

BIM and Public Procurement

State of Play, Impacts and Policy Recommendations for the
Revision of the Public Procurement Directives

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1. Executive Summary

Public procurement represents a significant share of economic activity within the European Union and currently serves as a central instrument for advancing strategic objectives, including digitalisation, industrial competitiveness and sustainability. In the construction sector, which accounts for a substantial proportion of public procurement expenditure, Building Information Modelling (BIM) has emerged as a key enabler of improved project delivery and better lifecycle management of public assets. BIM contributes significantly to meeting policy priorities embedded in the European Green Deal, the Energy Performance of Buildings Directive, the revised Construction Products Regulation and the broader Digital Built Environment agenda, notably by strengthening structured information management across the whole lifecycle of public assets.

The ongoing revision of the 2014 Public Procurement Directives offers a timely opportunity to assess whether stronger or mandatory provisions on BIM should be introduced at Union level. The current legal framework already permits the use of electronic modelling tools in public works procurement but does so in a permissive and largely unspecified manner. In the absence of common definitions, thresholds, or minimum information requirements, contracting authorities may require “BIM” or digital models without clarity on scope, purpose, or expected outputs, contributing to fragmented practices and legal uncertainty. Against this background, a large majority of consulted stakeholders express support for clearer regulatory direction, while evidence concerning market readiness, economic impacts and proportionality remain uneven. This study was therefore undertaken to provide an evidence-based assessment of the state of play, the barriers, risks and thresholds related to BIM adoption in public procurement, and the most appropriate policy pathways for EU intervention.

The analysis covers six Member States representing different levels of BIM maturity: Austria, Czech Republic, France, Germany, Greece and Portugal. The findings indicate that BIM adoption across the Union has progressed beyond the pilot phase but remains structurally and geographically uneven. In all countries examined, large contractors, major engineering firms and central public infrastructure clients demonstrate significantly higher levels of digital maturity than small and medium-sized enterprises (SMEs) and smaller regional or municipal contracting authorities. BIM use is most advanced in large-scale and technically complex projects, particularly in transport infrastructure and major public buildings. By contrast, routine municipal projects and smaller contracts frequently remain outside systematic BIM-based processes.

This divergence results in what may be characterised as a “two-speed” market. A digitally advanced segment of the industry operates at medium to high levels of BIM integration, while a substantial proportion of economic operators and

contracting authorities remain at an early stage of readiness. Even in Member States with established national strategies and structured implementation frameworks, adoption from both sides, public buyers and suppliers, correlates strongly with organisational scale, project complexity and client capacity.

A consistent and policy-relevant finding concerns the central role of public-sector capability. While technology availability is no longer a primary constraint, small contracting authorities often lack the internal expertise necessary to define appropriate information requirements, assess BIM deliverables during procurement procedures and ensure that digital information is effectively used throughout the asset lifecycle. Without strengthened client capacity, the potential efficiency and lifecycle benefits of BIM cannot be fully realised. In this respect, the core value of BIM lies not in modelling tools themselves but in structured information management processes that support cost efficiency, transparency and performance over the whole lifecycle of public assets.

The barriers identified across Member States are predominantly structural rather than technological. Skills shortages remain widespread, particularly among SMEs and within public administrations. Effective BIM implementation requires not only modelling competence but structured information management capacity, including the ability to define, manage and verify exchange requirements and common data environments. These capabilities are unevenly distributed and constitute a fundamental condition for realising lifecycle benefits.

Cost considerations represent a further constraint. BIM adoption entails both upfront and ongoing investments in software, hardware, training and organisational change. While larger firms can amortise these investments across multiple projects, SMEs and smaller contracting authorities face proportionally higher burdens. Subscription-based licensing models and continuous training requirements mean that BIM is associated with recurring operational costs rather than one-off transition expenditure. In markets characterised by tight margins, this creates hesitancy, particularly where demand signals from public buyers are inconsistent or unclear.

Fragmentation in standards and operational guidance further contributes to uncertainty. Although international standards are increasingly referenced, practical implementation guidance and harmonised procurement templates remain uneven across Member States. Divergent interpretations of open standards generate interoperability challenges, and the absence of clearly defined information requirements increases transaction costs and legal risk.

Legal and procurement-related uncertainty further slows down implementation. Stakeholders highlight concerns regarding proportionality under EU procurement principles, allocation of liability, intellectual property rights and the remuneration of BIM-related services. In less mature contexts, such uncertainty contributes to risk-averse behaviour among contracting authorities, who may avoid introducing BIM requirements for fear of procedural challenge. Clear definition of services,

responsibilities and remuneration is therefore essential to avoid unfunded mandates and legal ambiguity.

Despite these constraints, the evidence consistently demonstrates that BIM has already generated significant efficiency and quality gains and has the potential to increase those further. Reported benefits include improved coordination during design and construction, reduced rework and contract variations, enhanced cost predictability, and improved continuity of information as a basis for efficient operation and maintenance. The strongest cost–benefit profiles are observed in larger and more complex projects, where coordination risks and lifecycle implications are greatest. BIM also supports broader EU policy objectives by enabling improved sustainability assessment, long-term asset performance management, and digital transformation of the construction sector.

A central analytical finding concerns the temporal distribution of costs and benefits. Adjustment costs are typically front-loaded, whereas efficiency gains and lifecycle benefits accrue progressively over time. This temporal mismatch explains why stakeholder support for mandatory provisions is often conditional on phased implementation, adequate transition periods and robust supporting measures.

Against this background, the study concludes that the policy question is not whether BIM should remain permissible under the existing framework, but whether the Union should move from the current permissive but ambiguous regime towards a more structured and proportionate model.

Section 8 therefore develops three contrasted scenarios.

Scenario 1 (Status Quo) maintains the current legal baseline, under which contracting authorities may require digital modelling tools but without common definitions, thresholds or minimum information requirements. This option avoids short-term adjustment costs but perpetuates fragmentation, legal uncertainty and uneven market signals.

Scenario 2 (Voluntary but Framed Use) introduces a harmonised EU definition of procurement-relevant BIM uses; standardised information requirement templates, mandatory open formats, and indicative value thresholds anchored in EU procurement logic. BIM remains voluntary, but its use is structured and guided through a published roadmap and evidence review mechanism. This scenario improves clarity and reduces transaction costs, but uptake may remain uneven.

Scenario 3 (Mandatory with Dynamic Thresholds) introduces mandatory BIM requirements calibrated to contract value and project complexity and implemented through phased roadmaps and transition windows. Obligations scale progressively: coordination-focused requirements for smaller or lower-risk projects; extended cost, planning and delivery control requirements for larger or more complex works; and lifecycle-oriented deliverables for major projects. Thresholds are anchored to existing EU works thresholds but may extend below

them were justified by proportionality and evidence. Crucially, thresholds operate as adaptive policy levers rather than static cut-offs, with progression conditioned on evidence reviews and institutional readiness.

Across all scenarios, the analysis demonstrates that threshold design is the central regulatory instrument. Thresholds determine where obligations apply, how proportionality is safeguarded, and how adjustment costs are distributed between large operators and SMEs. In practical terms, this may involve anchoring obligations to the EU works threshold (currently €5,404,000), introducing a simplified sub-threshold trigger around €1 million for coordination-focused requirements, and progressively strengthening obligations for major works above €15 million and €50 million, where lifecycle, cost-control and performance gains are most material. Properly calibrated value- and complexity-based thresholds thus concentrate more advanced requirements on high-risk, high-value projects where cost–benefit ratios are strongest, while simplified compliance pathways, phased transition windows, client-provided digital infrastructure options and enforceable proportionality clauses ensure that SMEs and smaller contracting authorities are not exposed to disproportionate technical or financial burdens.

The study finds that mandatory BIM provisions can be justified on efficiency, competitiveness and policy-alignment grounds, provided they are embedded within a coherent regulatory architecture centred on structured information management, proportionality safeguards, phased implementation and robust supporting measures. The decisive factor is not whether BIM should be required, but how thresholds are calibrated, how implementation is sequenced, and how institutional and market capacity are supported over time.

Ambition in regulatory design must therefore be matched by investment in standards, skills, governance and institutional capability to ensure that BIM evolves from a permissive option under Article 22(4) into a credible and inclusive lever for improving public construction procurement across the Union.

2. Résumé Exécutif

La commande publique représente une part significative de l'activité économique au sein de l'Union européenne et constitue actuellement un instrument central pour la réalisation d'objectifs stratégiques, notamment en matière de numérisation, de compétitivité industrielle et de durabilité. Dans le secteur de la construction, qui représente une proportion substantielle des dépenses de commande publique, la modélisation des informations du bâtiment (BIM) s'est imposée comme un facteur clé d'amélioration de la réalisation des projets et d'une meilleure gestion du cycle de vie des actifs publics. Le BIM contribue de manière significative à la réalisation des priorités politiques inscrites dans le Pacte vert pour l'Europe, la directive sur la performance énergétique des bâtiments, le règlement révisé sur les produits de construction et le programme plus large en faveur d'un environnement bâti numérique, notamment en renforçant la gestion structurée de l'information tout au long du cycle de vie des actifs publics.

La révision en cours des directives de 2014 sur la commande publique offre une opportunité opportune d'évaluer s'il convient d'introduire des dispositions plus contraignantes, voire obligatoires, relatives au BIM au niveau de l'Union. Le cadre juridique actuel autorise déjà le recours à des outils de modélisation électronique dans la passation des marchés publics de travaux, mais d'une manière permissive et largement imprécise. En l'absence de définitions communes, de seuils ou d'exigences minimales en matière d'information, les pouvoirs adjudicateurs peuvent exiger le « BIM » ou des maquettes numériques sans clarté quant à leur portée, leur finalité ou leurs résultats attendus, ce qui contribue à des pratiques fragmentées et à une insécurité juridique. Dans ce contexte, une large majorité des parties prenantes consultées exprime son soutien à une orientation réglementaire plus claire, tandis que les données relatives à la maturité du marché, aux impacts économiques et à la proportionnalité demeurent inégales. La présente étude a donc été menée afin de fournir une évaluation fondée sur des données probantes de l'état des lieux, des obstacles, des risques et des seuils liés à l'adoption du BIM dans la commande publique, ainsi que des voies d'intervention les plus appropriées pour l'Union européenne.

L'analyse porte sur six États membres représentant différents niveaux de maturité en matière de BIM : l'Autriche, la République tchèque, la France, l'Allemagne, la Grèce et le Portugal. Les résultats indiquent que l'adoption du BIM au sein de l'Union a dépassé la phase pilote, mais demeure structurellement et géographiquement inégale. Dans tous les pays examinés, les grandes entreprises de construction, les principaux bureaux d'ingénierie et les maîtres d'ouvrage publics centraux font preuve d'un niveau de maturité numérique significativement plus élevé que les petites et moyennes entreprises (PME) et les pouvoirs adjudicateurs régionaux ou municipaux de plus petite taille. L'utilisation

du BIM est la plus avancée dans les projets de grande envergure et techniquement complexes, notamment dans les infrastructures de transport et les grands bâtiments publics. En revanche, les projets municipaux courants et les marchés de moindre importance restent fréquemment en dehors des processus systématiques fondés sur le BIM.

Cette divergence se traduit par ce qui peut être qualifié de marché « à deux vitesses ». Un segment numériquement avancé du secteur fonctionne à des niveaux d'intégration BIM moyens à élevés, tandis qu'une proportion substantielle d'opérateurs économiques et de pouvoirs adjudicateurs en est encore à un stade précoce de préparation. Même dans les États membres dotés de stratégies nationales établies et de cadres de mise en œuvre structurés, l'adoption — tant du côté des acheteurs publics que des prestataires — est fortement corrélée à la taille des organisations, à la complexité des projets et à la capacité des maîtres d'ouvrage.

Un résultat constant et pertinent du point de vue politique porte sur le rôle central de la capacité du secteur public. Si la disponibilité des technologies ne constitue plus une contrainte majeure, les pouvoirs adjudicateurs de petite taille manquent souvent des compétences internes nécessaires pour définir les exigences d'information appropriées, évaluer les livrables BIM lors des procédures de passation de marchés et veiller à ce que l'information numérique soit effectivement utilisée tout au long du cycle de vie des actifs. Sans renforcement des capacités des maîtres d'ouvrage, les gains potentiels en termes d'efficacité et de cycle de vie du BIM ne pourront être pleinement réalisés. À cet égard, la valeur fondamentale du BIM ne réside pas dans les outils de modélisation eux-mêmes, mais dans les processus structurés de gestion de l'information qui soutiennent l'efficacité des coûts, la transparence et la performance tout au long du cycle de vie des actifs publics.

Les obstacles identifiés dans les États membres sont principalement de nature structurelle plutôt que technologique. Les pénuries de compétences restent répandues, en particulier parmi les PME et au sein des administrations publiques. Une mise en œuvre efficace du BIM requiert non seulement des compétences en modélisation, mais aussi une capacité structurée de gestion de l'information, incluant l'aptitude à définir, gérer et vérifier les exigences d'échange et les environnements de données communs. Ces capacités sont inégalement réparties et constituent une condition fondamentale pour réaliser les bénéfices liés au cycle de vie.

Les considérations de coûts représentent une contrainte supplémentaire. L'adoption du BIM implique des investissements initiaux et récurrents en logiciels, matériels, formation et transformation organisationnelle. Si les grandes entreprises peuvent amortir ces investissements sur plusieurs projets, les PME

et les pouvoirs adjudicateurs de plus petite taille supportent des charges proportionnellement plus lourdes. Les modèles de licences par abonnement et les exigences de formation continue font du BIM un outil associé à des coûts opérationnels récurrents plutôt qu'à une dépense de transition ponctuelle. Dans des marchés caractérisés par des marges serrées, cela suscite des réticences, en particulier lorsque les signaux de demande émanant des acheteurs publics sont incohérents ou peu clairs.

