

Investment Banking
Financial Products

5G – the future of connectivity

Solactive 5G Technology Performance-Index

November 1, 2018

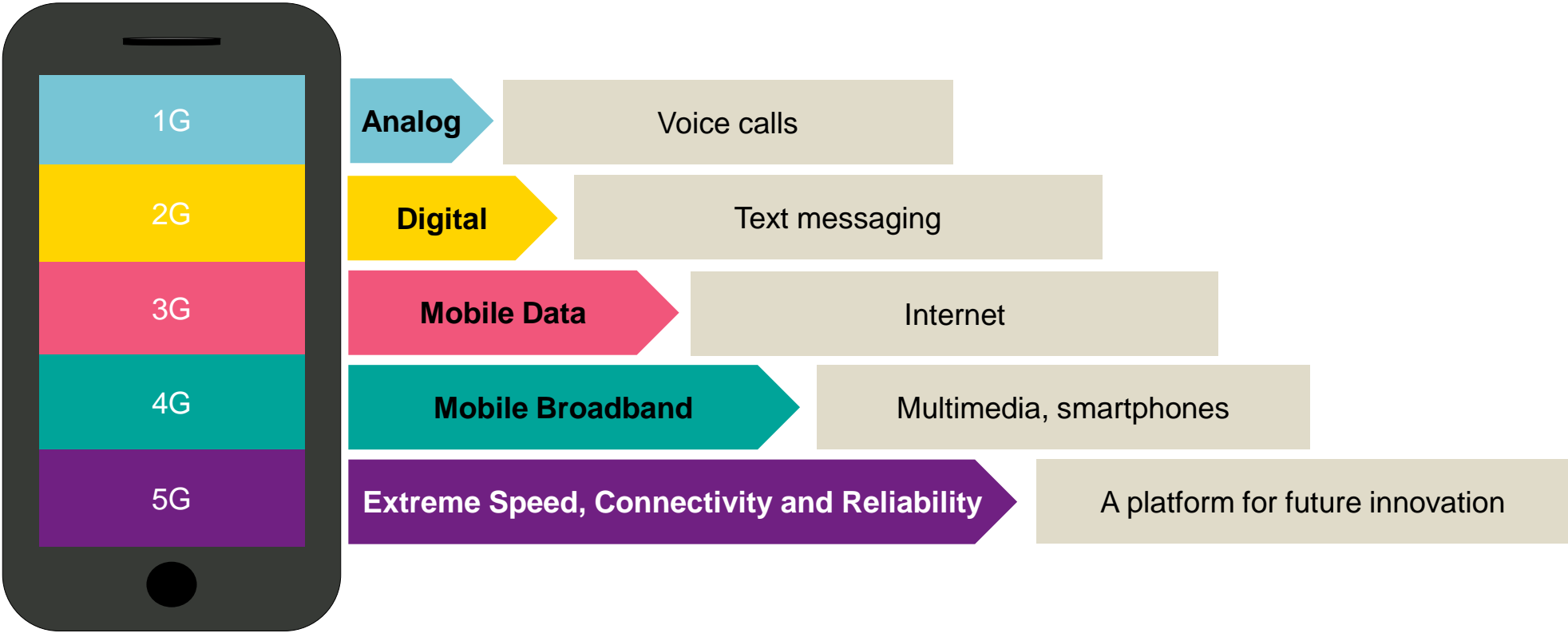
5G Technology – the future of connectivity

If “big data” is the new oil of the digital era, then 5G is the next set of pipes.¹

