

Setting the Scene of NRENs in Africa: 10 years of AfricaConnect



The AfricaConnect3 project receives funding from the European Union under Grant Contracts DCI-PANAF/2019/411-583/584/585/586



National Research and Education Networks in Africa



AfricaConnect (2011-2015) – E&S Africa



AfricaConnect2 (2015-2021) – pan-African



AfricaConnect3 (2019-2023) – pan-African



- ASREN**
- Algeria, ARN
- Egypt, EUN
- Marocco, MARWAN
- Tunisia, CCK

- WACREN**
- Burkina Faso, FasoREN
- Cameroon, RIC
- Chad, TchadREN
- Côte d'Ivoire, RITER
- Ghana, GARNET
- Ghana, GhREN
- Guinea, Gn-REN
- Mali, MaliREN
- Niger, NigerREN
- Nigeria, NgREN
- Sierra Leone, SLREN
- Togo, TogoRER
- Liberia, LRREN

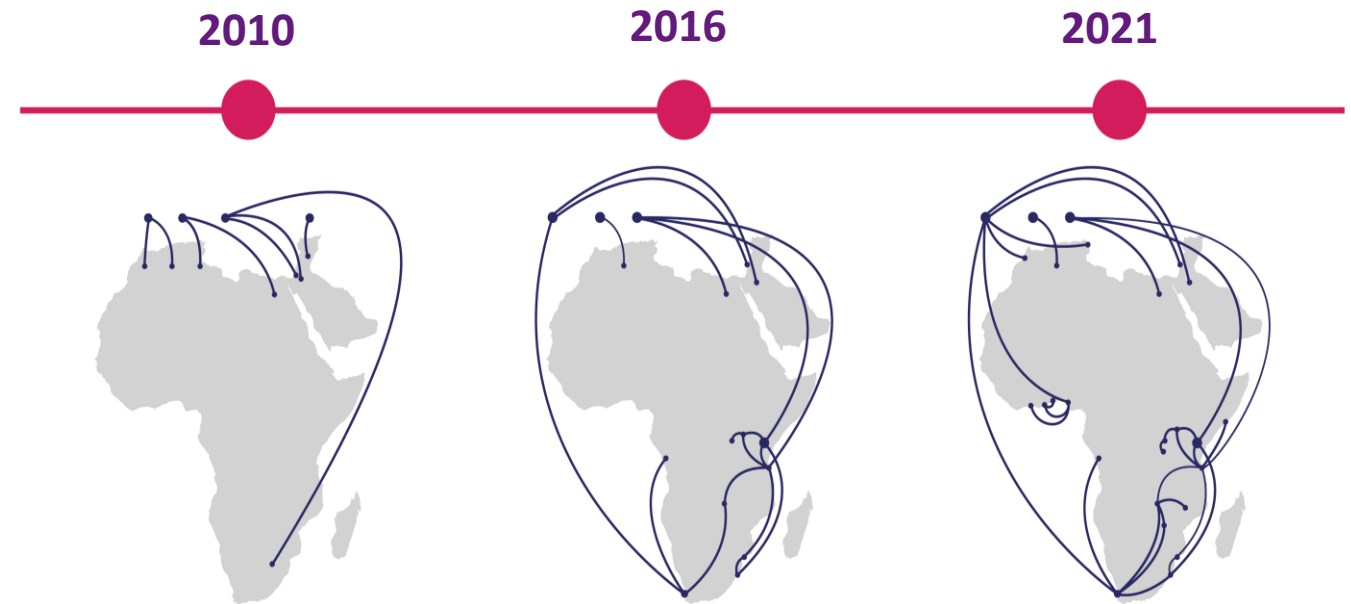
- UbuntuNet Alliance**
- Botswana, BotsREN
- Burundi, BERNET
- D. R. Congo, Eb@le
- Ethiopia, EthERNet
- Kenya, KENET
- Madagascar, iRENALA
- Malawi, MAREN
- Mozambique, MoREnet
- Namibia, Xnet
- Rwanda, RwEdNet
- Somalia, SomaliREN
- South Africa, TENET
- Sudan, SudREN
- Tanzania, TERNET
- Uganda, RENU
- Zambia, ZAMREN
- Zimbabwe, ZAMREN



