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FOREST INNOVATION READINESS

A self-assessment catalogue for innovators, start-ups, self-disrupting companies, and researchers-turned-entrepreneurs in the forest-based bioeconomy

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Cover image: Borysovsky, Adobe Stock

Executive summary

This guide is intended for innovators and innovation promoters in the forest sector. It provides an overview of important elements of innovation readiness that need to be addressed and achieved in order for an innovative solution – be it a product or service, a business or social initiative – to achieve adoption and impactful outcomes.

It provides clear use instruction and many forestry-related examples. It explains the benefits of applying a multi-dimensional approach to assessing innovation readiness to ensure success by increasing the likelihood of being adopted by intended users and achieving beneficial impacts.

The innovation readiness dimensions covered are:

Technological / functional readiness

Legal readiness

Integration, interoperability or systems readiness

Funding readiness

User / market readiness

Team / organisation readiness

Operational / business model readiness

Communication readiness

Circularity readiness

Society readiness

Introduction: Understanding Forest Innovation Readiness


Image: Ilana Beer, Burst

Who is this guide for and how should it be used?

This guide is intended for innovators working in, with, or around the forest sector and the forest-based bioeconomy. It is designed for a broad range of users, including researchers, start-ups, small and medium-sized enterprises, forest owners and managers, public-sector bodies, non-govermental organisations (NGOs), cooperatives, industry actors, project consortia, funders, incubators, accelerators, and others involved in developing, testing, supporting, funding, adopting, or scaling forest-related innovations.

The guide can be used at different stages of an innovation journey: from early idea development and research planning to piloting, demonstration to market entry, policy uptake, organisational implementation to wider societal adoption. It is intended as a practical self-assessment and reflection tool. Its purpose is not to provide a formal certification, audit, or pass/fail judgement, but to help innovators understand where their innovation currently stands, what evidence supports that assessment, what uncertainties remain, and what may need attention to move the innovation towards adoption.

In this sense, the guide can support several uses. It can help innovators identify gaps, prepare for funding or investment discussions, structure internal planning, align project partners, communicate progress to stakeholders, and monitor development over time. It can also be used to have more structured conversations between innovators and funders, support organisations, and innovation intermediaries about readiness, risk, evidence, and next steps.

The guide should be used with judgement. Assessing innovation readiness is not simply a matter of ticking off tasks. It aims to assess and improve the likelihood of successful adoption of an innovation. This means, it involves making sense of the maturity, feasibility, desirability, legitimacy, and implementability of an innovation in a specific context. Users of this guide are therefore encouraged to approach the self-assessment honestly and realistically, using the milestone indicators as prompts for reflection rather than as rigid administrative requirements.

Common forest innovation areas of activity, pathways, and types

Innovation in the forest sector takes many forms. It includes technological innovation, but it is not limited to technology. Forest-related innovation may involve new or improved products, services, processes, business models, governance arrangements, policy instruments, management practices, digital tools, data sets, equipment or consumables, social initiatives, environmental approaches or methods, financing mechanisms, or combinations of these. Sometimes, innovation involves applying an existing solution in a different way or in a context where it was not applied before.

Common areas of forest innovation activity include, for example:

- forest management, silviculture, restoration, and climate-adaptive forestry
- biodiversity, ecosystem resilience, fire, pest, drought, and disturbance-risk management
- digital forestry, remote sensing, artificial intelligence, decision-support systems, monitoring tools, and data platforms
- wood mobilisation, harvesting, logistics, traceability, and supply-chain coordination
- engineered wood products, timber construction, wood-based materials, and substitution of fossil- or mineral-based materials
- pulp, paper, packaging, fibres, textiles, biochemicals, bioplastics, bioenergy, and biorefinery pathways
- circularity, cascading use, reuse, recycling, side-stream valorisation, and waste reduction
- ecosystem services, carbon, water, recreation, health, and nature-based solutions
- forest-sector finance, insurance, investment, procurement, and payment models
- social innovation, community forestry, cooperation models, ownership arrangements, advisory services, and participatory governance
- policy, regulatory, planning, methodological, and institutional innovations

These areas often overlap. For example, a digital traceability tool may also support circularity, legal compliance, sustainability claims, market access, and communication. A new forest management approach may combine ecological, social, economic, policy, and organisational innovation. A wood-based product innovation may depend not only on technical performance, but also on supply-chain integration, certification, and regulatory clarity.

For this reason, the guide takes a broad view of innovation. It recognises that forest-sector innovations often emerge from complex social-ecological systems, landscapes, value chains, policy environments, or combinations of some or all of these. They may be developed by individual organisations, multi-actor consortia, public-private partnerships, community initiatives, or regional innovation ecosystems. They may aim to create commercial value, public value, environmental benefits, social benefits, or a combination of these.

How can innovation produce the best outcomes?

Innovation is often presented as a solution to contemporary societal, environmental, and economic pressures. In many cases, innovation is indeed a great way to create impactful solutions. New and improved ideas, technologies, practices, policies, and forms of cooperation may contribute to answers to challenges such as climate change, biodiversity loss, resource scarcity, rural development dynamics, industrial transformation, changing consumer expectations, and the need to move away from fossil-based systems.

However, innovation should not be treated as the panacea, which it is often presented as, without careful consideration. Not every innovation is beneficial, and not every problem can be solved through innovation alone. Innovations can create new risks, shift burdens from one group or place to another, increase resource demand, reinforce existing inequalities, or produce unintended environmental and social consequences. Some innovations may be technically impressive but poorly aligned with user needs, market realities, ecological limits, regulatory frameworks, or societal expectations. Others may solve a narrow problem while contributing to wider systemic pressures.

This is particularly important in the forest-based bioeconomy, where forests are expected to contribute simultaneously to climate impact mitigation, climate adaptation, biodiversity conservation, renewable materials, energy, rural livelihoods, recreation, cultural values, water and air quality regulation, soil protection, and economic development.

These expectations are not always easy to reconcile. Increase use of forest biomass may support substitution of fossil-based materials, but it may also raise concerns about biodiversity, carbon stocks, land-use intensity, ecosystem resilience, or competition between different biomass uses. In addition, digital, financial, policy, or governance innovations may improve decision-making and efficiency, but they may also introduce questions about access, fairness, accountability, data governance, and trust.

Innovation in the forest-based bioeconomy therefore needs to be assessed not only in terms of whether it works, but also in terms of what it enables, what it depends on, what trade-offs it creates, who benefits, who bears risks, and whether it contributes credibly to sustainability and societal goals. Readiness is not only about moving faster toward deployment. It is also about moving responsibly, with sufficient evidence, reflection, stakeholder engagement, and awareness of context.

Image: Sue Thompson, Flickr (CC BY-NC-ND 2.0)

What does innovation readiness mean?

In this guide, innovation readiness refers to the extent to which an innovation has developed the evidence, capabilities, relationships, resources, and contextual alignment needed to move responsibly through its next stages of development and testing towards implementation, adoption, and scaling or institutionalisation.

This definition includes, but goes beyond, technical maturity. An innovation may be technically functional but not yet ready for adoption and use. It may work in a laboratory, pilot site, demonstration setting, or controlled project environment, but still face barriers related to users, markets, regulation, funding, organisational capacity, stakeholder acceptance, integration into existing systems, or credible communication of its value and impacts. Conversely, an innovation may have strong societal demand or policy relevance but still require technical development, operational or business model clarification, or stronger evidence of feasibility.

Innovation readiness therefore makes the most sense as a concept, when it is not simply about isolated innovation 'maturity' claims, but about understanding how far an innovation has progressed towards adoption and, consequently, impact creation.

Image: Rodrigo Mendes

From TRL to multi-dimensional innovation readiness framework

One of the best-known approaches to assessing innovation maturity is the Technology Readiness Level, or TRL, scale. The TRL concept originated in the aerospace sector, particularly in work by NASA, as a way to assess the maturity of technologies from basic principles through to operational use.

