

# ITU Regional Initiative for EUROPE

ITU-UKE Workshop on Mapping of Terrestrial Broadband Infrastructure and Services  
2-3 July 2019 / Warsaw, Poland

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[www.itu.int/en/ITU-D/Regional-Presence/EUROPE](http://www.itu.int/en/ITU-D/Regional-Presence/EUROPE)

#ICT4SDG



SUSTAINABLE  
DEVELOPMENT

GOALS



World Summit  
on the Information Society  
Turning targets into action  
Geneva 2003 | Tunis 2005 | New York 2015



# EUROPE

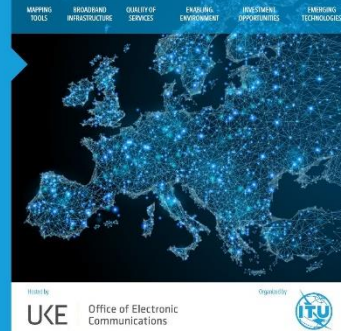
ITUEvents

ITU regional workshop  
for Europe on "Mapping  
of terrestrial broadband  
infrastructure and  
services"

2-3 July 2019  
Warsaw, Republic of Poland

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<http://itu.int/en/BBMAP/EUR-2019>

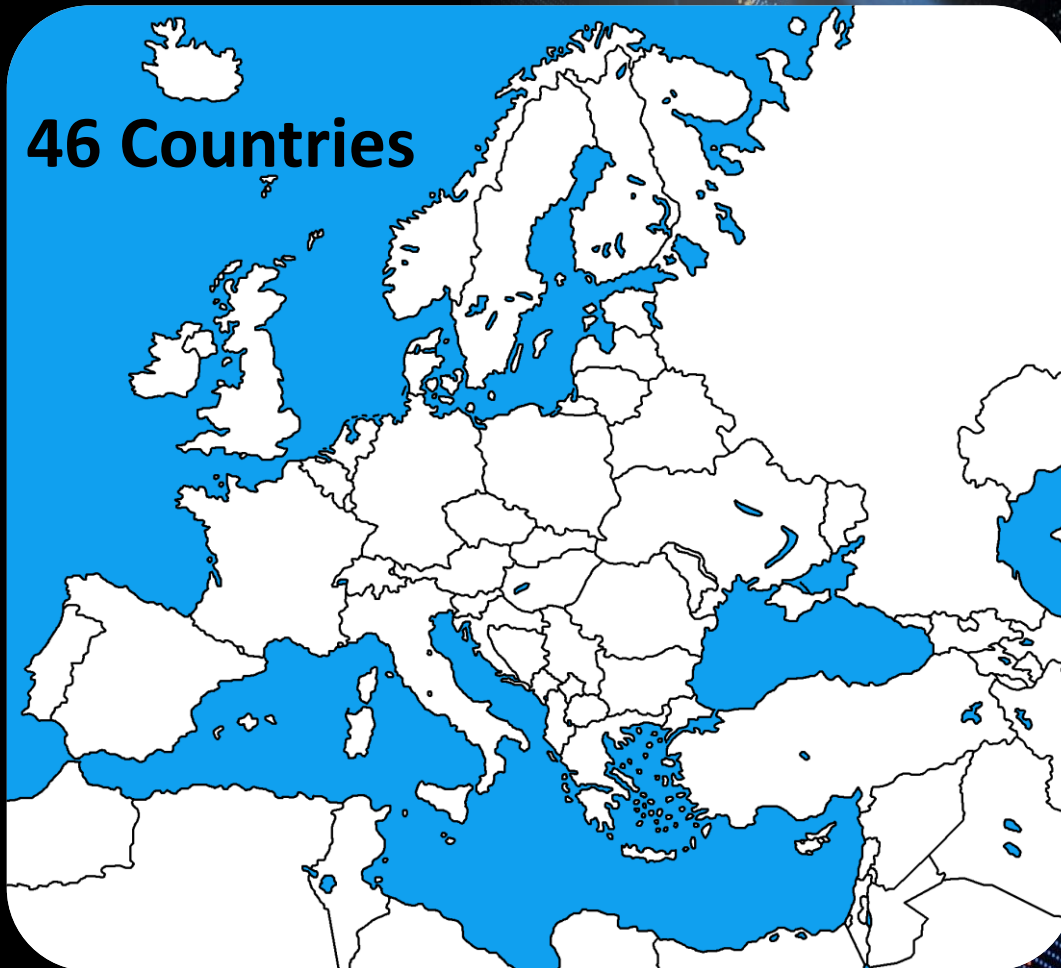
Organized within the framework of the ITU Regional  
Initiative for Europe on broadband infrastructure,  
broadcasting and spectrum management