La fragmentation des normes et des orientations opérationnelles contribue par ailleurs à l'incertitude. Bien que les normes internationales soient de plus en plus mentionnées, les orientations pratiques de mise en œuvre et les modèles harmonisés de passation de marchés demeurent inégaux d'un État membre à l'autre. Les interprétations divergentes des normes ouvertes engendrent des difficultés d'interopérabilité, et l'absence d'exigences d'information clairement définies accroît les coûts de transaction et le risque juridique.

L'incertitude juridique et liée à la commande publique ralentit également la mise en œuvre. Les parties prenantes soulignent des préoccupations relatives à la proportionnalité au regard des principes européens de la commande publique, à la répartition des responsabilités, aux droits de propriété intellectuelle et à la rémunération des prestations liées au BIM. Dans les contextes moins matures, cette incertitude contribue à des comportements prudents de la part des pouvoirs adjudicateurs, qui peuvent éviter d'introduire des exigences BIM par crainte de contestations procédurales. Une définition claire des prestations, des responsabilités et de la rémunération est donc essentielle pour éviter les mandats non financés et les ambiguïtés juridiques.

Malgré ces contraintes, les données démontrent de manière constante que le BIM a déjà généré des gains significatifs en termes d'efficacité et de qualité, et qu'il est susceptible de les accroître davantage. Les bénéfices recensés comprennent une meilleure coordination durant les phases de conception et de construction, une réduction des reprises et des avenants, une meilleure prévisibilité des coûts, ainsi qu'une continuité améliorée de l'information en tant que base pour une exploitation et une maintenance efficaces. Les profils coût-bénéfice les plus favorables sont observés dans les projets de grande envergure et plus complexes, où les risques de coordination et les implications en termes de cycle de vie sont les plus importants. Le BIM soutient également les objectifs politiques plus larges de l'Union européenne en permettant une meilleure évaluation de la durabilité, une gestion à long terme de la performance des actifs et la transformation numérique du secteur de la construction.

Un résultat analytique central porte sur la distribution temporelle des coûts et des bénéfices. Les coûts d'ajustement sont généralement concentrés en début de période, tandis que les gains d'efficacité et les bénéfices liés au cycle de vie

s'accumulent progressivement dans le temps. Ce décalage temporel explique pourquoi le soutien des parties prenantes à des dispositions obligatoires est souvent conditionné à une mise en œuvre progressive, à des périodes de transition adéquates et à des mesures d'accompagnement robustes.

Dans ce contexte, l'étude conclut que la question politique n'est pas de savoir si le BIM devrait rester autorisé dans le cadre existant, mais si l'Union devrait passer du régime actuellement permissif mais ambigu vers un modèle plus structuré et proportionné.

La section 8 développe en conséquence trois scénarios contrastés.

Le **scénario 1 (statu quo)** maintient la base juridique actuelle, dans laquelle les pouvoirs adjudicateurs peuvent exiger des outils de modélisation numérique, mais sans définitions communes, seuils ou exigences minimales d'information. Cette option évite les coûts d'ajustement à court terme, mais perpétue la fragmentation, l'insécurité juridique et des signaux de marché inégaux.

Le **scénario 2 (utilisation volontaire mais encadrée)** introduit une définition harmonisée au niveau de l'Union des usages du BIM pertinents pour la commande publique, des modèles standardisés d'exigences d'information, des formats ouverts obligatoires et des seuils de valeur indicatifs ancrés dans la logique de la commande publique européenne. Le BIM reste volontaire, mais son usage est structuré et guidé par une feuille de route publiée et un mécanisme de révision des données probantes. Ce scénario améliore la clarté et réduit les coûts de transaction, mais l'adoption pourrait demeurer inégale.

Le **scénario 3 (obligations avec seuils dynamiques)** introduit des exigences BIM obligatoires calibrées en fonction de la valeur du marché et de la complexité du projet, mises en œuvre par le biais de feuilles de route progressives et de fenêtres de transition. Les obligations s'échelonnent progressivement : exigences axées sur la coordination pour les projets plus petits ou à moindre risque ; exigences élargies en matière de contrôle des coûts, de planification et de livraison pour les travaux de plus grande envergure ou plus complexes ; et livrables orientés cycle de vie pour les projets majeurs. Les seuils sont ancrés aux seuils européens existants pour les travaux, mais peuvent s'étendre en dessous de ceux-ci lorsque cela est justifié par la proportionnalité et les données probantes. De manière cruciale, les seuils fonctionnent comme des leviers politiques adaptatifs plutôt que comme des points de coupure statiques, la progression étant conditionnée à des révisions fondées sur des données probantes et à la préparation institutionnelle.

Dans l'ensemble des scénarios, l'analyse démontre que la conception des seuils constitue l'instrument réglementaire central. Les seuils déterminent le champ d'application des obligations, la manière dont la proportionnalité est garantie et la façon dont les coûts d'ajustement sont répartis entre les grands opérateurs et les PME. Dans la pratique, cela peut impliquer d'ancrer les obligations au seuil européen pour les travaux (actuellement fixé à 5 404 000 €), d'introduire un déclencheur simplifié sous ce seuil autour de 1 million d'euros pour les exigences axées sur la coordination, et de renforcer progressivement les obligations pour les travaux importants dépassant 15 millions d'euros et 50 millions d'euros, où les gains en termes de cycle de vie, de maîtrise des coûts et de performance sont les plus substantiels. Des seuils basés sur la valeur et la complexité, correctement calibrés, concentrent ainsi les exigences les plus avancées sur les projets à hauts risques et à haute valeur ajoutée, où les ratios coût-bénéfice sont les plus favorables, tandis que des voies de conformité simplifiées, des fenêtres de transition progressives, des options d'infrastructure numérique fournies par le maître d'ouvrage et des clauses de proportionnalité exécutoires garantissent que les PME et les petits pouvoirs adjudicateurs ne sont pas exposés à des charges techniques ou financières disproportionnées.

L'étude conclut que des dispositions BIM obligatoires peuvent être justifiées sur le fondement de l'efficacité, de la compétitivité et de l'alignement des politiques, à condition qu'elles s'inscrivent dans une architecture réglementaire cohérente centrée sur la gestion structurée de l'information, des garanties de proportionnalité, une mise en œuvre progressive et des mesures d'accompagnement robustes. Le facteur déterminant n'est pas de savoir si le BIM doit être requis, mais comment les seuils sont calibrés, comment la mise en œuvre est séquencée, et comment les capacités institutionnelles et de marché sont soutenues dans le temps.

L'ambition dans la conception réglementaire doit donc s'accompagner d'investissements dans les normes, les compétences, la gouvernance et les capacités institutionnelles pour garantir que le BIM évolue d'une option permissive au titre de l'article 22, paragraphe 4, vers un levier crédible et inclusif d'amélioration de la commande publique dans le domaine de la construction à travers l'Union.

3. Introduction: Policy Context and Objectives of the Study

3.1. Policy context

Public procurement is increasingly recognised as a strategic lever to drive innovation, digital transformation, and sustainability across the European Union. The European Commission's Political Guidelines for 2024–2029 emphasise the role of procurement in fostering innovation and modernisation in strategic sectors, including construction and public works. Digitalisation and innovative design and construction methods, particularly Building Information Modelling (BIM), are seen as essential tools for achieving efficiency, quality, and sustainability in public housing and infrastructure projects. BIM enables enhanced collaboration among stakeholders, improved project management, and lifecycle optimisation of assets, aligning with broader EU policy objectives, including the new Construction Products Regulation (CPR) including the Digital Product Passport (DPP) and referring to Digital Built Environment (DBL), or the Energy Performance of Buildings Directive (EPBD).

Similarly, the newly published Communication from the Commission, “The European Strategy for Housing Construction: a more competitive and productive construction industry” ^[10] mentions that digital tools such as BIM have already demonstrated their potential to cut administrative burdens and shorten decision-making times in both public and private housing projects. In Member States that are already advanced in this area, the concrete benefits are already clear. BIM-based permitting systems implemented in Finland have contributed to reducing processing times, increasing transparency and improving data quality.

In parallel, the ongoing revision of the 2014 Public Procurement Directives provides a timely opportunity to integrate lessons learned from early BIM adoption experiences and address the practical challenges of introducing mandatory BIM requirements. Stakeholder consultations conducted in the context of this study indicate strong support for explicit BIM requirements in public procurement: approximately 75% of surveyed stakeholders advocate for clear regulatory guidance. However, while enthusiasm is high, evidence on the economic, operational, and market impacts of mandatory BIM provisions remains limited. Robust data and insights are essential to design and propose a proportionate and effective policy model for the review, ensuring that innovation is promoted without imposing undue burdens on public buyers or private-sector actors, particularly SMEs.

Against this backdrop, this study seeks to provide evidence-based expert advice to inform policy options for the European Commission. It aims to support decision-making on potential regulatory measures, including the integration of mandatory

BIM requirements, thresholds for applicability, phasing strategies, and the design of complementary support mechanisms to facilitate implementation across diverse market contexts.

3.2. Purpose and objectives of the study

The study aims to generate actionable insights on BIM adoption in public procurement, with a focus on informing the revision of the Public Procurement Directives and supporting EU-level policy development. Specifically, it seeks to:

1. Analyse the state of play and emerging trends in BIM adoption across selected EU Member States, scaling findings to the EU context to identify common patterns and country-specific differences.
2. Assess market readiness, evaluating the capacity of public buyers, large companies, and SMEs to adopt BIM in procurement processes.
3. Identify barriers, risks, and enabling factors for BIM implementation, including technical, organisational, financial, and human-resource aspects.
4. Evaluate economic and operational impacts on companies, particularly SMEs, arising from the introduction of mandatory BIM provisions.
5. Provide evidence-based guidance to support the design of proportionate and effective regulatory approaches, including thresholds, phasing, and support mechanisms, in line with the requirements of the forthcoming Impact Assessment for the revision of the Public Procurement Directives.

The study addresses a critical knowledge gap: while stakeholders recognise BIM as an essential tool for modernising design and construction procurement, practical evidence on implementation challenges and economic impacts remains scarce. By combining desk research with targeted expert consultations, the study generates qualitative and indicative quantitative insights to support policy design that balances ambition with feasibility.

3.3. Scope of the study

The analysis focuses on six EU Member States representing a gradient of BIM maturity: **Austria, Czech Republic, France, Germany, Greece, and Portugal.**



This selection enables comparison across advanced and emerging adopters, capturing both best practices and implementation challenges. The study also draws on EU-level resources to contextualise national findings and identify potential harmonisation pathways.

Key questions addressed include:

- What is the current level of BIM uptake in public procurement, and how does it vary by country, sector, and company size?
- What are the expected economic, operational, and organisational impacts for companies, including SMEs?
- Which regulatory options are proportionate, feasible, and likely to be accepted by stakeholders?
- How can thresholds, phased implementation, and support mechanisms mitigate burdens on smaller actors while fostering adoption?

The study primarily employs a qualitative approach, acknowledging the inherent limitations in available data. Quantitative evidence on BIM adoption and impacts

is often fragmented or unavailable, even in thorough desk research. To address this, expert interviews were conducted to provide informed estimates, real-world examples, and nuanced insights that complement the documentary review.

These consultations were critical to capturing practical experience, industry perspectives, and stakeholder expectations, particularly for SMEs and smaller public contracting authorities where publicly available information is scarce.

In summary, the study is designed to generate actionable, evidence-based insights to guide EU policy on BIM integration in public procurement. By assessing market readiness, implementation risks, and potential regulatory options, it provides a foundation for proportionate, effective, and widely supported policy measures that advance innovation, digitalisation, and efficiency in European construction projects.

4. Methodology and evidence based

The study adopts a mixed-methods approach, combining desk research, expert consultations, and comparative analysis to generate a robust evidence base for policy recommendations. This section outlines the research questions, hypotheses, data sources, and limitations.

4.1. Research questions and hypothesis

The study is structured around five core research questions, each associated with specific hypotheses:

BIM Market Readiness

- RQ1: What is the current level of BIM readiness in the construction and public procurement ecosystem in each country?
 - H1.1: BIM adoption and readiness are higher in large firms and major public clients than in SMEs and local contracting authorities.
 - H1.2: Countries with existing BIM strategies or mandates (e.g., Germany, Czech Republic) demonstrate higher practical readiness than those with recent or weakly implemented strategies (e.g., Portugal, Greece), although adoption remains uneven.

Challenges and Implementation Risks

- RQ2: What are the main barriers and challenges to implementing BIM in public procurement, and how are these perceived by public authorities, industry, and professional associations?
 - H2.1: Key barriers include limited skills, high initial costs of tools and training, and fragmented or unclear standards and guidance.
 - H2.2: Concerns regarding SMEs' ability to comply or bear disproportionate burdens represent central implementation risks.

Perceived Balance of Benefits vs. Challenges

- RQ3: Do stakeholders consider that BIM's benefits—efficiency, quality, and transparency—outweigh the challenges and costs in public procurement?
 - H3.1: Both public buyers and industry agree that BIM is inevitable and beneficial in the medium to long term.
 - H3.2: In the short term, stakeholders emphasise that benefits may not materialise without sufficient capacity building and standardisation.

Views on Mandatory BIM

- RQ4: How do public buyers and industry view mandatory BIM requirements, and how does support affect their acceptance?
 - H4.1: With clear Commission-backed support (funding, training, guidance), most stakeholders support a proportionate BIM mandate.
 - H4.2: Without such support, acceptance declines, with concerns about reduced competition, SME exclusion, and non-compliance risks.

