

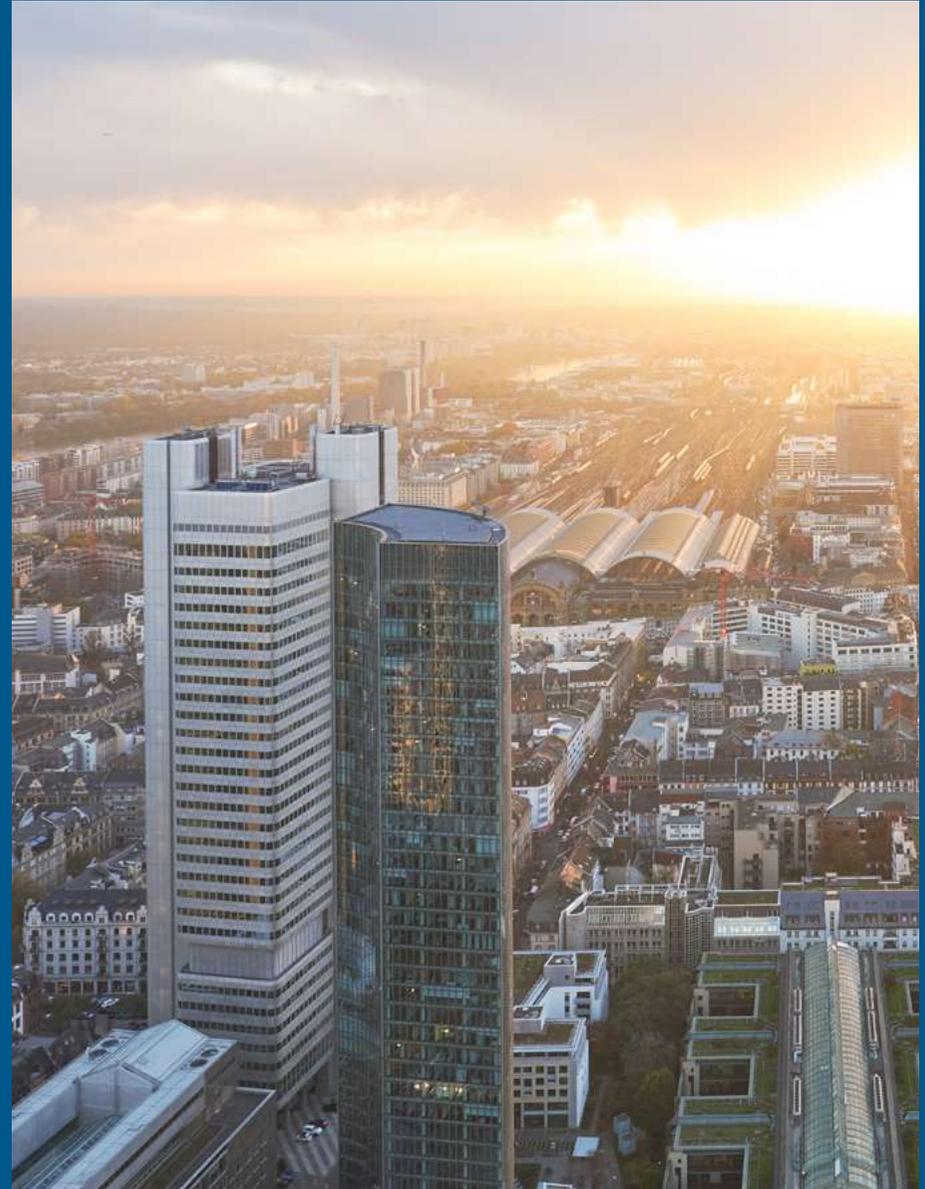


CONSORTIUM
OF EUROPEAN
BUILDING CONTROL

Building control

E-DELIVERY REPORT

May 2023



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About the Consortium of European Building Control (CEBC)

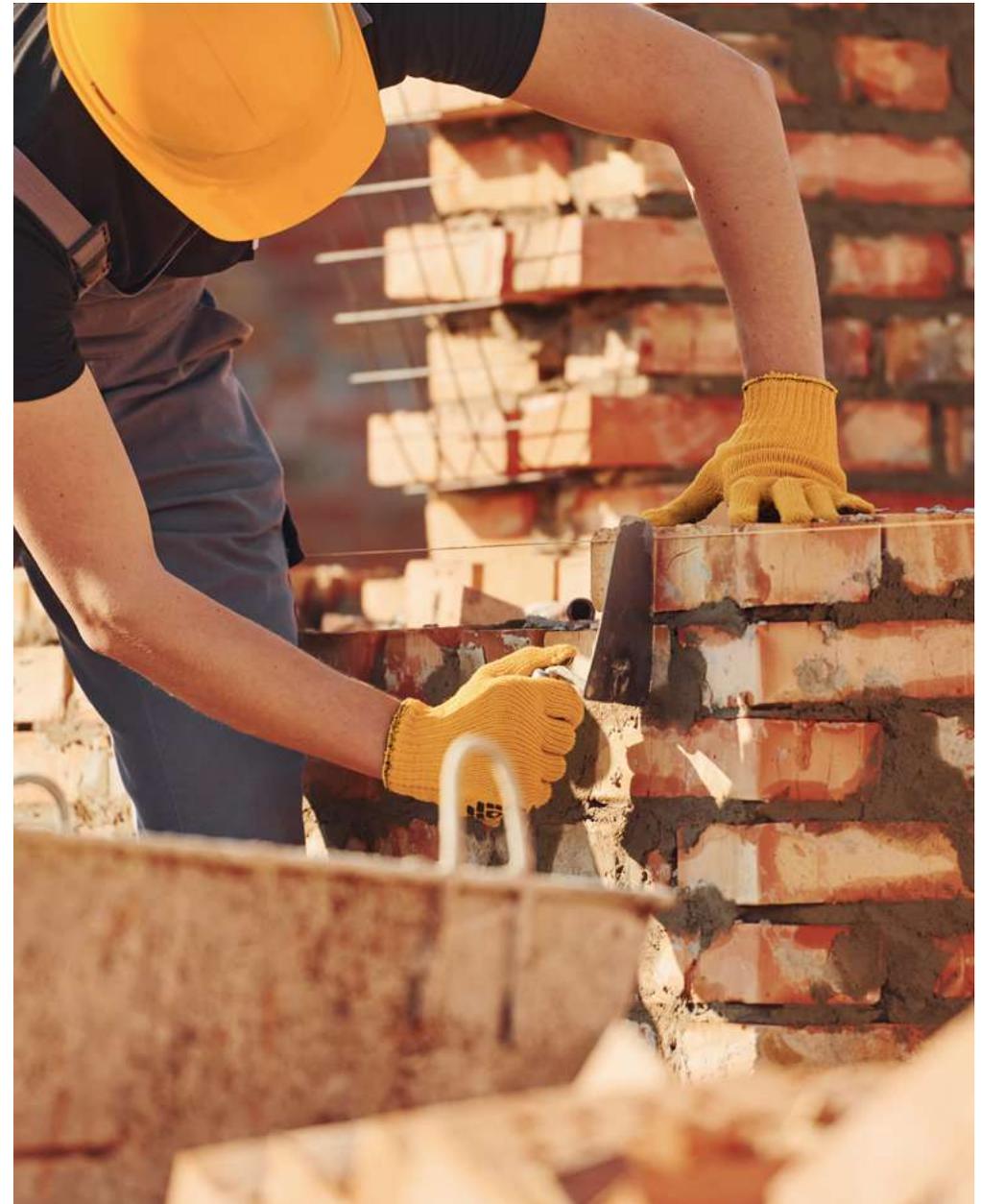
CEBC is an independent public organisation composed of member organisations (members) representing different European countries and associated non-European countries from both public and private sectors.

CEBC is comprised of about twenty-eight institutions from twenty countries. Members are involved in building control or in the development of appropriate legislation and standards associated with health, safety, accessibility, energy conservation and sustainability aspects of the built environment and include professional organisations, government bodies or a comparable agency.

The aim of the CEBC is to promote and contribute to improving the safety and sustainability of the built environment and to promote modern building control systems, which are both sustainable and business friendly.

Website: www.cebc.eu

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Introduction

The construction industry plays a significant role in many nations. This industry not only impacts the economy, but also has a direct influence on the social aspects of life, by creating, modifying, and improving the living environment. At the same time, the construction industry has a significant impact on the environment throughout the whole life cycle of a building, starting with the mining of raw materials and continuing until the end of a buildings life, i.e., its demolition. For example, in the European Union the construction sector provides eighteen million direct jobs and contributes about 9% of the European Union's gross domestic product. It also creates new jobs, drives economic growth, and provides solutions for social, climate and energy challenges¹. In recent years, the construction industry has faced major challenges in ensuring a balance between environmental, social, and economic aspects, and the manner in which the construction process is realised. The construction industry has been significantly affected by the COVID-19 pandemic. It is now critical to seek new approaches and apply creative and innovative solutions for the improvement of the construction process to be both competitive and sustainable. The role of digitalisation, automation, and the use of new technologies in the construction process is developing at pace. These technologies, as well as open data, provide additional support for the decision-making processes in the context of unconventional and sudden events. Government strategy and tactics play a significant role in achieving the main principles of sustainability.

In May 2018 CEBC published the first report on e-delivery in Europe, which provided an overview and comparison of electronic delivery of building control processes among member organisations. The replies to an online questionnaire accessed by thirty member organisations were analysed. It was found that the degree of digitalisation within member organisations (and member countries) varied greatly. What was common among all members was the understanding that there was a need to start the digitalisation process and to find new solutions for management of the construction process. New ideas and solutions were constantly being developed.

The challenges that the economies of all nations faced within the last few years, especially the restrictions caused by the pandemic, have intensified the necessity to give more attention to the digitalisation processes within the construction industry. CEBC members consequently took a decision to reassess the progress of digitalisation among the members and to provide an overview and comparative analyses of the data.

It is important to point out that the construction field is a non-harmonised area. All countries have developed their own systems to create a living environment of good quality, to ensure sustainable development, preservation of cultural, historical, and environmental values, as well as rational use of energy resources. In some countries the system mostly operates on state/municipal level, in others it is a dual system – joint public and private. The level of the centralisation also varies. In order to have an in-depth analysis of the digitalisation level of construction administrative process it is important to know an existing model system in a particular country. The report provides data-based analysis of the digitalisation level of construction administrative process among CEBC member states.

The report was prepared by the CEBC e-delivery working group: Diane Marshall (UK); Marcin Cudak (PL); Øyvind Kikut (NO); Pekka Virkamaki (FI); Saša Galonja (SI); Svetlana Mjakuškina (LV); Vytautas Ambrasas (LT).

¹ The European construction sector – A global partner – 2016 edition:
<https://ec.europa.eu/docsroom/documents/15866/attachments/1/translations>

Research design

The research subsequently performed by the CEBC e-delivery working group employed mainly qualitative research methods, such as questionnaires and logical constructive analysis. The web-based electronic questionnaire was composed of 70 questions (Annex A), divided into several parts:

General part – questions 1 to 11

Planning and permitting phase – questions 12 to 32

Construction phase – questions 33 to 44

Commissioning / completion of construction– questions 45 to 50

Use and maintenance - questions 51 to 56

Usage of BIM - questions 57 to 69

Best practice solutions – question 70

The survey was sent to the twenty-five individual members of CEBC. The answers were received between October and December 2022 from twenty-one respondents from seventeen countries:

1. Norway
2. United Kingdom (Scotland, England, Wales and Northern Ireland)
3. Denmark
4. Turkey
5. Cyprus
6. Slovenia
7. Lithuania
8. Poland
9. Spain
10. Finland
11. Romania
12. Ireland
13. Estonia
14. Germany
15. Croatia
16. Latvia
17. France



Executive summary

General information

The CEBC survey revealed that the last five years have brought a lot of changes in the construction digitalisation arena. Most European countries made significant and ambitious steps forward along the road of progress: creating user-friendly electronic services, adopting building control digital tools, or even starting innovative BIM related projects.

Therefore, the level of digitalisation around Europe in 2017 and in 2022 are two very different stories. In 2017 many European countries were still searching for the right electronic solutions to respond to the market demands to minimise bureaucracy, improve productivity, and increase the efficiency of construction management, today numerous modern tools and information systems are used.

Great examples of digitalisation have already increased the speed of services in construction, reduced the risk of human error in the project checking process and ensured more efficient building control. However new technologies and digital tools raise new challenges and opportunities, which must be addressed by politicians, practitioners, and developers.

What is the level of digitalisation in the field of construction around Europe? What digital solutions are adopted, and which phases of construction processes are digitalised in different countries? What could be learned from the pioneers of digitalisation and where can you find good practices? What is planned in construction digitalisation in the future? What are the new possibilities that BIM brings and what is waiting for the construction sector just around the corner? These and many more questions intrigue CEBC members and practitioners. This report aims to answer these questions and to help readers to choose the right future steps in the area of digitalisation in their countries.

Since construction regulation systems are very different around Europe, countries have had to choose their own individual paths in the field of digitalisation and there is no possibility to identify general “best of all” practice, nor to easily “copy paste” it. Therefore, the aim of the report is not to determine the most advanced country or one best practice.

On the contrary, the CEBC e-delivery group strives to present general trends and to share very different and unique good practices, which might be of interest

in specific situations and regulatory environments. Cooperation always creates additional value and possibilities, therefore, contacts of those who are shaping the future in digitalisation, will enable organisations to connect and cooperate, improve and evolve by tackling shared and common challenges.

Survey and data analysis showed these main trends in construction digitalisation in seventeen countries around Europe:

- Digitalisation in all countries is planned in a strategy or other planning document. The 3 main purposes of construction digitalisation are to minimize bureaucracy, improve productivity and to increase the efficiency of the construction processes management. In addition, a third of all countries indicated that digitalisation is important in order to minimize the risk of corruption, ensure data safety and improve cost delivery.
- The level of digitalisation in the construction area significantly increased since 2017. Survey showed that all phases of construction, from permitting phase until demolition of the building are already digitalised in six countries. Moreover, four countries have permitting, construction and commissioning phases digitalised, while permitting and construction phases are digitalised in almost all countries. However, the level of digitalisation in every construction phase differs – i.e., issuance of the building permit process is fully digitalised in just seven countries, while digital practices in permitting phase are used in most of them. In depth information on which processes are fully or partly digitalised in European countries can be found in section “e-delivery: facts and figures”.
- Despite significant recent achievements, countries have ambitious plans for further digitalisation in the construction area - 35% of countries are planning to digitalise some of the construction phases within the next year, another 41% are planning to do so within the next three years. The main priority for the near future is digitalisation of construction and commissioning phases.
- Nonetheless accidents in old buildings are an increasing concern around Europe and the maintenance of buildings phase is of utmost important to ensure safety of people, this phase is the least digitalised with only three countries having digital solutions. Another three countries are planning to create digital solutions for the maintenance phase in the near future,

therefore digitalisation of this area is also an emerging priority. Even though the digitalisation practice in the maintenance phase is still rare, some good practice solutions can be found in Latvia, Finland and Poland.

- Spatial planning is fully digitalised in six countries. Public access to spatial planning documents at municipality level is ensured in 71 % of them. Access to spatial planning documents in all levels (country, state / region and municipality) is available in five countries.
- Since construction regulation systems around Europe are very different, so are the digital practices. However, the survey showed that it is characteristic for Baltic countries to have one IT construction system, which is used at country level. This is not a trend in other parts of the continent - one-third of countries have more than one private IT system, 29% of countries have more than one IT construction system at municipality level.
- Complexity of construction information systems differs, but a majority of countries (13) indicated that IT construction systems in their country have electronic integration with at least one other system. Integration enables automatic exchange of information or data within the building sector or other sectors. Moreover, 62% of countries identified that existing systems also include historical status (time line) of a particular building.
- GDPR requirements and Russia's war of aggression in Ukraine led to a change in attitude towards data and infrastructure safety around Europe. A general rule is that the more complex the IT system, more challenges are faced in order to manage new emerging risks. The CEBC survey revealed, that the two most popular options to store database (where the data related to each application for a building permit is kept) are in own servers (9 countries) and public cloud (5 countries). In most countries (10) the database is maintained by the state.
- BIM based solutions are the key drivers of change in the construction sector. The survey showed that four countries have already started to use BIM in building control procedures and another seven are planning to do so in the near future. Ambitious BIM based automatic checking projects take place in Finland and Estonia. BIM based automatic checking tools and computer-aided systems to control the prescribed technical and other requirements of the building are the future of building control, which is waiting just around the corner.

Planning and permitting phase

A digitalised planning and permitting phase will help increase the speed of the building process, making exchange of information faster. Most of the countries have systems in place for digital communication both in the planning and permitting phase. Some systems make it possible for the applicant to upload or send information directly to the software used by the municipalities when handling the application and some of the countries are using that kind of software, while other countries still use email.

When it comes to exchange of information within the building sector or with other sectors, some countries lack that possibility. Having the possibility of exchanging information between public offices, will help reduce the case processing time and speed up the building process overall.

Only a few countries have digital checks of technical requirements in place. Having that possibility will greatly reduce the time spent on checking technical requirements, whether that is part of handling of the building application or part of the building control or supervision. Some countries, like Finland and Norway are currently working on making technical regulations readable by computers.

Construction phase

This phase is the one where most resources are deployed. Not only are the economic and human assets in place, but also the transition from the design to the maintenance phase is determined through the level of digitalisation. Hence, it seems key to define how the information is going to be distributed and archived.

Consequently, if the planning and permitting phase was fully digitalised it would compel the construction phase agents to follow the IT software previously implemented.

On the contrary, if the conceptual stage is digitalised in a non-structured system, the construction project will only digitalise the most urgent or key issues.

From the digitalisation perspective, the construction phase is fully or partly digitalised across ten countries (Norway, Denmark, Turkey, Lithuania, Poland, Finland, Spain, Estonia, Germany, and Latvia). Nevertheless, the level differs from 29% professionals (e.g. architects, engineers, ...), 19% builders, 10% investors, and 10% citizens. The demolition phase is electronically monitored in Latvia.

In this phase, the building control and certification authorities (e.g. Lithuania and Latvia) also play a significant role during the construction phase. Of the total inspections in all surveyed countries, 70% are performed via electronic means and in most cases, the reports are kept in the IT platform. The inspections recorded in paper format have been reduced to 30%.

The logbook is fully implemented in six countries where the information is stored within their IT systems.

Commissioning/ completion of construction

Commissioning/completion phase is the last formal step before the commencement of use of the construction investment. It is therefore understandable that stakeholders (professionals, investors, builders) expect the commissioning process to be easy and efficient. The digitisation of this process can meet these expectations in many aspects. It is therefore important to strive for further progress in digital services in this area.

Although more than 60% respondents answered that the commissioning/ completion phase has been digitised, many activities in this process are still performed in a non-digital way. Only 33% of respondents answered that the commissioning service is performed by the building control authority digitally and another 24% partly digitally. This means that in many countries the process of digitalisation of this phase probably needs to be continued or developed. In particular, only half of the respondents answered that it is possible for the client of the commissioning service to reuse the data, which was submitted in the system in previous phases. Taking into account the current approach to data management, probably the process of further digitisation of these services will aim at ensuring full re-usability of data in consistency with the other phases of the construction and maintenance process.

Use and maintenance

In three countries (Poland, Finland, Latvia) the use and maintenance phase are digitalised. The results of the inspection of the building in use phase are recorded electronically in Latvia and Poland, as well as kept within the system. The system in those countries also provides the information about changes of the building (i.e. change of use, refurbishments, minor and major reconstructions).

Due to the absence of digital tools, it might be rather difficult to analyse the performance of buildings, quality of buildings, as well as to analyse possible risks in the construction phase, which may cause problems later, when the building is already in use. Digitalisation in this field opens new possibilities for the countries to better ensure safety and quality of buildings in use.

