

6G4SOCIETY

TOWARDS A SOCIALY ACCEPTED AND SUSTAINABLE 6G

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**Operational Brief on
Inclusion-by-Design
for 6G**

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1. Highlights

Inclusion is a core European value and precondition for the legitimacy of sixth-generation (6G) mobile network deployment. As digital connectivity increasingly mediates healthcare, education, work, and civic participation, access and use now determine who can exercise democratic rights and access essential services. 6G's deeper integration with critical infrastructure will amplify these dynamics unless inclusion is embedded from the outset. Findings from the 6G4Society project show 45 percent of surveyed citizens identified inclusion and access as top priorities for future digital development, linking connectivity to social justice and quality of life [1]. Without proactive measures, next-generation networks risk reproducing and amplifying current patterns of exclusion, concentrating opportunity among already advantaged populations while deepen the marginalisation of vulnerable groups.

Project findings confirm that persistent gaps in current connectivity generations threaten to be replicated or worsened in 6G deployment. Rural and peripheral territories remain underserved, affordability provisions are uneven, and skills gaps persist among older adults, jobseekers, low-income households. Accessibility standards are only partially implemented, while citizens reported limited participation in infrastructure decisions. Evidence gathered through citizen surveys, expert interviews, and Smart Networks and Services Joint Undertaking (SNS JU) project analysis reveals that inclusion remains a widely articulated public expectation but an underdeveloped dimension of current research and deployment practice [1] [2] [3]. These insights underscore that the success of 6G will depend not only on technical performance but on embedding European values such as fairness, cohesion, and democratic legitimacy into its governance and design [4].

This operational brief examines:

HOW CAN EUROPE ENSURE THAT 6G DEPLOYMENT SERVES ALL CITIZENS RATHER THAN REPRODUCING EXISTING PATTERNS OF DIGITAL EXCLUSION?

It proposes six main recommendations:

Guarantee equitable infrastructure access and affordability through coverage planning, transparent reporting, and meaningful social tariffs;

Build sustainable local digital-skills ecosystems aligned with the European Digital Competence Framework (DigComp) [5];

Implement outcome-focused monitoring and intervention using disaggregated indicators and Key Value Indicators (KVI)s;

Embed accessibility-by-design across 6G systems and services in compliance with EN 301 549 [6] and emerging standards;

Strengthen participatory governance and procedural justice through meaningful community engagement;

Contribute to inclusion-focused research and coordinated European efforts.



2. Context of the Issue

As Europe prepares for 6G, inclusion has become a strategic test of fairness and cohesion. Connectivity is no longer a purely technical or commercial matter but the infrastructure through which individuals participate in modern life. In this context, exclusion from high-quality networks increasingly means exclusion from essential services and democratic processes.

European policy frameworks already acknowledge these challenges. [The Digital Decade Policy Programme](#) [7] sets binding targets for gigabit connectivity and digital skills by 2030; the [Gigabit Infrastructure Act](#) accelerates deployment [8]; the [European Electronic Communications Code](#) provides for universal service and affordability [9]; and the [Digital Education Action Plan](#), the [European Accessibility Act](#), and the [Web Accessibility Directive](#) outline pathways for skills and accessibility [10] [11]. Yet implementation remains uneven.

Rural regions continue to experience coverage and quality deficits, affordability mechanisms such as social tariffs vary widely [12], skills initiatives are fragmented. Current accessibility provisions address existing technologies; as 6G introduces new interaction modalities, these standards will need to evolve accordingly. Monitoring remains focused on infrastructure deployment rather than on whether connectivity produces tangible benefits for all populations.

The technical architecture of 6G introduces specific inclusion challenges that industry must address. AI-native network management will require higher digital literacy from users interacting with intelligent, adaptive services. Extended reality (XR) interfaces, including augmented and virtual reality, create new accessibility barriers from users with sensory or cognitive impairments unless designed inclusively from the outset [13]. Integrated sensing and communication (ISAC) capabilities may enable innovative assistive applications but also raise concerns about surveillance of vulnerable populations. Network slicing could enable tailored service tiers but risks creating stratified access where premium capabilities remain unaffordable for low-income users.

