



A changing NREN environment

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Public

Membership Association

GÉANT Association supports and represents over 38 NRENs + NORDUnet.

Together they support over 10,000 institutions and 50 million academic users.



GÉANT membership

NATIONAL MEMBERS

1 per country

REPRESENTATIVE MEMBER

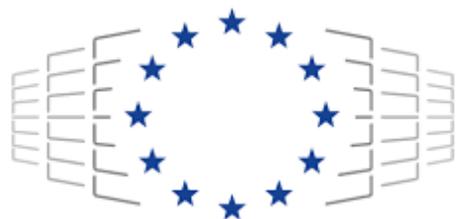
NORDUnet

ASSOCIATES

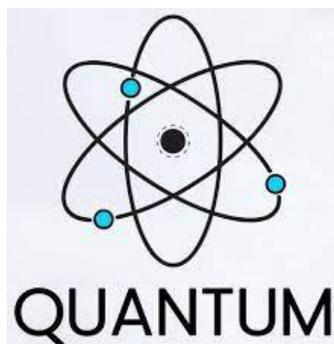
CERN
DeiC (Denmark)
European Space Agency
CSC/FUNET (Finland)
RHnet (Iceland)
KREN (Kosovo Research and Education)
SUNET (Sweden)
SIkt (Norway)



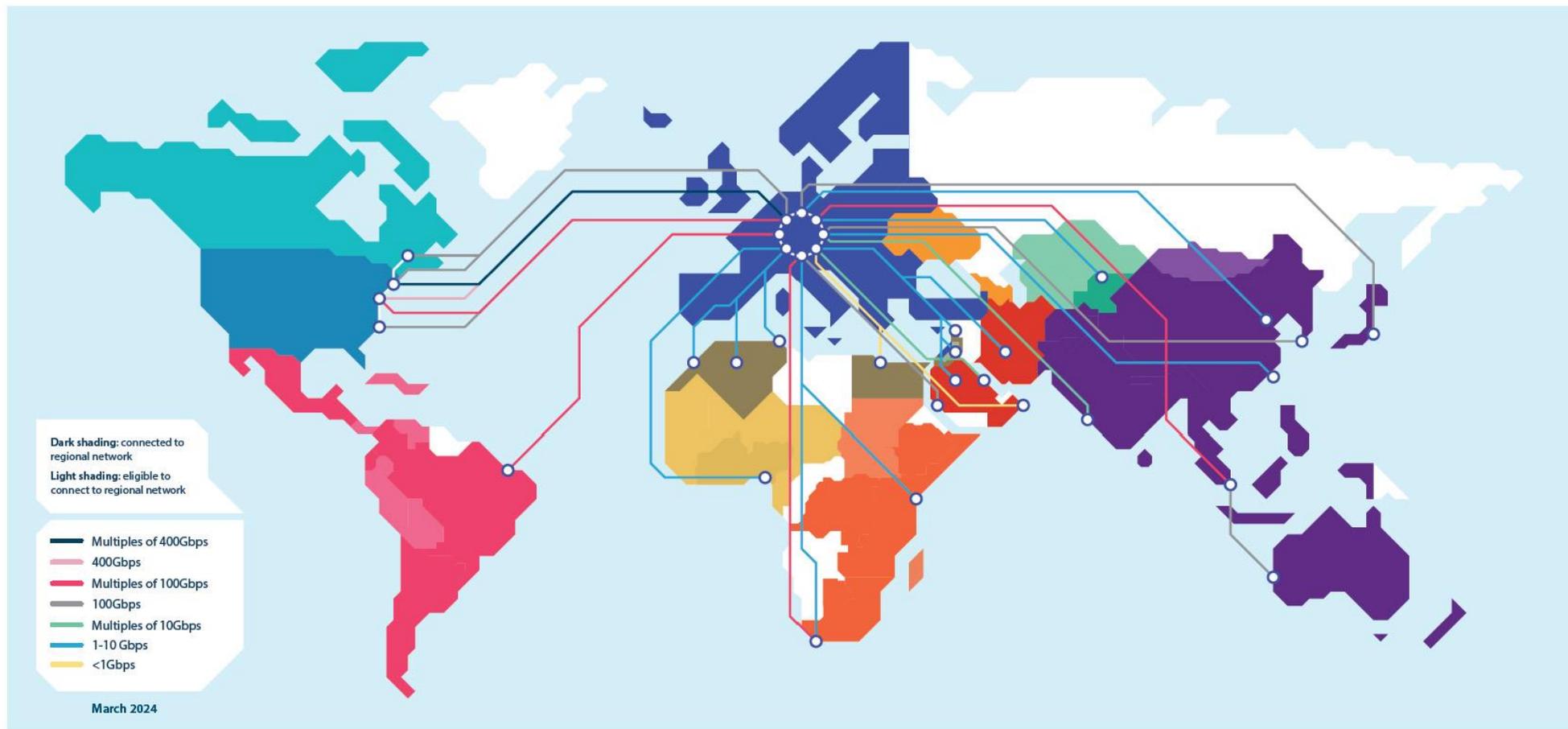
GEANT is part of the Pan-EU eInfra ecosystem