Usage of BIM

Four countries (UK, Turkey, Slovenia, France) use BIM in the building control procedures. Seven countries are planning to start to use BIM in the building control procedures. Most of the countries use BIM open standards. In most cases countries performed rule-based checks and archiving. The data/statistic recording about usage of BIM is available only in UK.

Trends in digitalisation and informatisation of building control

CEBC conducted the first survey of electronic delivery of building control processes in member organisations in 2017 and published the report in 2018. As digitalisation processes are happening rather quickly, the next survey and report have been planned for 2022 and 2023. Therefore, a five-year time difference is the period in which we can observe the changes and trends.

Direct comparison of questionnaires, answers and report is not possible as the questions are not the same, the questionnaire is structured differently, some member organisations have changed and not all have answered the 2022 questionnaire.

The findings in the 2018 report are divided into seven chapters:

- Application for Building Permit
- Process/assessment
- Decision/approval
- Site inspection/construction phase/completion
- Archive/sale of the data/commissioning
- BIM and Formats and
- Transition and Acceptance.

The 2023 report has following chapters:

- General information
- Planning and permitting phase
- Commissioning/ completion of construction
- Use and maintenance and
- Usage BIM.

Both follow the well-established process of investment into new building and building processes that are prescribed by national law. Electronic support and delivery does not change this process, its goal is to improve productivity, to allow for better responsibility/decisions traceability and minimise bureaucracy.

In general terms the level of digitalisation hasn't really changed – about 80% of member states had some sort of e-delivery system in place in 2018 and replies suggest that this number is still the same but in future years will rise to about 90 %. When we look more into the detail, it is obvious that in the permitting phase there hasn't been significant change as in 2017 that part of the process was already supported by IT solutions.

No significant change can be reported when the question asked is “are the paper documents being accepted”, as practically every member has, at both times, answered that paper applications are still possible, and no country, but Latvia, has gone »fully digital«. As of January 2020, In Latvia the construction administrative process is fully digitalised.

Changes can be detected in the construction phase, when in 2017 30% of all respondents stated that an electronic method of monitoring/controlling the construction phase was in place when it seems that the number has almost doubled by 2022. Answers regarding the electronic recording and keeping data on use and maintenance of buildings in 2017 confirmed only two countries had fully implemented solutions for monitoring the use of the building, maintenance, and refurbishment. In 2022 this number has risen to three.

The use of BIM in building control procedures was relatively low in 2017, when no country was using BIM in the building control procedures fully, two were using it partly and one quarter of respondents were planning to introduce it. In 2022 two counties report that they are fully using it, two are using it partly, but seven member organisations (38%) are planning to introduce it.

It seems that almost all countries are in the very active phases of digitalisation and informatisation of building control processes. Where solutions are already in place, systems are being further developed and becoming more sophisticated, and where previously there were no electronic tools now there are or are planned.

Good practices

In Q70 of the questionnaire the respondents noted the best practice solutions which are used in e-delivery in their country/region/municipality.

70. Please note any best practice solutions, which are used in e-delivery in your country / region/municipality. This information will be used in order to present best practice solutions in the report.

1. Scotland:

The present e-development portal that is used for the submission of Building Warrant applications and associated other applications is currently undergoing re-development to expand on its functionality and usability. The present system does however have one useful function in its document transfer facility, which allows applications to be shared nationally when workload assistance is sought by one local authority from another.

We operate a National Applications portal for Planning Permitting and Building Permitting since 2016. This is currently being refreshed and modernised. Several themed improvement areas in Building permitting will be supported by our Digital Transformation Strategy. Remote Inspections are underway at small scale and we seek to understand use cases where there is clear benefit prior to expanding if required its use. We have several initiatives underway or planned to digitally transform the services.

Scotland are also involved in an international project (Building Smart) to make technical regulations readable by computers.

2. Turkey:

We have “Electronically Concrete Controlling System”

3. Spain:

There are solutions implemented as blockchain technology or research by means of monitoring real buildings, among others.

4. Romania:

State Inspectorate for Constructions takes legal steps to establish a national register of building permits, which will be useful to all institutions and bodies in the mutual use of databases and the necessary information before requesting

the issuance of a building permit and until the post-use of a building.

5. Ireland:

In Ireland, the process for gaining approval to carry out construction works is provided in 2 parts. Part 1 being Planning permission, Part 2 - Building Control processes. Planning permission process is not currently digitalised but building control processes are. This includes the issuing of “Use Permit”- called certificate of compliance on completion is digitalised.

6. Croatia:

In the process of issuing a building permit, simultaneously collecting certificates for the main project from other authorities through the system in a given time.

7. Latvia:

In the Building Information System (BIS), the entire administrative process of construction, from design to construction commissioning, has been digitised. Electronic processing of construction administrative documents has been mandatory in Latvia since January 2020.

BIS capabilities:

- By reusing the data, because it relates to 20 IS of national significance, which allows the selection of data on a person or property in the country, thus reducing potential errors.
- Prepare the construction plan and submit it for approval at the construction board (the owner or an authorised person can receive the necessary data and approvals electronically). Electronically authorise process participants. Receive parallel approvals or comments on the construction plan.
- Get approval from the construction board and start construction.
- Electronic management of construction log and construction progress documents. BIS mobile application available.
- Electronic processing of commissioning documents. (Operational risk assessment functionality is available, operational map is available for public buildings in electronic format).
- Digitised construction debris accounting and monitoring process.
- Digitised construction specialist certification and monitoring process.

Users of the BIS system: real estate owners, construction specialists, builders, institutions involved in the supervision of the construction process, certifying authorities, building authorities, issuers of technical regulations.

From January 2023, electronic document management will also be mandatory for residential house managers to manage their home affairs. The functionality developed is available in production for voluntary use by the end of the year.

Upon an open invitation to member organisations, some have explained their solution in more detail.

Spain

The processing of building permits in Spain is a power delegated to the municipal level. There are 8,131 municipalities and each one decides the level of digitisation with which the technicians shall present their documentation. Spanish technicians in general, and Technical Architects are ready to present and manage licenses in different formats, from PDF to IFC (BIM).

The Building Book is implemented in any buildings, including those completed before the year 2000. This simplifies the digitalisation in each of the phases of the building process.

The execution phase and the control of buildings has been digitised through applications (software) and electronic devices. Large construction companies are investing significantly in processes that can be extended in their global projects. In this way, access to data is automated in a matter of seconds.

UK

D-COM Digital Compliance Ecosystem for the UK Construction Sector: In the future, it is envisioned that building control and construction compliance processes will be supported by digital system(s). This step change is required to meet the ever-increasing requirements for increased transparency and auditability.

To meet this need in the UK, the Construction Innovation Hub, Cardiff University, AEC3 UK Ltd and Solibri UK (who form the Digital Compliance (D-COM) Network) have developed a new 'digital ecosystem' to support digitised compliance processes and help construction firms in navigating the complex

regulatory landscape with greater ease and certainty. This ecosystem is built on top of existing standards and its APIs will shortly be openly released on GitHub.

This ecosystem provides three key services:

Document Serving: Enables the provision of regulatory documents in a machine-readable form.

Results Service: Enables the long-term secure storage of the results of automated compliance checking.

Rule Engine: A compliance checking engine. The rule engine executes compliance checks against a given document by utilising compliance data retrieved from a set of data sources including BIM model data and data provided by other software tools such as geometry checking tools and energy simulation tools.

Figure 1 shows an example of the user interface that brings the three aspects together, this integration of regulatory documents (on the right-hand side), the visualisation of compliance checking results (the left-hand side) and relating these results to BIM data (centre).

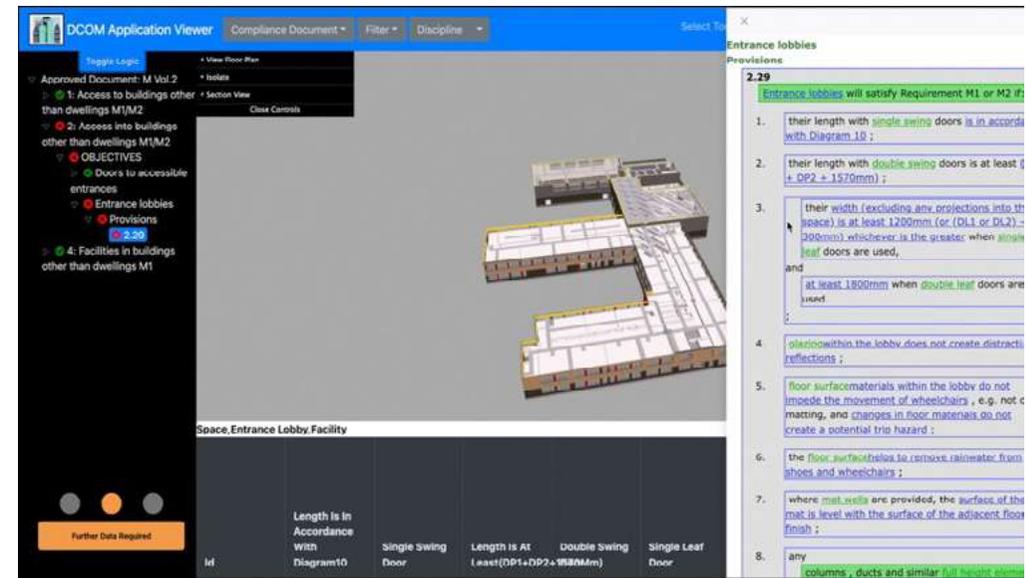


Figure 1 D-COM Digital Compliance Ecosystem

Figure 2 shows the D-COM vision of a new digital building control process. This process consists of: (1) submission: where information (including BIM) about a project is submitted. (2) pre-checking: The project team can perform pre-checking before formal submission (3) validation: automatically validates that all information is present and ensures payment has been made, and (4) determination: a qualified building control professional examines the application, decided upon any aspects that could not be checked automatically and makes the final overall decision.

The technology behind the D-COM compliance ecosystem is now being considered as part of the work of a current EU funded compliance checking initiative.

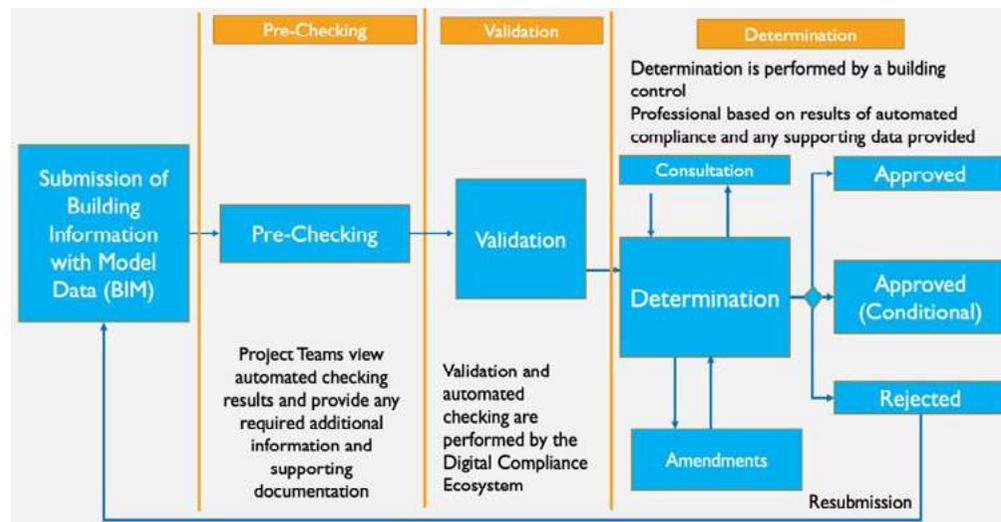


Figure 2 A vision of future digital building compliance processes

UK NHBC

The Building Control ejourney at NHBC starts when customers submit a new initial notice via our web-based portal. Once the initial notice has been submitted the project is managed and assessed via our fusion database by our technical staff who work remotely and can access our Fusion database from anywhere in the UK. The fusion database is used for project management, electronic document management, risk management (setting and releasing conditions) and recording key milestones or actions undertaken.

Our building inspectors work remotely in the field and record all inspections via our inspection software which communicates with our Fusion database to log and record all inspections including any non-compliances. Our building inspectors can also use a web base portal to request and record photographic evidence from our customers.

We make extensive use of virtual meetings for design team meetings with our customers and for collaborative working between our office-based staff and our site-based building inspectors.

Our web-based portal can be used by customers (and NHBC) to monitor the progress of each project including any outstanding technical conditions, inspection progress and performance, submit technical information including certifications, communicate with the project team, access any documents submitted to NHBC and access any documentation issued by NHBC including any Building Control Certificates.

Our current IT systems are in the process of being modernised to utilise the latest technologies and future proofing.

Latvia

In 2017, the State Construction Control Bureau (SCCB) began the development of the Building Information System (BIS, www.bis.gov.lv). Under the Construction Law, as of January 1, 2020, the construction administrative process must be fulfilled only in the BIS: from idea submission and approval (e-permit) to the commissioning and subsequent management of the building. You can do it at any time of the day or night, all without leaving your home!

BIS in figures:

- Exchanges data with 24 other information systems
- Includes 11 registers and databases (e.g. registers of construction specialists, building contractors, residential building managers, building energy certificates)
- Provides 96 online services to clients. Since 2017, the system has grown many times over:
 - The number of users has increased from about 14,000 to more than 123,000.
 - The number of construction records available in the system has risen from some 48,000 to 234,000.

BIS features in detail:

1. Transparent and uniform administrative construction proceedings for all municipalities
2. Circulation of information among construction participants
3. Registers and related online services for the construction and operation of buildings
4. Working environment and solutions tailored to supervisory authorities
5. Process automation and data reuse features
6. Information necessary for supervising the independent practice of construction specialists and access to construction record documentation
7. Publicly available information about certified construction specialists and their professional misconduct
8. An electronic building operation process that provides a single environment and support for the owners and managers of apartment buildings in addressing typical shared property management issues
9. Algorithms that determine risk level taking into account certain factors (e.g. building group, type of construction, previous experience of the parties involved) and enable risk-based supervision of construction sites and operation of buildings.

Poland

Digital solutions in the phases of construction and maintenance of buildings are not a standard even in countries that are very advanced in digitalisation. Poland has managed to implement digital tools in these areas, which may also be interesting for other countries. All you need to use those systems is a web browser or smartphone.

Electronic construction log - EDB

This system allows monitoring of construction works. The site manager and other participants of the construction process are required to enter all important information about ongoing construction works to the system. That information is accessible through the system anytime for the building control authority and other stakeholders. In the near future, an electronic construction log will be required for all construction works which need a building permit.

The EDB system is available at the following link:

<https://e-dziennikbudowy.gunb.gov.pl/>

Electronic maintenance log – c-KOB

This system allows monitoring of the technical condition of buildings in use and contains information about renovation works, inspections and technical opinions. What is most important, owners of buildings are responsible for ensuring periodical inspection conducted by certified building experts. Results of this inspection must be written on the system. In case of detection that the building is dangerous, the system provides this information to the building control authority.

The C-KOB system is available at the following link: <https://c-kob.gunb.gov.pl/>

Netherlands

On January 1, 2024, new legislation will enter into force for the physical living environment in the Netherlands.

With this law, the impairment of spatial regulations and the testing of building applications will also be completely renewed.

This new legislation promotes working in 3D but will initially open up the current zoning plans in 2D. 4 large municipalities in the Netherlands are now busy with a test to convert their 2D plans to 3D plans. With these 3D plans, not only will data be captured including surface, building height and use, but also noise contours,

archaeological regulations, safety contours and more.

From 2013 till now we are working on the development of 3D spatial planning regulation that can be used in the first stage of design, to check if the design fits within all the spatial regulation of that building plot. At the website <https://3dcityplanner.com/> you find multiple examples of a company who is working with this new structure of 3d planning.

As an appendix I have added an older document about this project in English. All other more recent documents about this project are in Dutch and are very difficult to translate. But this document shows very nicely what this project is about.

Lithuania

Territorial planning and construction digital services in one portal

All geodetic, territorial planning and construction e-services in Lithuania can be reached via Territorial planning and construction gates portal. In this portal every citizen has also a possibility to find any information related to territorial planning and building processes in the country.

“Monitor the territory” e-service from 2023-08-24 will allow the client of the portal to mark any territory of personal interest and automatically (in his chosen way: e-mail or other) get information about the start of any planning, permitting, completion of construction or other building related process in this territory.

Link: www.planuojustatau.lt

Institution: Ministry of Environment <https://am.lrv.lt/>

State territorial planning and construction inspectorate <https://vtpsi.lrv.lt>

Digital territorial planning process

Territorial planning processes in Republic of Lithuania are digital and performed remotely at all levels in one public Territorial planning documents preparation and territorial planning process state supervision information system (TPDRIS). This system provides the ability to conduct territorial planning processes electronically all the way from the decision on territorial planning document (TPD) preparation and planning goals to submission of approved documents to the territorial planning documents register (TPDR).

Electronic e-signed planning documents with all the accompanying documentation are submitted, reconciled, publicised, checked and approved through a web portal www.tpdri.lt. Via the system citizens can not only get acquainted with TPD, but also to submit proposals and receive answers from the planning organiser.

Links: www.tpdri.lt and www.tpdr.lt

Institution: State territorial planning and construction inspectorate

<https://vtpsi.lrv.lt>

Modern and complex building information system

All municipalities, institutions and companies, which are responsible for checking project documentation, issuing connection terms and special requirements and performing building control procedures are inner users of information system for building permits and state supervision of construction „Infostatyba“. All construction related e-services (32) in Lithuania are delivered remotely via “Infostatyba”.

Composite digital e-service “Build a house” allows citizens to conveniently get all related e-services without going away from home. Composite service includes all services from getting the address, getting connection to utility networks terms and conditions, informing the public about planned design of structures and getting approval to these proposals, issuing special requirements, submitting the documentation needed for a building permit and getting a building permit to completion of construction and registration of the building in Real property register. The system uses GIS data and is integrated with 16 other systems and registers to ensure automatic use of data and user-friendly e-services. A consultation platform is created in “Infostatyba” in order to help builders (with automated guiding information and visualisations, chat with institutions possibilities) to get from one service / phase to another and monitor the progress of requested e-services.

All state supervision of construction services is digitalised (inspections acts, unauthorized construction acts, construction suspension acts, mandatory instructions, etc.). The system enables the possibility to fill in inspection acts with tablet PC’s on the construction site, automatically set geolocation of inspection. The system automatically forms all e-services related documents, which are issued via the system by state institutions or municipalities (e-signed).



Link: EPTP - Directory of services planuojustatau.lt

Institution: State territorial planning and construction inspectorate
<https://vtpsi.lrv.lt>

Modern risk management solutions

A risk management information system is used by State territorial planning and construction inspectorate to target the riskiest builders, construction professionals (heads of constructions, technical supervisors of construction, contractors, expertise contractors) and construction sites. The list of most risky projects and entities is formed automatically by the system (list is formed based on aggregated riskiness score).

Risk management models (9) are integrated, for example aggregated riskiness of head of construction, technical supervisor of construction, building permit, as well as size of the building, type of construction works and territory, where building is being built, effects the riskiness of construction site and vice-versa.

The risk management system uses “Infostatyba” information about issued building permits, construction sites, where construction works take place, data about violations and accidents on site, as well as Labour inspectorate data about the riskiness of contractors. The risk management system provides the ability to better target the biggest risks and use building control human resources more efficiently.

Institution: State territorial planning and construction inspectorate
<https://vtpsi.lrv.lt>

Digital 3D Vilnius city model for planning and building control

“Vilniaus planas” is a professional, data-based company specialising in the development and management of digital solutions for sustainable and smooth functioning of Vilnius. Over the years, “Vilniaus planas” has become a constant intellectual partner in the development and growth of the city, representing the interests of the city of Vilnius and its residents.