Over time, TRL scales have been adopted and adapted by many organisations, sectors, and funding programmes. They are commonly used in research and innovation policy and projects, including by the European Commission, to describe the stage of development of technologies and to frame expectations for research, development, demonstration, and deployment activities.

TRL is useful because it provides a simple and widely recognised language for discussing technological maturity. It helps distinguish between early-stage research, proof of concept, validation, demonstration, and operational use. For technology-focused innovations, this can be extremely helpful.

However, TRL focuses exclusively on the maturity of the technology or technical functionality. It does not explain whether users are ready to adopt the innovation, whether the market is prepared, whether the business model is viable, whether the legal context is clear, whether the organisation has the capacity to implement the innovation, whether stakeholders consider it legitimate, whether funding is available, whether the innovation fits into existing systems, or whether its claims to utility are credible, etc.

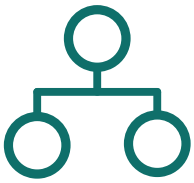
When it comes to successful adoption and use, these non-technical dimensions are just as important as technical performance, especially in complex sectors such as forestry. Indeed, exclusive focus on TRL, as it is often practiced, can obscure the crucial importance of other innovation readiness dimensions in achieving innovation adoption and desired impacts.

This guide therefore uses a multi-dimensional approach to innovation readiness based on the KTH Innovation Readiness Level model. Technological or functional readiness remains important, but it is assessed alongside other dimensions that influence whether an innovation can be responsibly developed, adopted, implemented, or scaled.

Image: Rodrigo Mendes

The readiness dimensions covered in this guide are:

Technological / functional readiness: This dimension considers whether the innovation works as intended. It examines the maturity of the underlying concept, prototype, method, product, service, process, or technical function, including testing, validation, performance, reliability, and operational use.



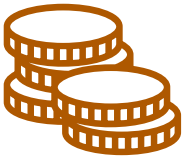
Integration, interoperability or systems readiness: This dimension considers whether the innovation can be integrated into the wider systems on which it depends. These may include technical systems, value chains, infrastructure, data systems, operational processes, supply chains, institutional arrangements, or landscape-level systems.

User / market readiness: This dimension considers whether there is a clear understanding of the intended users, customers, beneficiaries, or adopters; whether their needs and constraints are understood; and whether there is evidence of demand, willingness to use, willingness to pay, or other forms of uptake potential.

Operational / business model readiness: This dimension considers whether there is a plausible and sustainable model for creating, delivering, and capturing value. This may include revenue models, cost structures, customer relationships, knowledge of competitors and competing solutions, partnerships, procurement routes, service models, ownership arrangements, or non-commercial value-delivery models.

Circularity readiness: This dimension considers how well the innovation supports circular use of resources, including durability, reuse, repair, recycling, cascading use, side-stream valorisation, reduced waste, resource efficiency, and alignment with circular bioeconomy principles.

Legal readiness: This dimension considers whether the innovation has addressed relevant legal, regulatory, compliance, intellectual property, standards, certification, interoperability, data rights, procurement, product safety, and claims-related requirements. It includes both formal legal obligations and the practical legal conditions needed for implementation or adoption.



Funding readiness: This dimension considers whether the innovation has access to, or a credible pathway toward, the financial resources needed for its next stage. This may include grants, investment, loans, public procurement, blended finance, internal budgets, revenue generation, or other funding mechanisms.

Team / organisation readiness: This dimension considers whether the people and organisations involved have the skills, capacity, governance, leadership, partnerships, and internal structure and processes needed to develop, implement, manage, or scale the innovation.

Communication readiness: This dimension considers whether the innovation can be clearly, credibly, and appropriately communicated to relevant audiences. This includes a basic toolbox of communication assets and methods as well as relevant content explaining the problem, the proposed solution, the evidence, the benefits, the limitations, the risks, and the value proposition without overstating claims.

Society readiness: This dimension considers whether the innovation is socially acceptable, legitimate, trusted, and aligned with stakeholder expectations and societal needs. It includes stakeholder engagement, social licence, fairness, distribution of benefits and burdens, alignment with public values, and the broader ecosystem of actors whose support or acceptance may be needed.

Together, these dimensions provide a broader picture of innovation readiness than TRL alone. They help identify not only whether an innovation is technically mature, but whether it is sufficiently prepared for real-world development, adoption, and impact.

Applicability across innovation types

This guide is intended to be applicable across many different types of innovation. It can be used for technologies, equipment, digital tools, materials, products, services, business models, policy instruments, governance approaches, methodologies, process innovations, social initiatives, environmental interventions, as well as combinations of these.

This broad applicability is important because forest-sector innovation is diverse. Some innovations may involve a physical product, such as a new wood-based material or monitoring device. Others may involve software, such as a decision-support platform or traceability system. Some may involve new ways of organising cooperation between forest owners, processors, municipalities, or communities.

Others may involve policy design, financing mechanisms, restoration approaches, biodiversity monitoring methods, circular business models, advisory services, etc.

Not every readiness dimension will apply in the same way to every innovation, but they usually are applicable in some respects.

For example, a policy innovation may not require the same form of technological readiness as a piece of equipment, but its functional readiness (as a mechanism intended to produce certain desired outcomes) may still be assessed if the innovator decides to take an open-minded approach to the transferability of the assessment's intention.

The same applies to other readiness dimensions. Said policy innovation may require, most obviously, strong societal, legal, organisational, communication, and systems readiness, yet all other types of innovation also require these in their own ways:

- a digital tool may require particular attention to user readiness, data governance, interoperability, legal readiness, and business model readiness;
- a restoration initiative may depend significantly on ecological evidence, stakeholder legitimacy, funding, long-term monitoring, and organisational capacity;
- a new biomaterial may require technical validation, supply-chain integration, certification, market readiness, investment, and credible sustainability claims; however, other innovations require equivalent readiness across these dimensions in the ways that are relevant to them.

Users of this guide should therefore interpret the readiness dimensions in relation to their own innovation type, context, intended next steps and eventual adoption. The guide is not based on the assumption that all innovations follow the same pathway. Rather, it provides a structured way to ask relevant questions across different pathways.

The practical use of multiple innovation readiness dimensions

The readiness dimensions in this guide are presented separately for clarity, but in practice they are closely linked. For example, market readiness may depend on legal clarity, communication readiness, and evidence of technical performance. Funding readiness may depend on the strength of the business model, the credibility of the team, the maturity of the technology, and the level of societal support. Circularity readiness may depend on systems integration, user behaviour, legal requirements, and supply-chain coordination. Societal readiness may influence, and be influenced by, communication, legal, market, and organisational readiness.

There is also overlap between dimensions. This is not a flaw in the framework, but a reflection of how innovation works in practice. Real-world innovation challenges rarely fit neatly into separate categories. The dimensions are intended to provide different lenses on the same innovation, helping users notice issues that might otherwise be overlooked.

The milestone indicators within each dimension are generally presented as a sequence of increasing sophistication. However, innovation development is not always linear. Some milestones may be addressed in parallel. Some may need to be revisited several times. Some may be partially achieved, then revised as new evidence emerges. In some cases, later-stage learning may reveal that earlier assumptions were incorrect.

This is especially likely in complex sectors such as forestry, where ecological, social, market, regulatory, and institutional conditions may vary across regions and over time.

For this reason, users should not approach the self-assessment as a literal box-ticking exercise, even if completion of a set of milestones within one level indicates to them that they have achieved that level.The aim is not to claim the highest possible readiness level, but to develop a realistic understanding of the innovation's current position. A lower readiness level in one dimension is not a failure. It simply indicates where more learning, evidence, engagement, development, or support is needed. In many cases, the particularly useful insights come from identifying mismatches between dimensions, such as high technological readiness but low market readiness, strong societal interest but weak funding readiness, or a promising business model that still lacks legal clarity or systems integration.

Evidence is central to the assessment. Users of this guide should consider what evidence supports their judgement in each dimension and regarding each milestone. Evidence may include test results, pilot data, user feedback, stakeholder engagement records, market analysis, regulatory review, financial planning, life-cycle or circularity analysis, monitoring data, partnership agreements, implementation experience, or documented lessons from demonstrations. The type of evidence needed will depend on the innovation, the context, and the intended next step.

