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**Circular DigiBuild**

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## **D.3.6.2 Policies Synthesis Report**

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# D.3.6.2 – A Policies Synthesis Report

Possible improvements on already identified policies to legitimate the change for boosting the acquirement of emerging technologies for more circularity in construction · Activity 3.6 · Led by LP01 BAA · June 2026, updated October 2026

## 1. Executive Summary

This Policies Synthesis Report (Deliverable D.3.6.2) consolidates the policy improvement proposals of the Circular DigiBuild (CDB) partnership for the 13 partner countries of the Danube region. It shows how policies that were already identified in the KNOWLEDGE phase can be improved to speed up the uptake of emerging digital technologies for more circularity in construction, and it gives the arguments that legitimate these changes.

The report is based on input from all CDB partners: the country policy improvement documents, the country presentations and discussions at the online interregional peer-review workshop “Policy instruments improvements surgery” (D.3.6.1, 29 May 2026), the Territorial Action Plans (D.3.5.4) and the consultations with the Regional Multi-Stakeholder Groups (RMSG 8, D.3.6.4). It builds on the consolidated review of RIS3 and related policies (D.2.4.2, “The Review”).

The partners agree on a common diagnosis. The policy frameworks for digitalisation and for the circular economy exist in most countries, but they are implemented separately and are rarely translated into concrete rules for construction. Construction is a standalone smart specialisation

priority in very few countries. Public procurement is still driven by the lowest price, there are no clear end-of-waste criteria and quality standards for secondary construction materials, data on construction and demolition waste (CDW) are fragmented, SMEs cannot afford the initial investment in BIM and other digital tools, and there is a shortage of skilled professionals.

The most significant cross-cutting improvements proposed by the partners are:

- Link BIM to circularity. Phased BIM requirements in public procurement and permitting (already legislated in the Czech Republic from 2027 and in Serbia from 2028), with BIM deliverables that contain material data and feed material passports and CDW tracking.
- Circular green public procurement. Move from lowest price to lifecycle cost (LCC/TCO) criteria, with recycled-content requirements, pre-demolition audits and BIM deliverables; model tender clauses and procurement competence centres.
- Rules for secondary materials. End-of-waste criteria, quality assurance and certification of recycled and bio-based construction materials, and mandatory pre-demolition audits and selective demolition.
- Digital CDW tracking and material exchanges. Interoperable national platforms connected to waste registers and e-permitting systems, and marketplaces for secondary materials.
- Targeted finance for SMEs. Vouchers, grants and credit lines for BIM, digital tools and circular business models, with dedicated windows in existing national and EU instruments.
- Skills and certification. BIM, LCA/LCC and circular design in university and VET curricula, national certification schemes and training of public procurers and permitting authorities.
- Governance and collaboration. Inter-ministerial working groups, national platforms or hubs for circular and digital construction, and inclusion of construction in the next smart specialisation cycle.

These improvements are transferred into the Better Policies Annexe to the Strategy (D.3.6.3) and implemented through the Territorial Action Plans, with the DANUBE CiDiCon Cluster as the transnational coordination mechanism.

## 2. Introduction

### 2.1 Background and Context

The construction and building industry in the Danube region uses large amounts of resources, generates more than a third of total waste and emits greenhouse gases on a large scale. The sector is fragmented, risk-averse and slow to adopt digital innovation. Circular DigiBuild, funded under the Interreg Danube Region Programme (Priority 1, Specific Objective 1.1), brings together 18 partners from 13 countries to identify and improve policies that foster digitalisation-led circular economy innovations in construction.

Digital technologies such as BIM, digital twins, IoT, AI and material passports are prerequisites for circular construction, in which building materials are tracked, recovered and reused. Combined with new business models, they make it possible to keep materials in use and to measure the environmental benefits.

## 2.2 Purpose and Scope

D.3.6.2 is a report on possible improvements of already identified policies, trying to legitimate the change. It synthesises the policy and RIS3 improvement proposals for all 13 partner countries, gives the evidence and arguments for policy reform and addresses the national, regional and EU levels.

## 2.3 Relationship to Other Deliverables

| Deliverable       | Title                         | Relationship                                                            |
|-------------------|-------------------------------|-------------------------------------------------------------------------|
| D.2.4.2           | The Review                    | Foundation – consolidated review of policies in the 13 countries        |
| D.3.5.1 / D.3.5.5 | Danube Transnational Strategy | The improvements feed into the 2030 Strategy and its five pillars       |
| D.3.5.4           | Territorial Action Plans      | Country-level instruments that implement the improvements               |
| D.3.6.1           | Peer-review workshop          | Country proposals presented and discussed by all partners (29 May 2026) |
| D.3.6.2           | Policies Synthesis Report     | This report                                                             |
| D.3.6.3           | Better Policies Annexe        | Short common document annexed to the Strategy                           |
| D.3.6.4           | RMSG 8                        | Discussion of the improvements with national stakeholders               |

## 2.4 Methodology

The Working Group Change (WGG), led by LP01 BAA, coordinated the process. A common guidance document asked each partner to (A) identify the policy instrument targeted, (B) summarise the gaps from D.2.4.2, (C) propose concrete improvements with responsible bodies, timeline and funding, (D) identify transferable practices from other partner countries and (E) link the improvements to the Territorial Action Plan and the RMSG discussion. The country proposals were presented and challenged at the peer-review workshop D.3.6.1, discussed with national stakeholders in RMSG 8 and consolidated by LP01 BAA in this report.

