SUSTAIN-6G

SUSTainability Advanced and Innovative Networking with 6G

The European Lighthouse project

Facts & Figures

Call

- EU HORIZON-JU-SNS-2024-STREAM-B-01-07 Sustainability Lighthouse

Project Management

- *Coordinator: Christoph Schmelz, Nokia, Munich*
- Technical Manager: Olivier Bouchet, Orange, FR
- Innovation Manager: Anastasius Gavras, Eurescom, DE

Timeline

- Project start: 1.1.2025
- Project runtime: 2.5 years (– 30.6.2027)

Consortium

- 24 partners (7 Telco, 4 Industry, 5 academia, 8 SME)

Budget & Effort

- Total funding: 13 M€
- Total effort: ~40 full-time contributors over runtime

https://sustain-6g.eu

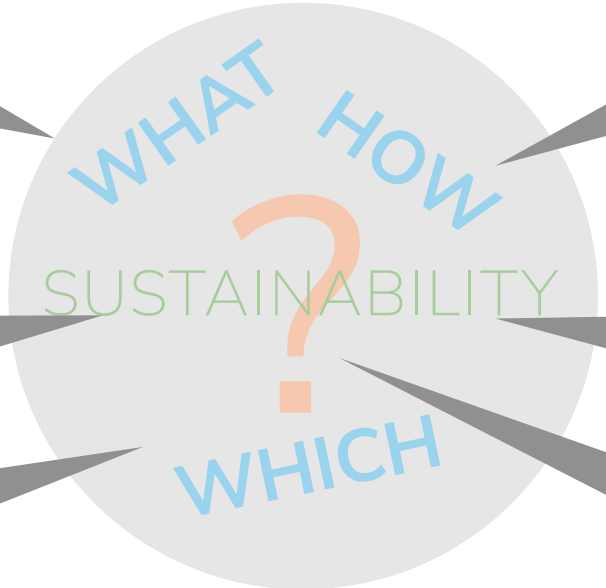
Motivation

Key questions on sustainability in the context of 6G

What is “sustainability”?

How can 6G help to make vertical applications sustainable?

How can “sustainability” be implemented?



How can “sustainability” be quantified?

Which technical enablers make 6G sustainable?

What do standards and regulation need to fully integrate sustainability in 6G?

Approach

The “Six Dimensions” of Sustainability in the context of 6G

	€ $ ¥ £ Economic	Societal	Environmental
Sustainable 6G	Long-term business viability & scalability Market competition & innovation Industry collaboration & partnerships Cost efficiency & resource optimisation Economic growth Regulatory framework & policy support	Bridging the digital divide (accessibility) Trustworthiness & Responsible AI Stakeholder engagement Ethical business practices Social well-being Cultural diversity Technology ethics	Net zero network design, deployment and operation Use of renewable energy sources Environmental data collection Storage and analysis Material usage and circularity Environmental Total Cost of Ownership
6G for Sustainability	Digital transformation Innovative business models Workforce development Opportunities for SMEs Value network integration Global reach Social & economic inclusion	Digital equity Services with high societal value Personal privacy and data protection Ethical business practices Reliable, resilient and accurate information Support for democratic values	Vertical-specific environmental challenges Biodiversity & geodiversity impact Optimisation of natural resources Monitor & reduce emissions Supply chain improvements Smart energy management Sustainable mobility

Sustainable 6G “by design” needs a holistic approach

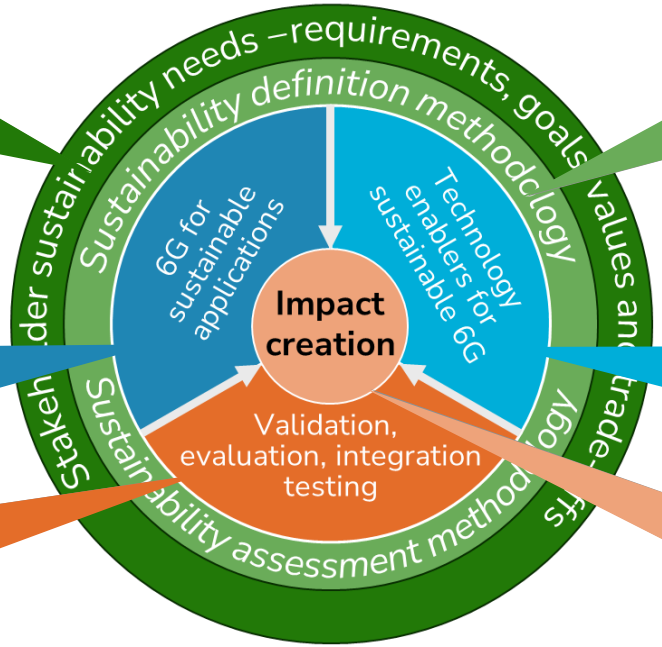
Approach

Sustainable 6G "by design" needs to look at the whole ecosystem

Sustainability needs: address environmental, societal, economic goals and values of stakeholders

