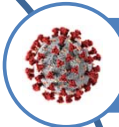



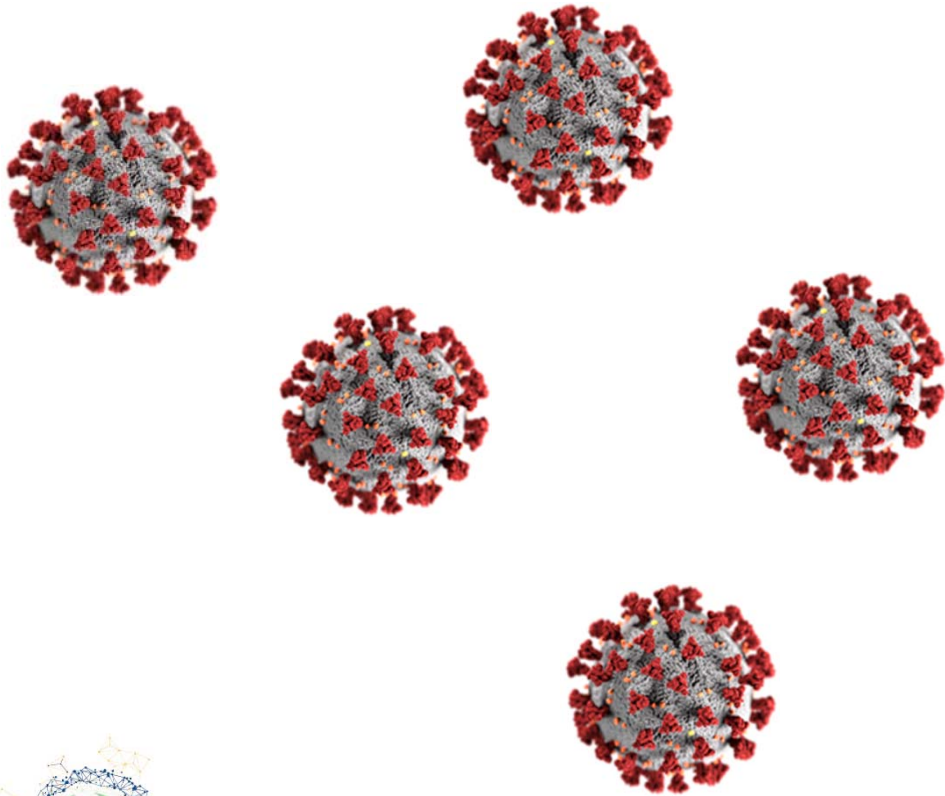


Agenda

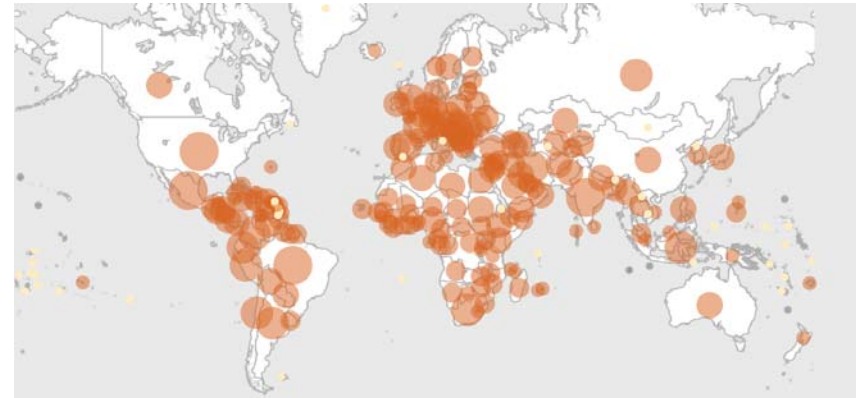
-  Global Overview & COVID's Impact
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-  Convergence – IoT in Commercial Buildings
-  PoE Devices



COVID-19



Number of deaths, Worldwide



WHO. 12th of October, 2020

Location	Confirmed cases	Deaths per M. inhabitants	Deaths
Worldwide	37,423,660	4,441	1,074,817

Trends Accelerated by COVID-19

Digital transformation

- ✓ Online platforms increasingly used
- ✓ Increasing sales of Cyber security software
- ✓ Higher level of mobility (working from home)
- ✓ Increase in automation and remote monitoring

"We have seen two years' worth of digital transformation in two months"

Microsoft's Chief Executive Officer Satya Nadella



"Work is no longer a place you go; it's what you do"

Cisco 4th of August, 2020

Macro trends

- ✓ Fewer permanent staff (learner organisation)
- ✓ More contract workers and staff used
- ✓ Increase in online retail, media, banking, education etc.



65+ startups enabling remote work

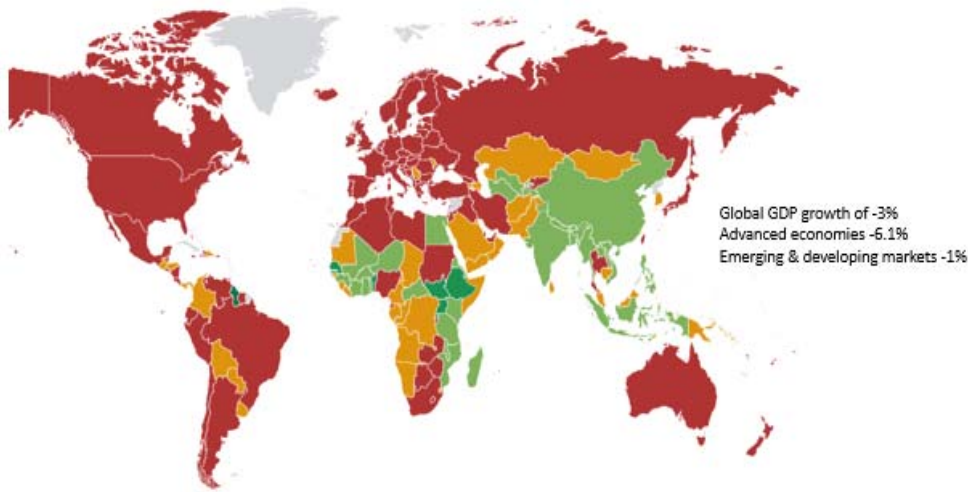
Messaging & Chat	Video Conferencing	Documentation & Knowledge
<ul style="list-style-type: none"> dialpad Quill Threads DISCORD spike VCC CloudApp Mastermost TROOPS 	<ul style="list-style-type: none"> around fuze lifesize loom Daily.co StarLeaf TechSmith 	<ul style="list-style-type: none"> Notion Dynamic Signal Bloomfire slapdash slab asdocs firefiles.ai Airtable
<ul style="list-style-type: none"> tandem Spatial teemly Pragli SOCCO Remotion 		<ul style="list-style-type: none"> monday.com Hive taskade MavenLink asana unito Basecamp paymo Wrike
<ul style="list-style-type: none"> workana clockwise krisp Mixmax calendly onelogin Focusmate motion woven 	<ul style="list-style-type: none"> Ditch Figma miro Frame.io Framer webflow 	<ul style="list-style-type: none"> Clubhouse codestream linear Linear
		<ul style="list-style-type: none"> Team Analytics bonfyre multitudes happeo REMOTE