# 3. Emerging Technologies for Circular Construction

## 3.1 Key Technologies and Policy Levers

| Technology                             | Role in circular construction                                                                                     | Policy levers proposed by partners                                                                                          |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| BIM                                    | Structured building and material data over the lifecycle; basis for material passports and design for disassembly | Phased BIM mandates in public procurement; BIM in permitting; openBIM (IFC/BCF) delivery standards; ISO 19650 transposition |
| Material and digital product passports | Documentation of materials for reuse and recycling at end of life                                                 | Common data models; DPP preparation for SMEs (CPR/ESPR); pilots on public buildings                                         |
| Digital CDW tracking                   | Traceability of waste and secondary                                                                               | Interoperability with waste registers and e-permitting;                                                                     |

|                       |                                                                                            |                                                                         |
|-----------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| platforms             | material flows                                                                             | national data spaces; material exchanges                                |
| Digital twins and IoT | Monitoring and optimisation of buildings in use                                            | Support for public building operators; R&D funding; data governance     |
| AI and data analytics | Estimating material stocks, detecting reusable components, reducing sensors and energy use | Applied research calls; demonstration projects (CDB pilots)             |
| E-permitting          | Digital approval procedures that can receive BIM models and CDW plans                      | Roadmaps for BIM-based submissions (e.g. eDozvola, eGraditev, SIA GEAP) |

## 3.2 Technology Readiness Across the Region

D.2.4.2 grouped the countries by readiness. Austria and Germany are advanced, with established BIM practice, innovation hubs and strong regulatory frameworks, although Germany still has to integrate BIM into building permit procedures in its 16 federal states. The Czech Republic, Slovenia, Slovakia, Hungary, Croatia, Romania and Bulgaria show moderate progress; the Czech Republic has adopted a BIM Act and Slovenia and Romania have BIM roadmaps. Bosnia and Herzegovina, Serbia, Montenegro and Moldova are in the early stage, but Serbia has legislated mandatory BIM from 2028, Montenegro has put construction among the priorities of its new S3 2026–2031, and Moldova introduces digital permitting with its new Code on Urbanism and Construction.

# 4. Cross-Cutting Policy Gaps and Barriers

The partners' inputs confirm the six cross-cutting gaps identified in D.2.4.2 and make them more specific.

## 4.1 Financial Barriers and Insufficient Incentives

Almost all countries lack funding lines dedicated to digital and circular construction. SMEs cannot cover the initial costs of BIM software, laser scanners, drones and IoT systems, and existing schemes are general or administratively heavy (Serbia, BiH, Czech Republic). Secondary materials are often more expensive than primary ones because landfilling is cheap and embodied carbon is not priced (Czech Republic, Romania). The partners propose vouchers and dedicated calls (Slovakia's innovation vouchers, Austria's funding windows, Serbia's Innovation Fund line, Moldova's ODA window), green credit lines with development banks (BiH, Moldova), a lower VAT rate for products with secondary content and higher landfill fees (Czech Republic), and demand-side renovation grants with a bonus for recycled or bio-based materials (Moldova, following the Austrian model).

## 4.2 Fragmented and Complex Regulatory Frameworks

Regulation for digital construction and for circularity is developed in separate ministries and rarely connected. BIM models cannot be submitted in building permit procedures in Germany; the Czech BIM Act, the Serbian BIM mandate and the Slovenian and Romanian roadmaps are not yet linked to material data and waste management. There are no end-of-waste criteria or technical standards for secondary materials in many countries (Slovakia, Serbia, Montenegro, Romania, Czech Republic, Moldova), enforcement at municipal level is weak, and public procurement is based on the lowest

price. The partners propose inter-ministerial coordination, BIM delivery requirements that include material data, end-of-waste criteria, mandatory pre-demolition audits and circular procurement criteria.

### 4.3 Skills Gaps and Workforce Development

Skills are the most frequently reported barrier. Ten of the thirteen countries report inadequate training in circular construction. There is a shortage of BIM modellers, LCA/LCC experts and circular designers, curricula change slowly, and public investors, procurers and inspectors often cannot translate environmental goals into binding tender and permit requirements (Czech Republic, Serbia). The partners propose curriculum reform, national certification schemes, micro-credentials, training of public officials and new vocational qualifications (e.g. four new professions in Bulgaria).

### 4.4 Low Digital Readiness and Data Infrastructure

Digital workflows are fragmented: designs are modelled, but sites and approvals still run on paper. CDW flows are not traceable, national waste registers, e-permitting and project data are not interoperable, and reliable statistics on reuse are missing. SMEs and municipalities are falling behind large firms. The partners propose national data standards, material passport data models, CDW tracking platforms connected to the waste registers and state-supported common data environments for public authorities.

### 4.5 Cultural Resistance and Awareness Gaps

The sector is conservative, and many companies fear the cost and risk of digitalisation; in Croatia, for example, the business model is passive, with short-term planning and low innovation awareness. Knowledge of circular principles such as design for disassembly and material reuse is limited among investors, municipalities and the public. The partners propose national campaigns, demonstration projects and success stories, including the CDB pilots, and targeted communication to each stakeholder group.

### 4.6 Weak Collaboration and Knowledge Transfer

Research results are slow to reach practice, cross-sector platforms are missing, and the supply chains for secondary materials are fragmented. The partners propose national platforms, networks and hubs for circular and digital construction, living labs, public-private partnerships and structured cross-border cooperation through the DANUBE CiDiCon Cluster.

## 5. Country-Level Policy Improvement Proposals

This section summarises the improvements proposed for each partner country. Each country profile gives the policy instruments targeted, the main gaps, the proposed improvements and the transferable elements.

