Final Report

28 July 2017

„TECHNICAL ASSISTANCE FOR REFORMING THE CONSTRUCTION DEVELOPMENT LEGISLATION FRAMEWORK IN CYPRUS“

SRSS/S2016/017

1. Activities performed

During the project the expert team performed various actives, starting with a fact-finding mission to Cyprus in order to get an overview of the system of planning and construction in Cyprus, its practical application, as well as the need for improvements. Based on these findings, the project proposal was set up, covering all necessary activities and related expertise needed.

The first mission took place 03-04 November 2016 in Nicosia, Cyprus. Before the mission started, the Ministry of Interior provided the experts background information on the discussed topics. Based on the information provided, the experts developed the first report (inception report).

One important task of the first mission was to get a deeper insight in the complexity of the Cypriot system, as well as an overview of the various stakeholder views. The expert team had consultations and meetings with the following groups:

- Planning and Building Local Authorities
- Planning Governmental Authorities
- Building Governmental Authorities
- Water Development Department
- Department of Environment
- Cyprus Architects Association
- Cyprus Association of Civil Engineers
- Cyprus Land and Building Developers Association
- Cyprus Tourism Association
- Meeting with Ministry of Interior Permanent Secretary
- Director of the Town Planning and Housing Department
- Ministry of Energy, Commerce, Industry and Tourism
- Sewerage Boards
- Director of Department of Land and Surveys
- Cyprus Fire Service
- Water Boards
- Department of Labour Inspection
- Cyprus Energy Agency
- Federation of Associations of Building Contractors Cyprus (OSEOK)
- Cyprus Employers and Industrialists Federation (OEB)
- Cyprus Chamber of Commerce & Industry (KEBE)
- Association of Town Planners
- Association of Topographers
- Association of Electrical Engineers
- Association of Mechanical Engineers

The various meetings with all concerned experts and stakeholder groups helped the project team to develop a feeling of sensitive subjects, legal basis, needs and requests for the future project work. On basis of the meetings the expert team developed the second report (interim report).

In order to uphold the working flow and the exchange of information between the experts, AEI arranged several telephone conferences. At these conferences the experts informed about the status quo of the project, imposed assignments as well as possible solutions and future steps. In addition to the telephone conferences, AEI also talked to each expert individually to get a deeper understanding of needs to guide the project process.

According to the exchange of the AEI and the Cypriot colleagues between the missions, the AEI had several calls with Andriana Patsalosavvi, civil engineer at the Ministry of Interior, to fulfill the wishes of the Cypriot partners on the highest possible level.

The second mission was held in Nicosia from the 26-28 April 2017 and included meetings with the following key-stakeholders:

- Meeting with the Monitoring Committee (MOI, Presidency, DGEPCD)
- Hygiene, health and the environment
- Protection against noise – Discussion with experts
- Energy efficiency and heat retention – Discussion with experts

Furthermore, the second mission was also dedicated to present the interim report to the Working Group, to the Planning Board and to the Ministry of Finance.

2. Reason and Purpose of the Project

The legislation in Cyprus dealing with buildings and construction works is very old. The first „Streets and Buildings Law“ was introduced in 1946, the present laws and regulations stem from the fifties to seventies of the last century. There were of course a great number of amendments, additional regulations, degrees and circulars over the last 60 years, which makes the whole package a very complicated and non-flexible legislative framework.

As a consequence, citizens and investors are confronted with remarkable delays in the issuance of building permits as well as in the issuance of final certificates. Furthermore, these de-lays of permits and certificates can also create problems for receiving title deeds issued by the department of lands and surveys.

Since the problems with title deeds have also consequences which may come down to financial and property issues, the topic “housing market and immovable property regulation” was even taken up in the “economic adjustment program for Cyprus” of the Directorate-General for economic and financial affairs of the European Commission in spring 2014 .

Before this background, the present project should assist in amending and streamlining the legislative framework for construction and development.

The project team, consisting of experts for construction law, construction regulations as well as zoning and planning was in close contact with the Ministry of the Interior (MoI), with a work-ing group established by the MoI in order to involve other parts of the administration, and with all relevant stakeholders concerned.

3. The Relevance of Building Control

3.1. The purpose of Building Control

Building control is often perceived as an administrative burden, which tends to be time consuming. However, the real intention of building control procedures is:

- To ensure that buildings are safe and healthy to use.
- To prevent building defects (appearing immediately or – in the case of hidden defects – after sometime).
- To prevent liability claims, compensations or administrative problems, which may result from not conforming to technical requirements or zoning provisions.
- Encourage innovation to produce energy efficient and sustainable buildings
- Support local, regional and national businesses
- Educate and inform building professionals, contractors and trades people
- Defend vulnerable communities and householders
- Drive out rogue traders
- Safeguard the investments of individuals and companies
- Enhance access for disabled, sick, young and old people
- Protect the community from dangerous structures
- Provide advice in support of the emergency services
- Ensure sports grounds and public venues are safe for crowds

Building control could, therefore, also be understood as a service helping to ensure that the construction process goes smoothly and that the completed building does not cause any further problems.

There is only very limited data available on building defects, but in general it is estimated that the average cost of building defects sums up to 10 – 15 % of the total construction cost if there is no qualified building control. In countries, where insurance systems require for more stringent building control, this cost of building defects can be reduced to 3 – 5 % of the total construction cost, whereby the cost of this building control is well below 1 % of the construction cost.

Beneficiaries of building control include:

- Governments departments, MPs and elected members that need to know that high levels of compliance are being achieved without over-burdening industry with red tape
- The public at risk from dangerous buildings due to floods, fires, wind, snow, collisions, explosions and earthquakes
- Building users who work in or use public and commercial buildings
- Interest groups representing people with special needs or lobbying on special issues
- Homeowners who pay for extensions, conversions and re-modelling existing homes
- Homeowners who buy new homes, or rent or part buy from housing providers
- Housing (social and affordable) scheme providers and their customers
- Developers speculatively building or converting properties
- Commercial and business property owners redeveloping, converting or upgrading existing buildings
- Building industry manufacturers and distributors who need to know that product standards are consistently and universally applied with the flexibility to support innovation

- Contractors who need to bid and tender for work knowing it is to be built to universally applied standards
- Architectural designers and specialist professionals who need to bid and tender for work knowing it is to be built to universally applied standards

Taking this into account it can be concluded that it is also of significant economic importance to ensure a smooth, but effective system of building control.

3.2. Comparison of Building Control Systems in Europe

There are only a few studies available comparing the systems of building control in different countries, of which the following are the most informative ones:

- Fučić, L. (2007), Efficacy of building control systems: a comparative research
- Koning, M., Errami, S., Saitua, R. (2017), Quality assurance in construction, Summary of a comparison between the English, German, Irish and Norwegian system, Economisch Instituut voor de Bouw, 2017.
- Meijer, F.,Visscher, H. (1998), The deregulation of building controls: a comparison of Dutch and other European systems. In: Environment and Planning B: Planning and Design 1998, 25, 617 – 629.
- Mikulits, R. (2006), Building Control Systems in Europe. The Consortium of European Building Control, Ipswich, 2006
- Moullier, T. (2009), Reforming Building Permits Why is it Important and What Can IFC Really Do?, International Finance Corporation, World Bank Group, February 2009,
- Pedro, J.B., Meijer, F., Visscher, H. (2010), Building control systems of European Union countries: A comparison of tasks and responsibilities. International Journal of Law in the Built Environment 2010, 2(1), 45-59.

In the context of the present assistance project, a particular discussion point was

- whether the approach, presently applied in Cyprus, of having two permits – a separate planning permit and a construction permit – should be kept, or
- whether the procedures should be streamlined by dealing with both aspects, zoning and planning on the one hand and technical requirements on the other hand, in one single building permit.

Unfortunately, the studies mentioned above do not explicitly deal with this question. However, based on an unpublished survey performed by CEBC , in only four Member States out of twelve there were separated planning permits and construction permits, whereas in the remaining eight countries there was only one permit.

Furthermore, no information is available in these studies to which extent there is a certain degree of discretion with regard to the fulfilment of the planning permissions.

4. Permitting and Building Control Procedures in Cyprus

4.1. Evaluation of the present system and general recommendations

The Construction Development Legislation Framework in Cyprus consists basically of the following two Laws and and one document called "Regulations":

- Streets and Buildings Regulation Law (preliminary draft of the consolidated version, April 2015)
- Town and Country Planning Law (consolidated version, 2015)
- Streets and Buildings Regulations (draft of the consolidated version, April 2015)

They are quite old, going back to 1959, 1954 and 1972, respectively. As a consequence, the structure of these laws and regulations are characterized by a multitude of amendments and editions which have been introduced over the decades, partly also with the character of ad hoc measures.

Since these laws and regulations have been developed incrementally over decades, the structure is very complicated, as can be shown by the following examples:

- Definitions are not only given at the beginning of the documents, but partly also somewhere in the middle, probably caused by amendments for which these additional definitions were necessary to be introduced (e.g. Streets and Buildings Regulation Law, Articles 9, 9A, 10C, 10D, 15A, 17, 26, Streets and Buildings Regulations, Articles 6, 6A, 18, 61 and Town and Country Planning Law, Articles 20, 28, 40 45A, 60);
- There are many references and back references which make it difficult to read and understand the text easily;
- Similarly, the structure of Articles is often confusing, extending over several pages with several levels of sub-points (Article – paragraph – sub-points with letters – sub-points with roman numerals);
- Sometimes provisions appear in places where they would not be expected, e.g. provisions concerning zoning and planning in art. 14 of the Streets and Buildings Regulation Law or parts IV and VI in the Streets and Buildings Regulations;
- A similar problem is the explicit enumeration of points which should be examined by the competent authority during the grant of the permit (Art. 9 of the Streets and Buildings Regulation Law) which could also be considered as implicit technical requirements which, however, are for the rest in the Streets and Buildings Regulations and not in the Law;
- Furthermore, such explicit enumerations could be understood in a way, that other issues concerning the technical requirements as given in the Streets and Buildings Regulations would not need to be examined by the competent authority in detail;
- Elements of Buildings Control Procedures, e.g. provisions concerning the supervision and the supervising engineer, are also scattered over both, the Streets and Buildings Regulation Law, and the Streets and Buildings Regulations.

Against this background, the following general recommendations should be taken into account in case of a revision of the Construction Development Legislation Framework:

In order to ensure legal certainty, it is important that the legislative framework is well structured, precise in the requirements and understandable. In the construction sector the following basic structure has proven to be appropriate, whereby each of the following subjects are dealt with in a separate piece of legislation or in a clear separated part of the legislation:

- Zoning and planning requirements
- Technical requirements to be fulfilled by buildings and construction works
- Procedures for building control (permits, inspections, approvals etc.)

It is recommended that this principle should also be followed in Cyprus.

Concerning building control, the following issue needs some further discussion: In simplified terms there are two principle types of systems in Europe (see also chapter 3.2):

- separate procedures and permits for planning on the one hand and the fulfilment of the technical requirements (Building Regulations) on the other hand (e.g. England and Wales)
- one comprehensive building permit, covering also the aspect of planning (e.g. Germany, Austria)

Generally speaking, a system with one permit covering both, planning and technical issues, has the advantage that the applicant has only to approach *one* authority which issues only *one* comprehensive permit. Ideally this is also a **one-stop shop** (sometimes also called single-window approach), which means that where other authorities need to give certain consents or approvals, this will be managed by the leading building authority, so that the applicant does not need to approach these other authorities in parallel (cf. chapter 4.3.2.1).

The reason why for example in England and Wales there is a planning permission on the one hand and another separate permit covering the technical requirements is that the building permit (technical permit) can also be issued by private organisations (so-called "approved inspectors"). Since the issuing of the planning permit will always remain a duty of a local authority, such a separation of permits was necessary in order to allow for a privatisation of the technical part (building control).

That means for Cyprus that a decision needs to be taken whether the involvement of private organisations for the performance (of technical building control) should be envisaged or not. Since the complete outsourcing of technical control to private organisation is applied only in a minority of countries in Europe, the suggestion of the current project for "technical assistance for reforming the construction development legislation framework" for Cyprus is:

1. to keep the building control as a duty of an authority and
2. to have one comprehensive permit for planning and technical issues of a construction project.

In this context it should also be considered that the reason for having a separate planning permit is often that there are not yet sufficiently detailed planning provisions available for major parts of a country. Therefore, together with the above recommendation goes the further recommendation that it is of high priority to establish meaningful zoning and planning maps and provisions in the whole country.

With regard to the technical requirements for buildings and construction works it is recommended to adopt a "**performance-based concept**" which is essentially split into the following two levels:

- functional requirements
- technical requirements

The following table explains this concept in more detail:

Figure 1 – Performance-based concept of building regulations

Type of Requirement		Definition	Example
Functional requirement		A requirement expressed only using qualitative terms, setting an objective which must be fulfilled.	"Buildings must be designed and constructed in such a way that, in the case of fire, users can leave the structure quickly and safely or can be rescued by other means."
Technical Requirement	*Performance requirement*	A requirement expressed using quantitative terms (e.g. physical quantity, characteristic) for which the fulfilment can be verified by calculation, testing or simulation.	Threshold values for the CO-concentration, smoke layer interface, smoke density, temperature, heat flux etc. on the escape route.
	Prescriptive requirement	A requirement expressed by reference to specific materials, constructions, classes, dimensions or specific design elements.	"From each point of every room of the building an exit to a safe place outside the building or a staircase must be reached within 40 m travelling distance."

Usually, the functional requirements of level one are established directly in the law or in another piece of legislation (e.g. regulations). Since these functional requirements are not very detailed, this piece of legislation can be kept quite slim. The technical requirements, however, which are more comprehensive, can easily be established outside the legislation itself, for example as guidelines or approved documents issued also by a governmental institution or drafted by a private technical institution and adopted by the government. In this case there is only a reference to these guidelines or approved documents in the legislation itself, and it is also stated that the functional requirements are deemed to be satisfied if these guidelines or approved documents have been applied.

It should, however, be possible to deviate from these guidelines or approved documents, in which case the applicant has to demonstrate that the (different) solution ensures an equivalent level of safety as if the technical requirements of the guidelines or approved documents had been fulfilled.

These recommendations will be elaborated in more detail in chapter 3 of this report.

As regards the procedures of building control the following two principles should be applied:

- The procedures should be different depending on the size and the use of the building or construction works, taking into account the specific risk. It would be disproportionate to apply the same procedure for a one family house on the one hand and a high-rise building or a large factory building on the other hand. Therefore, an appropriate differentiation should be introduced into legislation, possibly using different categories of buildings and construction works or separate guidance (Approved Documents) for residential and commercial building works as in England and Wales.
- Not all activities of building control need to be performed by the authority itself. Specific tasks like inspections or checking of calculations could be outsourced to private experts which are acting as an independent third party. For buildings or construction works which present only a low risk it could also be envisaged to introduce schemes of self-certification.

A proposal for this structure and the differentiation of procedures will be given in chapter 2.3.

4.2. Zoning and Planning

4.2.1. Introduction

For the purpose of the final report, the Town and Country planning law from Cyprus from 1972 and all amendments and related regulations were reviewed. Already at the first mission in Cyprus in November 2016, the team met different stakeholder groups who are involved in or concerned by spatial planning in Cyprus. Many inputs and ideas concerning a change of the legislation came also up from these experts during the sessions. Further on in the second mission the team received more detailed inputs, especially from the Working group and from stakeholders. Some ideas from the stakeholders were contradictory, and some were difficult to take on board, as the purpose of this report is not to rewrite the Cyprus planning law totally. In the last mission we also got very important input to planning issues from the Town and Planning Department and the Presidency office

The analysis and recommendations concerning zoning and planning as presented below, are a mixture of the indications and suggestions the team received from the stakeholders in Cyprus, of experiences gathered from different European projects in spatial planning, but also of experiences from working with the Styrian Spatial Planning law in Austria. However, it has to be underlined that all different systems have their advantages and disadvantages, and without knowing the detailed legal and material background of these systems in the different countries, it is not easy to understand the different approaches.

The recommendations given below also developed in a way of what could be easily changed in the existing system of spatial planning in Cyprus, and at the end of this chapter there are also suggestions for possible changes and improvements in short, middle and long term. It came also out during the meetings that – although many groups involved expressed the wish of a radical change – some changes can´t be implemented immediately.

4.2.2. Planning systems, instruments and procedures in Austria, Germany and Sweden

The team also performed brief overview of selected planning systems in Europe. The comparison was done mainly with a report of the study “International manual of Planning Practise” by Ryser/Franchini” (2008), with a review of “Planning and sustainable urban development in Sweden” by M. J. Lundström et al. (2013), gathered experiences of European spatial planning projects and the evaluating of the valid town and spatial planning laws and regulations of these countries.

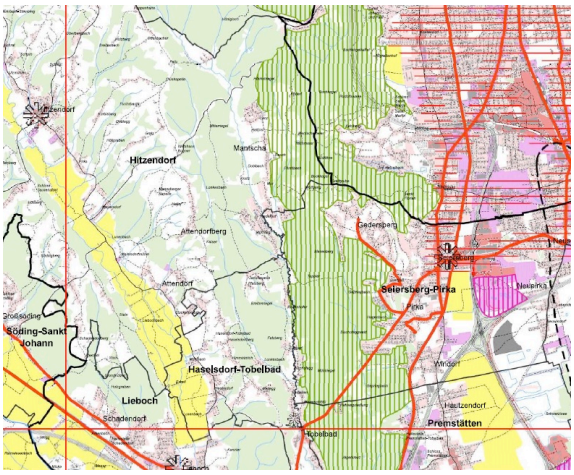
Austria:

In Austrian planning system there is no national planning act. In Article 15 of the federal constitution law, it is set that spatial planning is an issue of the 9 federal states. The so-called ÖROK, the Austrian Conference on Spatial Planning, is a kind of institution established by the federal government, the States (Länder) and municipalities to coordinate the spatial planning for Austria. Further on in the different spatial planning laws in Austria the states have to consider federal laws of matter, e.g. for raw material, water law, environmental law etc.

For the comparison of the different spatial planning systems of the three countries, the planning system of Styria was mainly described. This is based on the experiences of planning in Styria of the expert and also the variety of existing planning regulations of this federal state of Austria.

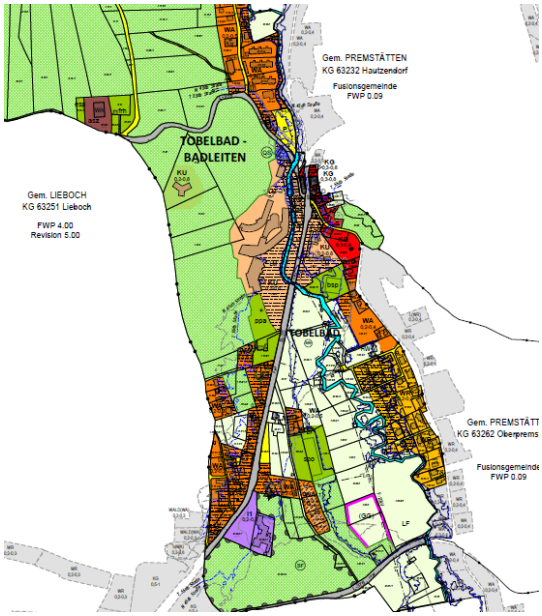
The Styrian Spatial planning Law was enacted in 1974 and got around 20 amendments till it was completely renewed throughout many working group sessions and the finally politically decision in 2010.

In the hierarchy of physical planning the regional development concepts with their regional development plans are after the state development programme (general settings for the state Styria) on second place in Styria. In the regional development concepts are binding determinations for the regions and set priority areas for green zones, raw materials, settlement areas and agricultural areas.



Regional plan of a region in Styria, scale 1:50,000, with priority areas for settlement (red), priority for green zones (green), priority for agriculture (yellow) and for industrial development (pink).

The 287 municipalities in Styria are in charge of the spatial planning and produce with the help of licensed planners every ten years the development concepts and land use map of their own area. The development concepts may also contain a so called general principle plan for building regulations. These concepts and maps are created under the spatial planning law and according to the regional developments concepts of the equivalent region. They are checked by the department for spatial planning in the Styrian Government and have to be decided in a governmental decision meeting. The land use map defines in the territory of the municipality the areas for building up land, the streets and roads and the open space. The development concepts also show up the development areas and their special uses.

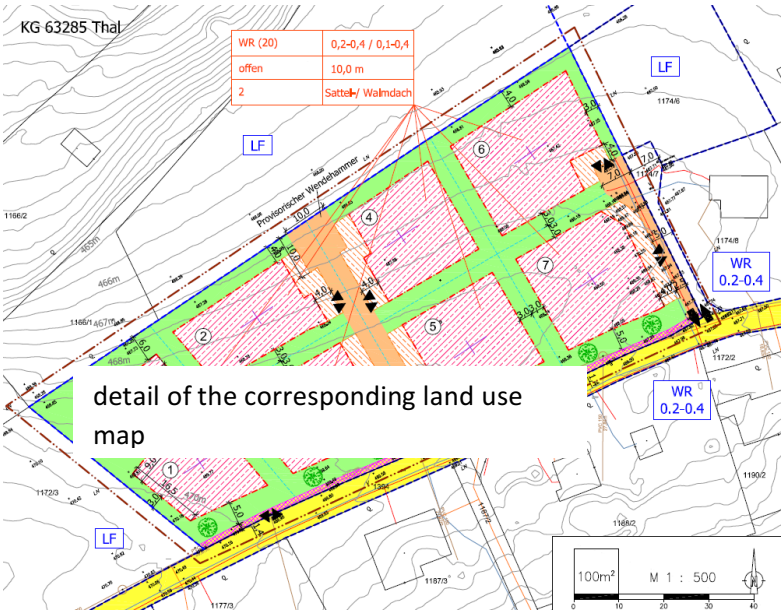


Land use map, scale 1: 5,000 with different building up categories

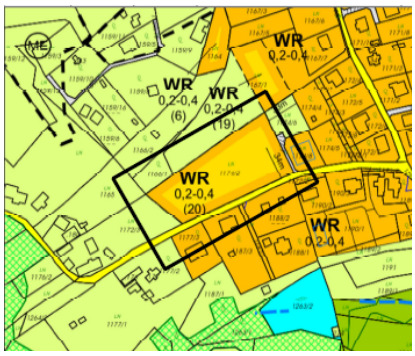
Under special circumstances, also according to certain criteria of the law there can be done intermediate changes for a special defined area in between the 10years planning period. Also these changes are checked by the authority and have to be decided in the governmental sessions.

Small areas which are already set in the development concept of the municipality as a development area can be changed in the land use map in a very short term procedure. There is no governmental decision making process needed. The authority makes a check of the determinations.

After enacting the land use maps of the municipality the municipality can start with the procedure of the zoning maps. This map is a very detailed plan for a bigger area over 3.000m² and determines the max. height of buildings, the amount of floors, the distances to the buildings and borders, regulations about form, shape and colour of roofs, green areas, parking area etc. The zoning map has to fit also to the regulations of the general principle plan for building regulations, if the municipality determined one in the development concept.



detail of the corresponding land use map



Zoning map, scale 1:500

The final building permit for the single houses needs to fit to all these instruments mentioned above and no deviations are allowed. These instruments are all binding instruments.

In order to speed up the permission process it is also necessary to provide information about the basic features of the building site with regard to infrastructure, the so called **"Suitability of the construction site".**

The investor, developer or owner of the building plot should provide the necessary information about the building plot together with the respective confirmations by authorities and infrastructure operators (Water Board, Energy, Sewerage board, Planning Department etc.). This relates in particular to the following topics:

- the intended use of the building is possible according to the planning law,
- sufficient supply of hygienically pure water supply for the purpose of the planned construction
- an energy supply and wastewater disposal corresponding to the intended purpose of the planned construction site is ensured,
- the subsoil is able to bear the loads, and the planned development does not jeopardize the stability of neighbouring construction sites,
- dangers caused by floods, groundwater, muddles, rock fall, landslides are not to be expected and

- a suitable and secure access (for example a public road) is given for the purpose of use of the building plot.

The municipality can also set a minimum or a maximum size for building plots for the municipal area or for parts of them, taking into account the character of the area and of neighbouring individual buildings.

Germany:

Also the German constitution defines the country´s system as a democratic, constitutional, social and federal country. Therefore, each of the 16 states has a constitution and the states have the political and administrative power to decide in nearly all questions about their territory. They have a subsidiary concept, which means every decision should be made at the lowest political level. So spatial planning in Germany is also organised hierarchically. At the top is the federation with some framework responsibilities but no direct planning competence. The municipalities represent the basic planning level where the main spatial planning authority is located. In addition, the states got planning authorities on their territory and the regions. Hence also in Germany, spatial planning is made according to the federal building code under defined guidelines and principles established at higher level, such as the federal spatial planning act.

The federal spatial planning act defines general regulations, principles, the planning processes and environmental assessment proof regulations. It has a framework character for whole Germany with some special regulations for the state Bavaria.

At the state level, the main task is to prepare strategies for the spatial development of the state territory. Each state has to prepare a state development plan. A ministerial conference on spatial planning is coordinating these plans. On the regional level there are set main functions of regional planning in a plan with inter-municipal coordination of urban development, infrastructures etc. The state law regulates the regional planning.

Finally, at the municipal level there are two planning instruments – the land use plan and the legally binding land use plan. Each municipality is in charge for preparing land use plans. It is based on an urban development plan. This plan defines the type of land use in the territory of the municipality and its developments. For the more detailed planning the legally binding land use plans are determined with detailed regulations of the single plots. It is in a way a zoning map like in Austria. The process of the planning is controlled by a council development office.

Sweden:

Sweden has in a way also a decentralized planning with a very detailed municipal planning system. The municipality decides where, when and which development should be made. The first building legislation in Sweden was already made in 1874. At that time it was very difficult to regulate the planning outside towns and settlements as the owners and developers couldn´t be really forced to follow the law system in Sweden. In early 1900 there came a new land policy, with the possibility that cities could possess ownership rights. At that time the first town plans were established, formulated and adopted by the municipal council and then formally approved by the king government.

Finally in 1947 the New Building Act was enacted with the basic principles of planning. From now it was clear that there are no building permits when there were deviations to these regulations. Now the municipalities could decide on land development.

Till now municipal plans (structure plans etc.) still have to be approved by the government. Six ministers and their departments are responsible for preparing and proposing government decisions regarding housing provisions, national physical planning and building matters. The central supervisor body is the National board of housing, building and planning. It is responsible for monitoring developments in field of physical planning, issuing building regulations and additional provisions.

At that time also the masterplans (zoning maps for larger areas) for towns and settlements where approved and the regional plans which cover several municipalities. A so called comprehensive plan (CP) lately was added as an instrument. It is guilty for the whole municipality area as a kind of informal overview of the whole municipality. The detailed development plan needs to fit to it. Area regulations are also binding maps but not very detailed but they have to fit also to the CP.

Since 1987 the Natural Resources act, the environmental code and the renewed Planning and Building Act are regulating all planning issues in Swedish municipalities and in regional planning.

The municipal councils is the supreme decision making body at municipal level. The council appoints an executive board and a building committee who prepares the planning matters and grants building and demolition permits.