Ultimately, this guide is intended to support informed sense-making. It helps innovators ask: What do we know? What do we still need to learn? What risks remain? Who needs to be involved? What assumptions are we making? What would need to be true and what steps are required for this innovation to move to its next stage?

Technological / functional readiness

This readiness dimension assesses in how far the functionality of your innovation has been developed. In some contexts, this might refer to technological readiness (including engineering or programming, systems integration, production process readiness, etc.). In others, this might refer methodological readiness (including organisational embedding, process integration, implementation readiness, etc.).

Level 1–3: The innovation is conceived

Level 1: An interesting problem leads to an innovation idea

- ☐ A problem has been identified (this can be based on a known or recently discovered operational, social or technical problem, new research findings, etc.)
- ☐ An idea for a solution (product, technology, process, initiative, practice, etc.) has been developed
- ☐ None of the above

Level 2: An innovation concept is formulated

- ☐ A solution concept (product, technology, process, etc.) and theory of change (explicit statement or visualisation of the chain of cause-and-effect relationships leading to a problem with identification of which particular relationship the innovation addresses to break the chain and how) has been described
- ☐ A practical application for the solution has been identified (may yet be speculative)
- ☐ None of the above

Level 3: The innovation concept is proven in the development concept

- ☐ First testing of individual key features within the development context has taken place
- ☐ Research and development for further innovation development has been initiated
- ☐ Initial understanding of end users' requirements (use case, adoption support, etc.) has been gained
- ☐ None of the above

Level 4–6: The innovation is validated

Level 4: The innovation is validated in the development environment

- ☐ Multiple key features of the innovation have been shown to work together in the development environment
- ☐ Any technology-related barriers to uptake (e.g. high costs, functional impairments, etc.) identified by tests of integrated key features in the development environment have been overcome
- ☐ None of the above

Level 5: The innovation is validated in a relevant (controlled) environment

- ☐ All features of the innovation have been shown to be working (individually or integrated) in an environment that simulates the relevant operational one
- ☐ Any technology-related barriers elicited by tests of the integrated full features in relevant controlled environment have been overcome
- ☐ End user requirements have been revised and more clearly defined
- ☐ None of the above

Level 6: A prototype is demonstrated in relevant (controlled) environment

- ☐ A functional model / prototype of the innovative methodology or technology has been shown to work in a controlled environment that simulates the relevant operational one
- ☐ A functional model / prototype of the innovative methodology or technology has been shown to create the desired impact and meet performance requirements
- ☐ None of the above

Level 7–9: The innovation is adopted

Level 7: A prototype is demonstrated in the realistic operational environment

- ☐ Prototype near or at complete technology / methodology level has been shown to work in the real operational environment
- ☐ The end users' requirements have been fully identified
- ☐ None of the above

Level 8: The innovation is completed and demonstrated in actual operations

- ☐ The complete innovation has been proven to work in actual operations by first users
- ☐ The innovation has progressed from test users to early adopters
- ☐ None of the above

Level 9: The innovation is proven in actual operations over time

- ☐ The complete innovation is scalable and has been proven to work in actual operations by multiple users over time
- ☐ Continuous development, improvement, optimisation of the innovation is in progress
- ☐ None of the above

Integration, interoperability or systems readiness

This readiness dimension assesses in how far the innovation is compatible with existing operational context conventions and systems or their components, such as ancillary products and processes of use, as well as how well it is prepared to work across different interfaces by conforming to or bridging required preconditions of practical application. Elements of an existing context, system or its components maybe technological in nature (e.g. technology operations requirements or shared formats), but they can also be social (e.g. inter-institutional dynamics or decision-maker expertise types and levels) or conventional (e.g. shared standards or terminology).

Level 1–3: Integration needs and approaches are defined

Level 1: Integration need identified

- ☐ Operational context has been described
- ☐ Integration problem statement has been drafted
- ☐ Candidate systems / components have been identified
- ☐ External and internal integration-relevant interfaces have been identified
- ☐ Stakeholders and integration owners have been identified

Level 2: Integration concept defined

- ☐ Interface concepts have been drafted
- ☐ Dependencies between systems or components have been captured
- ☐ Data / process flows across components and interfaces have been mapped
- ☐ Integration patterns have been defined
- ☐ Preliminary interoperability assumptions are validated conceptually

Level 3: Integration-relevant interfaces clearly specified

- ☐ Systems-, components-, services-, or organisations-relevant interaction or interface control documents have been drafted
- ☐ Compatible formats and effective connection points between systems, components, etc. have been specified
- ☐ Interoperability performance requirements have been defined
- ☐ Disconnect and exception handling have been defined
- ☐ Compliance requirements have been captured

Level 4–6: Integration is implemented

Level 4: Integration environment successfully established

- ☐ Integration support structures have been established
- ☐ Required tools, resources, and coordination mechanisms are available
- ☐ Common processes or working methods have been defined
- ☐ Communication and governance procedures are operational
- ☐ Pilot, rehearsal, simulation or trial activities are enabled
- ☐ Integration procedures are documented
- ☐ Dependencies, roles and responsibilities are coordinated

Level 5: Component integration successfully demonstrated

- ☐ Pairwise integrations have been tested
- ☐ Core interfaces are operational
- ☐ Basic data exchange and shared conventions have been verified
- ☐ Integration defects / disconnects have been identified and tracked
- ☐ Dependencies have been addressed or removed

Level 6: System integration validated

- ☐ Multiple sub-systems have been integrated concurrently
- ☐ End-to-end workflows are operational
- ☐ Performance baselines have been achieved
- ☐ Fault handling has been validated
- ☐ Operational scenarios have been tested in controlled environments

Level 7–9: Integrated is fully operational and maintained over time

Level 7: Operational integration successfully demonstrated

- ☐ Real users participate in the integration exercises / testing
- ☐ Realistic interoperability with operational context has been verified
- ☐ Interoperability has been tested under realistic use conditions
- ☐ Cross-organisational coordination has been proven

Level 8: Operational and production integration proven

- ☐ Adaptation for integrations has been fully incorporated
- ☐ Continuous monitoring of integration / interoperability is ongoing
- ☐ Stable interoperability is achieved under live conditions
- ☐ Interoperability challenges and disconnects are addressed

Level 9: Integration capability optimised and sustained

- ☐ Continuous integration / improvement is institutionalised
- ☐ Backward compatibility is managed systematically and successfully
- ☐ Integration-stable upgrade and change-management processes have been proven
- ☐ Innovation scaling under continuous integration condition has been proven

User / market readiness

This readiness dimension assesses in how far the users (or user groups) of your innovation, and their needs and contexts, have been understood. It is also sometimes called customer readiness, market readiness or demand readiness. It spans the problem definition, value proposition, market analysis, and identification and engagement of users.