# EUROPE REGION

# EUROPE



**46 Countries**



**#ICT4SDG**





# Regional Initiatives for Europe

# EUROPE

Broadband infrastructure, broadcasting and spectrum management

A citizen-centric approach to building services for national administrations

Accessibility, affordability and skills development for all to ensure digital inclusion and sustainable development

Enhancing trust and confidence in the use of information and communication technologies

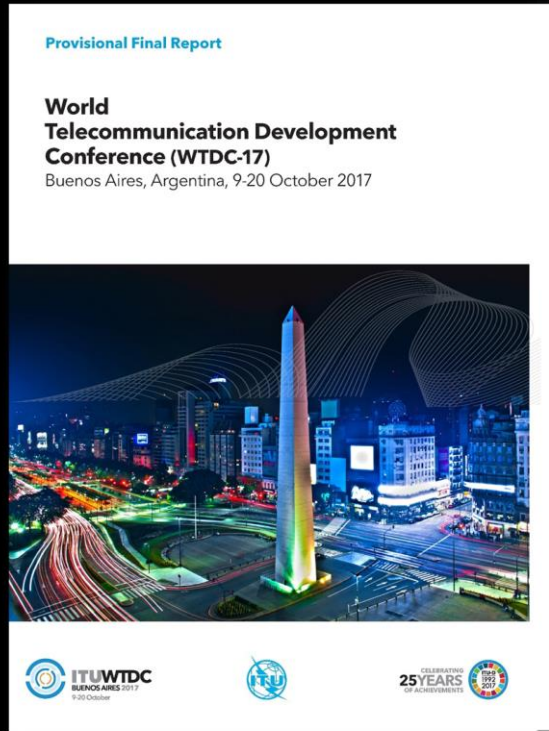
ICT-centric innovation ecosystems





# Implementation Framework

# EUROPE



ITU Logo

International Telecommunication Union  
Telecommunication Development Bureau

Project Budget Number: [Blank]

Project Title: International Telecommunication Union - Partner name: European Regional Initiative: E-Accessibility in Central and Eastern Europe-Internet and Digital Television-for blind people and people with visual impairment problems

Project Short Title: ITU-Partner name: June 2012

Start Date: [Blank]

Estimated End Date: [Blank]

Government Coop. Agency: Ministries in charge of ICTs, Regulatory bodies, Ministries of Education, International Telecommunication Union

Implementing Agency: ITU Headquarters, Geneva

Project Site: [Blank]

Beneficiary Country: Administrations, Regulators, Operators in countries of Central and Eastern Europe

ITU Project Manager: Jaroslav Ponder

**Brief Description:**  
This project aims at assisting Member States in order to offer e-accessibility (including Internet, information access and digital television) to blind people and people with visual impairment problems. To achieve this objective, ITU shall jointly with countries in Central and Eastern Europe promote the e-accessibility initiative and help them to achieve this goal through the creation of national and regional specialized libraries/databases in order to provide large-scale access via Internet for blind people and people with impairment problems; the establishment of relevant facilities (hardware and software) and implementation of training for users and instructors; the promotion and the fostering widespread adoption of access services via digital television.

On Behalf of: Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Name/Title: \_\_\_\_\_

ITU: \_\_\_\_\_ Mr. Brahma Sanou Director of BD

SUMMARY OF CONTRIBUTIONS	
Project Budget	USD
Project Personnel	
Equipment	
Training of Trainers	
Travel/visits	
Monitoring & Evaluation	
Workshop	
ITU Admin Support Cost	
Total:	

By: Cost sharing: -value-  
-value-  
Participating countries Contribution (in kind):  
- Training: -value-  
- Training Room / Business Centre  
- Communication Facilities  
- Infrastructure



# PRIORITIES 2018-2021

# EUROPE

**ICT  
Infrastructure**



**Digitization  
e-Services**



**Digital  
Inclusion**



**Cybersecurity**



**Innovation**



**#ICT4SDG**

 **SUSTAINABLE  
DEVELOPMENT GOALS**

working together towards  
**2025**

World Summit  
on the Information Society  
**Turning targets into action**  
Geneva 2003 | Tunis 2005 | New York 2015





# INFRASTRUCTURE



To facilitate high-speed connectivity with resilient and synergistic infrastructure development, deployment and sharing, whilst ensuring a trusted and quality user experience.