5G technology - the future of connectivity

A game changer

The Evolution of Radio Access Technology

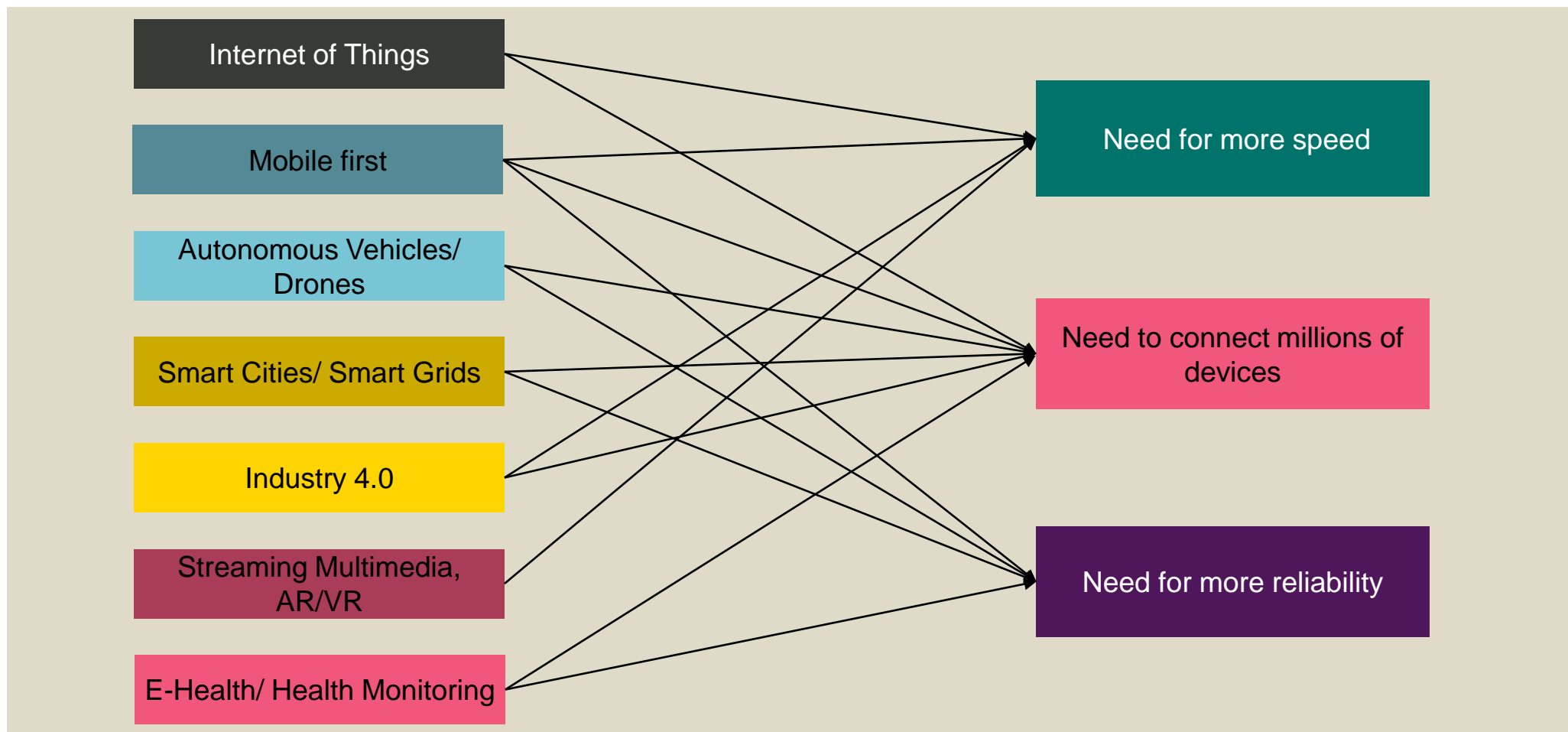


5G technology will contribute significantly to global growth through big investments in Capex and R&D. It will improve existing business processes, facilitate the creation of new business models and open new revenue streams for operators

Source: 5G Americas Whitepaper «5G Services & Use Cases» (17/11)

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Enabler for many digital developments



The observation of these developments call for a new generation of cellular mobile communications that meets the requirements for these trends to continue and unfold. The 5G technology is able to deliver these needs.

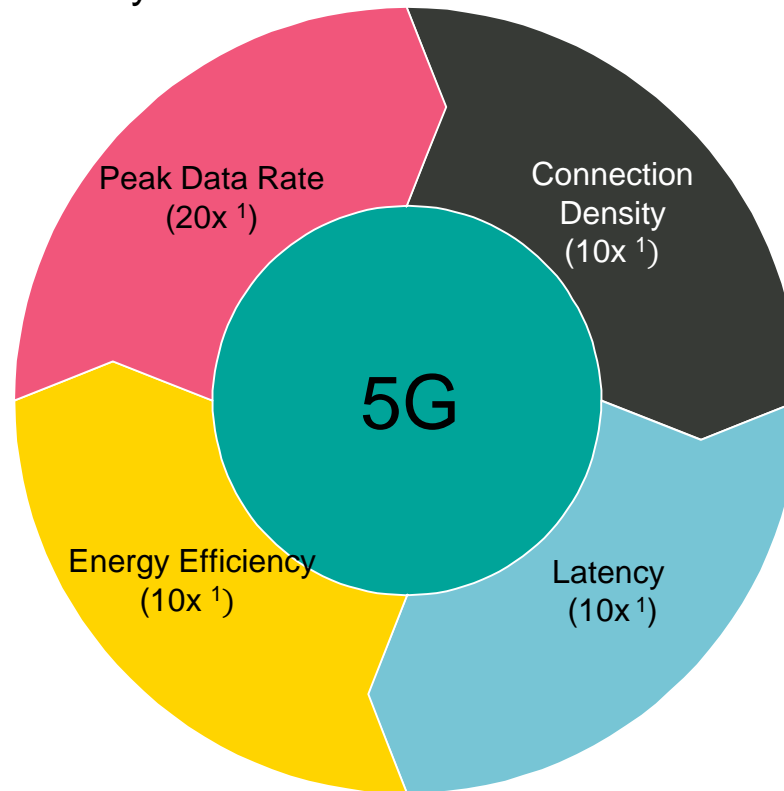
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What differentiates 5G?

Performance improvement in four key areas

1. Speed - Enhanced Mobile Broadband
 5G technology supports the expected increase in mobile data demand. This is accomplished by significant improvements in the peak data rate and area traffic capacity

4. Energy Usage
 For all future use cases 5G will lower energy consumption and therefore provide more energy efficient services



2. Connectivity - Massive Internet of Things (MIoT)
 5G provides the ability to a very high density of devices while improving the network energy efficiency - one million /km²