Created by You. Powered by CBINSIGHTS

Global Economy



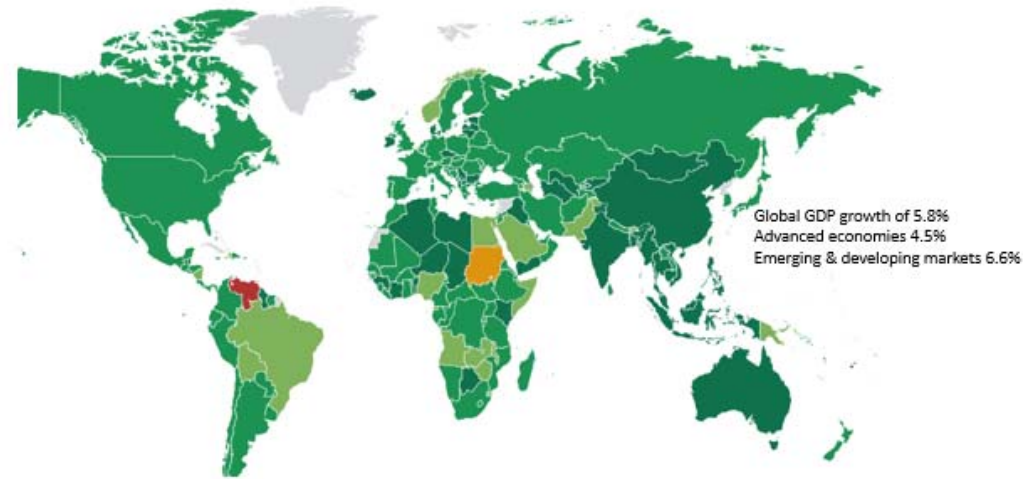
GDP forecast, 2020



● 6% or more ● 3% - 6% ● 0 - 3% ● -3% - 0 ● less than -3% ● no data

Source IMF, June 2020

GDP forecast, 2021



● 6% or more ● 3% - 6% ● 0 - 3% ● -3% - 0 ● less than -3% ● no data

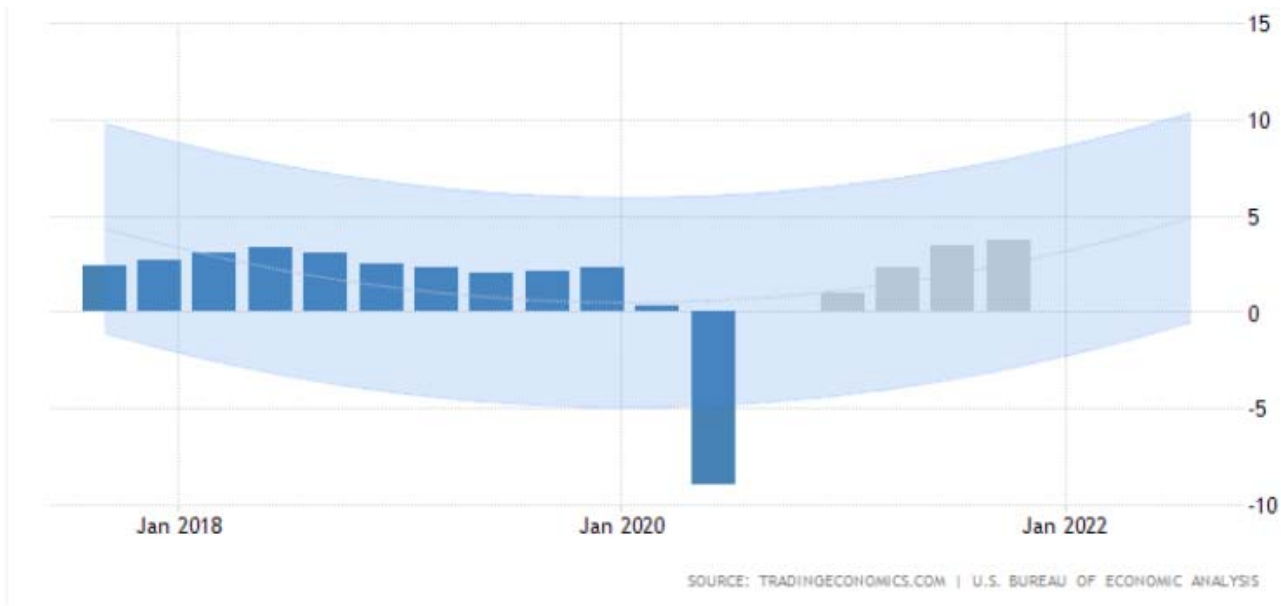
Source IMF, June 2020



U.S. Economy



GDP forecast, % change



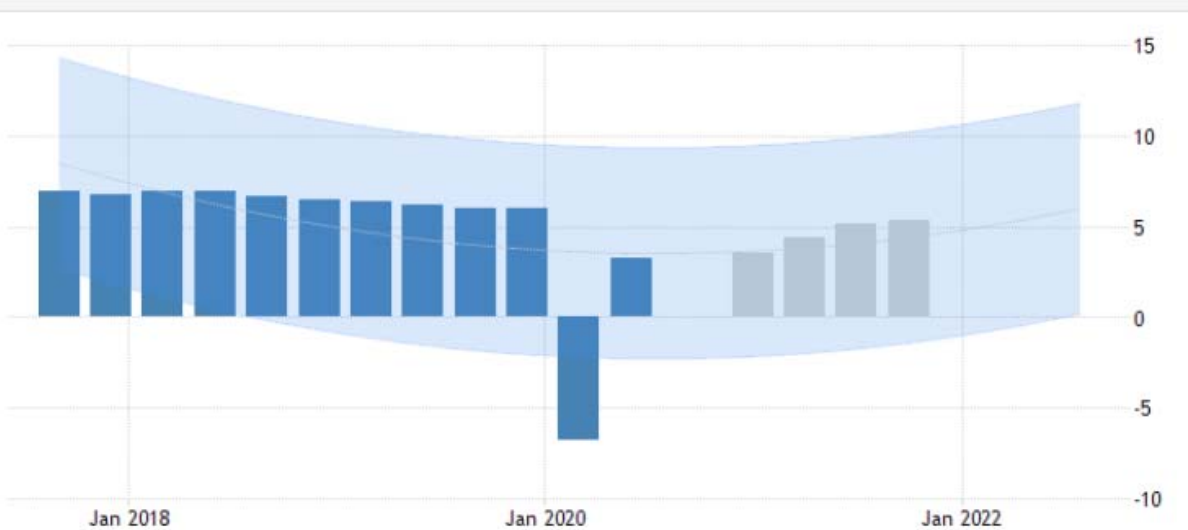
- Trade war with China
- The US Economy shrunk by nearly 31% in Q2
- US Election in November
- Recovery will depend on the US ability to control COVID



Chinese Economy



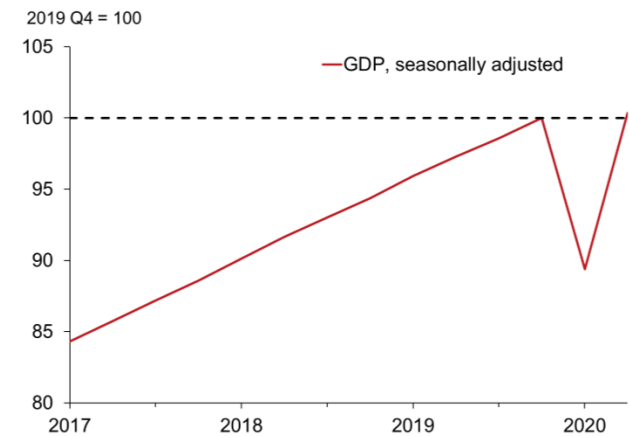
GDP forecast, % change



SOURCE: TRADINGECONOMICS.COM | NATIONAL BUREAU OF STATISTICS OF CHINA



- Weakest GDP growth for nearly 30 years, but still above other key economies
- Threat of trade wars, but huge domestic market to tap into
- Continue to be key global production hub, but companies looking at other options

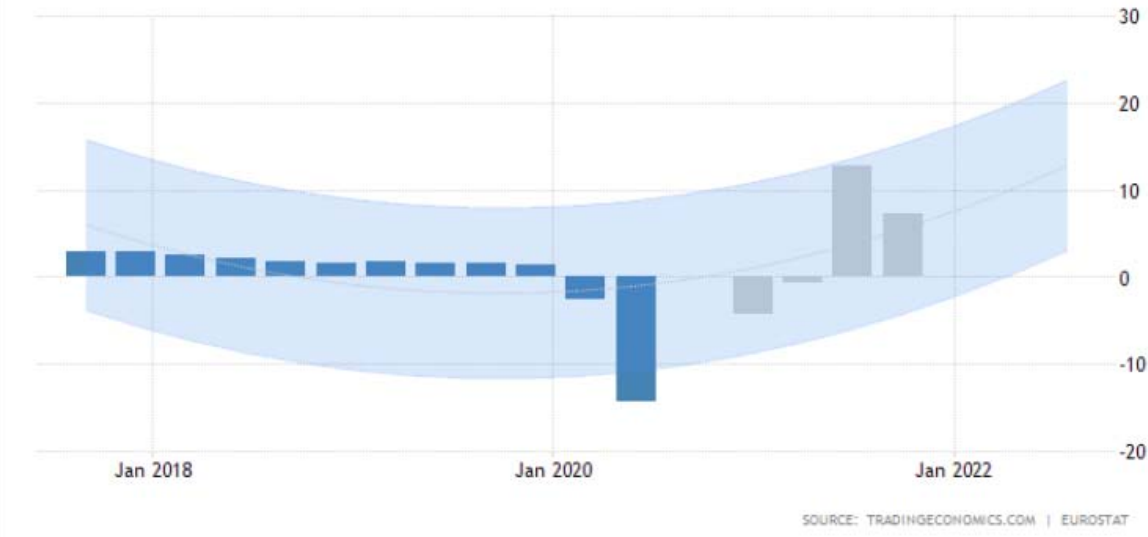


Source: OE/Haver Analytics

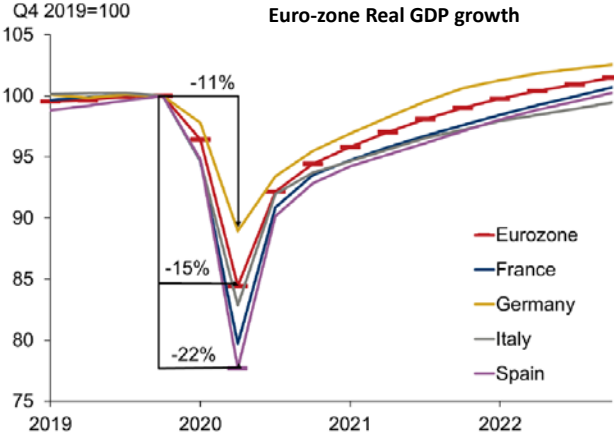
European Economy



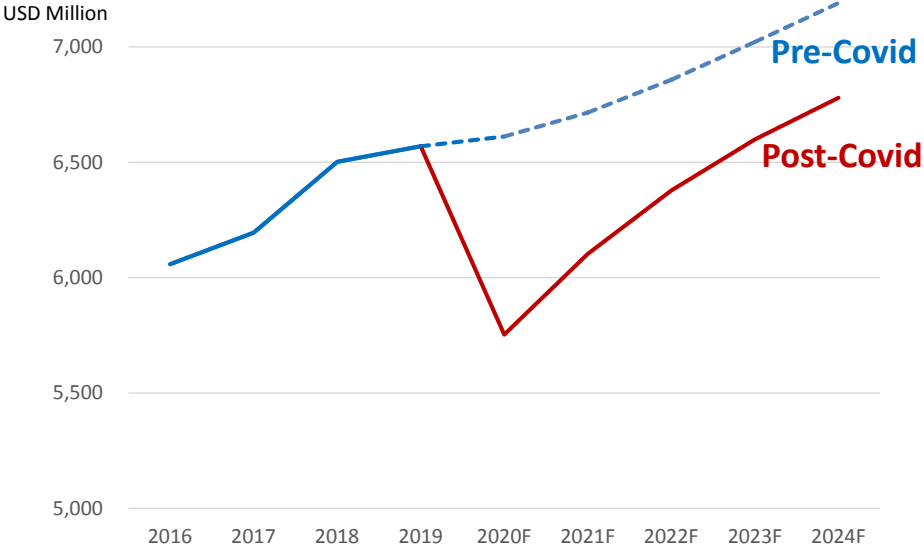
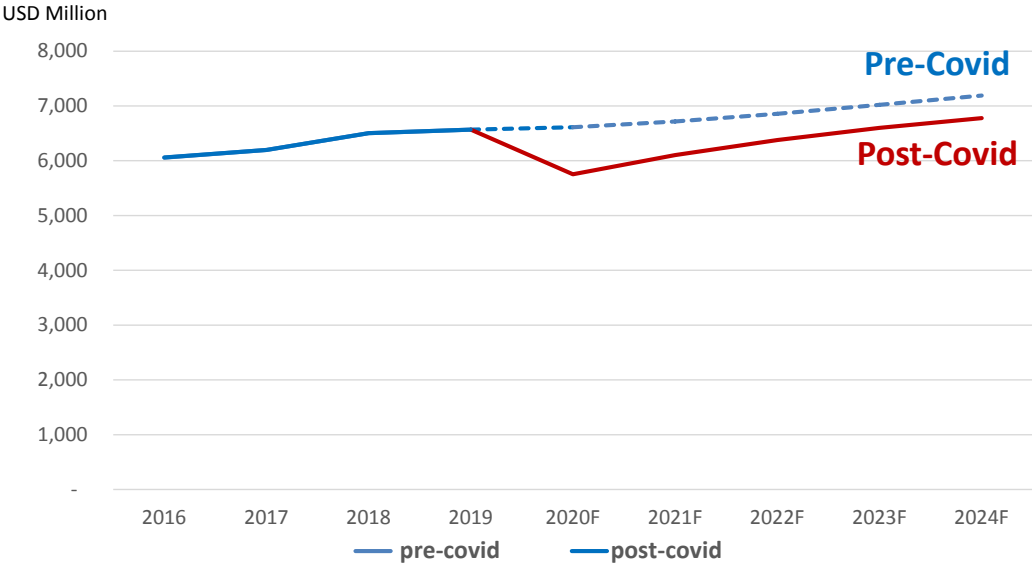
GDP forecast, % change