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World Summit  
on the Information Society  
Turning targets into action  
Geneva 2003 | Tunis 2005 | New York 2015





# INFRASTRUCTURE



## *EUR1: Broadband infrastructure, broadcasting and spectrum management*

**Expected results:** Assistance to the countries in need in the following

- Development of plans (national and regional) and feasibility studies for deployment of ubiquitous resilient high-speed connectivity, including 5G/IMT2020 and digital broadcasting deployment, with all relevant components including legislation, standards, organizational set-up, capacity building and cooperation mechanisms, as needed
- Sharing of guidelines on collaborative regulation between the telecommunication sector and other synergistic sectors such as energy, railway and transportation
- Assessment of dynamics, challenges and opportunities in respect of the roll-out of diverse broadband technologies across Europe in the context of the creation of ubiquitous resilient high-speed broadband infrastructure
- Sharing of best practices and case studies in cable TV, digital broadcasting, 5G experience, early use cases and trends in next-generation access network roll-out
- Mapping of the ubiquitous infrastructure and services, fostering harmonization of approaches across the region and taking into account infrastructure-sharing approaches applied by countries
- Establishment of quality-of-service systems and consumer-protection frameworks
- Development of plans for ICT for sustainable energy covering different types of ICT applications and innovations.



# INFRASTRUCTURE



ITALY, November 2018

**Electromagnetic Field Level and 5G Roll-out Expert Meeting**  
2-3 November 2017  
Rome, Italy

ITU Regional Initiative for Europe on Development of Broadband Access and Adoption of Broadband

Hosted by:  **Ministero dello Sviluppo Economico**

Organized by: 

**BROADBAND POLICIES & STRATEGIES** | **FUTURE 5G NETWORKS** | **BASE STATIONS** | **HEALTH ISSUES**  
INTERNET OF THINGS IoT | DEPLOYMENT COSTS | STAKEHOLDERS

UKRAINE, May 2018

**Digital Future powered by 4G/5G**  
14-16 May 2018  
Kiev, Ukraine

ITU Regional Initiatives for Europe and CIS on Development of Broadband Access and Adoption of Broadband

Hosted by: 

**DIGITAL TRANSFORMATION** | **CYBERSECURITY** | **INNOVATIVE SERVICES** | **LEGISLATIVE/REGULATORY ENVIRONMENT**

HUNGARY, July 2018

**ITUEvents**  
**ITU Regional Seminar 5G Implementation in Europe and CIS**  
*Strategies and Policies Enabling New Growth Opportunities*

3-5 July 2018  
Budapest, Hungary

Hosted by: 

**NATIONAL STRATEGIES FOR 5G DEPLOYMENT** | **5G PILOT IMPLEMENTATION** | **DIGITAL DIVIDEND**  
ENABLING ENVIRONMENT | NEW BUSINESS MODELS | SPECTRUM MANAGEMENT

LATVIA, July 2018

**5G TECHRITORY**  
**SEPTEMBER 27-28**  
**RIGA, LATVIA**

One of the leading 5G technology events worldwide

MONTENEGRO, October 2018

**ITU-EKIP Regulatory Forum for Europe**  
**Evolving Regulatory Frameworks for the Digital Future**  
1-2 October 2018  
Budva, Montenegro

ITU Regional Initiative for Europe on Broadband Infrastructure, Broadcasting and Spectrum Management

Hosted by: 

**4G/5G** | **SPECTRUM MANAGEMENT** | **INTERNET OF THINGS** | **FUTURE NETWORKS** | **QUALITY OF SERVICE**

ATHENS, October 2018

**ITUEvents**  
**Towards 5G Enabled Gigabit Society**  
11-12 October 2018  
Athens, Greece

ITU Regional Initiative for Europe on Broadband Infrastructure, Broadcasting and Spectrum Management

Hosted by: 

**5G NATIONAL STRATEGIES** | **POLICIES AND REGULATION** | **FUTURE NETWORKS** | **SPECTRUM MANAGEMENT** | **SMART CITIES**  
INTERNET OF THINGS | ARTIFICIAL INTELLIGENCE | MACHINE LEARNING | INNOVATION

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# INFRASTRUCTURE



- A series of seminars and workshops built the capacity of more than 1 100 stakeholders in the field of spectrum management and transition to digital broadcasting. This includes the following meetings:
  - Workshop on **The Future of Cable TV**, Geneva, Switzerland (25-26 January 2018)
  - Regional Seminar for Europe and CIS on **Digital Future Powered by 4G/5G**, Kiev, Ukraine (14-16 May 2018)
  - Regional Seminar for Europe and CIS on 5G Implementation in Europe and CIS: **Strategies and Policies Enabling New Growth Opportunities**, Budapest, Hungary (3-5 July 2018)
  - Regional Workshop for Europe and CIS on **“Broadband Development based on 4G and 5G Technologies”**, Almaty, Republic of Kazakhstan (17-18 September 2018)
  - Baltic Sea Region 5G Ecosystem Forum **“5G Technology”**, Riga, Latvia (27-28 September 2018)
  - Regional Regulatory Forum for Europe on **“Evolving Regulatory Frameworks for Digital Future”**, Budva, Montenegro (1-2 October 2018)
  - Forum on **“Towards 5G Enabled Gigabit Society”**, Athens, Greece (11-12 October 2018)
  - 3rd Annual CIS and CEE Spectrum Management Conference and ITU Workshop **“How to achieve interference free communication at the current technological stage”**, Minsk, Belarus (08/04/2019 - 11/04/2019)