The shift toward software-defined, cloud-native architectures concentrates technical complexity, potentially widening the gap between those who can navigate advanced services and those who cannot. Each of these architectural choices has inclusion implications that require proactive industry response. 6G4Society engagement activities indicate **inclusion is among the highest public priorities** for 6G. Surveys and workshops reveal citizens associate connectivity with equality of opportunity and rural community viability. Many expressed frustrations at infrastructure decisions made without consultation and at what they perceive as an urban bias in technological investment. Expert interviews with researchers and project leaders reinforced these concerns, highlighting the neglect of distributive justice (who benefits versus who bears burdens) and procedural justice (whether affected communities have a genuine voice) [2]. Understanding these dynamics requires moving beyond an oversimplified notion of a “digital divide” as merely connected versus unconnected. Two decades of research shows digital inequality unfolds across multiple layers.

2. Context of the Issue

Even among connected users, differences in skills, literacy, and confidence determine how effectively they benefit, while those with greater social and economic resources consistently derive larger gains. Scholars including Jan Van Dijk, Eszter Hargittai, Ellen Helsper, and Mark Warschauer, reveal that inclusion depends on reinforcing conditions: access, skills, and outcomes must advance together [14], [15], [16], [17], [18]. Van Dijk's sequential model of access, Hargittai's second-level digital divide (skills), and Helsper's third-level divide (tangible outcomes) provide the conceptual foundation for understanding that infrastructure deployment alone does not guarantee inclusion. Within 6G4Society, **inclusion is therefore understood as the set of conditions that enable all individuals and communities to participate meaningfully in digital life.**



It encompasses the capability to use technologies safely and autonomously, achievement of equitable outcomes across life domains, universal accessibility regardless of ability, and the exercise of voice in decisions shaping digital infrastructures. Inclusion, in this sense, is not a technical endpoint but a governance principle essential to 6G legitimacy.

The transition to 6G will magnify consequences of inaction. Early deployments will likely concentrate in profitable urban corridors and industrial zones, while AI-native architectures and advanced interfaces will demand higher digital literacy. Unless policy treats inclusion as a guiding criterion from the outset, Europe risks a two-speed digital society where some enjoy high-performance connectivity while others remain confined to outdated infrastructure and limited opportunity.

3. Operational Recommendations

Aligning 6G deployment with Europe's social model requires industry action across five mutually reinforcing dimensions. The following recommendations translate inclusion objectives into concrete operational practices for network operators, equipment vendors, and service providers.

R1

Guarantee equitable infrastructure access and affordability

Universal access to high-quality 6G infrastructure at affordable prices is fundamental to preventing reproduction of existing digital divides. Affordability is also an explicit universal service obligation under the European Electronic Communications Code, which requires Member States to ensure access at an affordable price and to take measures, including special tariff options or packages, when low-income consumers or those with special social needs are prevented from accessing adequate broadband. Without proactive deployment strategies, 6G rollout will concentrate in profitable urban areas, leaving rural and peripheral communities with outdated infrastructure. Industry has both commercial interest and social responsibility to ensure geographic location or economic status does not determine who benefits from next-generation connectivity. Operators who develop viable models for underserved areas position themselves for public co-investment, spectrum preferences, and strengthened community relationships. Operational options are:

1

Design network architectures for universal coverage: Evaluate technology options enabling cost-effective rural and low-density deployment: fixed wireless access (FWA) using 6G spectrum, integration with low-earth orbit (satellite) backhaul for remote areas, mesh network topologies reducing backhaul requirements, and small cell densification strategies adaptable to varied population densities. Model coverage economics early in network planning to identify areas requiring alternative technical approaches or public co-investment.

2

Implement transparent, standardised coverage reporting: Publish detailed coverage maps using standardised methodologies aligned with BEREC guidelines and national regulatory requirements. Report not only coverage footprint but quality metrics including throughput, latency, and reliability at the cell edge. Disaggregate reporting by geographic classification (urban, suburban, rural, remote) to enable identification of underserved areas. Provide machine-readable data formats enabling independent analysis and community access to deployment information.