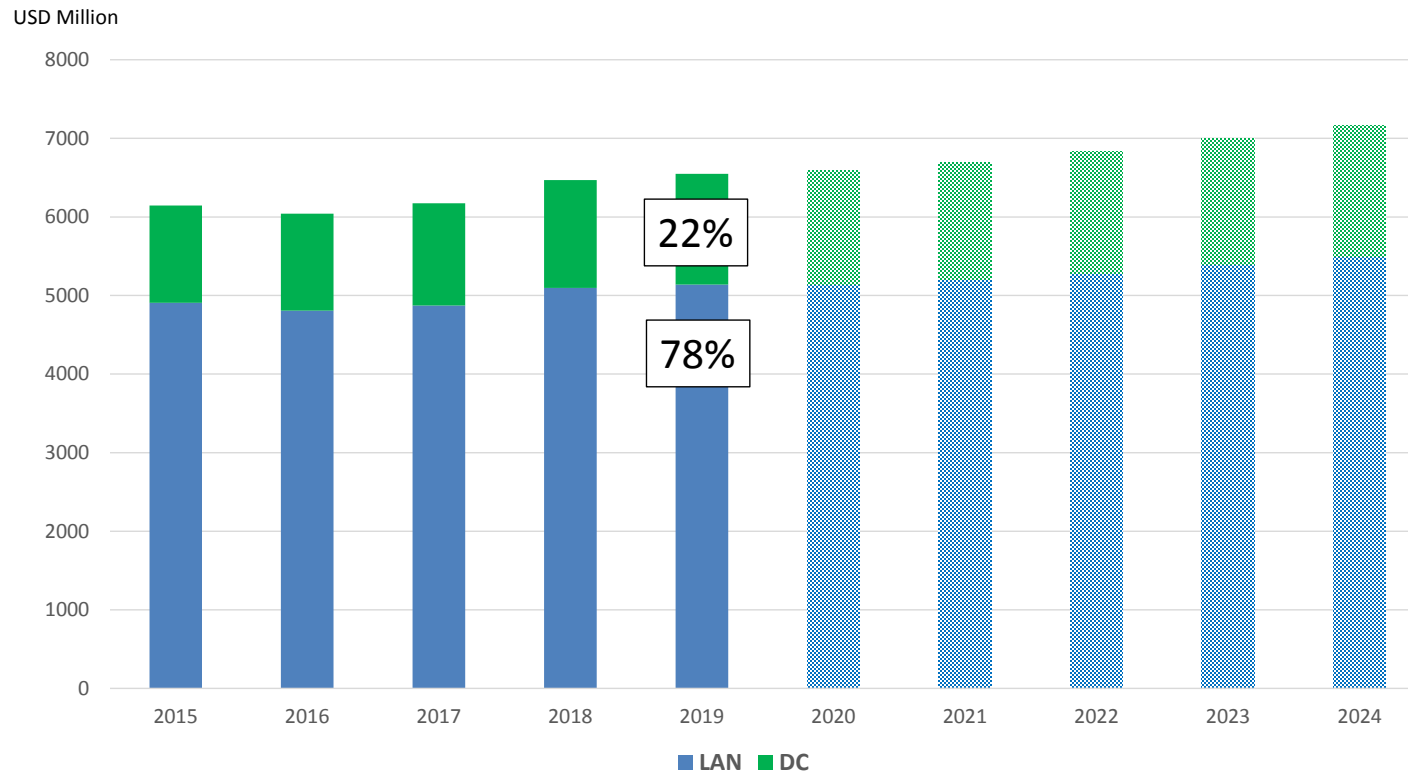
- Europe worst affected, but large variations
- UK and Southern Europe severely affected while Germany and Scandinavia fared well
- EU recovery fund agreed



Global Structured Cabling Pre- & Post COVID



Global Structured Cabling Pre-COVID, LAN and Data Centres

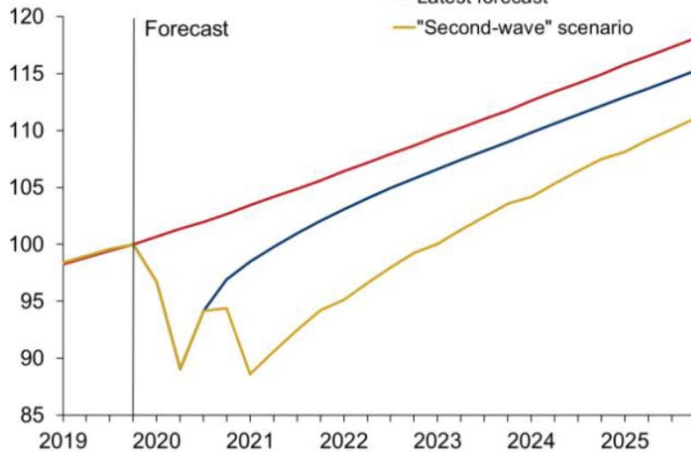


Post-COVID Global Forecast – LAN

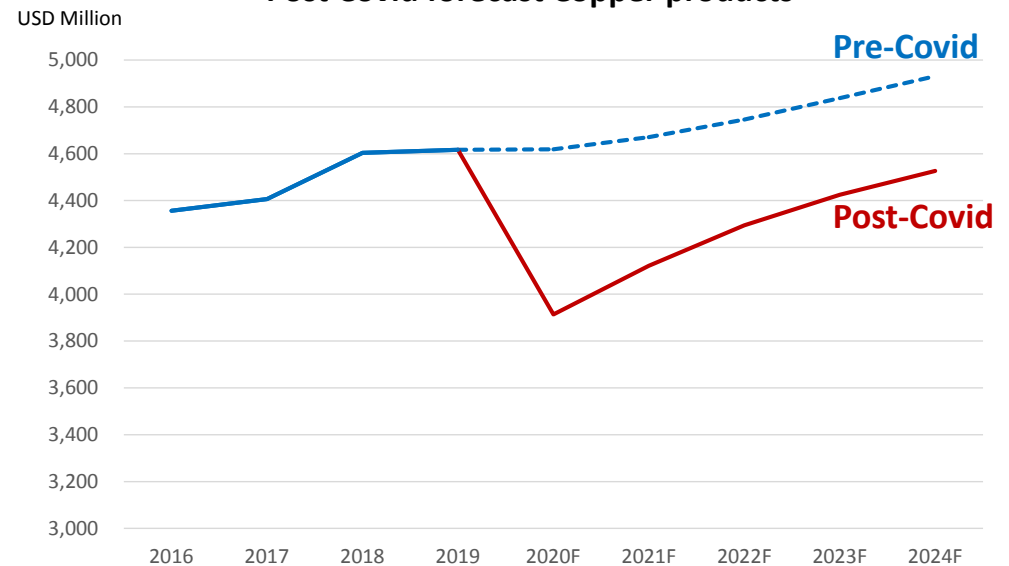
- Covid’s massive impact on sales in 2020
- Projects postponed and some cancelled in 2020
- Wireless increasing
- Less fixed voice & data outlets
- Moderate increase in connected building service devices
- Revised Global CAGR 2019 – 2024 of -0.4%

World GDP

2019Q4 = 100

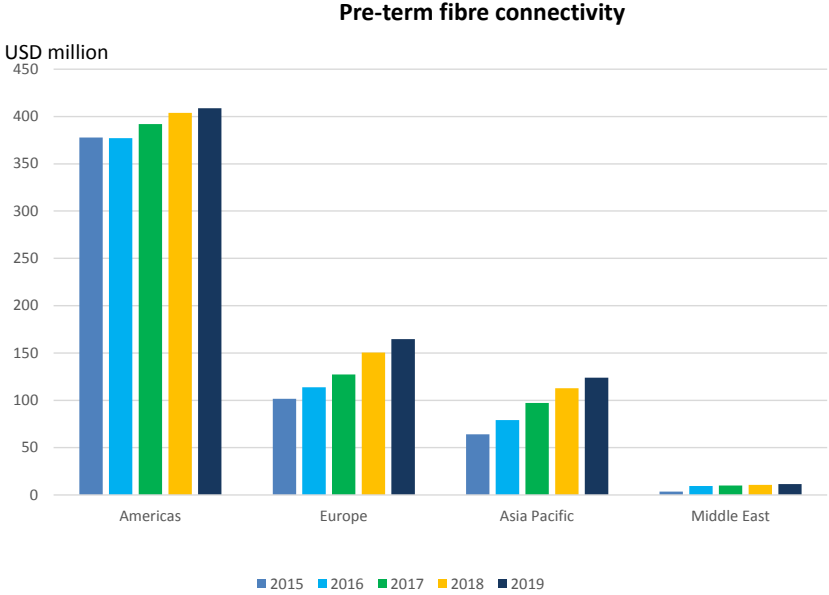
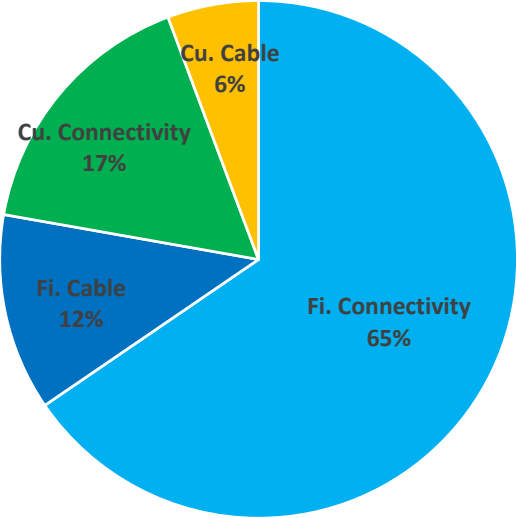