Comparison of the planning systems in Austria, Germany and Sweden

Acts/regulations	**Austria**	**Germany**	**Sweden**
National act/code	No ÖROK: Austrian Conference on Spatial Planning coordinates the spatial planning for Austria Hierarchical system	Yes **Federal Spatial planning act (2008)** Framework legislation for Germany, principles, definitions and environ-mental assessment issues Hierarchical system	Yes but municipal planning is an extended autonomy from state Planning acts for changes of land use and physical environment **1987:** -Natural resource act -Environment code -**Planning and Building Act** General requirements and regulations, hyrarchical system
National plan	*no*	*Possible (overall infrastructure etc.)*	*No but comprehensive plan (general overview)*
State act	**Spatial planning acts** (laws) and or building codes, acts (According to Article 15 of the federal constitution) **Spatial planning law Styria 2010**, version of 2015	Principles and binding goals in spatial structure plans	Inter-municipal coordination for preparation of municipality plans
State plan (Landesplan)	*no* , but a State development programme e.g. Styria	*Yes – state development plan*	*No*
Regional act	**Regional development concep**t for the regions (binding)	Objectives and intentions of regions	Regional planning to coordinate municipal planning
Regional plan	Yes in some states	Yes sometimes	Yes e.g. in Stockholm area (for areas covering several municipality)
Municipality/local level	in charge of the spatial planning of their area	**Federal building code** (1960) version of 2015, municipality are in charge	in charge of the spatial planning
Planning instruments:	*Local development concept, development plan and general principle plan for building reg.*	*Urban development plan*	*Structure Plan*
	Land use map/plan	*preparing land use plan*	*Special area regulation/detailed development plan*
	Zoning map	*Binding land use plan*	*Property regulation plan*

4.2.3. General settings of the structure of the Cyprus Town and Country planning law

Review

- Analysing the existing Town and Country planning law of Cyprus with all the regulations (13) and mandates (19) till 2014, it is very easy to lose track. The law is overloaded, as was also criticised by the stakeholders. All the amendments are established in specific documents separated from the law itself, and no consolidated version is available. It is also not comprehensible which amendment is the newest one.
- Further on you can find detailed building regulations, the obliged fees to pay also in the planning law although there is a separate Street and Building regulation. On the other hand you find regulations about the zoning maps in the Street and Building regulations which you miss totally in the Town and Country planning law.
- The structure of the law, reviewing from the table of content is divided into 10 parts. These parts are sometimes very long and also a little disarranged and showing a mixture of the planning instruments, the procedures, concerned areas (regional, local, districts), fees which have to be paid and so on.
- If you look for the meaning of words and determinations you find the definitions in the whole document, which makes it often difficult to find them.
- Looking more carefully to the content of the general law you miss very import inputs concerning environmental and climate issues and sustainable planning. These new topics, like uses of sustainable energy by windfarm, photovoltaic, determinations about percentage of green public spaces were added lately in the mandates.
- From the stakeholders we got to know that all environmental assessment proofs are also checked by the environmental department too, this causes big delays as it´s not made at the same time.
- In the law there are determinations concerning the spatial planning instruments for example the island plan, the local plan, the area scheme and the policy statement of the countryside. They are described and to each instrument you get the information about the planning procedure. This procedure and the notification are repeated in all details, although they are very often the same. This makes the law overloaded and confusing.
- The stakeholders are missing planning tools in the law

Suggestions, proposals

- Considering the above considerations, it is therefore recommended to find a new easy, readable, not overloaded structure. This means that all the existing mandates, regulations and amendments are put into one Town and Country planning law together, including always the last updates. A law is very often read by people who are not legal experts, by private people, technical experts and politicians, that's why it should be structured and written in a very simple way. The invited stakeholders at the first mission in Cyprus also stated that they are partly heading for a "radical change" of the law and/or a new law. Due to the Turkish occupation the planning legislation has a delay as planning started in 1990. In 26 years there were no big changes in law.
  ➔ That's why the stakeholders have a big interest in changes of the law and specially also of the planning structure. This change could be a **short term** process.
- As there is also a determined separate Street and building regulation, it would be also comprehensible to delete too detailed building regulations from the planning law and put it there. On the other hand the regulations concerning spatial planning, like for example determinations to the zoning maps should be placed in the Town and Country planning law **(short term process).**
- If there is a hierarchical planning system (a top down structure) like in Austria, the planning instruments should be structured in that way. A building permit could for example only be given when the area is dedicated as building land or changed into building land. The building permit has to take into account the provisions of the zoning map (if there is one), of the land-use map and of the development concept (bottom up). This suggestion needs for sure a **longer time to get into process.**
- To find the definition of the used terms in the law it would be helpful to set them at the beginning of the law. This could be done with the new arranging of the TPC law in a **short term.**
- If there is a need to mention building regulations in the spatial planning law, then it would be helpful to set a link to the building regulations or put also at the beginning necessary definitions about building issues. Also a **short term solution.**
- With the climate change and the awareness raising of the concerned people, during the last decades, new topics concerning sustainability were put through the mandates in form of determinations in the planning law. It is very difficult to find them in the "main" law itself and you could think this is not covered in Cyprus. These topics are mainly concerning environmental issues and could be set in the law after the table of content, and the definition of terms as a kind of general basic principles at the beginning.
  → Connected with these necessary determinations there are also important issues for planning like keeping up the characteristic landscape, avoiding of using conflicts and matching of different urban or rural subspaces. Looking to different spatial planning laws in other European countries you find them very often in a similar way. This is easy to change in a **short term** way.
- The environmental assessment proof: According to the European guidelines certain plans or projects which give an impact to the environment need the procedure of an assessment proof. To have the "doublecheck" with the planning and the environmental department it will deliver a good quality. But to avoid postponing the planning process could be made at the same time. The needed determinations concerning new provisions and procedures in the law according to the European directive could be done in a very **short term**.
  →The implementation of new provisions and procedures according to the European directive in the planning process should be done at least in **a middle term** way,
- During the first mission we got to know that the planning department is on the way to install working groups for the content. This is a very much appreciated idea and should be done within a certain time again and again, including of course evaluations from the experiences.
- Adding planning tools to the law could make the law additionally overloaded. But there could be made some separate guidelines which are also determined.
  In Styria, for example, we are delivering the spatial planning department guidelines for sustainable energy spatial planning, guidelines for a green planning, guidelines for the strategic environmental planning, a determination for how to produce the land use maps (a so called standard for map symbols) where it is also set in which electronic way it has to be delivered to add it to the Styrian GIS

system. So if there are some changes in these guidelines you don't have to change the whole law. Guidelines could be made with planners! **Middle to long term processes.**

- Health and safety regulations have nothing to do with spatial planning. They should be implemented separately or with in the building regulations (**short term** issue).

4.2.4. Planning instruments

The Island Plan

The purpose of making the so called Island Plan for Cyprus was that the plan should indicate the general policy in promoting and controlling development and may indicate the governmental intention of immovable property. It is including the location of population, industry and commerce, tourism, the patter of transport and public services. It should define areas of special social, historic and architectural or cultural interest or natural beauty and other matters of more than local importance. The plan should be reviewed by the Minister who is in charge and reported every year. After the evaluation of the plan, there should have been made detailed amendments.
During the first mission it came out, that this Island plan was never finished, due to the historical development.

Review

- The meaning of this plan was in a way to have a kind of national plan for the Island with general settings.
- Putting in the plan the determinations that the plan should be reviewed and evaluated every year is for sure a big task, but will help to make the system robust.

Suggestions, proposals

- Having a kind of national plan is very common in different European countries. It gives a useful basis for the other planning instruments which are more on a regional and local level. In Austria we don't have a national plan. Austria has itself 9 federal states with 9 different laws dealing with spatial planning. In Styria we have excellent regional plans with strict determinations especially concerning protected areas (natural protected, priority areas for raw materials, green zones, priority areas for industrial zones, priority areas for settlements and for agriculture These regional plans are above the local land use plans in order of hierarchical ranking. The local plans in Styria are very much influenced by political decisions. So the regional plans help significantly to get a sufficient planning without political or economic influence as they can really exclude building up areas in some places.
  - ➔ National plans and regional plans could give a general setting of the area of several municipalities and avoid too much political influence on the local stage.
- So in a way for Cyprus a national plan with a kind of general settings which are applicable for the whole Island can make the spatial planning quality better. After a couple of years they could be evaluated.
- In Austria there is a so called benching of spatial and regional planning – a top down planning system: Regional plan (for a district of the province of Styria) – a development concept (shows a long term development of around 15 years for the municipality with further development building up areas) – the local plan of the municipality – the zoning map (for certain bigger real estate areas mainly bigger than 3,000 m²) – finally the building permit for single houses. This means you just get an approval for your building when the planning fits to the above mentioned instruments.
  - ➔ Top down systems allow a good structure in planning and is not open for any deviations to the other planning instruments which are in a higher hierarchical level.

The local plan

The survey of any area in coordination with a plan, according to the law, is the so called Local Plan. Such areas should be defined by the reference to a map.

The purpose of a local plan in Cyprus is

- To secure orderly development in interests of health, amenities, convenience and general welfare of community,
- To indicate general principles of development, to define sites of particular purposes, to protect features or areas of social, historical or architectural importance and
- To safeguard routes of highways, pipelines and other services.

The content of the local plan:

- A local plan should include a map and descriptive matter
- specifying the population for the area
- indicate the proposed general use zone for land and buildings
- define the roads, public and other buildings and works, airfields, parks, pleasure grounds, nature reserves and other open spaces
- allocate areas for use for residential, agricultural, industrial, touristic, commercial and other purposes of any class specified in plan

Further provisions can be made:

- Distances between buildings, distance between buildings and boundaries and distance between buildings and centre of the road
- The proportion or ratio of land in respect to building sites
- The minimum size of building sites
- The height of buildings, the floor area of buildings
- The extent of immovable property to be laid out and exclusively reserved for the parking of vehicles and for the creation of public parking places
- Population density in any area and the allocation of public open spaces

The Minister is here also responsible for the elaboration or amendment of the local plan.

Review

- The local plans in Cyprus are in a way quite similar to local plans (land-use maps) in other European countries. But with the possibility of adding so-called “further provisions”, it gets a mixture of a local plan already including zoning map contents. This makes the plan overloaded, and if there are some changes in these provisions, which are very much concerning the real estate and the building itself, the whole plan has to be changed which would postpone the planning process and the permits.
- According to the stakeholders, there is also a poor database for planning, and the cataster is not updated very often.

Suggestions, proposals

- The purpose and the main content is set up in a very high quality, as it also contains open space issues which are very important in the Mediterranean area to cool down heat islands specially in cities.
- The so called “further provisions” which are very much concerning the real estate and the building itself, are in the meaning of the expert too detailed for this planning instrument. This planning instrument is the zoning plan in Cyprus. Problems can occure if a building needs to be changed (in size, heights for example the whole plan has to be changed and postpone the planning process and the permits. So in a way the planning permit and building permit are separated too. They have to fit to the land-use map.

➔ A solution could be to let the zoning plan in the way they are but for bigger areas which are still to develop there could be made a more detailed plan (detailed zoning map).

- It is not very clear for me if the very strict detailed building regulations are needed in a local plan. Due to the stakeholder discussions it came out that that because of strict regulations in the planning law it there are big delays for the final permits and there are always changes needed because of deviations. In the Styrian Spatial planning law it is since 2010 possible for the municipalities within the development concept (which is a long term planning instrument for the municipalities) to create so called general principle plan for building regulations (a sort of area guidelines). They should be an area wide preparation for the separate zoning maps with already set very rough regulations for different parts of the municipality for buildings. This guideline is done very generally, regulating for example the amount of floors, the kind of roof and green areas according to the existing buildings in the surrounding. More detailed zoning maps have to fit to these regulations.
- The data base for the cadaster should be updated more often.
- The plans should be delivered in an electronic way.

The zoning map

Review:

- In the Street and building regulation you find some issues of zoning. This is very much confusing as it is not completed and is not written down in a chapter where you expect it.
- The different regulations of heights of buildings, distances to borders and roads or similar, type, design of houses, number of floors, building degrees, determinations for open spaces and fences are all spread across different paragraphs and separated additionally due to the purpose of the building (residential, commercial, industrial etc.
- The zoning map in Cyprus is a more detailed local plan with building up issues. If there are deviations in the building process, the whole map needs to be changed. This causes delays.

Suggestions, proposals

- As already mentioned all these regulations are concerning the content of a zoning map. This is another separate planning instrument and should be set into the Town and Country planning law **(short term).**
- As the zoning map of Cyprus causes delays when there are changes in the planning, it could be suggested to make this planning instrument less detailed and install an additional instrument. This so called detailed zoning map could be set for bigger areas (e.g. > 5.000 m²), for areas which are very sensitive concerning the landscape and/or in protected zones etc. The detailed plans could have a kind of minimum content which is obligatory to be determined, such as regulations about the buildings (amount of floors, max. height), roof regulations (shape, colour), open spaces, infrastructure, allotments, etc. **(middle term).** Detailed zoning maps can be also determined in areas within a zoning map where the infrastructure, the access, surface drainage, division into building lot etc. is not yet fixed.
- During the third mission in Cyprus we agreed to a suggestion from the Town Planning Department to install a kind of new planning instrument in the TCP law – the so called Outline Planning – which in the UK already runs quite well and is there called Outline Portal. This is in a way an instrument for areas which are not having a local plan or zoning map. It may for example determine matters relative to land use, density, accessibility, provisions of adequate infrastructure (road network, parking facilities, public green areas) on a basis of a masterplan. Having this planning instrument e.g. for larger scale or special projects, it allows developers to investigate the feasibility and viability of the approved project. After this there can be made a detailed zoning map, if needed. This instrument could shorten a lot the procedure till getting a building permit and could be added in

the law in a **short term**. It could be executed in the context of building permit as a "pre permit consent" (see chapter 4.3.2.1).

The area scheme

Review:

- In the Town and Country law there is also mention of a so called area scheme. It is not really clear what is meant with it. It is for sure concerning just a part of a local map. It seems that these schemes also have to follow the same procedures like the local map. And that you can change also just separate area schemes, without changing the whole local map.

Suggestions, proposals

- Stakeholders suggested to disclaim area schemes because when you change a part of local map you finally have to adapt the whole map.
- In Austria it is possible to have the so called intermediate changes of a land-use map, but of course the whole map has to be updated continuously. But in Styria, for example, the land use-maps are renewed completely after 10 years. So a change in between is sometimes necessary, especially concerning economical needed changes.

The Statement of Policy

Review:

- The policy statement is an instrument for the countryside, for parts of the island´s territory which is not covered by any other development plan. The question is if this is a serious planning as it concerns the open spaces

Suggestions, proposals

- To keep this planning instrument like it is can cause severe decentralised planning problems,
  → Maybe some stricter regulations for this instrument should be established in the planning law.

4.2.5. Who is the planning – who is the checking authority?

Reviews:

- Engineers are in charge for planning with just one year experience
- There is a lack of a sufficient knowledge of consulting people concerning AutoCad and planning
- Being allowed by law to be a designer/planer and a supervision engineer for same project is not good for the quality of planning.
- According to the stakeholders input there are too many authorities involved
- 46 planning and building authorities all over Cyprus are too much
- There is no time limit for the checking authority
- District officer: competent authority for planning for example for Nicosia and villages (is this
- A third additionally planning authority besides the planning and building authority?), brings also time delays.

Suggestions, proposals

- The chamber should give guidelines for the minimum time of practise for planners. As one year practise it is far too less. In Austria, for example it is 3-5 years and you need a certificate which you get after a very intensive training and test. Updating knowledge by trainings afterwards should be mandated also.
- Also the experts in the authorities (in the planning departments) need a regular training on their issues and topics.

- To involve several authorities or departments in the checking process is normally a good way for ensuring high quality. But there should be a certain time period set where the different departments check the plans, projects etc. at the same time. This keeps up the quality but saves a lot of time. In Austria there is for the big changes (so called revision of a plan of a municipality) and intermediate changes of local maps and zoning plans for a certain time (etc. 8 weeks) where the drafts of plans are officially published and all departments can give their statements at this certain period.
  ➔ Statements from different departments which are concerned to the planning should be all done within the same time period (between 4-8 weeks).
- Reducing the amount of planning authorities in the country is needed. Maybe it is good to have for some planning issues like the infrastructural issues, natural preserving matters etc. more a regional authority and for detailed planning the municipality as a local authority.
- Stakeholders mentioned that there should be a penalty if a planner delivers his work incorrectly.
  →In some European countries planners need a license and must give a proof that they are doing frequent educations and seminars about planning. This increases the quality of planning a lot. The municipality can choose which planner they take for their local plans.
- There should be set time limits for the checking authority. In the law there could be a time set where the plans have to be reviewed by the authorities (see above).

4.2.6. Procedures, Planning permissions

Review:

- As already mentioned before in the law the procedure of the planning is very often the same and repeated in many parts of the law, but seems to be very complicated and lasting too long.
- In local plans there might be also detailed information about the building and the real estate itself. This causes big delays in getting a planning permit, as a planning permit is always needed. These local plans are mainly the zoning map with additional detail information. If the details are too complex very often changes are needed.
- Additionally to the authority (planning department) also the environmental department is checking the environmental assessment proof.
- The stakeholders stated that very often the documents which are coming to the planning department for a check are not complete. Photographs, plans etc. can be missing from the outset.
- Planning permissions for touristic projects also takes too long
- Additionally needed planning permissions extend the process
- It takes too long for getting a title deed. Without having a title deed you can´t get a building permission.
- There was also a remark from stakeholders concerning that a permit for division of land is needed in Cyprus before getting a building permit and this extends in a way the procedure.
- Stakeholders mentioned in several meetings and comments about possible deviations in planning.
- In Cyprus it is very common that most development arises through private sector initiatives demanding a certain extend of flexibility in terms of land-use, urban planning and building design, but also the fact that the majority of plots do not have adequate access, or other necessary infrastructure and only small proportion of the land has been subdivided into building plots and no road network scheme have been designed to prepare detailed zoning maps for a group of plots.

Suggestions, proposals

- Separating local plans from zoning maps. In Cyprus the zoning maps are nearly the same like the local maps, but also contain detailed information about the heights, the amount of floor levels, distances, street regulations etc. This gives already a very strict regulation for the whole area (municipality). The disadvantage is, that at the point of time when the local map is produced, all the detailed information of future projects of dwellings etc. is already given. This leads to deviations or to the need of a change of a local plan, which causes big delays.

➔ A proposal could be that for bigger areas it could be separately made a more detailed zoning plan and for the rest of municipalities the regulations are more general.

- The environmental assessment proof: According to the European guidelines certain plans or projects which give an impact to the environment need the procedure of an assessment proof.
  ➔ To have a "double-check" with the planning and the environmental department means that there is a good quality delivered at the end. But to avoid postponing the planning process this could be made at the same time.
- To avoid that with the delivered documents there are missing necessary photographs, plans etc. the department who is in charge should deliver a list for the necessary papers and documents and send them from time to time updates to the planners.
- It needs to be discussed if it is necessary to get a building permit when the building was planned according to a zoning map.
  ➔ In many countries for the so called small projects there is no planning permit needed, the applicants just have to send the papers to the building authority and announce the planning there.
- Also for touristic project there should be a co-ordination between the planning and touristic department to shorten the procedures
- It seems that not just the Town and Country planning law should be changed or improved, but also the procedures itself.
- Getting a title deed should not be connected with planning and building permits as it delays the process. In Austria the change of the title deed e.g. takes also very long. But
  ➔ The owner of the real estate at the moment the planning process start can also apply for the changes of the plan, before he sells the plot. So the building permit can be given earlier. Difficult to say for an expert from another country if a change can work in Cyprus.
- Concerning the division of land, with having (nearly) no planning permits anymore, this issue is covered within the building permit (see chapter 4.3.2.1). It should be compulsory to get a permit for the division of land.
- Basically deviations in planning should not occur. In different meetings, especially with the Town and Planning Department (TPD) we agreed that it could be considered to allow deviations under certain conditions. In this context it is proposed that there is an exhaustive list of possible deviations with defined criteria to keep the principles of equality.
- By reducing the planning permits there will be more free capacities in the TPD.
- The TPD tried many times to install a so called "Land Consolidation Act for urban areas.
  At the final meeting there was presented from the Town and Planning Department a kind of solution for the big amount of plots within zoning maps without any suitable access and other kind of infrastructure. The suggestion is to install the so called Land Consolidation Act. It is a method of introducing measures to facilitate the development of enclosed properties within areas designated for this purpose. The principles of this system lies on introducing an efficient system of proportional contribution of privately owned land plots for a development of all necessary infrastructure and community facilities within a large area that has been designated for development purposes through the provisions and zoning of the local plan. In particular, such infrastructure would include the traffic network, schools, public open spaces and squares, churches and other communal facilities. In return, owners acquire subdivided pots that are mature for immediate development, as the whole infrastructure has been constructed, based on rational urban planning principles for the benefit of the landowners themselves, but also for the community. The prospect is that through the introduction and operation of land consolidation schemes in urban areas, both private and state property – currently with no road access or other infrastructure – would be facilitated to activate its development right, within a short time span.
  Another advantage is that the implementation of this instrument of pro-active planning would reduce considerable pressure for urban sprawl and could keep free areas which are important to keep natural because of environmental issues or for agricultural use. The joint contribution of land

owners is one of the key elements in this concept. It could also solve co-ownership problems, border disputes and lift several burdens placed on ownerships, such as the rights of way etc.

4.2.7. Final recommendations

1) Suggestion for an outline, table of content of the new Town and Planning Law:

One of the general outcomes of the meetings during the missions in Cyprus with the stakeholder groups and the working group is to renew the TPL of Cyprus completely. Following the advices and due to some experienced gathered it is wise to set up a completely new structure of the law. The outline could contain the following headlines:

§ 1	Area of application
§ 2	Definitions of used terms
§ 3	Basic rules of Spatial planning
§ 4	Environmental assessment proof
§ 5	National and Regional planning framework and general settings
§ 6	Spatial planning (general issues)
§ 7	Spatial planning instruments (island plan, local plan, area scheme, zoning map, detailed zoning map, policy statement) – Description of the instrument, the area of application and its determined content
§ 8	Differences of building areas (settlement area, industrial area, agricultural area, touristic area, sports and recreation areas etc.)
§ 9	Planning procedures per planning instrument
§ 10	Planning authorities for different planning instruments
§ 11	Fees

2) Short, middle and long term changes:

Changing a law is not always easy to do as it is very much depending on political will and knowledge of experts. With the already hold working sessions with a defined working group in Cyprus and with the proposals of the experts after reviewing the existing Town and Planning Law and the inputs of the stakeholders it is already a great part done.
Some of the changes are very easy to do in a short term. Some changes need a longer period as it might change planning processes and need further political decisions.

	Short term	Middle term	Long term
Structural reform:			
Adding all regulations and amendments in one law together	**x**		
Restructuring the law	**x**		
Setting a new outline, table of content	**x**		
Putting definitions of the used terms at the beginning of the law	**x**		
Setting a separate chapter for planning processes and for authorities in charge	**x**		
Strict separating of building and planning regulations in 2 laws	**x**		
Setting general basic principles in the law	**x**		
Putting Zoning map regulations into TPL	**x**		
Deleting health and safety regulations from TPL	**x**		
Content/New Systems/Guidelines			
Installing detailed zoning maps		**x**	
Top down system in Planning			**x**
Setting determinations according to the European directives concerning environment assessment		**x**	
Producing guidelines as a help for planners, concerning different planning issues		**x**	**x**
Outline Planning	**x**		
Land consolidation act (scheme)		**x**	**x**

3) Advantages and disadvantages of a new structure of the planning system

Summarizing the suggestions and proposals above, including ideas from planning systems and instruments from other European countries, there are following advantages and disadvantages:

Topic	Advantages	Disadvantages
New structure of the existing law instead of just adding all amendments	It makes the law easier to read for people who are not daily involved in planning	Will take some time to get used to the new structure
Deleting building regulations from the TPL and putting in determinations about zoning maps from the Streets and Building Regulation	In that way all the planning issues concerning spatial planning with all planning instruments are gathered in one law	
Top down system in Planning	A top down system in the meaning that general regulations for whole Cyprus are set e.g. and the local plan, area scheme and zoning map have to fit to these regulations makes it easier for political decisions and no deviations can occur	It will last longer to install such a system or to adapt the existing planning regulations
Installing a new planning instrument like a detailed zoning map (DZM) – making the zoning maps less detailed	To have a DZM for some areas it makes it easier for necessary changings which might come up. If the zoning map is not too detailed it is a more or less general overview with not too detailed planning and changes are getting less, safes a lot of time	A further planning instrument needs to be developed, this could raise the planning costs.
National plan	A national plan can give a kind of general setting for specific topics like the infrastructure	A national plan cannot be that detailed like the local plans
Regional plans	A regional plan can give very important determinations about restricted areas (priority zones for agriculture, green areas, industrial areas…) for specific areas (regions), which are covering more municipalities.	A regional plan cannot be that detailed like the local plans
Trainings for planners, guidelines, working groups for planning iIssues	Will raise the quality of planning	Costs time for those who organise it etc.
Deviations in planning	Deviations could offer a certain degree of flexibility in order to consider specific cases.	Deviations are in conflict with the principle of equal treatment and can cause neighbourhood problems, e.g. the height of building is higher than determined (shadow)
Reducing the amount of checking authorities, checking at the same time period	Reduces the time from planning to building permit, gives a more or less better overview	can cost jobs
Outline planning	Providing a certain degree of certainty to applicant, planning possibility where no local plans	Not for all projects, not for all areas, danger of urban sprawl
Reducing amounts of planning permits	More staff resources in TP Department for fastening process	

Concerning deviations it is already stated in this report that basically deviations in planning should not occur. In several meetings, especially in coordination with the Town and Planning department it was agreed that it

could be considered to allow deviations under certain conditions. In order to clearly define these conditions it is proposed

- to establish an exhaustive list of possible deviations, and
- to define criteria which need to be fulfilled for accepting these deviations.

4) Comparison of spatial planning instruments in Cyprus and proposal for new instruments

Acts/regulations	Cyprus 2017	Cyprus future
National act/code	Yes **Town and Country Planning Law (version 2015)** Framework legislation for Cyprus, principles, definitions and environmental assessment issues	Yes Town and Country Planning Law (version 20..), Framework legislation for Cyprus, principles, definitions and environ-mental assessment issues Hierarchical system (top down)
National plan	Island plan, never enacted	Island plan
Regional act	no	Open to decide
Regional plan	No	Open to decide
Municipality/local level	in charge of the spatial planning of their area/TP dep.	Open to decide
Planning instruments:	Local plan	Local plan
	Zoning map	Zoning map
	Area scheme	Area scheme
	Policy statement	Policy statement
		Detailed zoning map
		Outline planning

4.3. Technical Control (Mikulits/Taylor)

4.3.1. Competent Authorities

There are different authorities which act as "Competent Authority" for issuing building permits, depending on the location. In the area of a Municipality, the Competent Authority is the Municipal Council, whereas in any other area it is the "District Officer". While the District Officer reports to the Minister of Interior, the Municipal Council consists of elected members with no direct reporting line to the Ministry.

This situation creates different categories of jurisdiction with regard to building permits and the technical building control. Furthermore, there were also complaints reported, mainly with regard to the following two problems:

- Long delays in the procedures for issuing building permits, and also for issuing "certificates of approval" at the stage of the completion of works; this might be due to a shortage of staff, but also

due to incompleteness of the applications. With regard to the latter it could however be implied that also the problems with incomplete applications might be a secondary effect of the shortage of staff, since a lack of staff leads certainly to a lower service quality and less effective assistance and advice given to the prospective applicants.
- Inconsistencies in the enforcement due to different interpretations of the legislation, differences in the implementation of circulars or instructions etc.; this should obviously be avoided for the sake of equal treatment.

For this reason a reform of the system of Competent Authorities for issuing building permits and certificates of approval should be considered when reforming the construction development legislation framework, along the following lines of thought:

- The Competent Authority should be able to act in an independent manner, and the decision making should be done by technocrats, since the issuing of building permits is an act of execution, applying the rules and requirements as established in the legislation framework;
- The size of the Competent Authorities and the area of their jurisdiction should be well balanced; on the one hand they should be large enough to allow for economies of scale and for the establishment of an efficient administration and technical infrastructure (see next bullet point), but on the other hand they should not be so large that they lose contact with their constituency; the present number of competent authorities seems to be too high in this respect;
- The Competent Authority should have the technical means, especially with regard to IT equipment, in order to apply new systems of e-application and e-permitting, and in future also BIM.
- Furthermore it should be taken into account that, according to the recommendation of this report, the planning permit and the building permit should be merged into one comprehensive permit; the future Competent Authorities should be able to cover both aspects.
- Finally, in order to ensure a high service quality of the Competent Authorities, they should be obliged to regularly perform internal audits. It could also be envisaged to publish the overall results on the websites of the Competent Authorities.

4.3.2. Procedures

The building control procedures relate to the following three phases:

- Procedure for issuing a building permit
- Control activities during construction (supervision, inspections etc.)
- Certificate of approval and related control activities after completion of the building or construction works

At present the procedures for these building control activities are scattered over the Streets and Buildings Law as well as the Streets and Buildings Regulations, and they are also mixed up with the (technical) requirements which need to be fulfilled.

As mentioned above (see chapter 2.1), the procedural rules on the one hand and the (technical) requirements which need to be fulfilled by the buildings and construction works on the other hand, should be dealt with in separate legal documents. This chapter deals with the procedural rules, while the following chapter 3 will deal with the technical requirements.

4.3.2.1. Building Permit

The Streets and Buildings Law requires that a building permit is being issued for nearly every building or construction works, with only very few exceptions. No differentiation is made whether the project in question is just a one-family house or a high-rise building. Also the use of the building is not taken into account, for a residential building or an office building applies the same procedure as for a warehouse, a multi-storey car park, a shopping center or a meeting place.

Not only is this lack of differentiation in the procedures not taking into account the actual risk related with the particular building, it means also that the Competent Authority is overloaded with many applications which need to be dealt with, even if a significant part of the projects would not need such a level of scrutiny. Therefore, such a **risk-based approach** with a differentiation of the procedures for issuing a building permit would have the following advantages:

- Reduction of burden from the Competent Authorities and
- in exchange the delivery of permits for the remaining part of projects which still need a fully-fledged building permit could be speeded up.

Before this background it is recommended to restructure the permitting procedures taking into account the following principles:

- **One comprehensive permit**, including the present planning permit and building permit;
- Introduction of a **categorization of buildings and construction works** depending on the risk related with the specific object, depending on the size and the use of the building or construction works;
- **Different (stepped) control procedures** for the different categories of buildings and construction works.

In the particular case of Cyprus it must also be considered, that there are not always zoning maps available which give sufficient information about the parameters for the possible development (e.g. distances from boundary, density, maximum height and/or maximum number of floors, coefficient of development, coefficient of cover area). In this respect the following three cases can be distinguished:

a) A zoning map is available, giving sufficient information about the parameters for the possible development;
b) The construction activity in case is a "permitted development" according to Annex A of the Town and Country General Development Order (R.A.A. 859/03);
c) No zoning map is available, and the project is no "permitted development".

In the case of a) and b) only a **building permit** is required. However, in the case of c) the parameters for the possible development are established at present in the "planning permit". Although according to the proposed new legislation framework there will no longer be a separate planning permit, the applicant (owner/investor) should be informed at an early stage about the parameters for the possible development in order to have a sound basis for the further detailing of his application for a building permit. For this purpose, it is proposed to define the parameters for the possible development through a consent based on a preliminary application. The procedure of application for and issuance of a building permit hence consists of the following two stages:

1. Pre-permit consent: A consent on the parameters for the possible development, based on a preliminary application; an appeal against this consent should be possible;
2. Building permit: The final permit based on a detailed application taking into account the parameters for the possible development as established in the pre-permit consent.

The pre-permit consent could be understood as a "masterplan", and its content should be limited to the parameters required for outline planning purposes on which the further detailing of the application can be based. Pre-permit consent and final building permit are two stages of one administrative act.