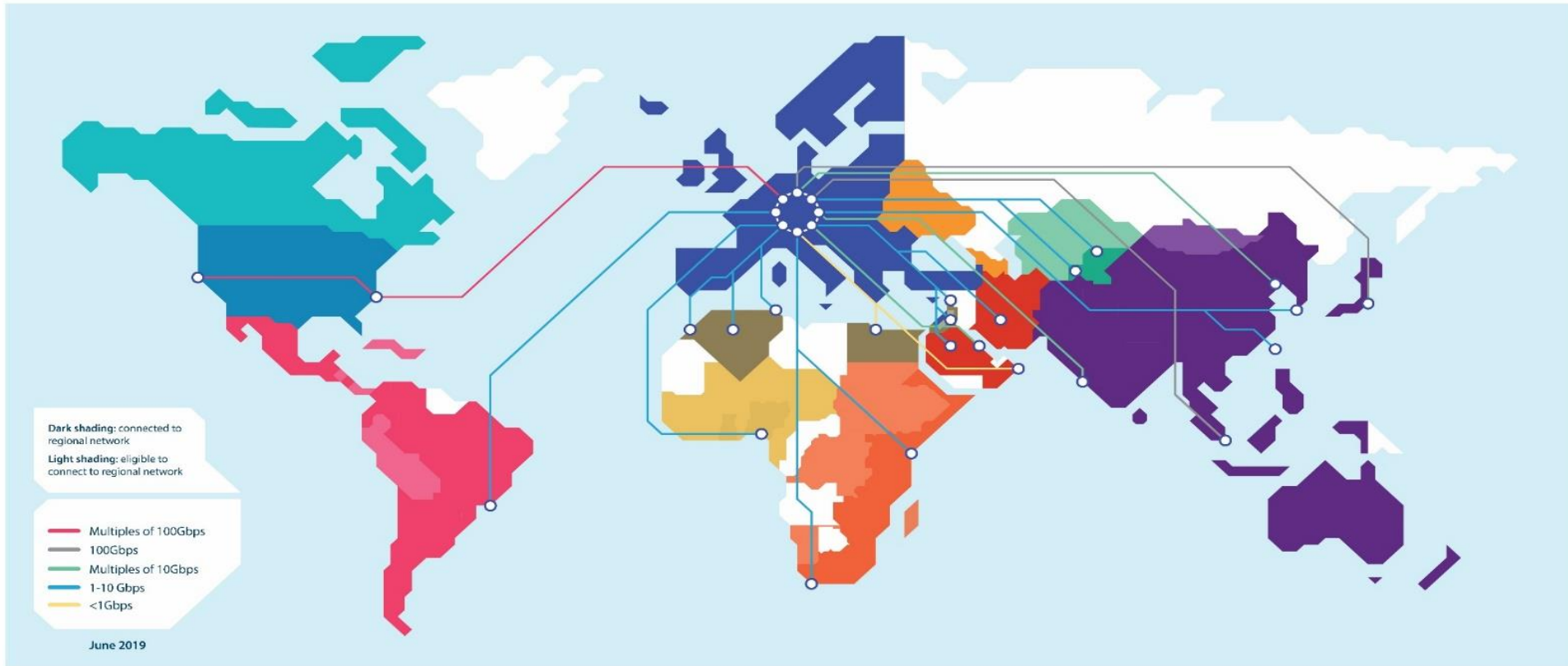
A Pan-African Network in the Making



- Since AfricaConnect **started in 2011, 22 out of 38 African** NRENs are connected to their regional network:
- **UbuntuNet Alliance:** Burundi, DRC, Kenya, Malawi, Mozambique, Rwanda, Somalia, South Africa, Tanzania, Uganda, Zambia and Zimbabwe.
- **WACREN:** Ghana, Nigeria and Togo. This spring/summer : Benin, Burkina Faso and Côte d'Ivoire.
- **ASREN:** Algeria, Egypt, Morocco and Tunisia.
- All three regional networks are growing.
- Next Countries to be connected: Mali and Ethiopia.