6G for Sustainability E2E ICT – Vertical interworking, sustainability mgmt., IoT devices

Guidelines + best practice recommendations for 6G design & implementation



Standardised definition and assessment of *sustainability metrics* quantification

Sustainable 6G RAN energy saving, AI/ML, OAM, Core/Cloud arch., Optical, Security

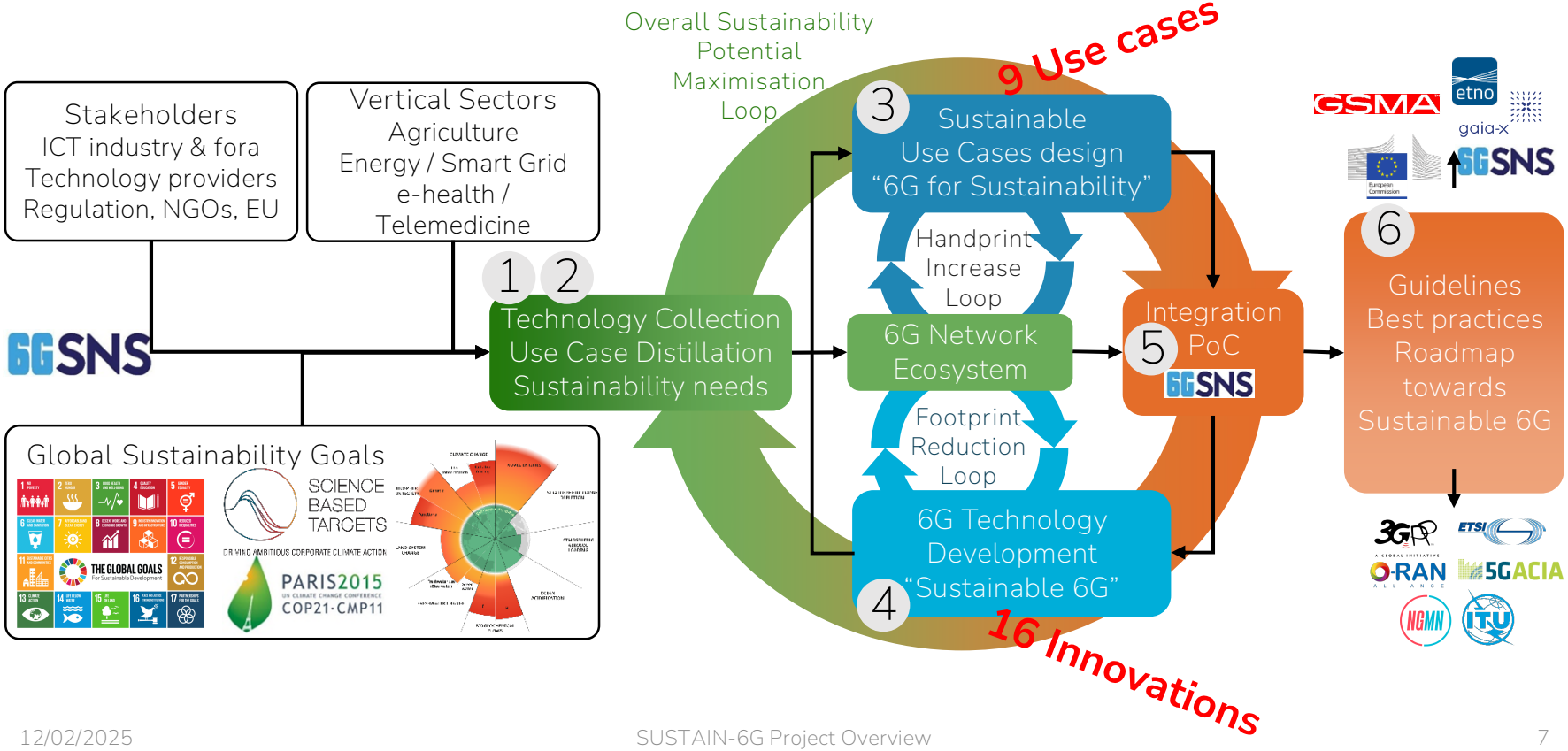
Strategic roadmap for regulation, policies, standardisation towards 6G sustainability by design