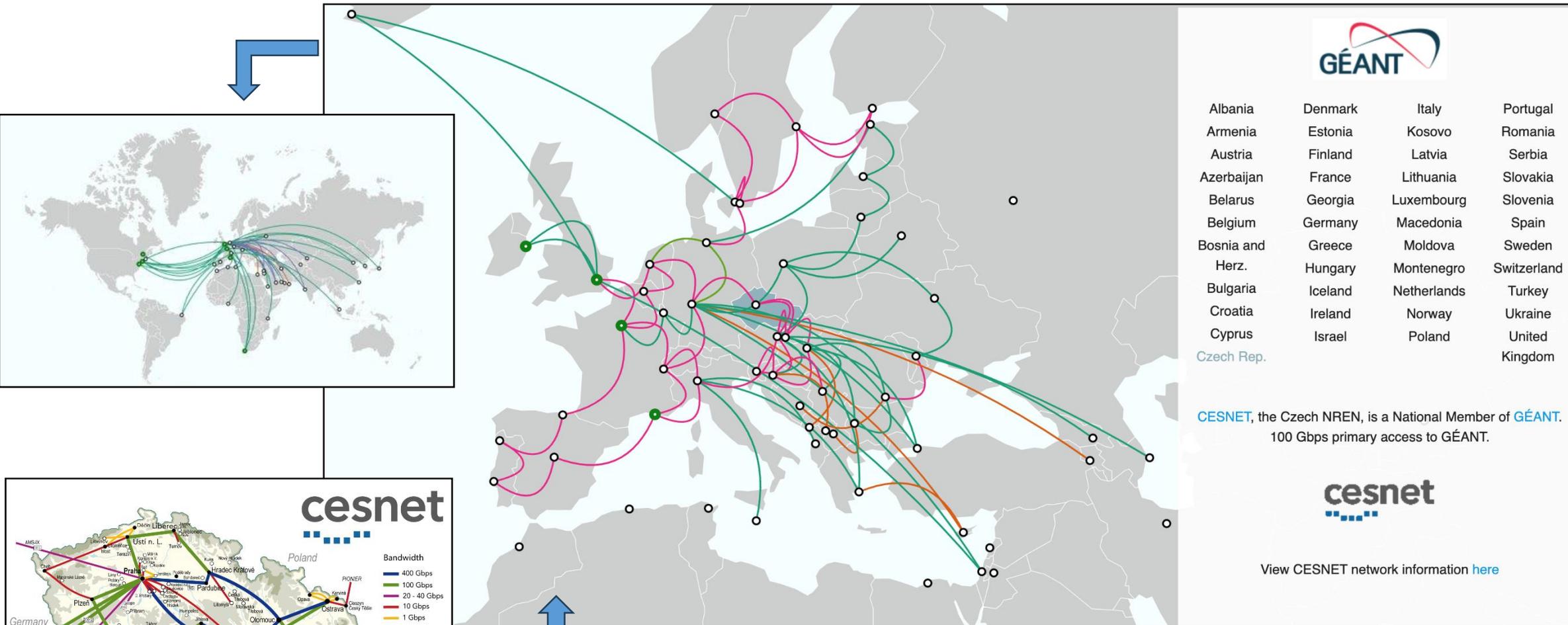


EuroHPC
Joint Undertaking



At the Heart of Global Research & Education Networking





Just upgraded:
CESNET now connects with 2x200G to GEANT

GÉANT Services

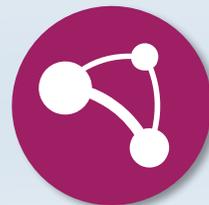
GÉANT develops the specialist services members need to support researchers, educators and innovators – at national, European and international levels.