Post Covid forecast Copper products

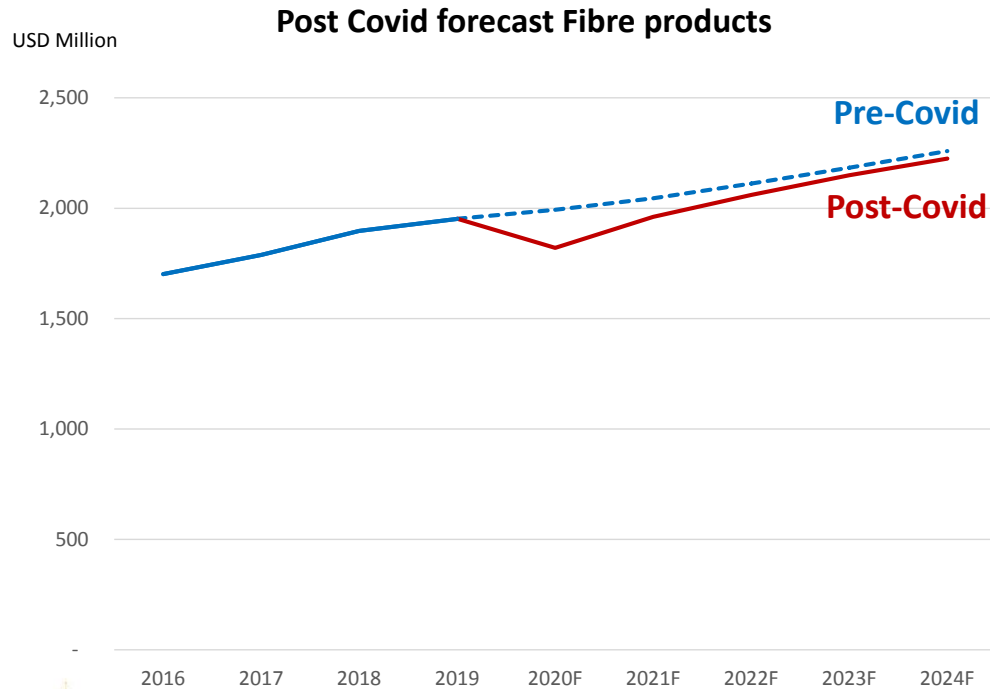


Source: Oxford Economics, Haver Analytics

Global Structured Cabling in Data Centres



Post-COVID Global Forecast – Data Centres



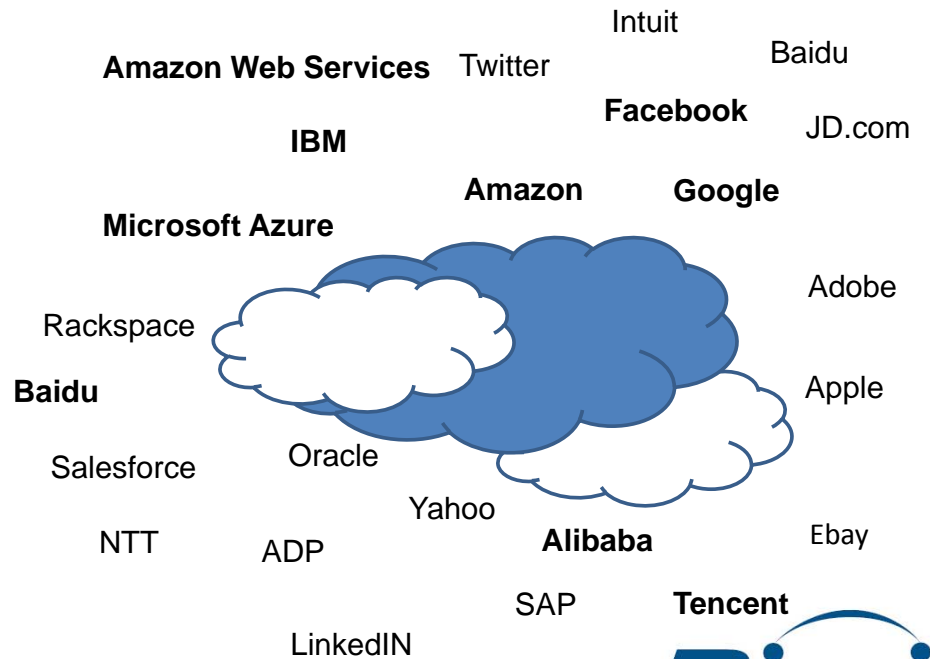
- Global IP traffic continues to increase
- Projects postponed due to lock-down
- Back at 2019 level in 2021
- Global CAGR 2019 – 2024 of 2.6%



Hyperscales

- 20 Hyperscale DC operators operate 500 - 550 data centres today
>700 DCs by 2030
- Traditional (non-cloud) IT infrastructure continues its decline, but still accounts for 44% in 2020

Hyperscale DC operators:



Premise, Edge and Cloud

Edge (Gateway, hub, base station)

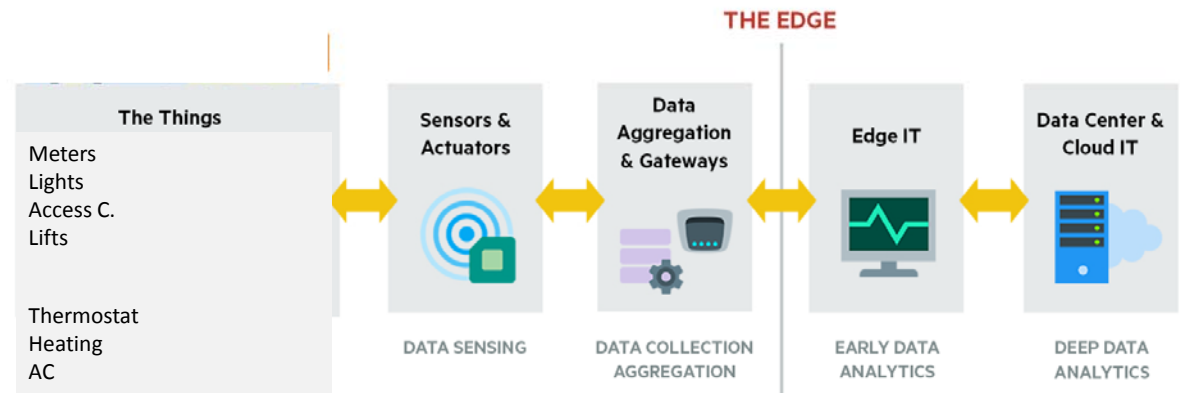
- Device (software) pre-process and store data locally
 - Speed, cost and security
- Edge computing is still small
- Growth mainly 5G and consumer related

Cloud

- Complex analytics
- Peak demand (cloud)

Premise DC

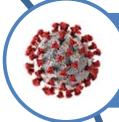



- Sensitive data



=> Hybrid solutions

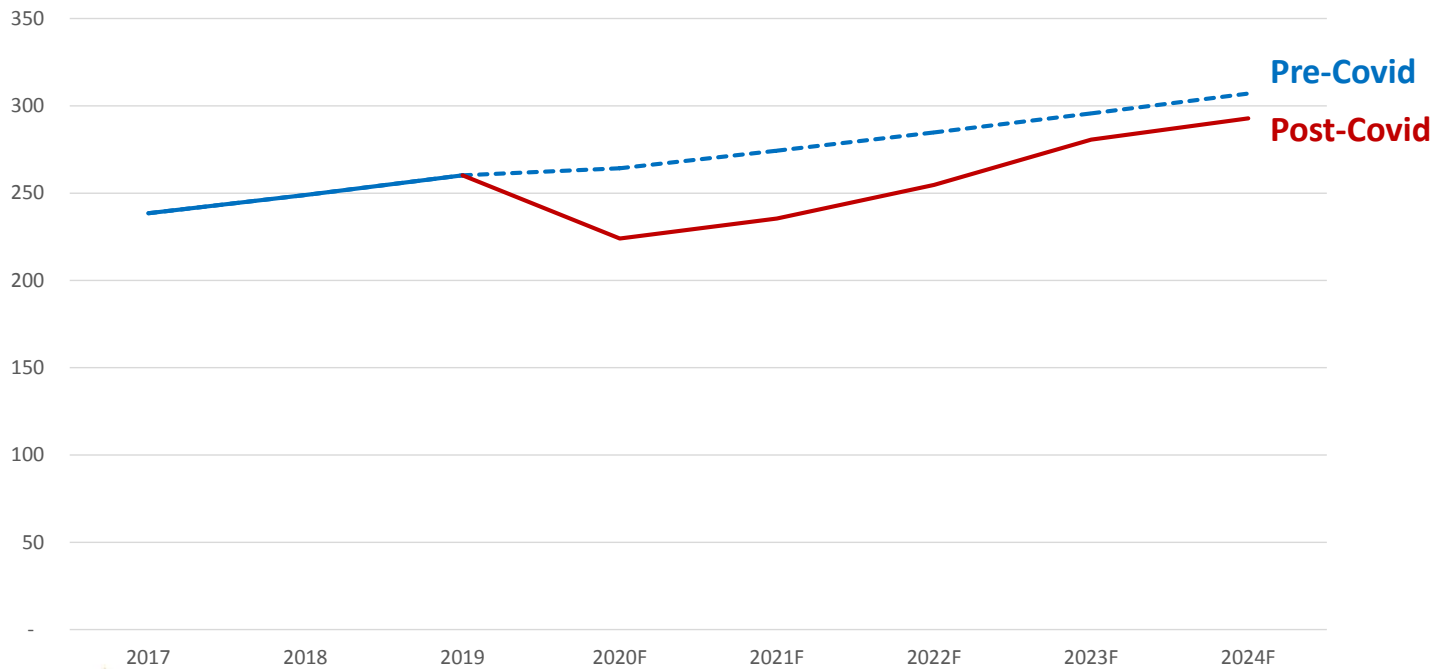


Agenda

-  Global Overview & COVID's Impact
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-  Convergence – IoT in Commercial Buildings
-  PoE Devices



