



Agentschap Telecom  
*Ministerie van Economische Zaken  
en Klimaat*

# CWTe Workshop on “6G visions”

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# Content

Agentschap Telecom

NL & digital transition

5G era isn't over yet

Regulatory framework is international

EU digital strategy

6G Speed, Spectrum, Safety & Security

Fieldlabs

Thinking forward / the 3 circles of necessity

6G Visionalized

”



# Agentschap Telecom / Radio Communications Agency NL

Mission: to improve peoples' and companies' trust in IT and communication networks, devices and electronic applications in the Netherlands. Agentschap Telecom is the authority on the digital infrastructure, and is part of Ministry of Economic affairs & Climate

**“Safely connected Netherlands”**

350+ employees , responsible on 4 area's

## Spectrum

- International harmonisation
- Coverage & QOS
- Licenses,
- Registrations (100.000+)
- Auctions
- EMC & EMF exposure
- Monitoring spectrum usage

## Infrastructure

- Networks (under- and overground [WIBON])
- Antenna register & database
- Antenna Bureau information office
- Satellite & filings



## Network en services

- Duty to report and duty of care regarding continuity
- Trust services
- Electronic identities (E-ID)
- Cybersecurity & digital trust
- NIS / Security of network and information systems (WBNI)
- Artificial Intelligence (AI)

## Devices & IoT

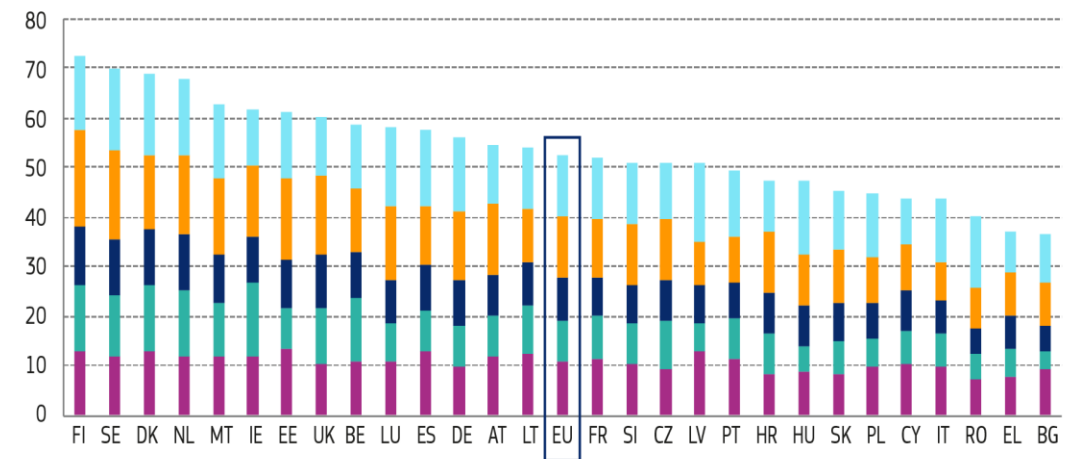
- Standardization
- EU Market access
- Equipment EMC, EMF
- Spectrum & security
- License exempt devices, incl IoT
- Cybersecurity





## NL & digital transition

- NL in top league Europe.
- From nice to have to must have.
- Digital connectivity leads to future economic growth and social welfare.
- Leverage effect: enables large innovations in other sectors

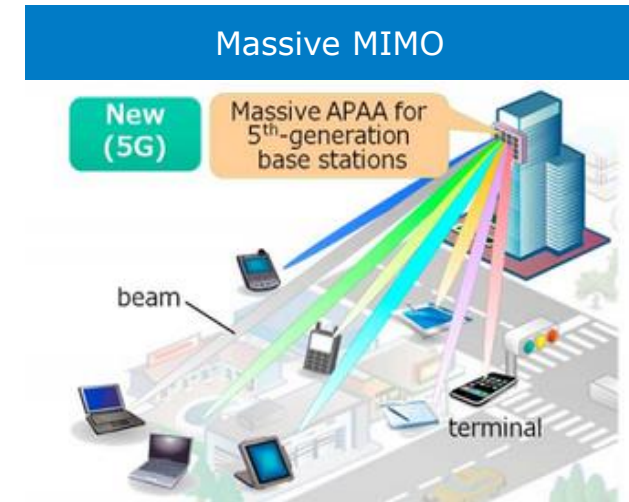


The Digital Economy and Society Index (DESI), dec 2020



## 5G era isn't over yet

- 3,5 GHz & 26 GHz
- Wifi6E
- E-Sim
- Open RAN
- Slicing
- Satellite
- mMIMO
- Small cells
- Edge computing