EU Roadmap for BIM Implementation

- RQ5: What roadmap is realistic and proportionate for mandatory BIM adoption?
 - H5.1: Stakeholders favour a phased approach, prioritising higher-value contracts or complex projects, combined with transition periods.
 - H5.2: Any EU-level roadmap must be supported by technical and financial assistance, particularly for SMEs and smaller contracting authorities.

4.2. Evidence base

Desk Research: A structured desk review was conducted across the six selected countries using a consistent template (see Annex 2). Sources included national BIM strategies, policy documents, impact assessments, cost–benefit studies, and reports from professional associations. The desk review enabled the identification of national mandates, maturity levels, success factors, and implementation challenges.

Expert Consultations: To complement limited quantitative data, 7–10 targeted interviews were conducted (1 to 2 interviews per country), including representatives from:

- Engineering and design associations
- Architectural associations
- Construction Industry Federation
- SMEs and local contractors
- BIM consultants and technology providers

These interviews provided qualitative insights on adoption levels, barriers, economic impacts, and perceptions of regulatory options. They were critical to

obtaining data points and illustrative figures not readily available in public sources. All interviews were anonymised to protect confidentiality. Templates and interview protocols are documented in the annex for reference.

Comparative Analysis: Findings from desk research and interviews were triangulated to identify common patterns, country-specific nuances, and lessons for EU-level policy. This enabled a comparative assessment of market readiness, perceived risks, and the feasibility of regulatory options, forming the foundation for evidence-based recommendations.

4.3. Limitation and mitigations measures

The study recognises key limitations:

- Limited quantitative data: Comprehensive statistics on BIM adoption and economic impacts are often unavailable.
- Qualitative emphasis: The study builds on the views of a diverse group of interviewees, including key market actors and professional organisations, providing high-quality insights from multiple perspectives.
- Representativeness: Interviews capture a sample of stakeholders; views may not fully represent all actors in a country.

Mitigation measures included triangulation of desk research with multiple stakeholders, careful selection of participants across sectors and sizes, and systematic documentation of findings to ensure transparency and consistency. This approach balances depth of insight with the practical constraints of available data, ensuring reliable inputs for policy design.

In conclusion, the methodology provides a robust, multi-country evidence base on BIM adoption, challenges, and opportunities in public procurement. By combining desk research, targeted expert interviews, and comparative analysis, the study delivers actionable insights to support proportionate, effective, and widely supported policy interventions at both national and EU levels.

5. Key Findings by Country

5.1. Austria

In Austria, BIM readiness is assessed at a medium level (3/5). Adoption is more advanced among large public clients and larger planning practices, while SMEs and small public authorities' lag. Although around 95% of planners are SMEs and BIM is already standard practice among many of them—especially in urban areas—uptake remains uneven, particularly in rural contexts. National strategies support the transition, but they do not automatically translate into higher readiness. The greatest challenges are faced by small public clients, typically managing smaller projects with limited internal capacity.

Contrary to expectations, the main barriers are not cost or skills. Instead, stakeholders point to three structural issues: insufficient standardisation (notably the lack of minimum BIM data quality requirements by phase and building type), interoperability problems caused by divergent software interpretations of ISO 16739-1 (IFC), and legal uncertainties related to copyright, liability, and platform governance. These implementation risks affect small public clients more than SMEs.

BIM's benefits lie primarily in efficiency, consistency, and continuity of information rather than transparency. These benefits clearly outweigh the costs when supported by mandatory data quality standards, EU and national investment in digital infrastructure and sovereignty, and open, public platforms for common data environments and long-term storage.

Support for mandatory BIM requirements is therefore conditional on infrastructure investment rather than direct SME subsidies. Key concerns include vendor lock-in, dependence on specific software solutions, and limited capacity among small public clients.

The recommended roadmap foresees a 5–10-year transition after establishing clear standards and legal frameworks, with phased implementation by project type and value thresholds, public investment in shared platforms, and solutions for long-term data reuse over 20–30 years. The core message is clear: standardisation first, mandates second.

5.2. Czech Republic

In the Czech Republic, BIM implementation has been systematically supported by the Government since 2016 through the Czech BIM Strategy, updated in 2024

(¹). A dedicated legal framework was adopted in 2025 with the Czech BIM Act⁽²⁾, introducing mandatory BIM for above-threshold public works in buildings and infrastructure from 2027, with phased implementation to 2032. The framework is supported by a comprehensive set of transposed international standards (including ISO 19650 series and openBIM standards including ISO 16739-1), and a national Construction Data Standard.

Market maturity remains uneven, with an average level around 2–3 out of 5. Large public clients, transport infrastructure authorities, large designers and large contractors show relatively high adoption, while SMEs, smaller public buyers and especially owners/operators lag behind. BIM requirements have increasingly been included in public procurement since 2019, starting with major rail and road projects and expanding to buildings and municipal infrastructure.

The main challenges are not technological availability but investment capacity, skills and organisational change, as well as standardization of processes and information requirements. Large public clients and suppliers can justify long-term investments in people, processes and technology, while smaller authorities and SMEs often rely on external consultants and struggle to achieve sufficient return on investment. The Regulatory Impact Assessment accompanying the Czech BIM Act confirms that the main long-term benefits lie in improved coordination, quality, productivity, error reduction and, crucially, in the reuse of data in operations and maintenance and public administration.

The Czech experience highlights two key policy lessons: first, BIM mandates must be phased and aligned with strong standardisation of information requirements; second, successful implementation depends on sustained investment in skills, governance, standards and public-sector capacity, rather than regulation alone.

5.3. France

France has pursued a progressive, incentive-based approach to digital construction and BIM rather than a single nationwide mandate. The national strategy began with the Plan Transition Numérique dans le Bâtiment (PTNB) in 2014–2015, backed by around €20 million, and continued through Plan BIM 2022. These programmes promoted BIM adoption through funding, guidance, pilot

(¹) Ministry of Industry and Trade of the Czech Republic (2024), The Update of the Czech BIM Implementation Strategy, <https://konceptcebim.gov.cz/dokumenty/aktualizace-koncepc-zavadeni-metody-bim-v-ceske-republice>

(²) Czech Act No. 330/2025 Col., *Act on the Management of Built Asset and Built Environment Information*, <https://www.e-sbirka.cz/sb/2025/330>

projects and training, functioning as a “soft mandate” rather than a legal obligation.

Today, BIM is widely used on major public building and infrastructure projects, particularly those led by large public clients such as Société du Grand Paris and major hospital, transport and education operators. However, adoption remains uneven: large contractors, design firms and metropolitan authorities show high maturity, while small municipalities and SMEs face persistent barriers related to skills, cost and complexity.

France has no explicit BIM requirement in the “Code de la commande publique”. BIM is instead required on a project-by-project basis by contracting authorities, within the framework of “Loi MOP” governing public construction. Legal compatibility is well established, provided contracts clearly define BIM roles, responsibilities, data ownership and handover processes. ISO 19650 series has been adopted nationally, with implementation coordinated by AFNOR, while initiatives such as MINnD provide contractual and technical guidance adapted to the French legal context.

BIM requirements are typically embedded in technical specifications, contract clauses and sometimes award criteria. Evaluations highlight improved coordination and quality on BIM projects, but also stress the need to strengthen public-sector capacity, standardisation and support for smaller actors to extend BIM beyond flagship projects.

5.4. Germany

BIM adoption is accelerating and its benefits are increasingly evident although standards and interoperability remain critical bottlenecks. BIM is now mandatory for federal public infrastructure and building procurement ⁽³⁾ and the construction BIM market is growing rapidly, with an expected CAGR (⁽⁴⁾) of around 12% till 2028. Around 70–78% of German construction professionals use BIM at some level, mainly in design and planning. Uptake among contractors and installers remains much lower (around 10–11%).

(3)

<https://www.bimdeutschland.de/english#:~:text=The%20BIM%20Deutschland%20initiative%0A%0AFollowing%20the%20initial%20preparatory,a%20compulsory%20requirement%20for%20public%20procurement%20processes.>

(4) CAGR = Compound Annual Growth Rate, source: <https://www.researchnester.com/de/reports/building-information-modeling-market/3219#>

The construction sector assesses the overall readiness as medium (3/5), with large construction companies significantly more advanced than SMEs. Architects highlight an even stronger divide by practice size: large practices are highly advanced (5), whereas most small and micro practices do not yet use BIM. Overall readiness therefore ranges from very high among large offices (5) to low among very small practices (2). Stakeholders broadly agree on key barriers: high costs for software, hardware and training, skills shortages and persistent interoperability and standardisation issues. The construction sector also highlights data security and rather low BIM capacity on the client-side in public authorities, while planners stress legal and liability uncertainty, unclear remuneration of BIM services, and weak demand signals from public clients.

The differentiating views between construction sector and planners do not contradict each other but reveal where policy design must be nuanced. Contractors see readiness and efficiency gains; planners, especially SMEs, face short-term cost and risk pressures. Without EU-level action, adoption will continue mainly among large firms, reinforcing gaps. Under a policy option introducing mandatory BIM without accompanying safeguards, compliance costs would fall unevenly across the value chain and lead to disproportionate burdens on SMEs and reduced competition. By contrast, mandatory BIM combined with targeted SME support, clear standards and remuneration rules, and stronger BIM capacity in contracting authorities would boost productivity while preserving SME participation.

Policy implication: requirements must be accompanied by support—especially for SMEs—and by capacity-building in public authorities together with clear requirements for the contractors.

5.5. Greece

The Greek legal and regulatory framework for public procurement permits the use of Building Information Modelling (BIM) but has not translated this permissibility into systematic practice. EU Directive 2014/24/EU, transposed through Law 4412/2016, allows contracting authorities to require electronic tools such as BIM in public works. However, Greek legislation does not mandate BIM use nor provide detailed implementation guidance. As a result, a significant gap exists between policy intent and procurement practice.

Primary research indicates that around two-thirds of Greek stakeholders report no or very limited BIM use in procurement and tendering. Public-sector respondents highlighted a lack of practical experience, organisational readiness, and internal procedures as key constraints. This implementation gap reflects Greece's early stage of BIM adoption and is driven by three interrelated factors: the absence of standardised procurement frameworks (such as model tender documents and BIM templates), proportionality concerns leading to risk-averse behaviour—particularly regarding SME participation—and limited internal

technical capacity within contracting authorities to define, evaluate, and manage BIM requirements.

At the strategic level, Greece developed a National BIM Strategy between 2020 and 2023 with support from the European Commission's DG REFORM. Despite this, awareness of the strategy among practitioners remains low, and it is not widely perceived as operational. Familiarity is largely limited to dedicated BIM professionals, who note the lack of clear national direction as a barrier to investment and planning.

Further constraining adoption is the absence of national BIM standards aligned with international frameworks such as ISO 19650 series. Misalignment between Greek design conventions and international BIM concepts, including Levels of Development, creates confusion over deliverables. Overall, while strategic frameworks exist, BIM governance in Greece has yet to mature into a coherent, operational reference environment for public procurement.

5.6. Portugal

Portugal is transitioning from fragmented, ad-hoc BIM adoption toward a more coordinated national approach, but implementation remains uneven. While BIM use has expanded over the past decade, maturity varies strongly by project scale and market segment: large firms and internationally exposed teams tend to apply collaborative BIM workflows, whereas many SMEs still rely on limited BIM authoring or 2D practices.

Recent empirical research characterises Portugal as a “late-adopting” EU context and shows that technology itself is not the main constraint. Instead, the most critical barriers are organisational and cultural: limited awareness of BIM benefits, shortage of skilled professionals, industry fragmentation, lack of experience, resistance to change, weak top-management support, and insufficient mechanisms to evaluate and learn from BIM implementations. Addressing these issues requires capacity building, pilot projects, incentives, and stronger feedback loops rather than purely technical solutions.

A major step forward was the political endorsement of the National Strategy for the Implementation of BIM (PortugalBIM) in September 2025. The strategy is structured around four pillars: capacity building, technology enablement, standardisation, and policy and governance. Its success will depend on pragmatic operationalisation, proportional requirements, open standards, and—crucially—strengthening public-sector capability to define, procure, validate, and use information effectively. However, concrete implementation has not yet progressed since its approval.

Regulatory frameworks, procurement practices, and national standardisation (notably through CT 197 and adoption of EN ISO 19650 series) are evolving, but

a persistent gap remains in the ability of contracting authorities to specify clear, outcome-oriented information requirements. Closing this gap is central to moving from “model delivery” to true information-driven BIM adoption across the sector.

6. State of play and Market Readiness for BIM in Public Procurement

6.1. An Uneven but Advancing European Landscape

Across the Member States analysed, Building Information Modelling (BIM) adoption in the construction sector has moved beyond experimentation but remains characterised by uneven maturity. In all countries reviewed, BIM is well established among leading actors—particularly large contractors, major design and engineering practices, and selected central public clients—while significant gaps persist among small and medium-sized enterprises (SMEs) and smaller contracting authorities. This pattern is consistent with recent European-level assessments, which identify structural asymmetries in skills, institutional capacity and investment capability as the principal barriers to more homogeneous uptake ⁽⁵⁾.

Countries with established strategies or long-standing national initiatives, notably the Czech Republic, France, Austria and Germany, display more developed BIM ecosystems, including a broader supply of consultants, trainers and technology providers ⁽⁶⁾. However, even in these contexts, BIM maturity remains strongly correlated with organisational scale, project complexity and client capacity. By contrast, in countries where strategies are recent or weakly implemented, such as Greece and Portugal, BIM adoption remains largely confined to leading private-sector actors and flagship projects, with limited penetration into routine public procurement practice ⁽⁷⁾.