Level 1–3: Users and adoption context understanding has been gained

Level 1: Hypothesising about the market and users is taking place

- ☐ A need (problem and opportunity) has been identified for verification
- ☐ Initial understanding of the market has been developed
- ☐ There is a speculative idea of who the user(s) / procurer(s) of the innovation will be
- ☐ None of the above

Level 2: The 'market need' is confirmed

- ☐ Some familiarity (typically based on research of secondary sources) with market and likely users (needs, available alternatives) has been achieved
- ☐ Initial draft problem description / needs hypothesis has been produced
- ☐ None of the above

Level 3: Market feedback has been sourced

- ☐ Increased familiarity with market and likely users has been achieved (typically through research of primary sources such as potential users or industry experts)
- ☐ The problem / needs hypothesis has been updated following user and expert feedback, and finalised
- ☐ None of the above

Level 4–6: User and client (groups) have been identified and engaged

Level 4: Understanding of multiple user groups is gained

- ☐ The identified problem / need has been confirmed by multiple user groups
- ☐ On the basis of the users identified, basic user / customer segmentation profiles have been created (including identifciation of budgetary and technical decision makers determining adoption decisions)
- ☐ Product / service hypotheses have been reformulated for (tailored to) each user segment, including differentiation from alternatives already available in the market
- ☐ None of the above

Level 5: Relations with users are established

- ☐ Contact and relationship with potential users has been established
- ☐ Identified users have expressed interest in the innovation
- ☐ A priority user group (initial focus) has been identified
- ☐ A first sales pitch (tailored to the priority user group) has been created
- ☐ None of the above

Level 6: User testing and user acquisition mechanisms are set up

- ☐ User testing has confirmed the value of the innovation
- ☐ The sales pitch has been updated on the basis of user feedback (including adaptation for different user groups)
- ☐ First user acquisition (for instance, sales) and initiation of structured user acquisition (including identification of potential outreach partners and stakeholders) activities have taken place
- ☐ Key partners for user acquisition have been identified
- ☐ None of the above

Level 7–9: The innovation is adopted

Level 7: First users adopt the innovation

- ☐ User agreements are in place with a small number of early adopters
- ☐ Negotiation of partnership agreements for user outreach have been initiated
- ☐ None of the above

Level 8: The initiative or business supports itself on the basis of adoption of the innovation

- ☐ The fully developed product or service is in use by a substantial number of users (if monetised: sold at or near market price)
- ☐ A functional user acquisition process is in place (for instance, through outreach partnerships or dedicated staff)
- ☐ None of the above

Level 9: Wide-spread use and scalability is achieved

- ☐ The solution is already in widespread use, and user acquisition is repeatable (scalable)
- ☐ The entity focuses on business / user base development (acquisition, growth of user base, building user demand, etc.).
- ☐ None of the above

Operational / business model readiness

This readiness dimension assesses the reflection engaged in and steps taken to ensure that your innovation can succeed in the operational context it exists in. It is also often referred to as business model readiness. Across different contexts, it spans the solution-problem-fit, entity or business operations, monetisation model if relevant, distribution strategy, competition / alternative solutions analysis, supply chains, resource needs, and sustainability impacts.

Level 1–3: The operational model is developed

Level 1: The operational model and context are being clarified

- ☐ The operational / business model for the innovation (including definition of resource needs, supply chains, production process, distribution strategy, monetisation, etc.) is being developed, but still unspecific and speculative
- ☐ Initial understanding of the potential of the operating context / market potential, competition and alternative solutions has been developed
- ☐ None of the above

Level 2: The operational model and contextual insights are developed with reference to the specifics of the innovation

- ☐ A description of the proposed operational concept has been drafted
- ☐ Initial research (typically secondary sources) has been conducted into the likely size of demand in the operational context / market and its distinguishable segments, as well as competition landscape
- ☐ None of the above

Level 3: The full operational model and relevant context insights are in place

- ☐ The full operational model is in place, including an analysis of factors causing positive and negative impacts on society and the environment
- ☐ The target operational context (including potential size of demand) and relevant competition or alternative solutions in use (with relevant details such as their positioning, operational models, pricing if relevant) have been well understood
- ☐ None of the above

Level 4–6: The operational model is tested

Level 4: Input and output, and impacts estimates are carried out

- ☐ Input needs and output potential have been identified; for instance main costs and main revenue streams / available resources, where relevant profit and loss projections estimated
- ☐ An initial assessment of positive versus negative environmental and social sustainability has been carried out
- ☐ None of the above

Level 5: Systematic realistic assessment of input and output, and impacts is carried out

- ☐ The operational model has been updated on the basis of expert (potential users, suppliers, etc.) feedback on likely costs and revenues, available resources, etc.
- ☐ Key measures to increase positive and decrease negative social and environmental impacts have been adopted
- ☐ None of the above

Level 6: All elements of the operational model are confirmed in a realistic context or confirmed by expert feedback

- ☐ Complete resource projections on the basis of information / feedback from a realistic operational context have shown the viability of the model
- ☐ The social and environmental sustainability (including any adopted adjustment measures) of the model has been confirmed in one or a few realistic operating scenarios
- ☐ None of the above

Level 7–9: The operational model is validated

Level 7: First adoption confirms the operational model

- ☐ First adoption or sales confirm ability of the operational model to meet user need / demand
- ☐ The practical application of the operational model has validated the input / output, including financial projections
- ☐ Agreements are in place with all relevant partners (collaborators, suppliers, distribution partners, etc.) and contribute positively to the operation model
- ☐ None of the above

Level 8: Further adoption confirms the operational model in a realistic context

- ☐ Metrics from initial operations (years 1–3) show that the model can meet internal and external expectations regarding use value, sales (where relevant), scalability, and social and environmental impact
- ☐ Production (including supply chains) and distribution processes are operational
- ☐ The operational model is in place but continues to be fine-tuned to improve resource efficiency and sustainability impacts
- ☐ None of the above

Level 9: The model operates smoothly and outcomes meet or exceed expectations

- ☐ Credible metrics are in place to track economic / resource efficient, environmental and social performance
- ☐ The operational model is sustainable and meets / exceeds expectations regarding use value, scalability, and environmental and social impacts over time
- ☐ None of the above

Circularity readiness

This readiness dimension assesses how prepared an organisation is to integrate circular economy principles, by helping both innovators and established companies understand how circular and sustainable their products, services, methodologies, or processes are at each stage of research, innovation, and development -regardless of sector.

Level 1–3: Describing the circularity concept

Level 1: The innovation's circularity potential has been identified

- ☐ The overall goal of achieving a circular business model has been defined
- ☐ A first understanding of potential positive and negative impacts on the environment and society has been formed
- ☐ The intervention addresses a problem or need linked to circularity
- ☐ None of the above

Level 2: The innovation's circularity concept has been formulated

- ☐ A concept has been defined describing how the intervention creates, delivers, or captures circular value
- ☐ Practices or models for measuring impact (e.g., carbon or biodiversity footprint, life cycle thinking) have been identified
- ☐ Key areas of positive (e.g., efficiency, reduced emissions) and negative (e.g., waste, risks) contribution have been described
- ☐ At least one benchmark or competitor applying circularity has been analysed
- ☐ None of the above

Level 3: The innovation's requirements and contributions have been understood

- ☐ A life cycle perspective has been applied to assess positive and negative contributions (e.g., inputs, production, use, end-of-life)
- ☐ Resources and activities to achieve the positive circularity impact or avoid / mitigate negative ones have been defined
- ☐ Stakeholders affected by positive or negative impacts have been identified
- ☐ Initial assumptions about costs and revenues linked to these practices have been documented
- ☐ None of the above

Level 4–6: Designing the circularity components

Level 4: The innovation's circularity hypothesis has been validated

- ☐ Preliminary stakeholder or expert feedback has been gathered to validate or challenge these hypotheses
- ☐ The dependency on scale has been validated, it has been clarified if benefits hold at larger scale only or are also feasible at smaller scale
- ☐ A plan to test key the measures designed to achieve the desired circularity impacts has been developed
- ☐ None of the above

Level 5: The innovation's realistic circularity potential has been tested through estimates, modelling and scenarios

- ☐ Key measures (e.g., resource reuse, energy savings, recycling responsibility) have been factored into finances
- ☐ The operations have been assessed for possible side effects or additional negative contributions
- ☐ Trade-offs between circularity measures (cost, feasibility, scalability) have been analysed
- ☐ The circularity-oriented business model has been authorised by the appropriate levels of the organisation
- ☐ None of the above

Level 6: A strategy has been developed for achieving the innovation's circularity potential

- ☐ Financial and operational data for real-world testing have been obtained
- ☐ Relevant processes have been identified, and necessary adjustments conceptualised and documented
- ☐ Staff involved in implementing the changes have been identified and informed of the change timeline and implementation management planning
- ☐ None of the above

Level 7–9: Testing and scaling the circularity components

Level 7: The circularity model (all measures adopted) of the innovation has been demonstrated to be operational in practice

- ☐ Systems for recovering, reusing, or extending value of resources / data / products have been tested in practice
- ☐ Actual costs and revenues from circular measures are compared to forecasts
- ☐ Impact assessments (e.g., Life Cycle Assessment) have been drafted
- ☐ Impacts assessments have been implemented
- ☐ None of the above

Level 8: The innovation's circularity model has been proven to be viable and suitable for broader integration

- ☐ Actual operations confirm that the model is economically viable (revenue ≥ cost)
- ☐ Negative impacts are actively reduced and positive ones increased
- ☐ None of the above

Level 9: Scalability and long-term impacts of the circularity model are confirmed through successful operations

- ☐ The business model is scalable and has been proven to be viable / sustainable in multiple operations over time
- ☐ The organisation contributes to sector-wide progress by sharing practices, mentoring, or influencing policy
- ☐ Collaboration with value-chain or ecosystem partners extends circularity beyond the organisation
- ☐ Actual operations confirm that positive impacts are achieved, and negative impacts mitigated
- ☐ None of the above

Legal readiness

This dimension of readiness assesses a number of legal considerations. Frequently taking a more specific focus, it is sometimes called intellectual property rights (IPR) readiness. It covers topics like legal entities, patents, trademarks, copyright, trade secrets, digital registration, and compliance.

