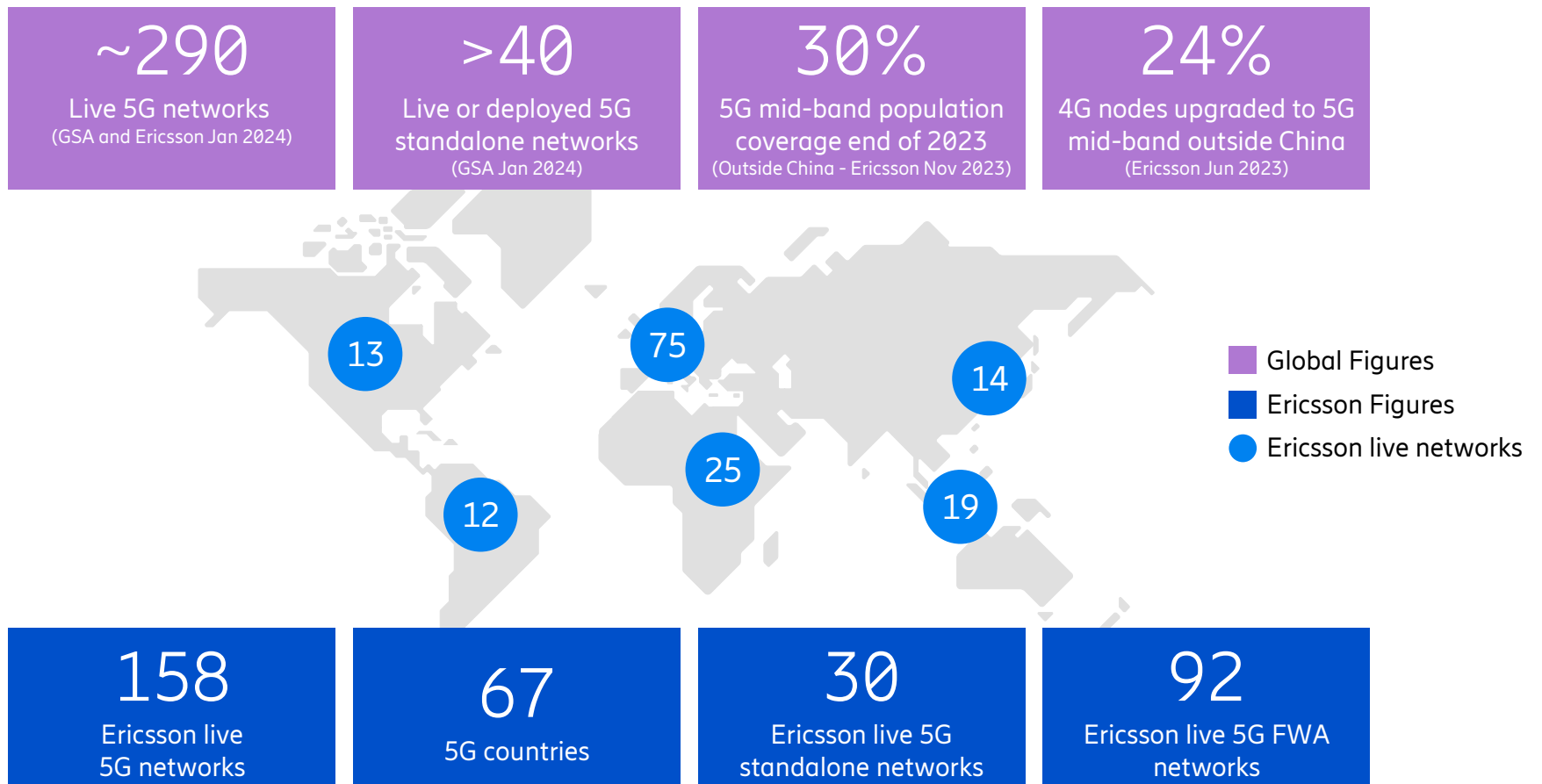


# On the way to 6G

Erik Ekudden  
SVP, CTO  
Ericsson

2024-04-11

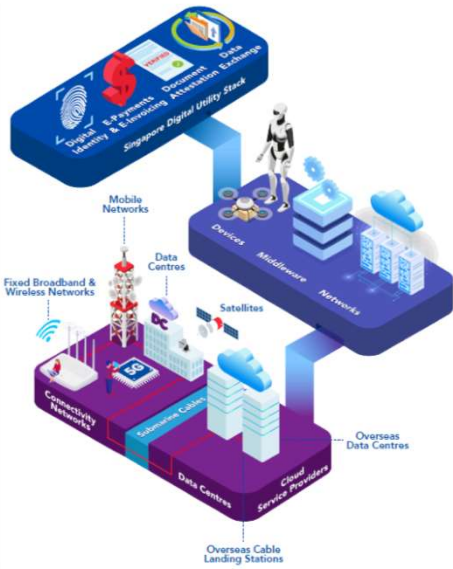
# Fast 5G uptake, but still early in the cycle