Middle East

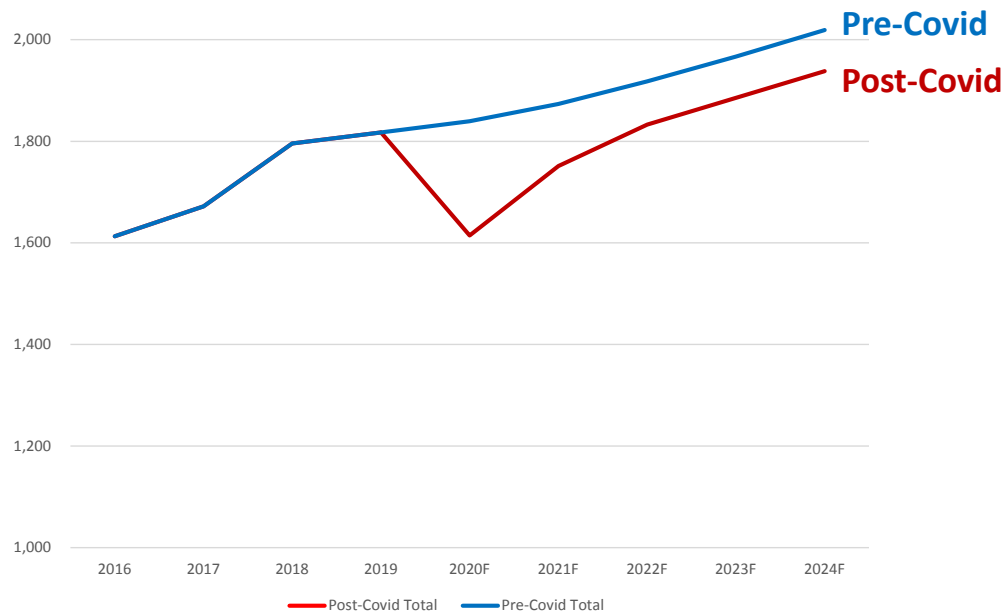


- Decline in cabling sales by 14% in 2020
- Oil revenue impact & Covid
- Moderate growth forecast
- Back at 2019 sales in 2023

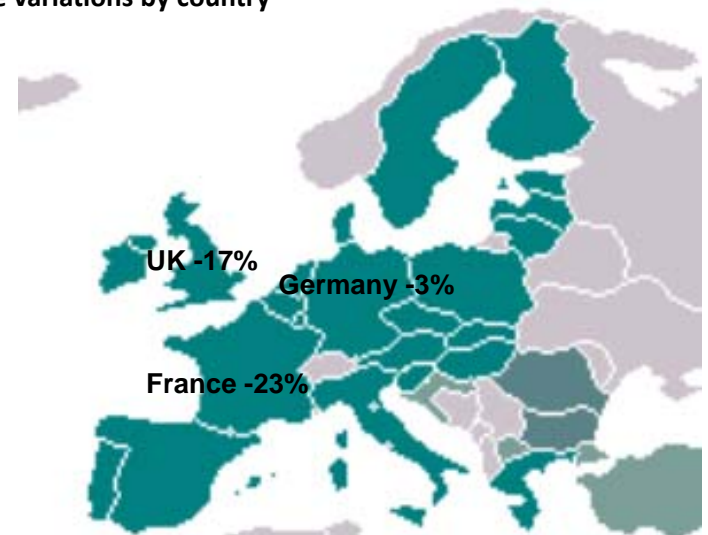
Region est. include: KSA, UAE, Egypt & Qatar



Europe



- Cabling sales declined 12% in 2020
- Large variations by country



Verticals

Negatively Impacted



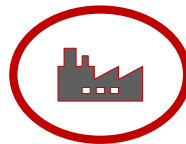
Tourism & hospitality



Aerospace



Transport



Motor vehicles



Education



Construction and Real Estate

Positively Impacted



Data centers & software



Pharmaceuticals & Hi-Tech goods



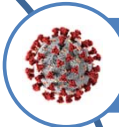



Healthcare



Ecommerce, delivery, warehousing



Agenda

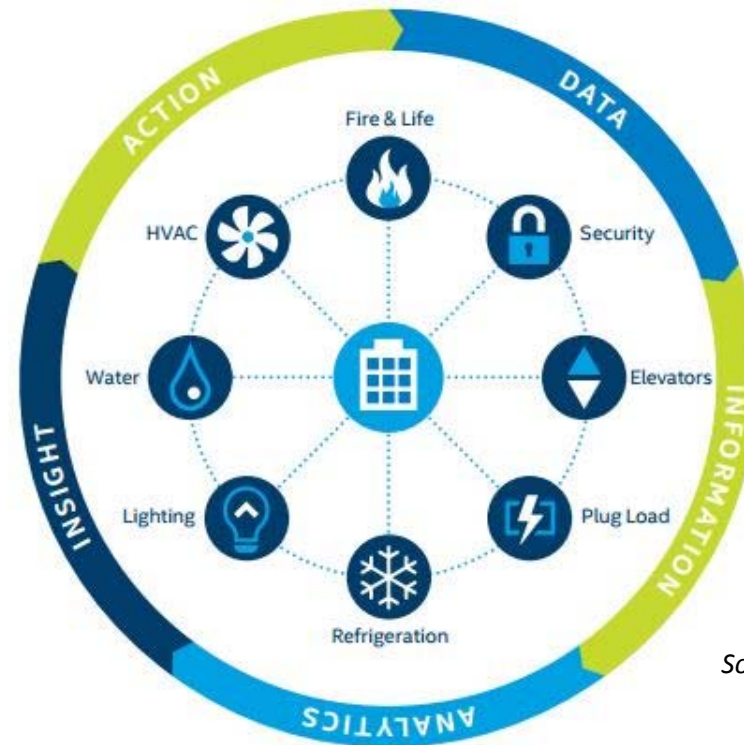
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Convergence and IoT

A lot of hype, so:

- How many devices are actually being connected in commercial buildings?
- What products are being connected to the Ethernet (wired) networks
- What is happening with wireless in buildings? - Which devices are being connected?
- What are the trends in the smart building space?



Source: Intel



Estimation of Connections - Methodology

Ethernet / structured cabling installed in LAN/commercial buildings worldwide

Million connections / nodes installed in commercial buildings

Data & Voice

Wireless Access Points

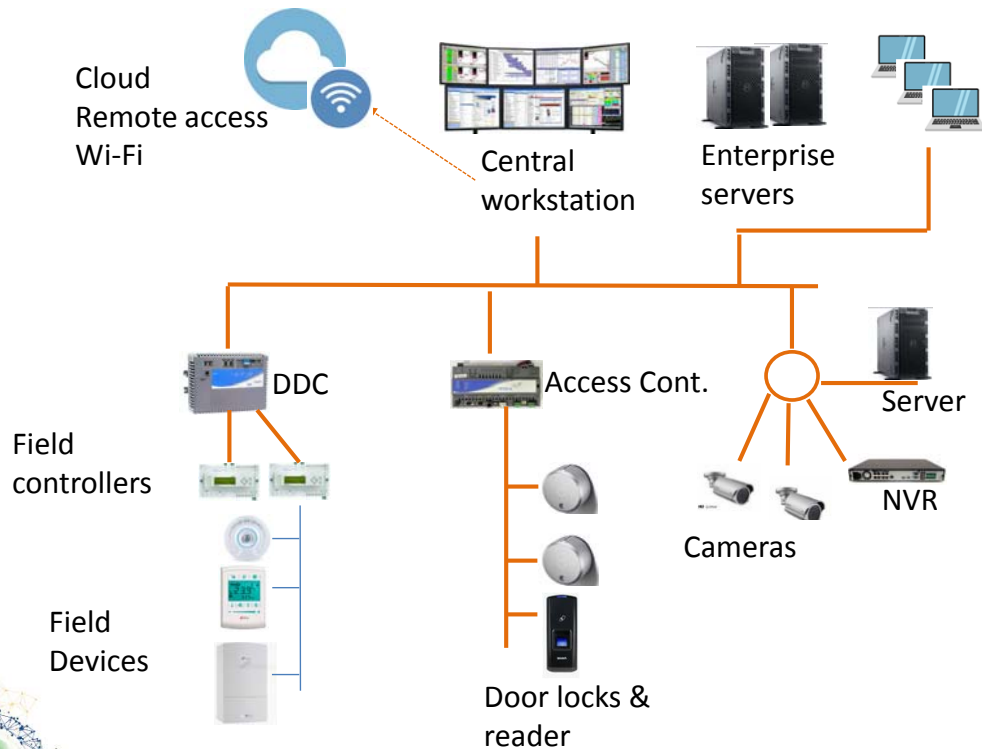
Building Service products

- IP uptake
- New + refurbishment
- Volume or penetration

Connected devices



Premise Network Infrastructure

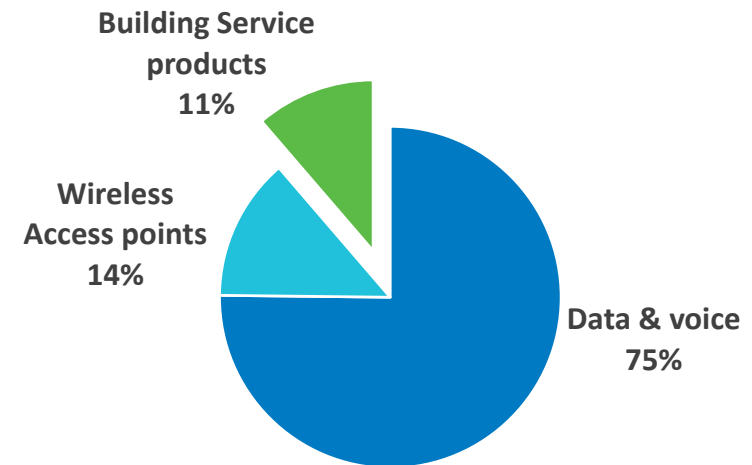
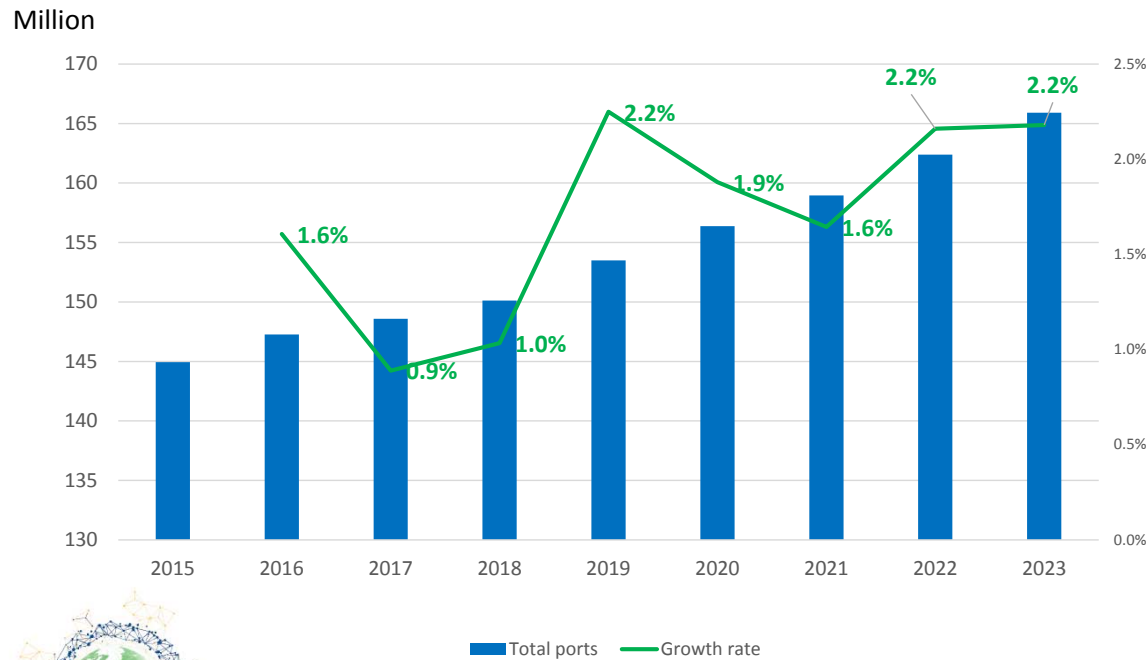