## Additional 5G related meetings

- ITU-T Workshop on “5G, Health and EMF”  
5 December 2017, Warsaw, Poland
- Contribution to Europe’s 5G Ambition: Investing in 5G Enabler Infrastructure, 20 June 2018, European Parliament, Brussels)
- 2nd Annual CIS and Central and South-Eastern European Spectrum Management Conference and ITU Regional Workshop “Broadband Development based on 4G and 5G Technologies”  
17-20 September 2018, Almaty, Kazakhstan
- Conference on EMF and 5G, Warsaw, 6-7 December 2019

Dec 2018, WARSAW



June 2018, BRUSSELS



Sep 2018, KAZAKHSTAN





# INFRASTRUCTURE



## UKRAINE, April 2019

**ITUEvents**

**ITU workshop for Europe and CIS**

*Using ICT to save lives*

24-26 April 2019  
Odessa, Ukraine

Follow us on twitter @ITU\_EUR and @ITUMoscow

Workshop organized within the framework of the ITU Regional Initiatives for Europe, CIS and the ITU Study Group 5 on the use of information and communication technologies in disaster management.

## UKRAINE, May 2019

**ITUEvents**

**ITU workshop for Europe and CIS**

**ICT infrastructure as a basis for digital economy**

14-16 May 2019  
Kiev, Ukraine

Follow us on twitter @ITU\_EUR and @ITUMoscow  
<http://itu.int/go/EUR-IBDE>

ITU Regional Initiatives for Europe, CIS and the ITU Study Group 5 on the use of information and communication technologies in disaster management.

## ITU Headquarters, June 2019

**ITUEvents**

**ITU workshop on the future of television for Europe**

7 June 2019  
ITU headquarters  
Geneva, Switzerland

<http://itu.int/go/TV-Europe>

Follow us on twitter @ITU\_EUR

Workshop organized within the framework of the ITU Regional Initiatives for Europe and the ITU Study Group 5 on the use of information and communication technologies in disaster management.

## ALBANIA, June 2019

**ITUEvents**

**ITU Seminar on Radiocommunication Matters for Europe**

24-27 June 2019  
Tirana, Albania

[www.itu.int/go/ITU-R/5/5ME-19](http://www.itu.int/go/ITU-R/5/5ME-19)

## POLAND, June 2019

**ITUEvents**

**ITU regional workshop for Europe on "Mapping of terrestrial broadband infrastructure and services"**

2-3 July 2019  
Warsaw, Republic of Poland

Follow us on twitter at @ITU\_EUR and @UKE2LUKE  
<http://itu.int/go/REBMAP-EUR-2019>

Organized within the framework of the ITU Regional Initiative for Europe on broadband infrastructure, broadcasting and spectrum management.

## MONTENEGRO, September 2019

**ITUEvents**

**ITU-EKIP regional regulatory forum for Europe**

30 September-1 October 2019  
Budva, Montenegro

## UKRAINE, October 2018

**ITUEvents**

**ITU regional economic dialogue on ICTs for Europe and CIS regions (RED-19)**

30-31 October 2019  
Odessa, Ukraine

Follow us on twitter @ITU\_EUR / @ITUMoscow  
[http://itu.int/go/EUR\\_RED-19](http://itu.int/go/EUR_RED-19)

Organized within the framework of the ITU Regional Initiatives for Europe, CIS and the ITU Study Group 5 on the use of information and communication technologies in disaster management.

## LATVIA, November 2019

**5G TECHRITORY**

**NOVEMBER 27-29**

ARE WE READY FOR 5G GLOBAL DEPLOYMENT FROM 2020?

Riga, Latvia | 2019

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World Summit  
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Turning targets into action  
Geneva 2003 | Tunis 2005 | New York 2015