# 5G driving change in Singapore & India



## Singapore's Digital Blueprint



## 5G SA @day 1 Innovative services

>95%  
5G SA  
population coverage

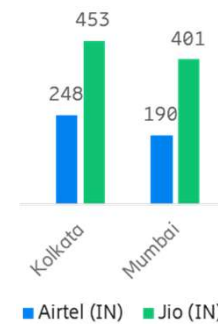
Prioritized  
services

Live-viewing at  
key events, e.g.  
Formula 1

## India 5G rollout-out

397,923  
5G RBS deployed in  
14 months by  
Bharti and Reliance

DL Median Throughput (Mbps)



## Digital services innovation focus



"5G Labs will help in developing new range of use case applications according to India's unique needs"  
- Narendra Modi, Prime Minister

**AWARD of 5G LAB to**  
INDIAN INSTITUTE OF TECHNOLOGY  
(INDIAN SCHOOL OF MINES), DHANBAD  
FOR NATION BUILDING

**100 5G LABS**  
FOR STUDENTS AND  
START-UP COMMUNITIES  
Empowering Higher Education Institutions  
to meet India's unique needs

# Differentiating traffic in high-performance networks



## QoS/speed/latency

Dynamic control  
Resource intense



## TCO/simple operations

Wireless  
as-a-service

## Reliability

Flexible manufacturing  
Broadcasting



## Positioning & advanced capabilities

3D mapping  
Location check

## Coverage (in/outdoor, 3D)

Automated  
guided vehicles



## Security, ID & authentication

Identification  
2-factor authentication  
Secure access service edge

Use 5G to its full potential

# Demanding 5G use cases already today



## Prioritized communication



First Responder support



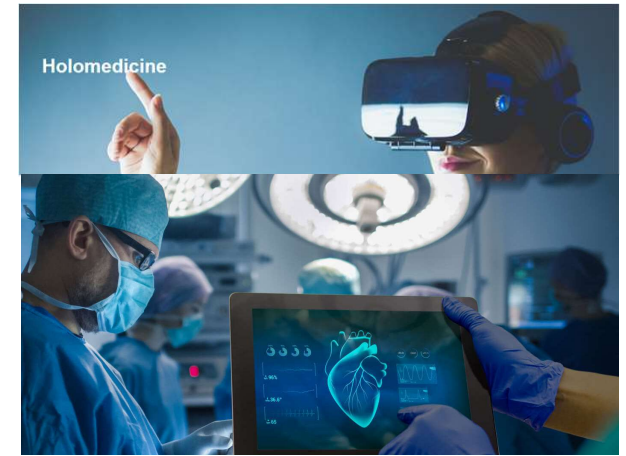
## Optimized manufacturing

Car assembly plants



## Real-time surgery

Holo-medicine with real-time XR



Reliable & resilient 5G networks, providing services with differentiated traffic

# Leverage 5G to drive digitalization

Continuous mobile innovation in hardware, software and automation



5G

## Open 5G Evolution

High performance, differentiated networks

Consumer

Residential

Industries

Enterprise

Governments

Society

Low/mid/high  
frequency bands

Stand  
Alone

Network  
slicing

RedCap  
IoT

Cloud Core  
Cloud RAN

API-driven  
monetization

AI-driven  
automation

Edge  
compute

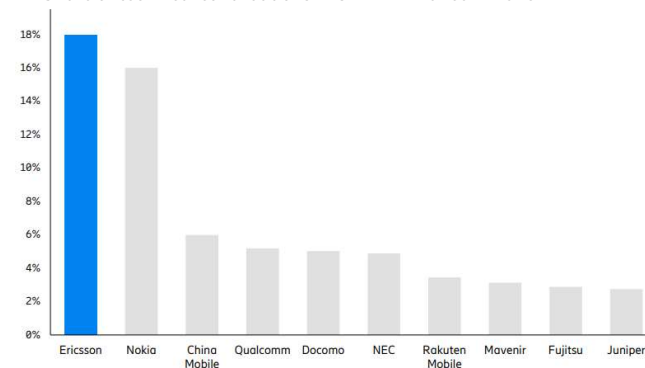
Networks will evolve with software capabilities for future services long into next decade

# Leadership in 5G openness, a new industry base

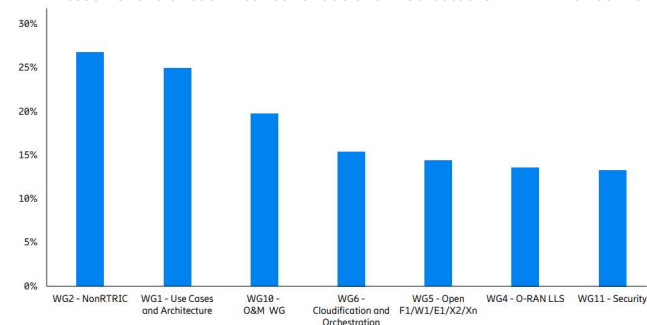


- Leading contributor in O-RAN alliance
- Defining next generation lower-layer split for improved performance
- Full support in product development

Share of technical contributions in O-RAN Alliance in 2023



Ericsson share of technical contributions in selected O-RAN Alliance working groups in 2023