Level 1–3: Understanding of legal concepts, requirements and options is developed

Level 1: Legal considerations receive initial attention

☐ Initial understanding has been gained about relevant legal entities

☐ Initial understanding has been gained regarding freedom to operate and intellectual property rights (IPR) opportunities or types (patents, trademarks, digital registration, etc.) and their practical relevance (securing uniqueness in a technical field, ownership and use-rights, etc.)

☐ Initial consideration has been given to securing relevant IPR (still speculative, no description or documentation of possible IPR is in place yet)

☐ None of the above

Level 2: Relevant legal arrangements are identified

☐ Different relevant legal entity types have been identified or continuation in an existing legal entity considered.

☐ Types of IPR have been mapped and possible applicable ones identified

☐ Inventors, creators, owners of IPR have been clarified, some knowledge of applicable IPR policies has been established, and any necessary restrictions included in contractual agreements (e.g., regarding non-disclosure)

☐ None of the above

Level 3: Suitable legal arrangements are selected and prepared

☐ Decision which legal entity is to be established has been taken or continuation in an existing legal entity decided

☐ A sufficiently clear and detailed description and prioritisation of IPR protection to be pursued has been created as the basis for the evaluation of protection potential

☐ Initial searches / analysis have been conducted (by innovation owner or professional) into relevant prior conflicting (external / third-party) IPR

☐ None of the above

Level 4–6: Legal arrangements are put into place

Level 4: Formalisation of relevant legal arrangements commences

☐ A suitable legal entity has been established

☐ IPR protection possibilities have been ascertained by a professional

☐ Priority IPR for protection has been confirmed, and a provisional (non-expert) application may have been drafted

☐ Compliance needs regarding different policies / regulations (health and safety, environmental, non-discrimination, data protection, etc.) are being considered

☐ None of the above

Level 5: Strategy for legal considerations is defined

☐ (Professional) analysis and planning / a strategy is in place on how to use IPR to create and protect value for the innovator / business, and a basic protocol for control of IPR is in place.

☐ A first formal IPR application / registration has been filed (supported by a professional)

☐ Potential compliance needs have been mapped as well as expertise requirements considered

☐ None of the above

Level 6: Implementation of legal strategy is taking place

☐ A full IPR strategy (including multiple IPRs, identifying additional IPRs, avoiding conflicts with existing external IPRs (for example, 'freedom to operate', etc.) is in place and has been validated by a professional

☐ Either a positive response on IPR application / registration has been received from authorities, or (in case of negative response) analysis of the unsuccessful application / registration conducted together with a professional

☐ Applicable compliance needs have been identified and a compliance process drafted

☐ None of the above

Level 7–9: Legal arrangements are consolidated

Level 7: All legal arrangements are operational

☐ Formal IPR applications / registrations have been filed for all relevant countries (in accordance with the strategy)

☐ Clear 'freedom to operate' assessment is in place (incl. understanding of dependency on / restrictions by third-party IPR, or agreements in place to access third-party IPR)

☐ Compliance assessment and necessary measures are regularly practiced

☐ None of the above

Level 8: Legal arrangements have been professionalised

☐ IPR has been granted in at least the first country, the strategy is fully implemented, related agreements are professionally managed, and processes for securing new IPR have been set up

☐ Additional and complementary IPR applications / registrations have been filed

☐ Compliance responsibility has been formalised (e.g., through a dedicated team member)

☐ None of the above

Level 9: Legal arrangements support the successful running of operations

☐ IPR practice supports operations / business, key and complementary IPR has been granted in all relevant countries, agreements are in place to ensure access to all necessary external IPR

☐ Compliance practice is continually carried out and adapted as new policies / regulations require

☐ None of the above

Funding readiness

This readiness dimension assesses the reflection engaged in and steps taken to ensure initial and ongoing funding for the innovation and organisation. It typically covers questions of investment (dilutive and non-dilutive), capital and revenue streams. It may also include considerations like crowd sourcing, public procurement, and initial versus maintenance funding requirements.

Level 1–3: Innovation activities, costs and funding needs are defined

Level 1: Innovation verification and financing needs are explored

- ☐ Some, little insight has been gained into relevant activities and costs of verifying the potential or feasibility of the innovation idea
- ☐ A little insight has been gathered into different funding types and options, including bootstrapping opportunities
- ☐ None of the above

Level 2: Initial activities and more detailed financing needs are formulated

- ☐ Initial (months 1–6) verification activities and associated costs have been described
- ☐ A basic plan with funding options for initial milestones is in place
- ☐ None of the above

Level 3: The focus from initial to near-term financing

- ☐ Funding and in-kind opportunities have been secured to realise the initial verification activities
- ☐ Growing familiarity with different funding types (own, soft, equity, customer, etc. funding) has been established
- ☐ None of the above

Level 4–6: Funding sources are explored and matched to needs

Level 4: Financing needs for the elaborated verification plan are covered

- ☐ Elaborated verification plan (months 3–12), including hypothesis to verify goals, timeline, funding needs, has been produced
- ☐ Relevant funding sources have been identified
- ☐ Sufficient funding for the implementation of a substantial part of the elaborated verification plan has been secured
- ☐ None of the above

Level 5: Preparation for near-term financing is taking place

- ☐ A funding pitch has been developed and tested on a relevant audience
- ☐ Near-term funding needs and a profit-and-losses budget have been identified through cash-flow planning for the upcoming 12 months (spreadsheet format)
- ☐ A funding strategy (sources, approach, pitch, etc.) has been decided on a pros and cons analysis (e.g. impact of funding on operating or business model, questions of ownership and control)
- ☐ None of the above

Level 6: Preparation for mid-term financing is taking place

- ☐ The funding pitch has been updated and tested on relevant audiences
- ☐ Mid-term funding needs and a profit-and-losses budget have been identified in a cash-flow planning for the coming from 3 to 5 years (spreadsheet format)
- ☐ Contact has been established with relevant funding sources
- ☐ None of the above

Level 7–9: Funding is secured

Level 7: Financing conversations are fully prepared and are taking place

- ☐ The funding pitch is complete, tried and tested, and a reasonably detailed operations / business plan with financial projections and milestones is in place
- ☐ Basic accounting systems and documentation are in place for financial follow-up
- ☐ Conversations are being conducted with potential external funding sources around a defined offer (how much money, for what, conditions, valuation, etc.)
- ☐ None of the above

Level 8: Preparation for financing agreements are in progress

- ☐ Key preparatory steps have been taken and documentation produced or collected for due diligence, including legal (correct legal entity, not fragmented), IPR, financial, operational documentation and agreements
- ☐ Concrete (term sheet level) discussions with one or more external funding sources with real interest are taking place
- ☐ None of the above

Level 9: Financing agreements are realised

- ☐ Money for 6–12 months runway (corresponding to operational / business plan) has been received
- ☐ A fully implemented financial monitoring and bookkeeping system is in place for continuous control of financial status and good forecast / foresight of future funding needs
- ☐ None of the above

Team / organisation readiness

This readiness dimension assesses the makeup and suitability of the organisational structures and team members. It is therefore sometimes also called team readiness. It covers such topic areas as leadership, roles, expertise, organisation structure, processes, culture, partners, advisors, stakeholders, and networks.