3

Design meaningful social tariff offerings: Develop genuinely affordable packages for low-income households that provide adequate service quality, not degraded connectivity. As a pragmatic benchmark for stress-testing affordability, the Broadband Commission's 2025 target recommends that entry-level broadband be priced below 2% of monthly GNI per capita in low and middle-income countries, offering a simple reference point for defining what "meaningful" affordability looks like in practice [29]. Align eligibility criteria with existing social benefit systems to streamline verification and maximise uptake. Ensure social tariff users receive equivalent customer service and network priority. Report on social tariff uptake, usage patterns, and barriers to adoption to enable continuous improvement.

4

Remove barriers to access for vulnerable groups: Simplify contract and identification requirements, accepting diverse documentation for service activation. Design onboarding processes accessible to users with limited digital experience, language barriers, or disabilities. Train customer service staff to assist users with varied needs, including protocols for supporting older adults, persons with disabilities, and users with low literacy. Offer multiple channel options (in-person, phone, accessible digital) for all service interactions.

5

Leverage European funding mechanisms for inclusive deployment: Actively pursue available funding through the Connecting Europe Facility (CEF Digital), Recovery and Resilience Facility, Structural Funds, and national broadband programmes. Develop proposals demonstrating how 6G deployment will address Digital Decade connectivity targets in underserved areas. Structure co-investment arrangements with public authorities for areas where commercial deployment alone is not viable. Participate in public-private partnerships targeting connectivity for schools, healthcare facilities, and public institutions in underserved regions.

R2

Whose values? The importance of exploring stakeholders and their values

Addressing persistent digital skills gaps requires moving beyond fragmented, short-term training toward sustainable community-based learning ecosystems. As 6G introduces AI-native architectures and advanced interfaces, **higher digital literacy** will be essential for meaningful participation. Without structured, locally embedded skills initiatives, existing inequalities will widen, leaving older adults, job-seekers, low-income households, and vulnerable groups unable to benefit. Building sustainable skills ecosystems ensures all citizens can use 6G technologies safely, autonomously, and effectively, transforming infrastructure access into genuine capability. Industry involvement in skills development also builds customer competence, reduces support costs, and strengthens community relationships. Operational options are:

Align skills initiatives with the European Competence Framework: Structure digital literacy programmes around DigComp 3.0 competence areas: information search, evaluation and management; communication and collaboration; digital content creation; safety; and problem solving. Use DigComp proficiency levels (Foundation, Intermediate, Advanced, Highly Specialised) to design learning pathways appropriate for different starting points. Leverage the framework's 500+ learning outcomes to design granular curricula addressing specific competency gaps. Where relevant, enable participants to obtain recognised certifications demonstrating competence acquisition. Track skills development against DigComp indicators to enable comparability and reporting.

Develop 6G-specific user competencies: Identify and address the new skills 6G technologies will require, building on DigComp 3.0's systematic integration of AI competence across all framework areas. Key Competencies include: understanding AI-driven service personalisation and automated decision-making; navigating extended reality (XR) interfaces safely; managing privacy and consent in sensing-enabled environments; configuring network slice preferences where user choice is available; critically evaluating AI-generated content and recommendations; and recognising misinformation in AI-mediated environments. Develop training modules addressing these emerging competencies before 6G services launch to ensure users are prepared.

Partner with community organisations for locally-embedded delivery: Collaborate with libraries, community centres, adult education providers, and civil society organisations to deliver skills programmes in trusted local settings [19]. Co-design curricula with community partners to address locally-identified needs and cultural contexts. Support train-the-trainer approaches that build sustainable local capacity rather than dependence on external providers. Prioritise deployment regions for skills investments to ensure communities gain capability alongside infrastructure.

Design accessible, multi-modal training programmes: Ensure skills programmes are accessible to participants with disabilities, following WCAG 2.1 guidelines for digital materials [20] and providing alternative formats (large print, audio, sign language interpretation) for in-person sessions. Offer multiple learning modalities: self-paced e-learning, facilitated group sessions, one-to-one support, and peer learning. Design mobile-first digital learning resources recognising that many users access training via smartphones. Provide offline-capable materials for users with limited or intermittent connectivity.

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Contribute tangible resources to skills ecosystems: Dedicate staff time to community education activities, including technical experts who can explain 6G technologies in accessible terms. Provide equipment (devices, connectivity, demonstration facilities) for training programmes. Offer premises for training sessions where available. Fund instructor development and provide ongoing technical support to training providers.