### Austria (PP3 AWS)

**Policy instruments targeted.** The Austrian policy and funding mix for digital and circular construction: the Digital Action Plan Austria, the Austrian Circular Economy Strategy, the innovation, building and implementation frameworks of the nine federal states, and the programmes of aws, FFG, KPC and the Climate and Energy Fund (KLIEN), in particular the aws “Building(s) Tomorrow” initiative. The aim is not a new strategy but better coherence and practical delivery across existing instruments.

**Main gaps.** High initial investment costs, weak construction demand and price sensitivity hold back SMEs; building codes and implementation frameworks differ across the federal states; legal and market conditions for secondary materials remain unclear in practice; digital building and material data are not interoperable across the lifecycle; there is no coherent nationwide education pathway combining circular and digital construction skills; and cooperation between companies, research and public authorities is insufficient.

**Proposed improvements:**

- Align funding instruments with digital and circular construction: screen and tag relevant aws, FFG, KPC and regional instruments (09/2026–03/2027), define entry points for BIM, material data, reuse and circular business models, and use staged support from feasibility to market uptake to reduce risk for SMEs.
- Strengthen demonstration, replication and market uptake: build on Austrian demonstrators such as the CDB Urban Mining Screener and Building(s) Tomorrow projects, replicate them in further cities, districts and building portfolios, and document costs, environmental benefits and data requirements to inform programme design and procurement.
- Improve interoperability and lifecycle data: open and interoperable BIM, GIS and material-data approaches with interfaces for material passports, urban mining and public asset management, and practical guidance on minimum data requirements, data governance and long-term maintenance.
- Build skills and organisational capacity: coordinated learning pathways in BIM/openBIM, LCA/LCC, material passports, circular design and deconstruction planning, combining formal education with micro-credentials, practice-based training and living labs (2026–2030).
- Establish coordinated governance and monitoring: an Austrian Circular Digital Construction Working Group linking ministries, federal states, funding bodies, municipalities, industry and research (07/2026–06/2027), and a T0 baseline for the national indicators (07–12/2026).  
Lead roles beyond aws are proposed for validation with the competent institutions.

**Transferable elements.** Austria offers Building(s) Tomorrow, VIE.CYCLE, BauKarussell and the open-source Urban Mining Screener, and plans to adapt BIM regulatory pilots (Germany), phased BIM and skills pathways (Slovenia), pre-demolition audits (Czech Republic) and the integrator role of the Bulgarian construction EDIH, using existing Austrian intermediaries and the Working Group rather than a new institution.

## Bosnia and Herzegovina (PP11 SERDA)

**Policy instruments targeted.** No national RIS3 has been adopted yet; it is being prepared in line with the Green Agenda for the Western Balkans. Relevant instruments: the Development Strategy of FBiH 2021–2027, the Strategy for Small Business in FBiH 2022–2027, the environmental strategies ESAP 2030+ of FBiH and Republika Srpska, the Economic Reform Programme and the draft Roadmap for Circular Economy, in which construction is a priority sector.

**Main gaps.** Very low business digitalisation and digital literacy; slow and inconsistent implementation of strategies; fragmented institutional support across state, entity and district levels; limited access to finance for SMEs; measures without dedicated funds or action plans.

**Proposed improvements:**

- Inter-institutional coordination mechanism across state, entity and Brčko District levels (MOFTER, entity ministries), 2026–2028.
- Minimum digital requirements in public procurement, BIM pilots in public infrastructure and national digital construction guidelines, 2026–2030.
- Green and digital transition grants, subsidised credit lines and guarantees through the Development Bank of FBiH and the Investment-Development Bank of RS.
- BIM and circular modules in VET and higher education and CPD for engineers, contractors and public staff.
- A national platform or hub for circular and digital construction, national awareness campaigns and green procurement guidelines.

**Transferable elements.** Adapting the Bulgarian EDIHCS hub model, Slovak-type innovation vouchers and Hungarian digital material tracking; the BiH public-private working group model is offered to other partners.

## Bulgaria (LP01 BAA, PP17 EDIHCS)

**Policy instruments targeted.** The Innovation Strategy for Smart Specialisation 2021–2027 (Ministry of Innovation and Growth), the Strategy for Transition to a Circular Economy 2022–2027, the Strategy for Digitalisation of the Construction Sector 2030 and its Roadmap, the Waste Management Act and CDW ordinances, the Spatial Planning Act and the Circular Public Procurement Action Plan (2021).

**Main gaps.** Construction is not a standalone RIS3 sector; CDW recycling is about 24% against the EU 70% target; there is no national BIM mandate; SME digital readiness, standardisation and interoperability are low; skills and awareness gaps persist.

**Proposed improvements:**

- Include construction as a key sector in the next RIS3.
- Targeted grants and tax incentives for SMEs adopting BIM, IoT and material passports.
- National data standards and a national platform for material passports, BIM and CDW tracking.
- Phased BIM requirements in public procurement, starting with large public infrastructure.

- Circular design and digital construction in UACEG curricula and VET, including four new vocational professions (Excellia), and a National Steering Committee for Circular Digital Construction with EDIHCS as the bridge between policy, research and industry.

**Transferable elements.** The EDIHCS hub model (11 partners, nationwide) and the digital lifecycle management of municipal infrastructure materials tested with the Municipality of Varna.