Level 1–3: Existing and missing team competences are identified and understood

Level 1: Team and competence needs are being explored

- ☐ Some, little insight has been gathered into what expertise or competences will be needed
- ☐ Some necessary expertise is available, but there are still expertise gaps (typically only one individual, missing expertise in a key area like technology or business skills)
- ☐ None of the above

Level 2: Types and limits of competences in the initial team are understood

- ☐ Initial competency / capacity to verify the innovation idea has been built or recruited (typically 1–2 individuals)
- ☐ Some additional competency needs have been identified
- ☐ None of the above

Level 3: Team competences are being built or sourced

- ☐ Further competencies have been recruited or developed
- ☐ Competency needs have been identified and a plan for sourcing them in the near term (<1 year) is in place
- ☐ None of the above

Level 4–6: Leadership and complementary competences are defined

Level 4: A first champion and team are in place

- ☐ A champion with a clear idea of direction and strategy is present
- ☐ Several needed competences are in place (typically multiple individuals); definition of and recruitment for complementary competencies and additional capacity has been initiated
- ☐ Internal discussions on roles, commitment and ownership going forward have started
- ☐ None of the above

Level 5: The initial founding team is formed and extended

- ☐ A founding team with the main needed competencies and significant capacity commitment is in place
- ☐ The team agrees on ownership, clarified roles, goals, and vision
- ☐ First processes and tools for knowledge and information sharing have been established in the team
- ☐ Sourcing of additional competences is in progress, keeping in mind the diversity needs of the team
- ☐ None of the above

Level 6: An advanced founding team is in place and operational

- ☐ A fully complementary, diverse and committed (responsible and accountable) founding team with all necessary competences and capacity to start building an organisation as well as clear leadership is in place
- ☐ Consideration is given to strengthening the team (e.g. recruitment of board members / advisers or awareness of risks to team performance such as conflicts, burnout, politics, etc.)
- ☐ None of the above

Level 7–9: Full team and organisational structures are in place

Level 7: A full team and team culture has been established

- ☐ A well-functioning team (including board members) with clear roles and an explicit organisational culture (including goals, vision, purpose, values, behaviours) are in place
- ☐ A plan for growing the team and organisation as well as continuous staff development and organisational learning is in place
- ☐ None of the above

Level 8: A professional organisation structure has been established

- ☐ A professional organisation structure with all necessary levels and roles (competent and diverse board, CEO and management with relevant experience, good HR practices, properly trained and motivated diverse staff) is in place
- ☐ None of the above

Level 9: The organisation is well-structured and fully functional

- ☐ A well-structured and -maintained organisation has been established that develops appropriately (all levels engage in continuous learning) and performs well (at all levels) over time
- ☐ None of the above

Communications readiness

This dimension considers whether the innovation can be clearly, credibly, and appropriately communicated to relevant audiences. This includes a basic toolbox of communication assets and methodologies as well as relevant content explaining the problem, the proposed solution, the evidence, the benefits, the limitations, the risks, and the value proposition without overstating claims.

Level 1–3: A basic set of communications content has been formulated

Level 1: Company-related communications content has been formulated

- ☐ A company name has been decided on
- ☐ The company's purpose, mission and vision statements have been formulated
- ☐ None of the above

Level 2: Product-related communications content has been formulated

- ☐ A product description has been created
- ☐ A product name has been decided
- ☐ First visual assets (technical drawings, conceptual illustrations, etc.) about the product have been created
- ☐ None of the above

Level 3: The company's and product's communicative positioning have been defined

- ☐ The company / product framing and storytelling approach has been defined
- ☐ The company's tone of voice has been defined
- ☐ None of the above

Level 4–6: Standard communications assets have been created

Level 4: Branding is in place

- ☐ A company logo has been created
- ☐ Branded templates (e.g. slide master, promotional materials, etc.) have been created
- ☐ More advanced visuals (prototype and usage context photos, etc.) have been created
- ☐ None of the above

Level 5: Communication formats are functional

- ☐ A basic website has been created
- ☐ Relevant social media channels, newsletter functionality, etc. have been created
- ☐ None of the above

Level 6: Outreach is fully prepared

- ☐ The website features significant content about the company and its product(s)
- ☐ A relevant stakeholder distribution list has been created
- ☐ None of the above

Level 7–9: Communications processes are implemented

Level 7: Communication is developed for smooth continuous implementation

- ☐ The distribution list is regularly updated
- ☐ Communication is a clearly assigned responsibility of at least one team member
- ☐ None of the above

Level 8: Strategic and responsive communication complement each other

- ☐ An outreach strategy has been created and additional communication opportunities are continuously monitored and utilised
- ☐ A (or a number of) spokesperson role(s) have been defined

Level 9: Communication is fully established and professionalised

- ☐ Sustained communications outreaches (social media, traditional media and PR, newsletter, etc.) are taking place
- ☐ Company and product communications are of high professional standards
- ☐ None of the above

Society readiness

This readiness dimension assesses in how far the societal context of your innovation, its key conditions and dynamics, practices and stakeholders, have been understood and taken into consideration in the development of your innovation, and in how far this has led to societal acceptance of the innovation.

Level 1–3: Relevant social dynamics and stakeholders are identified

Level 1: Relevant societal conditions and practices have been identified

- ☐ Conditions likely to support adoption of the innovation (common practices, societal structures, etc.) have been identified / mapped
- ☐ Conditions likely to hinder adoption of the innovation (common practices, societal structures, etc.) have been identified / mapped
- ☐ None of the above

Level 2: Relevant stakeholders have been identified

- ☐ Stakeholders likely to support adoption of the innovation (civil society, professional organisations, local communities and administrations, etc.) have been identified / mapped
- ☐ Stakeholders likely to hinder adoption of the innovation (civil society, professional organisations, local communities and administrations, etc.) have been identified / mapped
- ☐ None of the above

Level 3: Initial engagement with relevant stakeholders has taken place

- ☐ The innovation idea has been shared with relevant stakeholders (supportive and critical)
- ☐ Feedback on the innovation idea has been sought and received from relevant stakeholders
- ☐ None of the above

Level 4–6: The societal context has been taken into account in validation activities

Level 4: Societal readiness implications are taken into account in initial testing activities

- ☐ Impacts of societal dynamics and structures, etc. are simulated in the controlled testing environment
- ☐ None of the above

Level 5: Societal readiness implications are included in test design in the realistic environment

- ☐ The realistic testing environment is selected such that it includes the impacts of the relevant societal readiness dynamics and conditions
- ☐ None of the above

Level 6: The innovation has been demonstrated in a real environment with the collaboration of stakeholders

- ☐ Relevant stakeholders understand and accept the benefits of the innovation
- ☐ Relevant stakeholders support the development and implementation of the innovation
- ☐ Relevant stakeholders adopt or promote the innovation
- ☐ None of the above

Level 7–9: Societal readiness is considered in all parts of the innovation's iteration and full implementation

Level 7: Refinement of the innovation is in line with societal readiness considerations (societal structures, dynamics, stakeholders)

- ☐ The benefits of the innovation are accepted across all stakeholders
- ☐ Similar solutions and solutions building on the innovation are emerging and adopted in the same societal context
- ☐ None of the above

Level 8: Full innovation implementation takes account of societal readiness

- ☐ Innovation implementation fully takes into account the societal readiness implications of its context.
- ☐ Innovation implementation in other contexts is adapted to fit the respective societal readiness implications
- ☐ None of the above

Level 9: Societal acceptance of the innovation is proven across relevant contexts (locations, sectors, etc.)