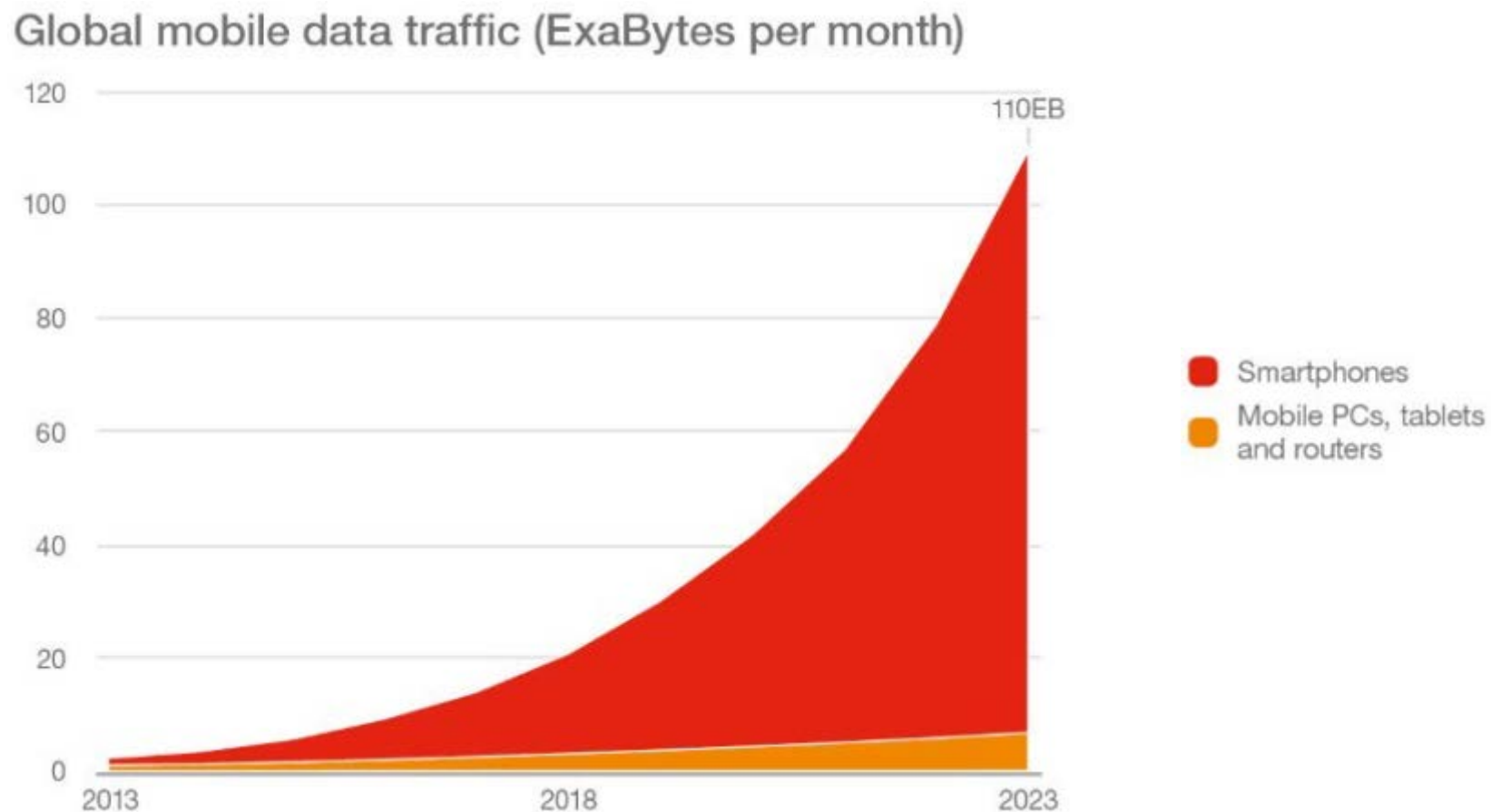
3. Reliability - Mission Critical Services (MCS)
 MCS support applications that require high reliability, ultra-low latency connectivity with strong security, e.g. autonomous vehicles or drones.

In essence 5G provides the capability, reliability, scope and speed to connect devices in all industries and therefore enables the increasing automation of processes, such as driverless cars and improves the interconnectivity between devices while simultaneously enhancing existing mobile broadband networks.

Source: ITU-Recommendation M.2083-0 (09/15)
 1: Compared to 4G technology

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Use case 1: Enhanced Mobile Broadband



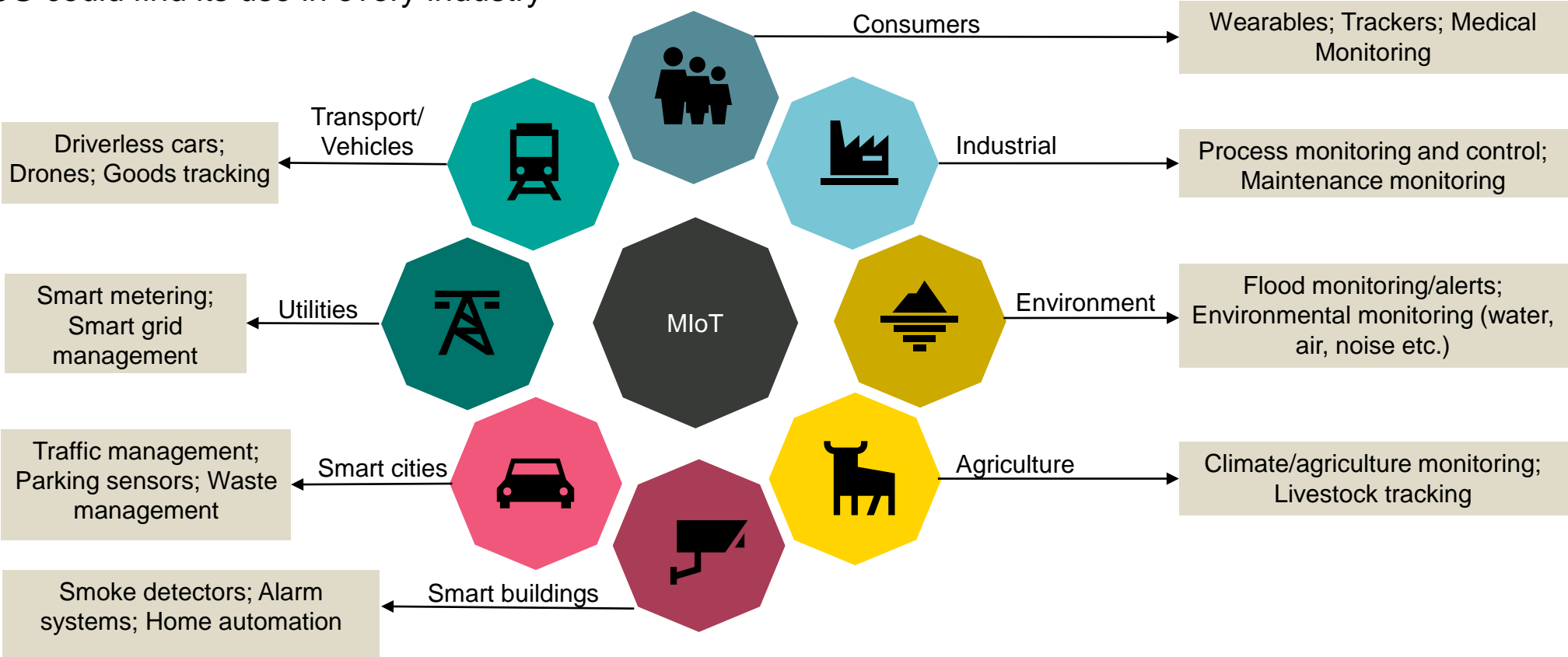
Total mobile data traffic is expected to rise at a compound annual growth rate of 42% from 2017 to 2023¹