Concerning the **risk-based approach** with a differentiation of projects depending on size and use, in the building regulations of other European Member States usually the following criteria are applied for a

categorizations of buildings and construction works. Of course, this list is just an example, and these criteria can be combined in different ways.

- Height of a building (ridge height or height of the highest floor level);
- Gross floor area or footprint area of a building;
- Number of storeys
- Use of the building (e.g. residential buildings, office buildings, lodging establishments, sales outlets, workshops, production plans, storage buildings, schools, meeting places, car parks, agricultural buildings, etc.)

Since the categorization should be simple, the number of categories should be limited, for example to three categories, to which all the different types of buildings (combinations of uses and size of buildings) should be assigned. The criterion for the categorization should be the risk for life and safety of occupants in case of structural failures, fire or other particular threats, taking into account the probability of such events for the particular type of buildings.

An example for a risk-based categorization of buildings and construction works can be found in the Eurocodes, EN 1990, Annex B 3.1, Table B1, where the following consequence classes are defined:

- CC 1:
  Low consequence for loss of human life, and economic, social or environmental consequences small or negligible;
- CC 2:
  Medium consequence for loss of human life, economic, social or environmental consequences considerable
- CC 3:
  High consequence for loss of human life, or economic, social or environmental consequences very great

The Eurocode gives also examples of buildings and construction works for each of the consequence classes:

- CC 1:
  Agricultural buildings where people do not normally enter (e.g. storage buildings), greenhouses
- CC 2:
  Residential and office buildings, public buildings where consequences of failure are medium (e.g. an office building)
- CC 3:
  Grandstands, public buildings where consequences of failure are high (e.g. a concert hall)

The consequence classes of the Eurocodes apply only for the structural design. For a more systematic approach, which can be applied generally in building regulations, the two criteria “size” and “use” could also be combined in a matrix in order to assign different buildings and construction works to the three categories. An example for such a matrix is given in figure 2.

Figure 2: Schematic example for the assignment of buildings and construction works to risk classes

Risk Class RC		Size Class SC			
		SC 1	SC 2	SC 3	SC 4
Use Category UC	UC 1	RC 1	RC 1	RC 2	RC 2
	UC 2	RC 1	RC 2	RC 2	RC 2
	UC 3	RC 2	RC 2	RC 2	RC 3
	UC 4	RC 2	RC 2	RC 3	RC 3

For the case of a system with three categories, a stepped approach for the procedure for issuing a building permit could for example be conceived as follows:

A) Notice:
In case of small and low-risk buildings and construction works it could be sufficient that the owner or investor is just informing the Competent Authority by a notice which type of building he is intending to construct on a particular plot. This notice would need to be accompanied by all necessary plans in order to provide significant information about the geometry of the building and the fulfillment of the technical requirements. The Competent Authority can react within a deadline which should be established in the Law, e.g. within four weeks. No reaction of the Competent Authority within this deadline would mean consent.

B) Simplified permission procedure: The application needs again to be accompanied by all necessary plans and documents, and the Competent Authority issues a building permit after checking of the submitted documentation. The checking of the documentation can be limited to a formal check and a plausibility check. There should be a deadline for the issuing of the permit (e.g. four weeks), and if the Competent Authority is not able to keep this deadline, the applicant needs to be informed about the reasons for not keeping the deadline.

C) Full permission procedure: The plans and documentation to be submitted might be more comprehensive in this case, depending on the type and use of the building. All neighbours of the plot on which the building or construction works is intended to be constructed need to be given the possibility to intervene before issuing the building permit. Depending on the complexity of works, the authority can delegate checks (e.g. for structural safety, building physics, energy efficiency etc.) to independent third party experts; due to the possible complexity of such projects an extension of the deadline for the issuing of a building permit should be possible.

At present up to ten other authorities or bodies need to give their consents or opinions before a building permit can be issued. This is a time-consuming task for the applicant, and in many cases the conditions which are established in these consultations requirements individually for each project could also be formulated as requirements in a generally applicable document (e.g. in the guidelines as proposed in chapter 5.1). In order to streamline the process, the following approach is proposed:

- The number of other authorities and bodies which need to be consulted before a building permit can be issued should be reduced, and where possible the requirements which are subject of these consultations should – if necessary – be generalized and taken over in the guidelines (see chapter 5.1).
- The consultation of other authorities – as far as still required – should be organized in the way of a one-stop shop (single window approach). Where other authorities need to give certain consents or approvals, they should be obliged to react within a certain deadline, and if they don't react, silence would mean consent. This consultation of other authorities should be managed by the Competent Authority, in order to ensure that the applicant does not need to approach these other authorities in parallel.

4.3.2.2. Control procedures and inspections

Presently the duty of controlling the fulfilment of the technical requirements is shared between the competent authority on the one hand and the supervising engineer on the other hand. While the distribution of tasks and an involvement of a third party control is a good approach and reflects best practice, there is room for improvement, since the approach taken in the Streets and Buildings Law shows the following deficiencies:

- The tasks of control are not clearly specified; for inspections, as an example, there are only very general provisions for the supervising engineer in the Streets and Buildings Regulation Law, whereas the Streets and Buildings Regulations mention inspection only at one place, and this is the case of the inspection of excavations which is performed by the Competent Authority;
- The supervising engineer is actually no third party, but a second party, since he may be (and is in most cases) the designer of the project;
- The same provisions apply for very small projects as well as for very large buildings, which is not proportionate. Like for the permitting procedure, there is also for the control procedures no differentiation depending on the risk that is connected with the building or construction works, taking into account its size and use.

In order to simplify the control regime without reducing the level of safety and quality achieved, the following approach is recommended:

Ideally, the same categorization as for the building permit should also be applied for the control procedures and inspections. The differentiation of the procedures could be envisaged as shown below:

A) No control on the building site, no inspection on the building site.

B) All controls and inspections are performed by the supervising engineer. This supervising engineer could follow the present concept, i.e. it is not required that the supervising engineer be independent. It would therefore be possible that the designer of the project acts also as the supervising engineer, as it is the practice also at present.

C) The supervising engineer is performing controls and inspections like for category B. In addition, an independent third party expert is performs inspections at critical stages of the construction process according to a pre-established control plan, and also at random. The independent third party expert can either be chosen by the Competent Authority and paid by the owner/investor, or he can be chosen by the owner/investor himself (to be decided and defined in the Law).

The Competent Authority should, however, perform spot checks for a random selection of a statistically significant percentage in all three categories.

It should also be made clear, that the control duties of the supervising engineer and the independent third party expert extend to the fulfillment of all functional requirements, including technical installations. Where there are specific provisions (e.g. energy certificates) or provisions under other legislation than construction legislation (e.g. lifts), the duty of the supervising engineer and the independent third party expert is only to

verify whether the required documents or clearances exist in connection with the building, but not to perform a material control themselves.

4.3.2.3. Certificate of approval

At present, after completion of the construction works a "Certificate of Approval" is required in order to be able to occupy or use the given building or construction works. This "Certificate of Approval" is issued by the competent authority. It applies to any construction works, independent of its size or use which means that, as for the building permit and control procedures, there is again no differentiation made according to the risk linked to the particular construction works or buildings.

Furthermore, the respective provisions are quite complicated. The supervising engineer shall always issue a "Certificate of Completion" as an input to the Competent Authority, which however may also ask the supervising engineer to hand out a "complete report on the performance of the work", without mentioning criteria in which cases this should be the case. The final "Certificate of Approval" may only be issued by the Competent Authority. The whole process is quite complicated, involving altogether up to three different documents which are required:

- Certificate of Completion
- Complete report on the performance of the work
- Certificate of Approval

Astonishingly, it is also possible to issue the "Certificate of Approval" in cases where the completed building or construction works does not fulfil all technical requirements, or even if there is no planning permission or construction permit in force (Art. 10B, paragraph 3). In such a case also a "Certificate of Approval with notes" can be issued.

It should also be considered that there is a connection between the "Certificate of Approval" and the procedures for entry into the land register (title deed), which makes the whole issue of the completion of the building a sensitive topic.

Carrying on the concept which has already been used above for the building permit and for the control procedures and inspections, it is recommended to apply the approach as shown below, again referring to the threefold categorization as with the other stages:

A) Declaration: Since this lowest category applies only to buildings and construction works of a small size and with low risk, it should be sufficient that the applicant (owner/investor) submits to the Competent Authority a declaration that all legal requirements have been respected and fulfilled.

B) Confirmation: The supervising engineer (who was also involved in the controls and inspections during construction) submits to the Competent Authority a formal confirmation that all legal requirements have been respected and fulfilled.

C) Certificate: The independent third party expert who performs additional inspections at critical stages and at random during the construction process issues after completion of the construction works a certificate stating that the completed building or construction works complies with all legal requirements.

Figure 3: Differentiation of building control measures according to the risk classes

	Risk Class 1 (RC 1)	Risk Class 2 (RC 2)	Risk Class 3 (RC 3)
Building Permit	Notice	Simplified permission procedure	Full permission procedure
Control procedures and inspections	No controls or inspection on the building site	Controls and inspections are performed by the supervising engineer	Controls and inspections by the supervising engineer + inspections by independent third party expert at critical stages
Completion	Declaration of the applicant	Confirmation by the supervising engineer	Certificate issued by the independent third party expert

4.3.2.4. Qualification

A very important aspect for the concept of building control in order to insure a satisfying level of safety and quality is that the economic operators and the supervising experts are qualified for their duties. For that purpose it is necessary to apply a reliable system of education and quality assurance. In most European Member States one of a following systems is applied:

- Licencing system run by the authority (formal authorisation by a governmental body responsible for the licencing of economic operators);
- Enrolment of economic operators into a list of experts by a professional association (e.g. chamber);
- Proof of qualification through an accreditation system (certificate issued by a certification body which is accredited for the certification for personal).

4.4. Enforcement

4.4.1. Dealing with Unauthorised Buildings and Construction Works

As previously described the report overall recommends the redrafting of the legislative framework that underpins the planning and building control systems. This provides the ideal opportunity to simultaneously carefully consider how to control unauthorised building and construction works. From the stakeholder meetings there did appear to be a little complacency currently towards ensuring detailed planning and regulatory compliance, it must, however, be stated that the existing enforcement procedures within Cyprus were not considered in detail as part of the project. Such a comprehensive reform of the legal framework coupled with overhauling enforcement procedures should see a culture change to more proactively control the built environment.

All enforcement should be based on national objectives delivered at a local level which ideally should be based on:

- Remedying the undesirable effects of unauthorised development and
- Bringing unauthorised activity under control to ensure that the credibility of the planning and building control systems are not undermined.

Local planning and building authorities need to take responsibility and take whatever enforcement action is considered necessary in the public interest in line with legislation. Such a decision to take enforcement action must be discretionary with the authority considering whether any breach of planning control identified is considered to unacceptably affect public amenity, the use of land and buildings or the policies contained in the local Development Plan. Similarly, consideration should be given to any breach of Building Regulations

and whether this detrimentally affects the performance of the building and its ability to meet the requirements of the regulations and in turn public safety.

To undertake any enforcement effectively and to adequately control unauthorised building and construction works will require a dedicated enforcement team within each planning and building authority. Alternatively, combined planning and building control enforcement teams could be established. Should a private sector approach be adopted for Building Control in addition to the public service delivered by the building authority, enforcement must remain a matter of the public authority. In such cases where a private sector provider is unable to secure compliance informally the project should be reverted to the public authority to commence formal action. Should private sector providers be included for Building Control it is important that they are unable to 'win work' on the basis of regulatory interpretation i.e. potentially accepting a lower standard of compliance to that that would be required by the public body.

All enforcement needs to be both proactive and importantly consistent to avoid a robust approach being undertaken in one region and a laid back approach in another region. To ensure consistency consideration should be given to developing an enforcement policy at a local level drafted in accordance with a national template.

In addition to developing and maintaining an enforcement policy each enforcement team should:

- Investigate allegations, enquires and complaints
- Correspond with complaints and offenders
- Negotiate remedial action
- Liaise with other public bodies and adjacent planning and building authorities to ensure consistency.
- Make recommendations as to the expediency of taking enforcement action
- Check compliance with enforcement notices and ultimately prosecute for non-compliance
- Appear as a witness for the planning/building authority in the local court of justice.

In the initial stages the control of unauthorised buildings/works should be a matter for professional officers within the enforcement team with the ultimate sanction or control being a matter for elected representatives on the basis of the officer recommendations thereby ensuring democracy.

Considering Building Control – if a person does not follow the building regulations in respect of building work or carries out work that does not comply with the requirements contained within the regulations they will be deemed to have contravened the regulations. It should then be incumbent, a duty of the local building authority to enforce the regulations within their particular geographical area of jurisdiction. This should initially be completed informally which would typically be via an initial inspection of the works to ascertain clearly the regulations breached and then be followed up in writing. The letter should describe clearly what work is considered to have contravened the regulations and what is required to put the matter right together with setting out a reasonable period of time in which to do so. If then, following a further inspection the work is not rectified formal proceedings should commence.

4.4.2. Twofold approach to formal action

Consideration should be given to having a twofold approach to formal action:

1. The person carrying out the offending work is prosecuted in a local court where an unlimited fine could be imposed depending upon the severity of the offence. And/or

2. A notice is served requiring the offending work to be altered or removed and if this does not take place the authority by application to the local court is then granted authority to enter the site and put the work right and recharge the owner.

All enforcement proceedings should be completed in a timely manner so consideration should be given to limiting any action taken to a period of 12 months from either completion or becoming aware of the situation.

All outstanding matters or enforcement proceedings should be linked to the sales or site registration process which should require both a notice of plans approval (initially) and a completion certificate issued when all works are completed.

The approach to planning enforcement will be very similar but due to a lack of ongoing control via site inspections (as with Building Control) and there being more detail within planning legislation a more detailed system of notices and control will be required which could include:

Type of planning enforcement notice	Effect of action
Right of entry	Authority to enter land to ascertain whether there has been a breach of planning control.
Ownership Notice	To require information as to the interests in the land.
Planning Contravention Notice	To request information and to set up a meeting with the 'offender'
Enforcement Notice	To remedy a breach of planning control.
Breach of Condition Notice	To secure compliance with the terms of a planning condition.
Planning Enforcement Order	To remedy a breach of planning control relating to the concealment of a building.
Repairs Notice	To secure works considered to be reasonably necessary for the long term preservation of a listed building.
Urgent Works Notice	To secure immediate works to stop deterioration of a listed building, or an unlisted building in a conservation area with the Secretary of State's permission.
Listed Building Enforcement Notice	To remedy a breach of planning control relating to listed buildings.
Amenity Clean Up Notice	To require steps to be taken to clean up land or buildings where their condition adversely affects the amenity of the area.
Advertisement Notices	To remove posters, structures containing notices and advertisements.
Stop Notice	To prohibit any or all of the activities which comprise the breach as specified in the related enforcement notice Temporary Stop Notice To require an activity which is in breach of planning to stop immediately.
Injunctions	To stop breaches that have occurred or are likely to occur causing serious harm with immediate effect.
Prosecution Notice	taken when a criminal offence is committed Direct Action Authority to enter onto land - to take steps required by a Notice and to recover costs.
Proceeds of Crime Notice	To seek to recover any monies or assets gained during the time a Notice was breached.

Consistency of approach in a fair and transparent manner is the key to successful enforcement together with changing the culture to place the burden of compliance directly with the developer or person carrying out the works. This should help to streamline procedures by attempting to resolve matters informally but having a robust regulatory system with effective measures to fall back on.

4.5. Insurance system

In some countries (e.g. England, Belgium, France) there are voluntary or compulsory insurance systems in addition to the administrative building control systems. Achieving regulatory compliance on its own is not necessarily a thorough safeguard to protect such an important investment, which a building always is (for an individual or a family the purchase of a new home is likely to be the most significant purchase made in a lifetime). Lenders also often ask for an insurance coverage, especially with regard to latent (hidden) defects. However, insurances and warranty providers often require a standard above and beyond that of regulatory compliance alone and have their own technical manual and inspection schemes in addition to the inspections made by Building Control.

5. Technical Requirements

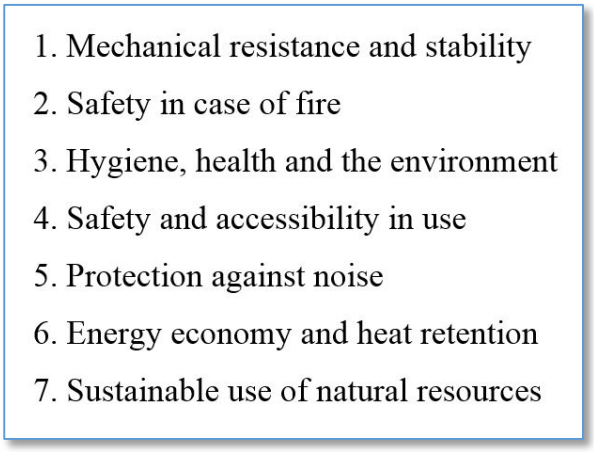
5.1. General Recommendations

As explained in chapter 2.1, it is recommended to deal with the procedural rules and with the (technical) requirements which need to be fulfilled in different pieces of legislation. The procedural rules are in this context procedures for the issuing of the building permit, procedures for control and inspection activities during construction and procedures for the approval after completion of the construction. Following this approach, and also taking into account the two tier approach of functional requirements and technical requirements (cf. chapter 2.1), the ideal structure for the establishment of a new "Construction Development Legislation Framework" would be as follows:

- Construction Law: contains all legal requirements, especially the rules for the above mentioned procedures;
- Construction Regulation: contains the functional requirements as explained in chapter 2.1 (i.e. requirements expressed only using qualitative terms setting an objective which must be fulfilled);
- Guidelines: not a piece of legislation itself, but a technical document (or several technical documents), which are referred to in the Construction Regulation; if the Guidelines are applied and fulfilled, the functional requirements of the Construction Regulation are deemed to be satisfied.

The structure of the requirements established in the Construction Regulation should follow the seven "Basic Requirements for Construction Works" as established in Annex I of the Construction Products Regulation (EU) No 305/2011 (cf. figure 4). Consequently, the Construction Regulation would break down these basic works requirements into a set of more detailed qualitative requirements, according to the technical needs in Cyprus.

Figure 4: Basic Requirements for Construction Works



The functional requirements being only qualitative, the Construction Regulation should further on refer to the Guidelines (approved documents) as concerns more detailed technical requirements.

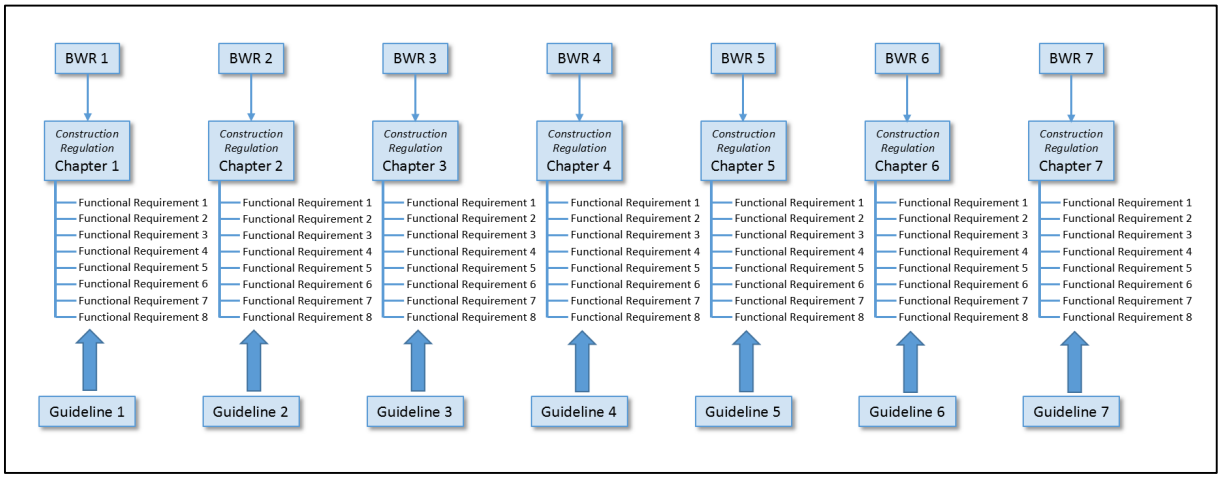
The Guidelines should be take over the structure of the functional requirements stated in the Construction Regulation, specifying them by means of concrete technical requirements. An example has been given in chapter 2.1, figure 1 with the functional requirement for the "escape in case of fire". In the Guidelines this functional requirement needs to be reflected by a set of technical requirements which ensure that this function requirement can be fulfilled. For the given example of the "escape in case of fire" there could be the following chapters of technical requirements:

- Means of escape
- Corridors and doors
- Stairs and staircases
- Emergency escape road lighting
- Fire detection and fire alarm systems
- Smoke and heat control systems

It is also possible, to distinguish within the Guidelines or even with separate Sub-Guidelines particular types of buildings or construction works (production plants, storehouses, park decks, shopping centres, meeting places etc.).

Ideally, the structure of the different levels of documents (Construction Regulation, Guidelines and possibly Sub-Guidelines) should relate to each other in order to ensure consistency. This could be achieved by applying the principal shown in figure 5:

Figure 5: Structural relationship between the documents of different levels

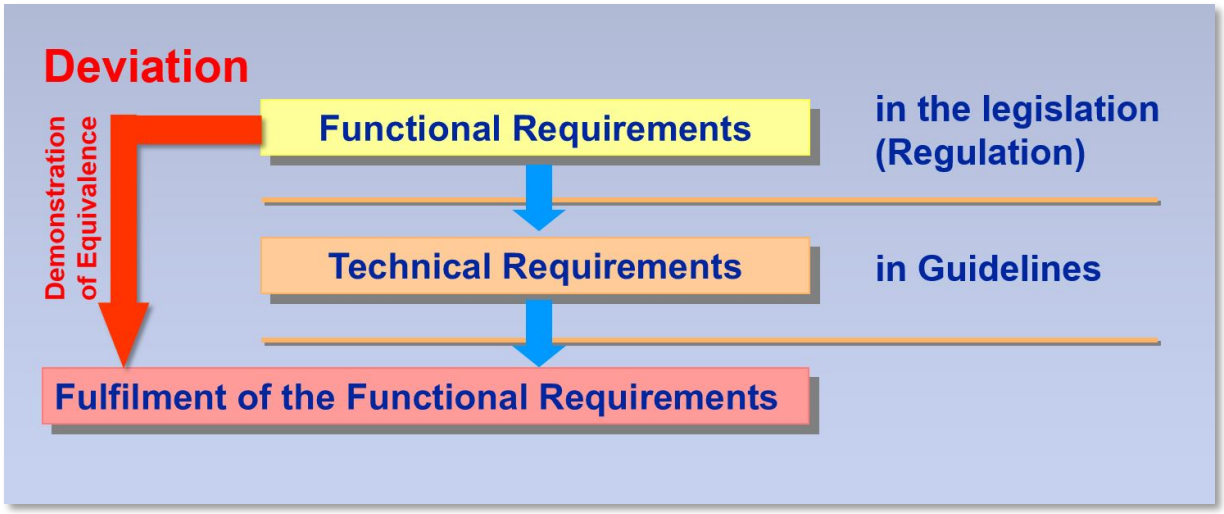


There are two possibilities how the Construction Regulation could refer to the Guidelines, depending on the legislative tradition:

a) The Construction Regulation provides that the functional requirements are deemed to be satisfied if the technical requirements of the Guidelines are fulfilled. This would mean that the Guidelines are not compulsory, and in case the Guidelines are not applied, the fulfilment of the functional requirements must be demonstrated otherwise;
b) The Construction Regulation states that the Guidelines are compulsory, however, a deviation from the Guidelines is possible under the condition that the applicant demonstrates that an equivalent level of safety is achieved.

This possibility to deviate from the Guidelines and to demonstrate the fulfilment of the functional requirements at an equivalent level is important in order to ensure sufficient flexibility for the application of innovative architectural concepts and new construction methods (cf. figure 6).

Figure 6: Deviations from Guidelines



When drafting Guidelines as explained above, it is important to involve stakeholders in an appropriate manner. The following sequence has proven to be advantageous:

1) Drafting process led by the responsible administrative unit (e.g. Ministry), involving experts with scientific or university background;
2) Presentation of the draft Guidelines in a hearing at which all stakeholders participate;
3) Adaptation of the draft Guidelines taking into account the results of the hearing;
4) Formal written consultation of the final draft Guidelines according to the legal necessities;
5) Amendment of the Construction Regulation in order to introduce a reference to the new edition of the Guidelines with a dated reference (e.g. “Guideline xy, edition April 2017”).

According to the experiences in Austria, it has also proven to be useful to provide an online tool in the internet in which the community of designers and other stakeholders applying the Guidelines can pose questions and propose improvements related to specific provisions of the Guidelines. The questions can be answered individually or by establishing FAQs. Such a tool facilitates also the regular revision of the Guidelines.

Usually building codes are revised in intervals of 3 to 5 years, which can also be recommended for the Guidelines proposed in this report for Cyprus. For the purpose of such revisions it has proved advantageous to establish a review committee consisting of experts of the responsible administrative unit (e.g. Ministry), and also involving experts with scientific or university background. This could also be the same group as for the drafting process (cf. point 1 above)

5.2. Hygiene, health and the environment

The requirements concerning “Hygiene, health and the environment” are scattered over many technical regulations which have accumulated over the last decades. The same applies to the related permitting and building control procedures. This situation implies considerable unclearness about the technical contents and the requirements which have to be fulfilled in the planning approval process. In particular, there are no aggregated technical regulations for individual specific subject areas, in this case for hygiene, health and environmental protection (cf. Inception Report ”Hygiene, Health and the Environment”).

Relevant provisions for "Hygiene, Health and Environmental Protection" can be found in the following documents:

StrBLaw Apr15_EN	Consolidated version of the Streets and Buildings Law 2006-2015	note
StrBReg Apr15_EN	Consolidated version of the Streets and Buildings Regulations 2006-2015	
R.A.A. 759_2003	The Town and Country Planning (Accident Hazards Related to Dangerous Substances) Regulations of 2003	
R.A.A. 334_2009 & R.A.A. 27_2014	(a) The Town and Country Planning (Government Industrial Areas) Special Development Order of 2009 (b) The Town and Country Planning (Government Industrial Areas) (Amending) Special Development Order of 2014	
Mandate1 _2003	The Town and Country Planning Mandate 1 of 2003	Student Dorms
Mandate1 _2005	The Town and Country Planning Mandate 1 of 2005	Prefabricated and wooden prefabricated buildings
Mandate 1_2014	The Town and Country Planning Mandate 1 of 2014	Use of renewable sources of energy (Document still pending)
	The Safety and Health at work Laws of 1996 to 2015	

An analysis of these documents shows the following issues:

- The above-mentioned regulations are very detailed in some areas, whereas in other areas the provisions are very indeterminate;
- In particular, sanitary facilities and water supply are examples of areas which have not yet been developed in the same way as other topics in the field of Hygiene, health and the environment;
- Environmental protection and sustainability, which play a more and more important role at European level, have not yet the same significance in these provisions.

5.2.1. Suggestions

According to the recommendation in chapter 3.1, *functional requirements* for buildings and construction works should be established in the Regulation, whereas the *technical requirements* should be developed in separate technical Guidelines. The suggestions in this section shall serve as a layout for the establishment of functional requirements for “Hygiene, Health and the Environment” and a respective technical Guideline in line with the above mentioned recommendation (cf. Figure 1 – Performance-based concept of building regulations).

The following topics (headings) could build the content of the functional requirements:

- Sanitation
- Waste water
- Other effluents
- Waste
- Combustion gases from furnaces
- Protection against moisture
- Water for industrial use
- Drinking water
- Protection from dangerous emissions
- Lighting and illumination
- Ventilation and heating
- Room levels and heights
- Storage of hazardous substances
- further topics, which can be important for the special situation in Cyprus, can be added to the functional requirements

Below some examples are given for selected topics, how the functional requirements in the Regulation could be conceived:

Sanitary facilities

Structures with accommodation areas must be equipped with an adequate number of sanitation fittings, for example, toilets and water outlets. These must satisfy hygiene requirements in view of the size and purpose of the structure. Other structures must also satisfy these requirements if they are designed to accommodate gatherings of a larger number of people.

Combustion gases from furnaces

Taking into account the type of furnace and fuel, combustion gases from furnaces must be drawn off to the outside in such a way that people's health and safety are not put at risk and that they are not disturbed to an unreasonable extent.

It must be possible to inspect and clean chimneys without difficulty.

Lighting and illumination

Accommodation areas must have as much natural light as experience has shown is necessary with regard to health and wellbeing, unless the purpose of the structure means that artificial lighting alone is sufficient. The shape of the room and the lighting ratios shall especially be taken into account in this regard.

It should be possible to light all rooms and generally accessible areas in structures in accordance with their purpose.

Level and height of the rooms

The floor level of the rooms in relation to the terrain must be designed and constructed in such a way that, in accordance with their purpose, the health and wellbeing of users is not adversely affected.

The height of the room must be appropriate to its purpose and ensure a sufficient volume of air with regard to the health and wellbeing of users.

The Guideline shall break down these functional requirements into more detailed technical requirements. The following example shows how this could be done for the functional requirement “Level and height of the rooms”:

Floor levels in rooms

For accommodation areas in dwellings, along at least one side containing windows, the floor levels must be above the ground situated adjacent to the accommodation area after completion.