Objectives

1. **Identify and understand sustainability needs and values**
   Review, consolidate and define sustainability goals, values, indicators based on stakeholder requirements
   Build a comprehensive inventory of 6G and relevant vertical UCs' concepts, technologies, components including their relevant KPIs and sustainability indicators
2. **Define methodologies for sustainability definition and assessment**
   Review and enhance concepts, processes, methodologies, and tools for holistically defining and assessing sustainability
3. **Enhance integration of vertical UCs with 6G to jointly reduce footprint and maximise handprint**
   Analyse, develop and deliver vertical UCs integrating 6G and enabling technologies to improve sustainability values
   Develop and deliver Sustainability Management Plane (SMP) to enable E2E integrated sustainability-driven operation across network and vertical domains
4. **Enhance 6G technologies to reduce footprint and increase handprint**
   Develop and deliver solutions and enhancements for selected 6G technologies and components towards sustainability improvements, by reducing 6G footprint and increase handprint in vertical sectors
5. **Validate, evaluate, and demonstrate sustainability value**
   Validate 6G technologies on their impact to sustainability (positive / negative)
   Evaluate and demonstrate methodologies, concepts, and solutions on applicability, implementability, and wrt. sustainability impact
6. **Impact generation, sustainability guidelines and strategic roadmap**
   Create impact through dissemination, standardisation, exploitation, by consolidating outcomes towards guidelines, best practices, business models and a strategic (standardisation and regulation) roadmap, to drive the development of 6G in a sustainability-integrated direction