1: Ericsson Report «Mobile data traffic growth outlook» (06/18)

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Use cases 2: Massive Internet of Things

5G could find its use in every industry



The broad-based application possibilities of 5G allows for its influence in virtually every industry. The technology has the potential to be part of every future business process.

Diagram: Cellular networks for Massive IoT, white paper by Ericsson (01/16)

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Use case 3: Mission Critical Services

Potential use cases in the automotive industry

- Vehicle-to-everything communication (autonomous vehicles) and allowing for features such as collision avoidance, emergency braking and intelligent traffic systems
- Remote monitoring and predictive maintenance
- Driver assistance (“see through” the front vehicle, in-dash junction cameras)
- Infotainment services (new opportunities for the provision of in-car entertainment and information services)



Other mission critical use cases

- Industry 4.0: cell automation, devices in assembly line communicate wirelessly; autonomous vehicles to transfer goods in factories; process automation, sensors and actuators communicate wirelessly with control units; logistics tracking; robot control; artificial intelligence
- Energy and utility: smart metering and smart grids
- Healthcare: e-health, remote monitoring of health through wireless devices; smarter medication



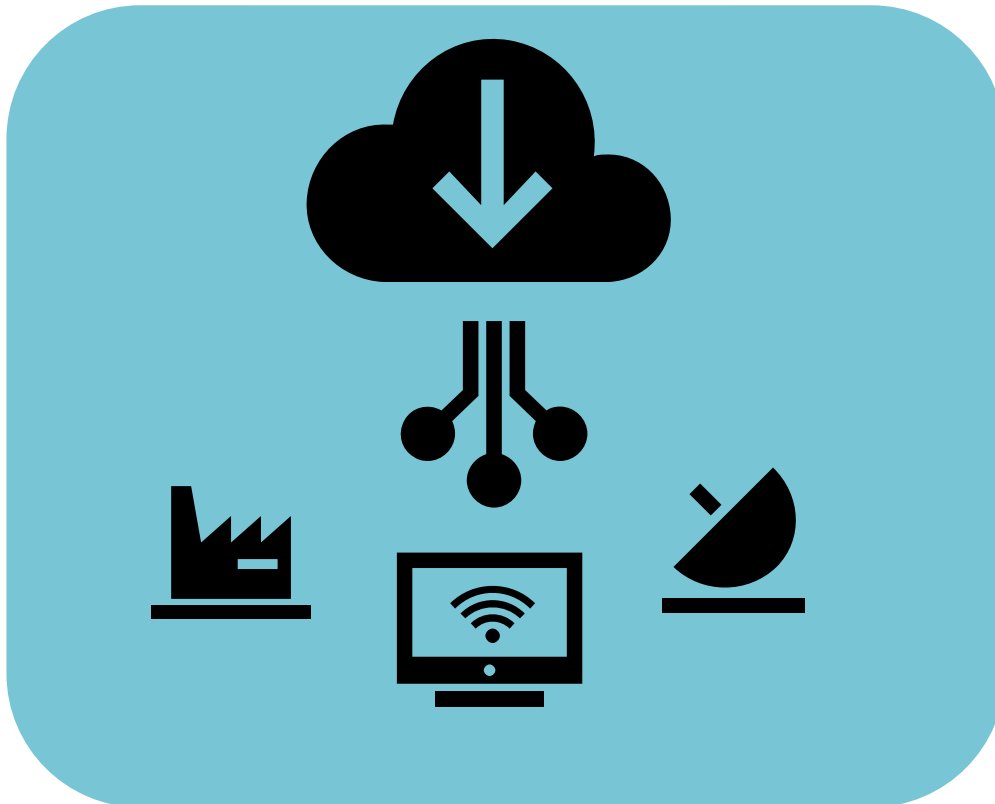
These use cases require ultra-low latency, high connection density and mobility as well as reliability and data throughput, which 5G will be able to provide.