Measure and report on skills outcomes systematically: Track participant competency development using DigComp 3.0 aligned assessments. Report on skills indicators (participation, completion, competency gains, certification) alongside deployment metrics. Disaggregate outcomes by demographic characteristics to identify groups requiring additional support. Use skills data to continuously improve programme design and service accessibility.

Collaborate with public employment and social services: Partner with public employment services (PES), social services, and education authorities to integrate digital skills into broader support pathways. Enable referral mechanisms connecting users identified as needing skills support with appropriate programmes. Share anonymised data (with appropriate consent and safeguards) enabling identification of skills gaps and targeted intervention and design. Align skills initiatives with national Digital Skills and Jobs Coalition commitments.

R3

Implement outcome-focused monitoring and intervention

Shifting from infrastructure-centric to outcome-focused monitoring is essential to ensure 6G deployment produces **tangible improvements in citizens' lives**. Current frameworks emphasize network coverage and speeds but rarely assess whether connectivity translates into real improvements in employment, education, health, and civic participation. The Digital Economy and Society Index (DESI) and Digital Decade monitoring track infrastructure deployment and basic skills, but outcome measurement remains underdeveloped. Without outcome-focused indicators, policymakers lack evidence to identify persistent inequalities or evaluate intervention effectiveness. Strengthening outcome monitoring reveals which groups and regions benefit from 6G and which remain excluded, enabling targeted interventions addressing root causes. Industry engagement in outcome measurement also provides evidence for public investment cases and demonstrates social value creation. Operational options are:

3. Operational Recommendations

INCLUSION BY DESIGN

Integrate Key Value Indicators (KVIs) alongside technical KPIs: Adopt the KVI approach emerging from SNS JU research (including 6G4Society) that complements traditional technical Key Performance Indicators with measures of societal value creation. Define inclusion-relevant KVIs such as: proportion of service area population actively using services; demographic representativeness of user base compared to population; accessibility compliance rates; affordability as percentage of household income (aligned with the internationally recognised 2% threshold [21]); and user-reported capability gains. Report KVIs alongside network performance metrics in regular operational reporting.

Measure tangible outcomes across life domains: Track whether connectivity translates to improved user outcomes in key domains: employment (job search success, remote work participation, skills certification); education (online learning completion, digital assessment participation) health (telehealth utilisation, health information access); civic participation (e-government service use, online democratic engagement); and social connection (communication with family, community participation). Use validated survey instruments and, where possible, linkage to administrative data to assess outcome changes over time.

Disaggregate all impact data systematically: Analyse service quality, usage patterns, and outcomes by demographic and geographic characteristics (age, gender, disability status, income level, education) and geographic classification (urban, suburban, rural, remote). Apply intersectional analysis recognising that exclusion compounds across multiple dimensions. Identify groups experiencing below-average outcomes and investigate root causes. Use disaggregated data to target service improvements, support interventions, and resource allocation.

Conduct social impact assessments before major deployments: Assess how benefits and burdens of planned deployments will be distributed across populations. Identify potentially excluded populations before deployment using demographic analysis and community consultation. Model affordability impacts across income distributions. Modify deployment plans, pricing, and support provisions to address anticipated negative impacts. Publish impact assessments and mitigation commitments transparently.

Contribute to European outcome research infrastructure: Share anonymised, privacy-preserving data with research institutions studying digital inclusion outcomes. Partner with universities and Eurostat initiatives developing harmonised outcome measurement methodologies. Participate in longitudinal research tracking user cohorts over time to understand sustained impacts beyond initial adoption. Enable evaluation of whether connectivity investment produce genuine, lasting benefit for underserved populations.

Establish feedback loops from outcomes to service design: Create mechanisms linking outcome monitoring to service improvement. Where outcome data reveals persistent gaps, investigate causes and implement targeted responses: adjusted pricing, enhanced support, interface modifications, or partnership interventions. Report publicly on how outcome evidence has informed service changes. Demonstrate commitment to continuous improvement based on inclusion evidence.