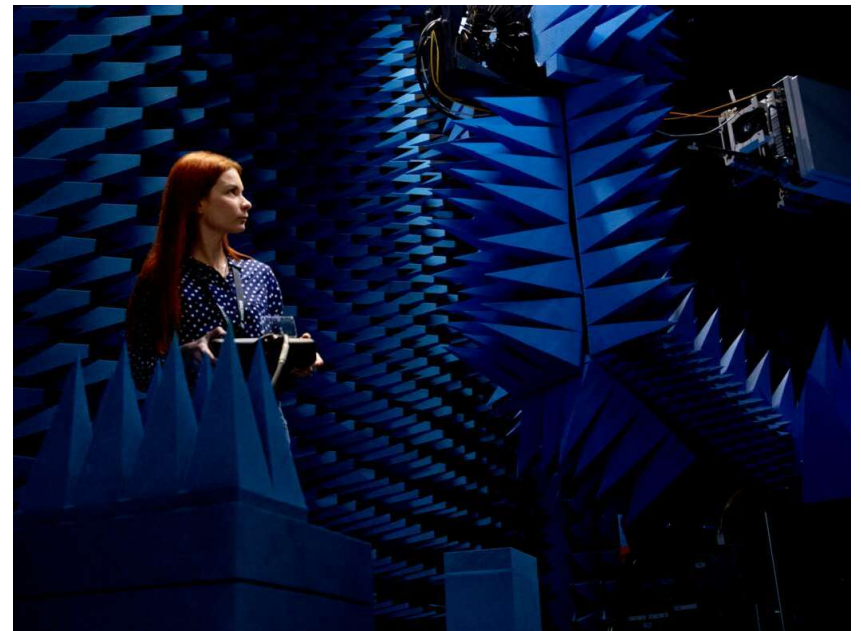
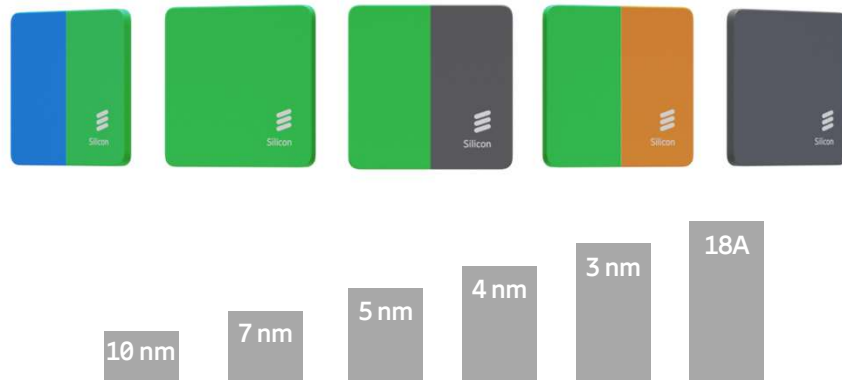
Source – O-RAN alliance standardization leadership report, Ericsson (February 2024)

A new baseline with flexibility and performance for open & programmable networks

# Ericsson Silicon, technology leadership in practice



- Cutting-edge long-term ASIC program
- Efficient compute base
- Leading performance



Industry-leading technology for supreme performance and energy efficiency



# Driving innovation cooperation in mobile systems



## Ericsson

Global leader in

- Innovation
- Standardization
- Market presence



Qualcomm

Google

Apple

Intel

AMD

Dell

Microsoft

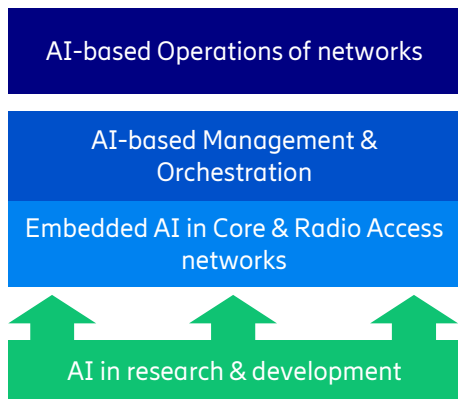
Amazon

Meta

*and more...*

Strong potential to jointly leverage American eco-system in 6G research

# Leading Telecom AI with world-wide R&D



**Auto incident detection**

~ 95% less incidents compared to the number of alarms

**Intelligent IT Ops**

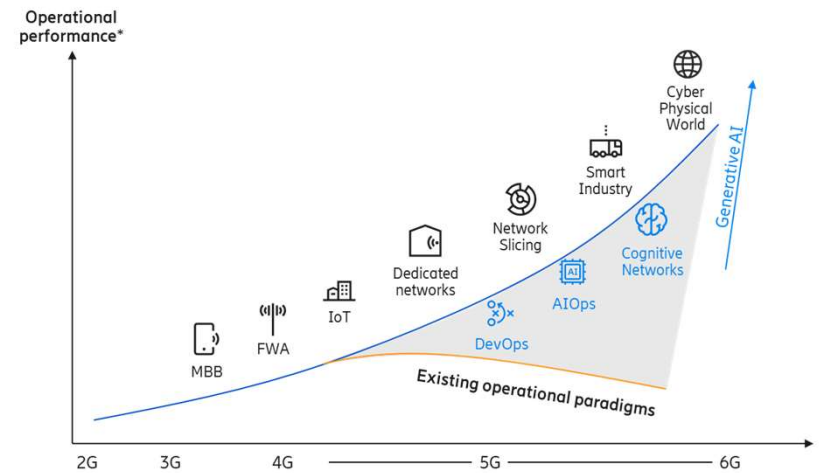
60% reduction in mean time for issue identification