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Network Slicing

Virtual end-to-end networks tailored to serve application requirements

A new revenue source for operators



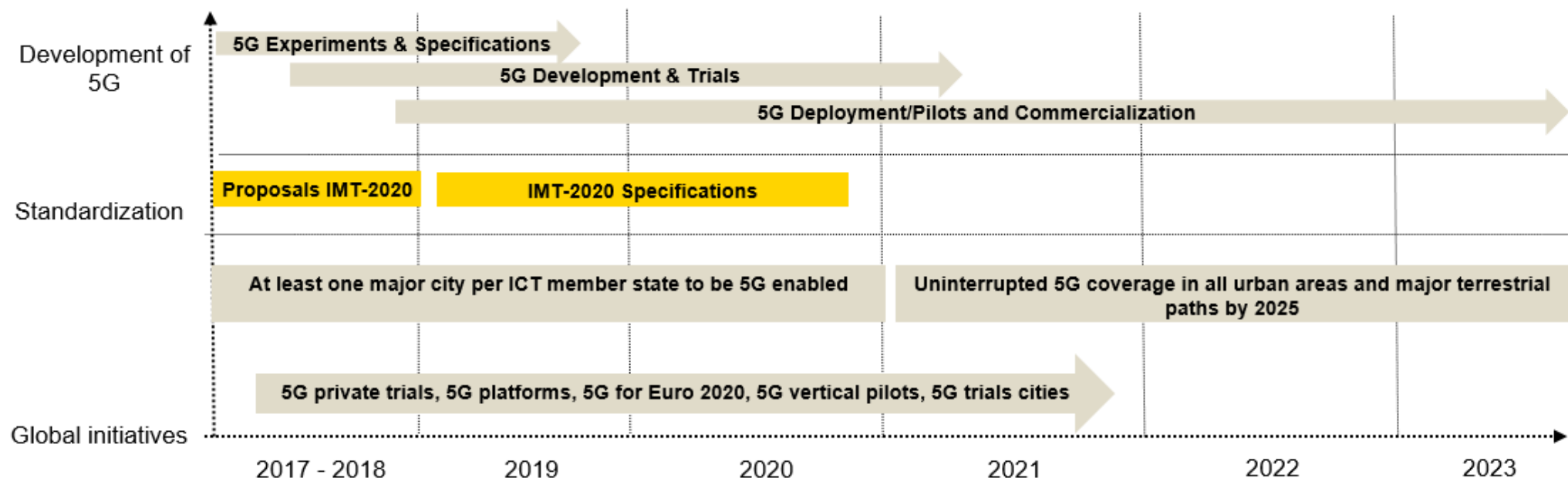
Network slicing is a key feature for the fifth generation network. Slicing allows to support a large number of use cases with differing requirements on a common infrastructure platform.

Example: In cases of catastrophic events as experienced during hurricane season, operators can create an emergency network that is available exclusively for rescue services and tailored to their specific needs.

Network Slicing opens up new possible revenue channels for network operators.

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Roadmap to 5G



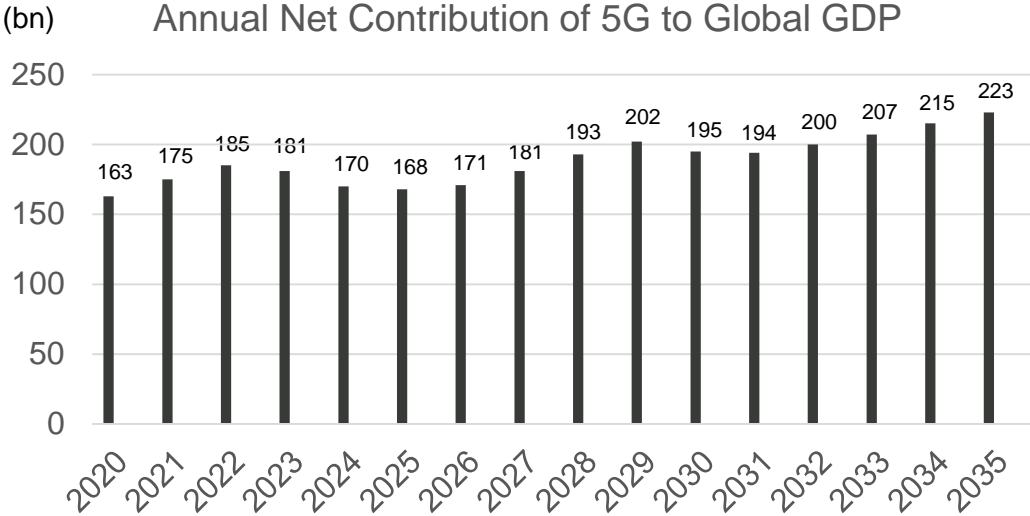
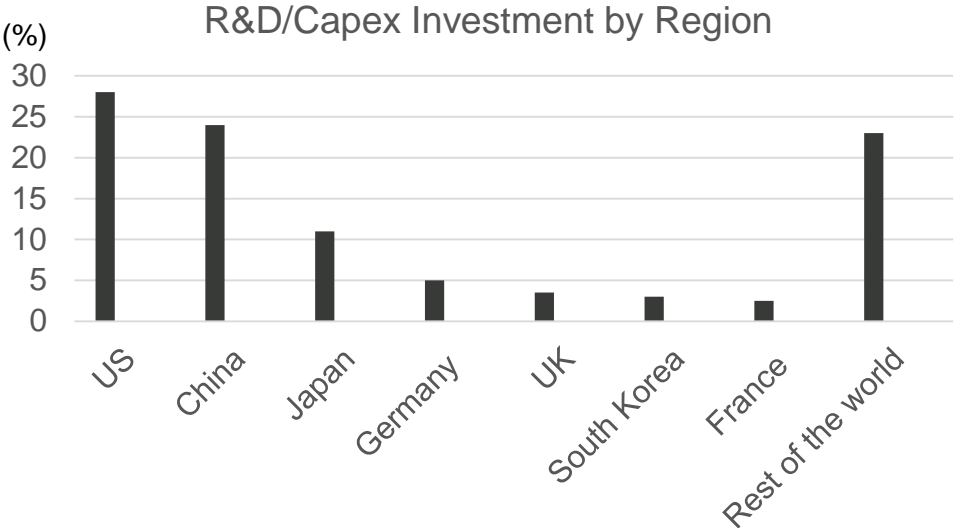
- Timing for commercial deployment of 5G varies but most operators expect to launch from around 2019 - 2020
- Internationally, 5G was trialed at the 2018 Winter Olympics in South Korea and is to be further trialed at the 2020 Olympic Games in Japan
- 80% of global telecommunication operators are engaged in 5G trials since 2017¹