This divergence highlights a central policy-relevant finding: market readiness is not determined solely by private-sector capability, but depends critically on public-sector demand, guidance and institutional preparedness. Overall, the European BIM landscape can be described as one of partial but incomplete transition, in which advanced pockets of practice coexist with large segments of the market that remain only marginally engaged with BIM-based processes ⁽⁸⁾.

⁽⁵⁾ EU BIM Task Group (2024), *European BIM Adoption and Maturity Review*.

⁽⁶⁾ High-Level Construction Forum (2022), *Digital Transition Pathway for Construction*.

⁽⁷⁾ European Commission (2023); Primary research (2026, Greece; Portugal).

⁽⁸⁾ EU BIM Task Group (2024).

6.2. Adoption by Type of Actor

6.2.1. Public Contracting Authorities

Public contracting authorities emerge as the most heterogeneous and, in many cases, structurally weakest link in the BIM adoption chain. In countries with more mature policy frameworks, such as the Czech Republic and France, large national, regional or metropolitan clients—particularly in transport, higher education, health or major cultural infrastructure—have developed in-house or externally supported BIM management capacity ⁽⁹⁾. By contrast, smaller regional and local authorities often display very low levels of readiness and rely heavily on external expertise ⁽¹⁰⁾.

The gap is more pronounced in Greece and Portugal. Stakeholder evidence indicates that BIM use in procurement and tendering phases remains limited, despite the absence of formal legal barriers. In Greece, a large majority of respondents report no use of BIM in tendering processes, pointing to limited internal capacity, procedural rigidity and the lack of practical guidance as the main obstacles. In Portugal, public administration readiness is commonly assessed as low, reflecting similar structural constraints rather than technological limitations.

Austria and Germany occupy an intermediate position. In both countries, large public clients show comparatively higher levels of adoption, while small authorities—often responsible for smaller projects in rural or peripheral areas—face persistent challenges in skills, organisational readiness and resource availability ⁽¹¹⁾. Overall, public-sector uptake mirrors the broader market: progress is visible, but uneven, and strongly dependent on project scale and client sophistication.

Taken together, the evidence suggests that public-sector capacity constraints, rather than legal or technical barriers, now constitute the principal bottleneck to wider BIM diffusion in public procurement. This finding is consistent with EU-level

⁽⁹⁾ French Plan BIM 2022 <https://www.ecologie.gouv.fr/politiques-publiques/batiment-numerique>

⁽¹⁰⁾ <https://build-up.ec.europa.eu/es/resources-and-tools/case-studies>

⁽¹¹⁾ Austrian national BIM readiness assessment: Austria's national Building Information Modeling (BIM) readiness is highly advanced, driven by the [ÖNORM A 6241 series of standards](#) in effect since July 2015, which provide a foundational, comprehensive framework for digital construction. The approach emphasizes open data standards (e.g., IFC), openBIM, and international compatibility to enhance productivity in the construction sector.

analyses emphasising the central role of client capability in driving digital transformation in construction ⁽¹²⁾.

6.2.2. Large Companies

engineering firms are consistently the most advanced BIM users. In the Czech Republic, large designers, engineers and contractors display systematic, project-wide BIM use, with maturity levels significantly above the market average ⁽¹³⁾. In Portugal, large and medium-sized architecture and engineering firms are widely considered to be on an advanced BIM trajectory, with competitiveness comparable to leading international markets.

In Germany and France, industry organisations and professional federations similarly report that BIM adoption is driven primarily by larger companies, with major construction groups and design offices operating at a high level of maturity both domestically and internationally. This concentration of capability among larger actors reflects several structural advantages: greater capacity to invest in software and training, access to specialised BIM roles (such as BIM managers and coordinators), and stronger exposure to complex projects and international markets where BIM is increasingly standard practice. It also explains why BIM is most firmly embedded in large-scale infrastructure, complex buildings and flagship public projects across all countries reviewed.

6.2.3. SME and Micro-Enterprises

In contrast, SMEs and micro-enterprises consistently lag behind, although with notable national variations. In the Czech Republic, SME designers and contractors display significantly lower maturity levels than their larger counterparts, while owners and operators remain at a very early stage of adoption ⁽¹⁴⁾. In Germany, survey data from the architectural profession indicates that around half of the practices, which are micro-practices, do not use BIM at all. Portuguese and Greek evidence points in the same direction: SMEs and freelance professionals report low levels of preparedness, driven by skills

⁽¹²⁾ High level construction forum: <https://build-up.ec.europa.eu/en/news-and-events/events/high-level-construction-forum-webinars-innovation-construction-sector>

⁽¹³⁾ Ministry of Industry and Trade of the Czech Republic (2024): *Czech BIM Strategy Monitoring Data* : <https://konceptebim.gov.cz/dokumenty/aktualizace-koncepce-zavadeni-metody-bim-v-ceske-republice>

⁽¹⁴⁾ Ministry of Industry and Trade of the Czech Republic (2024) - *Czech BIM Strategy Monitoring (2024)*: <https://konceptebim.gov.cz/dokumenty/aktualizace-koncepce-zavadeni-metody-bim-v-ceske-republice>

shortages, limited access to training, cost barriers and uncertainty about return on investment.

Austria presents a more nuanced picture. Although most planners are SMEs, BIM is reported to be relatively standard among them, except in rural areas. This suggests that firm size alone is not determinative; market structure, project typology, and the availability of national guidance and support measures also play a decisive role. Nevertheless, the persistence of a two-speed market—where BIM-capable large actors coexist with a long tail of low-adoption SMEs—remains one of the most significant structural challenges to mainstreaming BIM in public procurement ⁽¹⁵⁾.

6.3. Sectoral and Project-Type Differences

Across countries, BIM adoption is strongly correlated with project scale, technical complexity and lifecycle requirements. Transport and major infrastructure projects are consistently identified as the most advanced segments. In the Czech Republic, transport infrastructure exhibits significantly higher maturity than other public sectors ⁽¹⁶⁾. Greek stakeholders similarly highlight metro projects as the most structured BIM users, followed by utility infrastructure, with public buildings—and especially municipal projects—lagging.

In France and Portugal, BIM is considered standard practice on complex projects in major metropolitan areas, while smaller-scale, provincial or renovation projects often continue to rely on 2D processes. This sectoral gradient reflects both client capacity and supply-chain readiness, as well as the stronger business case for BIM in projects with higher coordination demands, longer lifecycles and greater technical complexity. From a policy perspective, this concentration of BIM use in high-value and high-complexity projects suggests that market forces alone are unlikely to ensure diffusion into more routine public procurement without targeted support measures ⁽¹⁷⁾.

⁽¹⁵⁾ EU BIM Task Group Survey Report (2024): https://eubim.eu/wp-content/uploads/2024/12/EUBTG_BIM_survey_report_2024.pdf

⁽¹⁶⁾ Ministry of Industry and Trade of the Czech Republic (2024) - *Czech BIM Strategy Monitoring (2024)* : <https://konceptcebim.gov.cz/dokumenty/aktualizace-koncepce-zavadeni-metody-bim-v-ceske-republice>

⁽¹⁷⁾ High Level Construction Forum (2022): <https://build-up.ec.europa.eu/en/news-and-events/events/high-level-construction-forum-webinars-innovation-construction-sector>

6.4. The role of National Strategies: Commitment versus Implementation

The comparison between countries with more established BIM strategies (notably the Czech Republic, France, Austria and Germany) and those where strategies are recent or weakly implemented (notably Greece and Portugal) highlights a critical distinction between formal policy commitment and operational impact.

The Czech Republic illustrates a relatively mature policy ecosystem, combining a long-term national BIM strategy, growing integration of BIM into qualification frameworks, widespread training provision and strong industry collaboration. This has supported the emergence of a competitive market for BIM consultancy services and a growing pool of certified professionals, translating into higher maturity among leading actors, albeit with persistent gaps among smaller clients and operators ⁽¹⁸⁾. France similarly benefits from long-standing national initiatives and a broad training offer aligned with international standards yet still faces challenges in extending BIM beyond flagship projects and large organisations ⁽¹⁹⁾.

Austria and Germany demonstrate that national strategies do facilitate the digital transition but cannot yet ensure homogeneous readiness, particularly among small public clients and micro-practices. Portugal's recently approved BIM strategy is widely perceived by stakeholders as lacking concrete implementation measures, funding and capacity-building support, limiting its impact on actual market behaviour ⁽²⁰⁾. Greece provides an even clearer illustration of the consequences of weak operationalisation: in the absence of procurement-specific frameworks and institutional support, individual skills have not translated into systematic public-sector practice.

6.5. Skills, Training and Market Ecosystems

All countries analysed recognise skills availability as a critical determinant of BIM readiness. The Czech Republic stands out for the breadth and coherence of its training ecosystem, spanning formal education, professional chambers, government-supported programmes and internationally recognised certification

⁽¹⁸⁾ buildingSMART Czech Republic Professional Certification Program:
<https://www.czbim.org/building-smart-cz/profesionalni-certifikace-buildingsmart/>

⁽¹⁹⁾ French Plan BIM 2022

⁽²⁰⁾ Portuguese Council of Ministers Resolution (2025)

(²¹). France also benefits from a dense training market and dedicated BIM manager and coordinator tracks aligned with ISO 19650 series principles.

In Greece and Portugal, by contrast, skills gaps are repeatedly cited as the primary barrier to wider adoption, particularly among SMEs and public authorities. This reinforces the conclusion that capacity-building, rather than technology, is now the binding constraint in many contexts. The maturity of BIM consultancy and technology provider markets further differentiates countries: where early private-sector leadership existed, as in the Czech Republic, a competitive and diversified support ecosystem has emerged; elsewhere, limited demand from public buyers has slowed the development of such markets (²²).

6.6. Synthesis and Policy Implications

a persistent two-speed market, in which large organisations and complex projects are BIM-advanced while SMEs and small contracting authorities lag behind; (ii) public-sector capacity as the critical bottleneck, with institutional skills, procedures and guidance now more constraining than legal permissibility; (iii) sectoral concentration of BIM use in public transport and major infrastructure; (iv) an implementation gap in national strategies; and (v) the decisive role of skills systems and market ecosystems in sustaining adoption.

Taken together, these findings indicate that BIM in public procurement has moved beyond experimentation in much of Europe but remains constrained by structural inequalities in capacity and readiness. The policy challenge for the revision of the Public Procurement Directives is therefore no longer whether BIM is viable, but how to mainstream it across the full spectrum of public clients and market actors in a proportionate, supported and sustainable manner (²³).

(²¹) buildingSMART International Professional Certification Program:

<https://education.buildingsmart.org/>

(²²) <https://www.buildingsmart.org/community/chapter-directory/buildingsmart-czech-republic/>

(²³) <https://interoperable-europe.ec.europa.eu/collection/rolling-plan-ict-standardisation/construction-building-information-modelling-rp2023>

7. Barriers, Challenges and Implementation Risks

7.1. Skills and Organisational Capacity Constrains

Across all countries examined, shortages in BIM-related skills and organisational know-how emerge as the most consistently cited barrier. Stakeholder input from Greece, Portugal and Germany points to insufficient access to targeted training and a limited pool of personnel with hands-on BIM experience, affecting both private firms and public bodies ⁽²⁴⁾. This constraint extends well beyond software operation. It encompasses process and information management capabilities, including familiarity with BIM workflows, information requirements (OIR, AIR, EIR), common data environments (CDEs) and collaborative protocols.

A recurrent weakness concerns the absence of clearly defined information requirements on the client side, particularly among public asset owners. Where Organisational (OIR), Asset (AIR) and Exchange (EIR) Information Requirements are not established, BIM implementation tends to be reduced to a design-stage deliverable rather than functioning as a whole-life information management approach. This undermines one of BIM's central value propositions, namely the structured use of information across the asset lifecycle for decision-making, operation and maintenance ⁽²⁵⁾.

National differences are significant but do not alter the overall pattern. The Czech Republic represents a comparatively advanced case in terms of training infrastructure, with BIM integrated into qualification frameworks, higher education curricula and professional certification schemes ⁽²⁶⁾. Nevertheless, even there, contracting authorities report that effective BIM use in procurement requires sustained investment in people and processes over several years, a threshold that only large clients with sufficient project volume can currently cross with confidence. Smaller authorities therefore tend to rely on external consultants, which mitigates short-term capacity gaps but limits internal capability building.

In France, a relatively dense training ecosystem exists, aligned with NF EN ISO 19650 series principles, yet skills gaps persist among SMEs and smaller public clients, particularly in relation to information management and procurement-related use of BIM. Germany shows a similar pattern: professional bodies and industry federations emphasise lack of skilled personnel, especially in small

⁽²⁴⁾ Stakeholder evidence: Greece, Portugal, Germany

⁽²⁵⁾ SO 19650 series guidance.

⁽²⁶⁾ buildingSMART Czech Republic Professional Certification Program:
<https://www.czbim.org/building-smart-cz/profesionalni-certifikace-buildingsmart/>

practices that face difficulty justifying training investments in the absence of stable demand resulting from incoherent mandatory requirements. In Greece, skills and organisational readiness are widely perceived as binding constraints, notably due to limited training opportunities and resistance to process change within organisations. In Portugal, by contrast, interviews indicate that training opportunities exist and organisations are generally willing to adapt, but progress is hindered by a lack of governmental support and incentives ⁽²⁷⁾.

Overall, the evidence suggests that skills shortages are not merely transitional frictions but reflect deeper structural gaps in education, professional development and public-sector capability. These gaps translate directly into implementation risks, including poorly specified requirements, ineffective evaluation of BIM deliverables, and underutilisation of information in later lifecycle phases.