**Performance Optimizers**

20% reduction on transmit power, 30% better UL and 6% better DL

**Ericsson Security Manager**

80% reduction in security engineering and 20% reduction in incident responses



Increasing network complexity, service performance and operational efficiency need stronger AI base

**AI is vital for NW operations & optimization—AI evolves with Generative AI**

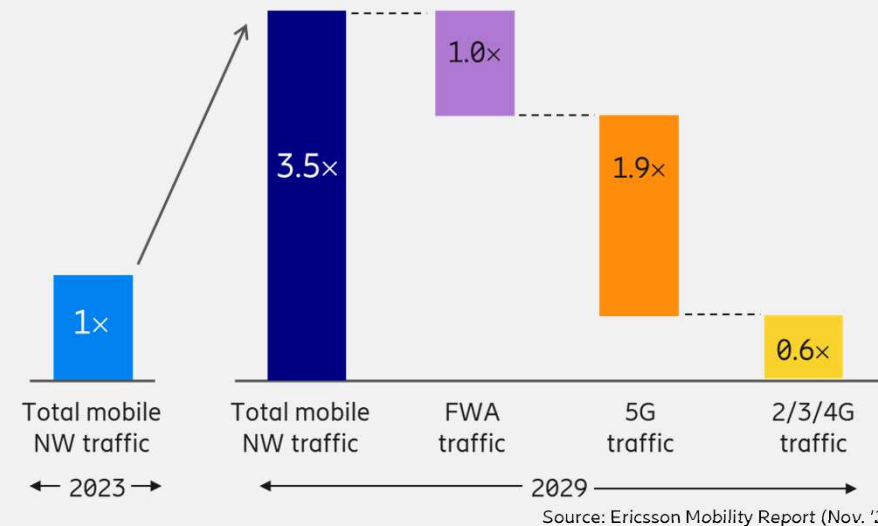
# New devices, new services, new demands with 5G



