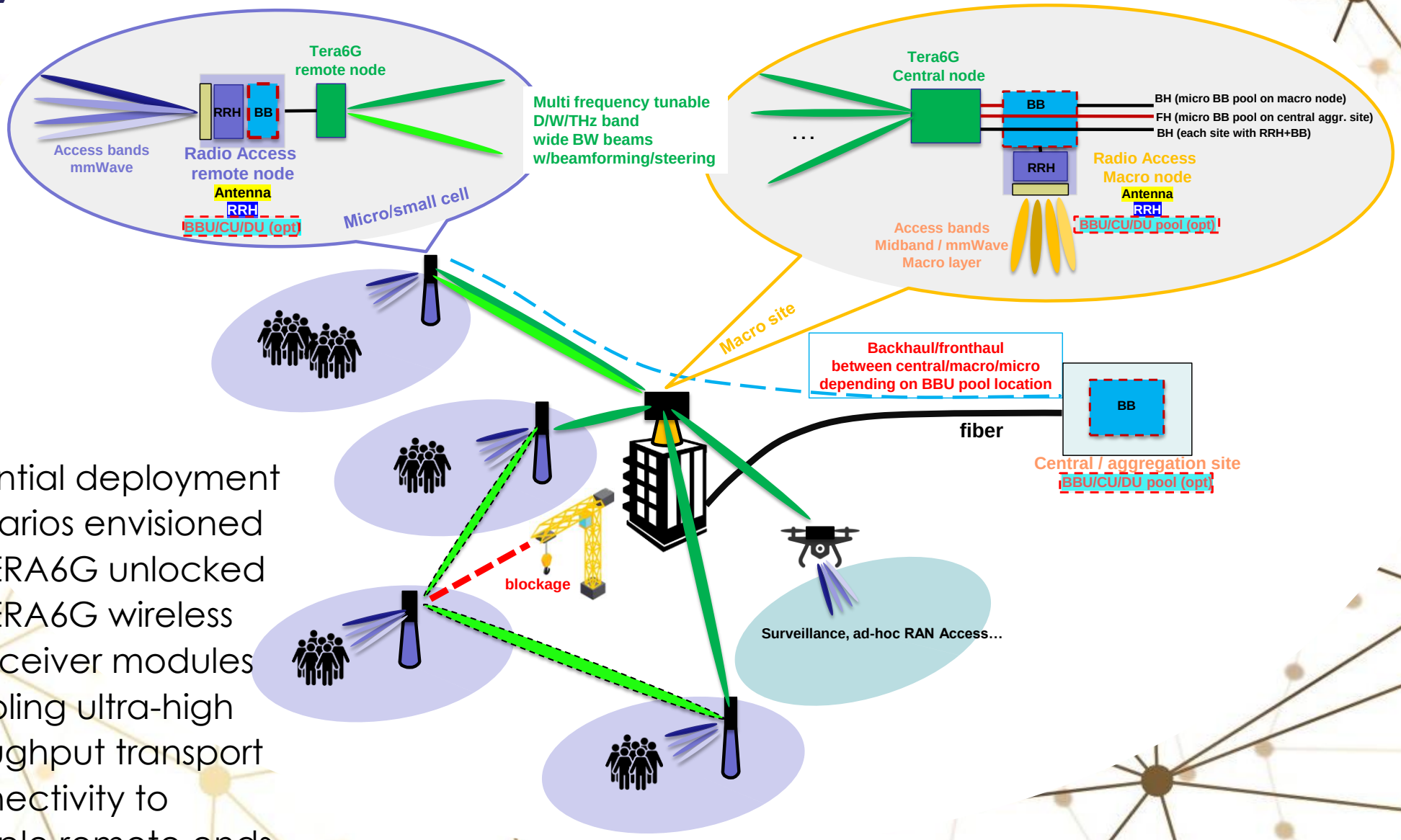
TERA6G is a HORIZON EUROPE project funded by the European Union whose objective is to develop a new generation and State-of-the-Art THz transceivers employing massive MIMO for beyond-5G networks.



Potential deployment scenarios envisioned by TERA6G unlocked by TERA6G wireless transceiver modules enabling ultra-high throughput transport connectivity to multiple remote ends as radio sites.

Co-funded by the European Union

6GSNS

TERA6G

TERAhertz integrated systems enabling 6G Terabit-per-second ultra-massive MIMO wireless networks

TERA6G project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101096949

TERA6G Factsheet

Call identifier:

HORIZON-JU-SNS-2022-STREAM-B-01-02

Grant Agreement No.: 101096949

Timeline: 1 January 2023 – 30 June 2026

Overall budget: € 6,114,000

EC contribution: € 5,892,962

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Project website: uc3m.es/research/tera6g

Consortium: 10 partners (5 EU countries)

Enabling the Fiber-over-the-air Concept

TERA6G aims to the development of wireless links with Terabit-per-second data throughput capacity, using hybrid photonic integration technology advances to develop disruptive wireless transceivers providing:

Agility: Ultra-wide bandwidth (up to 30GHz per channel, handling any modulation scheme) and continuous frequency tuning of the carrier frequency from 30GHz to 450GHz, reaching to the Terahertz range.

Scalability: Development of scalable Multiple-Input/Multiple-Output (MIMO) capable of handling many beams with 2-dimensional antenna arrays with beamforming and beam-steering,

Reconfigurability: TERA6G modules frequency agility and number of available wireless pencil-beams unlock implementing a variety of functions, from wireless data transmission to channel sounding and radar ranging.

Objectives

- Scalable **multi-MIMO Blass Matrix Transmitter** module handling up to 4 beams transmitted from a 2D array with 16 antenna elements in a 4x4 array.
- Scalable **multi-MIMO incoherent multi-band Receiver** module handling 4 beams with 4 different LO oscillators received at a 4x4 antenna array.
- **Reconfigurable transceiver modules**, capable of implementing different independent functionalities on each beam.
- **"Fiber over the air" and THz smart management**, integrating THz wireless technologies and systems, and designing Network Functions allowing their management as part of network slicing functionality aiming at dynamic automated management of multi-beam wireless system resources, fully programmable end-to-end orchestrated communication networks.
- Dynamic networks based on **adaptive, energy-efficient, multi-beam nodes**, developing methods and algorithms to maximize system energy efficiency adapting dynamically physical layer resources.