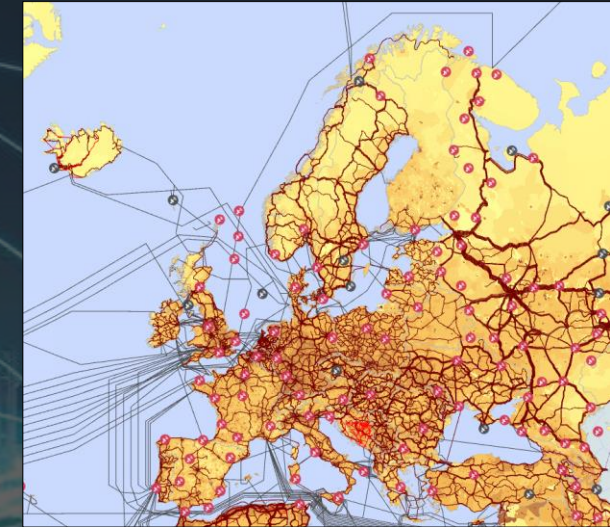




# INFRASTRUCTURE



- The following **publications** were made available in 2018:
  - The Future of Cable TV in Europe (2018) / The Future of Television (2019)
  - ICT for Sustainable Energy (2018)
  - Workshop reports (2018 and 2019)
- **Technical Assistance**
  - Albania: Update of the Broadband Policy
  - North Macedonia: Special Paper on ICT Infrastructure Development
- The Europe region part of the **ITU Broadband Map** was updated by reflecting the networks of several European operators.
- A **twinning programme** between Hungary and Albania led to an exchange of best practices in the field of spectrum management, in addition to development of the new spectrum strategy and policy in Albania.
- The above mentioned activities have been supplemented by a series of trainings delivered by the Europe region network of **ITU centres of excellence** that built capacity of more than 600 participants in field of broadband, Internet governance, cybersecurity and next generation networks.





# INFRASTRUCTURE Mapping



## NATIONAL MAPPING SYSTEMS

Technical Assistance  
Investment Opportunities

## REGIONAL/SUBREGIONAL APPROACHES

Supporting Harmonization

## GLOBAL ICT INFRASTRUCTURE MAPPING

Collecting Validated Data

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# MAPPING of INFRASTRUCTURE



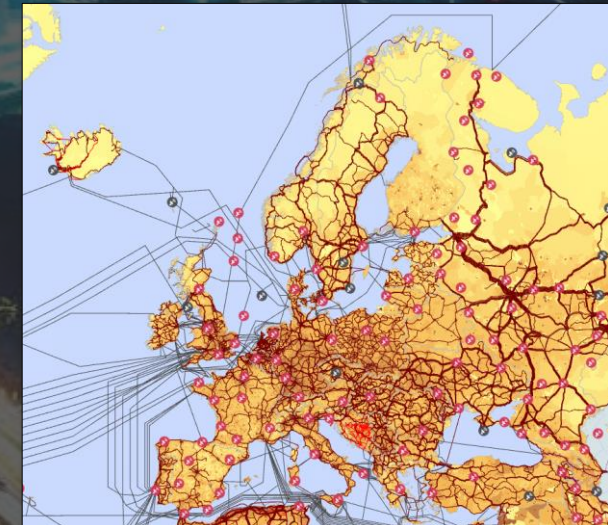
- National Mapping Systems in 46 countries of Europe Region
- Diverse level of development
  - Active
  - Partially active
  - Under construction
  - Unknown
- Technical country assistance by relevant stakeholders
- Possible project targeting group of non-EU countries





## Global Broadband Map: Broadband Transmission Capacity Indicators

- 1: Transmission network length (Route kilometres)
- 2: Node locations
- 3: Equipment type of terrestrial transmission network
- 4: Network capacity (bit rate)
- 5: Number of optical fibres within the cable
- 6: Operational status of the transmission network
- 7a: Percentage of population within reach of transmission networks
- 7b: Percentage of area within reach of transmission networks