Room height

Accommodation areas must have a clearance of at least 2.50 m, except single- and two-family dwellings and terraced houses, which must have a clearance of at least 2.40 m. If this height is not achieved at all points within the room, the air space must nevertheless be at least the same as it is in case of a horizontal ceiling. As regards accommodation areas in attic storeys, this minimum room height must at least be observed over half of the floor area, in which connection, when calculating this area, floor areas where the room height is below 1.50 m are not taken into consideration.

The clearance of rooms other than accommodation areas where people only stay on a temporary basis must be laid down in accordance with their intended purpose, while the room area and the number of persons to be accommodated shall be stipulated such that a sufficiently large volume of air is guaranteed. However, the clearance may not fall below 2.10 m under any circumstances.

Summery Hygiene, health and the environment

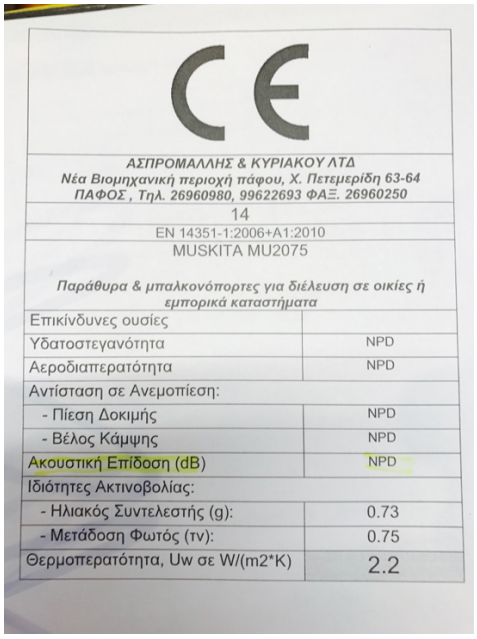
As a result of the comments and the intern discussions the functional requirements (see Annex I.a) and a technical guideline **“Hygiene, health and the environment”** have been developed (see Annex I.b) based on the topics (headings) given in cause 5.2.1.

5.3. Protection against noise

Whereas energy performance of buildings is included in the documents for the planning permit, sound insulation aspects are not yet included. Only for the Labour Inspection occupational noise (machinery noise) is an issue in Cyprus today. It seems that for environmental noise only the table in Mandate 2_2006 exists, which is connected to wind farms building.

Different sources convey the impression, that in many cases the sound insulation is perceived as to low, as we found during the recherche for the inception report. Moreover, there seem neither to exist basic acoustical principles for town, regional and physical planning, nor provisions in building regulations or for construction products (e.g. in Cyprus it is not required to give data about the performance of windows, doors etc. concerning their acoustic properties. The CE marking in the following examples indicate only “NPD - no performance determined” for the essential characteristics related to the basic requirement for construction works “protection against noise”.

Figure 7: Examples for the CE Marking of windows; for the acoustic performance a "npd" (no performance determined) is usual in Cyprus



CE

ΑΣΠΡΟΜΑΛΛΗΣ & ΚΥΡΙΑΚΟΥ ΛΤΔ
Νέα Βιομηχανική περιοχή πάφου, Χ. Πετεμερίδη 63-64
ΠΑΦΟΣ , Τηλ. 26960980, 99622693 ΦΑΞ. 26960250

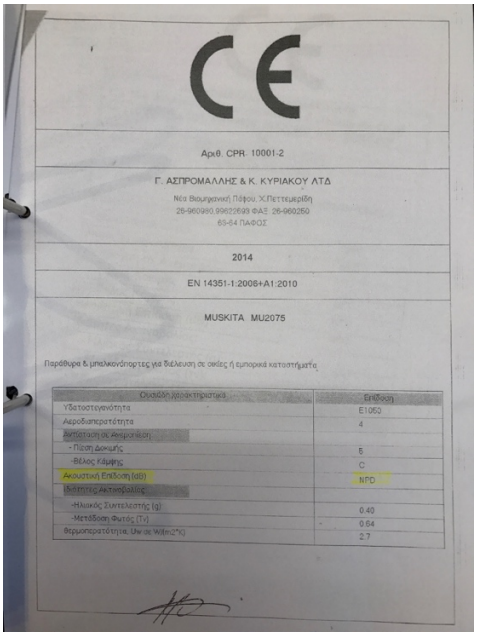
14

EN 14351-1:2006+A1:2010

MUSKITA MU2075

Παράθυρα & μπαλκονόπορτες για διέλευση σε οικίες ή εμπορικά καταστήματα

Επικίνδυνες ουσίες	
Υδατοστεγανότητα	NPD
Αεροδιαπερατότητα	NPD
Αντίσταση σε Ανεμοπίεση:	
- Πίεση Δοκιμής	NPD
- Βέλος Κάμψης	NPD
Ακουστική Επίδοση (dB)	NPD
Ιδιότητες Ακτινοβολίας:	
- Ηλιακός Συντελεστής (g):	0.73
- Μετάδοση Φωτός (τv):	0.75
Θερμοπερατότητα, Uw σε W/(m2*K)	2.2



CE

Αρχ. CPR: 10001-2

Γ. ΑΣΠΡΟΜΑΛΛΗΣ & Κ. ΚΥΡΙΑΚΟΥ ΛΤΔ

Νέα Βιομηχανική Πάφου, Χ.Πετεμερίδη
26-960980,99622693 ΦΑΞ. 26-960250
63-64 ΠΑΦΟΣ

2014

EN 14351-1:2006+A1:2010

MUSKITA MU2075

Παράθυρα & μπαλκονόπορτες για διέλευση σε οικίες ή εμπορικά καταστήματα

Ουσιώδη χαρακτηριστικά	Επίδοση
Υδατοστεγανότητα	E1050
Αεροδιαπερατότητα	4
Αντίσταση σε Ανεμοπίεση	
- Πίεση Δοκιμής	B
- Βέλος Κάμψης	C
Ακουστική Επίδοση (dB)	NPD
Ιδιότητες Ακτινοβολίας	
-Ηλιακός Συντελεστής (g)	0.40
-Μετάδοση Φωτός (Tv)	0.64
Θερμοπερατότητα, Uw σε W/(m2*K)	2.7

In addition, characteristic values of airborne or impact sound insulation of building components, the building envelope or interior parts of the buildings are not stated in the planning documents. Therefore, just the drawings and the description of the building components and construction details can be seen also as an implicit statement for the expected sound insulation. As there are typical construction systems used in Cyprus, one can conclude, that the level of sound insulation is extensively known for common constructions.

During the discussion with the Union of Municipalities in the first meeting it was stated, that there are at present no requirements in terms of sound insulation in Cyprus. Similarly, the Cyprus Tourism Association answered, that there are no special requirements concerning sound insulation in Cyprus today. Also during the discussion with the Ministry of Interior it was mentioned, that the lack of sound insulation requirements is a problem for the further development, and a purposeful process for this important issue should be implemented in future, for which suggestions are welcome.

However, the discussion with the Department of Land and Surveys showed, that that there is no connection between roads and infrastructure on the one hand, and building site dedication on the other. Also the planning permit does not take into account environmental noise.

It should also be considered that there are EU indicators for noise pollution in the environment, established by the EU Environmental Noise Directive (END), like L_{den} 55 dB and L_{night} 50 dB. Following these values, there are many noisy areas spread all over Europe. In most cases environmental noise is based on 4 sources:

- Roads
- Railways
- Airports
- Industry

For most European countries, there exist "Strategic Noise Maps", which are one possible basis for estimating the environmental noise.

Figure 8: Noise caused by roads within Europe (fig. on the left: day period, fig. on the right night period) (Source: http://noise.eea.europa.eu)

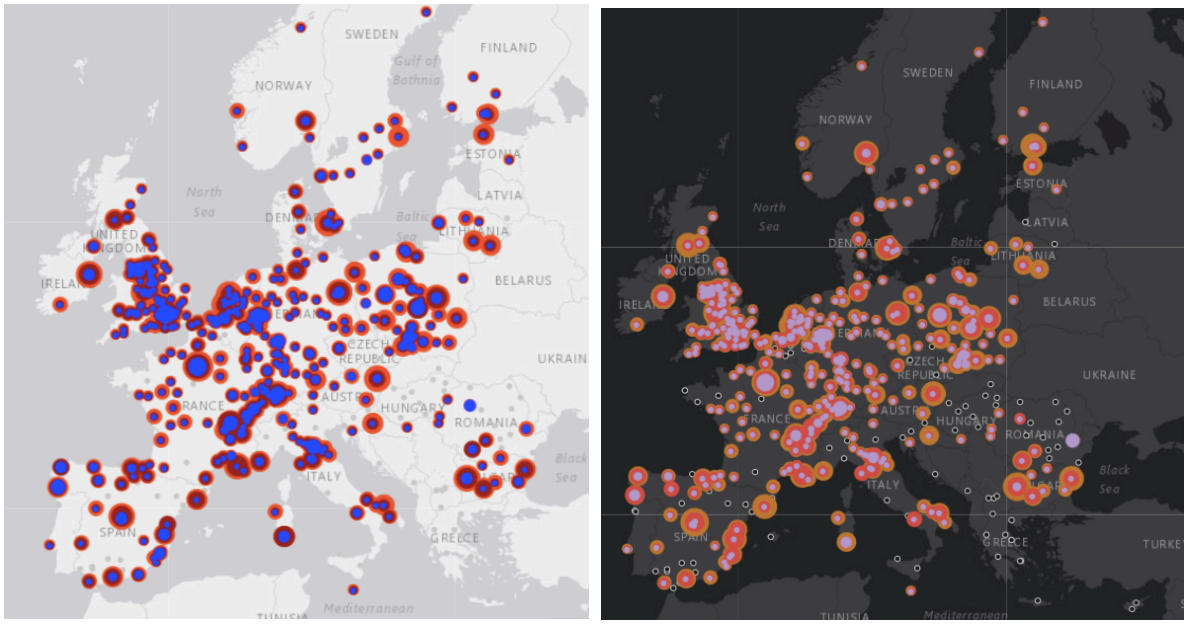


Figure 9: Noise caused by railway within Europe (fig. on the left: day period, fig. on the right night period) (Source: http://noise.eea.europa.eu)

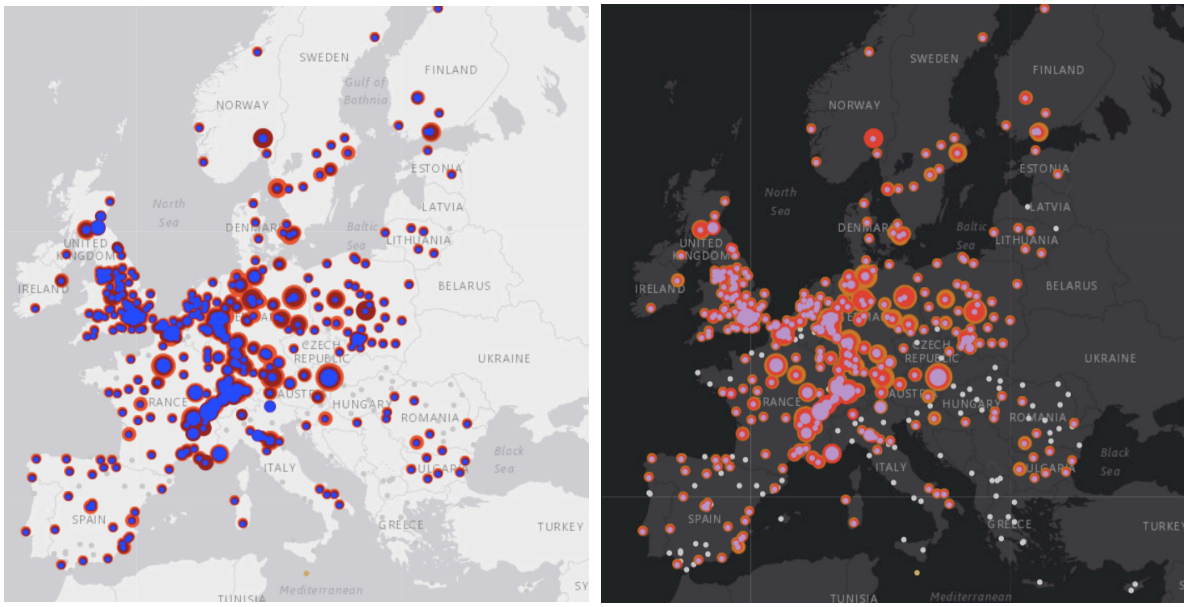


Figure 10: Noise caused by airports within Europe (fig. on the left: day period, fig. on the right night period) (Source: http://noise.eea.europa.eu)

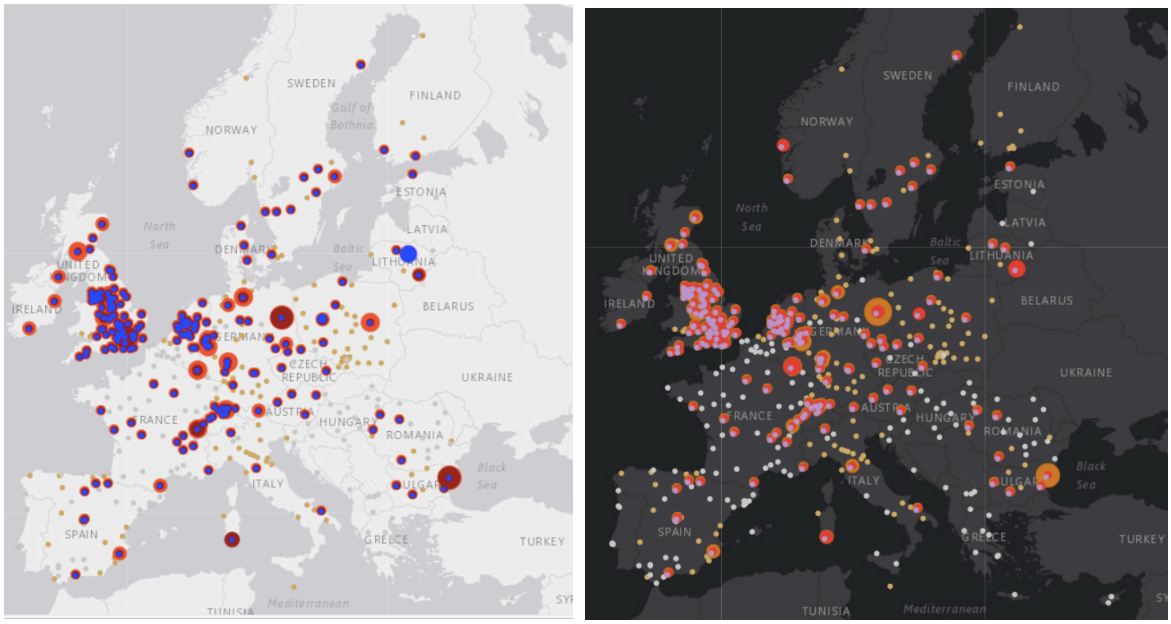
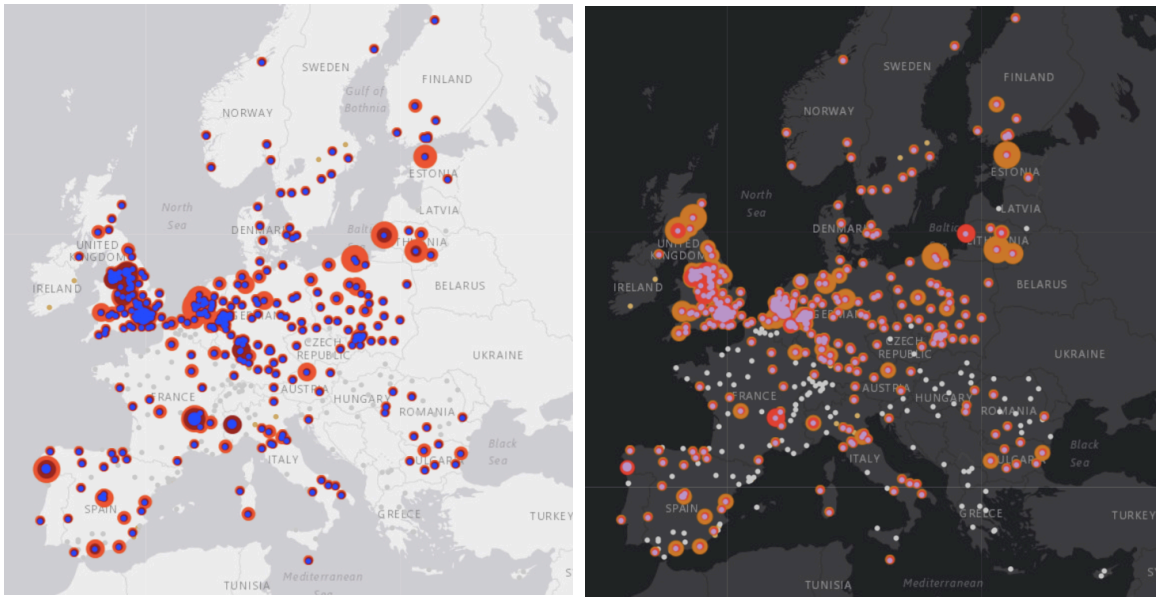


Figure 11: Noise caused by industry within Europe (fig. on the left: day period, fig. on the right night period) (Source: http://noise.eea.europa.eu)



For Cyprus we could not find such strategic noise maps, but for some areas, e.g. the Larnaca Airport area, there exists an extensive study about environmental noise (K.s Vogiatzis: Airport environmental noise mapping and land use management as an environmental protection action policy tool. The case of the Larnaka International Airport (Cyprus); Elsevier, Science of The Total Environment, Volume 424, 1 May 2012, Pages 162-173.

On the other hand, strategic noise maps do not include all relevant noise sources in every case, e.g. strategic noise environmental noise maps for train traffic only provide data about the sound immissions of transit routes. Strategic (partial) environmental noise maps for areas of shunting and transhipment operations are not suitable for determining the relevant external noise level in general.

Therefore, as a basis for environmental noise protection it would also be necessary to collect and provide data for environmental noise for implementing a future process concerning sound insulation of building envelopes.

The StrBLaw_Apr15_EN it is stated in 4 of 115/86 that "No permit will be issued by the competent authority concerning a project ….unless the competent authority…is fully content, that the following prerequisites are met with regards to the intended building construction:….(ii) it will be used in such a manner as not to have unfavourable effects on public health or the comfortable way of living of the residents of the area.

The European CPR states as the 5th basic requirement for construction works:
"Protection against noise: The construction works must be designed and built in such a way that noise perceived by the occupants or people nearby is kept to a level that will not threaten their health and will allow them to sleep, rest and work in satisfactory conditions."

Thus, if the above statement in the StrBLaw can be interpreted in a way that it includes "protection against noise" as a health matter, protection against noise is covered in the framework of this law, but it seems there are no further specific requirements existing concerning this matter, exept the following:

On page 15/99 it is stated, that during construction works the public and neighbours shall be protected from nuisance.

Mandate 2_2006 states for wind farms: "the level of noise pollution must be within the specified limits.."

Zone Type	Noise level during the day (DB (A))	Noise level during the night (DB (A))
Industrial Zone or Area	70	70
Craft Zone or Area	65	50
Residential or Tourist Zone (excluding areas with recreational and entertainment use prevailing)	50	35
Resting homes, sanatoria and hospitals	45	35

A statement concerning recommended noise levels is given in http://www.agpaphitis.com/Noise-Pollution-and-Regulations-in-Cyprus/pageid-828/, but it is not clear if this correlates to official recommendations:

"The recommended noise levels as provided by the World Health Organization serve as guidelines for the governments for the implementation of their own regulations"

During the two days of the first mission the meetings it was not possible to get any further information about specific requirements or numbers concerning sound protection for building constructions, neither for exterior walls nor for dividing walls or separating ceilings. It was only discussed that there are typical constructions in use, e.g. the following:

Internal Walls:

2 cm of plaster
10 cm hollow brick wall ca. 200 – 220 kg/m2
2 cm of plaster

Dividing walls – masonry cavity walls:

2 cm of plaster
10 cm hollow brick wall 200 – 220 kg/m2
5 cm cavity or insulation (optional)
10 cm hollow brick wall 200 – 220 kg/m2
2 cm plaster

Exterior walls:

Same as interior walls, in special cases masonry cavity walls, sometimes combined with an inner structural leaf of concrete block

Separating floor:

3 cm Tiles on mortar
10 cm lightweight concrete, pumice gravel, curuf…
15 – 20 cm concrete

Roof:

Roofing membrane
4-6 cm Site cast levelling concrete topping
15 cm concrete slab
2 cm Plaster

Windows:

aluminium frames with double glazing

The structure sometimes is combined with concrete frame construction

If we use that constructions to calculate the sound insulation between dwellings, we get the following sound reduction index / normalized impact sound levels:

Exterior wall R_w ca. 40 – 50 dB (estimated, depending on weight and type of brick)
Partition wall R_w ca. 40 – 50 dB (estimated, depending on weight and type of brick)
Floor $R_w \approx 55$ dB, $L_{nw} \geq 80$ dB
Roof $R_w \approx 55$ dB
Windows ≈15 - 33 dB, depending on the quality of sealing

The values for airborne sound insulation are common for moderate noisy areas, the impact sound protection seems to be very poor.

Further there are some other construction systems are in use, e.g. wood frame constructions, steel and panel constructions etc.

As there are no official requirements for sound insulation in Cyprus, it is not ensured that constructions comply to any minimal requirements for sound insulation, as well as some constructions above may provide a satisfying airborne sound insulation in some not too noisy areas. The impact sound insulation seems to be very poor in every case.
Furthermore, there are no requirements stated for noise reduction in rooms e.g. restaurants, workshops and there are no requirements included for room acoustic in schools, lecture room etc.

Especially noise reduction in rooms is also an essential item in health protection, so such specifications should be stated as minimal requirements.

We suggest splitting the introduction of requirements using two levels: an overall statement above sound protection in the law and a more precise description of detailed requirements in a guideline, which can be more easily adapted, expanded or updated.

For example, a statement for sound insulation in the law could be derived from the basic requirements of the European Construction Products Regulation (CPR):

Protection against noise – general requirements:

(1) *The construction works must be designed and built in such a way that noise perceived by the occupants or people nearby is kept to a level that will not threaten their health and will allow them to sleep, rest and work in satisfactory conditions.*
Buildings must be designed and constructed in such a way, that healthy, normally sensitive users or neighbors of this structure are not threaten in their health by noise or are subjected to unacceptable bothering by sound and vibrations that occur during the intended use. The purpose of use as well as the position of the building and its rooms must be considered.
(2) All components, in particular external and separating components, as well as accessible areas in buildings, must be designed and constructed in such a way, that the transmission of airborne, impact and structure borne sound is insulated as far as it is necessary to meet the requirements of section (1)
(3) Building services, stationary machines and technical installations, in the course of which sound is transmitted or vibrations can occur, must be installed and set up in a way to ensure compliance with the requirements of section (1).

Furthermore, we recommend introducing specific requirements concerning airborne-, impact- and structure borne sound insulation, but also for room acoustics concerning noise prevention within rooms and enhance the audibility e.g. for classrooms, presentation and conference rooms etc. (as a not really ideal example we can mention the circular shaped conference room in the office building of the ministry of finance, where we had some presentations during the second meeting).

For these specific requirements, we recommend creating a guideline, based on basic acoustical principals for town, regional and physical planning for environmental noise (e.g. based on ambient noise classes, in best case this classes are connected to zoning maps, where appropriate),
and based on a basic level for interior noise, combined with constructional provisions for such cases, where there does not exist a satisfying calculation model (especially for building services and some structure borne sound sources).
As basic standards, we can recommend using the European building and room acoustic standards, based on e.g. EN ISO 10140, EN ISO 717 and EN ISO 12354, EN ISO 10848 etc. series, and where necessary, to have national interpretations for these.

When introducing noise protection requirements, we recommend, that Cyprus should provide some accompanying measures:

(1) Provide rules how to estimate the environmental noise as a basis for the estimation of the acoustic performance of buildings from the acoustic performance of the elements.
(2) Provide data for the basic sound level within rooms of different usage (or provide directly the requirements derived from that)

(3) Collection of relevant acoustical data of specific building materials and constructions
(4) Provide sample calculations and/or robust details
(4) Adjust requirements for CE – marking of building materials and products
(5) Adapt the education and training for architects, designers and engineers, concerning building acoustic and room acoustics, but also provide practical knowledge for builders
(6) Establish one (ore more) state- or private lab(s), that is able to test and calculate materials, constructions etc. and to do certification acc. ISO 17020 and 17025
(7) Introduce inspections for a random quality control measurement
(8) Work on noise maps and connect it to the dedication plan.
(9) Proceed with strategic noise maps

Concerning rules to estimate the environmental noise, there exist different methods to estimate the environmental noise:

a) A very convenient method would be a possibility to derive "planning values" as zonal noise immission, which can be derived in areas, where the intended use is of a similar noise emission and is not covered or extended by additional sound sources.
The basis sound level here is an A-weighted, equivalent continuous sound pressure level $L_{A,eq}$
Example:

Planning values for zone related noise immission			
Zone	Description of zone	A-weighted equivalent continuous sound pressure level $L_{A,eq}$ in dB	
		Day	Night
A	Quiet zone, special noise protected area	45	35
B	Suburb residential area, rural residential area	50	40
C	Urban residential area, agricultural and forestry enterprises with residential housings	55	45
D	Urban core areas (offices, shops, trade and commerce without noise emission) mixed with residential buildings, zone for business without noise emission	60	50
E	Zone for low noise emission (logistics, production, services, management…)	65	55

b) Determination of the environmental noise level for a building on the basis of sound immission maps
Such maps can be calculated on the basis of specific rules for sound propagation and noise sources.
c) Estimation of the environmental noise level for a building by calculation of the environmental noise level at the façade or surface of a building
This also can be done on the basis of specific rules for the sound propagation and noise sources.
d) Estimation of the environmental noise level for a building by usage of strategic noise maps
Here it is necessary, which noise source (Road, Railway, Airplane, Industry) is dominant, otherwise all sources have to be taken into estimation.
e) Estimation by measurement
Not suitable for airplane noise. Here it is necessary to take all the possible influences into account, so often a long-term measurement is necessary to get reliable values.
f) Estimation of the environmental noise at a specific construction part (window, wall, roof etc.) by measurement or calculation.

It is recommended also to provide the possibility to calculate the environmental noise in front of a special part of the building. This often allows to reduce the requirements for that special part, e.g. when a window ist situated at d direction away from the noisy side of a building.

In some cases, specific noise sources may get a “bonus” (e.g. railway noise is less disturbing (e.g.- 5 dB) than a noise with a constant narrow-band frequency noise (e.g. + 5 dB).

These estimations can be used as a basis for the determination of the required noise protection, which will be stated in the proposed guideline for noise protection.

For the noise protection within buildings, we would suggest as a basis a noise-zone dependent basis sound level, which should be chosen in a way, that it could provide satisfying conditions for the intended usage, e.g. for lounge and recreation rooms:

Zone (according the table above)	A	B	C	D	E
Planning level L_A for the basis level in dB					
At day	20*	25*	30*	30*	30*
At night	15*	15*	20*	20*	20*

*) the levels should be chosen acc. To the sensitivity of the people, which depends on various factors (culture, practice, history…)

For different usages also a planning level should be stated, depending on the usage (e.g. for concentrated work you will need a low level, for a work in a shop a higher level may be right, considering, that a too high planning level may cause less productivity.

Rooms with a specific usage	Example Planning level for the basis level in dB
Theater, Concert Halls	25
Cinemas, Reading Rooms, Lecture rooms	30
Bigger Offices, shops, conference rooms*	35
Open-plan offices, supermarkets	50
*Small offices, surgeries are to be treated as lounge rooms – see table above	

The necessary sound level difference between rooms and necessary sound reduction indices can be derived from these planning levels, where in some cases deviations on different reasons can be recommended, based on experience. Examples for derived requirements are provided in the Annex II.b.

For the usage of descriptors in some cases it has to be decided, if common descriptors should be used or if there should be used some newer descriptors, and also, if spectrum adaptive terms should be introduced from the beginning. If most constructions are massive ones, this would not be necessary in a first step. If there is an increasing number of lightweight constructions, the introduction of some spectrum adaptive terms will be recommended to avoid a too poor sound insulation in the low frequency range. For Windows and glazings we can recommend the introduction of the spectrum adaptive term C_{tr}, which can be useful against urban traffic noise.

The descriptors which are used international, are very different, for airborne noise as well as for impact sound and other requirements. A newer set of descriptors and sound protection classes are discussed at the moment in ISO/CD 19488 Acoustics – Acoustic classification of dwellings.

Table 1 — Airborne sound insulation between dwellings and other rooms – Class limits (1)

Type of space	Class A	Class B	Class C	Class D	Class E	Class F
Between habitable rooms in a dwelling and rooms outside the dwelling, both in the horizontal and the vertical directions (MAIN REQUIREMENT)	$D_{nT,50} \geq 58$	$D_{nT,50} \geq 54$	$D_{nT,A} \geq 52$	$D_{nT,A} \geq 48$	$D_{nT,A} \geq 44$	$D_{nT,A} \geq 40$
Between habitable rooms in dwellings and common stairwells or access areas with an entrance door in the separating wall	$D_{nT,A} \geq 44$	$D_{nT,A} \geq 40$	$D_{nT,A} \geq 36$	$D_{nT,A} \geq 32$	$D_{nT,A} \geq 28$	$D_{nT,A} \geq 24$
Between habitable rooms in a dwelling and premises with noisy activities (2)	$D_{nT,50} \geq 64$	$D_{nT,50} \geq 60$	$D_{nT,A} \geq 58$	$D_{nT,A} \geq 54$	$D_{nT,A} \geq 50$	$D_{nT,A} \geq 46$

NOTES

1 Different descriptors are applied to reflect use of different frequency ranges and weightings. Instead of $D_{nT,A}$, $D_{nT,w}$ may be applied, if 2 dB is added to the limit value. If $D_{nT,A}$ is applied instead of $D_{nT,50}$, at least 4 dB must be added to the limit value of $D_{nT,50}$.