## Network assisted XR devices soon to come

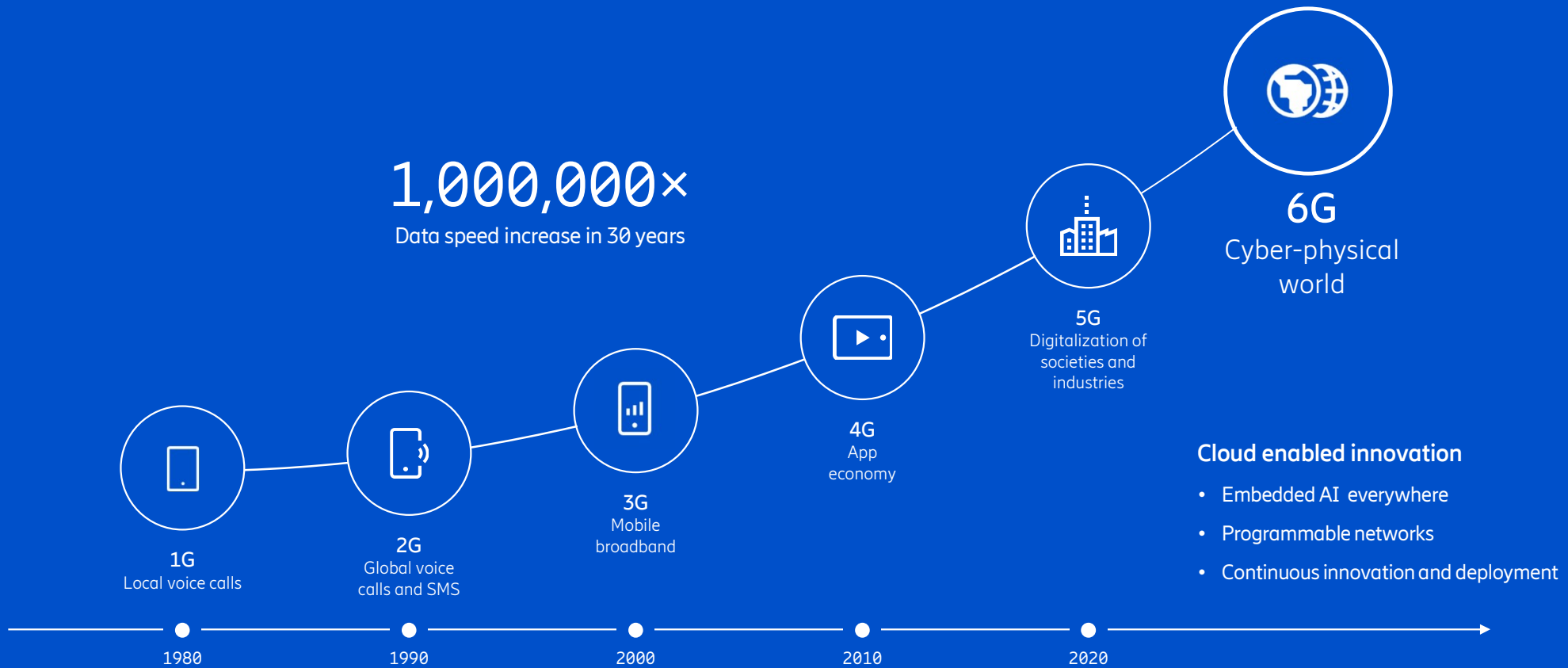


## Global mobile network traffic in 2029



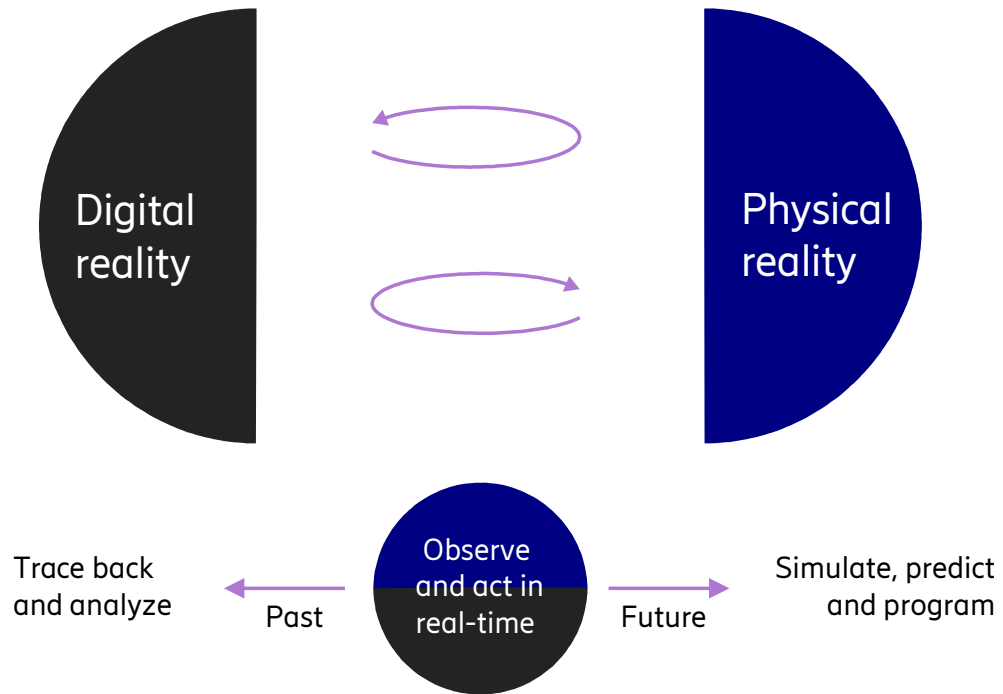
## New services and devices supported in advanced 5G networks