7.2. Costs Structures and Investment Requirements

Cost-related factors constitute a second, pervasive barrier, particularly for SMEs and smaller public clients. Stakeholders across all countries refer not to a single dominant expense, but to the cumulative burden of software licences and their maintenance or software subscription fees, hardware upgrades, or cloud subscriptions, staff training, and the organisational costs associated with process reconfiguration.

In the Czech Republic, these issues have been examined in detail in the context of the Regulatory Impact Assessments prepared for the planned BIM Act. These analyses confirm that contracting authorities must make significant longer-term investments in people, processes, standards and technology before BIM can be used at a level that generates net benefits in procurement and project delivery. Typically, only large authorities can justify such investments, given their project volume and capacity to achieve a return on investment. Smaller authorities therefore tend to externalise BIM-related functions to consultants, reinforcing a dependency that may limit internal learning and long-term efficiency gains. Similar dynamics are observed on the supply side: large design and construction firms can amortise investments across multiple projects, while SMEs often cannot justify comparable expenditure given smaller project sizes and thinner margins ⁽²⁸⁾.

Greek stakeholder evidence illustrates how cost considerations are assessed relative to prevailing fee structures in public projects. Respondents emphasise

⁽²⁷⁾ Stakeholder evidence (France, Germany, Greece, Portugal)

⁽²⁸⁾ Czech BIM Act Regulatory Impact Assessment (2023):
<https://www.zakonyprolidi.cz/monitor/7387332.htm>

that BIM-related investments—covering software, training and transition time—must be evaluated against already constrained remuneration levels. Comparative evidence from Northern Europe suggests first-year BIM adoption costs in the range of €12,000–€22,000 per person, with disproportionately higher impacts on small firms due to limited economies of scale. In the Greek market, annual licence costs of approximately €2,500–€3,500 per user, combined with training and productivity transition costs, can represent a substantial share of turnover for small practices, in some cases reaching double-digit percentages ⁽²⁹⁾.

Portuguese and German stakeholders report similar concerns. In Portugal, the cost of software and hardware, combined with the organisational impact of implementation, is identified as a major barrier, particularly for micro-firms that dominate the architectural profession. In Germany, high software and training costs, combined with unclear remuneration frameworks for BIM-related services, reduce incentives for smaller practices to invest, especially where client demand remains limited. French companies likewise report that the cost burden of BIM adoption weighs more heavily on SMEs, while public clients face parallel costs in defining strategies, procuring CDEs and training staff.

Importantly, stakeholders do not perceive BIM costs as purely temporary transition expenses. Subscription-based licensing models, continuous training needs and ongoing information requirements updates frame BIM as a permanent operational cost structure. This reinforces the risk that, in the absence of targeted support or adapted procurement strategies, BIM requirements could exacerbate market concentration and disadvantage smaller actors.

7.3. Standards Interoperability and Operational Guidance

A third cluster of barriers concerns standards, interoperability and the availability of practical guidance. In most countries, stakeholders report persistent uncertainty about expected BIM model content, information requirements and deliverables at different public project stages. In Greece, for example, the absence of nationally aligned definitions of Level of Development (LOD) in relation to design phases contributes to inconsistent interpretations of requirements and undermines both specification and verification of BIM outputs. Contracting authorities, especially the public ones, and designers as well as contractors often lack a shared reference framework for determining what information should be provided, and when.

Comparable issues are reported in Germany and Portugal, where poor interoperability and fragmented guidance are cited as obstacles to efficient information exchange. Austrian evidence points to particularly acute problems

⁽²⁹⁾ Nordic BIM Group : <https://www.nordicbim.com/>

arising from divergent interpretations of ISO 16739-1 (IFC) across software platforms, leading to practical interoperability failures even where nominal compliance with open standards exists.

These technical issues have direct economical, organisational and procedural implications. In the absence of stable, widely accepted standards and templates, contracting authorities must develop BIM requirements on a case-by-case basis. This is resource-intensive and presupposes expertise that many authorities do not possess. The European Construction Sector Observatory has repeatedly noted that uneven digital standards and interoperability gaps continue to hinder effective information exchange across the asset lifecycle in many Member States ⁽³⁰⁾.

By contrast, countries with more structured national frameworks, such as the Czech Republic and France, have made greater progress in reducing uncertainty through guidance aligned with ISO 19650 series and the promotion of openBIM approaches. Nevertheless, even in these contexts, stakeholders emphasise that standardisation is a necessary but not sufficient condition: without parallel investment in skills and institutional processes, standards alone do not guarantee effective implementation. Also, the international standards provide a framework requiring completion of content related to national legislation and technical standards and reflecting the tradition and legacy of construction practice in Member States.

7.4. Legal and Procurement Related Risks

Legal and procurement-related risks constitute a fourth, and often underappreciated, barrier. In Greece, the absence of BIM model tender documents and standardised BIM specifications forces contracting authorities to operate in a context of procedural and legal uncertainty, particularly when defining evaluation criteria, contractual provisions and information management obligations. Survey evidence indicates very limited practical experience with introducing BIM into tender documentation, reinforcing a tendency towards risk aversion.

The introduction of BIM also increases evaluation complexity. Preparing adequate Exchange Information Requirements within the tender documents and assessing related pre-contract BIM Execution Plans requires technical judgement to distinguish between proportionate and excessive proposals, yet a more detailed or sophisticated plan is not necessarily better suited to a given project. Without sufficient in-house expertise, contracting authorities face a real risk of either misjudging quality or relying excessively on formalistic criteria. Similar

⁽³⁰⁾ European Construction Sector Observatory (2021) : https://single-market-economy.ec.europa.eu/sectors/construction/european-construction-observatory-eco_en

concerns are reported in Germany, the Czech Republic and Portugal, where limited client-side capability is seen as a bottleneck for more systematic use of BIM in procurement.

From a legal perspective, BIM requirements may be vulnerable to challenge under the principles of equal treatment and proportionality enshrined in Directive 2014/24/EU, particularly where they are perceived as disproportionate, insufficiently justified, or de facto exclusionary. German, Portuguese and Czech professional bodies emphasise legal and liability uncertainties, as well as unclear remuneration frameworks, as factors discouraging smaller practices from investing in BIM. Austrian stakeholders similarly point to unresolved questions around copyright, liability and platform governance ⁽³¹⁾.

These risks can generate a “chilling effect”: risk-averse contracting authorities may prefer to avoid BIM requirements altogether rather than navigate uncertain legal terrain. International experience suggests that this dynamic can only be mitigated through standardised frameworks, phased implementation, and clear links between BIM requirements and genuine project needs.

7.5. Synthesis and Policy-Relevant Implications

Taken together, the evidence indicates that barriers to BIM adoption in public procurement are not primarily technological, but institutional, economic and procedural. Skills shortages, cost structures, fragmented standards, legal uncertainty and asymmetric impacts on SMEs form a self-reinforcing constraint system that slows diffusion and increases implementation risk.

A key policy-relevant finding is that many of these barriers are structural rather than speculative. This suggests that well-targeted measures—focusing on capacity-building, standardisation, financial support and legal certainty—could have a material and lasting impact on market readiness. Conversely, introducing mandatory BIM requirements without addressing these constraints risks distorting competition, increasing legal disputes and reinforcing existing capacity gaps between large and small actors.

These conclusions provide the analytical basis for Section 8, which examines the conditions under which more systematic or mandatory BIM requirements could be introduced in a proportionate, phased and sustainable manner.

⁽³¹⁾ Stakeholder Evidence (Austria, Germany)

8. Perceived Benefits vs. Challenges of BIM in Public Procurement ⁽³²⁾

8.1. Framing the benefit-cost debate across countries

Across the countries analysed, stakeholder perceptions of Building Information Modelling (BIM) in public procurement converge on a clear central proposition: **the benefits of BIM are widely recognised, but they are neither automatic nor evenly distributed over time, project types, or stakeholder groups**. The evidence points to a structurally similar pattern in the Czech Republic, Greece, Portugal, Austria, Germany and France: BIM is consistently associated with improvements in coordination, quality, risk management and lifecycle performance, yet its adoption is constrained by upfront costs, capability gaps, and transitional burdens—particularly for smaller organisations and in early project phases ⁽³³⁾.

This pattern closely mirrors the logic of EU-level cost–benefit frameworks, which emphasise that BIM’s value is primarily realised through **process integration, information quality, and lifecycle use of data**, rather than through digitalisation per se ⁽³⁴⁾. The national evidence examined here reinforces that resistance to BIM is rarely rooted in doubts about its intrinsic value. Instead, it reflects concerns about **who bears the costs, when those costs arise, and under what conditions benefits can be reliably captured**.

8.2. The nature of the perceived benefits: from coordination to lifecycle value

Across all countries, the most consistently cited benefits relate to **project coordination, quality assurance, and risk reduction**. The Czech national BIM strategy, both in its 2017 version and its 2024 update, articulates a comprehensive set of expected gains: improved collaboration among project participants, coordinated project development, design optimisation, early clash detection, reduced rework, better construction site management, and enhanced

⁽³²⁾ <https://webgate.ec.europa.eu/circabc-ewpp/d/d/workspace/SpacesStore/a85e53d8-a82b-47f9-a247-f0819f20466d/download>

⁽³³⁾ Stakeholder evidence: CZ, GR, PT, AT, DE, FR

⁽³⁴⁾ European Commission, *Cost-Benefit Analysis Methodology for BIM in Public Procurement*, 2021: https://single-market-economy.ec.europa.eu/news/costbenefit-analysis-building-information-modelling-bim-2021-07-05_en

health and safety and quality control (³⁵). These benefits are not presented as isolated technical improvements, but as elements of a more integrated project delivery and asset management approach, extending into operation and maintenance through the structured use of information models.

Stakeholder feedback from Greece strongly aligns with this framing. Respondents consistently emphasise BIM's contribution to quality assurance, coordination efficiency, risk mitigation, and lifecycle performance, and explicitly link these advantages to EU-level benefit categories used in public procurement cost–benefit analysis (³⁶). Importantly, these perceptions are shared across public and private actors, suggesting a relatively mature consensus on the **value proposition** of BIM, even in contexts where implementation remains uneven.

In Germany and France, the evidence from professional bodies and flagship projects further confirms this pattern. Reported benefits include fewer clashes and requests for information (RFIs), reduced rework, fewer delays and cost overruns, lower incidence of contract amendments, and improved overall quality. These operational gains are complemented by more strategic benefits, such as improved collaboration across disciplines, higher planning quality, and stronger alignment with sustainability and energy efficiency objectives—although the latter are often described as **under-communicated or under-exploited** in current practice.

Portugal adds a distinctive dimension to this debate by explicitly linking BIM to the **industrialisation of construction**. Here, stakeholders emphasise not only better coordination and earlier error detection, but also BIM's role as an enabler of modularisation, prefabrication, and factory-based production methods. This framing positions BIM not merely as a project management tool, but as a **structural lever for productivity and sustainability** in the construction sector.

Taken together, these perspectives suggest a high degree of convergence on the types of benefits expected from BIM: operational efficiency, quality improvement, risk reduction, and enhanced lifecycle management. Differences across countries are less about the nature of the benefits and more about their timing, distribution, and the conditions required for their realisation. This assessment is further supported by the cost–benefit study conducted by the EU BIM Task Group, which provides robust evidence that the greatest benefits are realised during the longest phase of asset use—namely the operation and maintenance phase—thereby

(³⁵) Ministry of Industry and Trade (CZ), *Strategy for the Implementation of the BIM Method in the Czech Republic*, 2017 and 2024 update - https://konceptcevim.gov.cz/wp-content/uploads/2023/04/BIM-Implementation-Strategy-in-the-Czech-Republic_EN.pdf

(³⁶) Stakeholder evidence: Greece; European Commission *Cost-Benefit Analysis Methodology for BIM in Public Procurement*, 2021: https://single-market-economy.ec.europa.eu/news/costbenefit-analysis-building-information-modelling-bim-2021-07-05_en

reinforcing the importance of lifecycle value as a central outcome of BIM adoption⁽³⁷⁾.

8.3. Public Buyers versus companies: aligned objectives, asymmetric impacts

While both public buyers and private companies broadly recognise the same benefit categories, the **distribution of costs and benefits** differs significantly between these groups. Public authorities tend to emphasise lifecycle value, asset performance and strategic objectives such as sustainability, resilience, and long-term value for money. In Greece, for example, BIM is explicitly framed as an enabler of green public procurement and climate objectives, allowing better assessment of energy consumption and lifecycle performance of public assets. Similar logics underpin the Czech strategy's strong focus on operation and maintenance and on information continuity across the asset lifecycle⁽³⁸⁾.

Private companies, by contrast, often see BIM-advantages primarily in lower project risks process **optimisation, fewer** disputes and higher quality. German evidence illustrates this divergence particularly clearly. Contractors report that benefits already outweigh costs, Planning practices, especially smaller ones, acknowledge substantial long-term benefits—such as higher planning quality, improved collaboration, and enhanced competitiveness—but frequently report that **short-term effort and uncertainty still outweigh perceived gains**, particularly in early design phases.

The Portuguese case is even more explicit about this tension. From the perspective of professional organisations, current cost structures—software, hardware renewal, training, and IT infrastructure—are not yet compensated by market returns, especially in a context where professional fees have declined significantly over the past decade despite rising technical complexity. This leads to a clear call for the public sector to “lead by example” by aligning procurement practices and remuneration levels with the technological demands it imposes.

These findings point to a structural asymmetry: **public clients are positioned to capture a significant share of BIM's long-term and lifecycle benefits, but doing so requires substantial upfront investment to be able to effectively require, manage, and control BIM processes**, while a substantial portion of the upfront investment burden falls on private market actors. Without corrective policy measures, this misalignment risks slowing adoption, even where the overall societal and sectoral case for BIM is strong.