2 Premises with noisy activities are rooms for shared services like laundries, central boiler house, joint/commercial kitchens or commercial premises like shops, workshops or cafés. However, in each case, noise levels should be estimated and the sound insulation designed accordingly, e.g. for party rooms, discotheques etc. Then, the limits given in Table 4 for service equipment noise could be used as design goals.

Table: Proposed/Discussed ISO/CD 19488 Proposal for class limits for airborne sound insulation between dwellings and other rooms (lounge rooms)

Table 2 — Impact sound pressure level in dwellings – Class limits

Type of space	Class A	Class B	Class C	Class D	Class E	Class F
In habitable rooms in dwellings from other dwellings, both in the horizontal and the vertical directions (MAIN REQUIREMENT)	$L'_{nT,50} \leq 50^{(1)}$ and $L'_{nT,w} \leq 46$	$L'_{nT,50} \leq 54^{(1)}$ and $L'_{nT,w} \leq 50$	$L'_{nT,w} \leq 54$	$L'_{nT,w} \leq 58$	$L'_{nT,w} \leq 62$	$L'_{nT,w} \leq 66$
In habitable rooms in dwellings from: - common stairwells or access areas - balconies or terraces or bath rooms not belonging to own dwelling (3)	$L'_{nT,w} \leq 50$	$L'_{nT,w} \leq 54$	$L'_{nT,w} \leq 58$	$L'_{nT,w} \leq 62$	$L'_{nT,w} \leq 66$	$L'_{nT,w} \leq 70$
In habitable rooms in dwellings from premises with noisy activities (2)	$L'_{nT,50} \leq 44^{(1)}$ and $L'_{nT,w} \leq 40$	$L'_{nT,50} \leq 48^{(1)}$ and $L'_{nT,w} \leq 44$	$L'_{nT,w} \leq 48$	$L'_{nT,w} \leq 52$	$L'_{nT,w} \leq 56$	$L'_{nT,w} \leq 60$

NOTES

1 Experience has shown that when applying the low-frequency rating, potentially disturbing high frequency sounds are not rated appropriately, and for this reason, an additional criterion for $L'_{nT,w}$ is applied. In order to account for both hard floor impact sounds as well as low frequency footstep sounds, it is required to fulfil the limit values for both criteria $L'_{nT,50}$ and $L'_{nT,w}$. The limit values for $L'_{nT,w}$ are 4 dB lower than those specified for $L'_{nT,50}$.

2 Premises with noisy activities are rooms for shared services like laundries, central boiler house, joint/commercial kitchens or commercial premises like shops, workshops or cafés. However, in each case, noise levels shall be estimated and the sound insulation designed accordingly, e.g. for party rooms, discotheques etc.

3 Impact sound from small balconies and rooms (area less than 4 m²) are not included, e.g. toilets and utility rooms.

Table: Proposed/Discussed ISO/CD 19488 Proposal for class limits for impact sound insulation between dwellings and other rooms (lounge rooms)

Table 3 — Facade sound insulation in dwellings – Class limits (1), (2), (3)

Type of space	Class A	Class B	Class C	Class D	Class E	Class F
Façades and roofs of habitable rooms in dwellings; in specific environment with sound sources characterised by L_{den}	$D_{nT,A,tr} \geq L_{den} - 20$	$D_{nT,A,tr} \geq L_{den} - 24$	$D_{nT,A,tr} \geq L_{den} - 28$	$D_{nT,A,tr} \geq L_{den} - 32$	$D_{nT,A,tr} \geq L_{den} - 36$	$D_{nT,A,tr} \geq L_{den} - 40$
NOTES 1 The sound insulation values are expressed as a weighted standardized sound level difference with a spectrum adaptation term for road traffic noise For other types of sound source than road traffic noise, $D_{nT,A,tr}$ shall be determined from the relevant level and spectrum of the sources. $D_{nT,w} + C_{tr,50\text{-}3150}$ may be used, where low frequency sound influences the indoor sound pressure level. e.g. where the sound comes from mechanical equipment placed outside the building. 2 L_{den} is the A-weighted free field sound pressure level for the general outdoor traffic noise as defined in the END (2002). L_{den} can vary slightly between countries for the same source, dependent on the national definition of the *day, evening* and *night* periods. 3 $D_{nT,A,tr} \geq 30$ dB applies as a minimum requirement to classes A-D						

Table: Proposed/Discussed ISO/CD 19488 Proposal for class limits for facade sound insulation in dwellings (lounge rooms)

Table 4 — Sound pressure levels in dwellings due to building service equipment – Class limits

Type of space and sources (1)	Quantity	Class A	Class B	Class C	Class D	Class E	Class F
In habitable rooms in dwellings from outdoor and indoor service equipment producing continuous noise	$L_{A,eq,nT}$	≤ 22	≤ 26	≤ 30	≤ 34	≤ 38	≤ 42
In habitable rooms in dwellings from outdoor and indoor service equipment producing intermittent or irregular noise, from neighbouring spaces	$L_{AF,max,nT}$ (2)	≤ 26	≤ 30	≤ 34	≤ 38	≤ 42	≤ 46
NOTES 1 Requirements relate to sounds that occur more than occasionally due to service equipment in neighbouring dwellings, equipment serving the whole building and service equipment within the dwelling for normal ventilation / heating / cooling. 2 $L_{AS,max,nT}$ may also be used, provided that 4 dB stricter limits (lower sound levels) are fulfilled, i.e. the same as the $L_{Aeq,nT}$							

Table: Proposed/Discussed ISO/CD 19488 Proposal for class limits due to building service equipment (lounge rooms)

Table 5 — Reverberation time T and ratio A/S_{walk} – Class limits

Type of space	Class A	Class B	Class C	Class D	Class E	Class F
In access areas, atriums, community rooms etc. (1),(2)	$T \leq 0{,}6$ s	$T \leq 0{,}9$ s	$T \leq 1{,}2$ s	$T \leq 1{,}5$ s	$T \leq 1{,}8$ s	$T \leq 2{,}1$ s
In common stairwells, corridors etc. (2)	$A/S_{walk} \geq 0{,}40$	$A/S_{walk} \geq 0{,}35$	$A/S_{walk} \geq 0{,}30$	$A/S_{walk} \geq 0{,}25$	$A/S_{walk} \geq 0{,}20$	$A/S_{walk} \geq 0{,}15$
NOTES 1 The limits are arithmetically averaged values and apply in each of the octave bands 250 Hz, 500 Hz, 1000 Hz and 2000 Hz. 2 Since sometimes measuring and predicting the reverberation time could be inaccurate in such enclosed areas, the requirement on the reverberation time might be replaced by the corresponding calculated amount of applied equivalent absorption area $A \geq 0{,}16\ V / T$.						

Table: Proposed/Discussed ISO/CD 19488 Proposal for class limits for reverberation time in staircases, atriums etc.

The above mentioned draft of classes can be used to get an impression of the discussed sound protection levels and may also be helpful in comparison with the international requirements.

Land	Kenngröße	Anforderung in dB	
		MF-Haus	Reihen-Haus
Österreich	$D_{n,T,w}$	55	60
Deutschland	R'_w	53	57
Italien	R'_w	50	50
Dänemark	R'_w	55	55
Norwegen	R'_w	55	55
Schweden	$R'_w+C_{50-3150}$	53	53
Finnland	R'_w	55	55
Großbritannie	$D_{n,T,w} + C_{tr}$	45	45
Frankreich	$D_{n,T,w} + C$	53	53
Schweiz	$D_{n,T,w} + C$	52	55
Niederlande	$I_{lu;k}$	0	0
Belgien	$D_{n,T,w}$	54	58
Spanien	$D_{nT,w} + C_{100-500}$	50	50
Portugal	$D_{n,w}$	50	50
Polen	R'_w+C	50	52
Tschechien	R'_w	52	57
Slovakai	R'_w	52	52
Ungarn	R'_w+C	51	56
Slovenien	R'_w	52	52
Estland	R'_w	55	55
Lettland	$D_{n,T,w}$ oder R'_w	54	54
Lithauen	R'_w	55	55
Island	R'_w	52	55
Irland	$D_{n,T,w}$	53	53

Land	Kenngröße	Anforderung in dB	
		MF-Haus	Reihen-Haus
Österreich	$L'_{nT,w}$	48	43
Deutschland	$L'_{n,w}$	53	48
Italien	$L'_{n,w}$	63	63
Dänemark	$L'_{n,w}$	53	58
Norwegen	$L'_{n,w}$	53	53
Schweden	$L'_{n,w} + C_{I,50-2500}$	56	56
Finnland	$L'_{n,w}$	53	53
Großbritannie	$L'_{nT,w}$	52	0
Frankreich	$L'_{nT,w}$	58	58
Schweiz	$L'_{nT,w} + C_I$	53	50
Niederlande	I_{co}	5	5
Belgien	$L'_{nT,w}$	58	50
Spanien	$L'_{nT,w}$	65	65
Portugal	$L'_{n,w}$	60	60
Polen	$L'_{n,w}$	58	53
Tschechien	$L'_{n,w}$	58	53
Slovakai	$L'_{n,w}$	58	58
Ungarn	$L'_{n,w}$	55	45
Slovenien	$L'_{n,w}$	58	58
Estland	$L'_{n,w}$	53	53
Lettland	$L'_{n,w}$	54	54
Lithauen	$L'_{n,w}$	53	53
Island	$L'_{n,w}$	58	53
Irland	$L'_{nT,w}$	62	0

Table: Airborne sound (left table) and impact sound (right table) requirements in different countries (Source: B. Rasmussen)

Additional Requirements:
To reduce the noise within rooms (restaurants, break rooms in schools etc. workshops, manufacturing rooms etc., we recommend also a requirement for a minimum sound absorption. To avoid problems in the usage of class rooms, lecture rooms, etc., a volume- dependent reverberation time is very useful for health and learning performance.

In addition to the above given recommendations a “red line” for a proposed sound protection guideline has been prepared as an Annex II.b to this final report.
The level of the specific requirements on the other hand should be chosen by experts of Cyprus to take into account the overall and specific boundary conditions that may exist. If necessary, further advice can be given to proceed in future.

The above-mentioned findings are based on the information during the two days of the first mission, the discussions during the second mission and some recherche. Other than these available documents may lead to changes, amendments or withdrawal of parts of this report statements.

5.4. Energy economy and heat retention

5.4.1. Introduction

Two batches of legal documents were received for review. All documents of the first batch from October 2016 were scanned in order to identify possible synergies with the field of energy efficiency. The following pieces of legislation identified as relevant regarding energy aspects have been reviewed with regard to elements linked with “energy economy and heat retention” and renewable energy:

StrBLaw_Apr15_EN
(2)StrBReg_Apr2015_EN

(3)EnergyPerfLaw_2009
(4)Energy PerfReg_2014
(5)-R.A.A. 163_2009
(6)-R.A.A. 164_2009
(7)-R.A.A. 446_2009
(39)-Mandate 1_2014
(30)-Mandate 2_2006

The Town Planning Law 2015 contains two relevant sections with regard to checking and enforcing the compliance with energy minimum requirements, namely:

(8)TownPlanningLaw_2015
Part V.—DEVELOPMENT —PLANNING CONTROL Planning permission
Part VI.—ENFORCEMENT OF PLANNING CONTROL Enforcement when planning permission required

Other relevant documents with regard to synergies are the following ones:

(28)-Mandate 2_2005: Dossier for applications
(34)-Mandate 1_2008: Handling applications
(38)-Mandate 1_2011: Simplified control

Utilisation of renewable energy sources (RES) is mentioned in more than one document and is specifically emphasised in document (39)-Mandate 1_2014. Attention must be paid to the fact that local plans dealt with in (8)-TownPlanningLaw_2015 and other documents influence the actually exploitable RES potential on building level which is regarded as an element of energy efficiency.

The second batch consisting of updated versions of legal documents was received in January 2017 and documents were scanned in order to identify possible synergies with the field of energy efficiency. The following documents were identified as relevant regarding energy aspects and reviewed in detail:

(3)-R.A.A.281_2013-Regulation of Streets and Buildings General Exemption Decree
(4)-L.210(1)_2012-The Regulation of Energy Performance of Buildings (Amending) Law of 2012
(5)-R.A.A.119_201-Minimum Energy Performance Requirements_Decree of 2016R.A.A. 119/2016

In addition, other information was used, such as the MURE II database. The report about Cyprus shows that energy-related aspects in buildings are regulated by the following legislation[1]:

- N. 142(I)/2006, N. 30(I)/2009, N. 210(I)/2012
  Laws for the Regulation of the Energy Performance of Buildings
- Κ.Δ.Π. 432/2013, Κ.Δ.Π. 433/2013, Κ.Δ.Π. 446/2009, Κ.Δ.Π. 412/2009, Κ.Δ.Π. 414/2009, Κ.Δ.Π. 160/2013, Κ.Δ.Π. 343/2013, Κ.Δ.Π. 386/2013, **Κ.Δ.Π. 119/2016**
  Decrees for the minimum efficiency requirements for new buildings and the EPC issuing.
- Κ.Δ.Π. 429/2006, **Κ.Δ.Π. 281/2013**
  The Streets and Buildings Regulation (for the energy performance of buildings)

[1] Compilation according to Cyprus Institute of Energy, CY1 Law for the Energy Performance of Buildings - Dwellings, MURE II, Last update: 14 January 2014, completed with recent information received from the Ministry of Interior (bold). CY1 document available at: http://www.measures-odyssee-mure.eu/topics_out.asp?tipo=All&Cod_mr=CY13/CY14/CY11/CY1/CY9/CY3&Cod_te=CY7/CY9/CY10/CY1/CY2&Cod_in=&Cod_tr=&Cod_gc=&stato=completed

- Κ.Δ.Π. 163/2009, Κ.Δ.Π. 413/2009
  Air-conditioning systems inspections (regulation and decree)
- Κ.Δ.Π. 119/2011, Κ.Δ.Π. 148/2013, Κ.Δ.Π. 149/2013, Κ.Δ.Π. 150/2013, Κ.Δ.Π. 151/2013
  Heating systems (boilers) inspections (regulation and decree)

5.4.2. Presentation of the facts and review

"Energy" in the current legislation under the Streets and Buildings Regulation Law (Ministry of Interior)

The competent Authority (Minister of Interior, delegating specific tasks to subsidiary bodies) sets the Terms and Conditions for the building permit, among others also the Terms and Conditions for energy efficiency. Through setting the Terms and Conditions, the obligation to present the Energy Performance Certificate (EPC) and meeting the energy efficiency minimum requirements have been made part of the building permit procedure. The EPC proves that the building meets energy-related requirements according to EPBD.

"Energy" in the current legislation under the Law for the Regulation of the Energy Performance of Buildings (Ministry of Energy, Commerce, Industry and Tourism)

The legislation under the Law for the Regulation of the Energy Performance of Buildings is the transposition of the EPBD in Cyprus.

"Energy" in the current legislation under The Town and Country Planning Law (Ministry of Interior)

Local plans influence the actually exploitable renewable energy potential on building level which is regarded as an element of energy efficiency. Therefore, the legislation under The Town and Country Planning Law can hinder or support achieving requirements regarding minimum shares of renewable energy and nearly zero energy requirements specified in the legislation under the Law for the Regulation of the Energy Performance of Building.

In addition to the received documents, the EPBD report on the Implementation of the EPBD in Cyprus (Status in December 2014) was used as a source of information, as well. The report developed during the Concerted Action 3 EPBD[2] shows that the EPBD is well on the way being implemented, including provisions for nearly zero energy buildings and setting up an independent control system based on an EPC registry, checking EPC on building permit level, carrying out on-site controls, and enforcing EPC compliance with defined measures.

MECIT is responsible and transposes the EPBD with the legislation under the Law for the Regulation of the Energy Performance of Buildings.

Identified problems in the field of energy efficiency and renewable energy during inception meeting

The below listed problems were compiled during the inception meeting and the discussions held with stakeholders.

Fragmented responsibility

- Two ministries are responsible for people building a house, making it complicated for them.

[2] http://www.epbd-ca.eu/countries/country-information

Lengthy procedures

- EPC is required as part of "terms and conditions" which have to be met in order to achieve the building permit.
- Minimum requirements are fixed during the consultation process.
- Energy Services MECIT receives the EPC with the building permit (consultation procedure) and can react on non-compliance.
- In case of non-compliance, the EPC is cancelled and a new EPC has to be presented.
- During construction: in case of non-compliance, inspector notifies on site: first warning, then court procedure in case of non-compliance.
- Procedures should be simplified in accordance with the simplification of general procedures.

Checking the EPC and ensuring EPC quality

- EPC required when selling or renting: EPC is not checked at all, quality control is missing.

Definition of energy minimum requirements

- Currently, focus is on insulation; there is no minimum requirement on cooling energy demand. Minimum requirements in terms of kWh exist only for heating and are available in the NZEB study. Cooling energy demand must be addressed.
- Currently, not much attention is paid to technical building systems; however, they will become important in future because of the importance of nearly zero energy (NZEB) requirements.
- The requirement should include that energy minimum requirements must be revisited and adapted after a defined period.

How to ensure EPC compliance

- The law is too vague and there are mandatory technical guidelines to specify the law. There is a lack of transparency and clarity regarding the rules, and therefore it is difficult to ensure compliance.
- EPC is submitted electronically including input data, but input data are not checked. A mechanism is needed to check input data and release pressure from inspectors because the random sample can be selected more systematically.
- Energy Services MECIT checks EPCs which are part of the building permit on a random basis (small board of 6 inspectors visiting the buildings during construction, in collaboration with municipalities); however, the sample is too small, the number of 6 inspectors is not sufficient, and therefore there is no clear picture about the real situation regarding EPC quality.
    - A Code of Practice for checking is needed.
    - Checking of technical systems is necessary. Supervision of mechanical is necessary. Attention has to be paid to the qualification of installers.
    - Inspectors are very important because they "train" the staff on the construction site about changes in legislation. However, there are not sufficient inspectors.
    - Example: Thermal insulation is new and there is resistance to implement it. Inspectors have an important informative role until thermal insulation becomes the norm.

Major renovations

- Problems to enforce the law for building renovations because of fragmentation: major renovation is defined in the building law, minimum requirements are defined in the energy performance law.
- Consider of harmonizing legal provisions; or issue a technical guidance document containing all provisions related with major renovations.
- Problems to enforce the law for building renovations because of step-wise implementation of energy efficiency measures: difficult to control.
- Issue with existing buildings: there is no awareness that minimum requirements have to be met; windows are changed without being aware of energy efficiency.

Renewable energy technologies

- Qualification of installers is essential.
- Developments with RE are treated like all other developments. However, they should be treated differently depending on the size of RE.
- There are restrictions regarding use of PV and other RES by Ministerial Decree. There could be a contradiction between energy minimum requirement related with RES and limitation of RES use by Decree.

Written comments provided by stakeholders: suggestion of solutions and additional information

With regard to energy efficiency and renewable energy, the following institutions provided comments after the inception workshop:

- Cyprus Federation of Employers and Industrialists
- Ministry of Energy, Commerce, Industry and Tourism (MECIT)
- Union of Cyprus Municipalities

MECIT and Cyprus Federation of Employers and Industrialists also presented suggestions to improve the content of the existing legislation regarding energy-related aspects.

The Union of Cyprus Municipalities presented suggestions regarding streamlining of procedures which are also relevant for energy-related aspects.

MECIT described another relevant regulation, namely **Κ.Δ.Π. 111/2006 under the Streets and Buildings Regulations Law, requiring that for each new installation of central heating system and air conditioning system a study is provided.**
Technical building systems are playing an increasingly important role in energy efficiency of buildings, and therefore a revision is recommended, taking into account EPBD requirements.

5.4.3. Analysis of the facts

Two responsible Ministries

Two ministries are in charge of "Energy efficiency and heat retention": Some aspects of "Energy efficiency and heat retention" are addressed by the current legislation under the Roads and Buildings Law (Ministry of Interior), while the implementation of the Energy Performance of Buildings Directive 2010/31/EU (EPBD) is the overall responsibility of the Ministry of Energy, Commerce, Industry and Tourism (MECIT). Renewable energy utilisation which is under the EPBD but also under the Renewable Energy Directive 2009/28/EC (RED) is addressed by a Mandate and an Order of the Town and Country planning Law (Ministry of Interior).

This situation requires a clear definition of interfaces.

Complex situation regarding legislation

Energy efficiency and renewable energy aspects are mainly addressed by the legislation under the Law for the Regulation of the Energy Performance of Buildings. Legal documents have been updated and have replaced previous versions. Several documents have to be compared and analysed to be able to understand the changes and follow the rules accordingly.

An example is provided below:

- Requirements from 2013 onwards according to Κ.Δ.Π. 432/2013:

- Walls and bearing construction elements U_{max} = 0.72 W/m^{2}K
- Horizontal shell elements and roofs in direct contact with the external environment U_{max} = 0.63 W/m^{2}K
- Floors over closed non heated spaces U_{max} = 2.0 W/m^{2}K
- Openings U_{max} = 3.23 W/m^{2}K
- In addition:
  - U_{mean} of building shell elements excluding floors, terraces and roof is 1.8 W/m^{2}K for non-residential and 1.3 W/m^{2}K for residential buildings
  - All new buildings are at least Energy Class B
  - Installation of solar panels for covering hot water consumption
  - Provision for future use of systems of electricity production
  - Maximum shading factor for openings = 0.63

- New requirements entered into force on 1st of January 2017 according to Regulation of Energy Performance of Buildings (Minimum Energy Performance Requirements) Decree of 2016 (Κ.Δ.Π. 119/2016):
  - Energy efficiency class in the EPC for a building: Equal or better than B
  - Walls and bearing construction elements U_{max} = 0.4 W/m^{2}K (exemptions allowed)
  - Horizontal elements and roofs U_{max} = 0.4 W/m^{2}K
  - Windows and doors U_{max} = 2.9 W/m^{2}K (exemptions allowed)
  - Maximum shading co-efficient = 0.63
  - Maximum installed lighting power (offices): 10 W/m2
  - Dwellings: At least 25% of total primary energy consumption from renewables (exemptions allowed)
  - Non-residential: At least 7% of total primary energy consumption from renewables (exemptions allowed)

In addition, there is an overlap with the legislation under the Town and Country Planning Law and with the legislation under the Streets and Buildings Regulation Law as they also regulate energy-related aspects for buildings.

Thus, the status quo is complex, and there is room for improvement concerning user friendliness and transparency of legislation.

Problems and solutions identified in the field of energy efficiency and renewable energy

Problems compiled during the inception meeting and suggestions for solutions provided by stakeholders can be allocated to the following categories:

- Problems and solutions related with fragmented responsibilities and lengthy procedures.
- Problems and solutions related with room for improvement as regards content of the legislation currently under the Law for the Regulation of the Energy Performance of Buildings and the legislation currently under the Town and Country Planning Law.

The first part needs to be addressed together with general simplification of procedures, and the second part can be addressed together with the re-structuring of the legislation as regards content.

Implementation of the EPBD in Cyprus

The report developed during the Concerted Action 3 EPBD[3] shows that the EPBD is well on the way being implemented. However, **further development will be necessary due to changing EU Directives**[4]Fehler! Textmarke nicht definiert., and this will affect the legislation under the Law for the Regulation of the Energy Performance of Buildings. At the same time, it can be a good chance to make legislation user-friendlier.

5.4.4. Recommendations presented with the interim report

Increasing transparency and user friendliness of legislation

Energy related requirements have been changing depending on EU policies. The recent review of EPBD and RED[5] shows that emphasis is put on actual building performance and contributions from renewable energy sources. Revision of requirements has taken place and will continue to take place in future, in order to comply with the European Directives mentioned above.
In the course of this process, primary legislation under the Law for the Regulation of the Energy Performance of Buildings could be compiled in one single document structured as follows (example):

- Minimum energy efficiency requirements, taking nearly zero energy requirements and cost optimal requirements into account; requirements regarding renewable energy shares
- Provisions regulating:
    - Calculation methods and tools
    - Qualification of experts
    - EPC registry
    - Control and enforcement
    - Energy related incentives
    - Building energy label, publication of energy indicators, presentation and handing over of EPC

Updated versions should be published in track changes mode and as clean version. This will improve transparency and increase user friendliness of legislation.

Comprehensive technical documents and secondary legislation should be referenced in the main text of the primary legislation but could be issued separately, such as:

- Description of calculation method and approved software tool
- Guide to Thermal Insulation of Building
- Technical Guide to Solar Systems
- Etc.

This approach would be in line with the European CPR stating as the 6th basic requirement for construction works:
"Energy economy and heat retention
The construction works and their heating, cooling, lighting and ventilation installations must be designed and built in such a way that the amount of energy they require in use shall be low, when account is taken of the occupants and of the climatic conditions of the location. Construction works must also be energy-efficient, using as little energy as possible during their construction and dismantling."

[3] http://www.epbd-ca.eu/countries/country-information
[4] http://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition
[5] http://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition

Possible approaches to address the identified problems related with fragmented responsibilities and procedures

There is clearly an overlap between legislation under the Town and Country Planning Law and the legislation under the Streets and Buildings Regulation Law with the legislation under the Law for the Regulation of the Energy Performance of Buildings. However, this overlap should be limited to procedural aspects, e.g. planning/building permit approval and approval of permit of use.

With regard to transparency and user friendliness of legislation, building specific energy-related aspects addressed in the legislation under the Town and Country Planning Law, in the legislation under the Streets and Buildings Regulation Law (Κ.Δ.Π. 111/2006 requiring that for each new installation of central heating system and air conditioning system a study is provided) and in the legislation under the Law for the Regulation of the Energy Performance of Buildings (see Background Document for the development of the Draft Guideline "Energy economy and heat retention" in the Annex II.a) should be consolidated.

In order to achieve this objective, interfaces between the Ministry of Interior and MECIT have to be well specified.

While aspects related with the buildings as such could be under the Ministry of Interior, horizontal aspects related with energy could remain under MECIT, in order to ensure synergies with other energy related European Directives and to benefit from well-established equipment and procedures (e.g. EPC database, independent control system).

5.4.5. Final recommendations considering stakeholder feedback from the interim and the final meeting

Most of the existing building-related energy legislation is under MECIT and directly connected with the implementation of Directive 2010/31/EU.

MECIT/Energy Service stated in a written feedback that the Energy Performance of Buildings Law is completed by a number of ministerial orders and technical guidelines issued by MECIT. This made it clear that the document on Energy according to CPR requirement 6 will have to be drafted in a different way compared with the documents on Noise Protection and Hygiene, Health and Environment, and will have to consider the existing legislation.

Taking stakeholder feedback into account, a Background Document for the development of the Guideline on Energy Economy and Heat Retention (see Annex II.a) was compiled.

The objectives of this document are defined as follows:

- to file fragmented energy-related provisions of existing Cypriote legislation according to a logical structure, to increase the transparency of energy-related legislation addressing the building sector and to allow for easier access for stakeholders of the building sector;
- to facilitate the discussion on further developing the legislation of an ad hoc committee between MECIT, Ministry of Interior, and building permit authorities or within the statuary committee for the implementation of the EPBD in Cyprus which the above mentioned parties are already members;
- to document room for improvement based on stakeholder comments and good practices in other countries.

Following the feedback from the Presidency, the University of Cyprus, and MECIT/Energy Service the chapters on Enforcement and control, Historic buildings, and Technical building installations were included. Following the general feedback, good examples from other countries were also included.

During the final meeting, the wish came up to have all energy-related provisions compiled in one document. However, different stakeholder groups will need a different type of detail and focus:

- Architects and engineers: Stakeholders need information about the requirements and might benefit from technical guidelines advising them how to design the building in order to meet the requirements.
- Municipalities: Stakeholders might need a guideline and a checklist how to check compliance of building designs and completed buildings. It might not be sufficient to provide the material but also necessary to offer a training how to apply the guideline and the checklist.

Therefore, it is suggested to use the Background Document for discussion how to proceed with possible follow-up activities. The Background Document is attached in the Annex III.a.

In addition a draft structure for the Guideline on Energy Economy and Heat Retention was developed and is also attached in the Annex III.b. It is based on the Background Document considering its comments, e.g. on minimum requirements for cooling energy demand and energy efficient lighting.

Annex I.a: Functional Requirements “Hygiene, Health and the Environment”

Section 1

❑ **General requirements**

All parts of structures must be designed and constructed in such a way as to meet the requirements for hygiene, health and environmental protection, taking into account their intended use.

Section 2

❑ **Sanitary facilities**

Structures with accommodation areas must be equipped with an adequate number of sanitation fittings, for example, toilets and water outlets. These must satisfy hygiene requirements in view of the size and purpose of the structure. Other structures must also satisfy these requirements if they are designed to accommodate gatherings of a larger number of people.

Section 3

❑ **Waste water**

(1) The collection and disposal of waste water and precipitation must be provided for in structures under consideration of their intended purpose.

(2) The systems for collecting and disposing of waste water and precipitation must be arranged, established and maintained in such a manner that they are safe for operation and that no risks or unreasonable nuisances arise.

(3) The bearing capacity of the subgrade and the dryness of structures may not be impaired by systems for collecting and disposing of waste-water and precipitation.

(4) Installations for the collection and disposal of sewage and rainwater must be able to be inspected and cleaned without great effort.