AT THE HEART OF GLOBAL RESEARCH AND EDUCATION NETWORKING



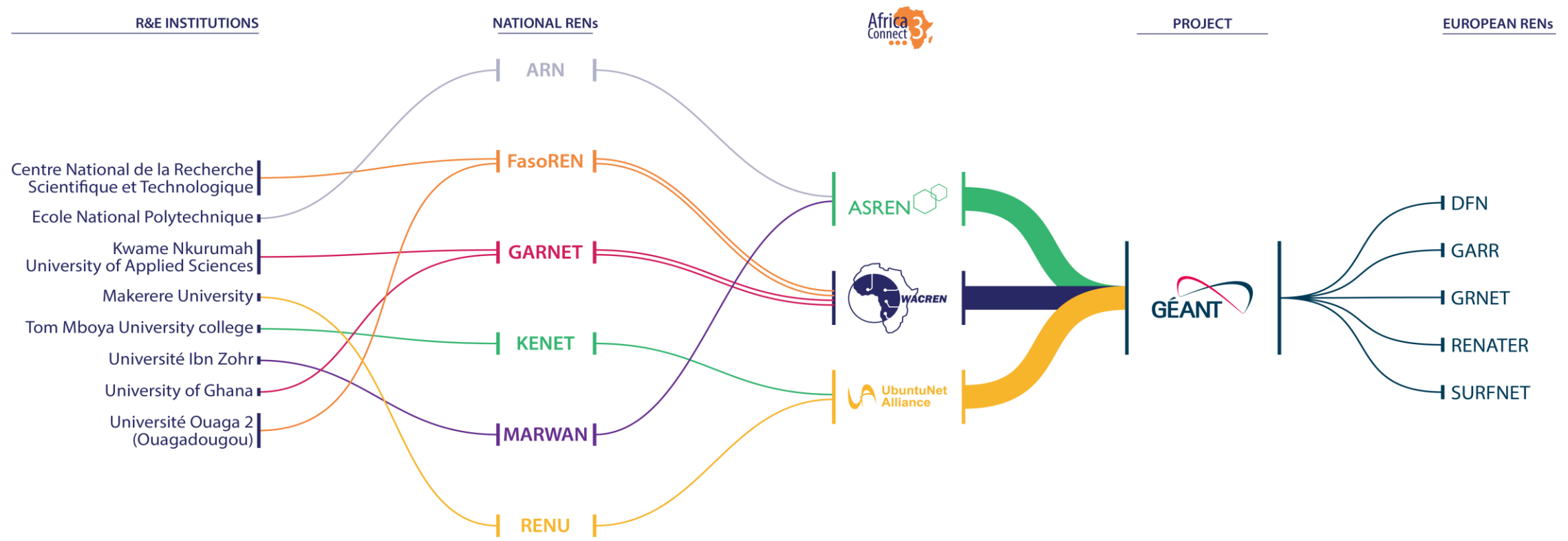
Canada & USA	Latin America	Europe	North Africa & Eastern Mediterranean	West & Central Africa	Eastern & Southern Africa	Central Asia	Asia-Pacific	Other R&E Networks

This map is produced as part of the GÉANT Specific Grant Agreement GAA-3 (No. 856736), that has received funding from the European Union's Horizon 2020 research and innovation programme under the GÉANT 2020 Framework Partnership Agreement (No. 623390). The content of this document is the sole responsibility of GÉANT and can under no circumstances be regarded as reflecting the position of the European Union.

