



SUSTAIN-6G

SUSTainability Advanced and Innovative Networking with 6G
European Lighthouse project

Epilogue – Summary & Recommendations

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Key messages

- 1 SUSTAIN-6G frames 6G innovation around sustainability goals**
Building on stakeholder inputs, it translates UN SDGs into technical research directions, ensuring future networks address environmental, societal, and economic challenges.
- 2 Technology is a lever for sustainability, not a neutral carrier**
The project investigates how 6G enablers can contribute directly to reducing resource consumption and enabling new, greener services.
- 3 Use cases shape the agenda – not the other way around**
With strong input from verticals (eHealth, agriculture, smart grids), technical designs address real sustainability needs, validating requirements through sectoral grounding.
- 4 MNO trade-offs are acknowledged and internalised**
From energy and cost to coverage and resilience, SUSTAIN-6G incorporates operator constraints and sustainability tensions into design choices, not as afterthoughts but as drivers.
- 5 System-level thinking is essential**
True sustainability comes from aligning connectivity, compute, control, and AI, enabling cross-layer and cross-actor optimisation – not fragmented gains.
- 6 SUSTAIN-6G D2.1 sets the foundation, not conclusions**
This first deliverable offers common definitions, design principles, perspectives and dimensions, and a methodological blueprint to guide future technical work – trade-offs are identified, but evaluation begins now.

What we achieved so far

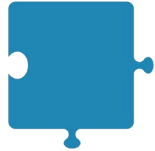
- 1 Created a shared sustainability baseline across **environmental, economic, societal pillars**
- 2 Laid down the aspects of 'Sustainable 6G' vs. '6G for Sustainability'
- 3 Provided **operators'** viewpoint
- 4 Identified sustainability **challenges** across **network segments** and use cases
- 5 Provided **early alignment with verticals**, shaping how 6G can empower agriculture, energy, and health.
- 6 Introduced **trade-offs** between sustainability and performance

Strategic recommendations



Sustainability KPIs and KVs must be defined early and integrated into system design.

This ensures that environmental, societal, and economic objectives guide the entire development lifecycle, from architecture to implementation and validation.



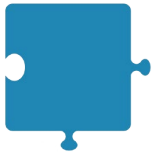
Sustainability requires multi-stakeholder coordination and negotiation.

No single actor can drive sustainable 6G alone. SUSTAIN-6G must act as a facilitator — enabling alignment across technical, regulatory, and vertical domains and managing trade-offs between often conflicting priorities.



Regulatory and standardisation activities must include sustainability dimensions.

Embedding sustainability in policy and standards will drive industry alignment and ensure measurable and verifiable sustainability outcomes.



Techno-economic models should account for material, energy, and long-term societal impacts across the full lifecycle. Such comprehensive modelling supports more informed trade-off analysis and better decision-making for future-proof 6G solutions.

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