## Croatia (PP14 TERA, PP15 ICENT)

**Policy instruments targeted.** The Smart Specialisation Strategy (S3) to 2029, the National Recovery and Resilience Plan 2021–2026, the Waste Management Plan 2023–2028, the Circular Economy Action Plan for Construction and Demolition Waste (2023–2027), the Programme for the Development of Circular Spatial and Building Management (2021–2030), the Low-Carbon Development Strategy, the National Development Strategy 2030 and the Digital Croatia Strategy 2032. Existing measures already support parts of the transition: the DIGIT project (reform of research and innovation towards a green and digital economy), Digitalisation Vouchers for SMEs, the Pilot Project for Green Infrastructure and/or Circular Management of Space and Buildings, and the Investment in Efficient Resource Use and Support for Transition to a Circular Economy.

**Main gaps.** The instruments exist but are fragmented and not targeted at construction: digitalisation and circularity run through separate programmes, financial support is not tailored to construction SMEs, and cross-ministry coordination is weak. There is no mandatory BIM, no national material passport system and no interoperable construction data platform; BIM is used in only 15–20% of projects and fewer than 500 professionals are certified. Only 20–25% of the 5–6 million tonnes of CDW are recycled, and circular measures focus on waste and resource targets rather than lifecycle data, secondary material markets, digital traceability and procurement-driven demand. The business model of the sector is passive, with low innovation awareness, short-term planning, unwilling decision makers and insufficient digital skills.

### Proposed improvements:

- One coordinated policy package for digital and circular construction that makes existing instruments construction-specific, measurable and easier for SMEs to use.
- Targeted financial incentives for construction SMEs adopting BIM, material passports, IoT, LCA tools and circular design, including construction-specific use of the existing digitalisation vouchers.
- A cross-ministry task force aligning construction, digitalisation, waste, innovation and procurement policies, and a national BIM roadmap with a BIM threshold for public projects, subject to impact assessment and consultation.
- An integrated Croatian Digital Circular Construction Platform linking BIM data, material tracking, CDW flows and reuse opportunities, starting from a CDW tracking prototype with utilities and recycling centres and a secondary materials marketplace.
- Circularity and digital innovation criteria in public tenders, and in S3 a cross-cutting “Smart Buildings and Digital Building Operation” sub-priority with smart building living labs, digital-twin vouchers and a Croatian Building Data Space (PP15 ICENT).

- Training and awareness for industry leaders and practitioners, curricula and VET reform, an annual national conference and a knowledge repository, with construction SMEs, chambers, universities, technology providers, architects, engineers, contractors and procurement officers.

**Transferable elements.** The T0–T2–T4 KPI method with a data-source quality annex, and the machine-learning “soft sensor” approach from the Croatian pilot, which reduces the number of physical sensors and e-waste. Croatia proposes to adapt the Bulgarian construction digital innovation hub (SME support, BIM demonstrations, test-before-invest), the Austrian VIE.CYCLE model (cross-ministry and city-level task force), German BIM and circular economy roadmaps (BIM-for-circularity standards with material data), Hungarian digital material tracking and waste marketplaces, Slovak BIM education and innovation vouchers, and Serbian and Czech recycling hubs and circular construction labs.

## Czech Republic (PP5 INCIEN)

**Policy instruments targeted.** RIS3, Circular Czechia 2040, the Waste Management Plan 2025–2035 and the Secondary Raw Materials Policy, the BIM concept and Act No. 330/2025 Coll. (BIM Act, mandatory BIM for above-limit public tenders from 2027), the Digital Building Permit Portal and the public procurement framework.

**Main gaps.** The frameworks exist but are implemented in separate ministries; support is poorly targeted and relies on isolated pilots; the market for secondary materials is weak (quality assurance, price, unclear waste status, missing norms); public investors lack the skills to set binding environmental criteria; BIM is not linked to material flows.

### Proposed improvements:

- Green public procurement as a market-shaping tool: LCC instead of lowest price, criteria for secondary content, pre-demolition audits, BIM material data and whole-life carbon, and a national GPP competence centre.
- Pre-demolition audits anchored in regulation for public projects above a set size, a clear waste/non-waste regime and quality standards for secondary materials.
- Economic instruments: higher landfill fees and lower VAT for products with a defined share of secondary material.
- Connection of the BIM Act with the Digital Building Permit Portal, interoperable material tracking platforms and a simplified BIM data standard for smaller regional projects.
- Mandatory BIM, whole-life carbon, LCA and circular economy content in architecture and civil engineering studies, and long-term collaboration forums and voluntary agreements.

**Transferable elements.** The BIM Act, the “Partnership For” voluntary agreement for low-emission buildings, demonstration projects with urban mining and material passports, and platforms such as CirkArena and NCS 4.0.

## Germany (PP4 HSH)

**Policy instruments targeted.** BIM in Germany and the Model Building Regulations, which each of the 16 federal states applies through its own building regulations; the Conference of Building Ministers is the key coordination body.

**Main gaps.** BIM is not integrated into building permit procedures and approval still relies on PDF documents; state regulations have no harmonised BIM requirements; authorities have little experience with BIM-based approval.

**Proposed improvements:**

- Add BIM requirements to the Model Building Regulations and enable BIM model submission in building permit procedures.
- Harmonise the implementation in the federal states and promote interoperable, standardised BIM workflows between authorities and industry.
- Pilot projects demonstrating BIM-supported approval and applied research on BIM for circular construction and lifecycle management.
- Build institutional BIM knowledge in public administrations through dialogue between policy makers, authorities, academia and industry.

**Transferable elements.** Research-based regulatory development: pilot results used as evidence for regulation, and the national BIM initiative as a reference for other partners.

