat global clients across industries from eight offices

## Selected Clients



## Applied Value Offices and Footprint







APPLIED VALUE GROUP