- ☐ Successful cross-market uptake of the solution proves societal acceptance of the innovation
- ☐ Continuous engagement of relevant stakeholders confirms societal acceptance of the innovation
- ☐ The innovation idea is fully established and similar solutions emerge from contexts beyond the original one
- ☐ None of the above

From readiness assessment to action, adoption, and future relevance


Image: tostphoto, Adobe Stock

From assessment to action to adoption

Completing the innovation readiness self-assessment is not the end of the process. Its main value lies in helping innovators move from reflection to action. The 9–level readiness scales and milestone indicators provide a structured way to understand where an innovation currently stands across different dimensions, but the results should not be interpreted as a simple pass/fail judgement or as a single overall score.

Instead, the assessment should be read as a readiness profile. While identifying areas of relative strength, this profile – equally importantly – helps identify areas that require further development, and areas where assumptions still need to be tested. The results should therefore be used to develop a practical roadmap. Innovators should ask – and may use the as-yet-uncompleted milestones to identify:

What are the next steps required in this innovation journey? Which gaps in the innovation's current readiness are most urgent to address? What evidence is inconclusive, missing or indicative of further need for action? Who needs to be involved? What can be addressed internally, and what requires external support?

A development roadmap does not need to advance every single readiness dimension equally at the same time. Priorities will depend on the type of innovation, its context, its stage of development, and its intended pathway. For some innovations, the immediate priority may be technical validation or field testing.

But for others, it may be stakeholder engagement, legal clarification, market exploration, funding, organisational capacity, or partnership-building. The key is to identify which actions are necessary to move toward adoption.

This process helps identify bottlenecks and enabling conditions. Some readiness gaps are more significant than others because they can prevent progress even when other dimensions are strong. For example, an innovation may be technically ready but unable to advance because procurement routes are unclear, key stakeholders are unconvinced, funding is unavailable, legal requirements are unresolved, or the innovation does not fit existing value chains or organisational routines.

So, these bottlenecks should be prioritised because that way they define what is really blocking progress.

At the same time, the assessment can help identify enabling conditions: the relationships, evidence, resources, decisions, policies, partnerships, or system changes that make adoption more likely. In the forest-based bioeconomy, enabling conditions often extend beyond the innovator's own organisation. They may involve forest owners, managers, processors, public authorities, policy makers, investors, certifiers, communities, researchers, industry associations, procurement bodies, or other actors.

This is where the shift from 'innovation push' to 'adoption pull' becomes important. Many innovations begin with a push dynamic: the innovator develops a solution and then tries to persuade others to notice, understand, fund, buy, procure, implement, or support it. Communication, marketing, sales, dissemination, and demonstration activities are important, but they are rarely sufficient on their own.

Adoption pull emerges when relevant actors begin to recognise the innovation as useful for their own needs and actively help create the conditions for its uptake. This requires more than promotion. It requires understanding the adoption pathway: who must be convinced, who makes decisions, who influences those decisions, who controls resources, and who creates an adoption-conducive environment by reducing risk, creating legitimacy, etc.

Innovators should therefore look beyond the obvious end user or customer and identify the broader decision chain around adoption.

This may include procurers, regulators, advisors, technical experts, investors, forest owner associations, industry intermediaries, municipality officials, community representatives, certification actors, implementation partners, and other champions. In many cases, adoption facilitation along these decision pathways depends on individuals or organisations that act as key connectors.

These connectors may not make the final decision themselves; however, they can introduce the innovation to the right networks, translate between different groups, interpret requirements, build trust, identify and help overcome hidden barriers, as well as assist in turning interest into concrete opportunities.

Moving from push to pull therefore involves strategic stakeholder work and partnership-building. Innovators should ask:

- Who, beyond end users, experiences or is affected by the problem that the innovation addresses?
- Who has the authority, resources, or influence to support adoption?
- Who might block or slow adoption if their concerns are not addressed?
- Who is already trusted by the intended adopters?
- Who can help connect the innovation to procurement, funding, policy, demonstration, or implementation of new opportunities?
- What evidence would these actors need in order to support the next step?

By answering these questions, innovators can move from simply presenting their innovation to actively unblocking the pathway toward adoption.

Futures thinking and innovation

Even when adoption considerations are focused beyond the present, innovations (and their readiness assessments) are often oriented in relation to current conditions: today's challenges, users, markets, policies, technologies, funding opportunities, and societal expectations.

However, innovations that aim to remain relevant over time also need to be considered in relation to possible futures. This is especially important when development, adoption, and scaling take place over several years, or when the innovation is linked to systems that change slowly but profoundly.

Futures thinking helps innovators ask not only what problem their innovation solves today, but also what kinds of future contexts it may need to operate in. It encourages innovators to explore emerging risks, opportunities, uncertainties, and needs before they become obvious.

This does not mean predicting the future. Rather, it means preparing for different plausible futures and designing innovations that are adaptable, resilient, and strategically relevant.

One useful approach is horizon scanning: the systematic observation of emerging trends, weak signals, early disruptions, policy debates, market experiments, social changes, technological developments, and environmental shifts. Weak signals may be uncertain or incomplete, but they can indicate possible trajectories. For innovators, they can help challenge assumptions and reveal new opportunities or risks.

Futures thinking can also involve scenario work. Scenarios are not forecasts; they are structured ways of imagining different possible futures. They can help innovators test whether their innovation would remain useful under different conditions.

For example, an innovation might be assessed against scenarios involving stricter biodiversity regulation, higher demand for materials causing lower carbon emissions, increased climate-related forest disturbances, new circular economy requirements, changing public expectations, digitalisation of forest management, or shifts in biomass availability and use.

Image: Ar Kay, Pexels

In the forest-based bioeconomy, futures thinking is particularly relevant because forestry operates across long biological, ecological, economic, and governance timescales. Decisions made today may affect forest landscapes, carbon dynamics, biodiversity, industrial capacity, rural livelihoods, and material flows for decades.

At the same time, the sector is facing significant uncertainty: climate change, shifting disturbance patterns, biodiversity pressures, evolving carbon and sustainability policies, circular economy expectations, digital transformation, rural demographic change, and shifting societal views about the role of forests. Forest-sector innovators should therefore consider questions such as:

- How might climate change affect forests, value chains, or users connected to this innovation?
- How might biodiversity, restoration, or land-use policies evolve?
- How might demand for timber, fibres, biomass, ecosystem services, carbon storage, recreation, or nature-based solutions change?
- How might circular economy requirements influence product design, resource use, reuse, recycling, or cascading use?
- How might digital technologies, data governance, and monitoring expectations reshape forestry and forest-based value chains?
- How might expectations of forests and forest-based products change?
- Under which future conditions would the innovation become more valuable, and under which conditions might it become less relevant or more contested, which of these might manifest and need to be addressed?

Linking futures thinking back to the readiness dimensions can strengthen the overall assessment. Technological or functional readiness can be considered not only in terms of current performance, but future performance requirements.

Systems readiness can include the ability to integrate with future infrastructure, value chains, data systems, or governance arrangements. User and market readiness can include emerging needs and changing demand. Business model readiness can consider whether the model remains viable under different future conditions.