Today, with the help of modern technologies we are creating a SMART city on many levels – starting from urban 3D Vilnius. A 3D model (3d.vilnius.lt) of a real-life situation provides the opportunity not only to have a virtual city, but also to evaluate the ongoing development of the city against the backdrop of this real

environment, to present the current and ongoing projects in a visually and clear way, to understand how the environment will be affected, how the well-being of those living nearby will be affected, and what visual pollution will occur. While developing new infrastructure, we also take care of the existing one.

Link: Vilniaus 3D modeliai | <https://3d.vilnius.lt>

Institution: “Vilniaus planas” (Vilniaus planas)

Finland

- IFC to become a mandatory building permit document in Finland
- The revised Finnish Building Act will enter into force in January 2025, when the IFC will be a mandatory building permit document for all new and renovation projects
- The full-scale e-Permitting process without paper in any part of the process started in 2014 and covers now whole Finland (280 municipalities)
- The reform will bring the entire building construction sector into the IFC era. Preparing the law and implementing the new articles has been a long process
- Building control authorities are already preparing the procedures required by the legislation (RAVA3Pro project)
- On EU-level has also started Accord project.

E-delivery: facts and figures

General Questions

The survey was sent to the twenty-five members of CEBC. The answers were received from twenty-one respondents from seventeen states: Norway, UK (Scotland, England and Wales), Denmark, Turkey, Cyprus, Slovenia, Lithuania, Poland, Spain, Finland, Romania, Ireland, Estonia, Germany, Croatia, Latvia, France.

Question 1:

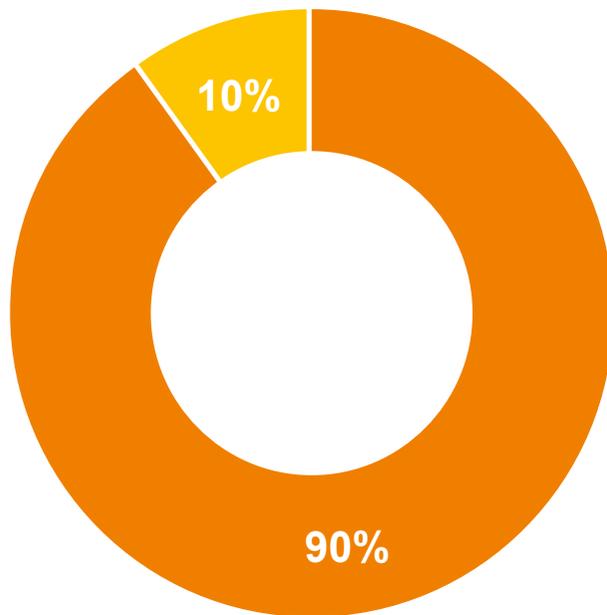
Select your country

Question 6:

Do you have a digitalisation strategy or other planning document in the construction sector?

Answer:

- Yes
- No



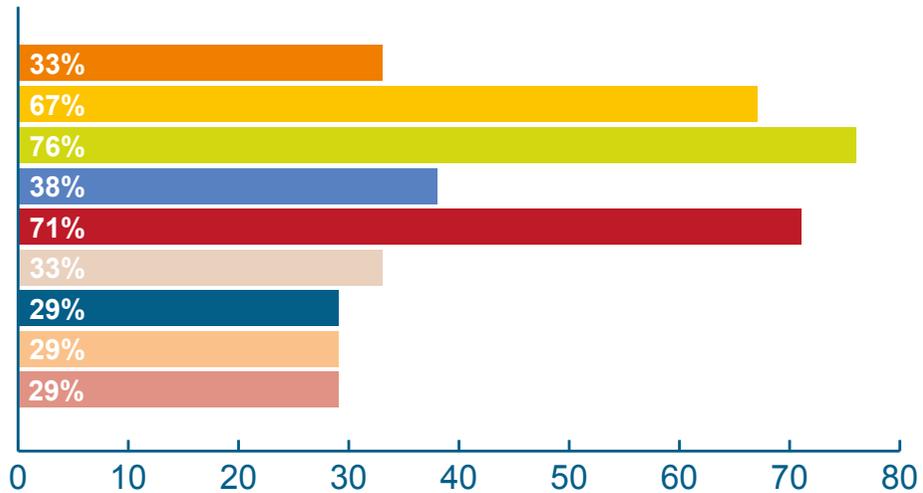
Yes	No	Yes	No
Norway	England	Spain	
UK	England and Wales	Finland	
Scotland		Romania	
Denmark		Ireland	
Turkey		Estonia	
Cyprus		Germany	
Slovenia		Croatia	
Lithuania		Latvia	
Poland		France	

Question 7:

What is the purpose of digitalisation in the construction sector?
(Several answers are possible)

Answer:

- Minimise risk of corruption
- Effective construction process management
- Minimise bureaucracy
- Data safety
- Improve productivity
- Better cost delivery
- Better decision-making process
- Responsibility / decisions traceability
- Better project schedule delivery



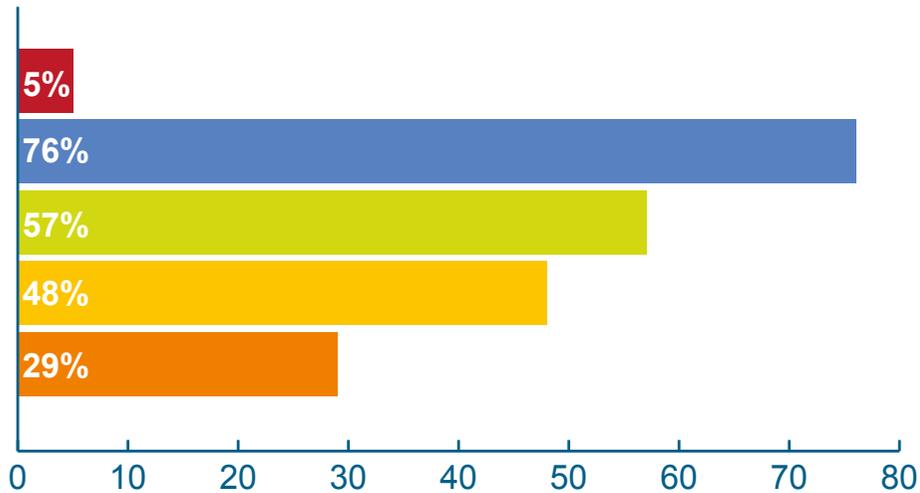
**Question 8:**

Which of the construction phases are already digitalised in your country?
(Several answers are possible)

Answer:

- None
- Permitting phase
- Construction phase
- Commissioning phase (use permit)
- Use and maintenance phase

Country	Permitting phase	Construction phase	Commissioning phase (use permit)	Use and maintenance phase	None
Norway	x	x	x	x	
UK	x	x			
Scotland	x	x			
Denmark	x	x	x	x	
Turkey	x	x	x	x	
Cyprus	x	x			
Slovenia					x
Lithuania	x	x	x		
Poland	x	x	x	x	
Spain	x	x			
Finland	x	x	x	x	
Ireland	x	x	x		
Estonia	x	x	x		
Germany	x	x	x		
Croatia	x	x			
Latvia	x	x	x	x	
France	x	x			





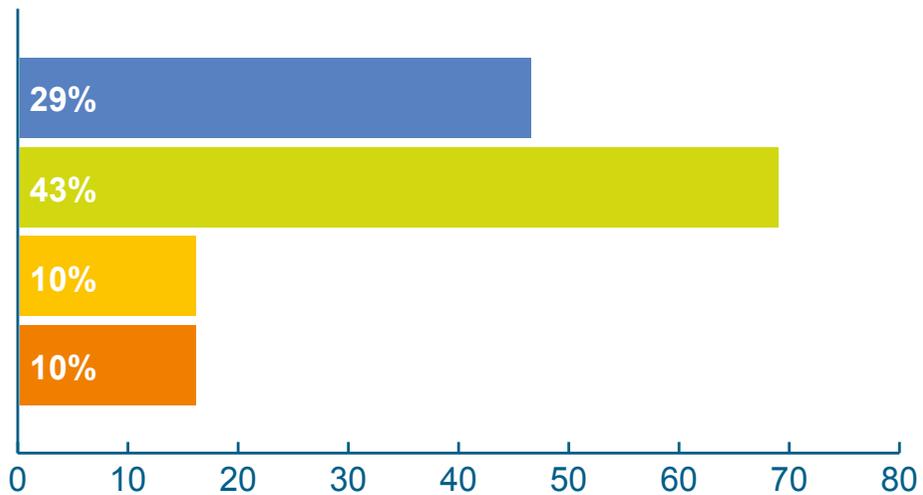
Question 9:

Are you planning to digitalise some of the construction phases in the future?

Answer:

- Yes, within next year
- Yes, within next three years
- Yes, in more than three years
- No

Country	Yes, within next year	Yes, within next three years	Yes, in more than three years	No
Norway		x		
UK		x		
Scotland		x		
England				x
England and Wales			x	
Denmark				
Turkey			x	
Cyprus				x
Slovenia	x			
Lithuania	x			
Poland	x			
Spain		x		
Finland		x		
Ireland		x		
Estonia	x			
Germany	x			
Croatia	x			
Latvia		x		
France		x		



Question 10:

What will be the next step(s) of the digitalisation of the construction process?
(Several answers are possible)

Answer:

- Permitting phase
- Construction phase
- Commissioning phase (use permit)
- Use and maintenance
- I don't know

Comments:

N/A as self-employed consultant (UK answered on Q9 “No”)

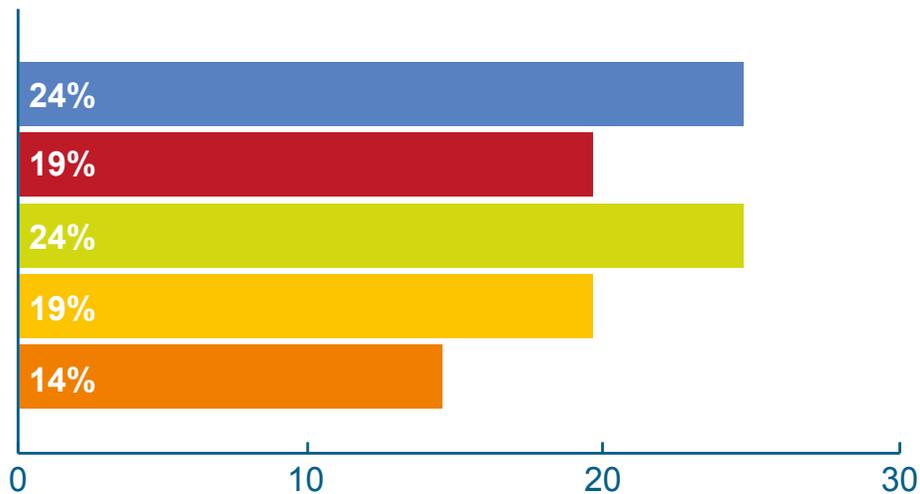
For certain structures it is mandatory to apply for a building permit by electronic means to a simplified platform used by BCAs. The platform for the integrated management (application, examination and issuance) is under construction and is expected to be launched mid of 2023 (Cyprus)

Modernisation of existing services (commissioning phase, permit phase) increasing efficiency, usage of GIS and BIM (Lithuania)

National Database of Built Environment and Buildings (Finland)

Building Control Process is fully digitised. Next stage is Planning Permission stage (Ireland)

Use of BIM within the digitalised construction process. Automation of the digitalised construction process. The digitalisation of the expertise (third part evaluation) process (Latvia)



Question 11:

How many IT construction systems are in your country?
(Several answers are possible)

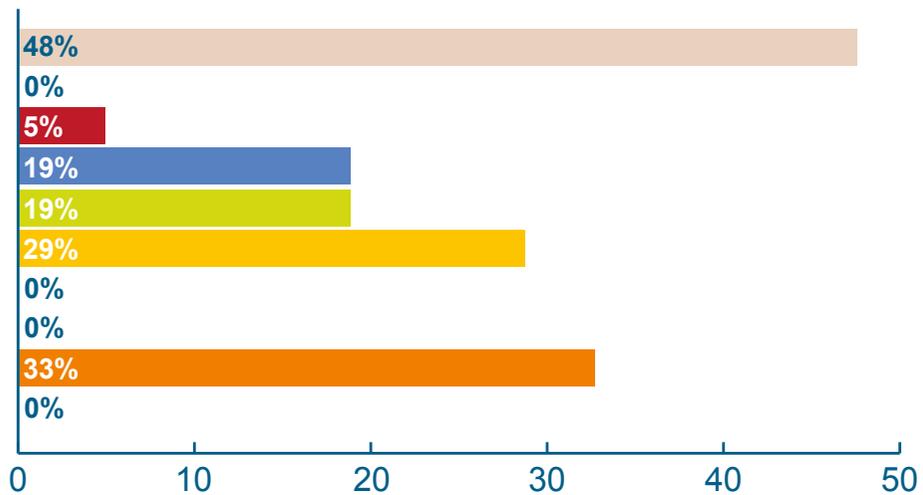
Answer:

- One on country level
- One on region/state level (0%)
- One on municipality level
- More than one on country level
- More than one on region/state level
- More than one on municipality level
- One on region/state level (0%)
- One private system (0%)
- More than one private system
- No systems are in place (0%)

Comments:

All IT systems are provided by private companies (Norway)

Essentially, one national in relation to Building Standards Verifiers (UK)



Planning and permitting phase

Question 12:

Is the planning and permitting phase digitalised?
(Several answers are possible)

Answer:

- Yes, planning phase
- Yes, permitting phase
- No

Comments:

Partial (France, Finland, Spain)

Planning is not digitalised. Building Control process is digitalised (Ireland)

Country	Yes, planning phase	Yes, permitting phase	No/Other
Norway	x	x	
UK		x	
Scotland	x	x	
England	x	x	
England and Wales	x	x	x
Denmark	x	x	
Turkey	x	x	x
Cyprus	x		
Slovenia	x	x	
Lithuania	x	x	
Poland	Partial	x	
Spain	Partial	Partial	
Finland	x	x	
Romania			x
Ireland			Building control process is digitalised
Estonia	x	x	
Germany	x	x	
Croatia		x	
Latvia	x	x	
France	Partial (30%)	Partial (30%)	

**Question 13:**

Who are users of the application/permitting service?
(Several answers are possible)

Answer:

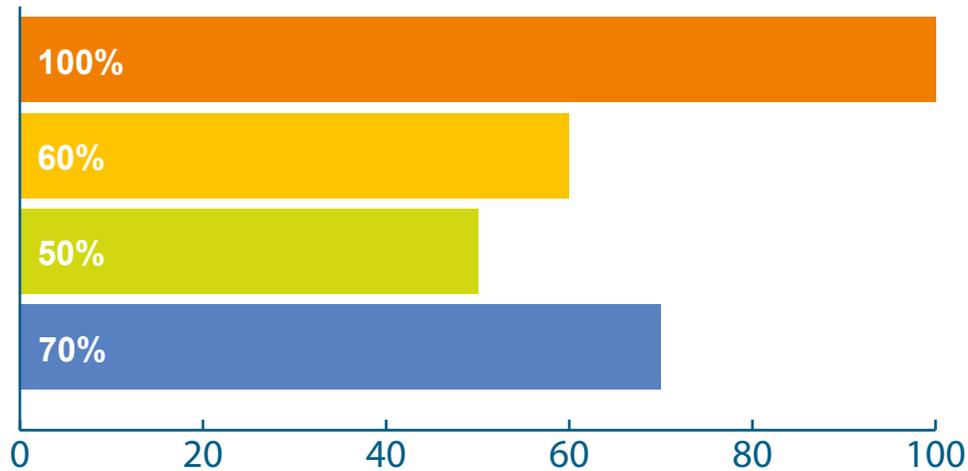
- Professionals (i.e. architects, engineers)
- Citizens (neighbours/others that may give notes to the application)
- Builders
- Investors

Comments:

Building authorities, issuers of technical regulation, certification authorities
(Latvia)

In theory anyone who is responsible for the construction (Denmark)

Applicants and Building Standards Surveyors; anyone can submit an application
through the digital portals (Scotland)



Country	Professionals	Citizens	Builders	Investors
Norway	x	x	x	x
UK	x			
Scotland	x	x	x	x
England	x	x	x	x
England and Wales	x	x	x	
Denmark	x	x	x	x
Turkey	x			
Cyprus	x			
Slovenia	x	x	x	x
Lithuania	x	x	x	x
Poland	x			x
Spain	x			
Finland	x	x	x	x
Romania				
Ireland	x			x
Estonia	x	x	x	x
Germany	x			x
Croatia	x	x		x
Latvia	x	x	x	x
France	x	x		x



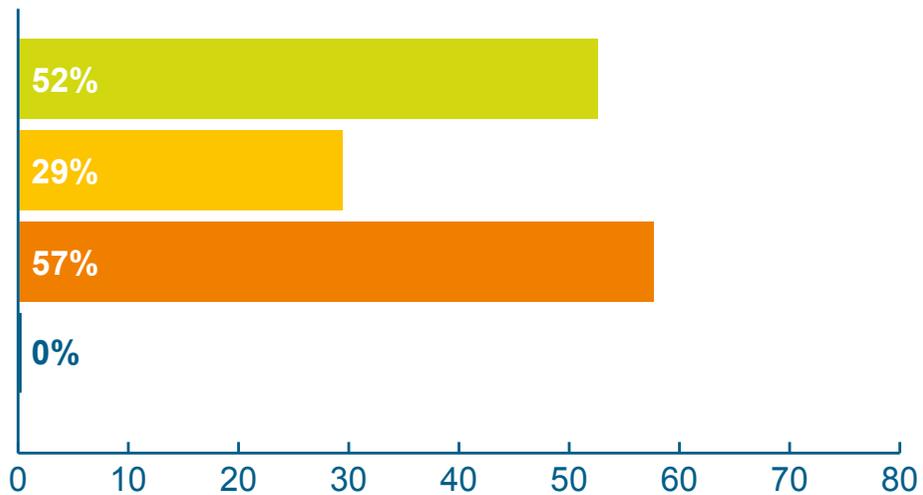
Question 14:

Does your country have a public access to spatial planning documents?

Answer:

- Yes (country level)
- Yes (state/regional level)
- Yes (municipality level)
- No (0%)

Country	Yes (country level)	Yes (state/regional level)	Yes (municipality level)
Norway			x
UK		x	
Scotland	x		x
England			x
England and Wales	x	x	x
Denmark	x		
Turkey			x
Cyprus	x		
Slovenia	x		x
Lithuania	x	x	x
Poland	x		x
Spain			x
Finland	x	x	x
Romania			
Ireland		x	x
Estonia	x	x	x
Germany		x	
Croatia	x		
Latvia	x	x	x
France			x





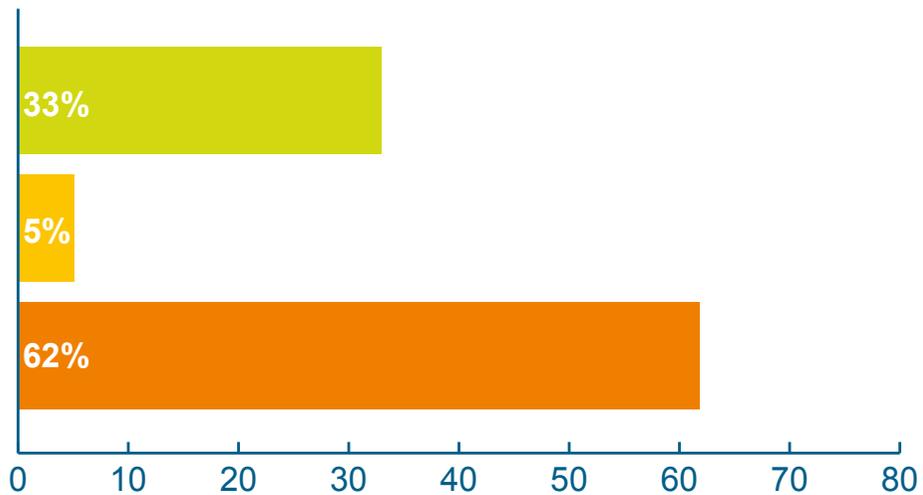
Question 15:

In what way it is possible to submit the application for building permit?