## Hungary (PP8 PBKIK)

**Policy instruments targeted.** The National Construction Economy Strategy with the National Construction Economy Register, Act C of 2023 on Hungarian Architecture, the National Building Renovation Plan, the National Energy Strategy 2030, and the national digital platforms e-napló (e-log) and the National Construction Business Register.

**Main gaps.** Construction SMEs have low digital readiness and fear the costs; awareness of AI and digital twins is very low; there is a shortage of BIM and IT specialists; civil society is weakly involved in circular initiatives.

**Proposed improvements:**

- Mandatory BIM for public investments.
- Development of the national digital platforms and their later connection with platforms in other Danube countries.
- Targeted national and EU financing for the digital and green transition of SMEs.
- Digital platforms for material tracking and CDW management, selective demolition and markets for secondary materials.
- A national “Digital and Circular Construction Innovation Network”, BIM and circular modules in universities and VET, and adult training and certification building on ConstructSkills4LIFE and ÉMI.

**Transferable elements.** Digital platforms for construction waste management that connect demolition companies with architects and developers, and building material passports.

## Republic of Moldova (PP16 BAC)

**Policy instruments targeted.** The National Development Strategy “European Moldova 2030”, the National Programme for the Promotion of Green and Circular Economy 2024–2028, the Environment Strategy 2024–2030, the National Waste Management Programme 2023–2027, the CDW Regulation in preparation, the Code on Urbanism and Construction (Law 434/2023) with digital permitting through SIA GEAP, and the SMART Moldova programme 2024–2027.

**Main gaps.** Construction is not a priority in SMART Moldova; formal CDW recycling is close to zero; there is no national BIM mandate and the construction norms do not include ISO 19650; skills are the binding constraint; procurement has no circular criteria.

### Proposed improvements:

- An inter-ministerial working group chaired by MIDR, adoption and enforcement of the CDW Regulation, and transposition of ISO 19650 and EN 17412 into the national norms.
- Model tender clauses on BIM, CDW plans and recycled content, piloted in at least three public tenders above €5 million by 2029.
- A voluntary national BIM roadmap (BIM in 10% of large public tenders by 2028 and 25% by 2030) and a national BIM helpdesk.
- A feasibility study and pilot for a national CDW tracking and material passport platform, linked to the voluntary collection centres.
- The GreenBuild Lab innovation hub, a national certification scheme, a “Green Renovation Bonus” and the “Construim Circular” campaign.

**Transferable elements.** The GreenBuild Lab as a local participation and living lab model, and the policy-stacking approach for early-stage countries.

## Montenegro (PP13 ZWMNE)

**Policy instruments targeted.** The Smart Specialisation Strategy 2019–2024 and the new S3 2026–2031, in which construction is one of five priority domains (“Construction in Harmony with Nature and People”); the Innovation Fund of Montenegro; the Law on Construction of Structures and the Law on Waste.

**Main gaps.** Traditional project management and limited digital tools; workforce training gaps; high upfront costs for prefabrication and modular construction; CDW recycling at an early stage because there are no specialised facilities.

### Proposed improvements:

- A national BIM standard in line with ISO 19650 and mandatory BIM and digital lifecycle monitoring in public projects.
- A functional e-permit system with BIM integration in municipal permitting.
- Clarification of waste and by-product status and end-of-waste criteria, specialised CDW facilities, digital CDW mapping and recycled-content quotas in public procurement.

- Vocational and university curricula and a national certification for circular and digital construction.
- R&D programmes linking SMEs and universities on CDW mapping, material passports and new materials from CDW.

**Transferable elements.** The Innovation Fund programmes for collaborative grants and proof of concept.

## Romania (PP10 ADR Vest, PP9 IRCM)

**Policy instruments targeted.** The regional RIS3 of the West Region, the national BIM roadmap of the Ministry of Development, Public Works and Administration, the draft Code of Territorial Planning, Urbanism and Construction, and the National Recovery and Resilience Plan (components on waste infrastructure and renovation).

**Main gaps.** BIM adoption is limited; CDW tracking is fragmented and illegal dumping undermines certified recycling; secondary materials are rarely used because virgin materials are cheaper; there is no standardised digital permitting and procurement is based on the lowest price.

### Proposed improvements:

- Use of the recovery plan for CDW infrastructure and circular renovation, and a national grant scheme for green and digital construction start-ups.
- Review of the draft construction code to remove barriers to digitalisation and circularity, and national end-of-waste criteria for recycled aggregates.
- ESG and DNSH criteria and recycled-material quotas in public procurement, and preparation of manufacturers for Digital Product Passports.
- BIM and circular engineering as permanent parts of accredited degrees and new BIM occupations in the national occupational registry.
- A national network for digital and circular construction innovation, regional living labs and the "Circular Build Romania" campaign.

**Transferable elements.** The integration of circularity into the regional RIS3 and the national BIM roadmap.

## Serbia (PP12 STP NS)

**Policy instruments targeted.** The Smart Specialisation Strategy 2020–2027, the Law on Planning and Construction (BIM mandatory for all facilities from 1 January 2028), the eDozvola e-permitting system, the National Waste Management Programme 2022–2031 (40% CDW recovery target) and the 2023 by-law requiring a CDW management plan for every building permit.

**Main gaps.** No implementing rules connect the 2028 BIM mandate to material and CDW data; there are no standards or end-of-waste criteria for secondary and bio-based materials; eDozvola, the national waste register and project data are not interoperable; procurement is driven by the lowest price; SMEs face high costs.