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A Global Network



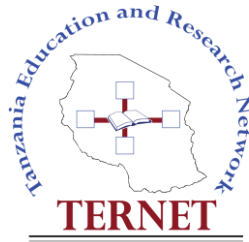
Impacts of NRENs in Africa



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Impact of NRENs in Africa



Over 1900 institutions connected are using a more affordable, reliable and high-speed internet to exchange high volumes of research data.



Universities in remote areas connected to high speed internet for research, teaching and learning.



Retained local talent and curb brain drain.



In Uganda, students used the NREN *to develop a software application to curtail bureaucratic administrative process.* The students eventually created a company called Zeenode.

In Egypt, the NREN is used to *monitor dust storms* to give early warning signals to asthma patients.

Impact of NRENs in Africa



Over 5 million students and researchers in Africa can collaborate with peers across the globe.



RENs continue to power learning and teaching through the provision of videoconferencing platforms, learning management systems and cloud support in times of pandemic.



The spirit of innovation and entrepreneurship in STEM have been activated in many youth, especially women through the [Women in WACREN initiative](#).

African NREN value propositions and challenges



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The Problem – The Digital Divide



Africa is contributing to only 2% of the World's research output, according to UNESCO



Africa has only 91 researchers per million people, while North America and Western Europe have 4000



Internet penetration in Africa still remains behind other parts of the world (39% in Africa versus 58% in the rest of the world)



Students and researchers in Africa have great potential in research and knowledge sharing but access to reliable and affordable connectivity is the problem



Investment into tech in Africa significantly trails investment in tech in other continents, such as Asia



NREN Value Propositions



Trusted Digital Africa Stakeholder:

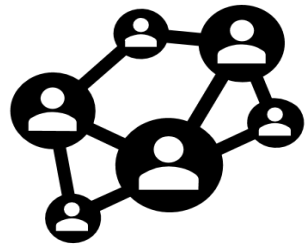
NRENs are not-for-profit organizations looking after the best interests of their end users.



Connectivity and dedicated services:

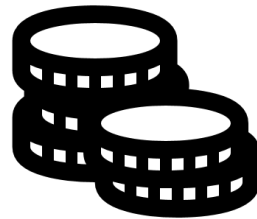
Provide dedicated and uncongested internet connectivity and value-added services for knowledge institutions (e.g. universities, research centres and libraries) to enable collaboration and access to data resources

NREN Value Propositions



Globally connected:

African RRENs are linked to global research and education networks across the globe via its interconnection with GÉANT: These linkages facilitate collaborative research and innovative learning worldwide.



Buying Club:

NRENs act as a Buying Club – enable lower prices for universities and research centres.

Buying club – lower prices

Before and After connecting to the EU-funded network

ZAMREN, Zambia 2011 / 2015	X60!	-94%!
RENU, Uganda 2013 / 2017	X19!	-89%!
ARN, Algeria 2003 / 2015	X55!	-97%!
TERNET, Tanzania 2011 / 2017 – 2012 / 2017	X7!	-75%!