**Cloud and
Real Time
Communication**



**Security and
Trust & Identity**



**Network and Network-
centric services**

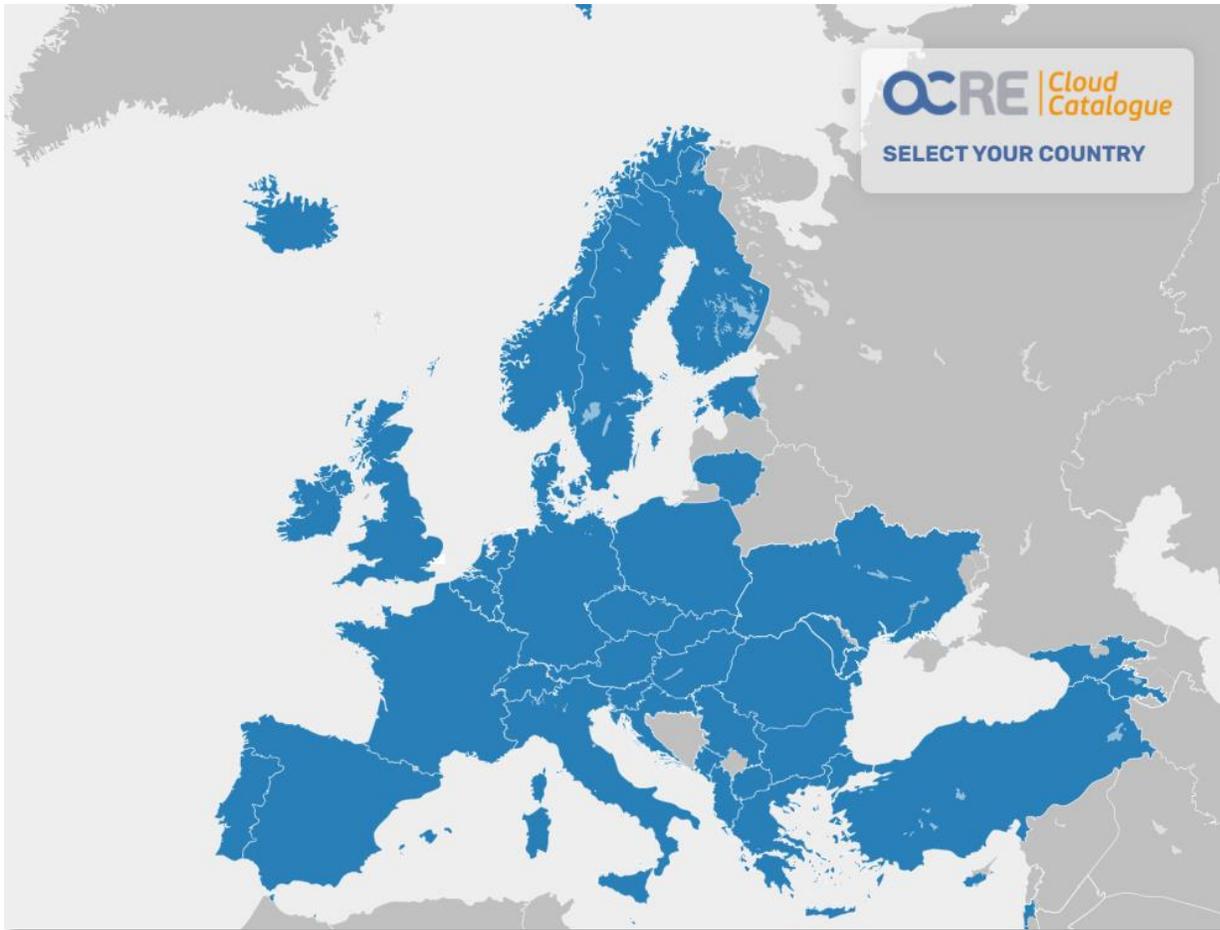


**Community &
Procurement Services**



**European
e-infrastructure projects**

Pan-EU collaboration for the benefit of all: OCRE - Procurement for Universities and Research Institutes in Europe



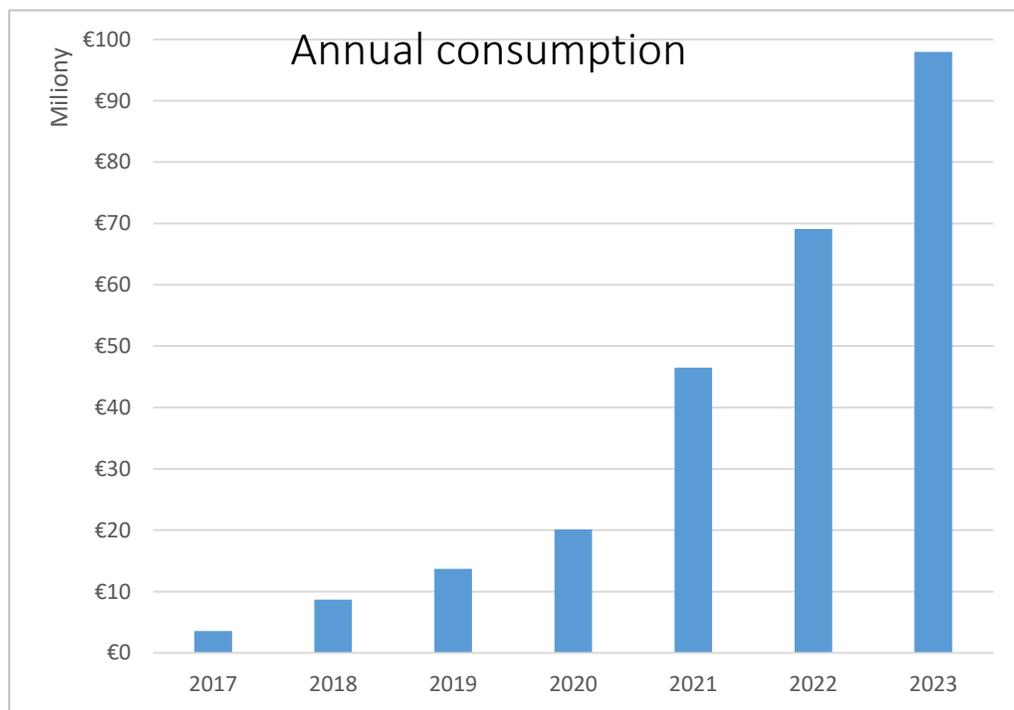
GEANT brings down cost of cloud services:

- 36 participating countries
- R&E institutions act as a Single Digital Market
- 12 different IaaS solutions (providers)
- 20 suppliers, incl. Amazon & Microsoft resellers
- 473 framework contracts

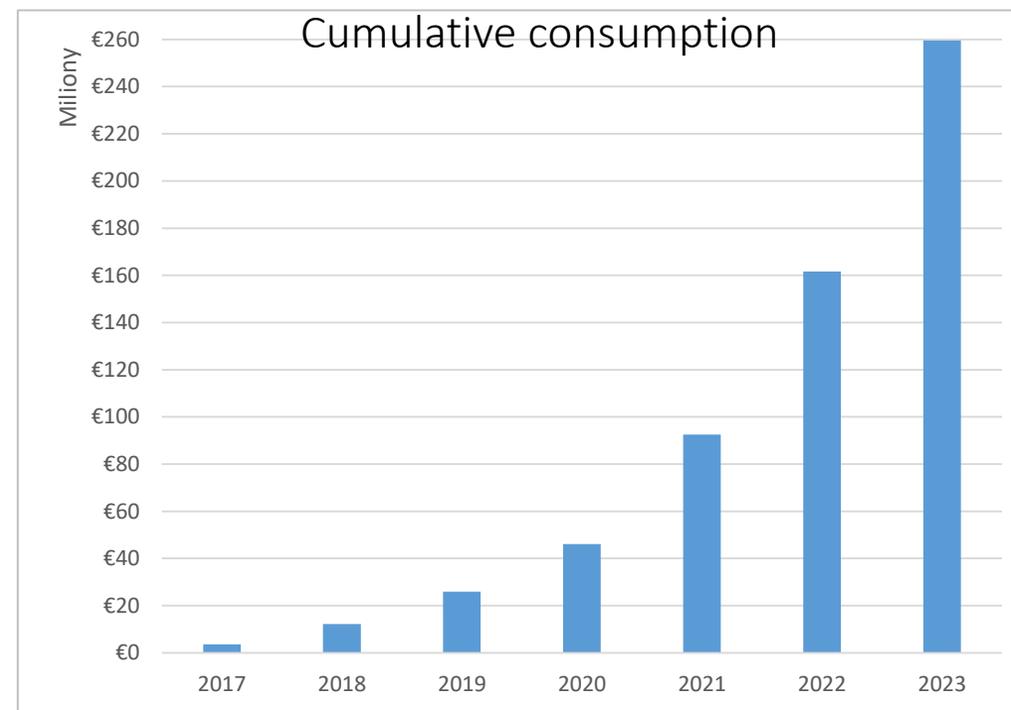
OCRE -Adoption

By end of 2023:

- 27 NREN users,
- 950+ institutions
- 100mEUR turnover p.a.