### Proposed improvements:

- BIM by-laws and delivery guidance with openBIM deliverables that include material data, and a roadmap for BIM submissions in eDozvola (2026–2027).
- A circular procurement toolkit with model tender clauses, piloted in 2028–2029.
- Digital CDW tracking interoperable with the national waste register, piloted with the Novi Sad recycling hub, and an online secondary-materials exchange.
- A quality assurance framework and end-of-waste criteria for recycled and bio-based materials.
- A voucher line of the Innovation Fund for SMEs, training of procurers and inspectors, and three-level governance (inter-ministerial group, TAP secretariat at STP NS, national platform).

**Transferable elements.** eDozvola, the Novi Sad CDW Recycling Hub and the CornHusk bio-based insulation developed in Novi Sad.

## Slovakia (PP6 SBA)

**Policy instruments targeted.** The RIS3 2021+ strategy, the Digital Transformation Strategy 2030, the Waste Management Strategy to 2035, the Green Public Procurement Action Plan and the transposition of the Energy Performance of Buildings Directive.

**Main gaps.** Digital and circular policies are strategically aligned but operationally weak; there is no national BIM strategy; data standards, traceability and end-of-waste criteria are missing; procurement relies on the lowest price; SME capacity is limited.

### Proposed improvements:

- A national BIM strategy with mandatory BIM in public projects and BIM handover standards (adoption 2025–2027, roll-out to 2030).
- Public procurement reform towards TCO/LCC, with the target of 70% of public procurement value and contracts through GPP by 2030.
- A disaggregated CDW data system, mandatory pre-demolition audits and selective demolition, and an updated Decree 344/2022 on the transition from waste to recycle.
- Support for the secondary materials market through material banks, simplified certification and SME finance, and preparation for Digital Product Passports.
- A national certification framework for BIM and circular professionals, courses in the national lifelong learning system, and a national knowledge hub and campaign.

**Transferable elements.** Innovation vouchers for SMEs and the approach of systematic adaptation of other partners' models to an SME-dominated market.

## Slovenia (PP7 UL)

**Policy instruments targeted.** The Slovenian Sustainable Smart Specialisation Strategy (S5) with the Strategic Research and Innovation Partnerships (SRIPs), and the national e-permitting platform eGraditev.

**Main gaps.** Digital and circular goals are planned and funded as separate objectives; IoT, AI and digital twins are rarely integrated, especially in SMEs; investment in R&D is unstable; knowledge transfer is weak.

**Proposed improvements:**

- Regulatory recognition of the non-waste status of certified secondary structural materials and environmental data tracking in eGraditev (2027).
- A minimum 10% recycled content in public building tenders and S5 “Circular Transition Grants” for construction SMEs (2028).
- Statutory BIM in all public construction projects by 2028 and a national material exchange platform.
- BIM, LCA and circular design in university and vocational curricula, and micro-credentials for professionals (2029).

**Transferable elements.** The SRIP model of quadruple-helix partnerships and the eGraditev e-permitting platform.

## 6. Transferable and Applicable Policy Improvements

In section D of the guidance, each partner identified practices from other countries that it wants to adapt. The cross-references show which models are the most transferable.

| Model                                       | Origin         | Adapted or proposed by                                                 | What is transferred                                                                                                                              |
|---------------------------------------------|----------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| EDIHCS hub model                            | Bulgaria       | Serbia, Slovakia, BiH, Slovenia, Hungary, Romania, Montenegro, Croatia | A digital innovation hub for construction that links industry, education, research and public authorities and offers test-before-invest services |
| Building(s) Tomorrow                        | Austria        | Serbia, Slovenia, Slovakia, Bulgaria                                   | Dedicated funding calls for construction innovation, awareness and networking                                                                    |
| VIE.CYCLE / Circular City Wien              | Austria        | Serbia, Slovakia, Bulgaria, Croatia                                    | Cross-institutional coordination of circular construction at city level                                                                          |
| Digital CDW platforms and material tracking | Hungary        | Serbia, Montenegro, BiH, Croatia                                       | Online platforms connecting CDW producers with re-users; material passports                                                                      |
| Innovation vouchers and BIM education       | Slovakia       | Serbia, BiH, Croatia                                                   | Small grants for SMEs adopting BIM and circular practices                                                                                        |
| BIM Act and green procurement               | Czech Republic | Montenegro, Moldova                                                    | Mandatory BIM above a value threshold; circular procurement criteria                                                                             |
| eDozvola e-permitting                       | Serbia         | Montenegro, Slovakia                                                   | Fully digital permitting as the basis for BIM-based approval                                                                                     |
| Novi Sad CDW                                | Serbia         | Montenegro, Croatia                                                    | Regional recycling centre with quality                                                                                                           |

|                                   |          |                |                                                                                                      |
|-----------------------------------|----------|----------------|------------------------------------------------------------------------------------------------------|
| Recycling Hub                     |          |                | control and digital registration                                                                     |
| BIM and circular economy roadmaps | Germany  | Croatia        | BIM-for-circularity standards including material data, reuse potential and future material passports |
| GreenBuild Lab                    | Moldova  | Bulgaria       | Living lab for local participation in circular construction                                          |
| Public-private working groups     | BiH      | Bulgaria       | Structured public-private coordination of the TAP                                                    |
| T0-T2-T4 KPI tracking             | Croatia  | Moldova        | Baselines, targets and data-quality grading for each KPI                                             |
| SRIP partnerships                 | Slovenia | Czech Republic | Quadruple-helix strategic partnerships                                                               |
| RIS3 West model                   | Romania  | Czech Republic | Integration of circularity in a regional smart specialisation strategy                               |

## 6.1 Financial Instruments and Incentive Mechanisms

The most transferable financial models are dedicated calls (Building(s) Tomorrow), innovation vouchers (Slovakia) and demand-side grants with a bonus for secondary materials (proposed by Moldova on the Austrian model). Fiscal instruments – lower VAT for products with secondary content and higher landfill fees – are proposed in the Czech Republic and deserve wider discussion. Several partners propose tagging existing national and EU instruments as eligible for “digital + circular” projects instead of creating new ones (Austria, Slovakia, BiH), or turning general instruments such as the Croatian digitalisation vouchers into construction-specific support (Croatia).