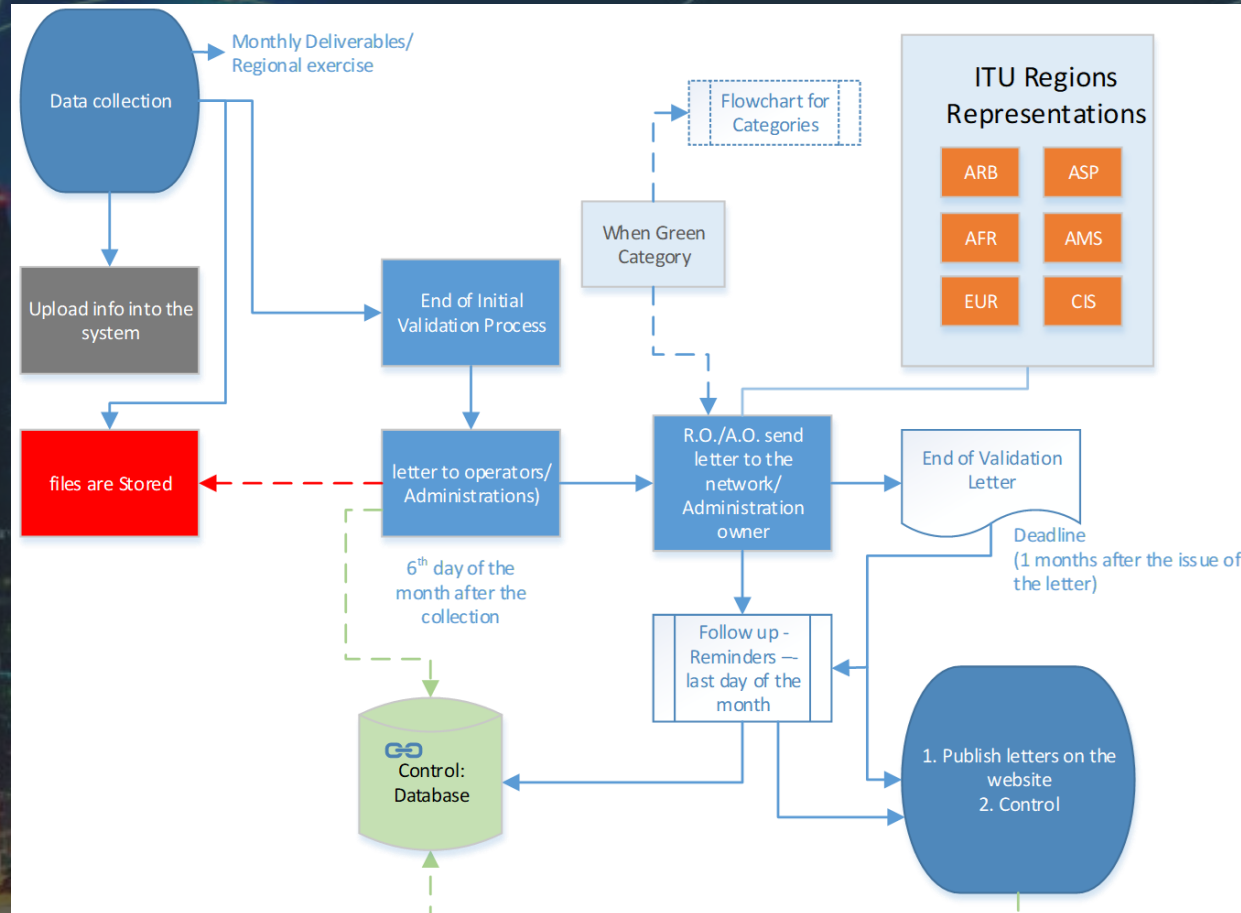




# INFRASTRUCTURE



- Europe in Global Broadband Map



The objective of the Validation Process is to engage network operators and administrations to verify the accuracy and integrity of the data, whilst it remains protected behind TIES.

As the lines are verified, their status will progress from either RED, AMBER or GREEN through to light blue for PUBLIC (**After final clearance**).

For a detailed description :

<https://www.itu.int/itu-d/tnd-map/validation/>

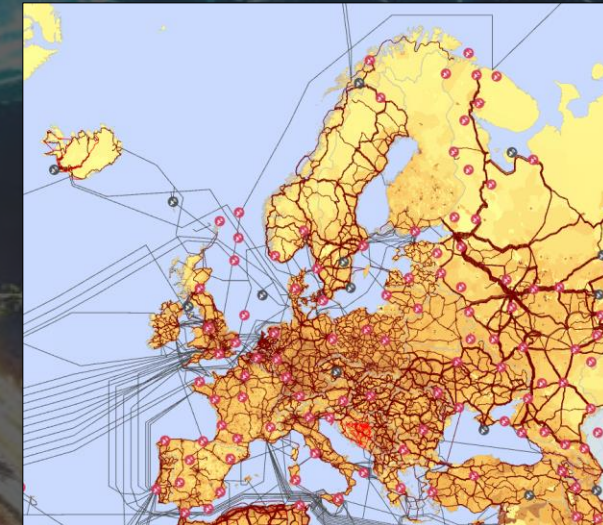


# INFRASTRUCTURE



## Global Broadband Map: Data Structure – Sample

COUNTRY	TYPE_INF	STATUS	CAPACITY	FIBRES	VALIDITY	NOTES	DISTANCE
Canada	Fibre Operational	Operational		0	0	3	93.50
Canada	Fibre Operational	Operational		0	0	3	49.45
Canada	Fibre Operational	Operational		0	0	3	75.38
Canada	Fibre Operational	Operational		0	0	3	168.88
Canada	Fibre Operational	Operational		0	0	3	118.91
Canada	Fibre Operational	Operational		0	0	3	171.91
Canada	Fibre Operational	Operational		0	0	3	142.00
Canada	Fibre Operational	Operational		0	0	3	123.47
Canada	Fibre Operational	Operational		0	0	3	87.78
Canada	Fibre Operational	Operational		0	0	3	34.32
Canada	Fibre Operational	Operational		0	0	3	133.62
Canada	Fibre Operational	Operational		0	0	3	246.96
Canada	Fibre Operational	Operational		0	0	3	69.41
Canada	Fibre Operational	Operational		0	0	3	315.05
Canada	Fibre Operational	Operational		0	0	3	161.57
Canada	Fibre Operational	Operational		0	0	3	164.29
Canada	Fibre Operational	Operational		0	0	3	57.41
Canada	Fibre Operational	Operational		0	0	3	228.04
Canada	Fibre Operational	Operational		0	0	3	94.67
Canada	Fibre Operational	Operational		0	0	3	76.51
Canada	Fibre Operational	Operational		0	0	3	82.14