Source: NRENS

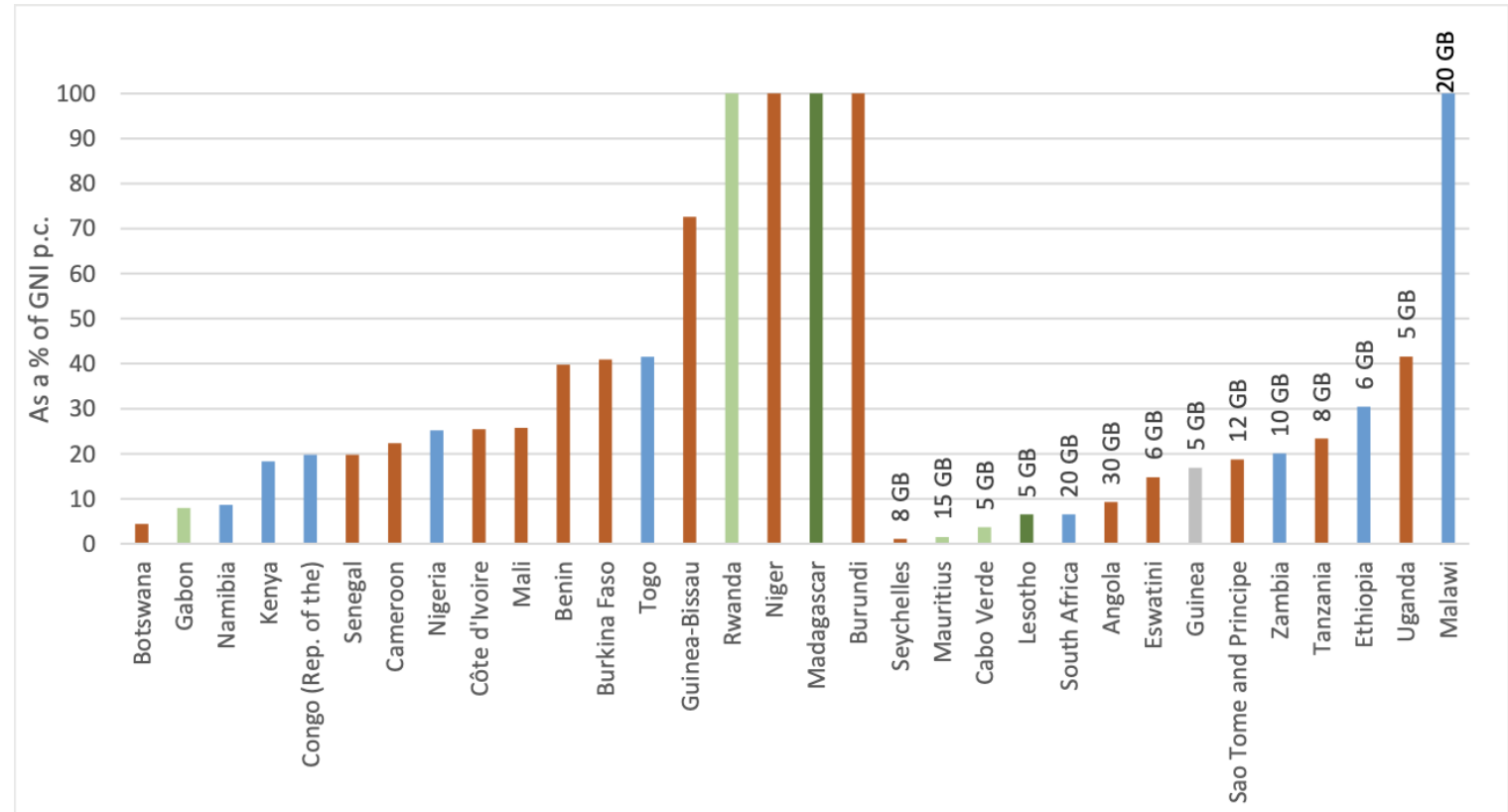
What stands in the way of NRENs and their RRENs?



Africa: Broadband Prices against GNI



- The graph illustrates African Broadband prices as a percentage of each countries respective GNI.
- Internet access/availability remains relatively expensive in Africa, with countries such as Guinea-Bissau, Rwanda, Niger, Madagascar and Burundi fairing the worst.