Answer:

- Only electronically
- Only in paper
- Both are permitted

Country	Only electronically	Only in paper	Both are permitted
Norway	x		
UK	x		
Scotland			x
England			x
England and Wales			x
Denmark	x		
Turkey			x
Cyprus			x
Slovenia			x
Lithuania			x
Poland			x
Spain			x
Finland	x		
Romania		x	
Ireland			x
Estonia	x		
Germany			x
Croatia	x		
Latvia	x		
France			x



Question 16:

How digitalised are the following processes?

	Fully digitalised	Not digitalised	Partly digitalised (part of the service or information is available only in paper form)	In development	Not applicable	Don't know
Spatial (territorial) planning process	Scotland, Denmark, Cyprus, Lithuania, England and Wales, Estonia, Latvia	UK, France,	Norway, England, Turkey, Poland, Spain, Finland, Romania, Ireland, Germany, Croatia,	Slovenia		
Possibility to upload GIS drawing on a digital map	Scotland, Denmark, Cyprus, Lithuania, Finland, England and Wales, Estonia, France	UK, Scotland, Ireland	England, Latvia	Norway, Spain, Germany	Turkey, Croatia	Slovenia, Poland, Romania
Submission of a project (design) documentation for building permit	Norway, UK, Scotland, Denmark, Slovenia, Lithuania, Poland, Finland, England and Wales, Estonia, Croatia, Latvia	Romania	England, Turkey, Spain, Ireland, France	Cyprus, Germany		
Assessment of application	Norway, UK, Scotland, Denmark, Lithuania, Spain, Finland, England and Wales, Estonia, Croatia, Latvia		Turkey, France, Ireland, England	Poland, Cyprus, Slovenia, Germany		Romania
Assessment of plans (design) on screen	Norway, Scotland, Denmark, Lithuania, Spain, Finland, England and Wales, Estonia, Latvia	UK	England, Turkey, Ireland, Germany	Cyprus, Poland, Croatia	Slovenia, Romania, France	
Implementation of required design documentation changes	UK, Scotland, Denmark, Lithuania, Finland, England and Wales, Estonia, Croatia, Latvia	Norway	England, Turkey, Cyprus, Spain, Ireland,	Slovenia, Poland, Germany	France	Romania
Request and obtain changes in building permit	Norway, UK, Scotland, Denmark, Lithuania, Poland, Spain, England and Wales, Croatia, Latvia	Romania	France, Ireland, Cyprus, Turkey, England	Germany, Slovenia		

Question 16: continued

	Fully digitalised	Not digitalised	Partly digitalised (part of the service or information is available only in paper form)	In development	Not applicable	Don't know
Communication with neighbours and 3rd parties	Norway, Scotland, Denmark, Spain, Finland, Estonia, Croatia, Latvia	France, Romania, England and Wales, UK	Ireland, Lithuania, Turkey, England, Scotland	Poland, Slovenia, Cyprus	Germany	
Communication with investors	Norway, Denmark, Finland, Estonia, Croatia, Latvia	UK, Romania, France	England, Turkey, Cyprus, Lithuania,	Slovenia, Poland,	Scotland, Germany	Spain, England and Wales, Ireland
Issuing the building permit	Norway, UK, Scotland, Denmark, Lithuania, England and Wales, Estonia, Croatia, Latvia	Romania	England, Turkey, Spain, Finland, Ireland, France	Cyprus, Slovenia, Poland, Germany		
Monitoring/controlling the construction phase	Scotland, Denmark, Poland, Estonia, Latvia	Norway, UK, England and Wales, Romania	Scotland, England, Turkey, Lithuania, Spain, Finland, Ireland	Slovenia, Croatia	Cyprus, Germany, France	
Register (archive) of permits	Norway, UK, Scotland, Denmark, Lithuania, Spain, England and Wales, Estonia, Croatia, Latvia	Romania	Scotland, England, Turkey, Finland, Ireland, Germany, France	Cyprus, Slovenia, Poland		
Data and document permanent archival	Norway, UK, Scotland, Denmark, Lithuania, England and Wales, Estonia, Latvia	Romania	Scotland, England, Turkey, Finland, Ireland, Germany, France	Cyprus, Slovenia, Poland, Spain, Croatia		

**Question 17:**

Do you have electronic integration with other systems? (exchange of information or data within the building sector or other sectors). If yes, how many?

Answer:

- 1-5
- 6-10
- More than 10
- No

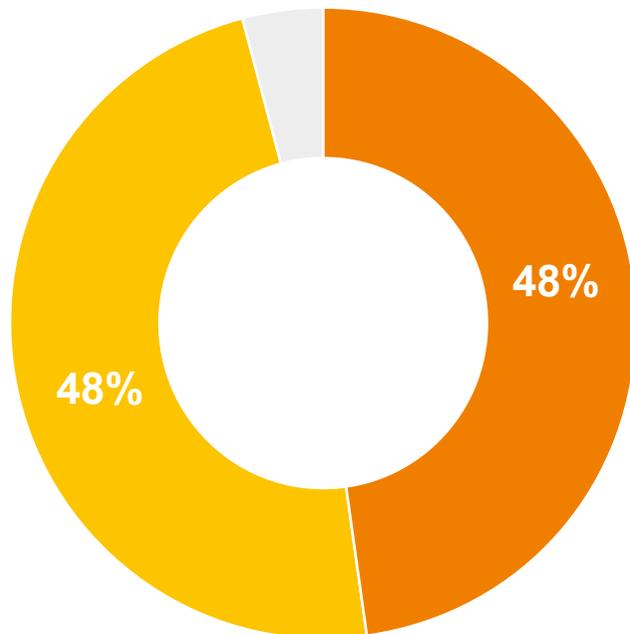
Country	1-5	6-10	More than 10	No
Norway	x			
UK	x			
Scotland	x			x
England				x
England and Wales				x
Denmark	x			
Turkey		x		
Cyprus	x			
Slovenia			x	
Lithuania			x	
Poland	x			
Spain			x	
Finland		x		
Romania	x			
Ireland				x
Estonia				
Germany				x
Croatia			x	
Latvia			x	
France				x

Question 18:

Do you use open formats or proprietary formats of electronic documents?

Answer:

- Proprietary (i.e. .pdf, .xml, .ifc)
- Both
- Open (i.e. .csv, .odf) (0%)



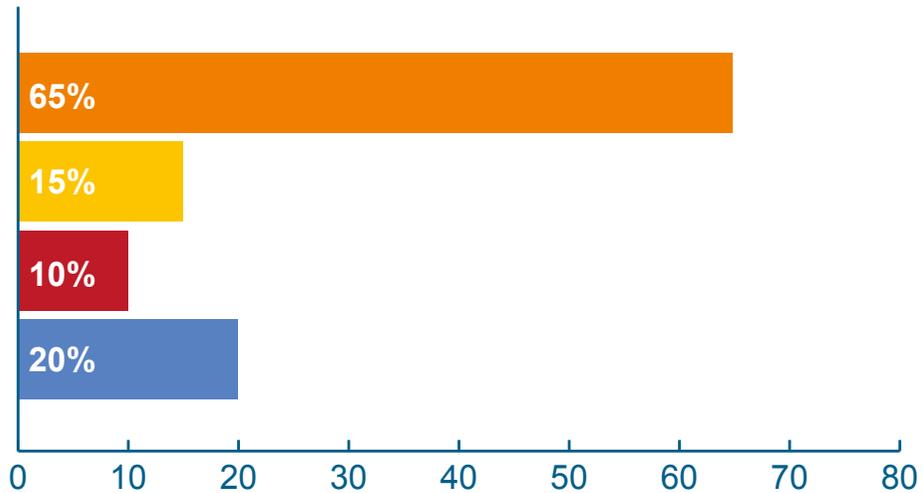


Question 19:

Are proprietary formats of electronic documents standardised?
(Several answers are possible)

Answer:

- Yes, on country level
- Yes, on regional/state level
- Yes, on municipal level
- No



Country	Yes, on country level	Yes, on regional/state level	Yes, on municipal level	No
Norway				x
UK		x		
Scotland				x
England				x
England and Wales				x
Denmark	x			
Turkey	x			
Cyprus	x			
Slovenia	x			
Lithuania	x			
Poland	x			
Spain	x	x	x	
Finland			x	
Romania	x			
Ireland	x			
Estonia	x			
Germany		x		
Croatia	x			
Latvia	x			
France	x			



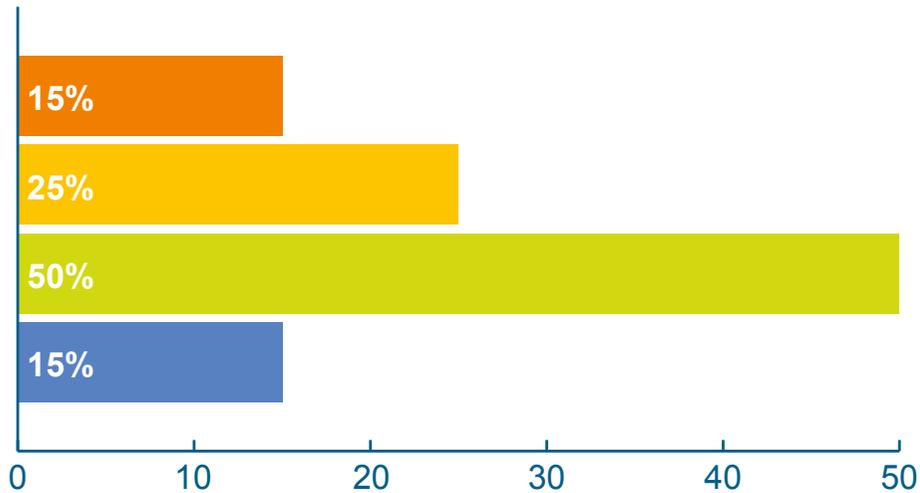
Question 20:

Do you have a database where the data related to each application for a building permit is kept? (Several answers are possible)

Answer:

- Yes, private cloud
- Yes, public cloud
- Yes, own servers
- No

Country	Yes, private cloud	Yes, public cloud	Yes, own servers	No
Norway	x			
UK		x		
Scotland	x		x	
England				x
England and Wales			x	
Denmark			x	
Turkey			x	
Cyprus			x	
Slovenia		x		
Lithuania				
Poland			x	
Spain			x	
Finland	x	x		
Romania				x
Ireland			x	
Estonia		x		
Germany				x
Croatia		x		
Latvia			x	
France			x	





Question 21:

At what level is this database, mentioned in question 20, being set up and maintained? (Several answers are possible)

Answer:

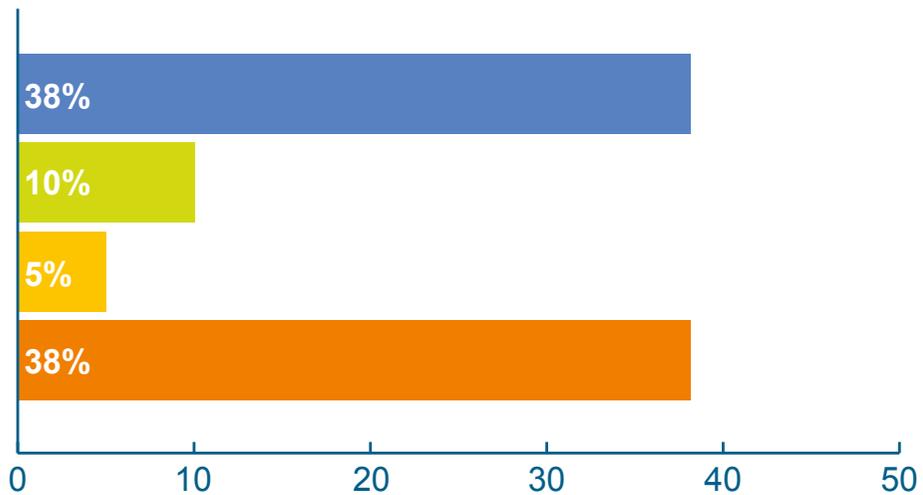
- Municipal
- Regional
- Provincial
- State

Comments:

The databases are maintained by private companies, but for the respective authority (Norway)

Own internal systems not open to the public (England and Wales)

Country	Municipal	Regional	Provincial	State
Norway	x	x	x	x
UK				x
Scotland	x	x		
England	x			
England and Wales				
Denmark	x			
Turkey	x			
Cyprus	x			
Slovenia				x
Lithuania				x
Poland				x
Spain		x		x
Finland	x			
Romania				
Ireland				x
Estonia				x
Germany	x			
Croatia				x
Latvia				x
France	x			

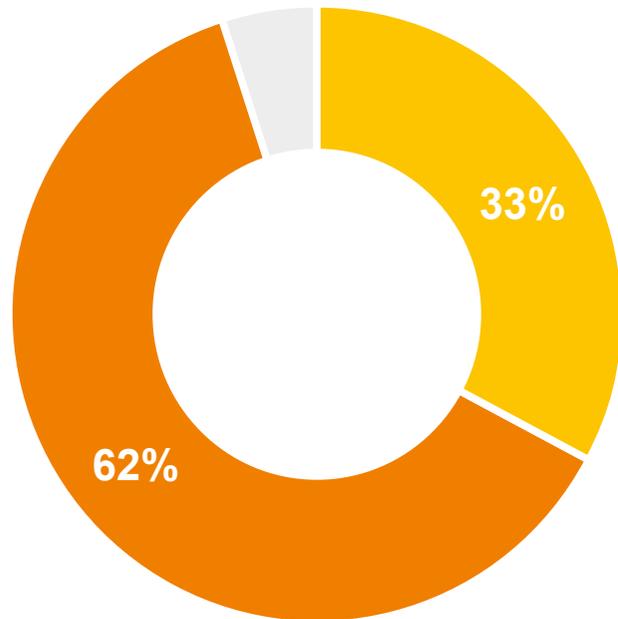


Question 22:

In the case of an existing database, is it possible to obtain information about the historical status (timeline) of a particular building?

Answer:

- Yes
- No

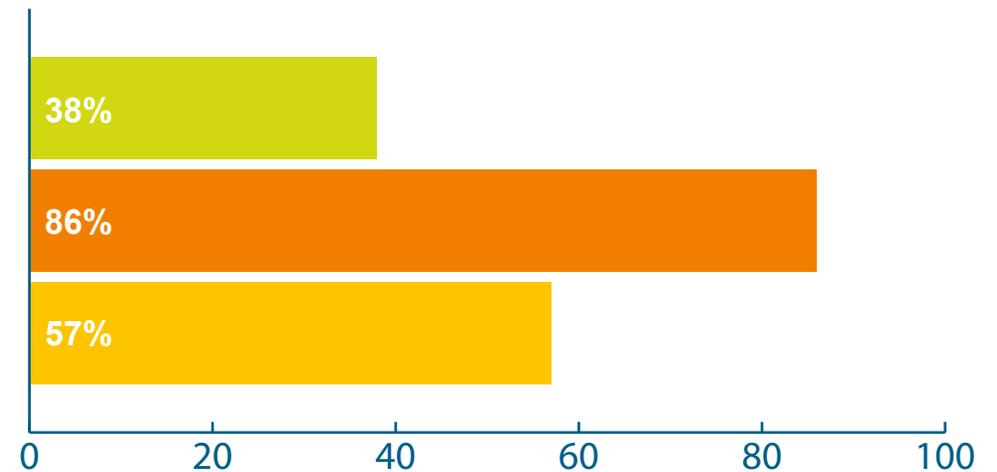


Question 23:

How do you communicate with other institutions?
(Several answers are possible)

Answer:

- Ordinary mail
- E-mail
- Via IT system



Question 24:

Do you use qualified digital certificates/digital signatures when dealing with processes in the field of building control?

Answer:

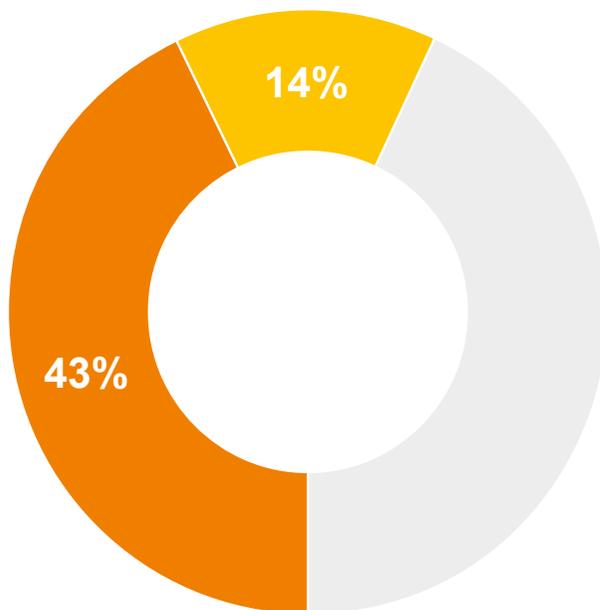
● Yes

● No

Other:

Partial: some of the documents can be signed with not qualified digital signature (Latvia).

No: France, Ireland, UK.





Question 25:

Is there a computer-aided system(s) in place to facilitate handling of applications (i.e. integration with databases, letter forms, auto-filling of the forms, facilitated reporting)

Answer:

- Yes
- No
- Partially
- In development
- Under construction

Comments

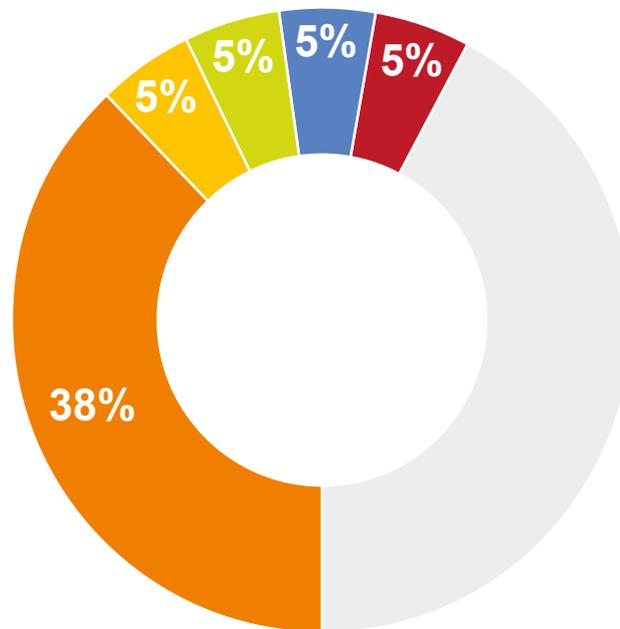
Not aware (England)

Our own system not open to the public or other bodies (England & Wales)

Under construction (Cyprus)

In development (Slovenia)

Partial (Spain)



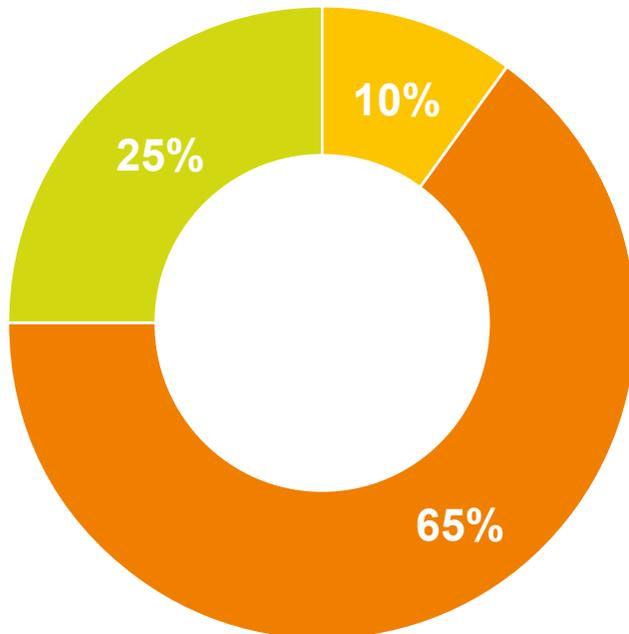
Country	Yes	No
Norway	x	
UK		x
Scotland	x	
England		
England and Wales	x	
Denmark	x	
Turkey	x	
Cyprus		
Slovenia		
Lithuania	x	
Poland	x	
Spain		
Finland	x	
Romania		x
Ireland	x	
Estonia	x	
Germany	x	
Croatia	x	
Latvia	x	
France		x

Question 26:

Is there a computer-aided system(s) in place to control the prescribed technical and other requirements of the building (electronic checking of BIM projects for compliance with national building regulations)?