98m EUR in 2023



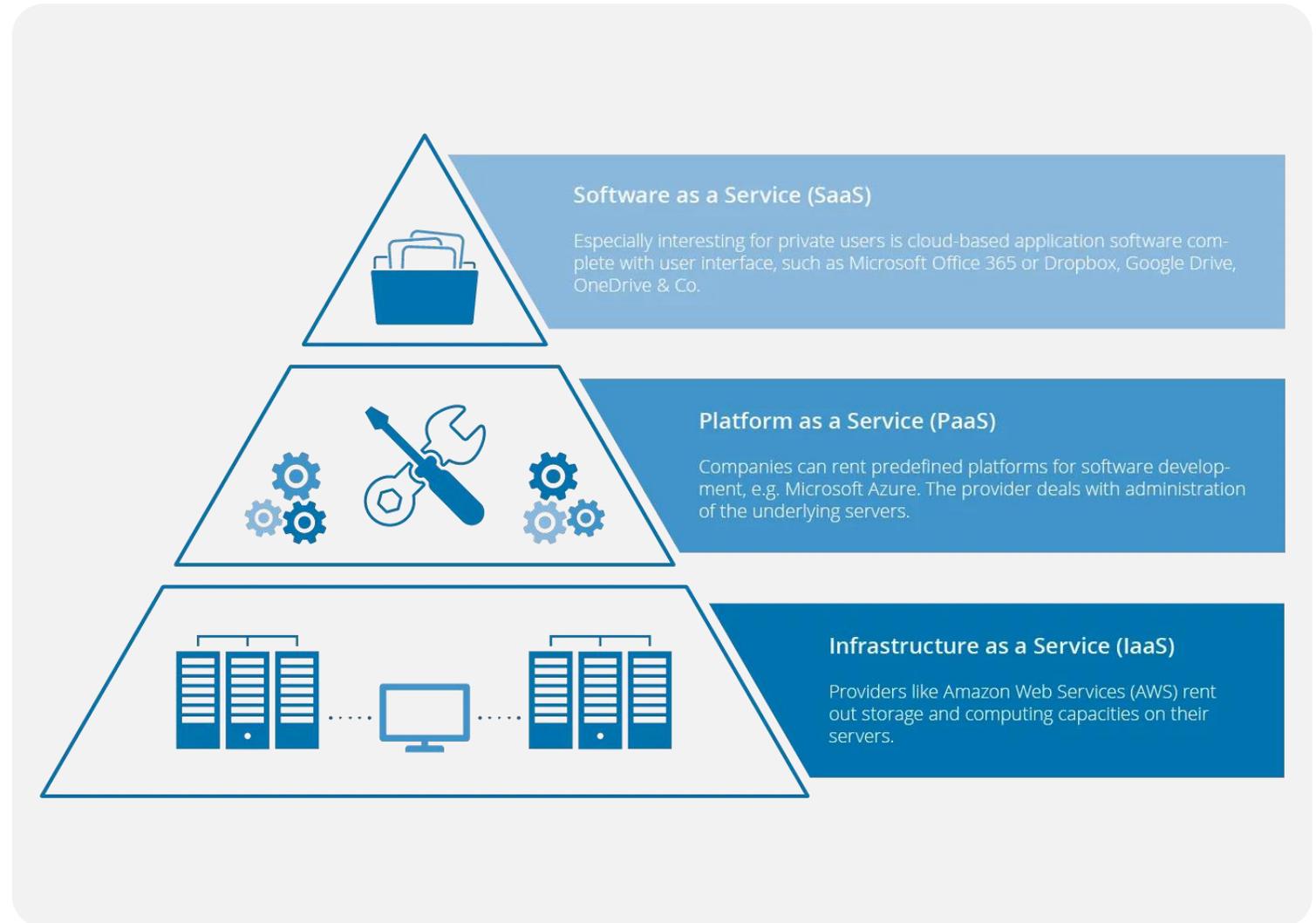
260M EUR by Dec 2023

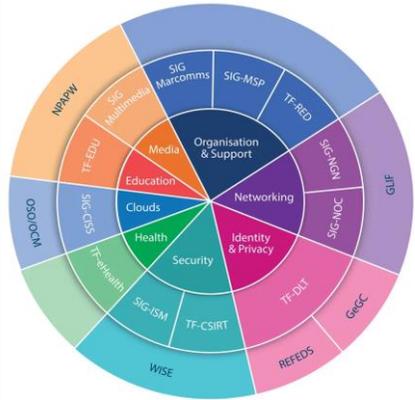
OCRE – what's next

- From Jan 2025 new framework IaaS+

→ enhancing the IaaS framework with SaaS and PaaS offering

- Expected total contract value* 600 – 750 M euro





Informal

Formal

Friendship

Human Network

GÉANT Community Programme and Events

Learning and Development – GLAD/Infoshares/eAcademy

Governance – projects and organisation



tnc24

Pan-EU Influencing factors: GEANT and NRENs in the Digital Europe

GN5 (Horizon Europe)

- Framework Partnership
- (Intercontinental) network
- Cybersecurity
- Digital identity and authentication
- Support for data access/transport

EOSC

- Founding member of EOSC
- Member of EOSC Board
- EOSC Working Groups
- Partner in EOSC Future project
- CESNET mandated member

EuroHPC

- Hyperconnectivity
 - Between supercomputing centers
 - And to data storage locations
- Access for all scientists in Europe
- Access for industry

Quantum

- Quantum networking
- Quantum Key Distribution
- Time and Frequency network

NREN Use case SIKT



Sikt
Norwegian Agency for Shared
Services in Education and Research

- From Network provider to driver for Digital Transformation in R&E in Norway
- Sikt was established on January 1, 2022,
 - out of a merger between the Norwegian Centre for Research Data Ltd, Uninett Ltd, and Unit, the Directorate for ICT and Joint Services in Higher Education & Research.
- Sikt's **aim** is to ensure great user experience and to aid in the digital transformation, data sharing, and open research.
- Sikt's **goal** is to support the education and research sector in achieving their objectives through reliable and high-quality services.