⁽³⁷⁾ <https://eubim.eu/cost-benefits/>

⁽³⁸⁾ Czech BIM Strategy, 2024 edition : <https://konceptcebim.gov.cz/dokumenty/aktualizace-konceptce-zavadeni-metody-bim-v-ceske-republice>

8.4. Short term costs versus long term value: a temporal mismatch

One of the most consistent themes across all countries is the **temporal mismatch between early-stage costs and delayed benefits**. In Greece, respondents repeatedly stress that BIM's value emerges "over time" and depends on "proper" or "well-organised" information management, signalling that benefits are cumulative and linked to learning effects, process maturity, and organisational capability development.¹¹ EU-level evidence similarly shows that BIM-related effort is concentrated in earlier project stages, while many of the most significant benefits materialise during construction and, even more so, during operation and maintenance.

This temporal structure is also evident in Germany, where contractors already report net benefits, but many smaller planning practices still experience BIM primarily as an additional workload in the short term. Austria reflects a comparable logic: stakeholders agree that BIM delivers efficiency, consistency and continuity, and that benefits can outweigh costs, but only under certain conditions and with appropriate supporting infrastructure.

The Czech and French evidence reinforces this perspective by highlighting benefits such as reduced rework, better coordination, and improved lifecycle management—outcomes that typically depend on **front-loaded investments in modelling, data structuring, and coordination**. In policy terms, this creates a challenge for procurement systems that remain heavily focused on short-term price considerations rather than whole-life value.

The result is a classic investment dilemma: actors are required to bear **immediate, visible costs**, while returns are **diffuse, delayed, and often captured by other parties or in later project phases**. Without mechanisms to rebalance this equation, rational short-term decision-making by individual organisations may continue to conflict with long-term system-level efficiency.

8.5. Conditions for realising benefits: from standards to skills and scale

Across countries and stakeholder groups, there is strong convergence on the view that **BIM does not create value by default**. Instead, benefits depend on a set of enabling conditions that recur throughout the evidence.

First, **project scale and complexity** matter. Greek stakeholders, in line with EU cost–benefit analysis, emphasise that BIM delivers the greatest value in larger and more complex projects, where early error avoidance, coordination, and lifecycle optimisation have the largest financial and operational impact. This

supports a proportional approach to BIM requirements, rather than uniform mandates across all project types.

Second, **standards and data quality requirements** are critical. Austrian stakeholders underline the need for mandatory standards defining data quality, supported by national or European funding for standardisation infrastructure and by shared digital platforms to harmonise delivery. Similar concerns are implicit in the Czech strategy's emphasis on coordinated project development and structured information use across the asset lifecycle and even for other public administration agenda utilizing built asset information ⁽³⁹⁾.

Third, **skills, training, and organisational capacity** emerge as decisive factors. Greek respondents explicitly call for investment in specialised personnel, expert-led training across all project stages, and financial support for digital transition, particularly for SMEs. This echo concerns raised in Portugal and Germany, where smaller practices face disproportionate adjustment costs and steeper learning curves.

Finally, **institutional predictability and policy coherence** play a central role. Stakeholders repeatedly stress that clear, stable signals about the use of BIM in public procurement are necessary to justify investments in capability development. Progressive and phased implementation approaches, rather than abrupt regulatory shifts, are widely seen as essential to allow market actors to adapt without excessive disruption.

8.6. Convergences and divergences across stakeholders' group and countries

At a high level, there is remarkable convergence across countries on the **strategic rationale** for BIM: better coordination, higher quality, reduced risk, and improved lifecycle value. There is also broad agreement that, under the right conditions, BIM can deliver further net benefits in public procurement.

Divergences arise primarily along three axes. First, **timing**: contractors and larger organisations tend to report earlier realisation of benefits, while smaller practices and designers often perceive BIM as a short-term burden with long-term promise. Second, **distribution**: public clients are structurally better positioned to capture lifecycle and portfolio-level benefits, whereas private firms shoulder much of the upfront investment. Third, **context**: countries and sectors with more mature standards, support structures, and market experience (as suggested by German and Austrian evidence) report a more favourable balance than those where cost

⁽³⁹⁾ Czech BIM Strategy, 2017/2024.

pressures and institutional support gaps remain acute (as highlighted in Portugal and parts of Greece).

These divergences do not undermine the overall case for BIM, but they do underscore the importance of **differentiated, context-sensitive policy support**.

8.7. Implications for Policy: aligning incentives with long term value

The cross-country evidence suggests that BIM can deliver further substantial net value in public procurement, particularly in larger and more complex projects and where lifecycle considerations are fully integrated. However, realising this value requires policies that **address the structural misalignment between short-term costs and long-term benefits**.

Key implications include: the need for proportionate and phased requirements aligned with project scale and market maturity; sustained investment in skills, standards and shared digital infrastructure; and procurement frameworks that place greater weight on whole-life value rather than initial cost alone. By rebalancing incentives and reducing adoption risk at firm level, such measures can help transform widely recognised potential benefits into consistently realised outcomes across the European public construction sector.

9. Impacts, Stakeholder Positions and Implementation Conditions

This section examines the likely impacts of introducing mandatory BIM in public procurement, based on stakeholder consultations, country case evidence and existing policy experience. The analysis focuses on three interrelated dimensions: the expected efficiency and quality gains, the adjustment costs and distributional effects across actors and the institutional and market conditions that shape implementation outcomes. The objective is not to assess the use of BIM as a method in abstract terms, but to identify **under which conditions a mandatory approach is likely to be effective, proportionate and credible**. These findings provide the analytical basis for the policy design choices discussed in Section 10.

9.1. Expected impacts

9.1.1. Efficiency, quality and lifecycle value

Across Member States, BIM has increased efficiency, consistency, and continuity of information rather than transparency and so improved coordination, reduced errors and rework and better continuity of information across the asset lifecycle, overall resulting in higher quality of built assets and the built environment. Evidence from more mature markets indicates that the main benefits tend to materialise in design coordination, cost control, change management and increased efficiency during construction and in the availability of structured DIGITAL information for operation and maintenance ⁽⁴⁰⁾. These effects are relevant for all projects, but show higher monetary benefits by complex projects, where information fragmentation and interface risks are highest.

However, the evidence also shows that the scope of the benefits depends on the quality of information management practices, the clarity of information requirements and the capacity of both contracting authorities and suppliers to integrate BIM into decision-making and project management processes. Where BIM is introduced primarily as a formal deliverable requirement, without corresponding changes in workflows and governance, impacts tend to remain limited and uneven ⁽⁴¹⁾.

⁽⁴⁰⁾ National BIM strategies and mature market case studies (e.g. FR, DE, AT).

⁽⁴¹⁾ Stakeholders evidence from all countries in the scope of this study

9.1.2. Costs and adjustment effects

In the short to medium term, the introduction of mandatory BIM entails adjustment costs for both public authorities and economic operators. These include investments in training and skills, organisational change, adaptation of procurement and contract management practices, and, in most cases, investments in software and IT infrastructure ⁽⁴²⁾. Stakeholders consistently describe these costs as front-loaded, while many of the efficiency and quality benefits accrue progressively over time and across the lifecycle of assets.

This temporal mismatch helps explain why support for mandatory BIM is frequently expressed in conditional terms. The perceived acceptability of obligations is closely linked to the availability of transition periods, guidance and support measures that reduce uncertainty and lower the initial adjustment burden ⁽⁴³⁾.

9.1.3. Market structure and competition

From a market perspective, BIM is expected to contribute further, in the medium term, to greater transparency, improved collaboration and more standardised information exchanges, more collaboration and enhanced digital culture. At the same time, stakeholders raise concerns that **poorly calibrated mandates** could generate adverse short-term effects, notably for SMEs. These include higher relative compliance costs, increased barriers to entry, and a temporary concentration of market opportunities among more digitally mature firms.

The evidence suggests that these risks are not inherent to BIM as such, but are closely linked to **how obligations are specified, phased and supported**. Proportionality, open standards and scalable requirements are therefore critical to mitigating potential distortions.

9.2. Stakeholder positions

9.2.1. Public authorities

Contracting authorities generally recognise the strategic relevance of BIM for digitising and modernising public construction management and improving control over project delivery and asset management.

⁽⁴²⁾ Stakeholders evidence all countries

⁽⁴³⁾ Stakeholders evidence; Greece, Portugal, Germany

Less mature or smaller authorities express stronger concerns about administrative burden and implementation risk, while more advanced central or sectoral bodies tend to view mandatory BIM as a useful coordination signal, provided it is embedded in a broader support framework.

9.2.2. Economic operators

Among economic operators, larger and more digitally mature firms are generally more favourable to mandatory BIM, as it can reduce fragmentation and create more predictable demand conditions. SMEs and less mature actors also see the benefits of mandatory BIM if supporting measures for costs for software, training and organisational impacts of transition are being put into place

Across firm sizes, there is broad convergence on the importance of open standards, clear information requirements and stable regulatory expectations.

9.2.3. Professional and sectoral organisations

Professional bodies and sectoral organisations typically support BIM as a driver of modernisation, quality improvement and better risk management. At the same time, they highlight the central role of skills development, organisational change and legal clarity, and warn against reducing BIM to a purely formal compliance exercise if obligations are introduced too rapidly or too rigidly.

9.3. Readiness and structural constraints

The level of BIM maturity varies significantly across Member States, sectors and types of contracting authorities. Key constraints identified in the evidence include uneven skills within public administrations, limited availability of structured training in some markets, fragmented use of standards and guidance, uncertainty about legal and contractual implications, and limited absorption capacity among smaller authorities and SMEs.

Conversely, experience from more advanced contexts suggests that when standards, guidance and support structures are in place, mandatory BIM can function as a stabilising and accelerating factor for diffusion, rather than as a source of disruption.

9.4. Key risks

Several systemic risks emerge from the analysis. These include administrative fragmentation, with divergent practices across contracting authorities; market

distortions affecting smaller actors; and loss of policy credibility if obligations are introduced without the means to implement and enforce them effectively.

These risks are consistently linked not to the principle of mandatory BIM itself, but to **the partial absence of proportionate scope, adequate sequencing and credible support measures, these need to be considered in the future.**

9.5. Analytical conclusion

Overall, the evidence indicates that mandatory BIM can generate further significant net benefits in terms of efficiency, quality and lifecycle value, particularly if obligations are proportionate and targeted, implementation must be supported (including proper education, training and certification programs), standards and guidance must precede or accompany legal requirements and sufficient transition periods must be ensured. This leads to a central policy conclusion: we need to **introduce mandatory BIM together with some support mechanisms**. On this basis, Section 10 examines the implications for regulatory architecture and an EU-level roadmap.

10. Threshold-Based Scenarios for BIM in Public Procurement: Policy Alignment, Cost–Benefit Balance, Roadmaps and Supporting Measures

10.1. Framing the Policy Question: Should BIM Be Mandatory, and Under What Conditions?

The revision of the Public Procurement Directives raises a fundamental policy question: whether, when, and under which conditions Building Information Modelling (BIM) should be required in public procurement. This question cannot be assessed in isolation from the **current legal framework**, which already allows—but does not structure—the use of digital modelling tools in public works procurement.

10.1.1. The current legal baseline and its limitations

The revision of the Public Procurement Directives raises a fundamental policy question: whether, when, and under which conditions Building Information Modelling (BIM) should be required in public procurement. This question cannot be assessed in isolation from the **current legal framework**, which already allows—but does not structure—the use of digital modelling tools in public works procurement.

The current legal baseline and its limitations

Article 22(4) of Directive 2014/24/EU provides that, for public works contracts and design contests, *Member States may require the use of specific electronic tools, such as building information electronic modelling tools or similar*. Where such tools are required, contracting authorities must offer alternative means of access until those tools become generally available.

While this provision established an important legal gateway for digitalisation, it also presents **three structural limitations** that have become increasingly evident in practice.

First, the Directive **does not define what is meant by “electronic modelling tools or similar”**, nor does it specify the scope, content, level of detail, or intended use of such tools. As a result, contracting authorities are legally permitted to require “BIM” or “electronic models” without clarifying what this entails in operational terms.

Second, the absence of a common definition or minimum requirements has led to **highly divergent interpretations** across contracting authorities and Member States. In practice, “BIM” may refer to anything from:

- basic 3D geometry with no structured information,
- discipline-specific models produced in proprietary formats,
- partial alphanumeric datasets disconnected from geometry, or
- fully coordinated, information-rich models intended for lifecycle use.

This variability creates **legal and market uncertainty**, as economic operators cannot reasonably anticipate what will be required under a “BIM” label alone.

Third, this ambiguity has **direct implications for competition and proportionality**. Where requirements are not clearly defined, contracting authorities' risk:

- unintentionally favouring specific tools, workflows, or incumbents;
- imposing disproportionate burdens on SMEs;
- generating disputes at tender and execution stages over unmet or misunderstood expectations.
- Overpaying for excessive data that does not correspond to the actual information needs of clearly defined BIM use cases.

In effect, while Article 22(4) permits the use of digital modelling tools, it does so **without providing the necessary regulatory clarity to ensure legal certainty, equal treatment, and proportionality**. The result is a fragmented landscape in which BIM is simultaneously allowed, encouraged, and poorly specified—undermining its potential benefits for both the public sector and the market.

10.1.2. From permissive ambiguity to structured proportionality

Evidence gathered through this study, as well as from EU-level assessments, shows broad consensus on BIM's potential to improve coordination, quality, risk management, and lifecycle value. At the same time, stakeholders consistently emphasise that **BIM does not deliver value by default**. Benefits materialise only when three conditions evolve together:

- clearly defined information requirements, specifying what is expected and why;
- sufficient institutional and market capacity, particularly among contracting authorities and SMEs; and

- a predictable implementation trajectory, allowing investments in skills and tools to be amortised over time.