Answer:

- Yes
- No
- Partial



Country	Yes	No	Partial
Norway		x	
UK	x		
Scotland		x	
England		x	
England and Wales		x	
Denmark		x	
Turkey	x		
Cyprus		x	
Slovenia		x	
Lithuania		x	
Poland		x	
Spain			x
Finland			x
Romania		x	
Ireland		x	
Estonia			x
Germany			x
Croatia		x	
Latvia		x	
France			x

Question 27:

What requirements for construction works are checked by IT systems?

Answer:

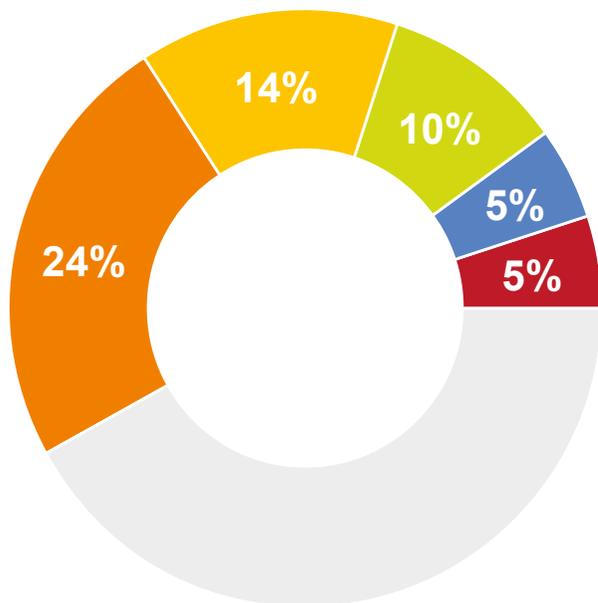
	Control is fully done by software	Control is partially done by software, partly manually	Control is done manually	No manual control is done
Structural strength and stability	Turkey	Spain, Finland, France, Scotland, England	Norway, UK, Scotland, Cyprus, Lithuania, Latvia, Poland, Romania, Germany	Slovenia, Ireland, Estonia, Croatia
Safety in case of fire	UK, Turkey	Spain, Finland, England and Wales, Ireland, France	Norway, Scotland, England, Cyprus, Lithuania, Poland, Romania, Ireland, Germany, Croatia, Latvia	Slovenia
Hygiene, health and the environment		Turkey, Spain, Finland, England and Wales, France	Norway, UK, Scotland, England, Cyprus, Lithuania, Romania, Estonia, Germany, Croatia, Latvia, Poland	Denmark, Slovenia, Ireland
Safety and accessibility in use	UK, Turkey	Spain, Finland, France	Norway, Scotland, England, Cyprus, Lithuania, England and Wales, Romania, Estonia, Germany, Latvia, Poland	Denmark, Slovenia, Ireland, Croatia
Protection against noise	Turkey	Spain, Finland, France, England and Wales	Norway, UK, Scotland, England, Cyprus, Lithuania, Estonia, Romania, Poland, Germany, Croatia	Denmark, Slovenia, Ireland, Latvia
Energy efficiency and heat loss	UK, Turkey, Finland	Scotland, England, England and Wales, Cyprus, Spain, Estonia, Latvia, France	Norway, Lithuania, Poland, Romania, Germany	Denmark, Slovenia, Ireland, Croatia
Sustainable use of natural resources		Spain, Finland, France	Norway, UK, Scotland, England, Turkey, Cyprus, Lithuania, Poland, Romania, Germany	England, England and Wales, Slovenia, Ireland, Estonia, Croatia, Latvia
Access for all	UK	Turkey, Spain, Finland, Romania, France	Norway, Scotland, England, Cyprus, Lithuania, England and Wales, Germany, Estonia, Latvia, Poland	Denmark, Slovenia, Croatia
Compliance with the spatial plan	Turkey	England, Spain	Norway, UK, Scotland, Cyprus, Lithuania, Finland, Romania, Ireland, Estonia, Germany, Croatia, Latvia, France, Poland	Denmark, Slovenia, England and Wales
Drainage provisions		Spain, Finland	Norway, UK, Scotland, England, Turkey, Cyprus, Lithuania, England and Wales, Romania, Ireland, Estonia, Germany, Croatia, France, Poland	Denmark, Slovenia, Latvia

Question 28:

Are any of the other requirements (i.e. compliance with the additional environmental provisions, the Energy Performance Certificate), which are subject to an approval done electronically?

Answer:

- Yes
- No
- Partial
- Planned
- I don't know

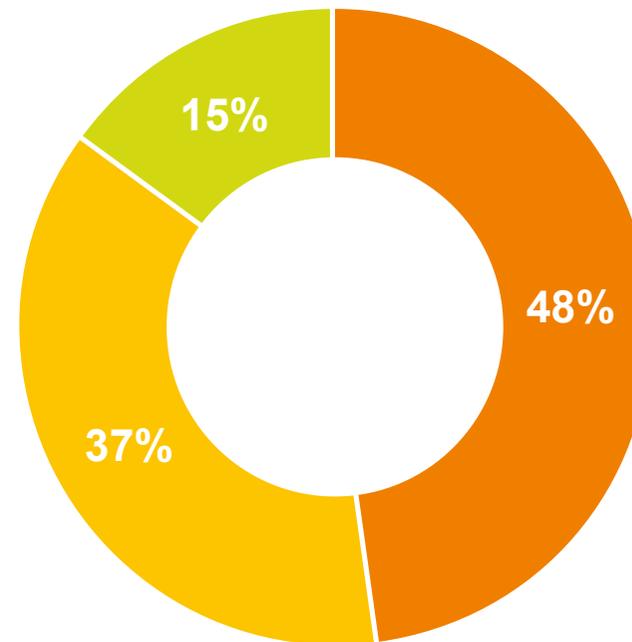


Question 29:

How are decisions notified (in processes where this is required)? (Several answers are possible)

Answer:

- Ordinary mail
- E-mail
- Via the IT system

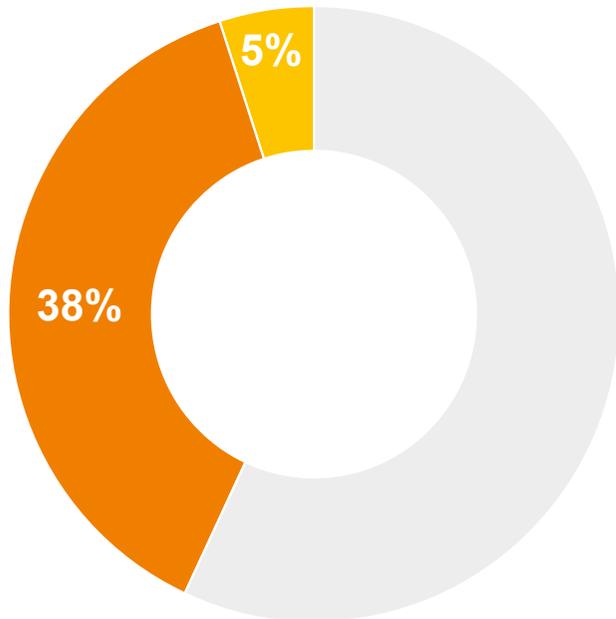


Question 30:

Does the digital system create formal documents for decisions?

Answer:

- Yes
- Yes, in some cases
- No (0%)

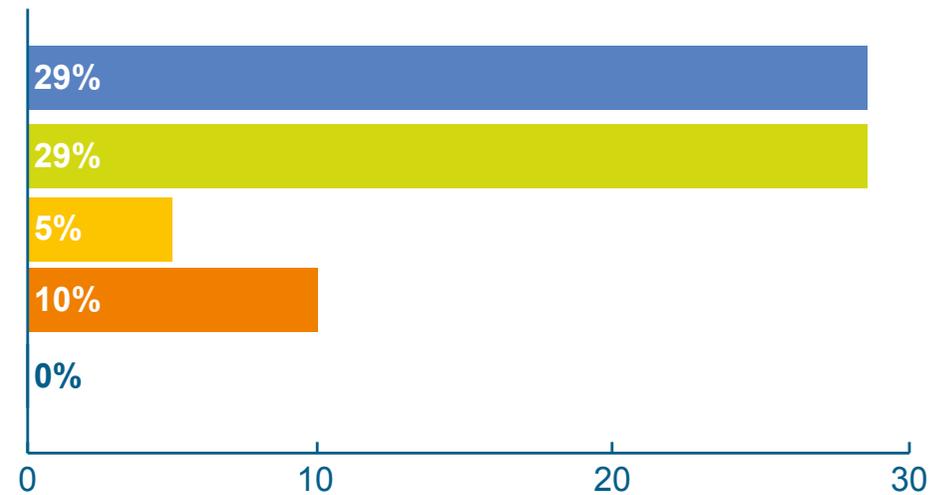


Question 31:

Is the client of the service notified on the status of an application for building permit? (Several answers are possible)

Answer:

- Yes, by email
- Yes, via the centralized construction system
- Yes, by another tool
- Yes
- No (0%)



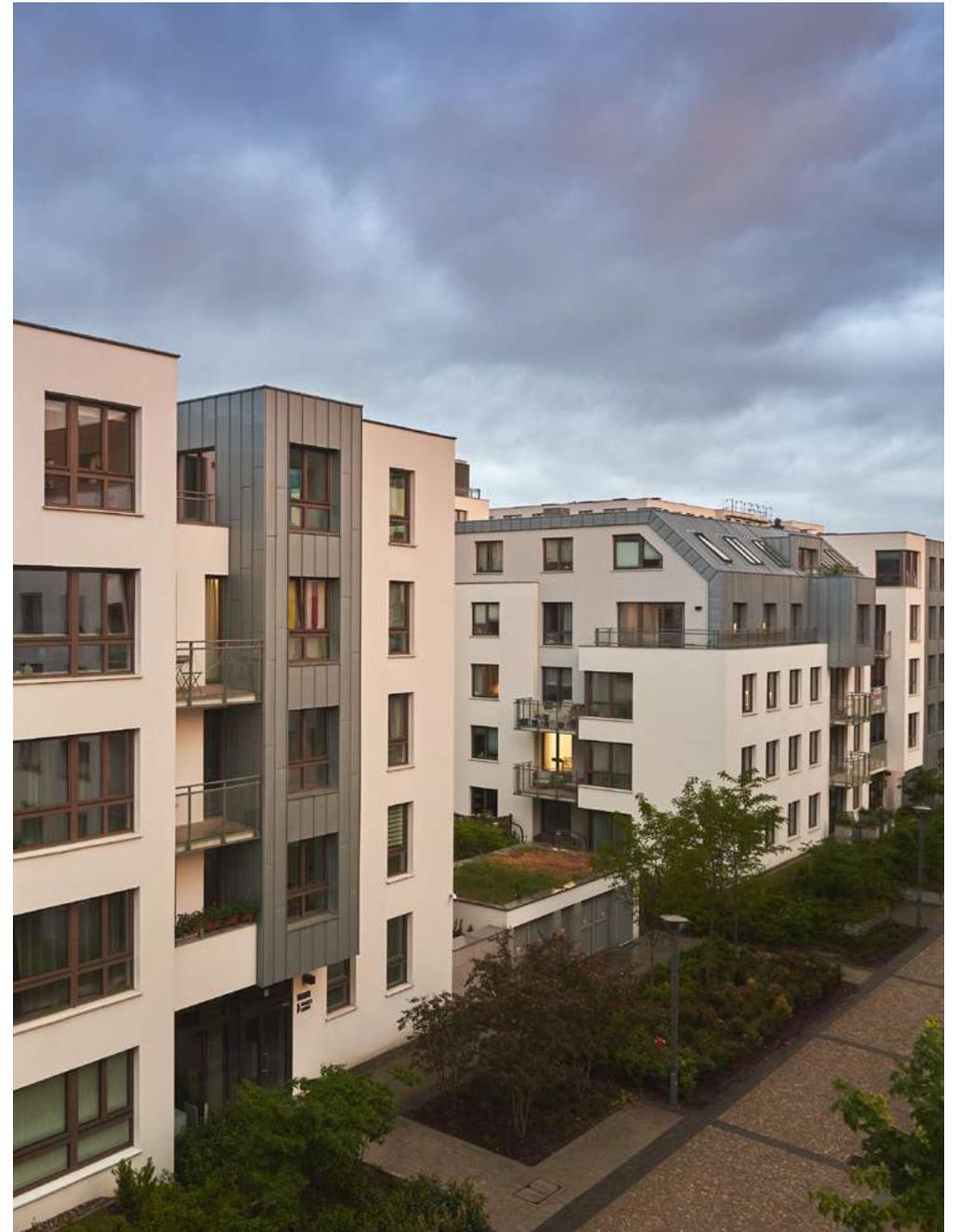
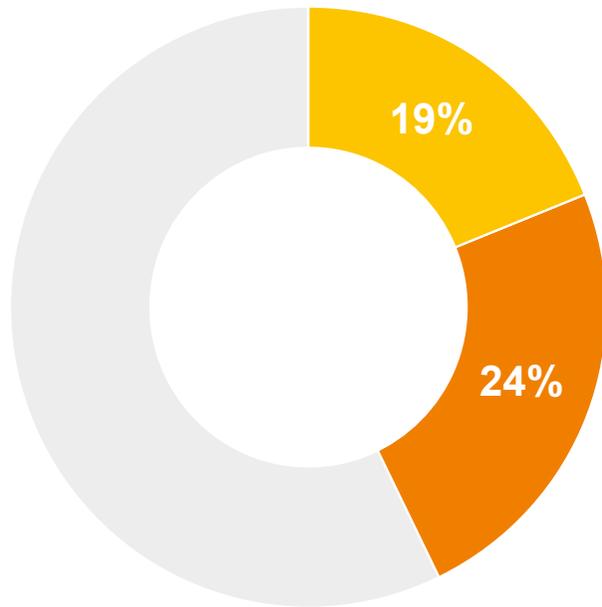
Question 32:

Can the client choose how they would like to receive notification of a decision?

Answer:

● Yes

● No



Construction phase

Question 33:

Is the construction phase digitalised?

Answer:

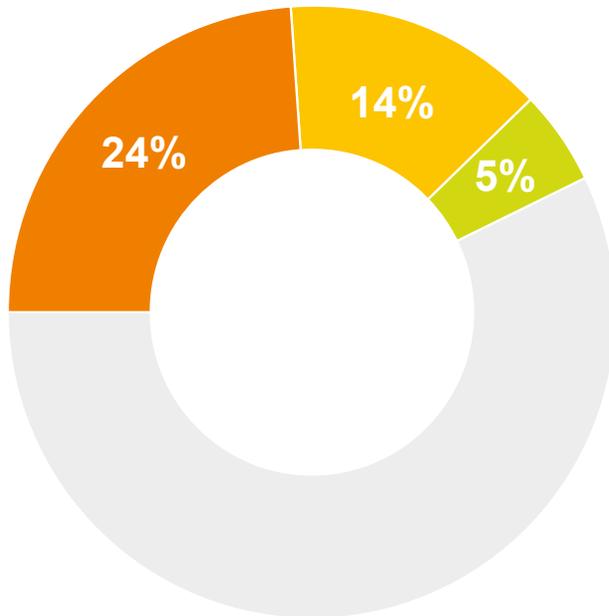
- Yes
- No
- Partial

Comments

Not on a national basis (England)

In development (Slovenia)

On voluntary base (France)



Country	Yes	No	Partial
Norway	x		
UK		x	
Scotland	x		
England			
England and Wales			x
Denmark	x		
Turkey	x		
Cyprus		x	
Slovenia			
Lithuania	x		
Poland	x		
Spain			x
Finland	x		
Romania		x	
Ireland		x	
Estonia	x		
Germany	x		
Croatia		x	
Latvia	x		
France			



Question 34:

Who are the users of IT systems in the construction phase?
(Several answers are possible)

Answer:

- Professionals (i.e. architects, engineers)
- Citizens (neighbours/others that may give notes to the application)
- Builders
- Investors

Comments

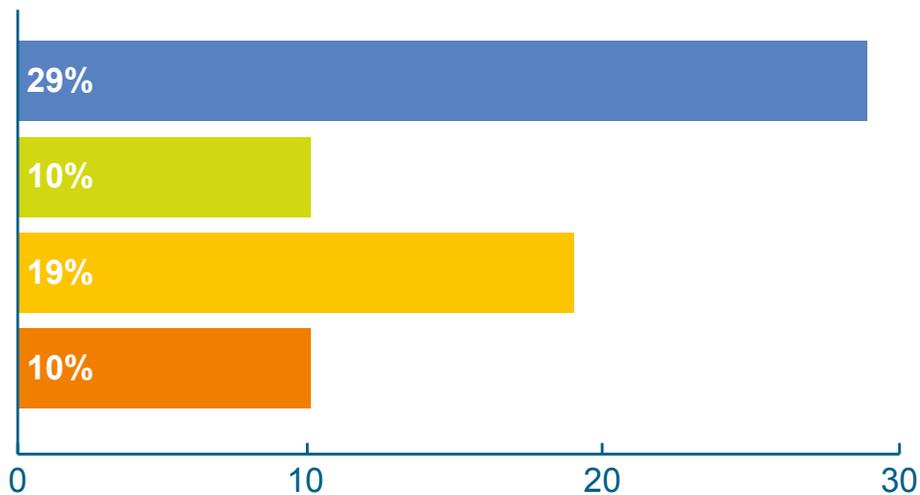
Building Standards Surveyors and applicants (Scotland)

Don't know - we have very little contact during construction phase (Denmark)

Institutions, Inspectorate (Lithuania)

Building authorities, certification authorities (Latvia)

Country	Professionals	Citizens	Builders	Investors
Norway	x	x		x
UK				
Scotland	x			
England	x	x	x	x
England and Wales	x		x	
Denmark				
Turkey	x			
Cyprus				
Slovenia	x		x	x
Lithuania	x		x	x
Poland	x			x
Spain	x		x	
Finland	x	x	x	x
Romania				
Ireland				
Estonia	x		x	
Germany	x			x
Croatia				
Latvia	x	x	x	x
France			x	x



Question 35:

How does the builder/ contractor / investor / professional notify each phase of construction process

Answer:

- They do not notify
- Notify in writing
- Via IT system

Question 36:

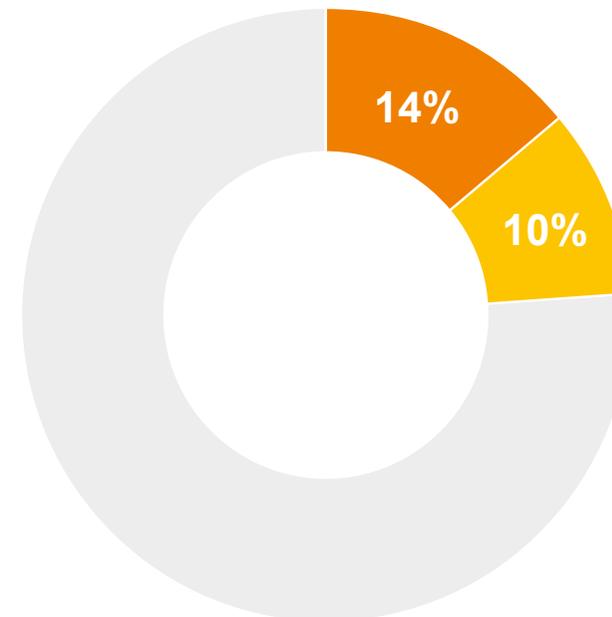
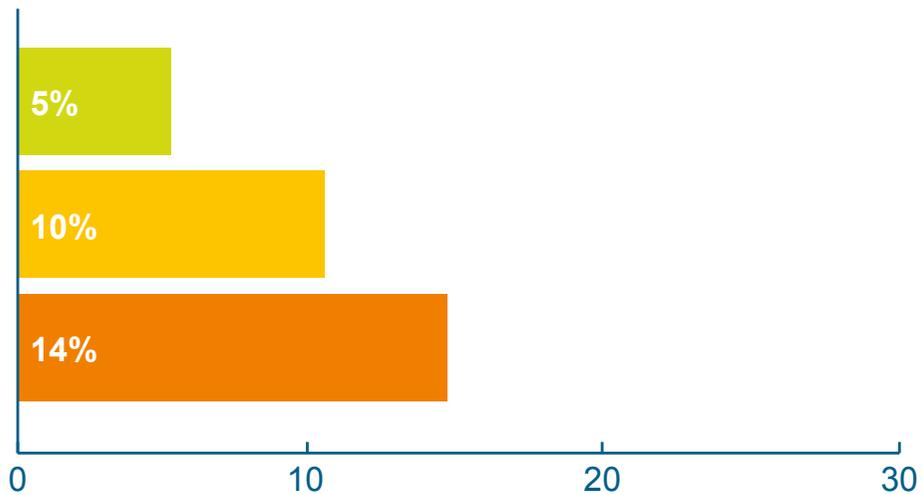
May the client choose the way in which the notification of a decision would be done?