Uninett in 2021 in short

→ 20 Products

→ 100 employees

→ 700 customers

→ Main Office in Trondheim

→ 1,5 million daily users

→ All employees
in Trondheim



Sikt in short

→ 80 Products

→ 500 employees

→ 700 customers

→ Main Office in Trondheim

→ 1,5 million daily users

→ Offices in
Oslo and Bergen





NREN Use case GRNET

- Greek NREN, established in 1995 operated as NREN serving R&E proving connectivity over the years expanding their service offering.
- In 2019 now supervised by the newly formed **Ministry of Digital Governance**
- The ministry is covering topics from R&D, Advanced Computing and Network Infrastructures, Information Systems and National Projects Management, EU and International Projects Infrastructures and Digital Transformation and Digital Competencies
 - a new organisational structure is put in place
 - GRNET mandates as Technical advisor to the government for Digital Transformation
 - Expansion of user base, specifically to government and public administration
 - e.g. actively involved in the design and development of [gov.gr](https://www.gov.gr) the main governmental web ecosystem of Greece.
- Annual budget from 6.9m EUR in 2019 --> 19m EUR in 2023
- 100 FTEs





NREN Use case GRNET - From R&E network provider to ICT provider for public services

 grnet@government
  grnet@education
  grnet@research
  grnet@health
  grnet@culture



Organizations and Institutions

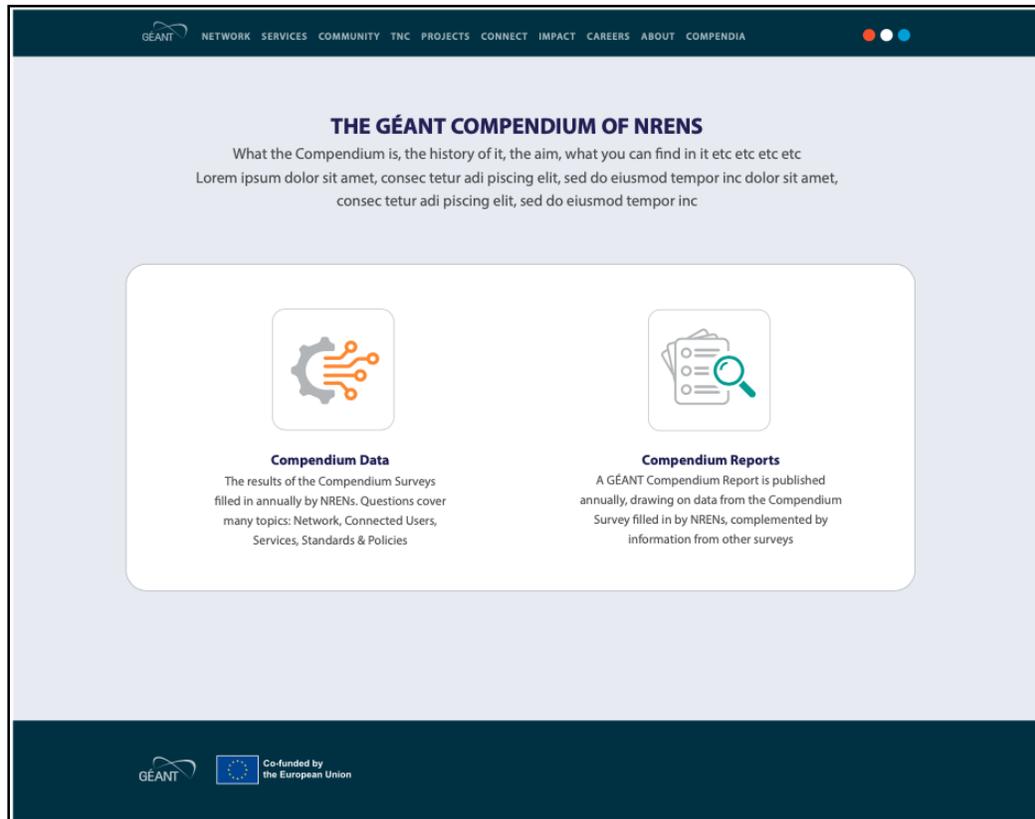
- Universities
- Research Centers
- Large Research Infrastructures
- Hellenic School Network
- Public Libraries
- Culture Centers
- Content Providers
- Public Administration sector
- Public Health Sector (Hospitals, Blood Donation/Transfusion Services)