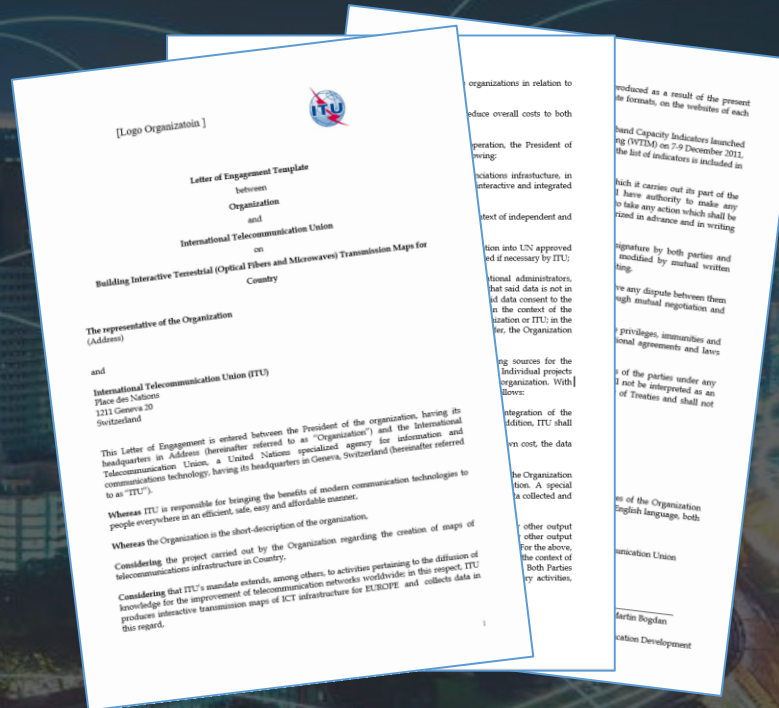
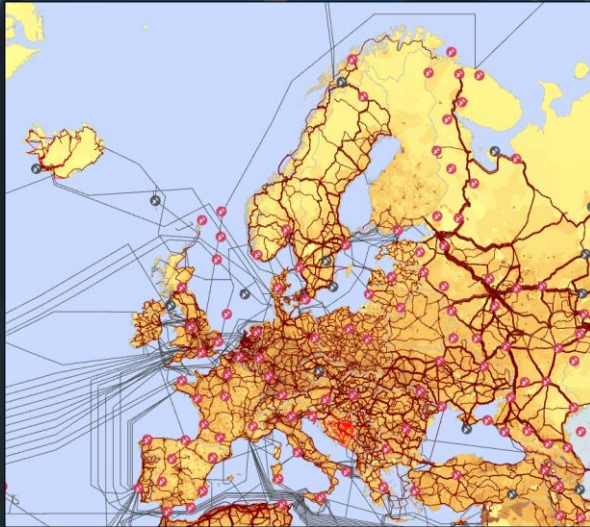




# MAPPING of INFRASTRUCTURE



- Europe in Global Broadband Map



STATUS OF DATA PER COUNTRY

LETTER OF ENGAGEMENT

DATA TRANSFER TO GLOBAL MAP

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# Next Steps

- Towards **mapping / investment opportunities maps** for non-EU countries of Europe region
  - Stocktaking of the mapping tools
  - Gap analysis
  - Harmonization of approaches of non-EU countries
  - Consultations at the ITU Regional Regulatory Forum for Europe, 30 September – 1 October
  - Technical assistance to the countries
- Invitation to the European countries to provide information to the **Global Terrestrial Transmission Map**



EUROPE

Thank You!!!

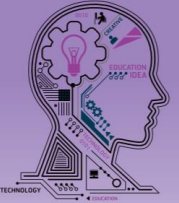
EURregion@itu.int



# ITU Centres of Excellence


# EUROPE

CYBERSECURITY    BROADBAND ACCESS    E-WASTE  
CONFORMANCE AND INTEROPERABILITY    CAPACITY BUILDING IN INTERNET GOVERNANCE



## TRAINING OPPORTUNITIES 2018

Offered by the ITU Centres of Excellence for Europe



STRATEGIC ASPECTS FOR INTERNET GOVERNANCE AND INNOVATIONS [5-12 February].....