Answer:

- Yes
- No

Other:

It depends on builders and professionals involved (Spain)



Question 37:

When communicating with other institutions during the construction phase, what type of IT solutions do you use? (Several answers are possible)

Answer:

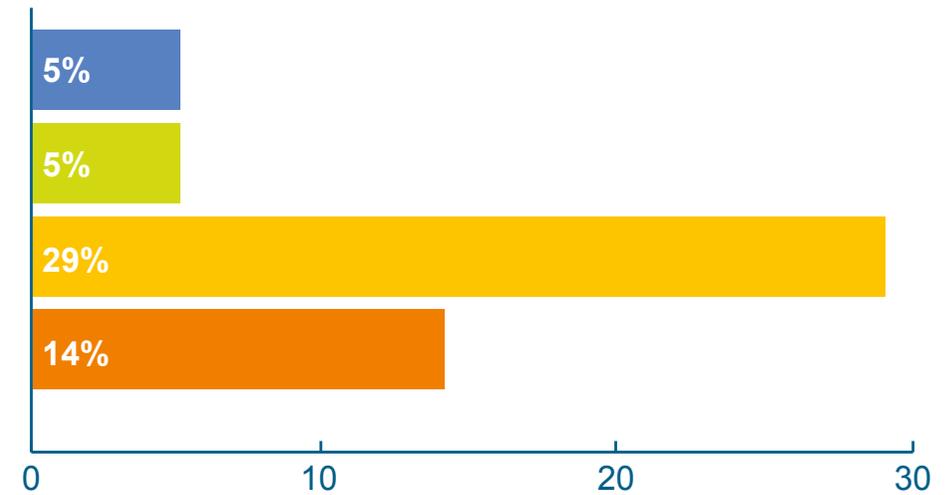
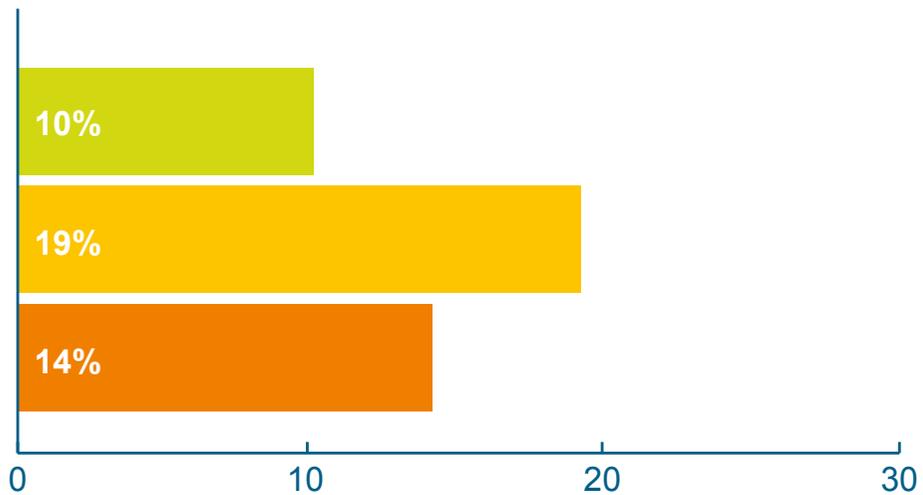
- Ordinary mail
- E-mail
- Via IT system

Question 38:

How do you record the changes between what was designed and what was built?

Answer:

- Notification by post
- Notification by e-mail
- Via IT system
- By a formal amendment application to the original application



Question 39:

Do building control personnel use electronic devices when they work on building sites?

Answer:

No answers collected due to an error with the electronic questionnaire.

Question 40:

How are the results of inspections on site performed by the building control authority recorded? (Several answers are possible)

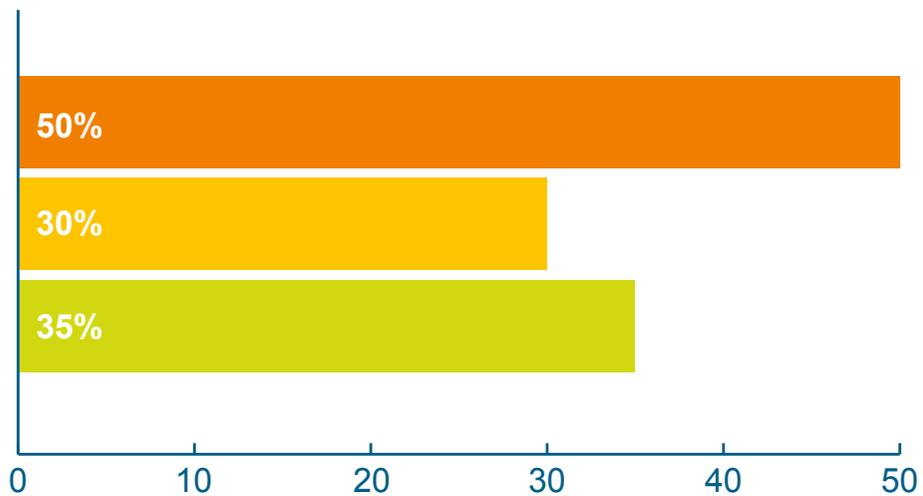
Answer:

- Electronic documents managed in IT system
- Electronic documents
- Paper documents

Comments

If paper, they will be scanned (Norway)

It is done by private third private control so they manage it on their own (Slovenia)



Country	Electronic documents managed in IT system	Electronic documents	Paper documents
Norway		x	x
UK			
Scotland	x	x	x
England	x	x	x
England and Wales	x		
Denmark	x		
Turkey	x		
Cyprus			
Slovenia			x
Lithuania	x		
Poland			x
Spain		x	
Finland	x		
Romania			
Ireland			
Estonia	x	x	
Germany			x
Croatia			
Latvia	x		
France	x	x	x

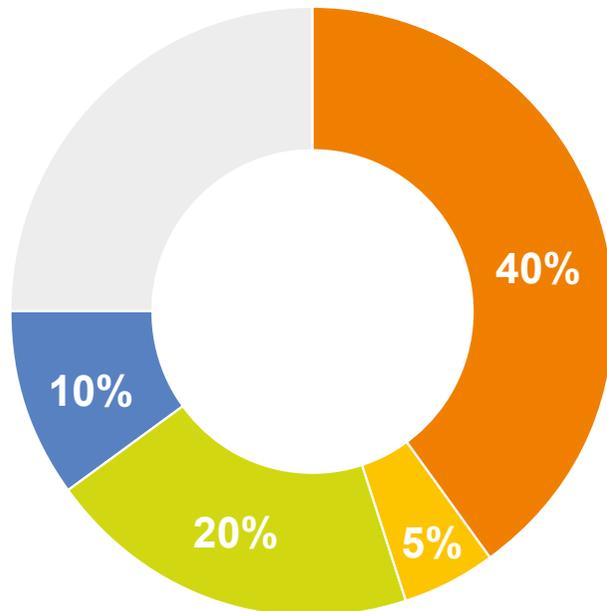


Question 41:

Is there a system that keeps a digital record of the building control results performed by building control authority during the construction phase?

Answer :

- Yes
- No
- Partial
- Inspections are not performed



Country	Yes	No	Partial	Inspections are not performed
Norway	x			
UK				
Scotland	x			
England			x	
England and Wales	x			
Denmark				x
Turkey		x		
Cyprus				
Slovenia				x
Lithuania	x			
Poland			x	
Spain			x	
Finland	x			
Romania				
Ireland				
Estonia	x			
Germany			x	
Croatia				
Latvia	x			
France	x			

Question 42:

Is the construction logbook an electronic document in your country?

Answer:

- Yes
- No
- Mostly
- Partial
- In development

Comments

The Construction Compliance and Notification Plan (CCNP) is the Building Standards record of what was requested to be seen. This is backed up by inspection and reasonable enquiry records (Scotland)

But can be paper based (England)

We do limited inspections during construction (Denmark)

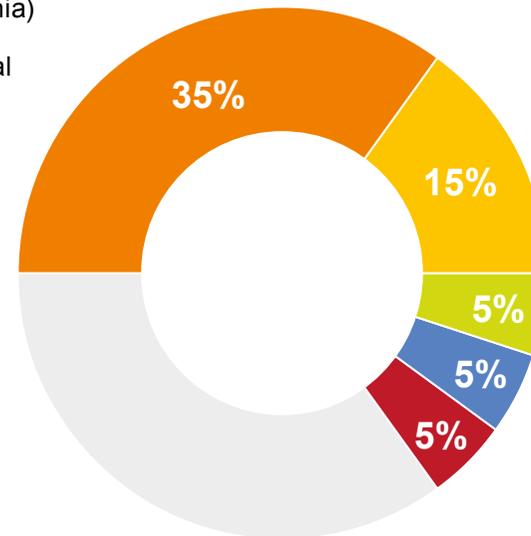
In development (Slovenia)

Construction log book is allowed in paper form until 2023-05-01 (Lithuania)

There is an app to ease this task but in most regions there isn't an official way to do it (Spain)

Mostly (Finland)

Partial (France)



Country	Yes	No
Norway	x	
UK		
Scotland		x
England	x	
England and Wales		
Denmark		
Turkey	x	
Cyprus		
Slovenia		
Lithuania	x	
Poland	x	
Spain	x	
Finland		
Romania		
Ireland		
Estonia		
Germany		x
Croatia		
Latvia	x	
France		

Question 43:

Is the construction logbook stored in the IT system of the authorities?

Answer:

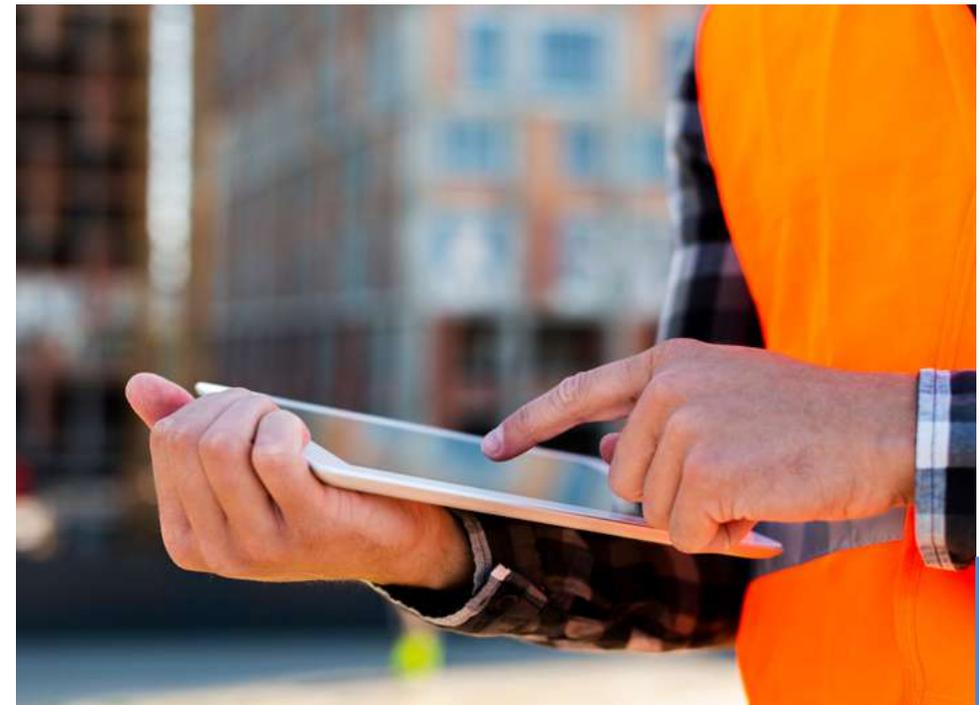
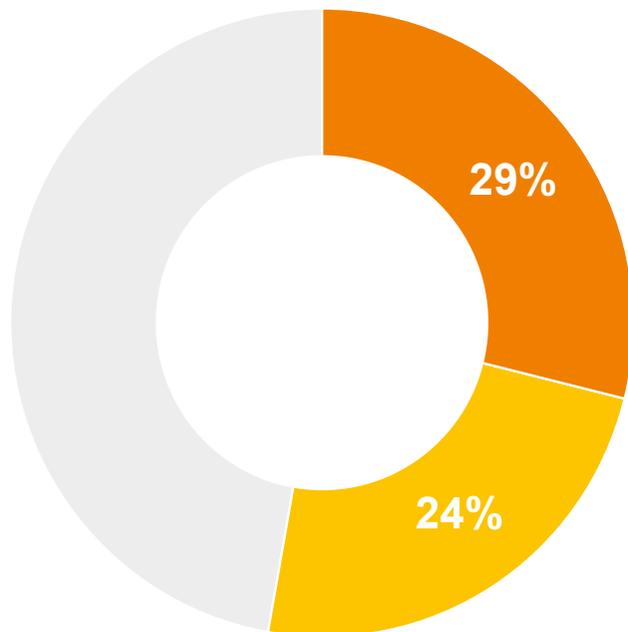
● Yes

● No

Comments:

Inspectors of authorities have a possibility to log in construction logbook of inspected object remotely (e-journal is not stores in state building information system, it is a private sector product); (Lithuania)

Sometimes (Germany)



Question 44:

Does your country/organisation have means of electronic monitoring of the demolition phase and reporting the quantity of construction & demolition waste and reporting its quality? Does your electronic system capture data on the demolition phase? If so, does it have the ability to report on the quantity and quality of demolition waste?

Answer:

- Yes
- Yes, but not part of building control
- No
- Partial
- Not applicable

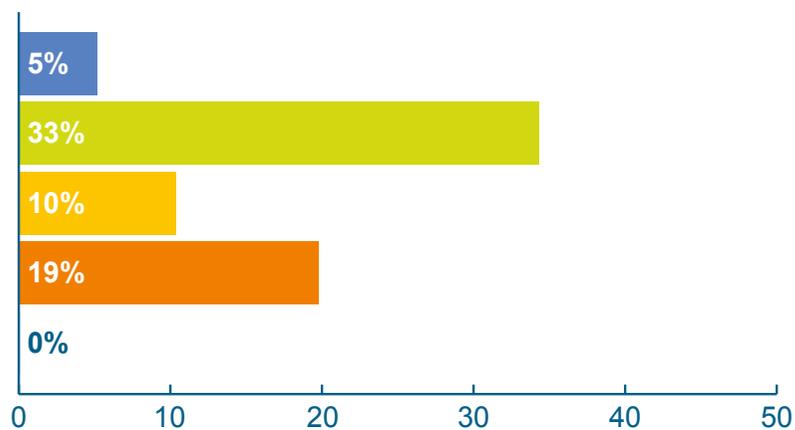
Comments:

Waste and where it is transferred is not a Building Standards matter. It is for Scottish Environmental Protection Agency and Environmental Health. (Scotland)

Not part of building control (Denmark)

Building permit for demolition of building and registration of declaration of demolition are e-services of construction information system, but the quantities of wastes are reported in other IT system, which is created to take account of construction waste and product packages (Lithuania)

Country	Yes	Yes, but not part of building control	No	Partial	Not applicable
Norway			x		
UK					
Scotland			x		
England				x	
England and Wales			x		
Denmark					
Turkey		x			
Cyprus					
Slovenia			x		
Lithuania					
Poland			x		
Spain				x	
Finland		x			
Romania					
Ireland					
Estonia				x	
Germany			x		
Croatia					
Latvia	x				
France				x	



Commissioning / completion of construction

Question 45:

Is the commission phase digitalised?

Answer:

- Yes
- No

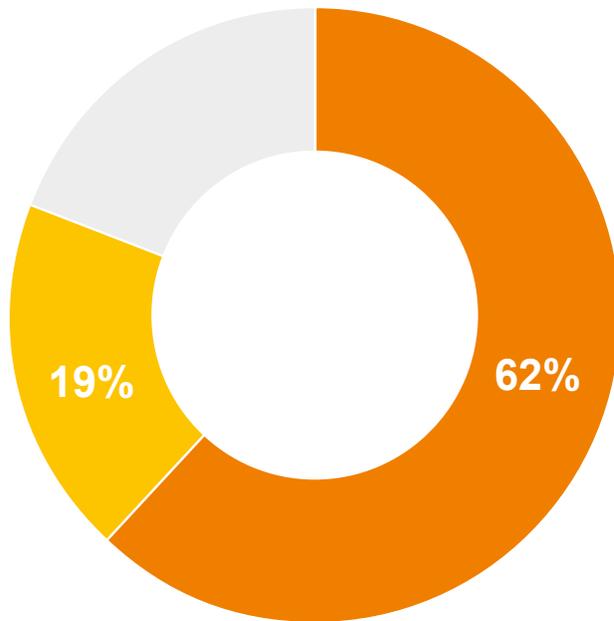
Comments

In development (Slovenia)

Partial: a cert of compliance on completion is issued by municipality on receipt of documents from parties but these are not verified by state bodies (Ireland)

On voluntary base (France)

Country	Yes	No
Norway	x	
UK		x
Scotland	x	
England		
England and Wales	x	
Denmark	x	
Turkey	x	
Cyprus		x
Slovenia		
Lithuania	x	
Poland	x	
Spain	x	
Finland	x	
Romania		x
Ireland		
Estonia	x	
Germany		x
Croatia	x	
Latvia	x	
France		





Question 46:

Who are the users of IT systems in the commissioning/completion phase?
Several answers are possible

Answer:

- Professionals (i.e. architects, engineers)
- Citizens (neighbours/others that may give notes to the application)
- Builders
- Investors

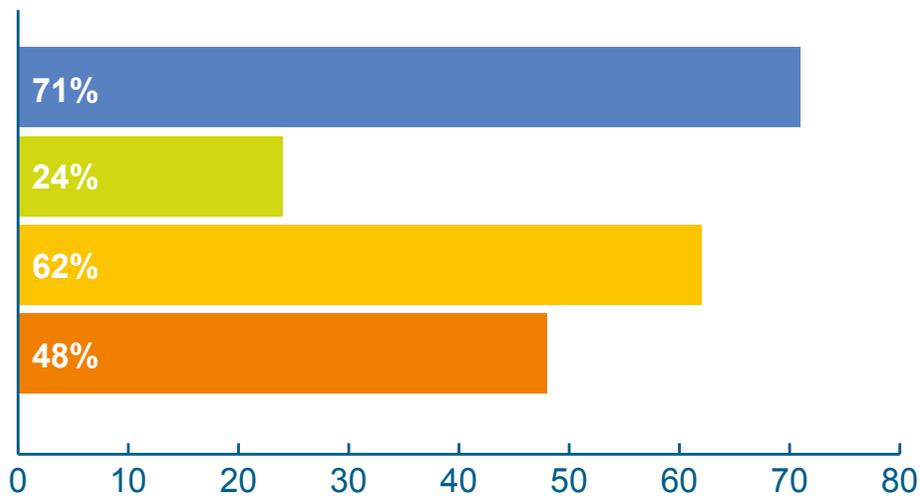
Comments

Building Standards Surveyors and applicants. Local authorities will use their own IT solution. Work is emerging on the use of open BIM for handover information (Scotland)

Institutions (Municipalities, Inspectorate, Cultural heritage department, etc.) (Lithuania)

Building authorities, issues of technical regulations, supervising authorities, certification authorities (Latvia)

Country	Professionals	Citizens	Builders	Investors
Norway	x	x	x	x
UK				
Scotland	x		x	
England	x		x	x
England and Wales	x		x	
Denmark	x	x	x	x
Turkey	x			
Cyprus				
Slovenia	x		x	x
Lithuania	x		x	x
Poland	x			x
Spain	x		x	
Finland	x		x	x
Romania				
Ireland	x	x	x	
Estonia	x	x	x	x
Germany				
Croatia	x			
Latvia	x	x	x	x
France	x		x	x



Question 47:

In what way it is possible to submit the application for completion of construction?