Users

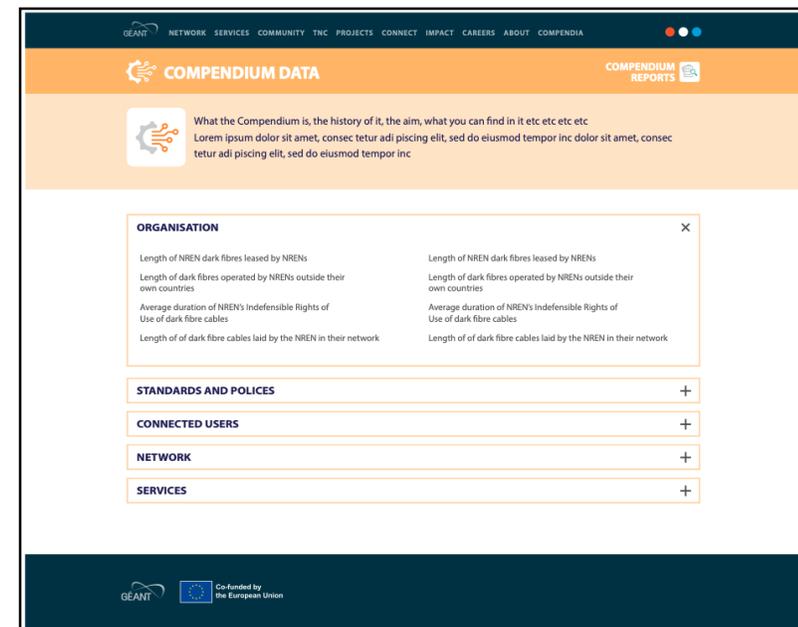
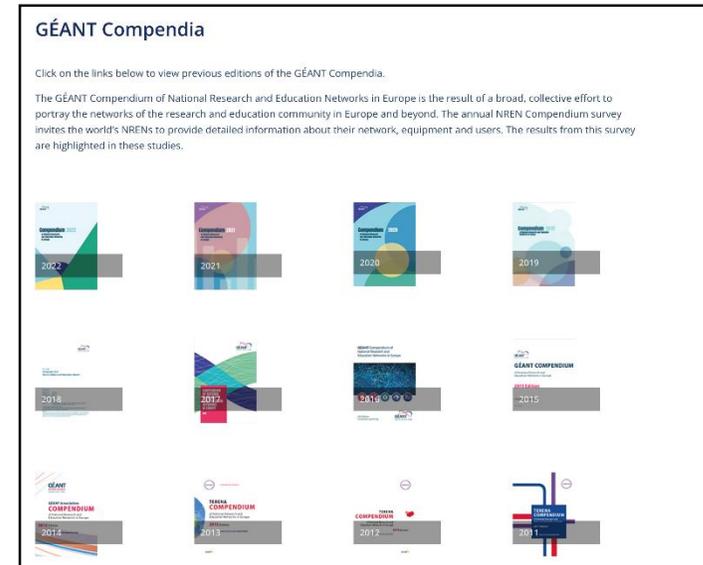
- **Academic and Research Community users (Students, Professors, Researchers, Academic and Administration Management, Network Operations Centers (NOC), Technical Staff)**
- **Health Sector users**
- **Hospital: Doctors, Administration, Management, NOC, Technical**
- **Blood Donor Volunteers**
- **Public Administration Officers**
- **Citizens**



THE GÉANT COMPENDIUM OF NRENS



New website just released:
<https://compendium.geant.org/>



The Data Explorer

- Allows to drill down into the data collected by the annual Compendium survey.
- Comparisons can be made between NRENs, and years.
- Data is downloadable.

Charging Mechanism of NRENs

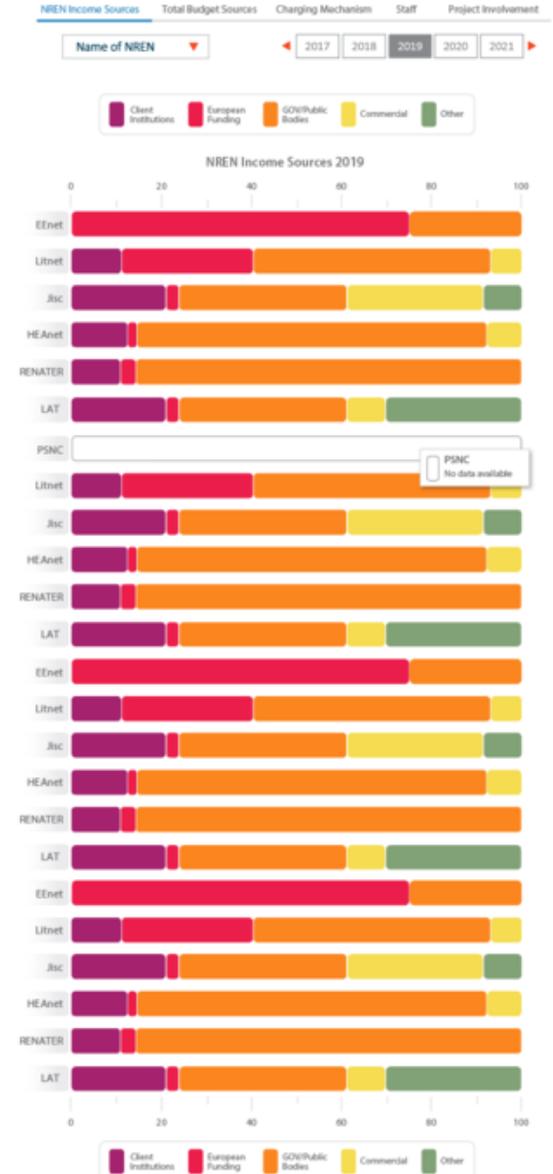
The charging structure is the way in which NRENs charge their customers for the services they provide. The charging structure can be based on a flat fee, usage based fee, a combination of both, or no direct charge. By selecting multiple years and NRENs, the table can be used to compare the charging structure of NRENs.