Against this background, the policy question is not whether BIM should be mandatory *per se*, but **how to move from the current permissive but ambiguous framework towards a structured, proportionate, and legally robust approach.**

10.1.3. Analytical rationale for a threshold- and use-based approach

The proposed BIM mandate framework responds directly to the limitations of the current legal situation through three core design principles.

First, it builds on **procurement threshold logic that contracting authorities already understand and apply**. Rather than introducing a single, uniform BIM obligation, requirements are linked to:

- contract value, anchored in EU procurement thresholds; and
- a clear classification of project complexity.

This approach aligns with the proportionality principle and avoids imposing identical digital obligations on projects with fundamentally different risk and coordination profiles.

Second, it shifts from tool-based ambiguity to a **use-based definition of BIM**, by specifying *mandatory BIM uses per phase*. Drawing on international precedents, such as Brazil's federal Decree No. 10,306/2020 and the Czech BIM Act, which requires BIM deliverables at key legal milestones including permitting, construction, approval, handover, and renovation, BIM is defined not by software or formats, but by clearly articulated purposes (e.g. coordination and clash detection, quantity take-off, planning and control, as-built information, asset management), with delivery in open, non-proprietary formats. This directly addresses the current problem whereby "BIM" is required without clarity on expected outputs or value.

Third, it distinguishes between **procurement-oriented BIM requirements** and more advanced digital ambitions such as BIM-based permitting and Digital Building Logbooks (DBL). The latter are treated as **strategic end-states rather than entry conditions**, reflecting EU evidence that such transitions require municipal capacity, robust data governance, and progressive maturation of machine-readable regulation. The EU Digital Building Permit study underlines that regulatory rules must first become clear, measurable, and finitely interpretable before automation can be scaled reliably.

10.1.4. Alignment with EU strategic objectives

European Strategy for Housing Construction (COM (2025) 991) explicitly identifies the simplification and digitalisation of permitting and administrative procedures as a productivity lever, while recognising uneven digital maturity across Member States and the predominance of SMEs in the construction sector. The Strategy highlights that permitting delays significantly increase construction costs and acknowledges the demonstrated potential of digital tools, including BIM, to reduce administrative burden and shorten decision-making timelines.

The European Affordable Housing Plan (COM (2025) 1025) reinforces this logic, positioning digitalisation and administrative simplification as key enablers of increased housing supply and affordability.

Finally, the recast Energy Performance of Buildings framework (Directive (EU) 2024/1275) provides a clear long-term direction through the introduction of Digital Building Logbooks, while explicitly warning against fragmentation and lack of interoperability. This reinforces the need for a **phased and coherent pathway**, rather than premature or inconsistent mandates.

10.1.5. Scope and structure of the scenario analysis

For these reasons, the analysis does not treat mandatory BIM as a binary choice. Instead, it assesses three contrasted scenarios reflecting different policy stances on:

- thresholds and proportionality;
- timing and sequencing; and
- the role of supporting measures.

These scenarios should not be understood as static alternatives, but as **successive stages along a potential implementation pathway**, where progression must remain evidence-based and reversible.

Defining a “minimum viable mandate”

To avoid over-prescription and disproportionate burdens, policy design should distinguish between core minimum obligations, and more advanced or project-specific BIM uses. A “minimum viable” mandate would focus on information management processes rather than tools, rely on open and interoperable standards, and allow scalability according to project size and complexity.

Clear definition of services, responsibilities and remuneration is also essential to avoid unfunded mandates and legal uncertainty. This supports a graduated obligation model anchored in a common European framework but adaptable to different national construction practices, maturity levels and project contexts.

10.2. Scenario 1 – Status Quo: No Change to Current Provisions

Description

Under Scenario 1, the revised Directives introduce no new BIM-related provisions. BIM remains permissible but entirely voluntary, without common definitions, thresholds, or standardised information requirements. Application continues on a case-by-case basis at the discretion of contracting authorities.

Advantages

The status quo avoids introducing new compliance obligations in a context of uneven digital maturity across Member States. It preserves flexibility for national approaches and avoids imposing requirements on markets that are not yet institutionally ready.

Risks and disadvantages

However, evidence indicates that the absence of a common framework perpetuates fragmented practices. BIM adoption remains concentrated in design phases and among larger organisations, while SMEs face unclear demand signals and limited incentives to invest. Contracting authorities repeatedly incur bespoke transaction costs when attempting BIM adoption without shared templates, evaluation criteria, or acceptance tests.

From an EU policy perspective, Scenario 1 also remains misaligned with emerging objectives in housing delivery, productivity, and digitalisation. EU policy initiatives increasingly identify digital tools, including BIM, as enablers of faster permitting, reduced administrative burden, and improved value for money. These benefits cannot scale in the absence of structured procurement-level information requirements.

Cost–benefit balance

While Scenario 1 avoids short-term adjustment costs, it delivers a **negative medium-term cost–benefit profile**, as isolated BIM initiatives fail to accumulate learning effects, interoperability, or lifecycle value.

Indicative trajectory

Scenario 1 entails no implementation roadmap and represents policy stagnation rather than a viable long-term option.

10.3. Scenario 2 – Voluntary but Framed BIM Usage

Description

Scenario 2 introduces a **structured voluntary framework** at Directive level. BIM remains non-mandatory, but its use is framed through:

- a harmonised BIM definition aligned with international standards;
- standardised organisational, exchange, and asset information requirement templates;
- mandatory use of open, non-proprietary formats;
- indicative value thresholds (anchored to EU procurement thresholds) where BIM use is recommended; and
- a published strengthening roadmap signalling possible future evolution.

Advantages

By reducing definitional and procedural uncertainty, Scenario 2 lowers entry barriers for both contracting authorities and market actors. Standardised templates and guidance reduce per-project specification costs and improve predictability for SMEs. The publication of indicative thresholds and a forward-looking roadmap addresses a key concern raised by stakeholders: the lack of clarity on future requirements.

Scenario 2 also aligns with EU housing and productivity objectives. Recent EU policy initiatives explicitly recognise that permitting delays increase costs and uncertainty and that digital tools such as BIM can reduce administrative burdens and accelerate decision-making, including through BIM-enabled permitting systems where maturity allows.

Risks and disadvantages

The principal risk lies in uneven uptake. Voluntary provisions may be adopted primarily by more mature administrations, perpetuating fragmentation across Member States. Without a regulatory obligation, the demand signal may remain insufficient to trigger broad-based capability building, particularly among SMEs.

Cost–benefit balance

Scenario 2 can deliver a **positive but uneven cost–benefit balance**. Benefits materialise where uptake occurs but remain contingent on political and administrative commitment at national and local levels.

Indicative implementation roadmap

- Years 1–2: Introduction of harmonised definitions, open format requirements, and model information requirement templates.
- Years 2–3: Publication of indicative thresholds and voluntary application guidance.

Years 3–6: Evidence review assessing uptake, costs, and benefits to inform any potential transition toward mandatory provisions.

10.4. Scenario 3 – Mandatory BIM with Graduated Requirements, Dynamic Thresholds and Phased Roadmaps

Description

Scenario 3 introduces **mandatory BIM requirements** in public procurement, calibrated through a combination of **procurement value thresholds**, **project complexity**, and **graduated levels of information and coordination requirements**. Rather than imposing a single, uniform obligation, this scenario applies **different mandatory BIM requirements depending on where coordination risk, delivery risk, and long-term public value are highest**.

The mandate is structured around three core principles:

- procurement value bands anchored in EU works thresholds, ensuring legal coherence and administrative familiarity;
- a project complexity lens, preventing under- or over-regulation based on contract value alone; and
- progressively stronger information and coordination requirements, each linked to a distinct policy objective, from procurement clarity to lifecycle value.

Mandatory BIM is defined through **clearly specified uses and expected deliverables**, not through software prescriptions. Open, non-proprietary formats are required to preserve interoperability, competition, and SME access.

BIM-based permitting and Digital Building Logbook integration are treated as **strategic end-states rather than entry conditions**, reflecting EU evidence that automation requires municipal capacity, mature data governance, and regulations that are clear, measurable, and finitely interpretable before scaling.

Graduated mandatory BIM requirements

Under Scenario 3, mandatory BIM is operationalised through **graduated levels of obligation**, which build cumulatively as project value and complexity increase.

At the **entry level**, mandatory requirements focus on **coordination and information management for procurement**. The objective is to reduce design inconsistencies, improve tender clarity, and ensure reliable quantities, without imposing unnecessary modelling or data burdens. Contracting authorities require discipline models for relevant systems, model-based coordination and clash management, and structured extraction of tender and construction documentation from models. Deliverables are limited to what is strictly necessary for procurement and coordination: a federated coordination model in an open format, documented issue resolution, and model-derived documentation where still legally required. A project common data environment and a simplified execution plan are mandatory, ensuring traceability, version control, and clear responsibilities.

For **larger or more complex projects**, mandatory requirements extend to **production control and predictability**. Here, BIM is required to support cost control, scheduling, and progress monitoring, proportional to project risk. Contracting authorities require model-linked quantities, coordinated models at defined gateways, and—where relevant—schedule-linked outputs. Information delivery becomes more structured, supported by a full execution plan and explicit acceptance criteria. This level targets projects where evidence shows that BIM delivers the clearest cost–benefit gains.

For **major projects or assets with significant operational or policy relevance**, mandatory requirements extend to **lifecycle and asset readiness**. Procurement deliverables are aligned with handover, maintenance, and long-term asset management needs. Verified as-built information models, structured asset data, and material or component identifiers are required where justified. These requirements ensure that procurement does not preclude future integration with digital building logbooks or advanced permitting systems, without making such integration a condition for compliance.

Advantages

A graduated mandatory approach provides the **strongest and most predictable demand signal** for sustained investment in BIM capability, while preserving proportionality. By targeting higher-value and higher-complexity projects first, the mandate applies where BIM's cost–benefit balance is most robust and institutional capacity strongest.

Crucially, the structure allows thresholds and requirements to evolve **only on the basis of evidence**, avoiding premature or irreversible obligations.

Scenario 3 is also the option **most closely aligned with EU housing, productivity, and digitalisation objectives**, notably those aimed at reducing coordination failures, shortening delivery times, and lowering administrative friction in construction and permitting processes.

Risks and disadvantages

The principal risk under a mandatory regime is **formal compliance without value creation**. If requirements are imposed without adequate transition periods, guidance, and support, contracting authorities may struggle to specify, evaluate, and manage BIM obligations, while SMEs may face disproportionate upfront costs.

For this reason, Scenario 3 is viable **only if phased implementation and enforceable proportionality mechanisms are treated as core design features, not optional safeguards**.

Cost–benefit balance

With appropriate supporting measures, Scenario 3 offers the **most favourable long-term cost–benefit profile** of all scenarios. While upfront implementation costs are higher than under voluntary approaches, productivity gains, reduced errors, and lifecycle efficiencies accrue over a five- to ten-year horizon at portfolio level. Evidence suggests that value realisation is strongest where requirements are clearly defined, stable over time, and aligned with project scale and risk.

Indicative implementation roadmap

- Preparatory phase (Years 1–3)
An EU-level framework is established, including standard definitions, templates, and guidance. Mandatory thresholds and graduated requirements are announced with clear lead times, allowing market actors to plan investments.
- Phase 1 (Years 3–5)
Mandatory BIM applies to higher-value and higher-complexity projects, focused on coordination and delivery control. A formal evidence review assesses uptake, costs, and benefits.
- Phase 2 (Years 5–7)
Conditional extension to lower thresholds or broader application of lifecycle-oriented requirements, subject to positive review outcomes.
- Phase 3 (Year 7+)
Possible further extension aligned with EU works thresholds. No automatic calendar-driven progression; each step requires an explicit policy decision based on evidence.

Risk mitigation

Risks of overreach are mitigated through:

- a clearly defined minimum mandatory baseline, limited to what is strictly necessary for procurement clarity and coordination;
- long transition periods (18–36 months);
- enforceable proportionality clauses; and

- comprehensive supporting measures, set out below.

10.5. Thresholds

Thresholds are a central design variable in any potential BIM-related intervention. They are not merely technical filters, but **regulatory instruments** that shape risk exposure, absorptive capacity, and the distribution of costs and benefits across contracting authorities and economic operators. Properly calibrated, thresholds can support gradual market adaptation, focus obligations where public value is highest, and reduce compliance and litigation risks. Poorly calibrated, they risk being perceived as an additional administrative layer rather than as a simplification mechanism.

Thresholds can be defined along several complementary dimensions, including **contract value, project type and technical complexity, category of contracting authority, and institutional capacity**. Interviews conducted for this study confirmed broad stakeholder support for a differentiated approach but also highlighted that no single monetary threshold would be considered universally appropriate. Instead, stakeholders consistently emphasised two points: the need for **clarity and predictability** regarding when obligations apply, and the importance of understanding in advance how threshold choices affect procurement practice, supply chains, and investment decisions.

From a regulatory design perspective, the challenge therefore lies less in selecting a precise numerical value than in ensuring that threshold-setting is clearly framed as a **risk-management and simplification tool**—concentrating requirements on higher-value and higher-risk projects—rather than as an indiscriminate expansion of procedural obligations.

Anchoring thresholds in EU procurement logic

One anchor point for any EU-level approach is the existing public procurement threshold framework. EU procurement thresholds applicable from 1 January 2026 include €5,404,000 for works contracts, with lower thresholds for supplies and services depending on the category of contracting authority. Using the EU works threshold as a major trigger for BIM obligations aligns with established cross-border interest logic and provides immediate legal familiarity for contracting authorities.