Answer:

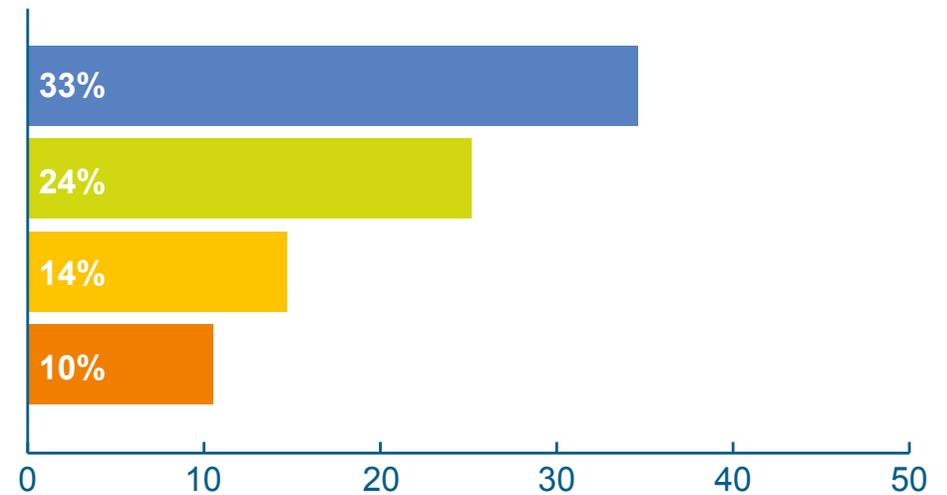
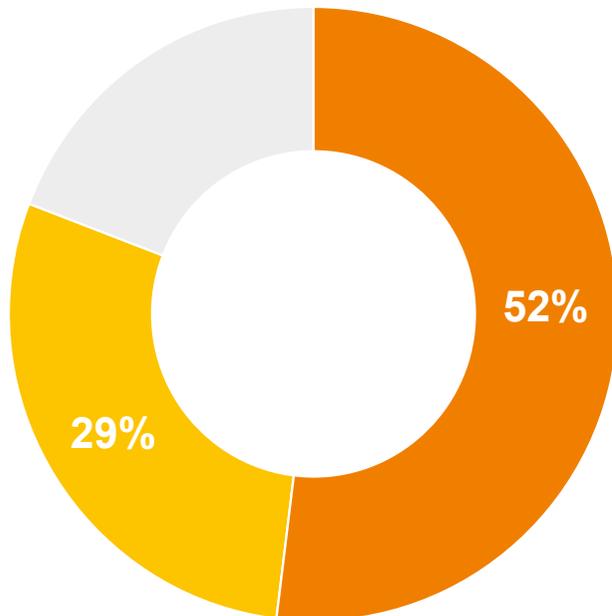
- Only electronically
- Only on paper (0%)
- Both are permitted

Question 48:

How is commissioning service performed by the building control authority?

Answers:

- Digitally
- Partly digitally
- Non digitally
- It is not performed



Question 49:

Is it possible for the client of commissioning service to reuse the data, which was submitted in the system in previous phases?

Answer:

● Yes

● No

Other:

It depends on the builders; (Spain); It's all in the same line of process; (Denmark); Not aware (England)

Question 50:

Use permit (authorisation of a use of building) is:

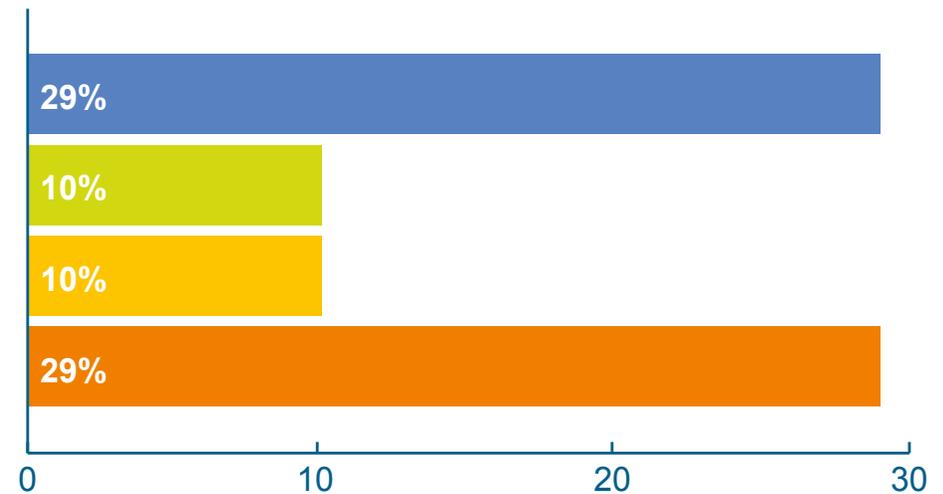
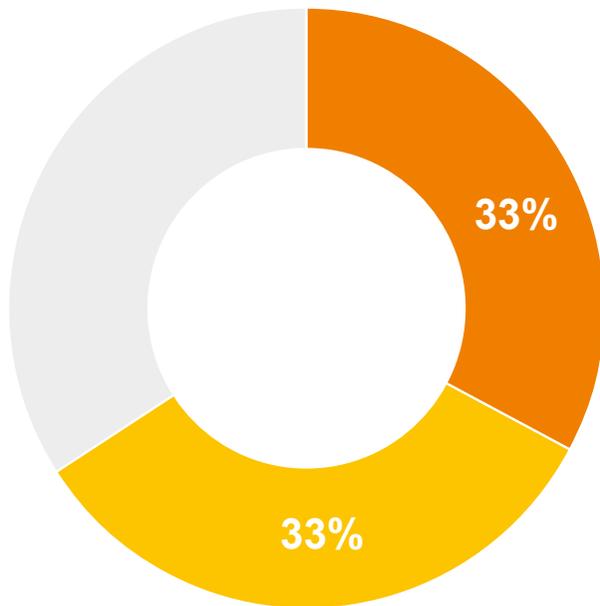
Answer:

● E-signed electronic document via IT system

● E-signed electronic document via other means

● Document in paper form

● Electronic document or document in paper form





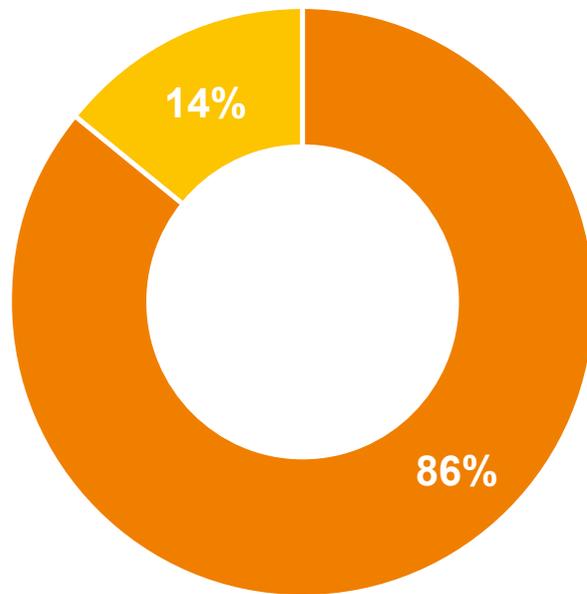
Use and maintenance

Question 51:

Is the use of maintenance phase digitalised?

Answer:

- Yes
- No



Country	Yes	No
Norway		x
UK		x
Scotland		x
England		x
England and Wales		x
Denmark		x
Turkey		x
Cyprus		x
Slovenia		x
Lithuania		x
Poland	x	
Spain		x
Finland	x	
Romania		x
Ireland		x
Estonia		x
Germany		x
Croatia		x
Latvia	x	
France		x



Question 52:

Who are the users of IT systems during the use phase?

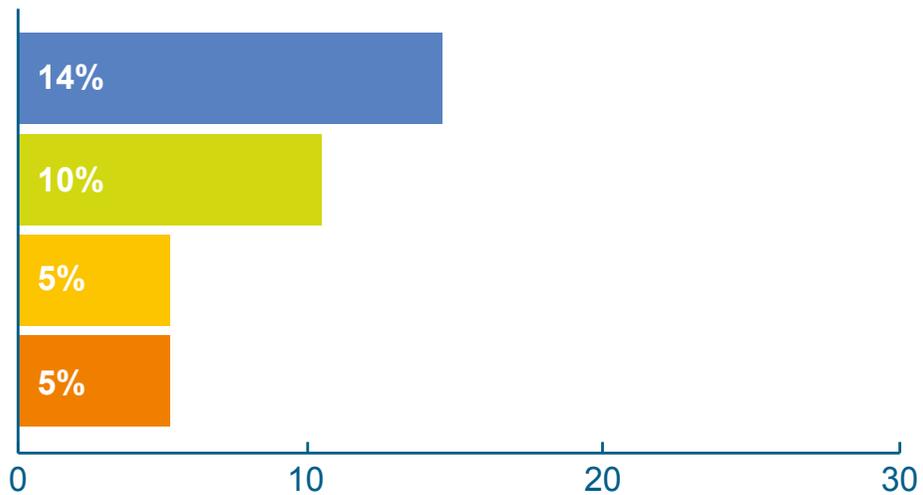
Answer

- Professionals (i.e. architects, engineers)
- Citizens (neighbours/others that may give notes to the application)
- Builders
- Investors

Comments

Building authorities, supervision authorities, property managers (Latvia)

Country	Professionals	Citizens	Builders	Investors
Poland	x	x		x
Finland	x		x	x
Latvia	x	x		x



Question 53:

How are the results of inspections of the building in use (maintenance) phase recorded?

Answer:

- Electronic documents, managed in IT system
- Electronic documents
- Paper documents
- Other
- Not carried out

Results:

Electronic documents, managed in IT system: Latvia, Poland

Other: Finland

Question 54:

Do you have a system that keeps a record of the building inspections of buildings in use (maintenance)?

Answer:

- Yes
- No
- Partial
- Inspections are not performed

Results:

No: Finland

Yes: Poland, Latvia

Question 55:

Do you have data on the technical and maintenance condition of the buildings?

Answer:

- Yes (national level)
- Yes (region / state level)
- Yes (municipality level)
- No

Results:

Yes (municipality level): Finland

Yes (national level): Latvia, Poland

Question 56:

Do you have a system that keeps records of the changes of the building (i.e. change of use, refurbishments, minor and major reconstructions)?

Answer:

- Yes
- No
- Partial

Results:

Yes, if it needs a building permit: Finland

Yes: Poland, Latvia



Usage of BIM

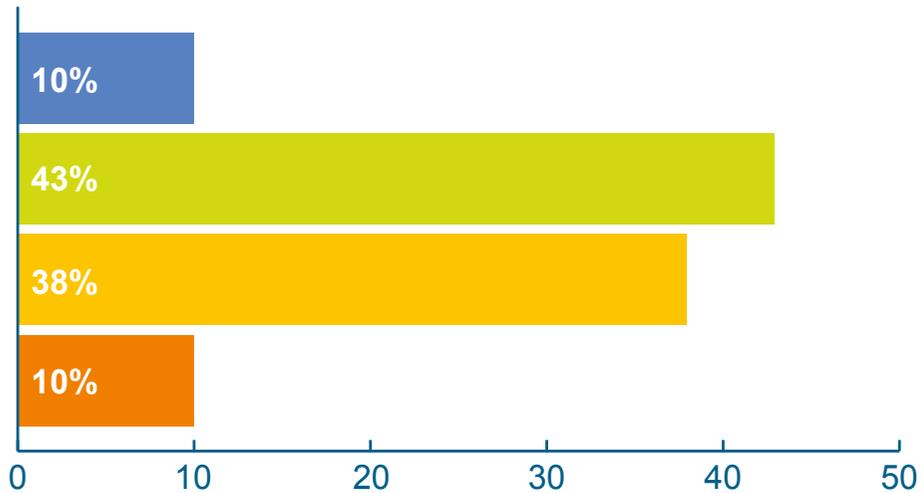
Question 57:

Do you use BIM in the building control procedure?

Answer:

- Yes
- No
- It is planned
- Partial

Country	Yes	No	It is planned	Partial
Norway			x	
UK	x			
Scotland			x	
England		x		
England and Wales		x		
Denmark		x		
Turkey	x			
Cyprus		x		
Slovenia				x
Lithuania			x	
Poland		x		
Spain			x	
Finland			x	
Romania		x		
Ireland		x		
Estonia			x	
Germany			x	
Croatia		x		
Latvia			x	
France				x



Question 58:

Which formats are used?

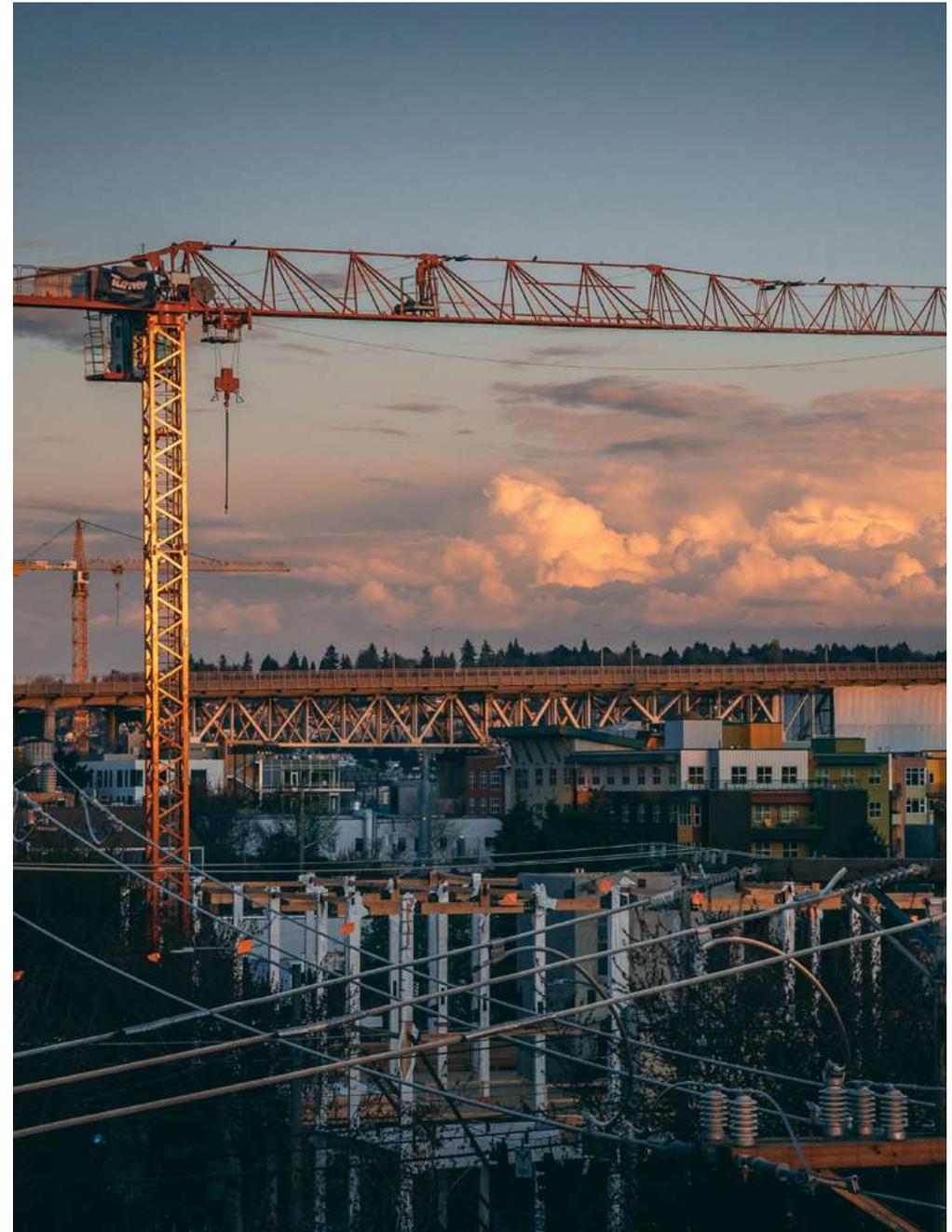
Answer:

- Open standards (IFC)
- Proprietary formats
- Both

Results:

Open standards (IFC): UK, Turkey, Slovenia

Both: France





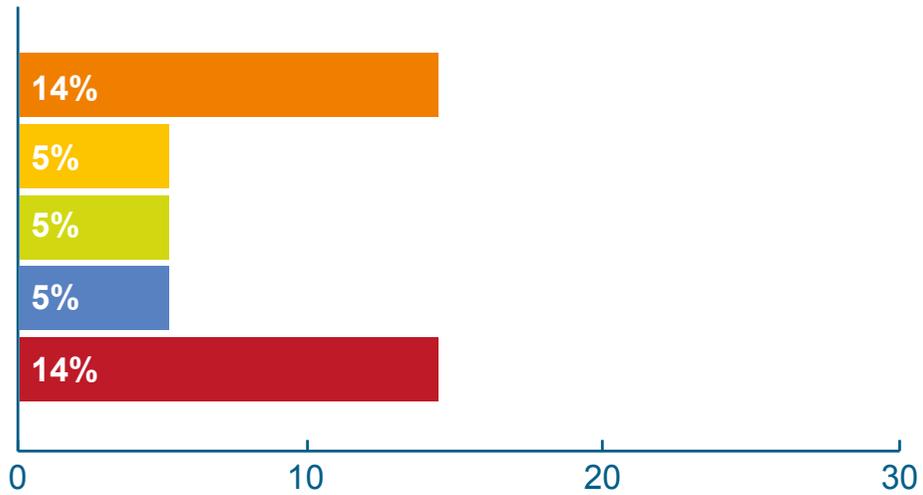
Question 59:

Which features are included in the process?

Answer:

- Archival
- Attribute extraction
- Visual checks in city models and 3D map
- Visual checks
- Rule-based checks

Country	Rule-based checks	Visual checks	Visual checks in city models and 3D map	Attribute extraction	Archival
UK	X				
Turkey	X	x	x		x
Cyprus					
Slovenia					x
France	X			x	x





Estimated usage of BIM

Question 60:

Do you have data/statistics regarding usage of BIM for your country?