Section 4

❑ **Other drains**

Other drains, in particular those from agricultural installations such as stables, fertilizer collection systems or silos, must be collected in such a way that the hygiene and health of persons are not compromised.

Section 5

❑ **Waste**

Facilities must be provided for the hygienic, harmless and harmless collection and disposal of waste, taking into account their intended use.

Section 6

❑ **Combustion gases from furnaces**

(1) Taking into account the type of furnace and fuel, combustion gases from furnaces must be drawn off to the outside in such a way that people’s health and safety are not put at risk and that they are not disturbed to an unreasonable extent.

(2) It must be possible to inspect and clean chimneys without difficulty.

Section 7

❑ **Protection against moisture**

(1) Structures shall be permanently protected to prevent moisture accumulation and water penetration in a manner suited to their intended purpose. In doing so, consideration must be given both to the groundwater and to the foreseeable surface water (eg slope water and flood events).

(2) Roofing, exterior walls, exterior windows and doors as well as other external components must provide protection against rainwater.

(3) Structures must be designed in all their parts according to their intended use in such a way as to avoid damaging accumulation of moisture by condensation of water vapor in components and on surfaces of components.

Section 8

❑ **Industrial water**

(1) A separate industrial supply water may only be planned and executed in such a way that it is not connected to the drinking water supply.

(2) A mix-up of industrial- and drinking water must be prevented by appropriate measures.

Section 9

❑ **Drinking water**

(1) Structures with rooms intended for occupancy must be equipped with a supply of drinking water which poses no health risks.

(2) Supply tanks, pipelines, fittings, water treatment components (such as heating, softening) and other components which come into contact with drinking water (such as pressure boosting systems) may not alter the water properties in a manner which jeopardises hygiene or health.

(3) It must be ensured that drinking water is not contaminated by outside influences in a manner that jeopardises hygiene or health, such as by faulty seals, unintended backflow or migration, by mineral or organic pollutants, or with respect to microbiology.

Section 10

❑ **Protection against dangerous emissions**

(1) All parts of structures must be planned and executed in such a manner that they do not cause any emissions which endanger the health of the structure's user, such as dangerous gases, particles or radiation.

(2) If emissions in dangerous concentrations are not eliminated on account of the intended purpose of the structure (such as in garages), structural or other measures must be taken to prevent harm to health. Measures such as special ventilation and air exhaust equipment or the establishment of alarm devices may be required.

(3) In case of dangerous emissions from below ground, all parts of structures must be planned and executed in such a manner that the health of the users is not endangered.

Section 11

❑ **Lighting and illumination**

(1) Accommodation areas must have as much natural light as experience has shown is necessary with regard to health and wellbeing, unless the purpose of the structure means that artificial lighting alone is sufficient. The shape of the room and the lighting ratios shall especially be taken into account in this regard.

(2) It should be possible to light all rooms and generally accessible areas in structures in accordance with their purpose.

Section 12

❑ **Ventilation and heating**

Rooms must be designed to be ventilated and heatable according to their intended use. Ventilation systems may not present a risk to personal health or constitute an unreasonable nuisance. The proper discharging of exhaust gases from firing installation may not be impaired.

Section 13

❑ **Level and height of the rooms**

(1) The floor level of the rooms in relation to the terrain must be designed and constructed in such a way that, in accordance with their purpose, the health and wellbeing of users is not adversely affected.

(2) The height of the room must be appropriate to its purpose and ensure a sufficient volume of air with regard to the health and wellbeing of users.

Section 14

❑ **Storage of hazardous substances**

Structures or parts thereof in which hazardous substances are stored must be executed in such a manner as to prevent endangerment of the life and health of persons, as well as harm to the environment from the leakage or penetration of said substances into the ground.

Annex I.b: Draft Guideline “Hygiene, Health and the Environment”

Contents

0 Preliminary remarks

1 Definitions

2 Sanitary facilities

3 Rainwater, wastewater, and other drains

4 Waste

5 Combustion gases from furnaces

6 Protection against moisture

7 Drinking water and process water

8 Protection against dangerous emissions

9 Lighting and illumination

10 Ventilation and heating

11 Level and height of rooms

12 Storage of hazardous substances

13 Special buildings

This Guideline is based on the outcome of sessions held by the Federal State expert group.

0 Preliminary remarks

All dimensions stated in this Guideline are finished dimensions following completion of the construction.

1 Definitions

The definitions contained in the document “Definitions for Hygiene, Health and the Environment” shall apply (see Annex I.c).

2 Sanitary facilities

2.1 General requirements

Floors and walls of sanitary rooms (toilets, bathrooms, and other wet rooms) must be easy to clean according to the various hygiene requirements. Toilets must normally be provided with water flushing systems.

2.2 Sanitary facilities in dwellings

Each dwelling in housing facilities must at least have a toilet, sink, and shower or bathtub in at least one sanitary room.

2.3 Sanitary facilities in structures which are not used for residential purposes

For structures which are not used for residential purposes, a sufficient number of toilets separated by gender must be installed depending on the intended purpose, the gender-based division of users, and the foreseeable concurrence of toilet usage. Toilet rooms in restaurants must not be directly accessible directly from guest rooms. Restaurants with no more than 8 serving places are not obliged to install toilets.

3 Rainwater, wastewater, and other drains

3.1 Collection and drainage of rainwater

3.1.1 Rainwater which is not used as process water must seep away, drain away or be discharged in a technically correct manner.

3.1.2 Devices for the technically correct collection and drainage of rainwater in structures shall then be required if

- rainwater falling on the structure is able to reach vehicular and pedestrian areas or neighbouring properties, or
- collective drainage is required in order to prevent any impairments (e.g. penetration of masonry, landslides).

In this regard, small surfaces (e.g. cornices, projections, balconies) do not need to be taken into account.

3.2 Collection and disposal of wastewater and other effluent

3.2.1 All structures

- which have a drinking water or process water supply,
- which have grounds in which condensation forms, or
- which see other types of wastewater

must be provided with systems to collect wastewater. Any other other collected wastewater must be disposed of properly.

3.2.2 Systems for collecting and disposing of wastewater must be planned and constructed so that neither the health of human beings nor the environment is being impaired, particularly by such things as:

- the backflow of wastewater into the structure,
- the escape of sewer gases into the structure, or
- the contamination of drinking water facility.

3.2.3 The floors and walls of septic tanks must be designed in a permanently liquid-tight, sulphate, and chloride-resistant manner. The tanks must be watertight all day long, ventilated, and provided with access openings located outside.

3.2.4 Manure collection systems, silos for wet silage, barn floors, and other components in which farmyard manure or sewage arises or is discharged must be liquid-tight. The effluent must be led into liquid-tight septic tanks which have no overflow.

3.2.5 Collection systems in accordance with Point 3.2.4 and septic tanks must be far enough away from drinking water wells and drinking water springs so that there is no risk of the drinking water being contaminated in accordance with the soil and groundwater conditions.

4 Waste

4.1 Structures must have waste collection points or waste collection rooms which comply with the intended purpose. These must be located and designed in such a way so that no unreasonable nuisance is caused by the use of waste collection bins as a result of dust, odour, or noise and that the proposed waste collection and pick-up type is easy to carry out.

4.2 Waste collection rooms must be aerated and ventilated. The ventilation apertures must be located in such a way so that no unreasonable nuisance is caused as a result of odour. The floors and walls of waste collection rooms must be easy to clean. The pick-up of waste must be possible from routes which are as short and as flat as possible.

4.3 Waste disposal chutes are not permitted.

5 Combustion gases from furnaces

5.1 General requirements for chimneys

5.1.1 All heat-producing appliances must be connected to chimneys which lead above the roof.

5.1.2 The mouths of chimneys must be located in such a way so that any effect on persons as a result of exhaust fumes is avoided and proper draft conditions are guaranteed.

5.1.3 The mouths of chimneys must be so high that, within a horizontal circumference of 10 m, they protrude above the bottoms of the lintels of all openable windows of communal areas and above the upper edge of supply air openings of ventilation systems, and must do so by the following minimum amounts:

- 3 m if the mouth is located in front of a window or supply air opening,
- 1 m for all other cases.

5.1.4 The mouth must extend above the crown by at least 0.4 m, or the following minimum distances must be observed in front of the roof surface area when measured normally from it:

- 0.6 m for gas or oil-fired heat-producing appliances in which the temperature of the exhaust gases is lowered below the dew point (condensing boiler),
- 1 m for all other cases.

For flat roofs, the mouth must be 0.4 m above the top of the attic and at least 1 m above the roof surface area.

5.1.5 By way of derogation from these provisions, mouths of chimneys for room-sealed gas-fired heat-producing appliances in which the temperature of the exhaust gases is lowered below the dew point (condensing boiler) shall be permitted in the external walls of existing structures if the connection to an existing chimney or the subsequent installation of a chimney leading above the roof is only possible with a disproportionate level of expenditure.

5.2 Resistant formation and effective discharge

5.2.1 Chimneys must be made from building materials which are sufficiently resistant when compared to the effects of heat and the chemical composition of exhaust gases and condensates.

5.2.2 Chimneys must be operationally tight and laid out in such a way so that exhaust gases can be effectively discharged, thus ensuring that no risk to the safety and health of individuals and no unreasonable nuisance is caused.

5.2.3 For any connecting pieces that are not part of the heat-producing appliance, the requirements of Points 5.2.1 and 5.2.2 apply analogously.

5.3 Openings for cleaning purposes

5.3.1 Each chimney must have openings for cleaning purposes which are easy to clean and inspect and which are installed at the very least on the lower (cleaning vent) and on the upper (sweeping vent) of the chimney. A sweeping vent shall not be required if the chimney can be swept out from the mouth via a secure access point and can also be examined. The size of the opening for cleaning purposes must be adjusted in line with the cross-sectional area of the chimney. A lower opening for cleaning purposes is not required if the chimney and heat-producing appliance including all connectors is clearly constructed in such a way so that soot can be easily removed above the heat-producing appliance without the need to dismantle it.

5.3.2 There must not be any openings for cleaning purposes in other residential or business units. Access to openings for cleaning purposes must not be via other residential or business units. Openings for cleaning purposes must be labelled in such a way so that the residential or business unit is uniquely classifiable.

5.4 Exhaust retardant devices

5.4.1 Devices which inhibit or prevent the removal of exhaust gases must not be installed. Throttle valves are, however, permitted in front of the junction with the chimney if an opening of a quarter of the cross-section, i.e. an opening of at least 25 cm2, remains open in the top part of the valve and only heat-producing appliances for solid fuels are connected.

5.4.2 The provisions of Point 5.4.1 do not apply to automatically controlled throttle valves with adequate safety devices.

5.5 Measurements

5.5.1 The clear cross-sectional area of the exhaust fume-carrying part of the chimney must be measured and formed in such a way so that suitable flow conditions are guaranteed. Attention must be paid in particular to the chimney type, the technical installation, and respective fuel thermal capacity of the proposed heat-producing appliance, the temperature of the exhaust fumes, and the effective height of the chimney, including any local conditions as well.

5.5.2 The clear cross-sectional area of the exhaust fume-carrying part of the chimney above the lowest opening for cleaning purposes must be kept constant right up to the mouth. Any changes in the cross-sectional form and type to an equivalent flow engineering form is permitted.

5.5.3 If exhaust fumes are derived under excess pressure during normal operation, then the exhaust fumes must be led into a ventilated flue liner for communal areas and adjacent rooms.

5.6 Discharge into the same flue liner of a chimney

5.6.1 Only exhaust fumes from the same floor and same residential or business unit may be discharged into the same exhaust fume-carrying part of a chimney.

5.6.2 If several heat-producing appliances for solid, liquid, or gaseous fuels are connected to the same exhaust fume-carrying part of a chimney, then the top of the lower junction and the bottom of the upper junction must be at least 30 cm apart; exhaust fumes from solid fuels must then be discharged into the bottom junction.

5.6.3 By way of derogation from Point 5.6.1, the discharge of exhaust fumes which flow from several residential or business units on the same floor or on different floors into the same chimney (e.g. air-exhaust fume systems) is permitted if only room sealed heat-producing appliances are connected to it and there is proof available regarding the suitability of the chimney and the fire-producing appliances.

6 Protection against moisture

6.1 Protection against moisture from the ground

Structures with communal areas and other structures whose intended purpose requires such measures must be permanently protected in all parts against the penetration and rising of water and moisture from the ground.

6.2 Protection against rainwater

The shell of structures with communal areas and other structures whose intended purpose requires such measures must be designed in such a way so that the penetration of rainwater into the structure and external components as well as within the interior of the structure is prevented effectively on a permanent basis.

6.3 Precautions against flooding

If the floor level of communal areas is not located above the level of a so-called “hundred-year” flood, then precautions must be taken for an equivalent level of protection against flooding.

6.4 Prevention of damage as a result of water vapour condensation

Surrounding components of structures with communal areas and other structures whose intended purpose requires such measures must be designed in such a way so that there is no damage as a result of water vapour condensation when used normally either within the components or on their surfaces. For external components with low retention capacities (e.g. window and door elements), there must be suitable measures in place to ensure that adjacent components are not soaked.

7 Drinking water and process water

7.1 All structures with communal areas must have a drinking water supply from the public drinking water network or from suitable private water supply systems (e.g. springs or wells).

7.2 There must not be any connections between drinking water pipes and process water pipes.

7.3 The various points of withdrawal must be labelled in the event there is a risk of confusion between drinking water and process water.

8 Protection against dangerous emissions

8.1 Pollutant concentration

Communal areas must be designed in such a way so that any dangerous emissions arising from building materials as well as from underground do not lead to concentrations which may affect the health of users in the event of an air exchange in line with the intended purpose. This shall be deemed to have been complied with for building materials if construction products which comply with the various provincial requirements for construction products are used as intended.

8.2 Radiation

Communal areas must be designed in such a way so that no traces of ionising radiation from building materials and radon emissions from underground occur which may affect the health of users. This shall be deemed to have been complied with for building materials with respect to ionising radiation if construction products which comply with the various provincial requirements for construction products are used as intended.

8.3 Ventilation of garages

8.3.1 Garages must be naturally or mechanically ventilated in such a way so that a half hourly average value for carbon monoxide (CO) of 50 ppm is not exceeded during normal operation.

8.3.2 For garages with no more than 50 m2 useful area, the requirement in accordance with Point 8.3.1 shall be deemed to have been complied with if there is a ventilation aperture of at least 200 cm² cross-sectional area per parking space.

8.3.3 For garages with more than 50 m^2 and no more than 250 m^2 useful area, in accordance with Point 8.3.1 shall be deemed to have been complied with if

- there is natural cross ventilation via supply air and exhaust air openings totalling at least 1 000 cm² cross-sectional area per parking space, or
- mechanical ventilation is guaranteed by way of a minimum 0.5 fold hourly air exchange, or
- each parking can be approached directly from the outside without any paths and there are ventilation apertures of at least 200 cm² cross-sectional area per parking space.

8.3.4 Garages with more than 250 m2 useful area must be provided with adequate measuring devices which activate alarm signals in the event a CO concentration of 250 ppm is exceeded over a period of more than a minute, as well as initiate measures to reduce the CO concentration (e.g. activation of mechanical ventilation system).

8.3.5 The requirement in accordance with Point 8.3.1 shall be deemed to have been complied with for garages with more than 250 m2 useful area for floors which are above ground as well as underground floors whose floors are no more than three metres below the surrounding area following completion if the floors are equipped with natural smoke and heat exhausting systems in accordance with Table 2 of OIB Guideline 2.2 “Safety in case of fire in garages, roofed parking spaces, and multi-storey car parks”. In such cases devices in accordance with Point 8.3.4 shall not be required. Half of these ventilation apertures from underground floors must be provided with shafts which lead at least 2 m above the surrounding area following completion.

8.3.6 All ventilation apertures of garages with more than 250 m2 useful area must be at least 5 m away from windows to be opened in communal areas.

9 Lighting and illumination

9.1 Requirements for exposure to light

9.1.1 For communal areas, the entire light ingress surface (net glass area) of the window must be at least 10 % of the floor area of this room, unless the specific use does not require this. This size increases from a room depth of more than 5 m by 1 % of the total floor area of the room per metre of additional room depth.

9.1.2 Sufficient outside incident light must be guaranteed for the light ingress surfaces required in accordance with Point 9.1.1. This is deemed in any case to have been complied with if an outside angle of incidence of 45 degrees is not exceeded based on the bottom of the exposure opening in the façade section. The direction of incident light may therefore be swivelled laterally by no more than 30 degrees.

9.1.3 If components such as balconies, roof overhangs, etc. of the same structure protrude more than 50 cm horizontally when measured within the required outside incident light, then the light ingress surface must be increased by 2 % of the floor area of the room per metre measured from the start of the protruding component within the outside incident light. Such components must not, however, protrude more than 3 m in front of the building.

9.2 Requirements regarding the visual connection outside

In communal areas of dwellings, all windows required for exposure to light must have an outside view of no less than 2 m. In at least one communal area of each dwelling, a window required for exposure to light which is 120 cm high must at least allow an outside horizontal view outside of no less than 6 m when measured normally to the façade.

9.3 Lighting

All rooms and generally accessible areas in structures must be illuminated in accordance with their intended purpose.

10 Ventilation and heating

10.1 Ventilation

10.1.1 Communal areas and sanitary rooms must be able to be ventilated by windows leading directly outside. This may be fully or partially waived if there is a mechanical ventilation system in place which allows a sufficient air change rate for the intended purpose. There must be ventilation in place for other internal rooms, with the exception of corridors.

10.1.2 If natural ventilation is not sufficient enough to ensure a healthy room temperature within communal areas, then an appropriately rated mechanical ventilation system must be installed.

10.1.3 A mechanical supply or exhaust air system must be installed in rooms whose intended purpose is likely to result in increased levels of air humidity (particularly in kitchens, bathrooms, wet rooms, etc.).

10.1.4 When installing heat-producing appliances, attention must be paid to ensure that the required volume of air in line with the design is able to flow through. Boiler rooms for open flue heat-producing appliances must have a supply of air from the outside; a minimum net cross-sectional area of 400 cm² must not be exceeded here:

- for heat-producing appliances for gaseous fuels with atmospheric burners as well as heat-producing appliances for solid fuels: 4 cm² per kW of nominal thermal capacity
- for other heat-producing appliances: 2 cm² per kW of nominal thermal capacity

For other installation rooms, the combustion air may also be supplied from other rooms if it can be demonstrated that sufficient combustion air is able to flow through when operating all mechanical and natural ventilation systems.

10.2 Heating

Communal areas and bathrooms must be able to be heated in such a way so that a room temperature can be achieved which is sufficient for the intended purpose. This does not include communal areas whose intended purpose does not include heating, or which are not intended for use in the heating period.

11 Level and height of rooms

11.1 Floor level of rooms

For accommodation areas in dwellings, along at least one side containing windows, the floor levels must be above the ground situated adjacent to the accommodation area after completion.

11.2 Room height

11.2.1 Accommodation areas must have a clearance of at least 2.50 m, except single- and two-family dwellings and terraced houses, which must have a clearance of at least 2.40 m. If this height is not achieved at all points within the room, the air space must nevertheless be at least the same as it is in case of a horizontal ceiling. As regards accommodation areas in attic storeys, this minimum room height must at least be observed over half of the floor area, in which connection, when calculating this area, floor areas where the room height is below 1.50 m are not taken into consideration.

11.2.2 The clearance of rooms other than accommodation areas where people only stay on a temporary basis must be laid down in accordance with their intended purpose, while the room area and the number of persons to be accommodated shall be stipulated such that a sufficiently large volume of air is guaranteed. However, the clearance may not fall below 2.10 m under any circumstances.

12 Storage of hazardous substances

12.1 The contamination of water or soil as a result of the leakage of stored hazardous substances must be prevented by way of technical measures such as collecting trays or the double wall design of containers and pipes so that there is no risk to humans and no environmental damage is caused.

12.2 When storing hazardous substances in areas which flood in the event of “hundred-year” floods, efforts must be made to ensure that the escape of such substances in the event of a flood is prevented (e.g. protection of storage areas against penetrating and pressuring water, safeguarding of storage containers against floating, external pressure, and water intake).

12.3 Sufficient ventilation must be ensured in order to prevent the accumulation of volatile substances in the ambient air.

Annex I.c: Definitions for Hygiene, Health and the Environment

- **Above ground floor**

  Floor, the external peripheries of which lie in total over more than half the adjacent area following completion. Not considered above ground floors are those in which there are no flats, business units, or parts of such (e.g. non-extended roof areas).

- **Above ground floor, operational structure**

  Floor, the external peripheries of which lie in total over more than half the adjacent area following completion.

- **Accommodation facility**

  Buildings or building parts that serve as lodgings for persons and that have more than 10 guest beds.

- **Connecting piece**

  Structural component or structural components for the connection between the exhaust of the heat-producing appliance and the chimney.

- **Drinking water**

  Water for human consumption which is suitable for drinking or use without risk to human health.

- **Exhaust emissions**

  Gaseous combustion product occurring in the heat-producing appliance when burning solid, liquid, and/or gaseous fuels, including the solid or liquid components floating in it and any excess air.

- **Exhaust emission system**

  System for discharging exhaust emissions from heat-producing appliances for solid, liquid, or gaseous fuels to the atmosphere; connectors are not part of the exhaust emission system.

- **Flat**

  All individual rooms or collection of rooms which are structurally self-contained and designed for residential use and enable the running of a household.

- **Floor**

  Section of a building between the upper surfaces of the floors of rooms situated on top of each other or the open section between the upper surface of the floor and the bottom surface of the roof if each of the required room heights is attained. Sections of buildings which are offset to one another up to and including half floor height, are considered to be floors.

- **Floor, operational structure**

  All rooms situated on the same level and those rooms or parts of rooms offset at the height of this level. Balconies, galleries, and stages in a room are not considered an individual floor if their net floor area is less than half of the net floor area of the room in which they are located. The following are not considered separate floors:
  - Rooms above the last floor above the ground, which is used solely for housing building service systems for heating, ventilation, air conditioning, and sanitary purposes,
  - service rooms if the number of constantly open hatchways to floors above or below is greater than the number of closed areas, e.g. press basement,
  - ancillary areas within a room which are functionally connected to this room, e.g. foreman's office,
  - machine rooms for lifts,
  - accessible walkways and landings, e.g. grating in high bay racking for reaching individual storage levels.

- **Heat-producing appliance**

  Heat-generating device in which combustion products are formed that need to be discharged into outdoor air.

- **Light entry area**

  Net glass area of a window not including frame and glazing bars.
- **Non-residential building**

  Buildings not primarily used for residential purposes.
- **Process water**

  Water obtained from rain water, ground water, or local sources and wells, which is used (e.g. for toilet flushing, washing, or watering), satisfies the technological requirements of the respective process and is not designated for human consumption.
- **Residential building**

  Building completely or primarily used for residential purposes.
- **Run-off rain water**

  Rain, including melt water, which flows off roof and ground surfaces or the external surfaces of buildings and is not changed through use.
- **Underground floor**

  Floor, the external peripheries of which lie in total over not more than half the adjacent area following completion.
- **Waste collection area**

  Fully enclosed space used for efficient technical and hygienic collection and interim storage of waste
- **Waste collection point**

  Open or partially closed or covered facility used for optimal technical and hygienic interim storage of waste.
- **Wastewater**

  Water which is modified as a result of use and any water flowing into the drainage system, such as domestic sewage, industrial, and commercial wastewater as well as condensates.

Annex II.a: Cited standards and other technical regulations

Document Nr.	Title	Issue	CBR Guideline:
EN ISO 717-1	Acoustics – Rating of sound insulation in Buildings and of building elements – Part 1: Airborne sound insulation	2013-06	CBR Guideline 5
EN ISO 717-2	Acoustics – Rating of sound insulation in Buildings and of building elements – Part 2: Impact sound insulation	2013-06	CBR Guideline 5
ISO 16283-1	Acoustics – Field measurement of sound insulation in buildings and of buildingelements – Part 1: Airborne sound insulation	2016	CBR Guideline 5
ISO/FDIS 16283-2	Acoustics — Field measurement of sound insulation in buildings and of building elements – Part 2: Impact sound insulation.	2015	CBR Guideline 5
ISO 3382-2+ Cor 1	Acoustics – Measurement of room acoustic parameters – Part 2: Reverberation time in ordinary rooms	2008/2009	CBR Guideline 5
EN 12354-1:	Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 1: Airborne sound insulation between rooms	2000 (NEW draft 2016)	CBR Guideline 5
EN 12354-2:	Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 2: Impact sound insulation between rooms.	2000 (new draft 2016)	CBR Guideline 5
EN 12354-3:	Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound.	2000 (new draft 2016)	CBR Guideline 5
ISO 10052	Acoustics – Field measurements of airborne and impact sound insulation and of equipment noise – Survey methods + Amd 1:2010	2004	CBR Guideline 5
ISO 16032	Acoustics – Measurement of noise from service equipment in buildings – Engineering method.	2004	CBR Guideline 5
ISO 10140-2	Acoustics — Laboratory measurement of sound insulation of building elements — Part 2: Measurement of airborne sound insulation.	2010	CBR Guideline 5
ISO 10848-2	Acoustics — Laboratory measurement of the flanking transmission of airborne and impact sound between adjoining rooms — Part 2: Application to light elements when the junction has a small influence.	2006 (new draft 2017)	CBR Guideline 5

To be completed…

Annex II.b: Draft Guideline "Protection against Noise"

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This Guideline is based on the outcome of meetings and research work done by an expert group used by AEI.AT to draw up a proposal for reforming the Construction development legislation framework for Cyprus. The work of this expert committee was coordinated by AEI.AT in accordance with the intention of the Ministri of Interior of Cyprus.

0 Preliminary remarks

This Guideline shall apply to buildings and building elements which are used for the residence of people and whose intended usages requires noise protection. These covers rooms in flats or dwellings and in buildings for residential purposes, office buildings, rooms in buildings for accomodation and hotel rooms, schools, nurseries, hospitals, etc.

1 Definitions

The definitions contained in the document "CBR Guidelines – Definitions" shall apply.

2 Protection against noise

2.1 Scope

The specified requirements are designed to provide sufficient protection for normally sentient people for resitential rooms (and similar used rooms) as well as ajacent side rooms against noise emissions from other units used by third parties, belonging to the same building or from adjacent buildings or noise from the outside

2.2 Protection of a building/room against ambient noise

2.2.1 **The relevant location-based or (where appropriate) on the position of an element based external noise level has to be determined according to the state of the art of using adjustment values (rating). This has to be done separately during the day (06:00 to 22:00) (L_{DE}) as well as during the night (L_N); the least favourable value shall be used in the following to determine the depending requirements.**

2.2.2 **Unless any more stringent requirements arise from Points 2.2.3 and 2.2.4, then the values for the resulting weighted sound insulation index $R'_{res,w}$ of the external components must not be less than 33 dB in total and the weighted sound reduction index R_w of external components exept windows, doors or glazing elements must not be less than 43 dB in total; this shall apply irrespective of the relevant external noise level and the building use.**

Remark: alternative future used descriptor: weighted standardizes level difference $D_{ls,2m,nT,w}$

2.2.3 **For rooms in residential buildings, residential rooms in dwellings, flats, hotels, schools, nurseries, hospitals, spas, etc., the following values for the resulting weighted building sound insulation index $R'_{res,w}$ of the external components must not be fallen short of in total:**

Table 1:– Minimum sound protection by external building components elements

Minimum sound protection of external building elements									
Building Elements protecting rooms for residential purposes or similar as described	Minimum sound protection levels ($R'_{res,w}$, R'_w, R_w bzw. $R_w + C_{tr}$ in dB) in relation to environmental/ambient exterior noise levels								
	row	1	2	3	4	5	6	7	column e
									1
	Day	≤ 50	51 bis 55	56 bis 60	61 bis 65	66 bis 70	71 bis 75	76 bis 80	2
	Night	≤ 40	41 bis 45	46 bis 50	51 bis 55	56 bis 60	61 bis 65	66 bis 70	3
May be adequate to zone		A, B	C	D	E	–	–		4
For rooms in buildings for residential purposes, hotels, schools, nurseries, hospitals, spa buildings etc.									5
– Exterior components, Facade (overall)	$R'_{res,w}$	33	38	38	43	43	48	53	6
Opaque exterior lements[1])	R_w	43	43	43	48	48	53	58	7
Windows, external oors, etc. [1])[2])	*Rw* *Rw + Ctr*	28 23	33 28	33 28	38 33	38 33	43 38	48 43	8
– Building separating walls [3]) each leaf	R'_w	52	52	52	52	52	52	52	9
– ceilings and walls separating a room to an attic / a loft	R'_w	42	42	42	47	47	47	47	10
– Ceilings and Walls separating a room to a passage or garage	R'_w	60	60	60	60	60	60	60	11
For rooms in office buildings and similar used									12
– Exterior components, facade (overall)	$R'_{res,w}$	33	33	33	33	38	43	48	13
Opaque exterior elements [1])	R_w	43	43	43	43	43	48	53	14
Windows and external doors, etc. [1])[2])	R_w $R_w + C_{tr}$	28 23	28 23	28 23	28 23	33 28	38 33	43 38	15
– Building separating walls 3) (each leaf)	R'_w	52	52	52	52	52	52	52	16
– Ceilings and walls separating a room to an attic / a loft	R'_w	42	42	42	42	42	42	42	17
– Ceilings and walls separating a room to a passage or garage	R'_w	60	60	60	60	60	60	60	18

[1]) If the percentage of Area of windows and doors exeeds 30% of the external components of a room the required sound insulation Index of the elements have to be determined according ther percntage of area to fulfill the requirement oft he resulting sound reduchtion index oft he overall external component

[2]) Windows, French windows and external doors and comparable parts of the façade, “opaque elements”.