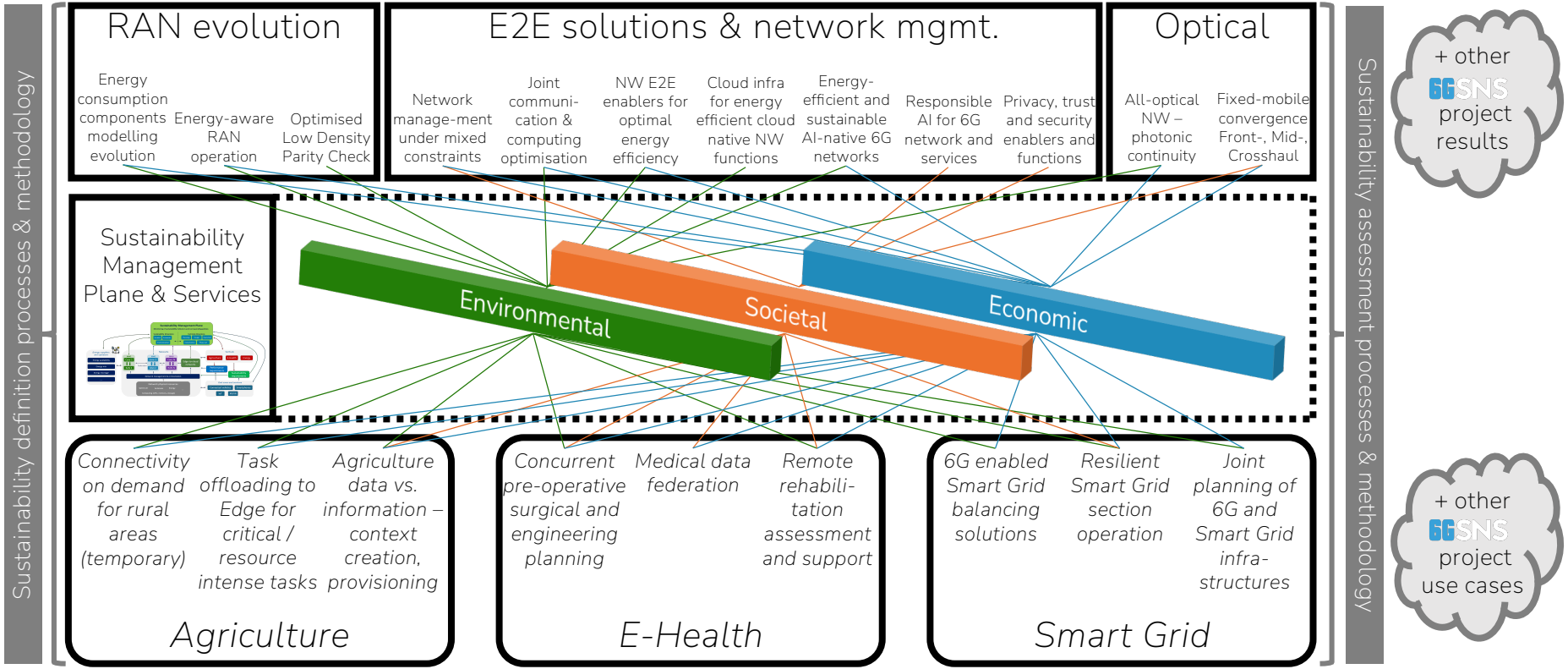
Methodology

In relation to project objectives



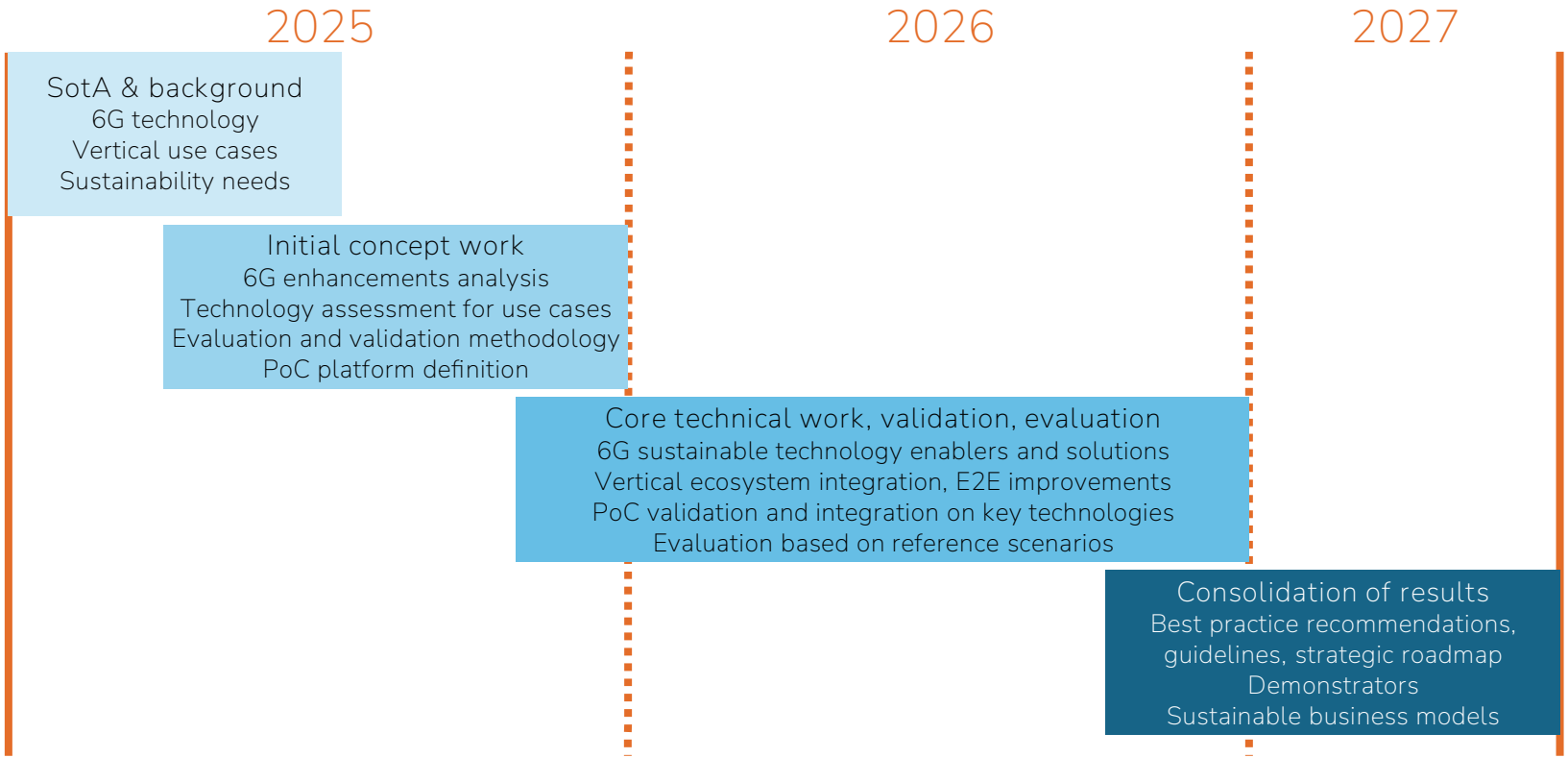
Research, Innovation, Impact Generation

Key relations between enablers, use cases and sustainability dimensions



Timeline

Project phases



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SUSTAIN-6G Disclaimer

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