Answer:

- Yes
- No

Results:

No: Turkey, Slovenia, France

Yes: UK

Question 61-68

Answer

61-68

Results:

Country: UK

Question 69:

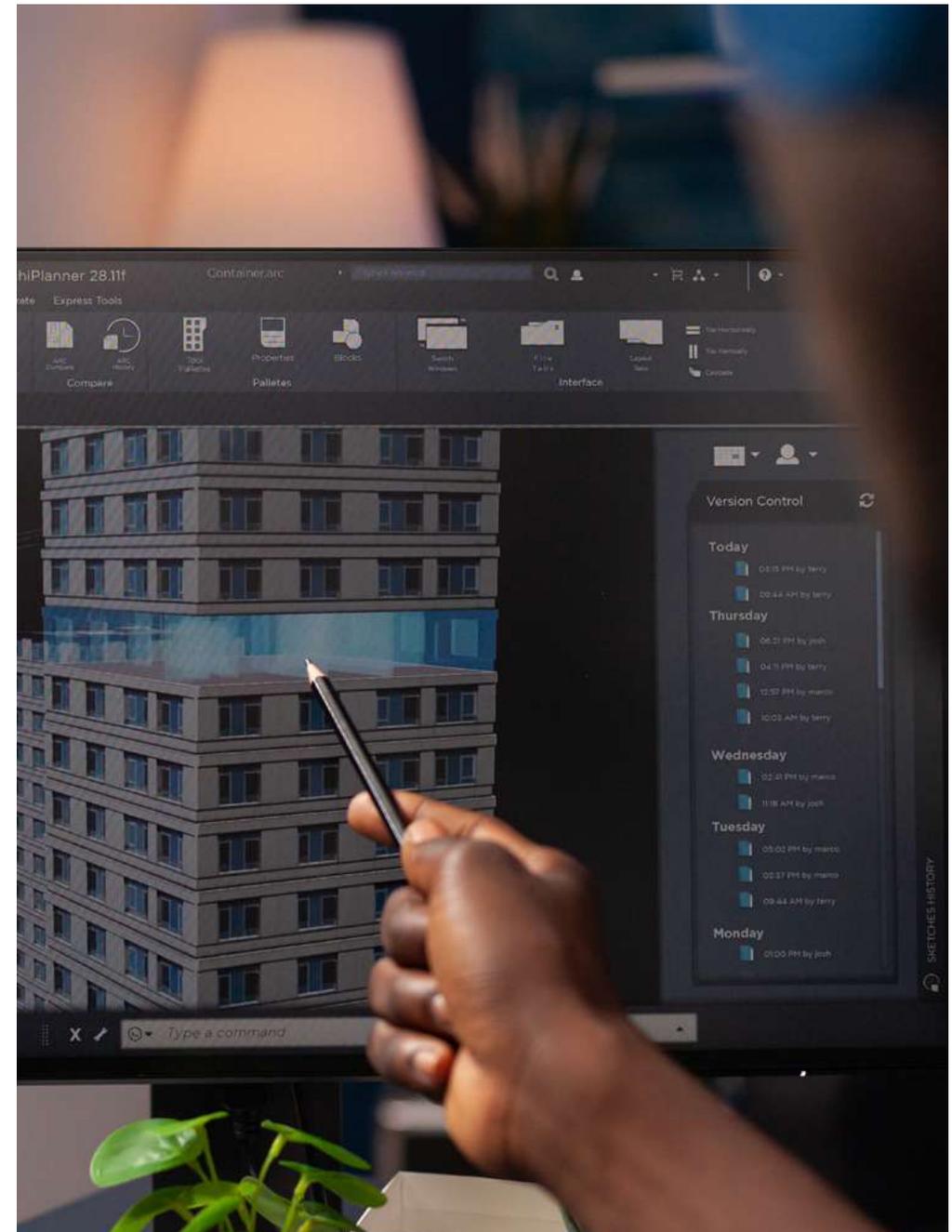
What are the three most common BIM software used?

Answer:

- Acad
- Archicad
- Revit
- SketchUp
- Infurnia
- Vector works
- Other

Results:

Revit: UK





Annex: Questionnaire

e-delivery - Digitalization in the construction sector

Organization: CEBC (<http://www.cebc.eu>)

Please note the following: the questionnaire will take up to 30 minutes to complete. Unfortunately, there is no “save and continue later” option, so please leave the browser window open if you must pause during the survey. Under each chapter, you will have the possibility to skip some of the questions if any of the phases of the construction process is not digitalized yet and you will answer “no” to the first question in each chapter (page).

In some of the questions, you have a possibility to choose two or more answers. You will see that some of those questions have an alternative reply named “other”. This is to give you the possibility to write free text answers to explain your choice.

If you have remarks to questions without the “other” alternative, you are encouraged to write your remarks in last question.

Members that would like to send examples of their good practices or detailed information/presentations regarding individual e-delivery systems, are encouraged to do so. In this case send us an e-mail.

If you have questions regarding the questionnaire, the members of the group are at your service:

Saša Galonja sasa.galonja@gov.si

Svetlana Mjakuškina svetlana.mjakuskina@bvkb.gov.lv

Marcin Cudak m.cudak@gunb.gov.pl

Pekka Virkamaki pekka.virkamaki@vantaa.fi

Vytautas Ambrazas v.ambrazas@vtpsi.lt

Øyvind Kikut oyk@dibk.no (our web guru)

We kindly ask you to complete this survey by Friday, October 7, 2022.

Thank you all very much

General questions

1. Your country:

2. Organisation/Authority

3. Surname

4. First name

5. E-mail

Digitalization in the construction sector

6. Do you have a digitalization strategy or other planning document in the construction sector?

- Yes
- No

7. What is the purpose of digitalization with the of construction sector? (Several answers are possible)

- Minimize risk of corruption
- Effective construction process management
- Minimize bureaucracy
- Data safety
- Improve productivity
- Better cost delivery
- Better project schedule delivery
- Better decision-making progress
- Responsibility/Decisions traceability

8. Which of the construction phases are already digitalized in your country (Several answers are possible)

- None
- Permitting phase
- Construction phase
- Commissioning phase (use permit)
- Use and maintenance phase

9. Are you planning to digitalize some of the construction phases in the future?

- Yes, within next year
- Yes, within the next 3 years
- Yes, in more than 3 years
- No

10. What will be the next step(s) of the digitalization of the construction process? (Several answers are possible)

- Permitting phase
- Construction phase
- Commissioning phase (use permit)
- Use and maintenance
- I don't know

11. How many IT construction systems are in your country? (Several answers are possible)

- One on country level
- One on region/state level
- One on municipality level
- More than one on country level
- More than one on region/state level
- More than one on municipality level
- One private system
- More than one private system
- No systems are in place

Planning and permitting phase

12. Is the planning and permitting phase digitalized? (Several answers are possible)

- Yes, planning phase
- Yes, permitting phase
- No

13. Who are the users of the digitalized services in the planning and permitting phase? (Several answers are possible)

- Professionals (i.e. architects, engineers)
- Citizens (neighbours/others that may give notes to the application)
- Builders
- Investors

14. Does your country have public web access to spatial planning documents? (Several answers are possible)

- Yes (country level)
- Yes (state/regional level)
- Yes (municipality level)
- No

15. In what way is it possible to submit the application for building permit?

- Only electronically
- Only in paper
- Both are permitted

16. How digitalised are the following processes?

	Fully digitalized	Not digitalised	Partly digitalized (parts of the service or information is available only in paper form)	In development	Not applicable	Don't know
Spatial (territorial)planning process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Possibility to upload GIS drawing on a digital map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Submission of a project (design) documentation for building permit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assessment of application	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assessments of plans (design) on screen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementation of required designs documentation changes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Request and obtain changes in building permit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication with neighbours and 3rd parties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication with investors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Issuing the Building permit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Monitoring/ controlling the construction phase	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Register (archive) of permits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



17. Do you have electronic integration with other systems? (exchange of information or data within the building sector or with other sectors) If yes, how many?

- 1-5
- 6-10
- More than 10
- No

18. Do you use open formats or proprietary formats of electronic documents?

- Open (i.e. .csv, .odf)
- Proprietary (i.e. .pdf, .xml, .ifc)
- Both

19. Are formats of electronic documents standardised? (Several answers are possible)

- Yes, on country level
- Yes, on region/state level
- Yes, on municipal level
- No

20. Do you have a database where the data related to each application for a building permit is kept? (Several answers are possible)

- Yes, private cloud
- Yes, public cloud
- Yes, own servers
- No

21. At what level is the database, mentioned in question 20, being set up and maintained? (Several answers are possible)

- Municipal
- Regional
- Provincial
- State

22. In the case of an existing database, is it possible to obtain information about the historical status (timeline) of a particular building

- Yes
- No

23. How do you communicate with other institutions? (Several answers are possible)

- Ordinary mail
- E-mail
- Via IT-system

24. Do you use qualified digital certificates/digital signatures when dealing with processes in the field of building control?

- Yes
- No

25. Is there a computer aided system in place to facilitate handling of applications (i.e. integration with databases, letter forms, autofilling of forms, facilitated reporting)

- Yes
- No



26. Is there a computer-aided system(s) in place to control the prescribed technical and other requirements of the building (electronic checking of BIM projects for compliance with national building regulations)?

- Yes
- No
- Partly

27. Which requirements for construction works are checked by IT systems? (mark the appropriate box)

	Control is fully done by software	Control is partially done by software, partly manually	Control is done manually	No manual control is done
Structural strength and stability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety in case of fire	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hygiene, health and environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety and accessibility in use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protection against noise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy efficiency and heat loss	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable use of natural recourses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access for all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compliance with spatial plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drainage provisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EV charging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overheating/ solar gain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heating system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staircase design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. Are any of the other requirements (i.e. compliance with the additional environmental provisions, the Energy Performance Certificate), which are subject to an approval, done electronically?

- Yes
- No
- Partially
- Planned
- I don't know

29. How are decisions notified (in processes where this is required)? (Several answers are possible)

- Ordinary mail
- E-mail
- Via the IT system

30. Does the digital system create formal documents for decisions?

- Yes
- No

31. Is the client of the service notified on status of an application for building permit? (Several answers are possible)

- Yes, by email
- Yes, via the centralized construction system
- Yes, by another tool
- Yes
- No

32. Can the client choose in which way the notification of a permit/decision would be done?

- Yes
- No

Construction phase

33. Is the construction phase digitalized?

- Yes
- No
- Partly

34. Who are the users of IT systems in the construction phase? (Several answers are possible)

- Professionals (i.e. architects, engineers)
- Citizens (neighbours/others that may give notes to the application)
- Builders
- Investors

35. How does the builder/contractor/investor/professional notify each phase of the construction process

- They do not notify
- Notify in writing
- Via IT system

36. May the client choose the way in which the notification of a decision would be done?

- Yes
- No

37. When communicating with other institutions in the construction phase, what type of IT solutions do you use? (Several answers are possible)

- Ordinary mail
- E-mail
- Via IT system

38. How do you record the changes between what was designed and what was built? (Several answers are possible)

- Notification by post
- Notification by e-mail
- Via IT system
- By a formal amendment application to the original application

39. Do building control personnel use electronic devices when they are on building sites? (Mark where applicable)

Smart phone	<input type="radio"/>
Tablet	<input type="radio"/>
Other electronic devices	<input type="radio"/>
Laptop	<input type="radio"/>
Drones	<input type="radio"/>

40. How are the results of inspections in site performed by the building control authority recorded? (Several answers are possible)

- Electronic documents managed in an IT system
- Electronic documents
- Paper documents

41. Is there a system that keeps a digital record of the building control results performed by the building control authority during the construction phase?

- Yes
- No
- Partly
- Inspections are not performed

42. Is the construction logbook an electronic document in your country?

- Yes
- No

43. Is the construction logbook stored in the IT system of the authorities?

- Yes
- No

44. Does your country/organisation have means of electronic monitoring of the demolition phase and reporting the quantity of construction & demolition waste and reporting its quality? Does your electronic system capture data on the demolition phase? If so, does it have the ability to report on the quantity and quality of demolition waste?

- Yes
- Yes, but not part of the building control
- No
- Partly
- Not applicable

Commissioning/completion of construction

45. Is the commissioning face digitalized?

- Yes
- No

46. Who are the users of IT systems in the commissioning/completion phase? (Several answers are possible)

- Professionals (i.e. architects, engineers)
- Citizens (neighbours/others that may give notes to the application)
- Builders
- Investors

47. In what way it is possible to submit the application for completion of construction?

- Only electronically
- Only on paper
- Both are permitted

48. How is commissioning service performed by the building control authority?

- Digitally
- Partly digitally
- Non digitally
- It is not performed

49. Is it possible for the client of commissioning service to reuse the data, which was submitted in the system in previous phases?

- Yes
- No



50. Use permit (authorisation of a use of building) is:

- E-signed electronic document issued via IT system
- E-signed electronic documents issued via other means
- Document in paper form
- Electronic document or document in paper form

Use and maintenance

51. Is the use and maintenance phase digitalized?

- Yes
- No

52. Who are the users of the IT services during use phase (several answers are possible)

- Professionals (i.e. architects, engineers)
- Citizens
- Builders
- Investors

53. How are the results of inspections of the building in use (maintenance) phase recorded?

- Electronic documents, managed in IT system
- Electronic documents
- Paper documents
- Other
- Not carried out

54. Do you have a system that keeps a record of the building inspections of buildings in use (maintenance)?

- Yes
- No
- Partly
- Inspections are not performed

55. Do you have data on the technical and maintenance condition of the buildings?

- Yes (national level)
- Yes (region/state level)
- Yes (municipality level)
- No

56. Do you have a system that keeps records of the changes of the building (i.e. change of use, refurbishments, minor and major reconstructions)?

- Yes
- No
- Partly

Usage of BIM

57. Do you use BIM in the building control procedure?

- Yes
- No
- It is planned
- Partly

58. Which formats are used?

- Open standards (IFC)
- Proprietary formats
- Both

59. Which features are included in the process?

- Rule-based checks
- Visual checks
- Visual checks in city models and 3D maps
- Attribute extraction
- Archival



Estimated usage of BIM

60. Do you have data/statistics regarding usage of BIM for your country

Yes

No

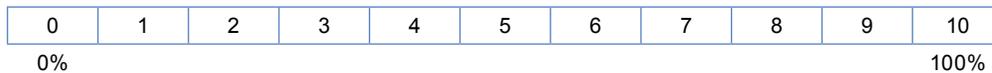
61. Please estimate the use of BIM for one dwelling houses
(intervals in 10%)



62. Please estimate the use of BIM for multi dwelling houses
(intervals in 10%)



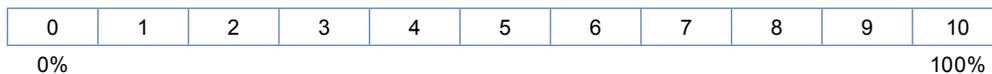
63. Please estimate the use of BIM for hotels
(intervals in 10%)



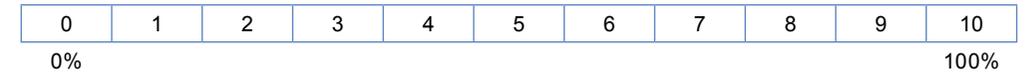
64. Please estimate the use of BIM for offices
(intervals in 10%)



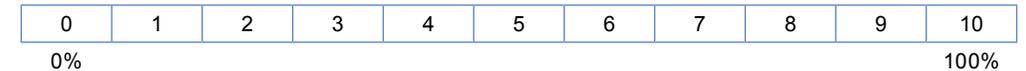
65. Please estimate the use of BIM for shops
(intervals in 10%)



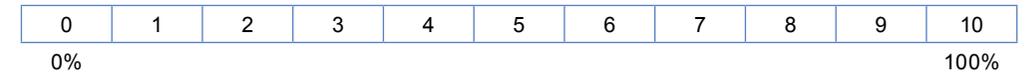
66. Please estimate the use of BIM for industrial buildings
(intervals in 10%)



67. Please estimate the use of BIM for schools and hospitals
(intervals in 10%)



68. Please estimate the use of BIM for civil engineering works
(intervals in 10%)



69. What are the three most common BIM software used?

ACAD

ArchiCAD

Revit

SketchUp

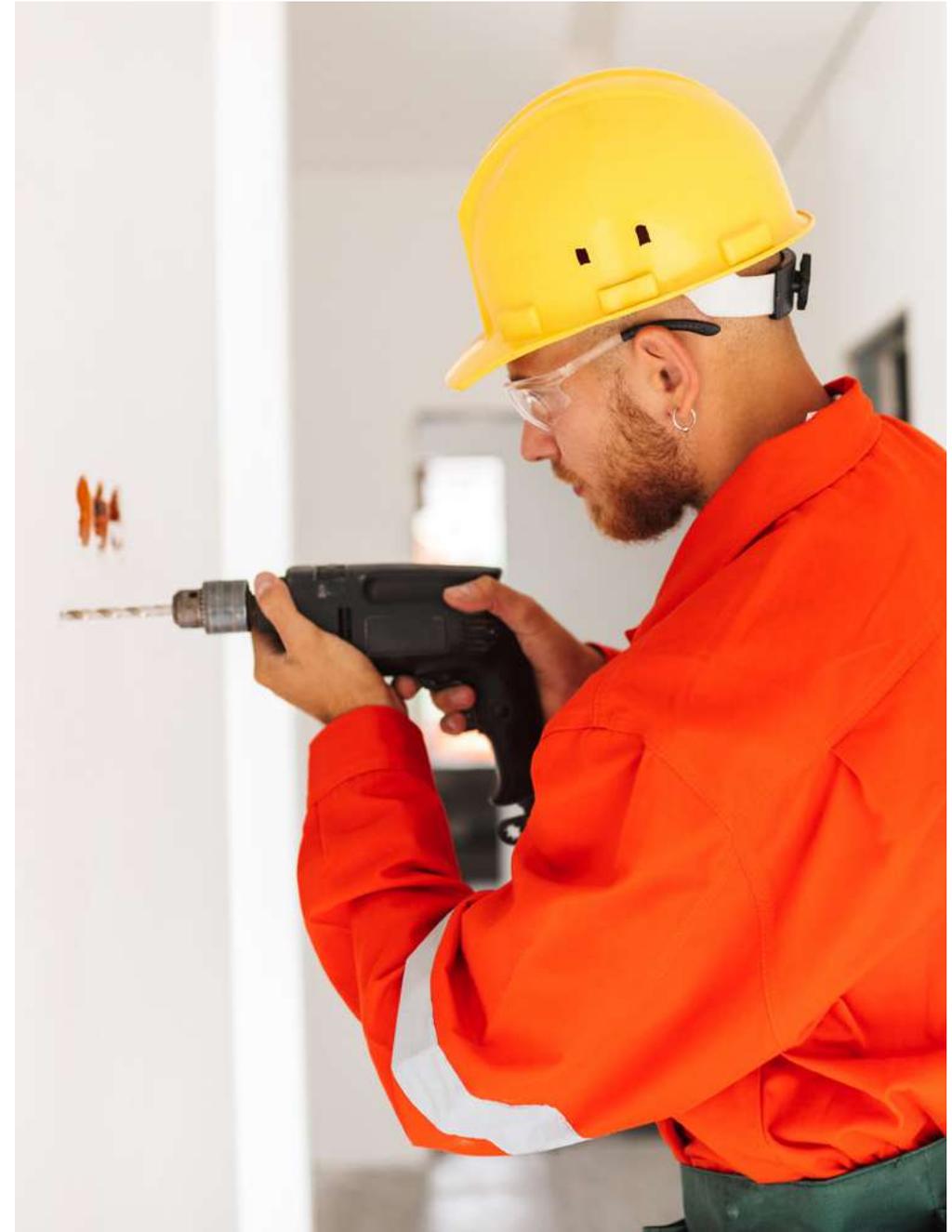
Infurnia

Vector works

Other

Thank you for completing the survey. Here is one last question

70. Please note any best practice solutions, which are used in e-delivery in your country / region/municipality. This information will be used in order to present best practice solutions in the report.



Author of report

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