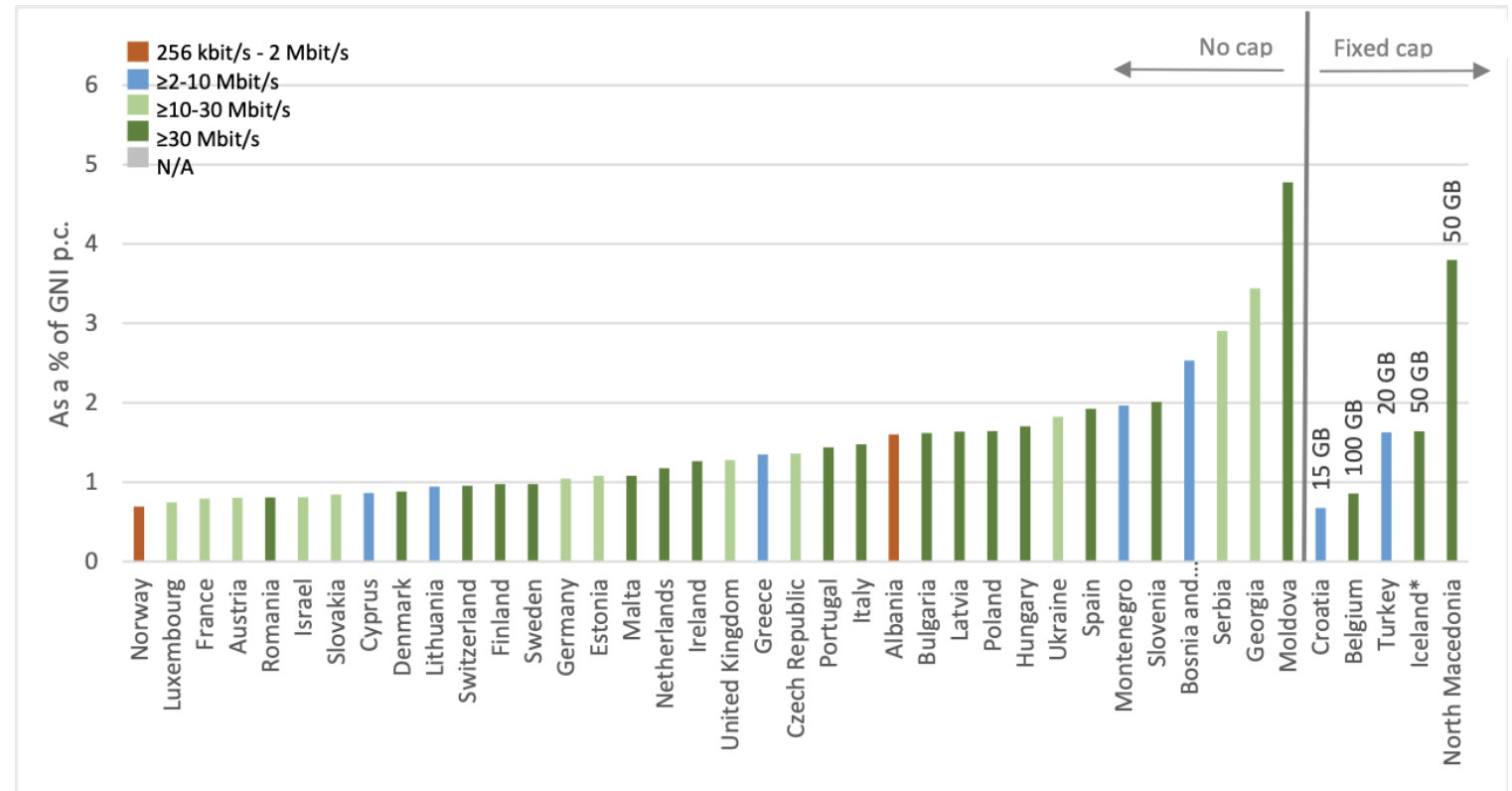
Graph courtesy of ITU, Measuring Digital Development, ICT Price Trends report, 2019.



Europe: Broadband Prices against GNI



- The graph illustrates European Broadband prices as a percentage of each country's respective GNI.
- In comparison to Africa, broadband prices in relation to the GNI of separate European states remains very low, dwindling between percentages below 1% and hitting a maximum of below 4%.



Graph courtesy of ITU, Measuring Digital Development, ICT Price Trends report, 2019.