- A number of dedicated sub-networks with a common backbone or connected via V-LAN
- = one physical network supporting multiple virtual subnets



Number of Connections/Drops (wired), Pre-COVID

Worldwide sales of copper nodes/connections



Buildings – The New Working Normal

- *Need to build confidence and trust for tenants to return to buildings*

- ✓ Redesigned lay-out
- ✓ Building occupancy tracking
- ✓ Contact tracing applications
- ✓ Access to buildings
- ✓ Temperature measurements
- ✓ Touch free/contact free equipment
- ✓ Air quality (fresh/cleaned air)
- ✓ Cleaning of facilities & surfaces
- ✓ Real-time record keeping of cleaning

Solutions & Opportunities

- Re-opening of buildings -> maintenance
- Innovative solution -> to reduce cost
- Increase in remote monitoring
- New offering to solve Covid related issues
- Partnerships



More retrofit



Increase in service & maintenance



Increase scope & expertise

CORONAVIRUS SAFETY

Follow these easy steps to help prevent the spread of COVID-19.



Disinfect surfaces around your home and work.



Wash your hands for at least 20 seconds.



Sneeze or cough? Cover your mouth.

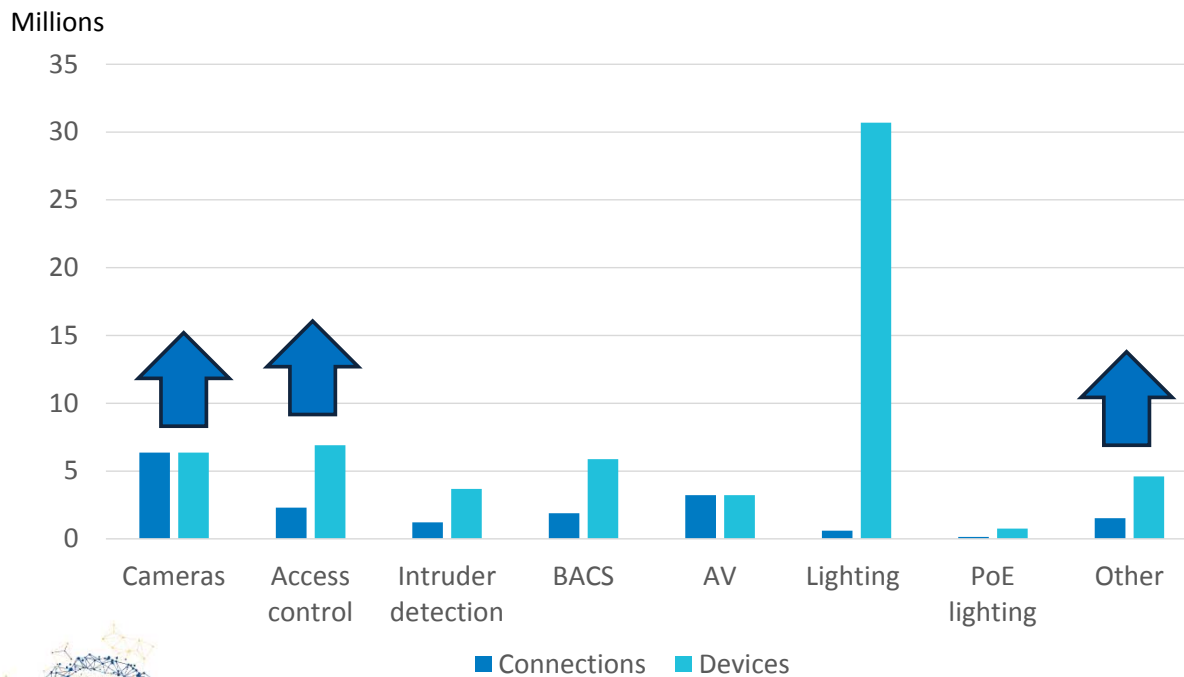


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Ethernet Connections & Devices in Commercial Buildings

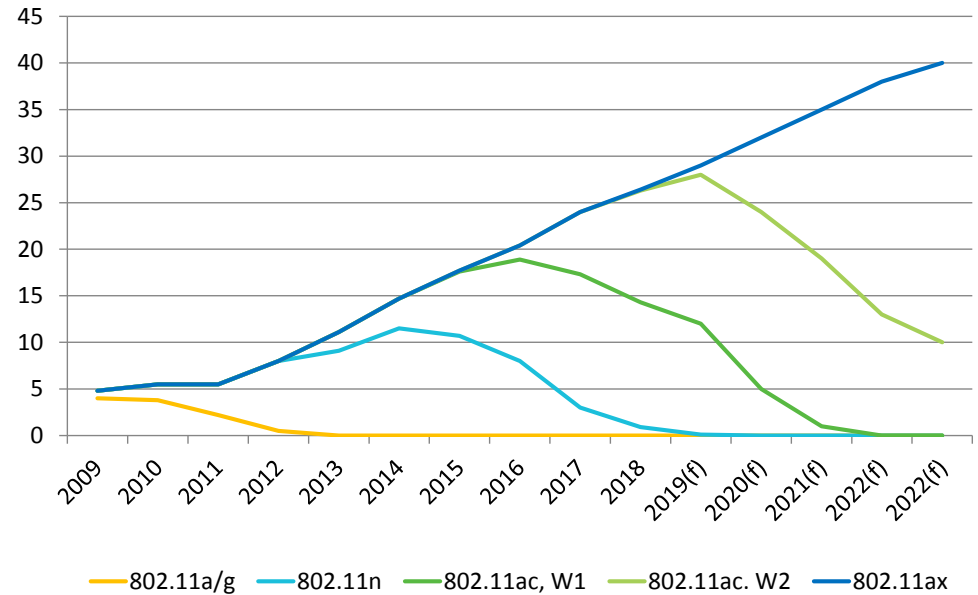
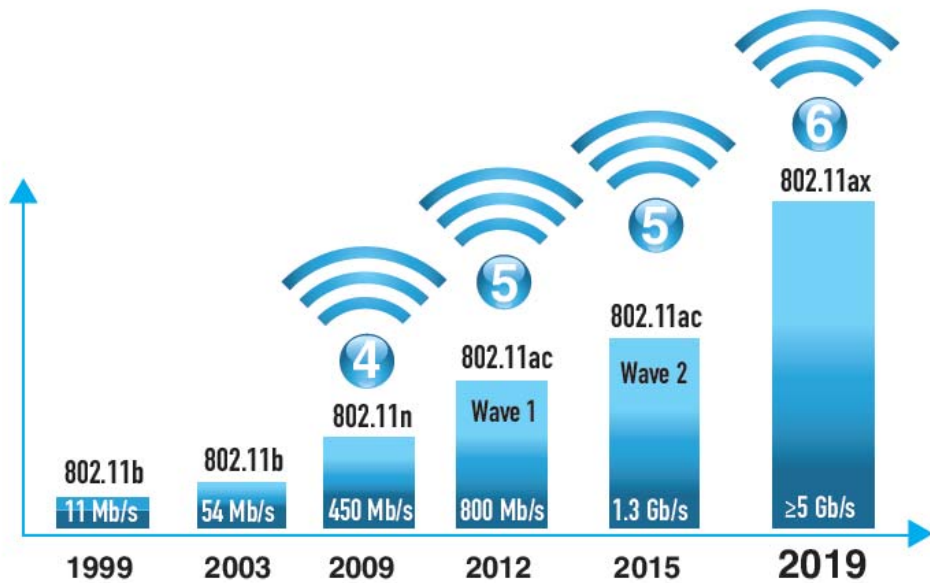
- *The demand for devices is growing*



- The number of devices was around 62 million in 2019
- Covid will boost trend particularly for products which enable a safe & smarter environment

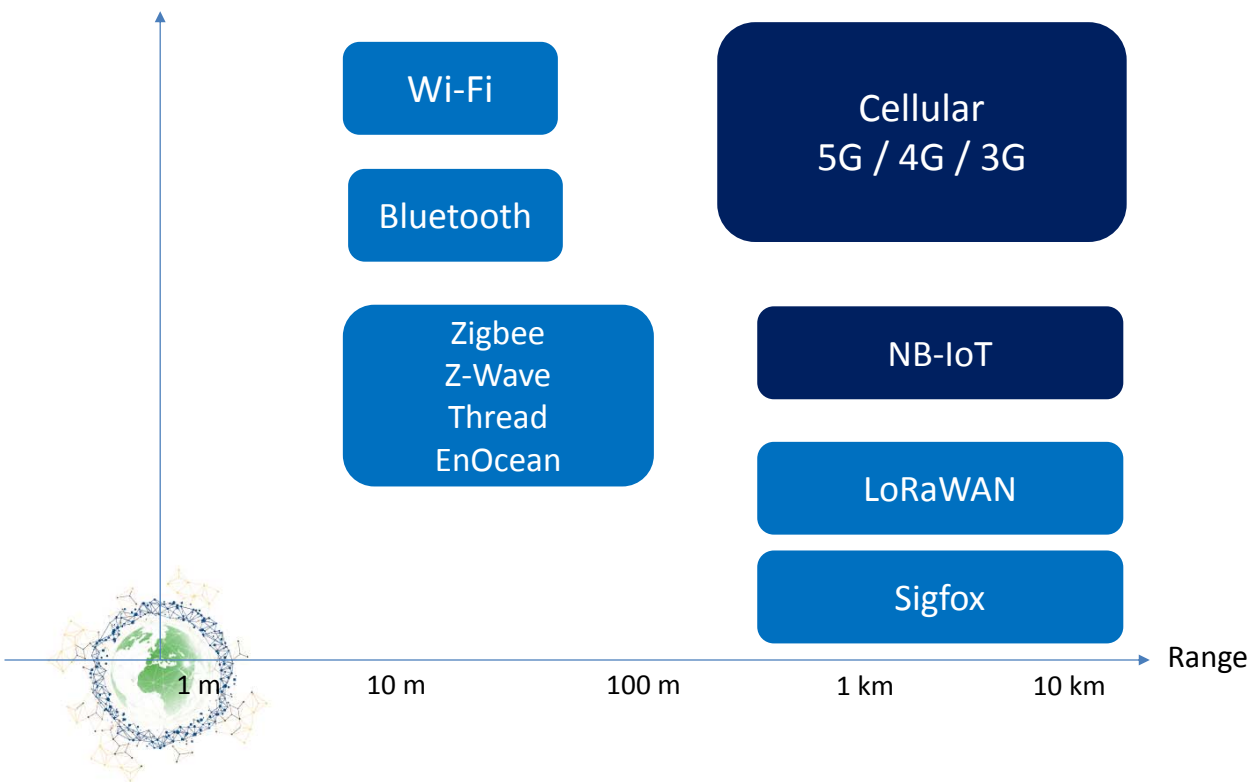


The Use of Wireless Continues to Increase



Wireless Technologies

Data rate &
Power consumption



- IoT deployment needs connectivity
- A range of options, depending on
 - Range/distance
 - Cost
 - Scalability
 - Power consumption.