CSV EXCEL IMAGE

Select NRENs

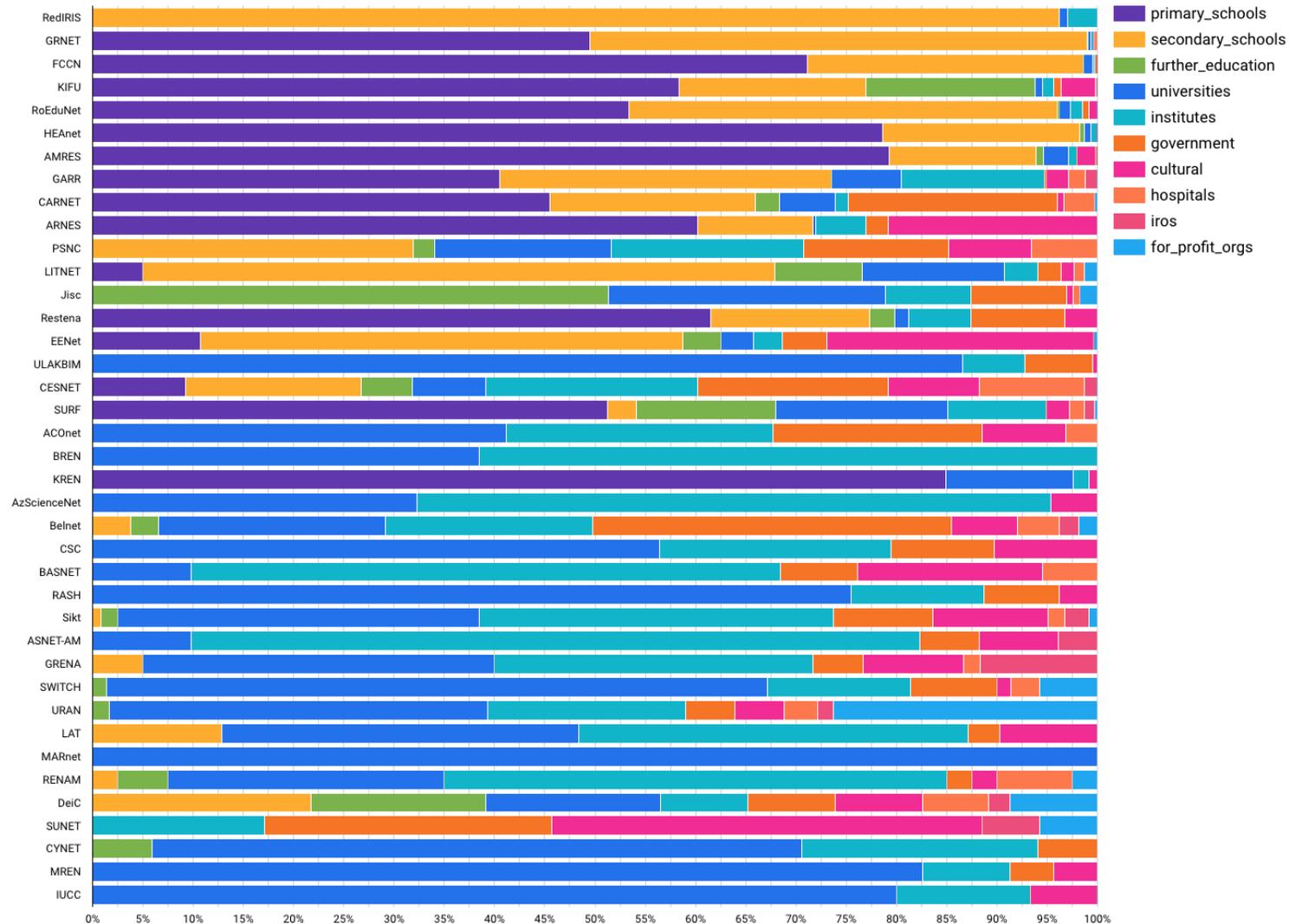
2019 2021 2022 2023

	Flat fee based on bandwidth	Usage based fee	Combination flat fee & usage basedfee	No Direct Charge	Other
ACDnet					
AMRES					
ARNES					
ASN-AM					
AzScienceNet					
BASNET					
BREN					
Belnet					
CARNET					
CESNET					
PSN					