The AfricaConnect3 project



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Project Profile: AfricaConnect 3

Start date: 16 November 2019

Duration: 48 months

Funds: European Union Grant Contract

DCI-PANAF/2019/411-583/584/585/585

- **Budget: 37.5M EUR (80% EU funding, 30M EUR)**
 - Funding for connectivity, equipment and cloud: **23.2M EUR**

AC3 Objectives and Outputs

- Enhance human capital development in Africa.
- Unlock the potential of education and research through increased access of African education and research institutions to digital infrastructures and technologies.



Output 1: Access to affordable and adequate e-infrastructures is increased.



Output 2: Dedicated RE services and applications are developed.



Output 3: Adequate human resource capacity and expertise is built.

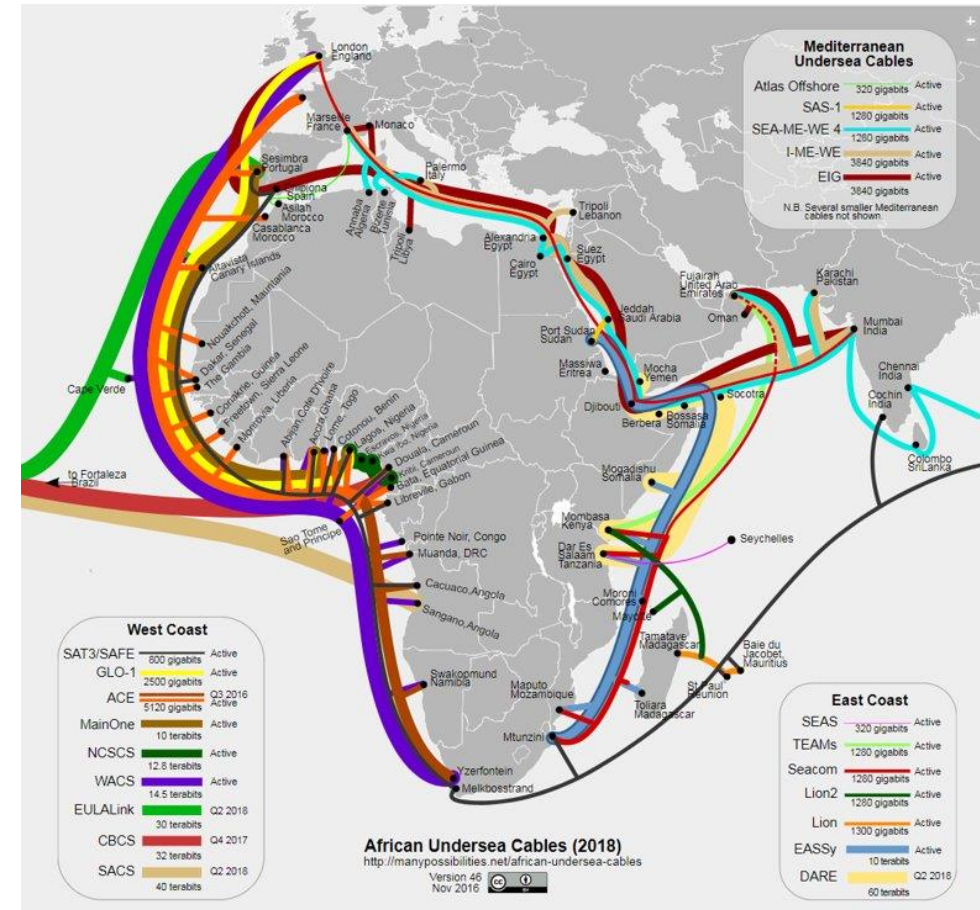


Output 4: Digital transformation in research and education is raised.