## 6.2 Regulatory Innovation and Simplification

A common sequence emerges: (1) a BIM mandate for public projects above a threshold, (2) BIM delivery requirements that include material data, (3) BIM-based e-permitting, (4) end-of-waste criteria and quality standards for secondary materials, and (5) mandatory pre-demolition audits. Countries are at different steps of this sequence, which makes peer learning practical: the Czech Republic and Serbia on BIM legislation, Serbia on e-permitting and CDW plans, and Slovakia and the Czech Republic on pre-demolition audits.

## 6.3 Education, Training and Skills Development

All partners propose curriculum changes, and most propose national certification. New elements are the training of public procurers, permitting authorities and inspectors (Serbia, Moldova, Czech Republic), micro-credentials (Austria, Slovenia) and new vocational qualifications (Bulgaria).

## 6.4 Digital Infrastructure and Data Frameworks

Interoperability is the key issue: the partners propose linking BIM data with e-permitting systems and national waste registers (Serbia, Czech Republic, Moldova, Slovenia) and creating national data spaces or platforms for material tracking (Austria, Bulgaria, Croatia, Hungary). Common Danube-wide

data standards for material passports would allow the national platforms to be connected later, as proposed by Hungary.

## 6.5 Collaboration and Stakeholder Engagement

The partners propose national platforms, networks or hubs for circular and digital construction in almost every country, often with a TAP secretariat at the CDB partner and a steering committee chaired by the ministry responsible for construction. The DANUBE CiDiCon Cluster connects these national structures and is named by several partners as the transnational coordination and knowledge-transfer mechanism.

# 7. Legitimizing the Change

## 7.1 EU Policy Alignment

The proposed improvements support the European Green Deal, the Circular Economy Action Plan, the revised Construction Products Regulation and the Ecodesign for Sustainable Products Regulation with the Digital Product Passport, the recast Energy Performance of Buildings Directive, the EU Taxonomy and Level(s), and the EU Strategy for the Danube Region. For Serbia, Montenegro, BiH and Moldova they also support EU accession (Chapter 27) and the Green Agenda for the Western Balkans.

## 7.2 Existing Legal Hooks

Many improvements do not require new policies but implementing rules for decisions that have already been taken: the Czech BIM Act (2027), the Serbian BIM mandate (2028), the Serbian and Moldovan CDW targets and regulations, the Slovak GPP targets, the Montenegrin S3 2026–2031, the Moldovan Code on Urbanism and Construction and the Bulgarian Strategy for Digitalisation of the Construction Sector. This makes the changes realistic within the 2026–2030 horizon.

## 7.3 Economic and Environmental Case

Circular construction reduces material costs, creates markets for secondary materials and new jobs, and improves the lifecycle performance of buildings. The construction sector produces about a third of EU waste; CDW recycling rates of about 20–25% in several partner countries show the size of the untapped potential. Digital tools reduce the cost of information: Serbia's eDozvola cut permitting time from about 150 to under 30 days.

## 7.4 Evidence from CDB Pilot Activities

The three CDB pilots (Output 3.1) provide practical evidence:

- Austria – Urban Mining Screener. For a district of five building complexes in Innsbruck (30,783 m<sup>3</sup>) the open-source tool estimated about 55,060 t of materials and 8,610 t CO<sub>2</sub>e, with more than 90% accuracy for the total mass.

- Bulgaria – Municipality of Varna. Digital lifecycle management of municipal infrastructure materials with unique digital identifiers, hosted on municipal servers and accepted by the Municipality.
- Croatia – machine learning for smart buildings. Soft-sensor models of fan coil units reached NRMSE 2.20% and  $R^2$  0.973, replacing physical sensors and reducing e-waste.

RMSG stakeholders confirmed the relevance of the pilots; for example, Czech and Slovak stakeholders linked the Austrian material mapping to Level(s) and the EU Taxonomy and saw the Croatian approach as practical and economically useful.

## 7.5 Stakeholder Validation

The country proposals were presented and discussed by all partners at the peer-review workshop D.3.6.1 (online, 29 May 2026). In the RMSG 8 meetings (D.3.6.4) partners discussed the improvements with national stakeholders. The Czech RMSG (Prague, 8 June 2026) discussed D.3.6.2 and D.3.6.3 in detail and confirmed that the proposals are aligned with national priorities; the RMSG in Bosnia and Herzegovina (11 June 2026) endorsed the recommendations and incorporated them into the BiH TAP; the Slovak RMSG prioritised the areas of the Slovak TAP; and the Hungarian and Montenegrin RMSGs discussed BIM, material passports and digital CDW platforms. The Letters of Intent collected for the Territorial Action Plans show the commitment of stakeholders to implement the measures.