Connected Wireless Devices in Commercial Buildings



Bluetooth beacons, tags, sensors and lighting.

75 m devices



Devices in BACS (sensors, lights, thermostats and other field devices). Lighting (switches and sensors).

50 - 100 m devices

150-200 m devices



Lighting controls

20 m devices

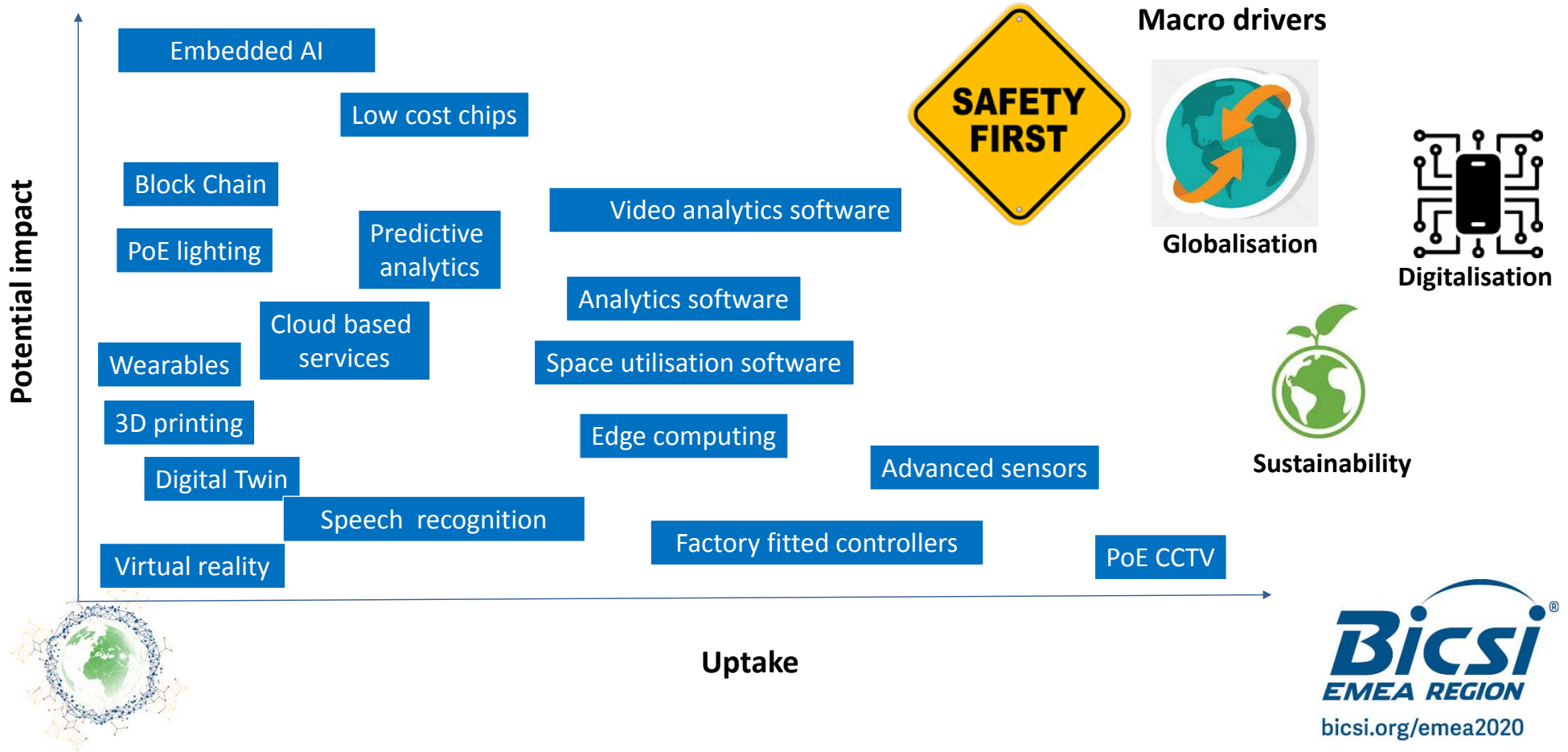


Limited use in commercial buildings.

10 m devices

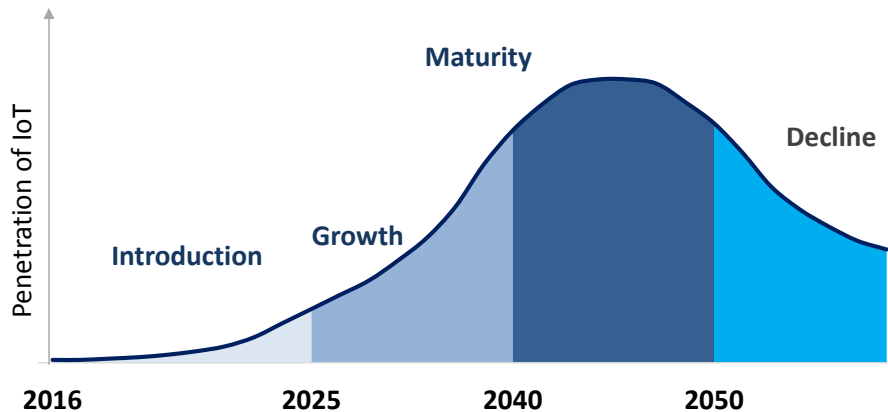


Smart Product & Technologies in Buildings



HVAC Field Devices and Connectivity

Market development of IoT Field device for HVAC



Penetration of IoT connected field devices, % volume of sales

Product	% of IoT connected product 2019	% of IoT connected product 2025	% of IoT connected product 2040
Valve	1%	5%	20%
Dampers	0.5%	3%	25%
Sensors	3%	10%	40%

Drivers:

- IoT service development
- Migration of supervision software to the cloud
- Real time monitoring / Remote control
- Smart phones as individual control device
- User customisation and individual control

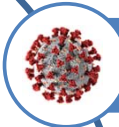





Limitations:

- IoT only when needed
- Network coverage
- Cyber security (an endless battle)

