

NO. 02

September 2025 –
February 2026

TeraGreen

Towards Energy-Efficient
Tbps Wireless Links

This 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 GA N° 101139117.

General Project Information

Between September 2025 and February 2026, the TeraGreen consortium continued advancing its energy-efficient THz communication technologies for future 6G systems.

This period combined strong scientific progress, active dissemination, and close collaboration across the European partners, both online and during face-to-face meetings.



Key Facts:

- Grant Agreement: 101139117
- Programme: HORIZON-JU-SNS-2023
- Duration: 2024-2027
- 6 leading partners across Europe

Consortium Meeting in Gothenburg



6G SNS



Co-funded by
the European Union

In October 2025, TeraGreen partners met in Gothenburg, Sweden, for a two-day consortium meeting hosted by Ericsson.

During the meeting, partners:

- Reviewed progress on transmitters, receivers, and antenna systems
- Discussed integration steps toward system-level demonstrations
- Aligned on upcoming deliverables and milestones
- Strengthened collaboration across the consortium

The discussions focused on achieving Tbit/s data rates while significantly reducing energy consumption for future 6G wireless networks.

Scientific Achievements and Visibility in the European 6G Ecosystem



6G SNS

During this period, the consortium reported several key research results:

- Paper accepted at IEEE ICC 2025 on frequency offset estimation with 1-bit quantization
- Paper accepted at GeMiC 2025 on a scannable quasi-optical THz system
- Continued work on energy-efficient receiver architectures and THz communication concepts

These results confirm the project's strong scientific impact within the European 6G research community.

TeraGreen was featured in the SNS Journal 2025 among leading European projects shaping the evolution of 5G and the development of future 6G technologies.

The project aims to:

- Increase aggregated data rates by a factor of 10
- Reduce energy consumption per transmitted bit by at least 1000 times
- Enable scalable THz wireless backhaul solutions

Technical Progress



During the period from September 2025 to February 2026, the TeraGreen consortium continued advancing the core technologies required for energy-efficient THz wireless links. Work focused on component development, system integration, and laboratory validation activities.

Key developments included:

300 GHz Transmitters and Receivers

- Ongoing development of high-frequency MMIC transmitter and receiver units
- Integration of silicon-based THz front-end components
- Optimization of energy efficiency at ultra-high data rates

Quasi-Optical Antenna Systems

- Progress in steerable quasi-optical antenna designs
- Simulation and characterization of beam-steering capabilities
- Preparation for integration with transmitter and receiver modules

Baseband and Signal Processing

- Development of the first baseband design for single-stream transmission
- Work on energy-efficient receiver architectures
- **Validation of signal processing concepts for THz communication**

Laboratory Integration Activities

- Assembly and testing of integrated transmitter-receiver subsystems
- Preparation of samples for the outdoor demonstrator
- Initial laboratory validation of integrated components

These activities represent a critical step toward system-level validation and the realization of high-capacity, energy-efficient wireless backhaul links.

Next Steps and Outlook



Next Steps

As the project approaches its next major milestones, the consortium is transitioning from component-level development to integrated system demonstrations.

Upcoming Meetings

- Executive Board Meeting

26 February 2026

- 3rd Consortium Meeting

12–13 March 2026, TU Dresden

These meetings will focus on integration results, risk mitigation, and preparation for the next project phase.

Technical Focus for the Coming Months

The consortium will concentrate on:

System Integration

- Final integration of 300 GHz transmitter and receiver units
- Coupling of front-end electronics with quasi-optical antenna systems
- Preparation of the first complete wireless link prototypes

Laboratory Validation

- End-to-end testing of integrated THz subsystems
- Performance characterization under realistic conditions
- Verification of energy-efficiency targets

Outdoor Demonstration Preparation

- Packaging and preparation of demonstrator components
- Integration into the outdoor test platform
- Readiness for medium-range wireless backhaul demonstrations

Dissemination and Standardization

- Increased scientific publications and conference participation
- Contributions to the SNS and European 6G ecosystem
- Preparation of public deliverables and technical reports