Expanding high-speed networks

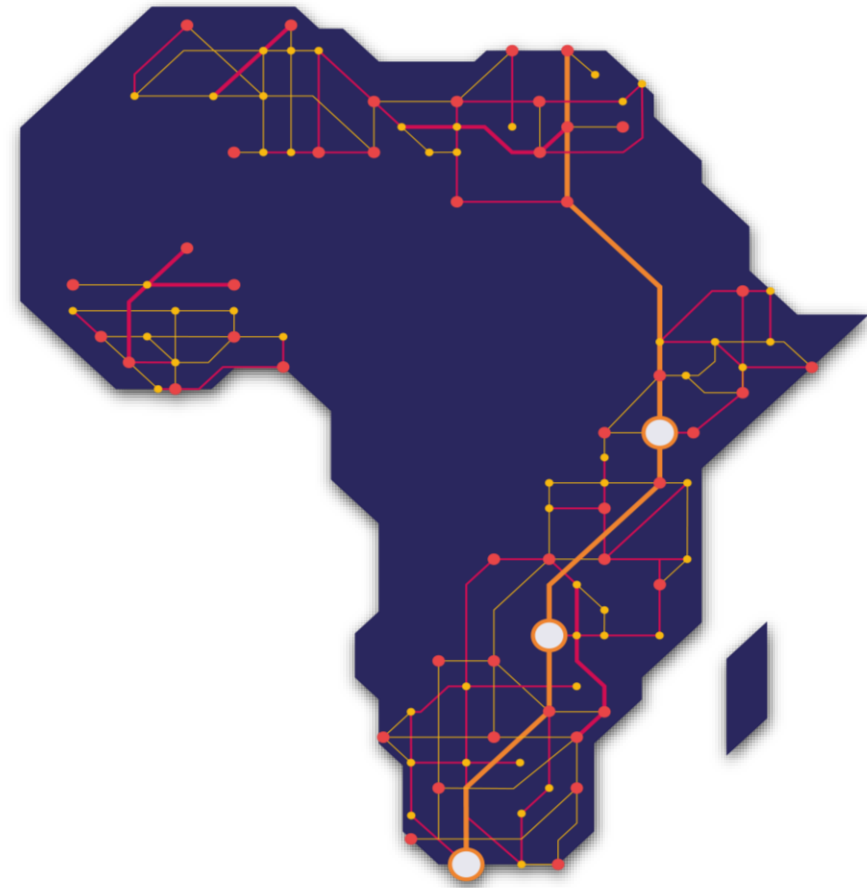


- Development of RREN Network Topologies and Strategies.
- Procurement and deployment of Connectivity and Equipment.
- Maintenance and Management of the Regional Network:
 - a. Provide remote support to network beneficiaries.
 - b. Provide Direct Engineering Assistance.
 - c. Organize periodic service and performance review meetings with connectivity providers.



Developing R&E Services

- Service outreach to science communities, deployment of R&E applications and access to repositories
- Trust and Identity for seamless access
- Proactive Cybersecurity for NRENs and their Digital Assets
- Federated Identity Management for Libraries



- [eduroam](#) means 'education roaming' - enables free Wi-Fi access for students and researchers across the globe.
- Same login and password regardless of the geographical location.
- Available in 17 African countries (pilots in 6 additional countries)
- Worldwide in 106 countries and growing!
- Usually on campus, but it can go beyond.
- AC3 aims to expand the reach of eduroam in Africa.



Building Capacity for R&E

- Governance and Systems Review
- Sustainability Plan
- **Sharing NREN best practices**
- Africa Training Initiative for R&E
 - Network operation and management
 - Cloud implementation and services
 - eduroam, eduGAIN...
 - Research and science Hackfest
- **Women engagement and empowerment**



Engaging and Disseminating



- **Advocacy and Donor Engagement**
 - Government officials
 - Telcom operators and regulators
 - Donor foundations
 - Development agencies
- **REN and User Engagement Conferences**
 - Annual conferences
 - AfriGEO and GMES Communities
 - Health, Environment, Energy, etc.
- **Project Visibility and Dissemination**
 - Peer-reviewed journal for REN communities



Thank you

Any questions?



@AC3_News



AC3-Community



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