LEGAL AND REGULATORY BARRIERS TO THE INTRODUCTION OF CLOUD SERVICES IN THE EU [5-12 March].....

WIRELESS ACCESS TECHNOLOGIES TO INTERNET NETWORK [2-9 April].....

FIBER OPTIC SPLICING AND INSTALLATION [23-25 May].....

FUTURE BROADBAND INTERNET ACCESS [29 May - 25 June].....

CYBER SECURITY AWARENESS FOR SMES [04 June].....

SOFTWARE CONFORMANCE TESTING AND AUDIT [27-28 June].....

INTERNATIONAL SUMMER SCHOOL ON CYBERSECURITY [09-13 July].....

SECURITY AND QOS IN INTERNET NETWORK [24 September-01 October].....

INTRODUCTION TO CYBER SECURITY FOR LIFECYCLE OF THE NEW MILLENNIUM [01 October].....

BROADBAND ACCESS [October].....

NETWORK AND IT SECURITY [October].....

TECHNICAL, BUSINESS AND REGULATORY ASPECTS OF 5G NETWORK [25-26 October].....

FIBER OPTIC SPLICING AND INSTALLATION [24-26 October].....

NEXT GENERATION MOBILE BROADBAND [20 November - 17 December].....

CE MARK FOR TELECOMMUNICATION, ACHIEVING COMPLIANCE FROM THE DIRECTIVES TO THE TEST LAB [21-23 November].....

## ITU Centres of Excellence for Europe

### Training opportunities 2019



ITU Academy  
Empowering minds



NO	TRAINING COURSE TOPIC	COE	DATES	VENUE	TRAINING FEE	TYPE OF TRAINING
1	Strategic Aspects for Internet Governance and Innovations	NIT	4-11 March	Online	150 USD	Online
2	Wireless Access Technologies to Internet Network	NIT	8-15 April	Online	150 USD	Online
3	Cybersecurity Techniques	ISS	May-December	Online: Self-paced	250 USD	Online
4	Governing Cyber Security at the National Level: Best practices and lessons learned	NRD CS	7-10 May	Vilnius, Lithuania	800 USD	Face-to-face
5	Building broadband telemedicine networks and providing e-health services at the local, regional and national levels	ONAT	16-17 May	Odessa, Ukraine	150 USD	Face-to-face
7	Legal and regulatory barriers to the introduction of cloud services in the EU	NIT	20-27 May	Online	150 USD	Online
6	Features of 5G technology implementation at the local (some towns), regional (district, region) and national level	ONAT	23-24 May	Odessa, Ukraine	150 USD	Face-to-face
8	NGN Evolution, Future Networks and Ultra-broadband Internet	FEIT	28 May - 24 June	Online	150 USD	Online
9	Cyber Incident Response (Self-Paced Course)	ISS	June-December	Online: Self-paced	250 USD	Online
10	CODATA/RDA Research Data Science Summer School	ICTP	12-16 August	Trieste, Italy	500 USD	Face-to-face
11	CODATA/RDA Advanced Workshop on IoT and Big-Data Analytics	ICTP	19-23 August	Trieste Italy	500 USD	Face-to-face
12	Security and QoS in Internet Network	NIT	26 August-2 September	Online	150 USD	Online
13	Technical Aspects of Wireless Solutions for the Internet of Things (IoT)	ICTP	2-4 September	Trieste, Italy	500 USD	Face-to-face
14	Incident Response Practice: Hands-on scenario-based training	NRD CS	17-20 September	Vilnius, Lithuania	800 USD	Face-to-face
15	Technical, business and regulatory aspects of 5G Networks	NIT	30 September 7 October	Online	150 USD	Online
16	Automation of broadband networks designing. Selecting the most appropriate solutions to build network	ONAT	October	Ashgabat, Turkmenistan	Free (in Russian)	Face-to-face
17	QoS Technologies and Regulation for Fixed and Mobile	NIT	24-25 October	Warsaw, Poland	500 USD	Face-to-face
18	IoT Entrepreneurship	ICTP	6-8 November	Trieste, Italy	500 USD	Face-to-face
19	The use of adaptive technologies to transmit video over radio channels	ONAT	7-8 November	Odessa, Ukraine	Free (in Russian)	Face-to-face
20	CODATA/RDA/ICTP/TWAS Research Data Science Summer School in West Africa	ICTP	18-22 November	Nigeria	300 USD	Face-to-face
21	Wireless and Mobile Ultra-broadband: LTE-A PRO, WLAN, and 5G NR	FEIT	19 November 16 December	Online	150 USD	Online

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