However, desk research and comparative evidence from Member States suggest that **effective BIM mandates rarely rely on a single threshold**. Where mandates aim to transform delivery practices rather than merely formalise existing ones, they often introduce **graduated obligations below the EU works threshold**, while preserving proportionality. Italy's phased approach, which culminates in BIM requirements for many public works down to €1 million after successive stages at higher values, and Denmark's ICT regulation, which links

digital model requirements to differentiated value bands and explicitly allows waivers for renovation and maintenance, both illustrate how thresholds can be used dynamically rather than as binary switches.

These examples confirm that anchoring to EU thresholds provides legal coherence, but **does not preclude more nuanced calibration**, provided that obligations scale with risk and capacity.

Combining value thresholds with project complexity

A value-only approach risks under-requiring BIM for technically complex or safety-critical projects below the threshold, while over-requiring it for simple projects above it. Conversely, a purely complexity-based approach risks arbitrariness and inconsistent application. For this reason, the proposed approach combines **contract value bands with a structured project complexity classification**, an approach that is consistent with the dynamic threshold logic developed under Scenario 3.

Under this logic, lower-value and low-complexity projects are subject to limited or voluntary requirements, while higher-value and higher-complexity projects trigger progressively stronger obligations. Complexity is assessed based on objective characteristics such as the number of systems and interfaces, phasing constraints, safety or performance requirements, regulatory context, and delivery conditions (for example, dense urban settings, heritage constraints, or accelerated delivery models). This reflects the Commission's recognition that digital maturity and process integration vary significantly across Member States and across lifecycle stages, and that mandatory requirements must therefore **scale by context and risk profile**, rather than by value alone.

Graduated mandatory application

Applying thresholds through a matrix of **value bands and complexity levels** allows mandatory BIM requirements to be introduced in a **phased and evidence-responsive manner**, rather than through a single step change. Below a lower sub-threshold band (around €1 million), BIM remains voluntary or limited to simplified coordination-focused requirements were justified by complexity. Between this lower band and the EU works threshold, minimum mandatory requirements can apply for medium- and high-complexity projects, while remaining proportionate for simpler works. Above the EU works threshold, mandatory requirements become the norm, with their scope increasing for larger and more complex projects. For major projects, higher-value bands can justify lifecycle-oriented deliverables aligned with long-term asset management needs.

Such a structure supports the **phased roadmap approach** envisaged under Scenario 3, in which mandatory scope is expanded only following defined transition periods and evidence reviews, ensuring that thresholds remain adaptable rather than static.

Proportionality and SME impact

From a proportionality perspective, threshold choices have important distributive effects. Higher thresholds limit immediate compliance costs and concentrate obligations where economies of scale are strongest but may slow market-wide diffusion. Lower thresholds accelerate standardisation and learning effects, but increase short-term adjustment costs, particularly for SMEs and smaller contracting authorities.

To manage this trade-off, the threshold model embeds **explicit proportionality and transition mechanisms**, which are essential to the legal and operational viability of a mandatory scenario. These include simplified mandatory pathways for smaller or lower-risk projects, reduced information requirements, and simplified execution planning. They also include the possibility for contracting authorities to provide or procure shared digital collaboration environments, reducing fixed costs and avoiding vendor lock-in—an approach already normalised in some Member States.³ Transitional windows of sufficient length, combined with explicit waivers for renovation and maintenance works where costs outweigh benefits, further strengthen legal defensibility and market acceptance.

Policy rationale and link to Scenario 3

This threshold framework forms the **analytical and legal foundation of Scenario 3 (mandatory BIM with dynamic thresholds and phased roadmaps)**. In that scenario, thresholds operate not as fixed regulatory cut-offs but as **adaptive policy levers**, enabling mandatory requirements to be introduced first where public value, risk reduction, and productivity gains are most demonstrable. Regular evidence reviews and clearly defined transition windows allow thresholds to be adjusted over time, ensuring that any extension of scope reflects demonstrated market readiness and institutional capacity rather than automatic calendar effects. In this way, threshold-setting becomes a core instrument for managing transition risk, safeguarding proportionality, and sustaining long-term policy credibility.

10.6. Supporting Measures as Legal and Operational Preconditions

Supporting measures are not ancillary to the policy choice on BIM. They are **legal and operational preconditions** for any effective use of BIM in public procurement and become **decisive** where mandatory approaches are envisaged. Without them, a BIM mandate would risk legal fragility under proportionality and non-discrimination principles, inconsistent implementation across Member States, and limited value creation in practice.

Evidence from Member States and EU-level studies consistently shows that BIM delivers benefits only when obligations are **clearly specified, institutionally supported, and introduced along a predictable trajectory**. Supporting measures therefore serve three simultaneous functions: ensuring legal certainty, enabling operational feasibility, and safeguarding market access—particularly for SMEs.

EU-level clarification and standardisation

A first precondition is **clarity at EU level** on what constitutes BIM in procurement terms. The current legal framework allows contracting authorities to require electronic modelling tools, but does not define the scope, content, or expected outputs of such requirements. In the absence of common reference points, contracting authorities may impose widely divergent—and sometimes incompatible—interpretations of “BIM”, leading to legal uncertainty, fragmented market practices, and barriers to competition.

EU-level reference instruments are therefore essential. These include shared definitions of procurement-relevant BIM uses, model templates for information requirements and execution planning calibrated to different levels of obligation, and standard acceptance criteria. Harmonised evaluation principles are equally important to prevent discriminatory tender practices based on proprietary tools or excessive data demands. Such instruments do not impose uniform solutions, but establish a **common baseline of expectations**, allowing proportional adaptation at national or project level.

Contracting authority capacity and procurement practice

Mandatory or semi-mandatory BIM cannot succeed unless contracting authorities are able to **specify, assess, and manage BIM requirements competently**. Capacity-building must therefore focus on BIM as a **procurement and contract-management instrument**, not as a design or modelling exercise.

This includes training on how to define information needs linked to procurement objectives, how to assess compliance with model-based deliverables, and how to manage risk allocation and acceptance testing over the project lifecycle. Clear guidance is also required on how BIM obligations interact with contractual remedies, change management, and performance verification. Without such capacity, there is a high risk of formal compliance without effective use, undermining both value for money and legal robustness.

Safeguarding SME participation and market access

SME accessibility is a central proportionality concern. While BIM can lower barriers over time by improving transparency and coordination, upfront costs related to tools, processes, and learning remain a constraint—particularly in markets where demand signals are fragmented or unstable.

Supporting measures must therefore actively mitigate fixed costs. One effective approach, already demonstrated in several Member States, is the use of **client-provided or shared digital collaboration environments**, reducing duplication and avoiding vendor lock-in. Complementary financial instruments—such as targeted vouchers, transitional funding, or support for initial capability building—can further smooth the transition, particularly during early mandatory phases.

These measures are not subsidies to industry, but **investments in market functioning**, ensuring that competition remains broad and innovation-driven rather than concentrated among a small number of large suppliers.

Transitional arrangements and enforceable proportionality

Transition periods are not merely good practice; they are essential for compliance with EU proportionality principles. Evidence suggests that transition windows of 18 to 36 months are necessary to allow contracting authorities, suppliers, and training systems to adjust meaningfully to new obligations.

In parallel, proportionality must be enforceable in practice, not only stated in principle. Explicit provisions allowing derogations for renovation and maintenance works—where modelling costs outweigh expected benefits—are an important safeguard, as demonstrated by existing national frameworks. Clear criteria for such waivers reduce legal uncertainty and prevent inconsistent application across contracting authorities.

Coherence with permitting and digital building logbook pathways

Finally, supporting measures must ensure **clear separation between procurement-oriented BIM requirements and more advanced digital permitting or building logbook systems**. While BIM can support future automation, EU evidence shows that premature linkage to permitting or regulatory automation risks failure if underlying rules are not yet clear, measurable, and machine-readable.

Supporting measures should therefore frame advanced digital permitting and lifecycle data integration as **progressive pathways**, aligned with broader regulatory and data-governance reforms, rather than as immediate compliance requirements. This sequencing preserves optionality, avoids overburdening early adopters, and ensures that procurement reform does not outpace institutional readiness.

In sum, supporting measures are the backbone that determines whether BIM policy remains aspirational or becomes operational. They are indispensable under all scenarios, but **they are the condition that makes a graduated mandatory approach legally defensible, economically efficient, and politically sustainable**.

This study confirms that Building Information Modelling (BIM) in EU public procurement is no longer experimental. Adoption is real and expanding, particularly among large infrastructure clients and major economic operators. However, market readiness remains structurally uneven. Digital maturity correlates strongly with organisational scale, project value and technical complexity. Without regulatory coordination, this divergence risks becoming entrenched.

The economic case for BIM is well substantiated. Evidence across Member States consistently demonstrates improved coordination, reduced rework, better cost predictability and stronger lifecycle information continuity. These gains are most visible in complex and high-value projects. However, benefits depend on structured implementation and typically materialise over time, while adjustment costs are front-loaded. This temporal imbalance explains both stakeholder caution and the importance of phased policy design.

The principal barriers identified are institutional rather than technological. Public-sector capability gaps, fragmented standards, legal uncertainty regarding liability and remuneration, and inconsistent information requirements represent systemic constraints. In this context, the effectiveness of any EU intervention depends less on the formal introduction of an obligation and more on the clarity, sequencing and support architecture accompanying it.

For the Impact Assessment, the central policy insight is that the question is not whether BIM can be required, but under which conditions such a requirement produces net Union-wide benefits.

The scenario analysis in Section 8 demonstrates that a purely permissive approach maintains fragmentation, while a structured voluntary framework improves clarity but may not close maturity gaps. A mandatory approach can be justified where it is proportionate, threshold-based and dynamically sequenced. Thresholds emerge as the core regulatory lever: by anchoring obligations to contract value and project complexity—starting with coordination-focused requirements and scaling towards lifecycle deliverables for major works—EU action can concentrate regulatory intensity where cost–benefit ratios are strongest.

Proportionality is therefore operationalised not as a general principle, but through concrete design features: value bands aligned with EU procurement logic; differentiated requirements for low-, medium- and high-complexity projects; phased implementation windows; simplified compliance routes for smaller contracts; and explicit review mechanisms. Such a model allows gradual market adaptation while limiting SME exposure to disproportionate burdens.

SME impact remains a decisive consideration. Construction markets across the Union are dominated by small and micro-enterprises. Regulatory design must therefore ensure that BIM obligations do not reinforce market concentration or create de facto barriers to entry. Simplified requirements for lower-value projects,

shared digital infrastructure options, transition periods and targeted support mechanisms are essential to safeguard competitive neutrality and inclusiveness.

EU intervention is justified where it enhances internal market coherence, reduces fragmentation of national mandates, and aligns procurement practice with the Union's digital and green objectives. However, effectiveness depends on complementary measures: open and interoperable standards to avoid vendor lock-in; strengthened client capability; harmonised guidance; and coordinated monitoring and feedback loops allowing calibration over time.

The evidence supports the introduction of a **minimum viable EU BIM framework centred on structured information management rather than specific tools or software**. Whether implemented as a framed voluntary model or as a dynamic mandatory regime, regulatory clarity must precede regulatory intensity. Standards, templates and governance arrangements should be operational before full enforcement of obligations.

Ultimately, mandatory BIM at EU level should not be conceived as a stand-alone technical requirement. It constitutes a governance instrument for improving the efficiency, transparency and sustainability of public construction procurement. If carefully calibrated through thresholds, phased rollout and institutional support, it can strengthen competitiveness, lifecycle performance and strategic autonomy. If introduced without proportionality safeguards and implementation capacity, it risks generating administrative burden and uneven compliance.

The policy choice facing the European Commission is therefore one of design and sequencing. The study demonstrates that a proportionate, threshold-based and roadmap-driven approach offers a credible pathway to align digital transformation with internal market principles while maximising public value.

Annexe: Authors information

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Portugal - António Aguiar Costa is Associate Professor at Instituto Superior Técnico, University of Lisbon, and a recognised specialist in BIM and digital transformation in the construction sector. He has contributed to BIM implementation and policy development in Portugal, including the national BIM strategy process, and has played a leading role in BIM standardization through his presidency of CT197-BIM, the Portuguese National BIM Standardization Committee. He has represented Portugal in CEN/TC442 and in the EU BIM Task Group, contributing to European work on BIM standards, digital information management, and sectoral transformation. He also served as President of the

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Austria - Peter Kompolschek is an architect and a graduate of Graz University of Technology, running his own architectural firm in Vienna and Villach. Since its founding, he has been the Austrian delegate to the EU BIM Task Group and is currently a member of its steering committee. He has been involved in national BIM standardization since 2007 and has served as national chair since 2010. Since the founding of CEN/TC 442, he has been the chair of WG03 "Information Delivery" and is a co-author of several national and international standards and is currently particularly involved in the further development of the EN ISO 19650 series.

Czech Republic - Leoš Svoboda works at the Ministry of Industry and Trade of the Czech Republic on legislation and strategy for the national BIM implementation and represents the country in international initiatives, including the EU BIM Task Group and the EU BIM Public Officials Group. He is a co-author of the Czech BIM Strategy, the BIM Act, and the Spatial Information Infrastructure Development strategy. He graduated from the Faculty of Civil Engineering at the Czech Technical University and had a two-decade career in a global corporation in the United States and Europe. In BIM, he provided consulting to public and private entities and participated in research projects in the digitalization of the built environment. As Vice-Chairman of the Czech BIM Council, he was responsible for establishing the buildingSMART Czech Republic Chapter and

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