3. Operational Recommendations

R4

Embed accessibility-by-design across 6G systems and services

Ensuring 6G technologies are accessible to persons with disabilities and older adults from earliest development stages is both a legal obligation and social imperative. Accessibility is also anchored in disability-rights governance: the UN Convention on the Rights of Persons with Disabilities (CRPD) requires equal access to information and communications, including ICT and systems, as a condition for independent living and full participation [28]. Current accessibility provisions, including EN 301 549 and the Web Accessibility Directive, were designed for existing technologies and **require** extension to address the novel interaction modalities 6G will introduce. Extended reality interfaces, AI-driven voice interactions, haptic feedback systems, and sensing-based services each create new accessibility challenges that must be addressed proactively. Without accessibility by design, next-generation networks will reproduce and amplify existing barriers, preventing millions of Europeans from accessing essential services mediated through 6G infrastructure. Industry leadership on accessibility also opens markets, reduces retrofitting costs, and demonstrates social responsibility. Operational options are:

1

Apply accessibility standards from project inception: Treat accessibility as baseline requirement for all development, not an afterthought or compliance checkbox. Apply EN 301 549 to all products and services. EN 301 549 is explicitly designed for use in European public procurement and is directly linked to the requirements of the Web Accessibility Directive for public sector websites and mobile applications, making it a concrete compliance bridge between policy obligations and testable technical requirements. Implement Web Content Accessibility Guidelines (WCAG) 2.1 Level AA as minimum for all web and application interfaces, anticipating WCAG 3.0 requirements as they emerge. Use WAI-ARIA (Accessible Rich Internet Applications) specifications for dynamic content and advanced interface components. Document accessibility requirements in technical specifications from earliest design stages.

2

Address 6G-specific accessibility challenges proactively: Identify and mitigate accessibility barriers arising from novel 6G interaction modalities. For extended reality (XR) interfaces: ensure alternative access paths for users who cannot use VR/AR; provide audio descriptions and haptic alternatives for visual content; address motion sickness and vestibular concerns. For AI-driven voice interfaces: support diverse speech patterns, accents, and assistive communication devices; provide text alternatives for voice-only interactions. For haptic feedback systems: offer visual and audio alternatives; accommodate users with sensory processing differences. For sensing-based services: ensure informed consent mechanisms are accessible; provide alternatives for users uncomfortable with environmental sensing.

3

Involve disabled people meaningfully in design and testing: Engage disabled people's organisations (DPOs) and accessibility experts from the earliest development stages, not only for final validation. Establish ongoing advisory relationships with disability communities, not one-off consultations. Conduct usability testing with users across the full spectrum of disabilities: visual, hearing, motor, cognitive, and neurodiverse. Compensate disabled consultants fairly for expertise contributed. Document how user feedback influenced design decisions and communicate changes back to participants.

INCLUSION

BY DESIGN

4

Implement continuous accessibility auditing and remediation: Conduct regular accessibility assessments using both automated testing tools and expert manual evaluation. Test with actual assistive technologies: screen readers (JAWS, NVDA, VoiceOver), switch access, eye tracking, and voice control. Publish accessibility conformance statements and improvement roadmaps, transparently. Establish rapid remediation processes for identified barriers, with clear timelines and accountability. Track accessibility metrics over time and report progress publicly.

5

Pioneer 6G-enabled assistive technology innovation: Leverage 6G capabilities to create accessibility innovations beyond compliance: ultra-low-latency real-time captioning and sign language interpretation; AI-powered audio description for visual content; haptic navigation assistance using network positioning; personalised interface adaptation using AI; remote assistance enabling support workers to guide users through complex tasks. Partner with assistive technology developers and research institutions to prototype and validate new accessibility applications. Demonstrate accessibility leadership through innovation, not just compliance.

6

Build accessibility competence across the organisation: Train all development, design, and customer service staff on accessibility fundamentals and disability awareness. Include accessibility criteria in procurement requirements for third-party components and services. Designate accessibility champions within development teams with authority to halt releases with significant accessibility barriers. Contribute accessibility learnings to industry forums, standards bodies, and open-source communities. Participate in ETSI, 3GPP, and O-RAN accessibility discussions to embed accessibility in 6G specifications from the outset.