# Driving mobile networks for new waves of innovation



# Connecting a cyber-physical world

Wireless metaverses, twinning and more



# What's in the cyber-physical world?



Massive merged reality



Massive twinning



Situational awareness



Sustainable food production



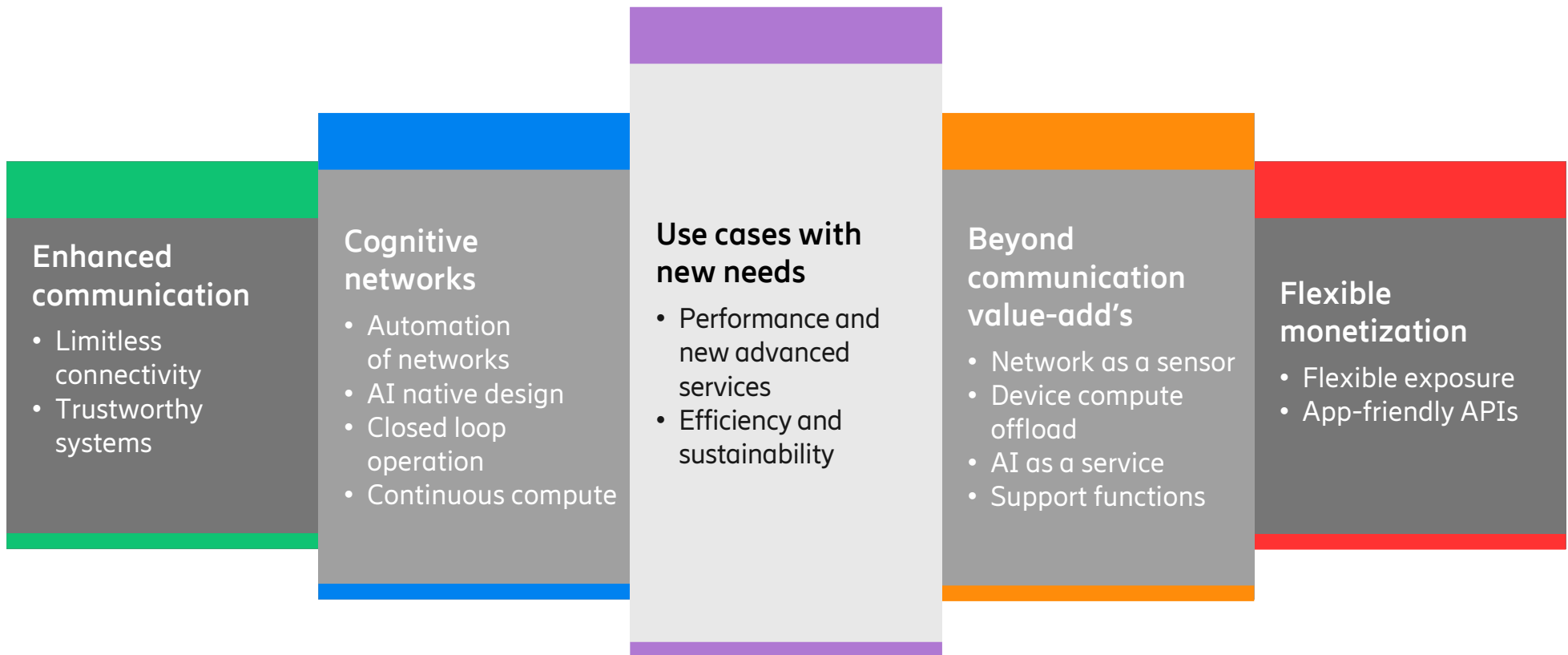
Efficient data



E-health for all



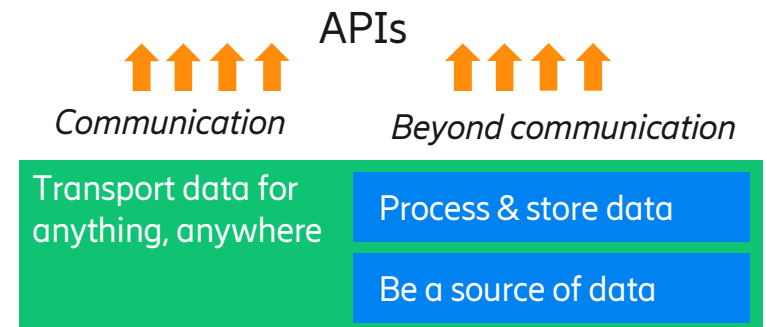
# 6G building blocks



# Networks-driven versatile monetization



- Future networks should be designed to better interact directly with the app ecosystem
  - Tailored communication service APIs
- Future networks can also take a bigger role in the combined ecosystem
  - Data and information service APIs

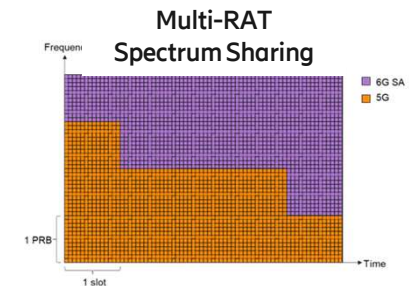
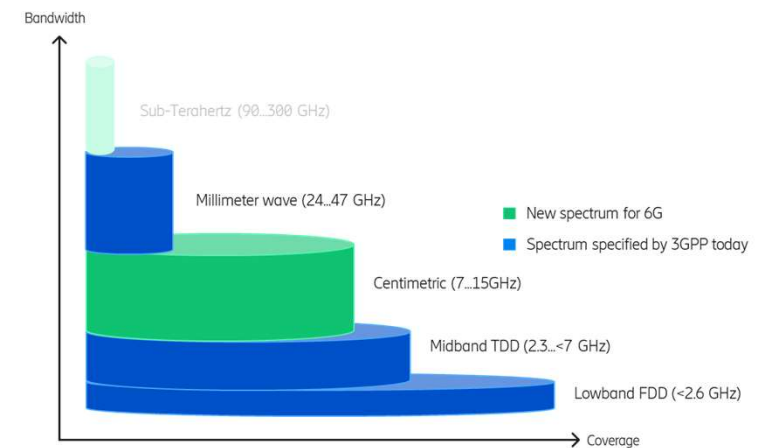