[3]) Walls, which will be built as a leaf of a separating wall (as a cavity wall) to an (curror ent future) adjoining building, regardless of the sound reduction index of an existing wall.

2.2.4 **The sound protection of ventilation ducts to the exterior, such as window fans, individual room air handling units, and supply air and exhaust air openings must be chosen to ensure that the required resulting weighted sound reduction index $R'_{res,w}$ of the external components is fullfilled in closed position and is not fallen short of by more than 5 dB when in minimum necessary operating position.**

2.3 Protection against airborne noise within buildings

2.3.1 **Walls, ceilings, and other partitioning elements between rooms have to be designed to provide reasonable protection against noise transmission by providing the following values of the weighted standard sound level difference $D_{nT,w}$**

Remark: $D_{nT,100}$ or $D_{nT,50}$ or R'_w are alternative possible descriptors

Minimum weighted standardized sound level difference $D_{nT,w}$ within buildings			
to		from	$D_{nT,w}$ [dB] without / with connecting Door, window or other opening
1	Residential rooms and equivalent	separated residential rooms of other utilisation units*	55 / 50
		separated common open rooms (z.B. Staircases, corridors, cellar rooms, rooms for common use)	55 / 50
		other separated rooms (bathrooms, restrooms etc.)	55 / 50
2	Hotelrooms, Classrooms, patient’s rooms in hospitals, nursery group rooms, residential rooms in institutions	Rooms of the same category	55 / 50
		separated commmon open rooms (z.B. staircases, corridors, cellar rooms, rooms for common use)	55 / 38
		separated siderooms	50 / 35
3	siderooms	separated residential rooms	50 / 35
		common open rooms (z.B. Staircases, corridors, cellar rooms, rooms for common use)	50 / 35
		separated siderooms	50/ 35
*) definition of other utilisation units: in schools the individual class rooms, in nurseries individual group rooms, in hospitals individual patient's room; in office buildings just sepatated office rooms used by third parties.			
Within buildings with a mixed utilisation used by third parties the requirements are accordimg to these circumstances equivalent to the above mentioned.			

2.3.2 **Protection against airborne noise Doors within buildings**

Unless a higher weighted sound insulation index is required in order to fulfil the requirements for the required weighted standard sound level difference $D_{nT,w}$ in accordance with Point 2.3.1, the weighted sound insulation index R_w of doors (door leaf including frame) must notbe less than the following values:

Minimum weighted sound reduction index of doors (leaf including frame) R_w			
from		to	R_w [dB]
1	common used rooms (z.B. staircases, corridors)	Residential rooms of flats, dwellings without noise protecting anteroom or lobby	42
		Residential rooms of flats, dwellings with a noise protecting anteroom or lobby	33
2	Residential room	Separated residential rooms with usage by third parties	42
		Separated Siderooms with usage by third parties	33
3	Hotelrooms, Classrooms, patient's rooms in hospitals, nursery group rooms, residential rooms in institutions	Rooms of the same category	42
		Common open rooms (z.B. staircases, corridors)	33
4	Classrooms, group rooms in nurseries	Rooms of the same category	42
		Common open rooms (z.B. staircases, corridors)	28
*) definition of other utilisation units: in schools the individual class rooms, in nurseries individual group rooms, in hospitals individual patient's room; in office buildings just sepatated office rooms used by third parties.			
Within buildings with a mixed utilisation used by third parties the requirements are accordimg to these circumstances equivalent to the above mentioned.			

2.4 Protection against impact noise within buildings

2.4.1 **The weighted standard impact sound level $L'_{nT,w}$ within buildings must not exceed the required values:**

Remark: $L'_{nT,100}$ or $L'_{nT,50}$ or L'_n are alternative possible descriptors

Maximum weighted impact sound level $L'_{nT,w}$			
within		from	$L'_{nT,w}$ [dB]
1	residential rooms and comparable	third party used rooms (dwellings, flats, schools, nurseries, hospitals, hotels, rooms of institutions, office rooms und comparable used rooms)	48
		common open terraces, rooftop gardens, balconies, loggias and attics/lofts	48
		common open rooms (z.B. staircases, access balconies)	50
		usable tarraces, rooftop gardens, balconies, loggias and attics/lofts	53
2	bathrooms, siderooms	Rooms used by third parties (dwellings, flats, schools, nurseries, hospitals, rooms of institutions, office rooms and comparable used rooms)	53
		Common open terraces, rooftop gardens, balconies, loggias and attics/lofts	53
		Common open rooms (z.B. staircases, access balconies)	55
		usable tarraces, rooftop gardens, balconies, loggias and attics/lofts	58

*) definition of other utilisation units: in schools the individual class rooms, in nurseries individual group rooms, in hospitals individual patient's room; in office buildings just sepatated office rooms used by third parties.
Within buildings with a mixed utilisation used by third parties the requirements are accordimg to these circumstances equivalent to the above mentioned.

The requirements have to be fulfilled without taking into account easily removable floor coverings (carpets, floor mats…). Screeds, glued parquet, tiled floors, which are permanently installed, may be taken into account. For hotels and similar accomodation facilities and for balconies, which are not open for common usage, the requirements may be met by consideration of permanent installed sound absorbing coverings (fitted carpets, affixed carpets, plastic floorings, linoleum etc.)

2.5 Noise requirements for building equipment and appliances

2.5.1 **The maximum system noise level $L_{AFmax,nT}$ arising from the operation of building equipment from third party units must not exceed the value of 25 dB for constant and intermittent noises, and must not exceed the value of 30 dB for short-time noises. To siderooms 5 dB may be added to the mentioned values.**

Remark: L_{eq} is an alternative or aditional possible descriptor

2.5.2 **If there is a mechanical ventilation system or aircondition equipment in use, then the noise from these equipment, based on the minimum required operation mode, must not exceed an equivalent appliance noise level $L_{Aeq,nT}$ of 25 dB for rooms which need noise protection for sleeping purposes (e.g. residential rooms in dwellings or flats except the kitchen), and must not exceed 30 dB for rooms which need noise protection for concentration purposes (e.g. classrooms).**

2.6 Noise requirements between terraced houses and adjoining buildings

2.6.1 **Walls between rooms in terraced houses and adjacent terraced house units as well as between adjoining buildings must be designed that the weighted standardized sound level difference $D_{nT,w}$ is not less than 60 dB.**

Remark: $D_{nT,100}$ or $D_{nT,50}$ or R'_w are alternative possible descriptors

2.6.2 **The weighted standard impact noise level $L'_{nT,w}$ of adjacent buildings or adjacent terraced house units to rooms in terraced houses as well as between adjoining buildings must not exceed a value of 43 dB.**

Remark: $L'_{nT,100}$ or $L'_{nT,50}$ or $L'_{n,w}$ are alternative possible descriptors

2.6.3 **For building equipment and appliances the requirements given in point 2.5 shall apply.**

2.7 Additional noise requirements for buildings used other than for residential, office, or school purposes

The following requirements shall apply in addition to Points 2.3 to 2.6 to buildings with rooms, where the noise emission exceeds that of rooms used for residential or office-like functions:

2.7.1 **The acoustic characteristics required for dimensioning purposes must be determined**

according to the role of technology.

Remark: Requirements for airborne noise protection between service rooms and residential rooms or similar third arty used rooms, are to be estimated according formular (1) and (2), whereas the strcter requirement has to be fulfilled.

(1) $D_{nT,w} + C_{tr} = L_{A,eq} - L_{PB} + 5\ dB \geq 55\ dB$

(2) $D_{nT,w} + C_{tr} = L_{A,sp} - L_{PB} - 5\ dB \geq 55\ dB$

Descriptors stand for:

$D_{nT,w}$	standardized weighted level difference in dB
C_{tr}	Spektrum-adaptive term for traffic
$L_{A,eq}$	relevent inside noise level in dB
$L_{A,sp}$	charakterizing peak level within the service room in dB
L_{PB}	planning basis level according to 0 in dB

Tabelle 1– planning basis level L_{PB} in the residential or similar used third party room depending on the relevant ambient noise level

Planning basis level L_{PB} in the residential or similar used third party room depending on the relevant ambient noise level [1])									
Relevant ambient noise level			A	B	C	D	E	F	G, H, I
day (6:00 – 22:00)	Relevant ambient noise level	dB	≤ 40	41 bis 45	46 bis 50	51 bis 55	56 bis 60	61 bis 65	> 65
	Planning basis level L_{PB}	dB	15	20	25	30	30	30	30
night (22:00 – 6:00)	Relevant ambient noise level	dB	≤ 30	31 bis 35	36 bis 40	41 bis 45	46 bis 50	51 bis 55	> 55
	Planning basis level L_{PB}	dB	10	15	15	20	20	20	20
[1]) An estimation by planning zone alloation is not permitted!									

For other utilisations than residential purposes the following value for the planning basis level has to be used:

- Lecture hall, auditorium 30 dB
- Larger offices, open-plan offices, shops, meeting facilities 35 dB
- Großraumbüros 40 dB

2.7.2 **The planning base level L_{PB} of a residential room, which is used by a third party must not be exceeded by the rating level L_r. Overall, characterizing peak levels $L_{A,Sp}$ may not exceed the applicable planning base level L_{PB} by more than 10 dB.**

2.7.3 **The weighted standard impact noise level $L'_{nT,w}$ in residential rooms, which are used ba a third party, must not exceed the following values:**

(a) 38 dB for use-related noise generation only between 6:00 and 22:00,
(b) 33 dB for use-related noise generation also between 22:00 and 6:00, and
(c) 60 dB in residential rooms of third parties within shops, outlets and rooms of similar use.

2.8 Rooms with specific uses

Different requirements may be necessary or indeed be sufficient in individual cases for rooms with specific uses. In specific cases also organisational measures may be put in place to provide protection against noise (e.g. for retirement and nursing homes, hospitals, etc.).

3 Room acoustics

3.1 Scope

Requirements for room acoustics shall apply if a number of minimum measures are required with respect to acoustic quality or noise reduction in rooms. This does not include rooms with special requirements for their acoustic performance (e.g. opera houses, concert halls, sound recording studios).

3.2 Requirements for acoustic quality

3.2.1 **For rooms which are used for speaking in (auditoriums, lecture rooms) for volumes V between 30 m³ and 10 000 m³, the requirement for the reverberation time T = (0.37 × lg V) - totals 0.14 in seconds for the octave bands from 250 Hz to 2 000 Hz.**

3.2.2 **For rooms which are used for communication purposes (classrooms, media rooms, meeting rooms, rooms for audio-visual presentations) for volumes V between 30 m³ and 1 000 m³, the requirement for the reverberation time T = (0.32 × lg V) - totals 0.17 in seconds for the octave bands from 250 Hz to 2 000 Hz.**

3.2.3 **Deviations of ± 20 % from the various requirements in accordance with Points 3.2.1 and 3.2.2 are permitted within the individual octave bands.**

3.2.4 **The reverberation time has to be calculated according to the generally recognized rule of technology.**

3.3 Requirements for noise reduction

3.3.1 **The following minimum requirement for noise reduction must be observed for rooms in which requirements for noise reduction have been created in order to protect users (e.g. working stations, work rooms, and corridors in schools, nursery rooms, recreation rooms, dining rooms):**

(d) The average sound absorption level of the external peripheries (empty room, planning value) must, in octave bands 250 Hz to 4000 Hz, be at least $\alpha_{m,B}$ = 0.20, for the octave band centre frequencies of 500, 1000, and 2000 Hz $\alpha_{m,B}$ = 0.25 if possible.

The average sound absorption level $\alpha_{m,B}$ must be determined according to the state of the art.

3.3.2 **It is recommended that the reveberation time in staircases and corridors or joint access areas should not exeed 1.3 s.**

3.3.3 **A deviation from the requirements in accordance with Point 3.3.1 shall be permitted if the installation of absorbent surfaces cannot be sufficiently done for clear operational, technical or structural reasons (e.g. impact on climate, hygiene).**

4 Shock protection

4.1 Scope

In buildings, building parts, and other structures, measures must be put in place to prevent the transmission of vibrations from technical equipment and other vibration exciters in such a way, that there is no unacceptable level of interference for persons in residential rooms in the same building or in residential rooms of ajacent buildings as a result of such vibrations. This Guideline does not include the specification of requirements for protection against vibrations which come from other buildings that may affect the building or building elements.

4.2 Requirements

The generally recognized rules of technology. have to be used with respect to the reasonableness of vibrations and the achievement of sufficient vibration protection.

REMARKS concerning Sound Protection Values:

- The aim of the requirements is to provide satisfiying conditions for residential and similar used rooms (offices…) for normal sensitive people.
- The aim value is the planning basis level in a room.
- The "noise load" for the environmental or ambient noise can be derived by different ways:
- *A very convenient method would be a possibility to derive "planning values" as zonal noise immission, which can be derived in areas, where the intended use is of a similar noise emission and is not covered or extended by additional sound sources.*
- *The basis sound level here is an A-weighted, equivalent continuous sound pressure level LA,eq*
- *Example:*

- *Planning values for zone related noise immission*			
- *Zone*	- *Description of zone*	- *A-weighted equivalent continuous sound pressure level LA,eq in dB*	
-	-	- *Day*	- *Night*
- *A*	- *Quiet zone, special noise protected area*	- *45*	- *35*
- *B*	- *Suburb residential area, rural residential area*	- *50*	- *40*
- *C*	- *Urban residential area, agricultural and forestry enterprises with residential housings*	- *55*	- *45*
- *D*	- *Urban core areas (offices, shops, trade and commerce without noise emission) mixed with residential buildings, zone for business without noise emission*	- *60*	- *50*
- *E*	- *Zone for low noise emission (logistics, production, services, management…)*	- *65*	- *55*

-
- *Determination of the environmental noise level for a building on the basis of sound immission maps*
- *Such maps can be calculated on the basis of specific rules for sound propagation and noise sources.*
- *Estimation of the environmental noise level for a building by calculation of the environmental noise level at the façade or surface of a building*
- *This also can be done on the basis of specific rules for the sound propagation and noise sources.*
- *Estimation of the environmental noise level for a building by usage of strategic noise maps*

- *Here it is necessary, which noise source (Road, Railway, Airplane, Industry) is dominant, otherwise all sources have to be taken into estimation.*
- *Estimation by measurement*
  Not suitable for airplane noise. Here it is necessary to take all the possible influences into account, so often a long-term measurement is necessary to get reliable values.
- *Estimation of the environmental noise at a specific construction part (window, wall, roof etc.) by measurement or calculation.*
- *It is recommended also to provide the possibility to calculate the environmental noise in front of a special part of the building. This often allows to reduce the requirements for that special part, e.g. when a window ist situated at d direction away from the noisy side of a building.*
- *In some cases, specific noise sources may get a "bonus" (e.g. railway noise is less disturbing (e.g.- 5 dB) than a noise with a constant narrow-band frequency noise (e.g. + 5 dB).*
- These estimations can be used as a basis for the determination of the required noise protection, which will be stated in the proposed guideline for noise protection.
- For the interior noise emitted from rooms of a third party the level is depending on the behavior/culture of the third party and the usage of the rooms. It can be derived from measurements or estimation or experience.
- From that the required airborne and impact sound protection for the building surface and also the partition walls and ceilings between such rooms and other rooms used by third parties can be derived.
- In addition within rooms ui´tilization dependend acoustical conditions for health and good usability should be derived.
- Further vibritions should be kept in a acceptable level.

Finally, for the different requirements "robust details" for common used construction systems can be derived, e.g. as is done in the requirements of England; the details and materials are proved to archive the required noise protection when fulfilled properly.

Diagram 2.7 **Wall type 1 – tied junction – external cavity wall with internal masonry wall**

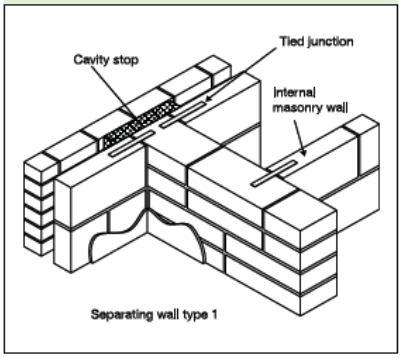


Diagram 3.8 **Floor type 1.2B – wall type 1**

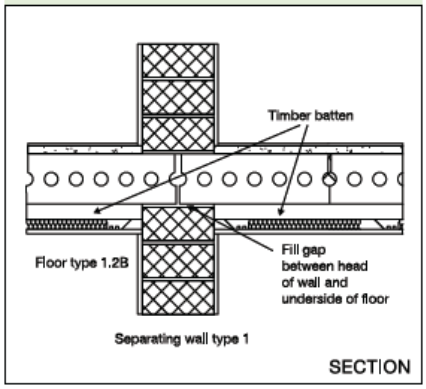


Diagram 3.1 **Types of separating floo**

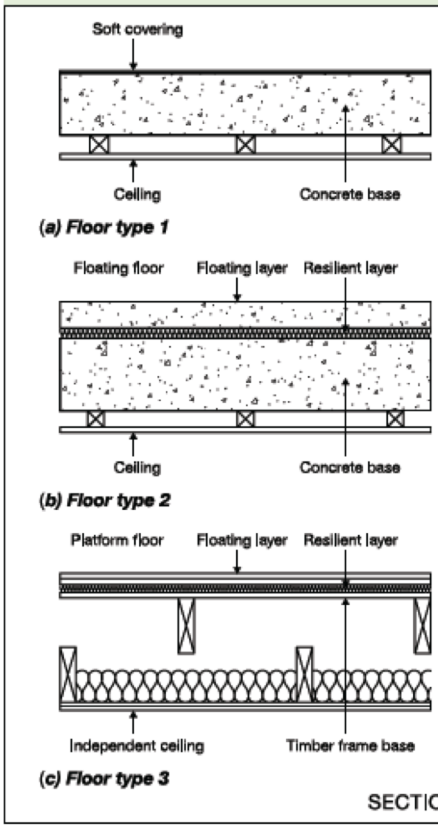


Diagram 2.31 **Wall type 3 – external cavity wall with masonry inner leaf**

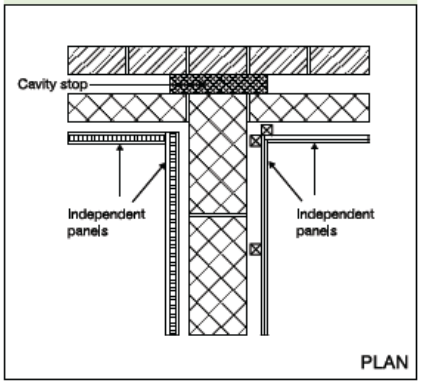
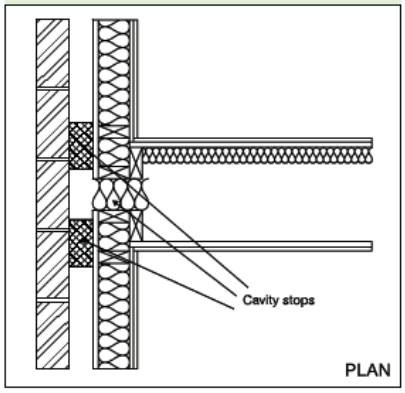


Diagram 2.38 **Wall type 4 – external cavity wall with timber frame inner leaf**



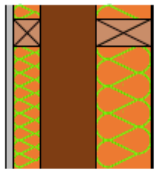
It is recommended as a basis to use “building element” formulars, where the used materials and their properties are declared and the results of the elements are proofed.

TYP: 2	Building Element EW 01 exterior Wall	Responsible Architect/Planner	GZ.:	Formblatt WBF 6 a Blatt: 1

BAUPHYSIKALISCHER NACHWEIS

Steiermärkische Energieeinsparungs- und Wärmeschutzverordnung, LGBl.Nr. 61/2008

AUFBAU: Detail	Nr.	Position Nr.	Building Material / Material	thickness m	Sp.weight kg/m³	$\lambda_R(\alpha)$ W/mK	d/λ_R $(1/\alpha)$ m²K/W
			Innerer Wärmeübergangskoeffizient α_i			7,692	0,130
	1	9	Rigips Feuerschutzplatte RF15	0,0150	800	0,250	0,060
	2	5	Holz Lattung dazw.		500	0,130	0,138
	3	7	Baumit Fassadendämmplatte Mineral 040	0,0600	155	0,040	1,350
	4	6	Brettschichtholz BBS125	0,1200	470	0,130	0,923
	5	5	Holz Lattung dazw.		500	0,130	0,138
	6	4	Baumit Fassadendämmplatte Mineral 040	0,1200	155	0,040	2,700
	7	3	Guttafol DO 135 S	0,0005	250	0,047	0,011
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
			Äußerer Wärmeübergangskoeffizient α_a			7,692	0,130
			FLÄCHENBEZOGENE MASSE m' (kg/m²)		102,64		
im Plan: Außenwand hinterlüftet			SUMME	0,316	$1/k = 1/\alpha_a + \sum d/\lambda + 1/\alpha_i$		5,037



M 1 : 10

WÄRMESCHUTZNACHWEIS gemäß EnEV- u. WSVO			Planwert	erforderlich
Wärmedurchlasswiderstand	D(R)	m²K/W	5,037	0,000
Wärmedurchgangskoeffizient	k(U)	W/m²K	0,199	0,350

SCHALLSCHUTZNACHWEIS gemäß DVO zum Steierm.WBFG 1993			Planwert	erforderlich
Bewert. Schalldämm-Maß	R_w	dB		
Bewert. Normschallpegeldiff.	$D_{n,T,W}$	dB		
Bewert. Normtrittschallpegel	$L_{n,T,W}$	dB		

Sound Protection:

Position Nr.

Bearbeiter Manuel Troger

Seite 1

For specific constructions, it is possible to have a proving by calculations or by robust details, in other cases measurements have to be done. In some cases also catalog values could be used when available.

Annex II.c: Definitions for “Protection against Noise”

single-number quantity for airborne sound insulation rating

value, in decibels, of the reference curve at 500 Hz after shifting it in accordance with the method specified in part 1 of ISO 717.

spectrum adaptation term

value, in decibels, of the reference curve at 500 Hz after shifting it in accordance with the method specified in part 1 of ISO 717.

airborne sound insulation between rooms

This is the characteristic of a building construction to protect against airborne sound transmission in a building. The rvalue is given as a single-number quantity expressed in decibels (dB).

impact sound pressure level

This characterises the extent to which a building construction transfers impact sound within the building to a specified room. The value is given as a single-number quantity s expressed in decibels (dB).

airborne sound insulation of facades and external elements

This characterises the facade’s and/or external element’s ability to insulate against airborne sound transmission into a building to a specified room. The value is given as a single-number quantity expressed in decibels (dB).

sound pressure level from service equipment

Received sound pressure level in a room due to the operation of a specific piece of service equipment or plant in a building. The measurement result is given as a single-number quantity A-weighted time-averaged sound pressure level and/or the A-weighted maximum sound pressure level using timeweighting Fast (F), expressed in decibels (dB).

service equipment

a building's permanent outdoor and indoor technical installations, such as ventilation systems, lifts, heatingsystems, cooling systems, emergency power supplies, sanitary installations, central vacuum cleaner, heat pumps, motorised equipment like roller shutters and garage doors, internal rainwater pipes, and other similar installations necessary for operation of the building

reverberation time

This time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped. The quantity is denoted by **T**, and is expressed in seconds (s).

Energy-equivalent system noise level ($L_{A,eq,nT}$)

A-weighted average equivalent sound pressure level based on standardized reverberation time.

Maximum system noise level ($L_{AF,max, nT}$)

maximum A-weighted average equivalent sound pressure level, detected in position "fast" as maximum noise level during a measurement period or a noise event.

Rating Level (L_f)

the A-weighted average equivalent sound pressure level of a noise during a specified time period, adjusted e.g. for tonal character and impulsiveness.

Adjustment level to the rating level (L_z)

Adjustment level e.g. for tonal character and impulsiveness

Recreation room, room for residential and similar purposes

Room intended for use by people for longer periods of time (e.g. living room and bedroom, kitchen-diner, office, classroom), but not including bathrooms and toilets.

Ambient noise level related to the position of a specific element

Ambient noise level applying adjustment values (rating level) resulting from the location-based ambient noise level with respect to the position of the structural component on the building shell.

Significant ambient noise level

Basis for determining the requirements for sound insulation of structural components applying adjustment values (rating level).

Significant, location-related ambient noise level

Ambient noise level applying adjustment values (rating level) resulting from location-related environmental noise situation at 4 m above the ground.

Weighted sound reduction index (R_w)

Singular statement for the sound insulation of a test element (wall, window, door...etc) determined in accordance with EN ISO 717-1 from the values of R (in the one third octave bands from 100 Hz to 3150 Hz).

Weighted apparent sound reduction index (R'_w)

Singular statement for the sound insulation of a test element (wall, window, door...etc) including the influence of the radiated sound power by flanking elements or other components, determined in accordance with EN ISO 717-1 from the values of R' (in the one third octave bands from 100 Hz to 3150 Hz).

Resulting weighted apparent sound reduction index ($R'_{res,w}$)

Singular statement for the sound insulation of a test element consiting of several elements (e.g. an exterior wall with windows and outer doors) including the influence of the radiated sound power by

flanking elements or other components, determined in accordance with EN ISO 717-1 from the values of R' (in the one third octave bands from 100 Hz to 3150 Hz).

Standardized level difference $D_{2m,nT}$

The Difference between outdoor sound pressure level at 2 m in front of the facade and the sound pressure level in the receiving room, correspondending to a reference value of revebaration time T_0. For dwellings and similar used rooms T_0 is 0.5 s.
If there are spectrum adaptive terms are added, the following formulars are to be applied:
$D_{nT,50} = D_{nT,w} + C_{50\text{-}3150}$

$D_{nT,100} = D_{nT,w} + C$

Weighted standardizes level difference for facades:

According to EN ISO 16283-3 the following descriptor for facades or exterior building envelope is defined:

$D_{2m,nT,w}$

(REMARK: alternative descriptor: $R'_{res,w}$)

If there are spectrum adaptive terms are added, the following formulars are to be applied:
$D_{2m,nT50} = D_{2m,nT,w} + C_{tr50\text{-}3150}$
$D_{2m,nT100} = D_{2m,nT,w} + C_{tr100\text{-}3150}$

Reverberation time (T)

Time it takes for the sound pressure level to fall by 60 dB after the noise source has been turned off.

Basic planning level (L_{PB})

Sound pressure level in a room which can be assumed to be exeeded 95% of the messuring time, used as a planning basis for calculations.

Average sound absorption coefficient ($\alpha_{m,B}$)

Sound absorption coefficient produced on average over all room demarcation areas.

$$\alpha_{m,B} = \frac{\sum_{i}^{n} \alpha_i \cdot S_i}{\sum_{i}^{n} S_i}$$

S_i 'i' partial area of room demarcation areas in m²
α_i sound absorption coefficient of ''' partial areas of room demarcation areas
n number of room demarcation areas

Weighted standard sound level differential ($D_{nT,w}$)

Single-digit indication for the standard sound level differential determined in accordance with ÖNORM EN ISO 717-1 from the values of D_{nT} (in third octave bands 100 Hz to 3150 Hz).

Spectrum adjustment value (C_{tr})

Value added to the single-digit indication R_w or R'_w or $D_{nT,w}$ in order to take into account the noise level spectrum “road traffic noise”.

Characterizing peak level in business premises ($L_{A,Sp}$)

value measured using the time weighting ‘F’ (fast) and A rating or calculated maximum value of a characterizing peak level.

Weighted standard impact sound pressure level ($L'_{nT,w}$)

Singular statement for the impact sound pressure level determined in accordance with EN ISO 717-2 from the values of L'_{nT} (in third octave bands 100 Hz to 3150 Hz or in octave bands 125 Hz to 2000 Hz).

Supporting structure

Part of a structure consisting of a planned arrangement of interconnecting supporting structural components.

Separating ceiling or slab

Ceiling between flats or ceiling between business units as well as to other building parts.

Separating wall, partition wall

Wall between flats or wall between business units as well as to other building parts (e.g. staircases)

Residential building

Building completely or primarily used for residential purposes.

Flat

All individual rooms or collection of rooms which are structurally self-contained and designed for residential use and enable the running of a household.

Opaque elements

Elements of the exterior components of a room, exept Windows, French windows and external doors and comparable parts of a façade.

Annex III a: Background Document for the development of a Guideline on Energy Economy and Heat Retention

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1 Introduction

1.1 Objectives and scope

Objectives of this background document:

1. to compile functional and technical energy-related requirements in accordance with the 6th basic requirement for construction works of the European Construction Product Regulation (CPR);
2. to increase the transparency of energy-related legislation addressing the building sector and to allow for easier access for stakeholders of the building sector;
3. to facilitate the discussion on further developing the legislation of an ad hoc committee between MECIT, Ministry of Interior, and building permit authorities or within the statuary committee for the implementation of the EPBD in Cyprus which the above mentioned parties are already members;
    - to provide a logical structure of energy-related requirements addressing the building sector, based on the requirements of relevant European Directives and good practices in other countries;
    - to file fragmented energy-related provisions of existing Cypriote legislation according to this structure, thus ensuring easy access for information and discussion;
    - to document room for improvement based on stakeholder comments and good practices in other countries.

CPR 6th basic requirement for construction works:

> "Energy economy and heat retention
>
> The construction works and their heating, cooling, lighting and ventilation installations must be designed and built in such a way that the amount of energy they require in use shall be low, when account is taken of the occupants and of the climatic conditions of the location. Construction works must also be energy-efficient, using as little energy as possible during their construction and dismantling."