Source: DotEcon report "Study on Implications of 5G Deployment on Future Business Models"

¹: Ericsson study "5G Readiness Survey 2017: An Assessment of Operators' progress on the Road to 5G"

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Economic Contribution



- 7 countries expected to be at the forefront of 5G investment and development
- Collective investment in R&D and Capex to average around USD 200 billion annually until 2035¹
- Potential sales activity across multiple industries sectors could reach \$12.3 trillion in 2035¹

- Average global GDP of 2.9% p.a. until 2035 of which 5G will contribute 0.2%. In other words 5G adds 7% to the global growth rate¹
- In total 5G will add \$3 trillion to global GDP by 2035. In perspective this means the total contribution of 5G to real GDP growth will be equivalent to the current GDP of India.

1: Source: IHS Markit, study «The 5G Economy: How 5G will contribute to the global economy»

Solactive 5G Technology Performance-Index

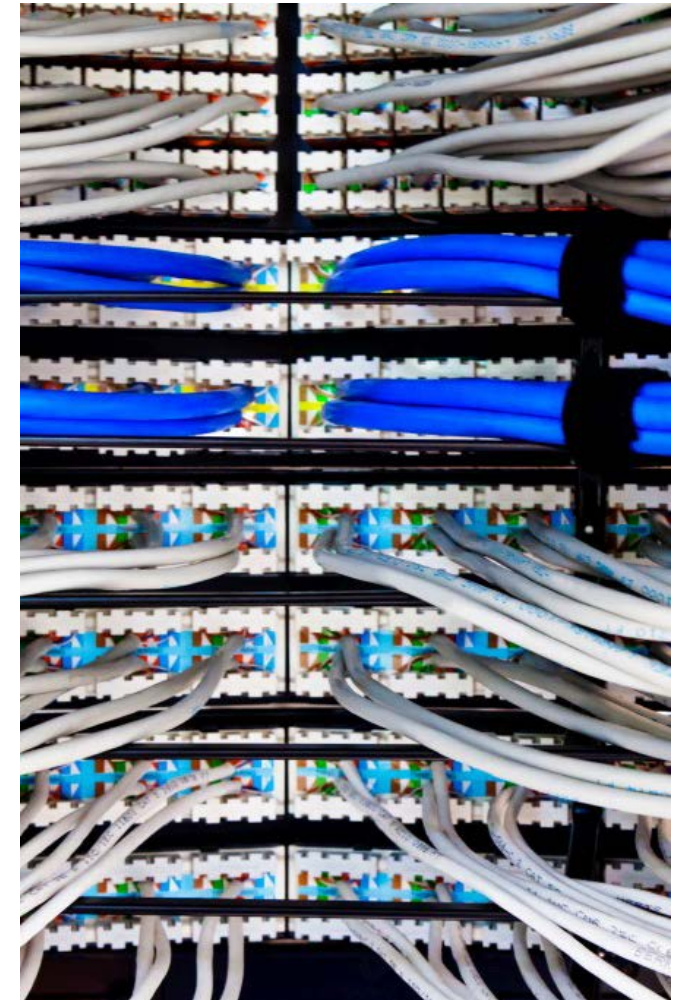
A rules-based index for efficient investing in 5G technology.

Diversified, transparent and strictly rules-based Solactive 5G Technology Performance-Index

An efficient way to invest in 5G technology

- 5G technology is ripe for commercial deployment around 2020, making it an investment opportunity at its current stage
- The **dynamic indexing** strategy reflects the changes we are expecting to experience with the development and deployment of the 5G technology
- The dynamic 5G Technology Performance Index ensures that **the theme is replicated in a diversified, transparent and strictly rules-based manner at all times.**
- It contains companies that are already generating or expected to generate revenues with 5G technology in the defined (sub)sectors.
- The 5G technology theme certificate could represent an efficient means of investing in the theme of current and future 5G technology.

The index comprises up to 20 companies from 5G technology subsectors.