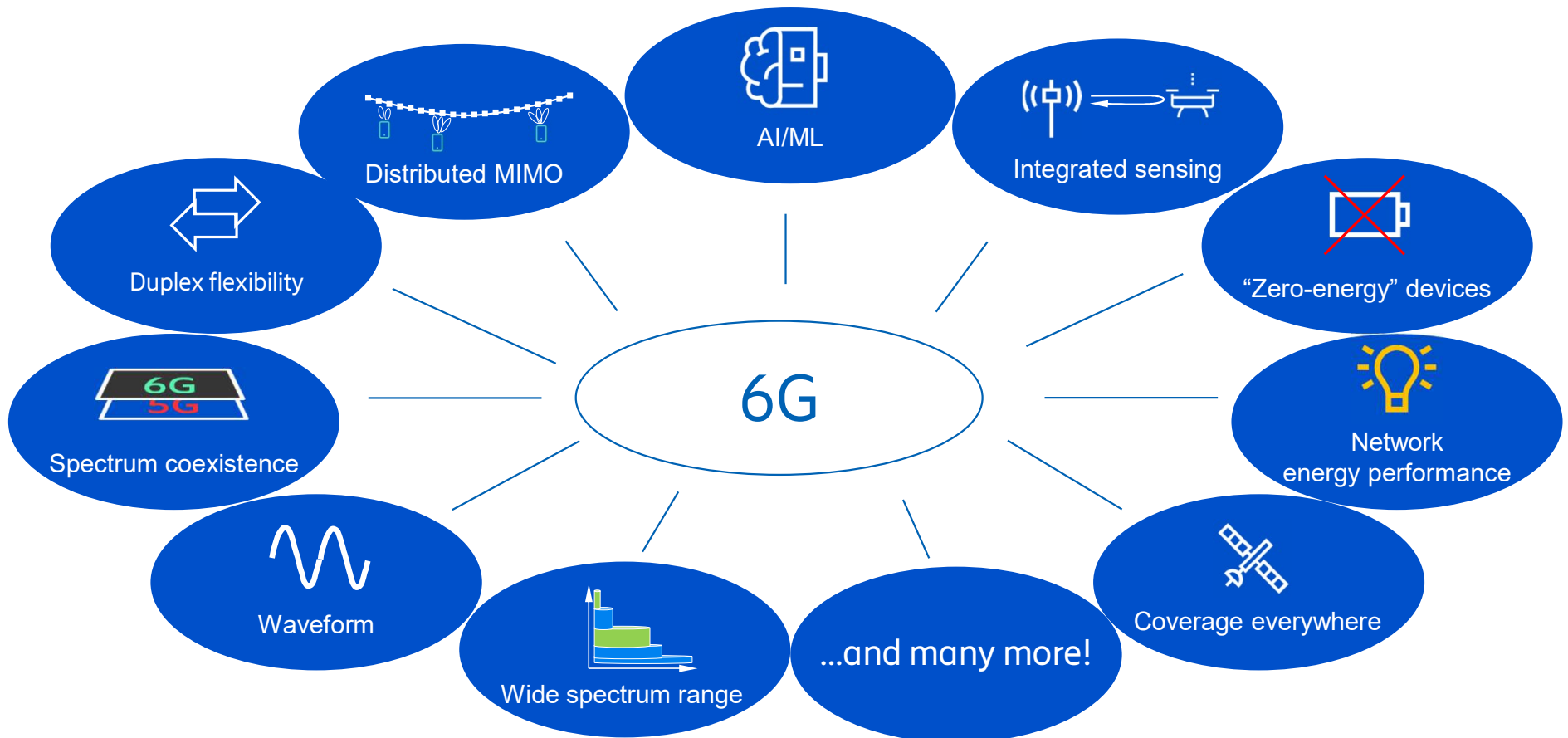
# Minimize complexity, maximize performance

## Key 6G principles

- 6G RAN shall have a standalone architecture
- 6G RAN shall interface to an Evolved 5G Core
- The standardized 6G architecture should include key open interfaces
- 6G shall operate in all existing 3GPP bands and in new cmWave bands
- 6G Spectrum Sharing shall be supported between 5G and 6G
- 6G shall support new and evolved use cases, efficiently & sustainably



# 6G technology components

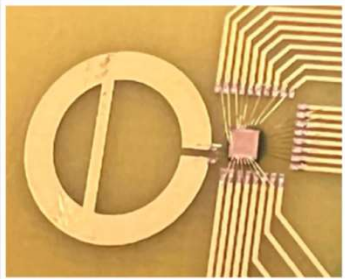


# 6G zero-energy devices

Massive IoT and Zero energy devices, shown at MWC



## Zero-energy IoT devices



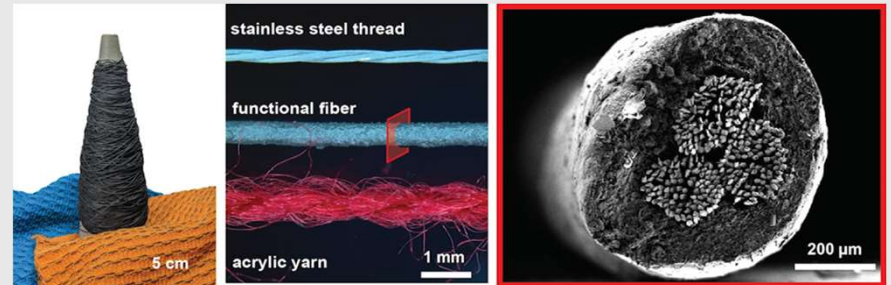
[2]

### First prototype:

- Designed to fit with fabric
- No need for batteries

Potential future IoT device for 6G

## Tactile textiles with piezoresistive fibers



[1]

### Application potential:

- Feel body pressure and movements to monitor patient

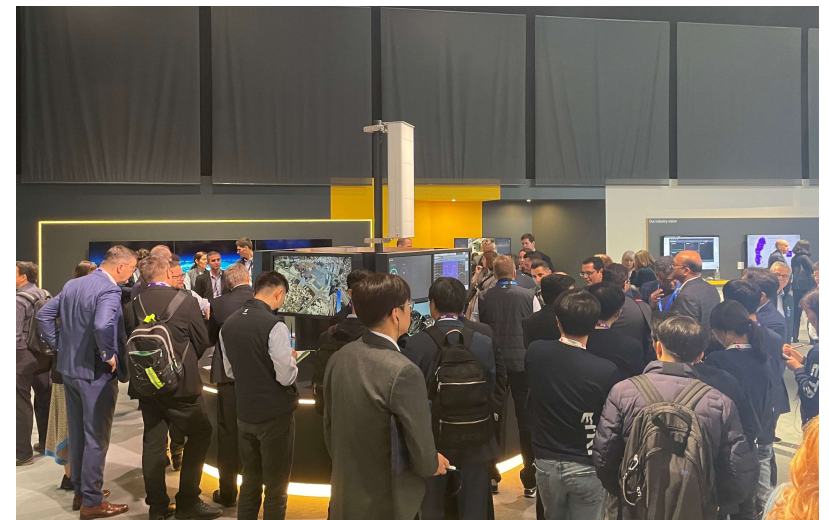
Need low-energy connection to the mobile network