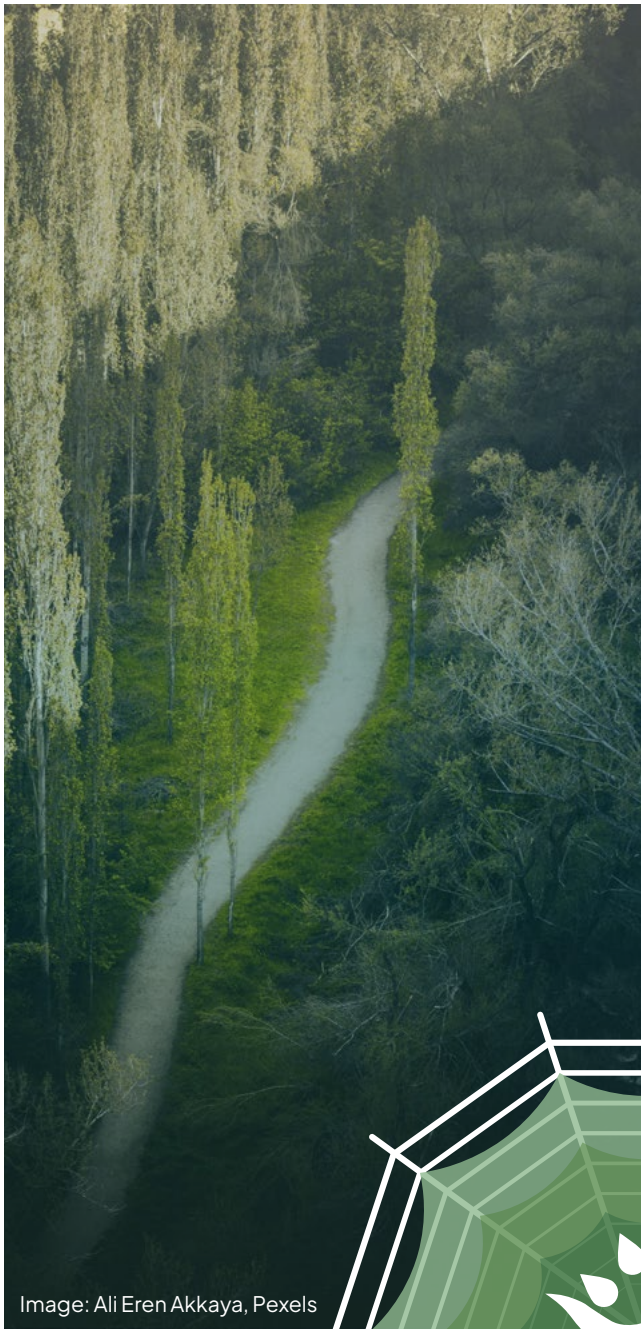


Image: Ali Eren Akkaya, Pexels

Circularity readiness can be assessed against future expectations for resource efficiency, reuse, recycling, and reduced waste. Legal readiness can include awareness of possible regulatory, standards, certification, procurement, or claims-related developments. Funding readiness can consider alignment with future investment and policy priorities. Team and organisational readiness can include adaptive capacity. Communication readiness can include the ability to explain long-term relevance credibly. Societal readiness can include changing public values, stakeholder expectations, legitimacy, and social licence.

In this way, futures thinking helps ensure that innovation readiness is not only about being prepared for immediate adoption, but also about remaining relevant, credible, and useful as conditions change.


Image: mododeolhar, Pexels

Innovation readiness assessment as a tool for learning and communication

Hence, as time goes by, innovation readiness may need reassessing. Indeed, innovation readiness assessments may change even in the short term as evidence is generated, assumptions are tested and re-considered, stakeholders are engaged, partnerships are formed, funding conditions develop, and the wider context shifts. For this reason, the self-assessment should be treated as part of an ongoing learning cycle rather than as a one-off practice exercise.

Innovators should consider repeating the assessment after significant development moments, such as the completion of a pilot, a demonstration, a user test, a market study, a regulatory review, a funding round, a partnership agreement, a procurement process, or a major change in policy or market conditions. Reassessment can show where progress has been made, where new gaps have emerged, where earlier assumptions need to be revised, or whether replication from one context to another is feasible.

This iterative approach is especially important in complex sectors such as forestry, where ecological, social, regulatory, market, and institutional conditions may vary across regions and over time. An innovation may appear ready in one context but require further adaptation in another. A successful pilot may reveal new scaling challenges. Stakeholder engagement may uncover concerns that were not visible at earlier stages. Legal or funding conditions may change. New evidence may strengthen the case for adoption, or it may show that the innovation needs to be redesigned, repositioned, or implemented differently.

Reassessment should therefore be understood as a sign of ongoing learning, not as resulting from a deficiency of the innovation. Therefore the purpose is to keep the innovation aligned with evidence, context, stakeholder needs, as well as future opportunities.

In this process, the assessment can also be used as a shared conversation tool with partners, funders, procurers, users, policymakers, and stakeholders. Rather than presenting only a readiness score, innovators can use the results of their multi-dimension innovation self-assessment to explain what has been achieved, what evidence exists, what remains uncertain, and what support or collaboration is needed. This can make discussions more concrete and transparent.

For funders and investors, the readiness profile can clarify development needs, risks, and the logic of the next funding step. For partners, it can identify where their capabilities or networks could help improve readiness. For procurers or adopters, it can show what has been validated and what would need to be tested in a real-world setting. For stakeholders, it can demonstrate that concerns related to societal, environmental, legal, circularity, or implementation issues are being considered rather than ignored.

Used in this way, the self-assessment becomes more than an internal reflection exercise. It becomes a basis for alignment, collaboration, and progress. The ultimate aim is not simply to increase readiness levels across all dimensions. It is to support innovations that are credible, useful, adoptable, adaptable, and relevant to the future of the forest sector and the forest-based bioeconomy.

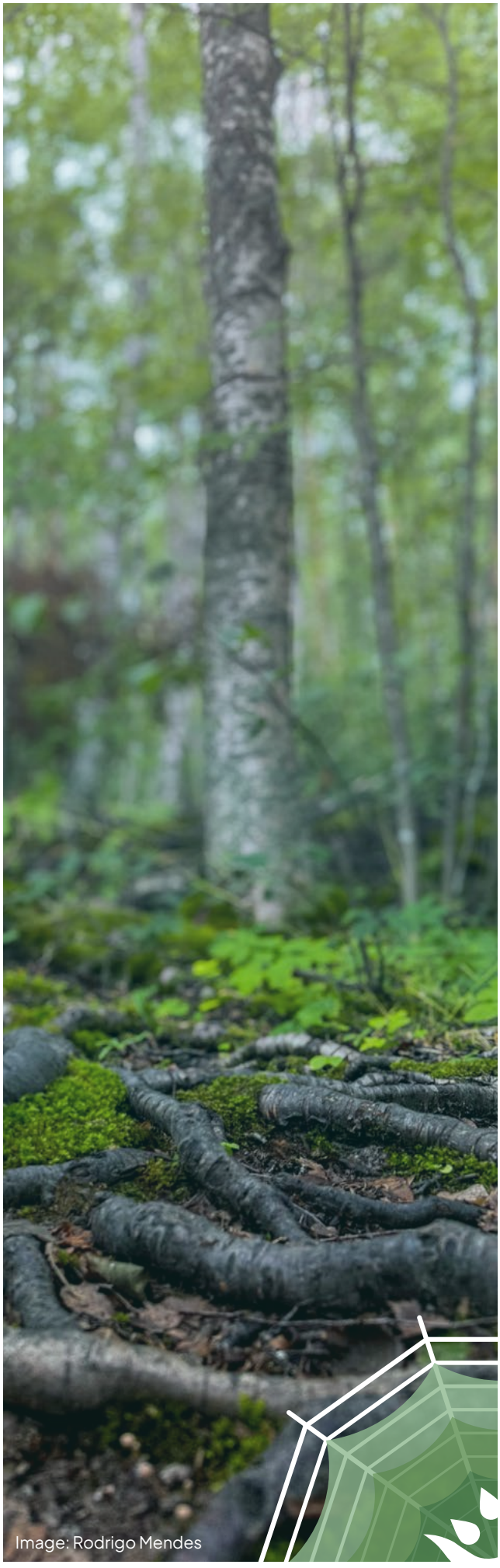


Image: Rodrigo Mendes

About this publication

This Forest Innovation Readiness publication brings together established and emerging innovation readiness thinking with the forest sector and bioeconomy expertise of the European Forest Institute (EFI). It is the result of a multitude of first-hand engagements with forest innovators across the work of the EFI Bioregions and projects such as FIRE-RES, and aims to comprehensively address the innovation challenges they routinely encounter.

While the research on examples and some writing and editing tasks were supported by the use of ChatGPT, the concept and content development of the material presented, the text production, and all final editing and quality assurance were carried out by the authors and editor.

Feedback and suggestions for further development of this and other aids to forest and bioeconomy innovators is welcome.

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