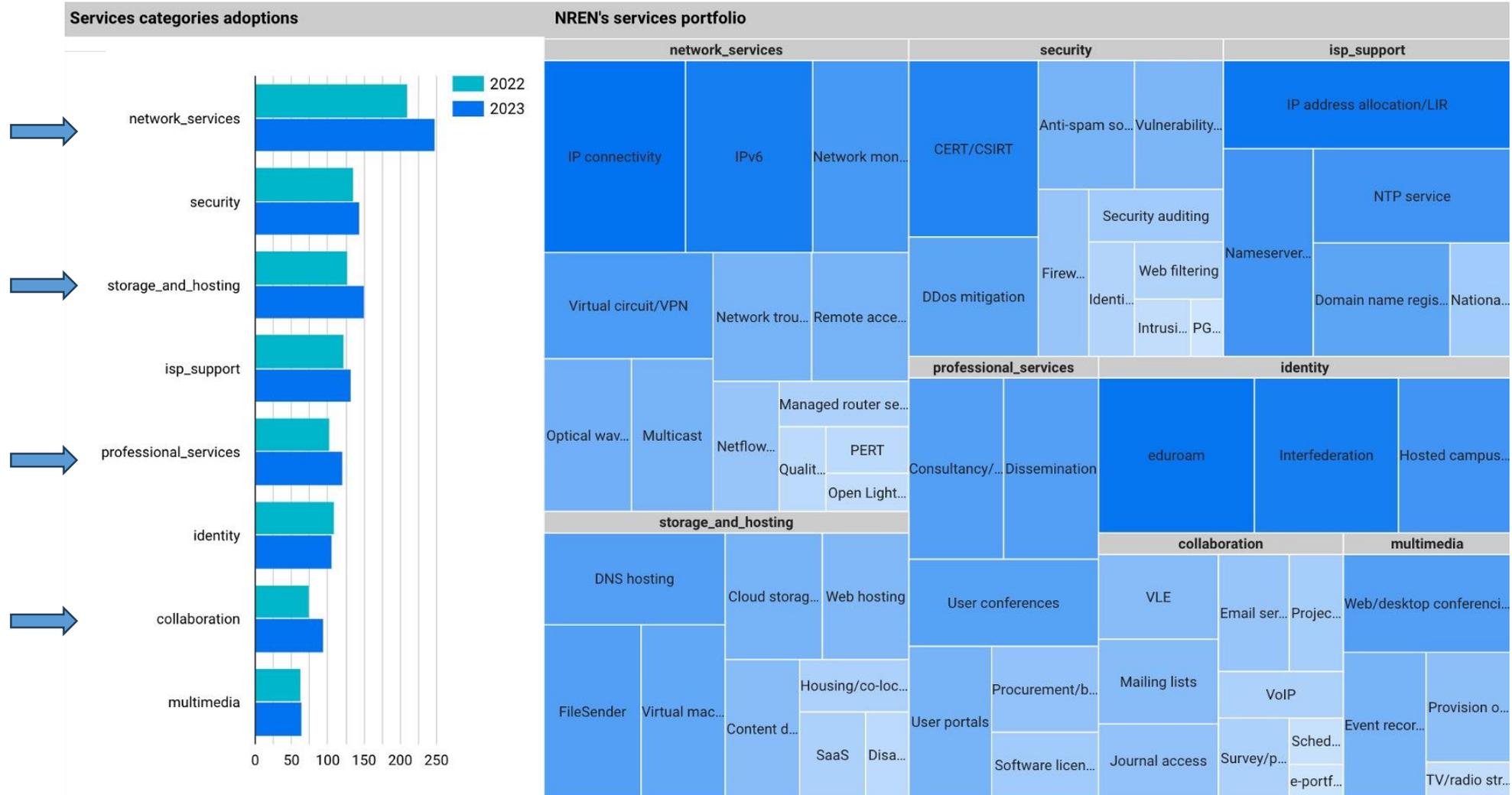


<https://compendium.geant.org/>

Diversity of connected users - EU NREN

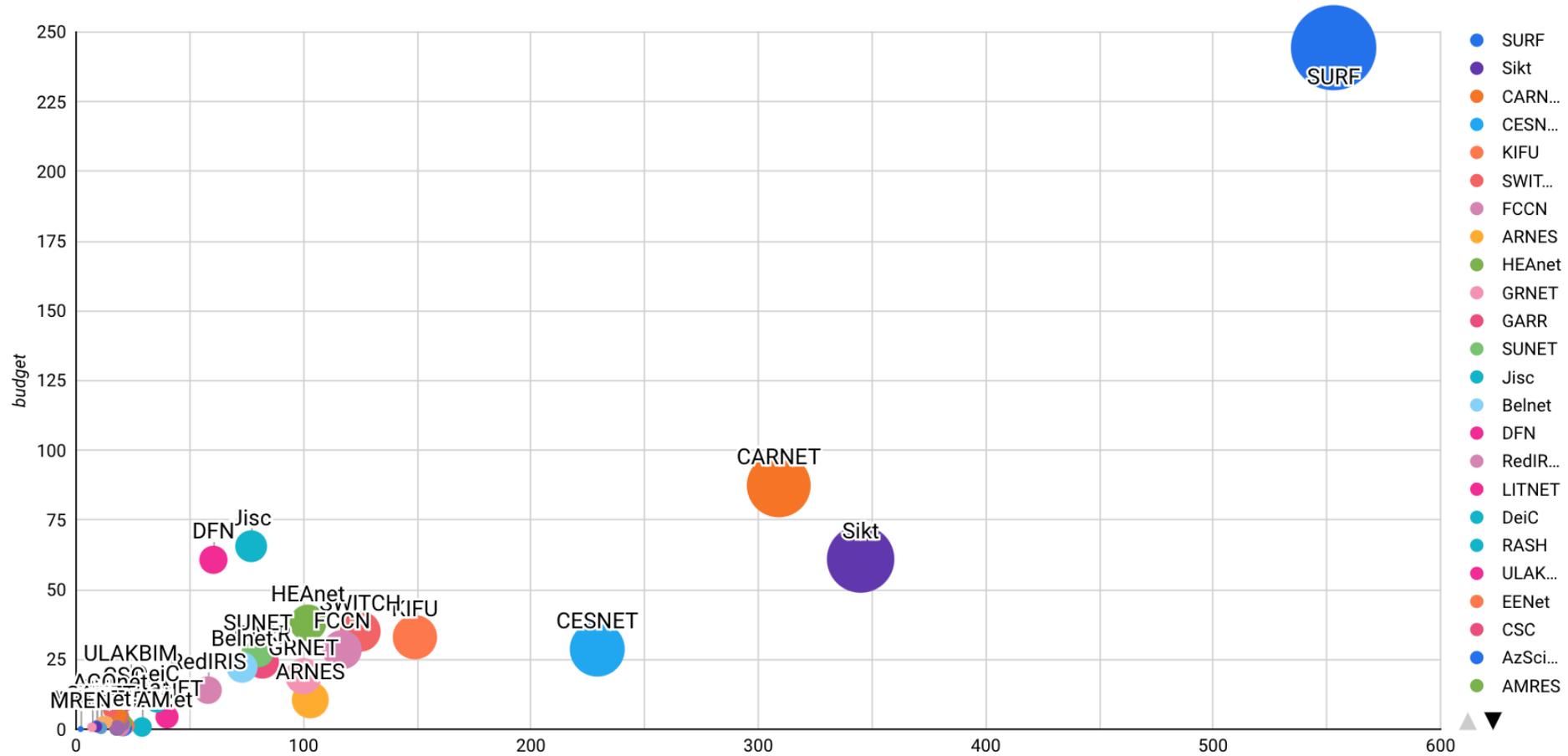


Service Portfolio EU NRENs - 2023



EU NREN Budget vs Employees - 2023

Between 2 and 553 FTEs
Budgets from 75k to 244m EUR



Disclaimer: NRENs are free to decide how they define the part of their organisation dedicated to core NREN business, and the budget. The merging of different parts of a large NREN into a single organisation, with a single budget can lead to significant changes between years, as can receiving funding for specific time-bound projects.

The forces of change:

- Global
 - shared research infrastructure (SKA/ITER/LHC etc.)
 - UNESCO analysis of research citation
- Technical
 - AI
 - Big data
- Political instability
 - Digital sovereignty
 - Increased focus on security
- Governance and business models
 - Market creation amongst RI – procurement/commercial relations
 - Evolving role of NRENs



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- Informal collaboration as basis for trust and exploring ideas
- Formal collaboration to leverage economies of scale



Thank you!

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[or find me here for a chat]