Long-term use case vision to study future network needs

# Technology qualification on the way to 6G



- Lab and field trials are needed to assess key technology steps
- WRC23 identified study items in
  - 7–8 and 14–15 GHz bands
- Potential new radio units need to
  - manage scattered spectrum in a wide bandwidth
  - coexistence with incumbents (e.g. satellite service)
- Prototype equipment under study
  - Two wide-band power amplifiers



# Ericsson 6G research engagements in USA



## Academic collaborations

- Princeton University (new)
- University of Texas Austin
- MIT
- Stanford University
- New York University
- Rutgers University
- University of Colorado Boulder

## National Science Foundation

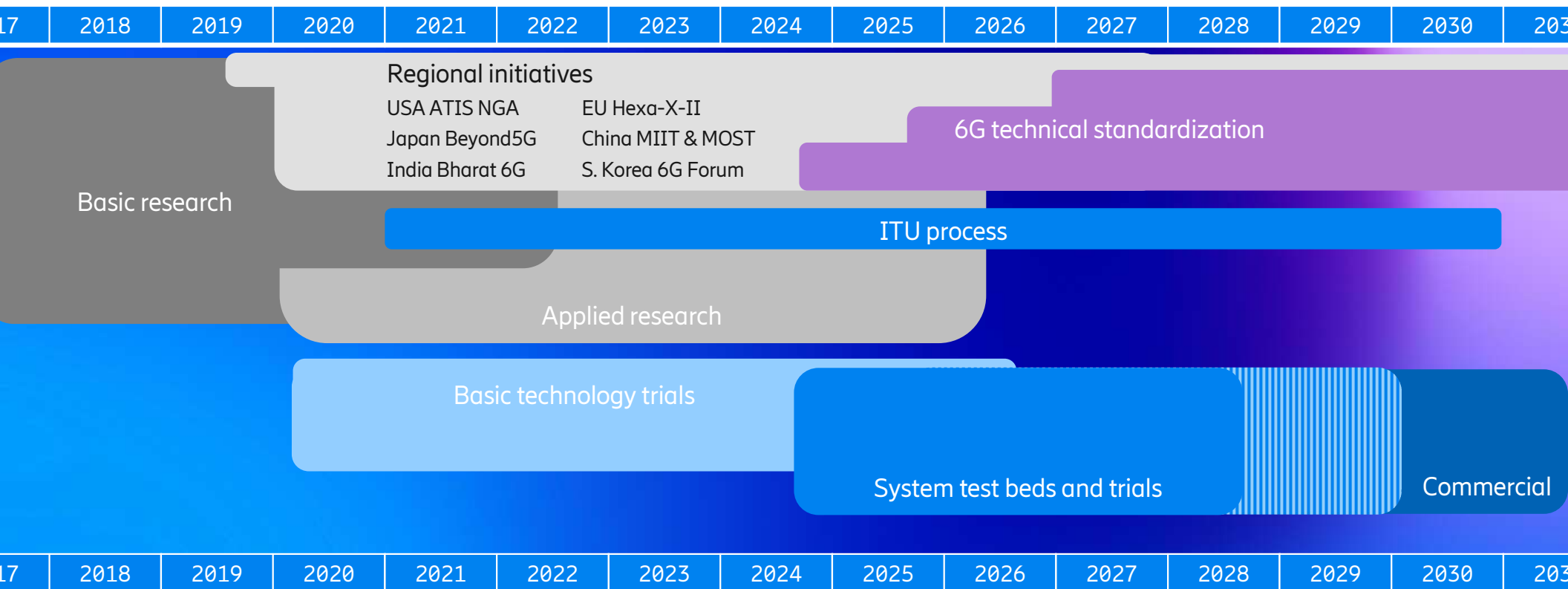
- RINGS partnership
- "RINGS 2.0" discussions
- FuSe and FuSe2 partnerships
- PAWR partnership
- US-Sweden 6G Research

## ATIS Next G Alliance

- Founding member
- Multiple leadership positions
- Research council
- Many contributions

A strong partnership between Ericsson & American leading organizations shaping 6G

# 6G industry timeline



# Pushing the boundaries on the way to 6G



- Continued deployment and evolution of 5G necessary to support demanding services
- 5G experience will provide vital input to 6G definition
- Early 6G studies well on way in the USA
- Important to shape study inputs for standardization activities
- Technology trials will provide essential feedback
- Leverage on strong local eco-system





6G - Follow the journey to the next generation networks - Ericsson