*5G still on its way from promise to proven  
NL policy of technology and service neutrality*



# Regulatory framework is international



ITU  
World Radio Conference (WRC)

## EU Digital Strategy

Smart Networks and Services  
Green deal  
Cybersecurity Act  
5G Tool box  
E-idas  
RED  
Telecomcode EECC  
AI Whitebook  
NIS & NIS 2

## NL Policies

National Digitalisation Strategy (NDS)  
Action Plan Digital Connectivity  
Roadmap Digital Hardware & Software  
Dynamic document WRC23  
National Radio Spectrum Policy  
Strategic Action Plan AI (SAPAI)  
National Antenna Policy  
WBNI/WIBON/WDO/TW/...

## Organisations Europe

ETSI  
ENISA  
BEREC  
RSPG  
ESA  
ECC / CEPT  
RSC EU CIE





# EU Digital Strategy



**Technology that works for people**



**A fair competitive digital economy**



**An open democratic and sustainable society**

## Europe as a global leader

The European Union will

- aim to become a global role model for the digital economy
- support developing economies in going digital
- develop digital standards and promote them internationally

## EU Digital compass 2030



1. Digitally literate citizens and highly qualified digital professionals
2. Secure, high-performance and sustainable digital infrastructure
3. Digital transformation of businesses
4. Digitalisation of public services

“...EU (..) will invest more in the strategic capacities that allow us to develop, and use digital solutions at scale and to strive for interoperability in key digital infrastructures, such as extensive 5G (and future 6G) networks.....”



## 6G & Speed

### 6G will be a 'next level' speed

- Gigabit > Terabit capacities
- Sub-millisecond response times
- Real-time automation
- Internet of senses, bio technology
- Digital twin of the physical world

### Challenging technology

- Extreme low latency
- Capacity but reduction energy consumption
- Antenna technology (-materials?)
- Bio technology
- ..







# 6G & Spectrum (ITU)

## WRC-2019

- Identified several bands in the millimeter frequency range for International Mobile Telecommunications (IMT)
- (3,5 , 26,) 40,5-43,5 GHz en 66-71 GHz.

## WRC- 2023

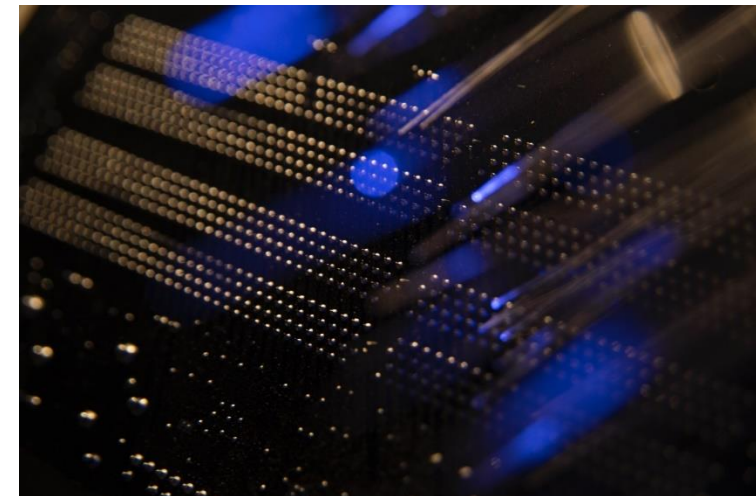
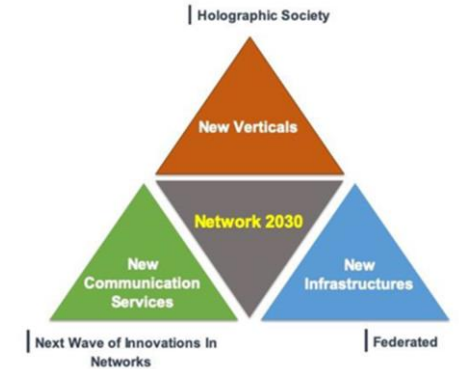
- Goals of the WRC23 agenda vary from harmonizing global use of frequency bands for e.g. satellite, exploring more spectrum for IMT, RLAN, for maritime and aeronautical purposes, etc.. up to the use of high-altitude platform stations as IMT base stations.
- Min EZK/Agentschap Telecom organization country delegation NL
- ECC CEPT European Common Proposals (ECPs)



Several “6G”- studies started

E.g.:

- **ITU-R: Working Party “IMT future technology trends towards 2030 and beyond”**  
*Report is expected to be delivered in 2022*
- **ITU-T: Study Group - Future networks**





# 6G & Spectrum (EU)

## Radio Spectrum Policy Group (RSPG)

### 1. Sharing

- Innovative sharing solutions including databases and a light licensing regime on automated platforms to foster more dynamic sharing.
- Regimes to respond to demand for local networks

### 2. Sufficient spectrum to respond to European policy initiatives

- Actively support 6G (and other technologies beyond 5G) R&D and ensure available EU harmonised spectrum, address vertical needs in the mm-Wave-bands
- Improving broadband connectivity and availability of spectrum for WAS/RLAN and for Space, Transport, (Broadcasting and PMSE), UAS/Drones
- Combat Climate Change and support Green Deal.

***RSPG policy-opinions on these 2 items are expected to be ready June 2021***

## DG Connect:

### 6 Key Dimensions of 6G

#### Vertical use cases beyond 5G

higher capacity, xGbps speed, new spectrum, sub ms latency, location, ultra high device density

#### New classes of applications

XR, Holographic coms, Internet of Senses

#### Fully Automated Infrastructure

Autonomous management, AI

#### Ultra low energy/EMF

Optical techs, architecture, optimizing computing vs networking, EMF aware

#### Ultra high security

Quantum, blockchain, from component to application

#### Sustainable Development goals

Affordability of tech, Open RAN, infrastructure access, climate change.



# 6G & Safety and security

## Essential requirements

- **EMF; protection health**  
ICNIRP limits, ALARA-principle, measurements
- **EMC; no disturbances**
- **Spectrum; efficient use of frequencies**



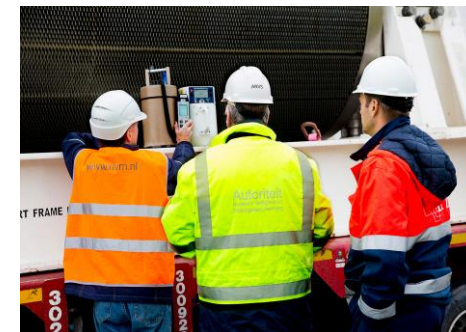
## EU Radio Equipment Directive (RED)

Product regulation for a safe and secure connectivity.

### Newly in RED (=upgrade):

All radio equipment capable to communicate with internet.

Expected approval EU Delegated act on RED 3.3, Q3 2021





## 6G Safety and security (cont)



**Agentschap Telecom: Business Continuity – Digital Security (cybersecurity) – Digital Trust**

**Regulatory, standardization, audits, and law enforcement**

Cloud and Online Marketplaces

(NIS)

Safe and interference free devices and connections (radio frequencies)

(EECC)

Energy (gas, oil, electricity)

(NIS)

Digitale Infrastructuur (Internet)

(NIS / EECC)

Telecom (network providers and ISP)

(EECC)

Above- and underground networks

(EECC/Wibon)

Trustworthy transactions and identification (PKI, eID)

(eIDAS / Wet DO)

Secure devices and services

(Cyber security Act, RED, Metrology)



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free devices and connections

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(gas, oil, electricity)

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(Internet)

**NEW**

Cybersecurity act; Agentschap Telecom becomes NCCA, the National Cybersecurity Certification Authority  
Radio Equipment Directive; Upgrade with art 3.3., ie incl cyber security for all devices possible to connect to the internet  
Artificial Intelligence; EU expected to come up with coding for use of AI in so called 'high risk' sectors

(EECC)

(EECC/Wibon)

(eIDAS /Wet DO)

(Cyber security Act, RED,  
Metrology)



# Fieldlabs

- **Triple Helix model of cooperation**

- Universities, institutions TNO, ..
- R&D companies, business, industry, new startups
- Government, regulator