R5

Implement outcome-focused monitoring and intervention

Ensuring affected communities have meaningful voice in infrastructure decisions is fundamental to democratic legitimacy and social acceptance of 6G deployment. Current consultation processes often occur too late to influence design, use inadequate formats, or fail to reach marginalised populations. Without **genuine participatory governance**, 6G rollout will be perceived as imposed from above, eroding public trust and risking the controversies that affected 5G deployment in some regions. The Aarhus Convention establishes the right to public participation in environmental decision-making, applicable to telecommunications infrastructure given its environmental and territorial implications. The European Electronic Communications Code also emphasises stakeholder consultation in spectrum and infrastructure decisions. Industry commitment to meaningful participation builds social licence to operate, reduces deployment conflicts, and generate valuable local knowledge.

Operational options are:

3. Operational Recommendations

VISION BY

1

Engage communities early, when decisions can still be influenced: Initiate community engagement before finalising deployment plans, site selections, or service designs, not after decisions are effectively made. Apply the IAP2 (International Association for Public Participation) spectrum of participation [22], moving beyond informing and consulting toward genuine involvement and collaboration where appropriate. Provide information early enough to enable genuine input, with realistic response timelines (minimum 30 days for significant decisions). Be transparent about which aspects of decisions are open to influence and which are constrained.

2

Make participation processes genuinely accessible: Design engagement processes accessible to all community members, including persons with disabilities, older adults, those with limited digital skills, and non-native speakers. Offer multiple participation channels: in-person meetings, online platforms, written submissions, telephone options, and door-to-door outreach for hard-to-reach populations. Ensure physical venues are accessible; provide sign language interpretation, captioning, and materials in alternative formats. Schedule sessions at varied times to accommodate different work patterns. Provide childcare where feasible to enable parent participation.

3

Deploy inclusive digital participation platforms: Utilise digital engagement tools (such as Decidim, Consul, or similar open-source civic technology platforms) to broaden participation beyond those who can attend in-person meetings. Ensure platforms meet WCAG 2.1 accessibility standards. Combine digital engagement with offline methods recognising that digital-only participation excludes those most affected by connectivity gaps. Provide moderation that ensures respectful dialogue and prevents domination by vocal minorities. Publish all contributions and responses transparently.

4

Translate technical information for non-expert audiences: Produce plain-language summaries of deployment plans, environmental assessments, and technical specifications. Explain what infrastructure will look like, where it will be located, what services it will enable, and what impacts (positive and negative) are anticipated. Use visualisations, maps, and simulations to help communities understand proposals. Avoid jargon; where technical terms are necessary, explain them clearly. Offer community briefing sessions where residents can ask questions and receive accessible explanations.

5

Establish community benefit arrangements: Negotiate tangible local benefits for communities hosting infrastructure, going beyond basic connectivity provision. Consider: priority access to new services; community digital hubs in partnership with local authorities; digital skills programmes for local residents; local employment and supplier opportunities during construction and operation; contributions to community funds or facilities. Document commitments formally and report on delivery. Recognise that communities accepting infrastructure burdens (visual impact, construction disruption) deserve corresponding benefits.

6

Create accountability mechanisms for participation outcomes: Document engagement processes comprehensively, including who participated, what concerns were raised, and how input was addressed. Publish participation reports showing how community feedback influenced final decisions, and explaining clearly where input could not be accommodated and why. Establish complaint mechanisms for communities who believe engagement was inadequate. Build ongoing relationships with affected communities beyond approval-seeking, including regular updates during deployment and channels for ongoing feedback during operation.

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3. Operational Recommendations

INCLUSION

R6

Reinforce targeted research and coordinated policy support

Addressing inclusion challenges comprehensively requires dedicated research to develop evidence-based approaches and coordinated action across stakeholders. Industry engagement with research initiatives and multi-stakeholder coordination mechanisms is essential to translate inclusion principles into operational practice. Active participation in these ecosystems positions European industry to shape emerging frameworks, contribute practical knowledge, and demonstrate commitment to inclusion beyond compliance. Operational options are:

Contribute operational data to inclusion research: Share anonymised, privacy-preserving data with research institutions studying digital inclusion, enabling identification of gaps and evaluation of intervention effectiveness. Participate in SNS JU and Horizon Europe research projects addressing inclusion dimensions of 6G. Support development of inclusion-focused Key Value Indicators (KVI) by providing operational perspectives on measurability and relevance. Enable academic access to network performance data disaggregated by geography and demographics where privacy permits.