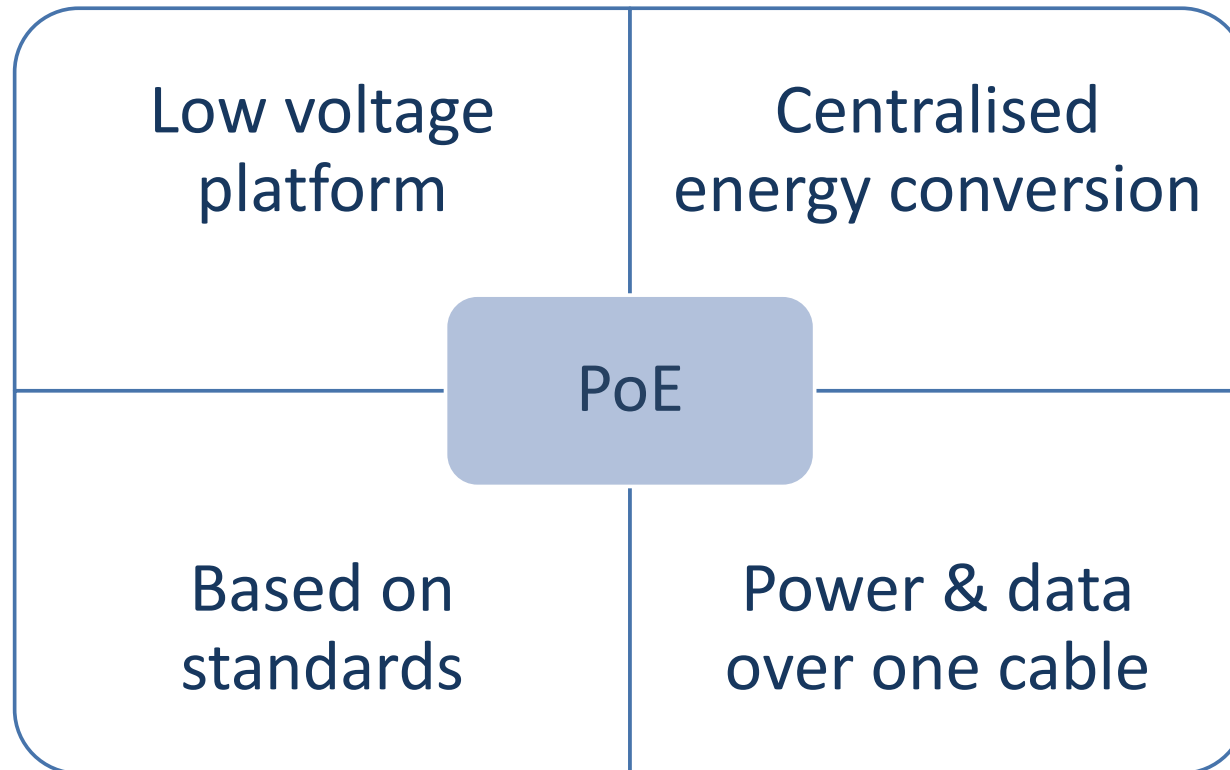


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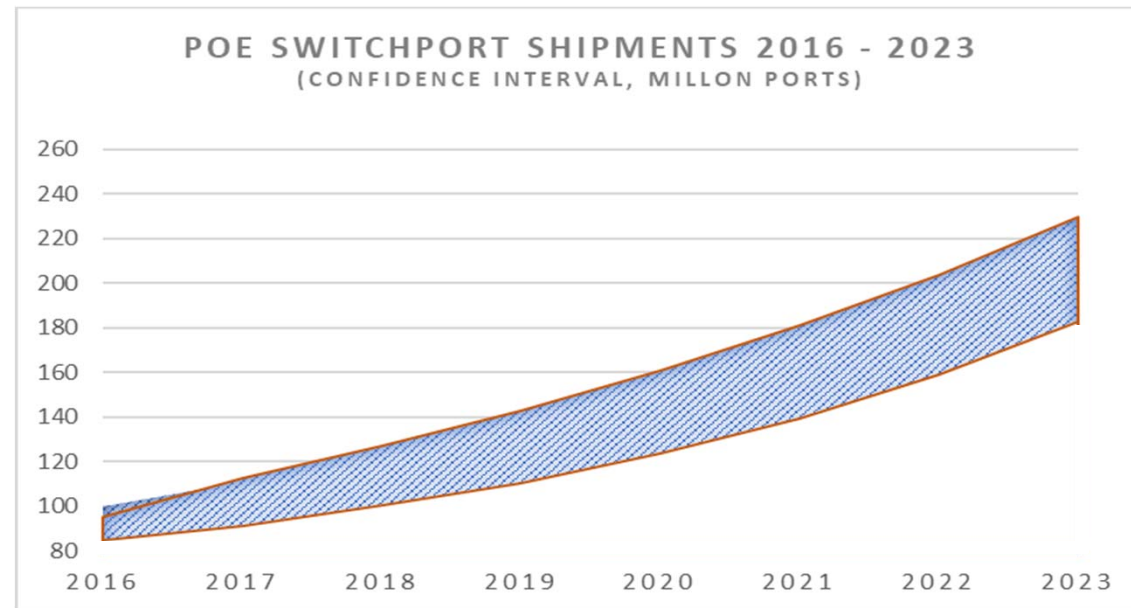


Why PoE?



PoE Numbers

- 2019 Global PoE port shipments 113 – 139 MM
- Dell’Oro: 850 MM ports sold over the 2019-2023 period
- Grand View Research: 12.6% CAGR over 2017-2025 period
- **BSRIA: PoE ports reach between 180-230 MM ports (2023)**



PoE Numbers

Key applications:

- VoIP Phones
- WAPS
- CCTV cameras
- Sensors (across sectors)
- Motor & actuators (industrial)
- Others including building service products (emerging market)

Application	Percentage of PoE ports	Number of PoE ports
CCTV cameras	18%	20 million
VoIP Phones	32%	36 million
Wireless Access Points	23%	26 million
Sensors	7%	7.9 million
Motors and actuators	4%	4.5 million
Others	15%	17 million
Included under others:		
- BACS	< 1%	~ 200 K
- A/V		~ 300 K
- Access control		~ 230 K
- Lighting		~ 250 K



PoE Current and Future Applications

SECURITY
ICT
BUILDING AUTOMATION & CONTROL



CCTV



Access Control



Intruder alarms



Lift controls



AV Systems



WAPs



VoIP phones



Thin clients



Lighting



Parking management systems



Room controllers

SENSORS











Presence, movement, temperature, light, pressure, humidity, gases, water leakage, explosion...



Automated blinds



Variable air volume units

RETAIL

INDUSTRIAL



Point of sale terminals



Self checkout machines



People counter, direction detection, queue monitors...



DC motors



RFID



Human Machine Interfaces



PoE clocks



Industrial PoE switches

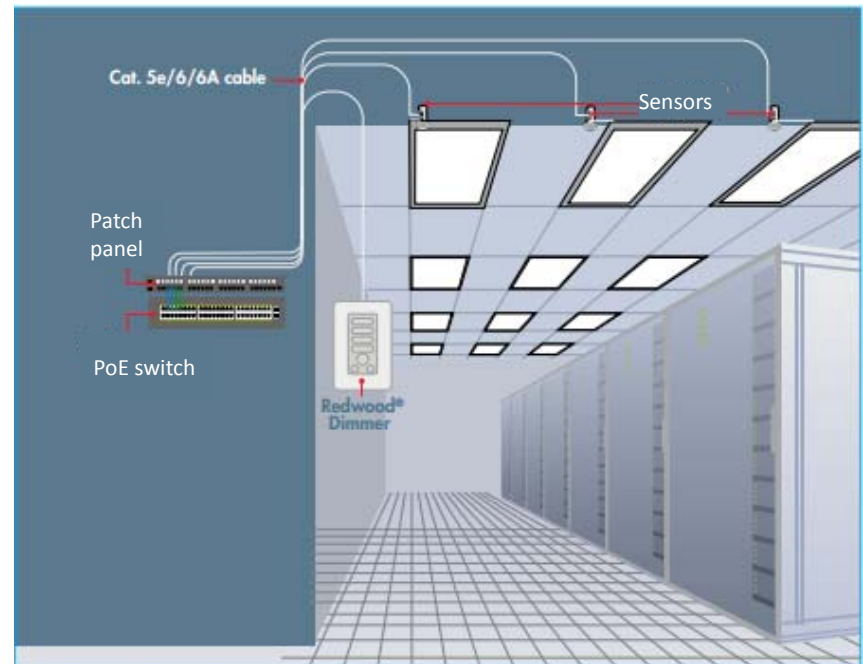




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PoE Lighting Systems

- One cable does it all (Cat 5E – Cat 6A)
- Lower installation costs and simpler lighting fixtures
- Faster and less disruptive changes
- Much safer than the AC version
- Future-proof platform to host all IoT devices (ideally installed using a zone cabling architecture)



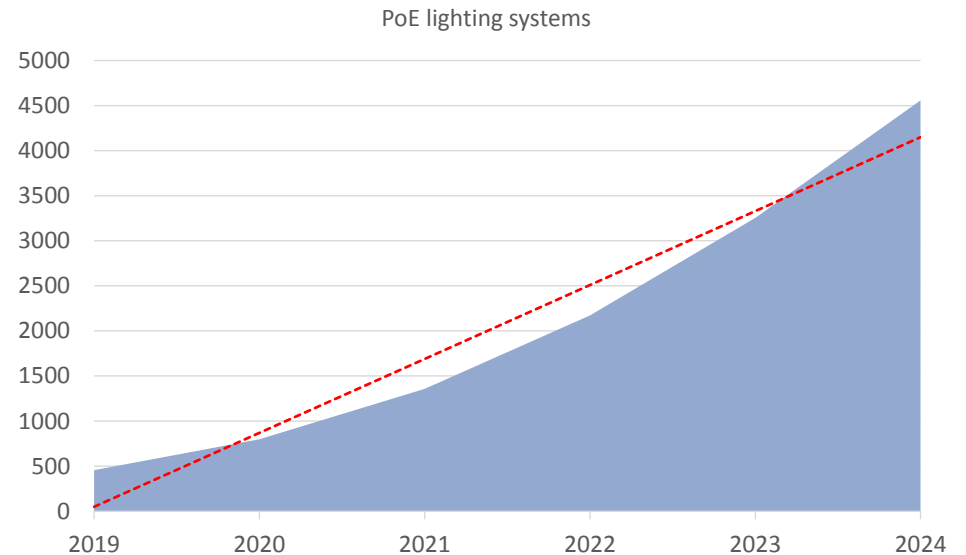
Example of PoE lighting system (source: Redwood)



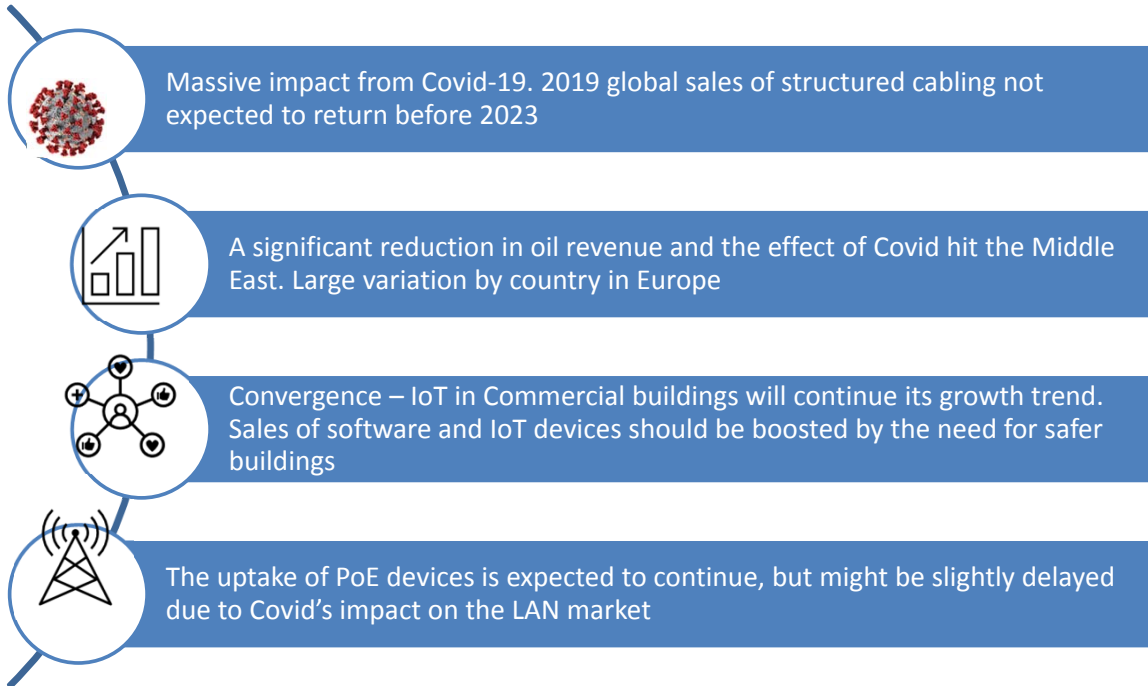
PoE Lighting – Market Size

- The PoE market is still small.
- BSRIA expects the market to double in size over the next two years and to see a high double-digit growth rates until 2024.

	USD million
Lighting fixtures	220 - 250
PoE switches	100 - 134
Smart controls & sensors	76 - 85
Cabling & fixtures	60 - 81
Total	456 - 550



To Conclude...





Lone Hansen

Senior Manager – IT Cabling, BACS & Associated Technologies
Worldwide Market Intelligence

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