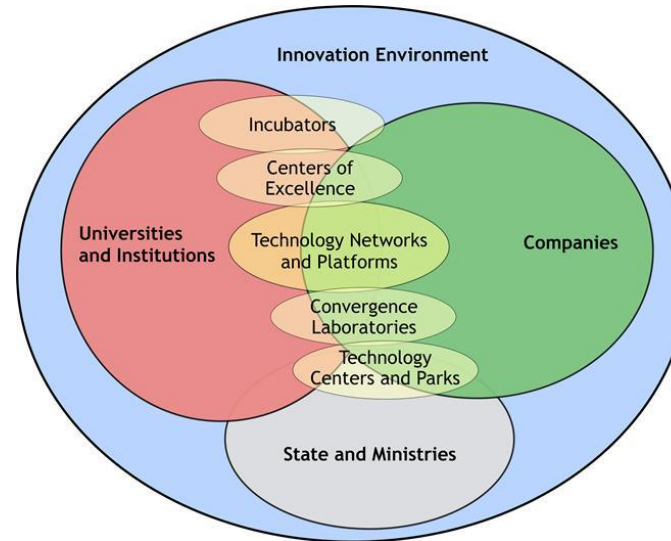
- **Ecosystem of fieldlabs (5G > 6G)**

- **Test licenses**

- **Preparation for WRC'23**

- **Conducting, fields for exploration**

- E.g. Artificial Intelligence, Dynamic spectrum, Quantum computing, Energy transition, New internet architecture, Antenna technology, Photonica, ..



## Ministry EZK & TNO workshop (22/4/2021)

- EU Smart Networks and Services
- 900 Mln Euro for R&I projects
- Opportunities for financing research and developments



# Thinking forward, 3 necessities

- Increase of societal complexity requires excellent digital infrastructure
- Circles of necessity: Availability > Reliability > Trust



Availability

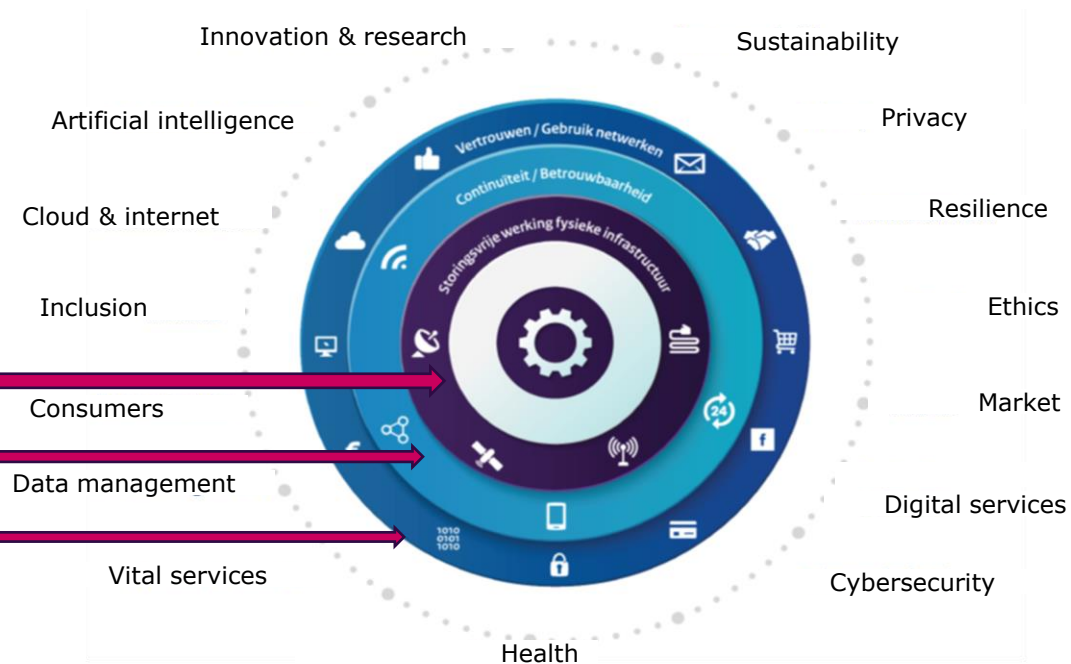
Reliability

Trust

First circle /inner ring

Second circle/ 2<sup>nd</sup> ring

Third circle / 3<sup>rd</sup> ring



*The 3 circles of necessity / Agentschap Telecom*



## 6G visualized

- **Transmission:** Higher frequencies, up to optical, THz (nearby) visual light , fiber-to-the-room
- **Network:** New eco system of interoperable networks, including verticals, p2p, mesh, satellite
- **Method:** Dynamic spectrum use, AI, and quantum computing,
- **Material:** Sensing antennas, smart surfaces, new furniture

### Impact of (new) societal goals:

- Reduction energy consumption, sustainability, health, ethical concerns
- GDPR Privacy, transparency, data integrity and cybersecurity
- Digital sovereignty, geo-politics

**A higher grade of technological complexity & new societal goals will require a higher grade of interoperability in order to fulfill the circles of necessity i.e. availability, reliability and trust.**





**Thank you for your attention**

*“ We can’t innovate frequencies.  
But we can innovate the way we use them !”*