Engage with European inclusion coordination mechanisms: Participate in multi-stakeholder inclusion initiatives at European and national levels, including Digital Skills and Jobs Coalition commitments, national broadband competence offices, and accessibility coordination bodies. Collaborate with regulators, civil society organisations, and local authorities on coherent inclusion approaches. Contribute industry perspective to policy consultations on digital inclusion, ensuring operational feasibility of proposed measures.

Utilise living labs and testbeds for inclusive design validation: Leverage SNS JU experimental facilities and national 6G testbeds to validate inclusive design approaches before production deployment. Test accessibility features, multi-modal interfaces, and simplified user experiences with diverse user populations in controlled environments. Pilot community engagement approaches and skills interventions in testbed regions. Share learnings with research community and standards bodies.

Build internal co-design and inclusive research capabilities: Develop organisational capacity for participatory design methods that involve end users, including marginalised groups, throughout development processes. Train product and service teams on inclusive research practices: accessible user testing, ethical engagement with vulnerable populations, and meaningful incorporation of diverse feedback. Document and publish co-design methodologies and learnings to support industry-wide capacity building.

Support development of inclusion standards and guidance: Contribute operational experience to standards bodies (ETSI, 3GPP, O-RAN Alliance) developing accessibility and inclusion provisions for 6G specifications. Participate in CEN/CENELEC working groups on accessibility standards. Engage with BEREC and national regulators on practical implementation of universal service and social tariff requirements. Share implementation learnings that can inform guidance for the sector.

BY DESIGN



4. Evidence and analysis

Project findings are based on triangulation of quantitative (surveys), qualitative (interviews and workshops), and desk-research methods, ensuring robustness and alignment between citizen, expert, and institutional viewpoints. Survey responses reflect participant perceptions rather than the full EU population, while evidence from SNS JU projects represents early-stage research rather than deployed infrastructures. Nevertheless, the extensive combination of scientific literature, citizen surveys, participatory workshops, interviews with practitioners and experts in acceptance, 6G, green ICT, smart cities and sustainability, consultations with policymakers, and engagement within the SNS JU community provides complementary academic, civic, and institutional perspectives on how societal values are currently represented and operationalised in 6G research and innovation.

Citizen surveys showed 45% of respondents viewed **inclusion and access as key priorities for future connectivity**. Participants highlighted persistent **coverage gaps**, particularly in rural and natural-park areas, and expressed concern that advanced mobile generations benefit urban centres while neglecting those in precarious conditions. Workshops linked connectivity directly to social **justice, equality of opportunity, and community sustainability**.

Expert interviews emphasized the importance of **distributive and procedural justice**, noting that **stakeholder engagement** in technological development often occurs too late to influence design. Consultations with research and innovation projects confirmed that while many acknowledge inclusion as relevant, **few operationalise it** beyond basic access metrics.

The evidence converges on a clear conclusion: inclusion remains a widely articulated public expectation but an **underdeveloped dimension** of current research and deployment practice. Treating it as a **governance principle**, integrating access, skills, equitable outcomes, accessibility, and participation from earliest development stages, is essential to ensuring 6G delivers on Europe's commitment to fairness, cohesion, and democratic legitimacy.

5. Sources

This operational brief synthesises findings from 6G4Society Deliverables D1.1 [23] and D1.2 [24], as well as related outputs under WP2 and WP3. It draws on EU policy frameworks including the Digital Decade Policy Programme, the Gigabit Infrastructure Act, the European Electronic Communications Code, the Digital Education Action Plan, the European Accessibility Act, the Web Accessibility Directive, and the Aarhus Convention on public participation in environmental matters.

Technical and operational guidance draws on: the European Digital Competence Framework (DigComp 3.0) [5]; EN 301 549 [6] and Web Content Accessibility Guidelines (WCAG 2.1) [20]; the Digital Economy and Society Index (DESI) monitoring framework [25]; and BEREC guidelines on universal service and social tariffs [26]. Participation methodologies reference the IAP2 Spectrum of Public Participation [22].





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 Project deliverables are publicly available through
the 6G4Society Zenodo repository:
<https://zenodo.org/communities/6g4society>



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