# 8. Recommendations for Policy Makers

## 8.1 National and Regional Level

- A. Connect digital and circular policy. Set up inter-ministerial coordination for construction, environment and digitalisation, and include construction in the next smart specialisation cycle.
- B. Make BIM work for circularity. Introduce phased BIM requirements in public procurement and permitting, with delivery standards that include material data.
- C. Make circular procurement the norm. Use lifecycle-cost award criteria, recycled-content requirements, pre-demolition audits and model tender clauses, supported by procurement competence centres.
- D. Create a market for secondary materials. Adopt end-of-waste criteria, quality standards and certification, and consider fiscal incentives.
- E. Build interoperable data infrastructure. Connect BIM, e-permitting and waste registers; develop material passport and CDW tracking platforms.
- F. Target SME finance. Open vouchers and dedicated windows in existing national and EU instruments for BIM, digital tools and circular business models.
- G. Invest in skills. Reform curricula, introduce certification and train public officials.

## 8.2 EU and Transnational Level

- H. Common data standards. Harmonised data models for material passports and CDW tracking across the Danube region, aligned with the Digital Product Passport.

- I. Transnational knowledge transfer. Support peer learning between advanced and early-stage countries through the DANUBE CiDiCon Cluster.
- J. Replication of the CDB pilots. Dedicated funding for replicating the three pilots in other partner countries, based on the Pilot Blueprints (D.3.4.3).
- K. Programming 2028–2034. Recognise digital and circular construction as a priority in the future cohesion and Interreg programmes.

### 8.3 Priorities by Country Group

| Group       | Countries                                                               | Priority focus                                                                                          |
|-------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Advanced    | Austria, Germany                                                        | Integrate BIM into approval procedures, connect data, scale reuse markets and share good practice       |
| Moderate    | Bulgaria, Croatia, Czech Republic, Hungary, Romania, Slovakia, Slovenia | Link BIM mandates with material data, reform procurement, create incentives and hubs                    |
| Early-stage | Bosnia and Herzegovina, Montenegro, Serbia, Moldova                     | Implement existing strategies, build data infrastructure and CDW facilities, raise awareness and skills |

## 9. Conclusion and Next Steps

The synthesis shows that the Danube countries share the same barriers but are at different stages, which creates good conditions for learning from each other. The partners propose realistic improvements that mostly build on existing strategies and laws: implementing rules, procurement criteria, data standards, targeted finance and skills. The key message is that digital and circular policies must be implemented together – BIM, material data, procurement and waste management are parts of one system.

The improvements are integrated into the Better Policies Annexe (D.3.6.3) to the 2030 Danube Region Digital Innovation Strategy for Circular Construction and into the Territorial Action Plans. They will be presented to regional and European policy makers at the thematic workshop and the final high-level policy event in Hungary (D.3.6.5, D.3.6.6). The DANUBE CiDiCon Cluster will follow their implementation after the project.

## 10. Annex A: Partner Input Summary

| Country                | Partner    | Main policy targeted                                                                                                                 | Top improvements                                                                                                                         |
|------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Austria                | PP3 AWS    | Austrian policy and funding mix: Digital Action Plan; Circular Economy Strategy; federal-state frameworks; aws, FFG, KPC instruments | Funding screening and tagging; replication of demonstrators; interoperable lifecycle data; skills pathway; Working Group and T0 baseline |
| Bosnia and Herzegovina | PP11 SERDA | FBiH strategies; draft CE Roadmap; RIS3 in preparation                                                                               | Inter-institutional coordination; digital procurement requirements; green credit lines                                                   |

|                |                         |                                                                                               |                                                                                                                                      |
|----------------|-------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Bulgaria       | LP01 BAA, PP17 EDIHCS   | ISSS 2021–2027; Construction Digitalisation Strategy 2030                                     | Construction in RIS3; BIM in public procurement; national material platform                                                          |
| Croatia        | PP14 TERA, PP15 ICENT   | S3 to 2029; NRRP 2021–2026; Waste Management Plan 2023–2028; CE Action Plan for CDW 2023–2027 | Construction-specific digital-circular SME incentives; cross-ministry task force; BIM and circularity criteria in public procurement |
| Czech Republic | PP5 INCEN               | BIM Act 330/2025; Circular Czechia 2040                                                       | Circular GPP and competence centre; pre-demolition audits; secondary materials market                                                |
| Germany        | PP4 HSH                 | Model Building Regulations; BIM in Germany                                                    | BIM in permitting; harmonisation across states; BIM approval pilots                                                                  |
| Hungary        | PP8 PBKIK               | National Construction Economy Strategy; Act C of 2023                                         | Mandatory BIM for public investment; national digital platforms; SME financing                                                       |
| Moldova        | PP16 BAC                | Green and Circular Economy Programme 2024–2028; Code on Urbanism and Construction             | CDW Regulation; model tender clauses; BIM roadmap and GreenBuild Lab                                                                 |
| Montenegro     | PP13 ZWMNE              | S3 2026–2031; Law on Construction; Law on Waste                                               | National BIM standard; end-of-waste criteria; recycled-content quotas                                                                |
| Romania        | PP10 ADR Vest, PP9 IRCM | RIS3 West; national BIM roadmap; draft construction code                                      | End-of-waste criteria; procurement quotas; BIM in degree programmes                                                                  |
| Serbia         | PP12 STP NS             | Law on Planning and Construction; NWMP 2022–2031                                              | BIM by-laws linked to CDW data; circular procurement; CDW tracking                                                                   |
| Slovakia       | PP6 SBA                 | RIS3 2021+; GPP Action Plan; Waste Strategy 2035                                              | National BIM strategy; 70% GPP; pre-demolition audits                                                                                |
| Slovenia       | PP7 UL                  | S5 and SRIPs; eGraditev                                                                       | Non-waste status of secondary materials; 10% recycled content; BIM in all public projects                                            |