The 5 Industries compromising the index

Solactive 5G Technology Performance-Index

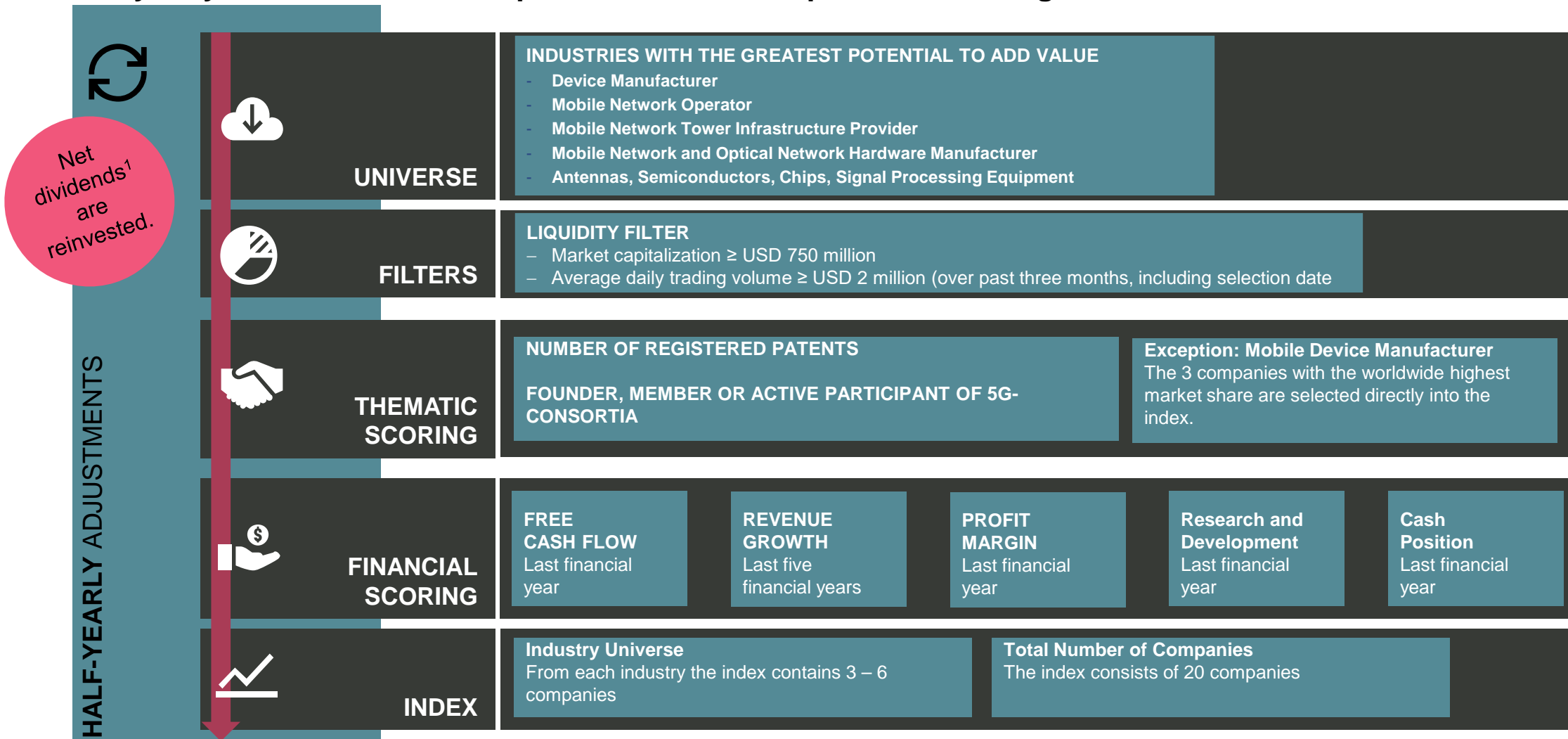
All members of the index are linked to the 5G technology, either indirectly by providing its infrastructure or directly by using or selling it as a service

1	Device Manufacturer	Manufacturer of physical devices, in particular smartphones. Example: Apple
2	Mobile Network Operator	Provider of wireless communication services for end-users of 5G. Example: China Mobile
3	Mobile Network and Optical Network Hardware	Supplying hardware for the data communication network. Example: Ericsson
4	Antennas, Semiconductors, Chips, Signal Processing Equipment, Networking Software	Companies providing hardware and software for the 5G infrastructure. Example: Qualcomm.
5	Mobile Network Tower Infrastructure Provider	Building and maintaining the phone masts. Example: American Tower Corp.

Index concept

Solactive 5G Technology Performance-Index

Half-yearly review of index composition with subsequent rebalancing



¹ After deduction of country-specific withholding taxes; ² Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hong Kong, Ireland, Italy, Japan, South Korea, Netherlands, Norway, New Zealand, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States of America
Source: Solactive Index Guidelines; illustration: Vontobel

Indicative initial composition

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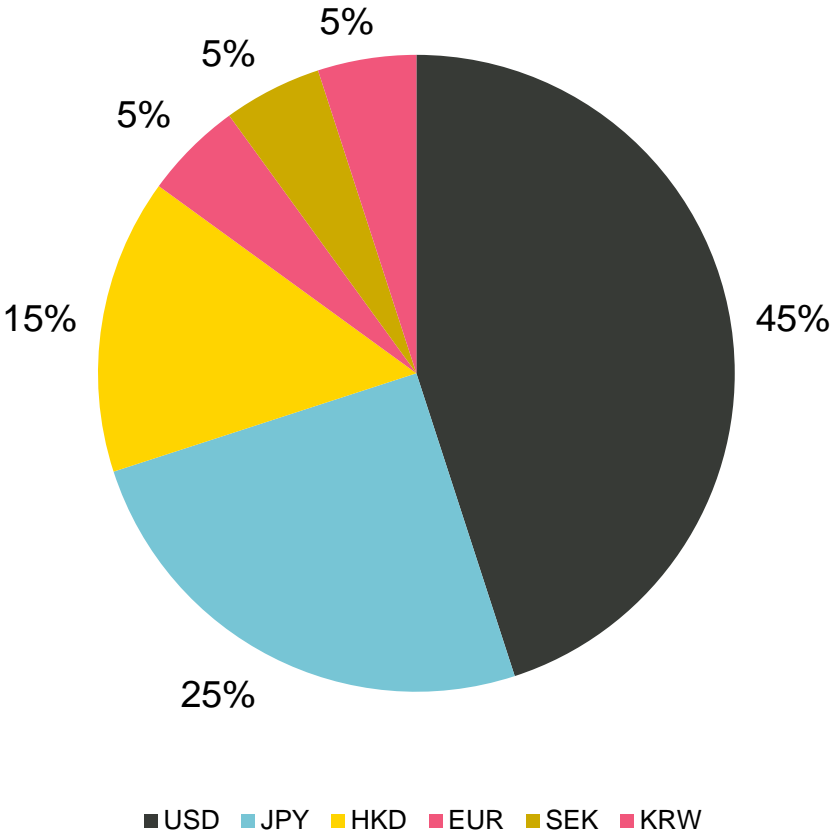
COMPANY	CATEGORY	CURRENCY	WEIGHTING
Apple Inc.	Device Manufacturer	USD	5%
Samsung Electronics Co. Ltd	Device Manufacturer	KRW	5%
Xiaomi Corp.	Device Manufacturer	HKD	5%
Intel Corporation	Antennas, Semiconductors, Chips, Networking Software ¹	USD	5%
Qualcomm Inc.	Antennas, Semiconductors, Chips, Networking Software	USD	5%
Broadcom Inc.	Antennas, Semiconductors, Chips, Networking Software	USD	5%
Mitsubishi Electric Corp.	Antennas, Semiconductors, Chips, Networking Software	JPY	5%
Cisco Systems Inc.	Mobile Network and Optical Network Hardware	USD	5%
Ericsson Telefon AB Class B	Mobile Network and Optical Network Hardware	SEK	5%
Fujitsu Ltd. ORD	Mobile Network and Optical Network Hardware	JPY	5%
Nokia OYI	Mobile Network and Optical Network Hardware	EUR	5%
AT&T	Mobile Network Operator	USD	5%
NTT DoCoMo Inc.	Mobile Network Operator	JPY	5%
China Mobile Ltd.	Mobile Network Operator	HKD	5%
China Telecom Corp. Ltd.	Mobile Network Operator	HKD	5%
Softbank Group Corp.	Mobile Network Operator	JPY	5%
KDDI Corp. (DDI) ORD	Mobile Network Operator	JPY	5%
American Tower Corp.	Mobile Network Tower Manufacturer	USD	5%
Crown Castle International Corp.	Mobile Network Tower Manufacturer	USD	5%
SBA Communications Corp-CL A	Mobile Network Tower Manufacturer	USD	5%

1: Antennas, Semiconductors, Chips, Signal Processing Equipment, Networking Software

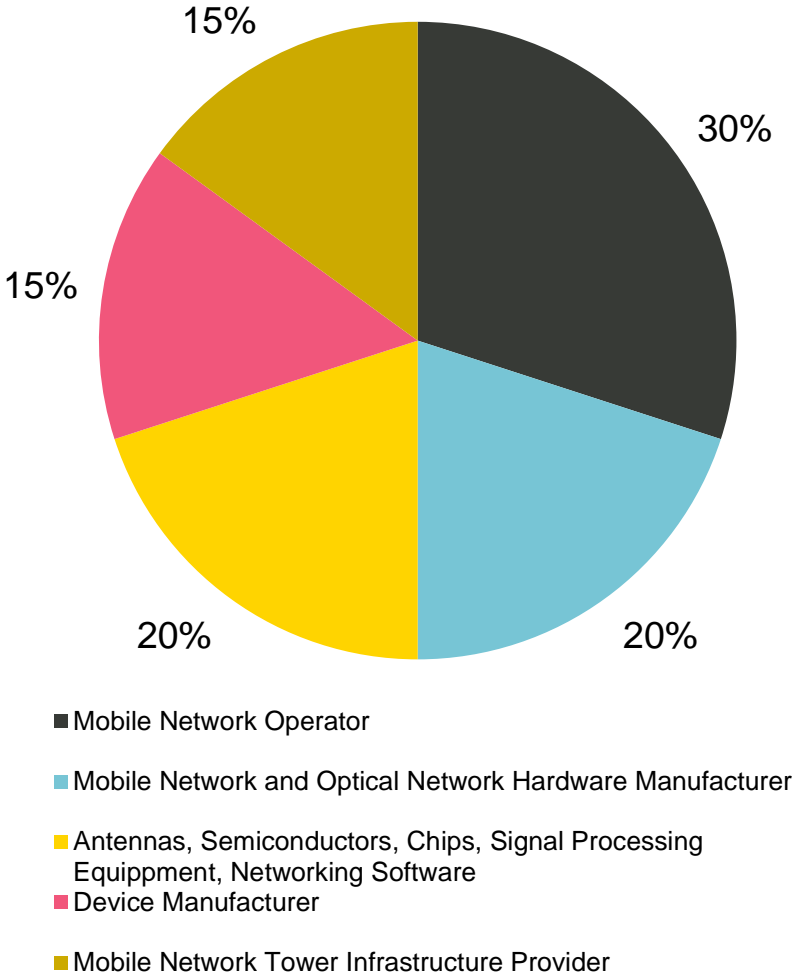
Initial weightings by currencies and categories

Solactive 5G Technology Performance-Index

Weightings by currency



Weightings by industry



Product details

Solactive 5G Technology Performance-Index

Index Guidelines






In subscription until


12pm CET on 30 November 2018





PRODUCT DETAILS


SSPA product type	Tracker Certificate (1300)
Underlying	Solactive 5G Technology Performance Index (Index currency USD)
Initial fixing / payment date	3 December 2018 / 10 December 2018
Maturity	Open end
Management fee	1.20% p.a.
Issuer	Vontobel Financial Products Ltd., DIFC Dubai (is not subject to any prudential supervision and has no rating)
Guarantor	Vontobel Holding AG, Zurich (Moody's A3)


			
Currency	CHF	USD	EUR
ISIN / symbol	CH0441918965 / ZSL5CV	CH0441918924 / ZSL5UV	CH0441918957 / ZSL5EV
Issue price	CHF 101.50 (CHF 1.50 front-load fee included)	USD 101.50 (USD 1.50 front-load fee included)	EUR 101.50 (EUR 1.50 front-load fee included)
Spot reference price (index level)	USD 100.00	USD 100.00	USD 100.00


Details page 

Term sheet 

Details page 

Term sheet 

Details page 

Term sheet 

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