Chapters are structured as follows:

- Overview: provides a brief description how the matter is regulated in Cyprus
- Cypriote legislation: provides a compilation of legislation relevant for the matter
- Comments: provides good examples from other countries, weaknesses detected during stakeholder discussions and documentation of room for improvement.

The structure and the content of this document was compiled based on stakeholder discussions and stakeholder feedback (especially the chapters on Technical building installations, Enforcement and control, and Historic buildings), translated legislation received from the Ministry of Interior, good practice examples collected in European projects, and information about EPBD implementation in Cyprus published by the Concerted Action EPBD.

The Guideline does not contain any suggestions for new legislation. Nevertheless, the documented room for improvement can provide useful input for future revisions and amendments.

This Guideline covers EPBD 2010/31/EU (Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast)) and provides references to other relevant energy-related Directives.

Directly copied text from the translation received from the Ministry of Interior is written in italics.

1.2 General definitions and abbreviations

1.2.1 General definitions

General definitions are available in the following legislation:

- Law amending the Regulation of Energy Performance of Buildings Law Number 210 (I) 2012 (L.210(1)_2012)
- Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)
- Energy Performance Regulations – The Regulation of Streets and Buildings Law R.A.A 429/2006 (Energy PerfReg_2014)

1.2.2 Abbreviations

CPR Construction Product Regulation (Regulation EU 305/2011)

EE Energy efficiency

EED Energy Efficiency Directive (Directive 2012/27/EU)

EPBD Energy Performance of Buildings Directive (Directive 2010/31/EU)

EPC Energy Performance Certificate

NZEB Nearly Zero Energy Building

PV Photovoltaic

RE Renewable energy

RES Renewable energy sources

2 Procedural aspects

2.1 Permit procedure

2.1.1 Overview

Energy-related building requirements and their actual implementation are part of the building legislation.

The competent Authority (Minister of Interior, delegating specific tasks to subsidiary bodies) sets the Terms and Conditions for the building permit, among others also the Terms and Conditions for energy efficiency.

Subchapters in the Chapter on Functional and Technical Requirements shall be seen under the permit procedures of the building legislation.

Through setting the Terms and Conditions, the obligation to present the Energy Performance Certificate (EPC) and meeting the energy efficiency minimum requirements have been made part of the building permit procedure. The EPC proves that the building meets energy-related requirements according to EPBD.

2.1.2 Cypriote legislation

Type of legislation	Short description
The Regulation of Energy Performance of Buildings Law; Decree under section 15 (1) R.A.A. 119/2016	It is regulated that minimum energy performance requirements apply in any case and are subject to control by the Independent Control System according to Article 18 EPBD: *6. The provisions of this Decree shall apply also to buildings that are exempted from the obligation to obtain a planning and / or building permit.*
Draft on the Consolidation of the Streets and Buildings Regulation Law (StrBLaw_Apr15_EN)	This law deals with procedural aspects of permissions and exemptions as well as qualification requirements for experts involved in the procedures. Energy-related building aspects are not dealt with separately but as part of the general procedures. It includes definitions of “energy efficiency of a building”, “building”, “existing building”.
Draft on the Consolidation of the Streets and Buildings Regulation Law (StrBLaw_Apr15_EN)	It regulates the supporting documents which can be requested by the authority to check energy efficiency: *8.-(1) Prior to granting the permit in virtue of article 3, the competent authority may request the submission of such designs, sketches and calculations or it may request the provision of such a description of the intended project, as for it to be convinced of the necessity and it may require the alteration of such designs, sketches and calculations submitted in this manner, particularly- …* *(g) in order to ensure the energy efficiency of the building.*
Draft on the Consolidation of the Streets and Buildings Regulations (StrBReg_Apr2015_EN)	This regulation contains more detailed provisions regarding procedural aspects, requirements, and definitions of building types. It includes provisions about shading elements which are important from the energy efficiency perspective: *14.-(1) Sunblinds, including any support, frame or other construction attached thereto and forming part thereof shall be placed at such height and shall open to such maximum projection as the competent authority may approve.*

	Other provisions could affect energy efficiency and renewable energy use in buildings but there is no direct mentioning of energy-related building aspects. The following elements of the regulation contain provisions which are also relevant for energy-related aspects: PART III. – Building Permits: Procedures are also relevant for checking compliance with energy related minimum requirements PART IV. – Heights and Space around Buildings: Parameters influence RES exploitation PART V. Ventilation of Buildings: Mechanical ventilation should be energy efficient, this refers to minimum requirements for technical building systems PART VIII and following address building components and define requirements, however not regarding energy efficiency: Ensure consistent approach with energy performance requirements defined by other legislation; avoid contradictions PART XII. – Public Buildings: Specific requirements, but not regarding energy criteria. However, public buildings should have an exemplary role with regard to energy efficiency and renewable energy use in buildings PART XIID – Project Supervision and PART XIIE – Project Execution – Sites: Ensure quality of the works and compliance of as-built situation also with regard to energy-related requirements

2.1.3 Comments

Legislation contains procedural aspects to be harmonized with the revision of the general procedures regarding planning permit and construction permit.

Lessons learned from European countries emphasize the importance of consistent and clear procedures regarding energy-related requirements, checking compliance, and sanctioning in case of non-compliance, in order to achieve actual energy efficiency under as-built conditions.

Regarding Technical systems, quality of the works is especially important to avoid sources of failures in building operation and to achieve actual building energy efficiency. Supervision procedures / commissioning procedures should be defined.

In European countries, energy performance requirements mainly refer to final and primary energy consumption indicators, and the achieved performance must be shown in the Energy Performance Certificate (EPC). Although the EPBD does not specify the point in time when the EPC must be available, several countries introduced the procedure that EPCs submitted as a condition to receive the building permit must be updated to the as-built situation and only then will they be valid for 10 years.

Status quo analysis in Europe and good practice examples:

Compliance and control: overview and outcomes - Wina Roelens, Xavier Loncour, Marcello Antinucci - Core theme report of the third Concerted Action EPBD, August 2015 www.epbd-ca.eu/caoutcomes/2011-2015

Belgium/Flemish region control and penalty scheme of the energy performance legislation: checking procedure and fines – Clarisse Mees - QUALICHeCK Fact Sheet #48, February 2017

http://qualicheck-platform.eu/2017/02/fact-sheet-48-belgiumflemish-region-control-and-penalty-scheme-of-the-energy-performance-legislation-checking-procedure-and-fines/

Regulatory compliance checks of residential ventilation systems in France - François Rémi Carrié, Sandrine Charrier, Adeline Bailly - QUALICHeCK Fact Sheet #06, November 2015 http://qualicheck-platform.eu/2016/03/fact-sheet-06-regulatory-compliance-checks-of-residential-ventilation-systems-in-france/

Building airtightness in France: regulatory context, control procedures, results – Sandrine Charrier, Adeline Bailly, François Rémi Carrié - QUALICHeCK Fact Sheet #07, December 2015 http://qualicheck-platform.eu/2016/03/fact-sheet-07-building-airtightness-in-france-regulatory-context-control-procedures-results/

Ductwork airtightness in France: regulatory context, control procedures, results – Sandrine Charrier, Adeline Bailly Mélois, François Rémi Carrié - QUALICHeCK Factsheet #54, February 2017 http://qualicheck-platform.eu/2017/02/fact-sheet-54-ductwork-airtightness-in-france-regulatory-context-contol-procedures-results/

Belgian/Flemish evaluation scheme for ventilation systems - Samuel Caillou, Paul Van den Bossche - QUALICHeCK Factsheet #55, February 2017 http://qualicheck-platform.eu/2017/02/fact-sheet-55-belgianflemisch-evaluation-scheme-for-ventilation-systems/

Durier, F., Geissler, S., Wouters, P.: Source Book for improved compliance of Energy Performance Certificates (EPCs) of buildings, February 2017 http://qualicheck-platform.eu/2017/02/source-book-for-improved-compliance-of-epcs-of-buildings-final/

2.2 Control and enforcement of requirements – EPC compliance

2.2.1 Overview

The MECIT Energy Service receives the EPC with the building permit (consultation procedure) and can react on non-compliance. In case of non-compliance, the EPC is cancelled and a new EPC has to be presented. During construction, in case of non-compliance, the inspector notifies on-site: first warning, then court procedure in case of non-compliance.

The competent authority is the building authority.

2.2.2 Cypriote legislation

Type of legislation	Short description
(6)-R.A.A. 164_2009 The Regulation of the Energy Performance of Buildings (Energy Certification of Buildings) Regulations of 2009 K.D.P 164/2009	The provision is as follows: *18.- (1) In all cases, the information contained in the energy performance of building certificate and the recommendations which are registered in the energy performance of buildings certificates' register shall be considered correct until proven otherwise.*
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

2.2.3 Comments

According to stakeholders' view, there is a lack of transparency and clarity regarding the rules, and therefore it is difficult to ensure EPC compliance. The EPC is submitted electronically including input data, but input data are not checked. A mechanism is needed to check input data and release pressure from inspectors because the random samples can be selected more systematically (see also Chapter on Independent EPC Control System).

Checking compliance with minimum energy performance requirements in case of retrofitting existing building is difficult as in some cases building permits are not required.

Ideally, databases for administrating technical systems, competent inspectors, registered EPC experts and Energy Performance Certificates should be linked and allow for cross-checking, in order to facilitate checking of compliance (see QUALICHeCK Factsheet #34 below).

Experiences from other European countries show that the competent authority uses the submitted verification documents to check the compliance of the building design with minimum energy performance requirements, prior to issuing the Building Permit. At building permit stage, improvements could be required if non-compliance is detected. At completion stage, a fine could be collected in case of non-compliance.

However, verification documents must be easy to check and Building Officials in charge of control and enforcement should be trained on the procedural requirements of the energy-related legislation and on the background knowledge of energy efficiency in general.

According to Article 27 EPBD, penalties must be put in place in order to respond to cases of non-compliance with the provisions of the EPBD.

Good practice examples:

Belgium/Flemish region control and penalty scheme of the energy performance legislation: checking procedure and fines – Clarisse Mees - QUALICHeCK Fact Sheet #48, February 2017
http://qualicheck-platform.eu/2017/02/fact-sheet-48-belgiumflemish-region-control-and-penalty-scheme-of-the-energy-performance-legislation-checking-procedure-and-fines/

Voluntary control scheme developed by the province of Salzburg: building services systems declaration based on as-built characteristics - Susanne Geissler - QUALICHeCK Factsheet #34, December 2016
http://qualicheck-platform.eu/2016/12/fact-sheet-33-building-services-systems-declaration-based-on-as-built-characteristics-province-of-salzburg/

2.3 Buildings affected by minimum energy performance requirements

2.3.1 Overview

In principle, all buildings are subject to minimum energy performance requirements. However, exemptions are possible.

2.3.2 Cypriote legislation

Type of legislation	Short description
The Regulation of Energy Performance of Buildings Law; Decree under section 15 (1) (R.A.A. 119/2016)	**New buildings:** Energy performance requirements apply to "any new building and any new building unit". **Existing buildings:** Energy efficiency requirements apply to a building element forming part of the envelope of the building or the building unit when it is replaced or retrofitted or is added to an existing building.
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	**Existing buildings:** Energy efficiency requirements apply to major renovations. "Major renovation" means the renovation of a building which undergoes renovation of more than 25% of the building envelope.
Energy Performance Regulations – The Regulation of Streets and Buildings Law (R.A.A 429/2006) (Energy PerfReg_2014)	**Exemptions are regulated as follows:** *3(1). These Regulations shall apply to all cases of new buildings or building units, as well as to cases of buildings or building units that undergo major renovation:* *Provided that, in the cases of buildings or building units that undergo major renovation, their energy performance is upgraded so as to meet the minimum energy performance requirements of the building, to the point where, in the judgment of the competent authority, this is technically, functionally and economically feasible.* *(2) These Regulations shall not apply to the following:* *(a) Buildings which are declared to be listed buildings in accordance with the Town and Country Planning Act or ancient monuments in accordance with the Antiquities Law, if their compliance with the provisions would materially alter, in the judgment of the Town Planning Authority or the Director of the Antiquities Department respectively, their character.* *4.(2)(c) in the case of buildings that undergo major renovation, where it is not possible to upgrade energy performance, a*

	technological and economic study must be forwarded electronically to the Energy Service in order to substantiate this fact, …
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	The building classes exempted from the obligation of minimum energy performance requirements and from securing energy performance of buildings certificates are specified in Appendix II (Section 8).

2.3.3 Comments

Individual exemptions from minimum energy performance requirements can be problematic, because the result of the assessment "*where it is not possible to upgrade energy performance"* might be influenced by the knowledge of the expert submitting the technological and electronic study.

A Technical Guideline with cost efficient renovation measures structured by building type and construction period could be useful to support stakeholders as well as the competent authority in practice.

2.4 Review and adaptation of legislation

2.4.1 Overview

Review and adaptation refers to energy performance minimum requirements and the methodology for calculating the energy performance of buildings.

2.4.2 Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	14 (2) The methodology for calculating the energy performance of buildings is reviewed in order to adapt to the technical progress in the field of constructions, taking into account the relevant standards in force. 15 (4) The minimum energy performance requirements of buildings are reviewed at regular intervals not exceeding five years, to reflect the technical progress in the field of construction.

2.4.3 Comments

Energy-related laws and secondary legislation as well as Technical Guidelines should be reviewed regarding their effectiveness, namely the energy performance minimum requirements, the calculation methods and tools, the building label and incentives, and the control and enforcement procedures. Adaptations should be made based on evaluation results.

The material developed during the QUALICHeCK project[6] and the Concerted Action EPBD[7] can provide valuable input for continuously improving the legal framework.

It should be noted that frequent adaptations create problems for stakeholders to keep themselves updated.

[6] http://qualicheck-platform.eu/

[7] http://www.epbd-ca.eu/ca-outcomes/2011-2015

3 Functional and technical building requirements

3.1 Minimum energy performance requirements for new buildings

3.1.1 Overview

Minimum energy performance requirements set out in the below mentioned Table 1 in R.A.A. 119/2016 refer to the building envelope, the energy efficiency class, and a minimum share of renewable energy (see also Chapter on Minimum Renewable Energy Requirements). Exemptions from the obligation to meet a specific share of renewable energy are possible ("no space or other legislative rules preventing it").

Different requirements may apply to residential buildings and non-residential buildings.

3.1.2 Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It updates the scope and requirements of the basic framework: for example, it addresses cost-optimal levels and **NZEB requirements:** *5A (1) For purposes of implementing the provisions of this Law all new buildings shall be nearly zero-energy buildings as from 1 January 2021 while, as from 1 January 2019, all new buildings housing public authorities or which are their property shall be nearly zero-energy buildings.* **Determining minimum energy requirements shall take into account:** *(a) the general indoor climate so to avoid possible negative effects such as inadequate ventilation, as well as the local conditions and the designated function and the age of the building or building unit; (c) the achievement of cost-optimal levels of the minimum energy performance of buildings' requirements;*
Regulation of Energy Performance of Buildings Law (Minimum Energy Performance Requirements) Decree of 2016 Decree under section 15/1 (R.A.A. 119/2016)	**This regulation contains more specifications, e.g. regarding the application of energy minimum requirements:** *3. The minimum energy performance requirements for any new building and any new building unit are set out in Table 1.*
Guide to Thermal Insulation of Buildings according to R.A.A. 119/2016 The Regulation of Energy Performance of Buildings Law; Decree under section 15 (1)	**"Guide to Thermal Insulation of Buildings"** means the Guide issued by the Energy Service of the Ministry of Commerce, Industry and Tourism which sets out and explains the general principles of thermal insulation of the building envelope, the methodology of calculating the thermal transmittance rates and the presentation of calculations on thermal transmittance rates (U-value), and the methodology for calculating effective thermal capacity rates.

MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

3.1.3 Comments

Minimum energy performance requirements should be defined in a way that allows for easy verification, control, and enforcement. It is important to have verification in mind when defining energy-related requirements to ensure the effectiveness of EPBD implementation. Minimum energy performance requirements for cooling energy demand are needed.

3.2 Minimum energy performance requirements for existing buildings

3.2.1 Overview

Minimum energy performance requirements set out in the below mentioned Table 2 and Table 3 in R.A.A. 119/2016 only refer to the building envelope and energy performance class.

Different requirements may apply to residential buildings and non-residential buildings.

3.2.2 Cypriote legislation

Type of legislation	Short description
Draft on the Consolidation of the Streets and Buildings Regulation Law (StrBLaw_Apr15_EN)	**Existing building is defined as follows:** *"Existing building" means the building or complex of buildings consisting of more than one units erected upon the issue of a construction permit under article 3, and which has been substantially completed and its individual unit is held or may be held independently and comfortably enjoyed as a unit, on the date of entry into force of the Streets and Buildings Regulation (Amending) Law of 2011.*
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of the scope and requirements of the basic framework: *(2) For every building or building unit undergoing major renovation, the energy performance of the building or the renovated part thereof shall be upgraded in order to meet the minimum energy performance requirements as these are set out in the minimum energy performance requirements of buildings decree.* *(3) Every building element that forms part of the building envelope and is part of an addition to the existing building shall meet the minimum energy performance requirements for the building, as specified in the minimum energy performance of buildings decree.*
The Regulation of Energy Performance of Buildings Law; Decree under section 15/1 (R.A.A. 119/2016)	**This regulation contains more specifications, e.g. regarding the application of energy minimum requirements:** *4. (1) The minimum energy performance requirements for any building and any building unit undergoing major renovation are set out in Table 2.* *(2) If the implementation of the minimum energy performance requirements is not possible in connection with a building or building unit undergoing major renovation, the consultant shall prepare a technical and economic analysis to substantiate this fact, which shall be sent to the Energy Service of the Ministry of Energy, Commerce, Industry and Tourism for approval.*
The Regulation of Energy Performance of Buildings Law; Decree under section 15 (1) (R.A.A. 119/2016)	*5. The minimum energy performance requirements of a building element forming part of the envelope of the building or the building unit when it is replaced or retrofitted or is added to an existing building, is set out in Table 3.*

MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

3.2.3 Comments

Minimum energy performance requirements should be defined in a way that allows for easy verification, control, and enforcement. It is important to have verification in mind when defining energy-related requirements to ensure the effectiveness of EPBD implementation. Minimum energy performance requirements for cooling energy demand are needed.

There are problems to enforce the law for building renovations because of the step-wise implementation of energy efficiency measures which is difficult to control. There is a lack of awareness that minimum requirements have to be met. For example, windows are changed without being aware of energy efficiency.

A Technical Guidance Document containing all provisions related with major renovations (including step-wise implementation) should be issued to facilitate implementation.

3.3 Minimum renewable energy requirements for buildings

3.3.1 Overview

In general, a share of renewable energy is mandatory for all new buildings. Solar systems for hot water production are mandatory for new residential buildings (solar thermal systems). Minimum energy performance requirements for any new building and any new building unit are set out in Table 1 in R.A.A. 119/2016 mentioned below. Exemptions are possible.

Different requirements may apply to residential buildings and non-residential buildings.

3.3.2 Cypriote legislation

Type of legislation	Short description
The Regulation of Energy Performance of Buildings Law Decree of 2016 Decree under section 15/1 (R.A.A. 119/2016)	The regulation contains specifications regarding the application of renewable energy systems: *3. The minimum energy performance requirements for any new building and any new building unit are set out in Table 1.* Table 1 includes provisions regarding renewable energy shares. Exemptions from the obligation to meet a specific share of renewable energy are possible ("no space or other legislative rules preventing it").
Regulation of Energy Performance of Buildings (minimum requirements for the energy performance of buildings) Regulatory Administrative Act 446/2009 Decree under section 15(1) (R.A.A. 446_2009)	The regulation contains specifications regarding the application of renewable energy systems: *4. (1) … for every new building that is used as a residence a solar system shall be installed in order to satisfy the hot water requirements, in accordance with the Technical Guide to Solar Systems and in accordance with the terms of the competent planning authority.* *7) Provision for the use of systems generating electricity from renewable energy sources (RES)* *Provision shall be made in consultation with the electricity supplier (EAC or other) and it shall include: (a) placing in the building a larger electricity measuring box, so as to allow for additional available space to install the RES meter, and (b) placing the suitable piping, which shall start from the meter box and end to the future potential position of installation of the RES system.*
Regulation of Streets and Buildings General Exemption Decree, Decree on the basis of section 4B (R.A.A.281_2013)	The Decree contains the definition of a PV system and defines the exemption of the building permit under specific conditions.
Regulation of Energy Performance of Buildings (minimum requirements for the energy performance of buildings) Decree under section 15(1) (R.A.A. 446_2009)	4. (1) It is regulated that for every new building that is used as a residence a solar system shall be installed in order to satisfy the hot water requirements, in accordance with the **Technical Guide to Solar Systems** and in accordance with the terms of the competent planning authority.
Technical Guide to Solar Systems according to R.A.A. 446 Regulation of Energy	**Technical Guide to Solar Systems**

Performance of Buildings Decree under section 15(1)	
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

The Town and Country Planning Law Mandate 1 of 2014 Use of renewable energy sources with regard to developments (Mandate 1_2014)	The Mandate is to establish **incentives (or and conditions) to encourage the use of solar power plants (photovoltaic) and solar thermal installations**. Provisions are as follows: b. PV: the entire installation shall be connected to the electricity distribution network of the Electricity Authority Cyprus (EAC). e. For all developments covered by this Mandate**, the submission of the "Energy Performance Certificate"** (as well as of the relevant documents/ calculations) to the Building Authority in accordance with the Regulation of Energy Performance of Buildings Law L.142(I)/2006 (and of its subsequent amendments) is mandatory, and **includes all the existing developments regardless of size as well**. f. The building coefficient (%) established as an incentive with this Mandate cannot be transferred to another property. 5. During the examination of the planning permission, the Planning Authority shall confirm, following a relevant consultation with the Energy Service, that the recommended RES technology, the required mechanical installations, surfaces, places and methods of installations (e.g. for solar panels etc.) shall be able to satisfy the minimum requirements for energy generation (in conjunction with the respective requirements of the development's energy performance) in accordance with the content of the Table below. 6.1 In submitting the application for the obtainment of the Construction Permit, the applicant must accompany his/her application with the "Certificate of Energy Performance", all of the remaining documents and calculations emanating from the implementation of the Regulation of Energy Performance of Buildings Law L.142(I)/2006 and an accompanying Letter which shall also be granted by the Energy Service and in which the contribution of the forms of RES determined in paragraph 2a of this Mandate shall be certified, to all the energy needs of the development. There is a TABLE OF INCENTIVES AND CONDITIONS REGARDING THE USE OF RES providing more information.
The Town and Country Planning Law Order no. 2 of 2006 in accordance with Article 6 of the Law (Mandate 2_2006)	Provisions are as follows: 5.1 PV systems installed in the shell of buildings with a purpose to partially or completely cover the energy needs for the uses of the construction … A planning permit is required in order to add such facilities in existing buildings, unless the Planning Authority deems that the installation of PV systems is a subtask in buildings that have already obtained approval under the Town and Country Planning General Development Order. Applications in relation to such installations will be considered favourably, provided that they are harmoniously incorporated into the building and do not harm the microclimate in their surroundings and neighbouring facilities and developments (reflection and glare, local temperature rise, etc.). Additionally, guidelines will also apply for the aesthetic improvement of the built environment.

3.3.3 Comments

Legislation contains procedural aspects to be harmonized with the revision of the general procedures regarding planning permit and construction permit.

Information should be added where more information can be obtained about the building coefficient (%) and the respective calculation method.

Information about checking compliance should be added.

A reference to the Guidelines which will apply for the aesthetic improvement of the built environment should be included.

“Solar Systems” should be identified: “Solar thermal systems” or “Photovoltaic systems”.

Qualification of installers is essential and should be addressed.

Developments with RE are treated like all other developments. However, they should be treated differently depending on the size of RE.

Incentives for renewable energy measures could be dealt with together with incentives for energy efficiency measures, in order to cover energy-related incentives in a consistent way.

3.4 Cost optimal levels and NZEB requirements

3.4.1 Overview

The minimum energy performance requirements for NZEBs are stricter than the current minimum energy performance requirements. All new buildings shall be nearly zero-energy buildings as from 1 January 2021. From 1 January 2019, all new buildings housing public authorities or which are their property shall be nearly zero-energy buildings.

Different requirements may apply to residential buildings and non-residential buildings.

3.4.2 Cypriote legislation

Type of legislation	Short description
Number 210 (I) 2012 Law amending the regulation of Energy Performance of Buildings Law (L.210(1)_2012)	**Update of scope and requirements of the basic framework:** for example, addresses cost-optimal levels, **NZEB requirements:** *5A (1) For purposes of implementing the provisions of this Law all new buildings shall be nearly zero-energy buildings as from 1 January 2021 while, as from 1 January 2019, all new buildings housing public authorities or which are their property shall be nearly zero-energy buildings.* **Determining minimum energy requirements shall take into account:** *(c) the achievement of cost-optimal levels of the minimum energy performance of buildings' requirements;*
Number 210 (I) 2012 Law amending the regulation of Energy Performance of Buildings Law (L.210(1)_2012)	"ANNEX I" (Section 4) contains provisions concerning a comparative methodology framework for determining cost-optimal levels of energy performance requirements for buildings and building elements: *2. Detailed rules for applying the comparative methodology framework in determining the cost-optimal level requirements for energy performance in buildings and building elements, are set out in Annex I to Regulation (EU) No. 244/2012.*
Regulation (EU) No. 244/2012	Annex 1 to Regulation (EU) No. 244/2012 specifies detailed rules for applying the comparative methodology framework in determining the cost-optimal level requirements for energy performance in buildings and building elements.
NZEB Ministerial order of 2014 Κ.Δ.Π. 432/2013	The **minimum energy performance requirements for NZEBs** are stricter than the current minimum energy performance requirements: lower U-values, energy class A, a maximum consumption of primary energy (different for residential buildings and office buildings), at least 25% of the demand to be covered by RES, and a limitation of maximum average power lighting installed in office buildings.
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

3.4.3 Comments

Currently, the focus of minimum requirements is on insulation; there is no minimum requirement on cooling energy demand. Minimum requirements in terms of kWh exist only for heating and are available in the NZEB study. Cooling energy demand must be addressed, as well. Minimum energy performance requirements for cooling energy demand are needed.

Currently, not much attention is paid to technical building systems. However, they will become much more relevant than before because of importance of NZEB requirements.

Good practice example: Minimum energy performance requirements for cooling energy demand

The EPBD implementation in Italy is a good practice example how to define minimum energy performance requirements for cooling energy demand. Information is available in the National Report on the Implementation of the EPBD in Italy, Status in December 2014, http://www.epbd-ca.eu/countries/country-information.

3.5 Energy efficient technical building systems and inspection

3.5.1 Overview

There are energy-related requirements for heating, ventilation, and air-conditioning systems. There are also specifications regarding the type of drawings, calculations, etc. to be submitted to the building authority.

There are provisions regarding the inspection of technical systems including the qualification requirements for inspectors.

Requirements for new buildings and existing buildings and residential buildings and non-residential buildings may differ.

3.5.2 Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of scope and requirements of the basic framework: *9A .- (1) New technical building systems building installed in existing buildings or building systems units, technical building systems being replaced in buildings and building units as well as existing technical building systems being upgraded shall meet the requirements concerning the overall energy performance, the proper installation, proper sizing, calibration and control in order to optimise the energy use of technical building systems.* *(2) The requirements to be met by the new technical building systems being installed in existing buildings, technical building systems being replaced, and technical building systems being upgraded, shall cover at least the following:* *(a) heating systems,* *(b) hot water systems,* *(c) air-conditioning systems,* *(d) large ventilation systems,* *or a combination thereof.* *(3) The installation of technical building systems shall be made by installers of technical building systems.* *(4) During the study and design of the technical systems described in subsection (1) provision shall be made for safe access for the purposes of installing and / or calibrating and / or controlling and / or testing and*

	/ and / or maintaining or inspecting the equipment of these systems through permanent suitable means of access.
The Regulation of Energy Performance of Buildings Law (Inspection of air conditioning systems) R.A.A. 163/2009	It contains specifications regarding inspection of technical systems: staff inspecting air conditioning systems must meet defined qualification requirements.
Κ.Δ.Π. 111/2006 under the Streets and Buildings Regulations Law	It defines requirements for heating, ventilation and air-conditioning and regulates the type of drawings, calculations, etc. to be submitted to the building authority. It requires that for each new installation a study is provided.
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

3.5.3 Comments

The Roads and Buildings Law through the Regulation Κ.Δ.Π. 111/2006 requires that for each new installation of central heating systems and air-conditioning systems a study is provided. However, the regulation excepts single family homes, and it is not clear how it is implemented in existing buildings where a new building technical system is installed.

Technical building systems are playing an increasingly important role in energy efficiency of buildings, and therefore a complete revision of this matter should be considered, taking into account NZEB developments and EPBD requirements in general, including matters of sizing the system according to the thermal needs of the buildings in line with the provisions of article 8 EPBD. Energy efficiency of lighting systems and proper dimensioning of lighting for commercial buildings should also be included.

Quality of the works is especially important to avoid sources of failures in building operation and to achieve actual building energy efficiency. Supervision procedures / commissioning procedures should be defined.

Information gathered during the inspection of technical systems should be collected in a database in order to allow for easy data processing for different purposes (e.g. evaluation for policy making). Ideally, databases for administrating technical systems, competent inspectors, registered EPC experts and Energy Performance Certificates should be linked and allow for cross-checking, in order to facilitate checking of compliance.

Good practice examples:

Increasing the expertise of building professionals for a better quality of construction: The French programme PACTE – Julien Thomas, Slyvain Mangili, François Durier - QUALICHeCK Fact

Sheet #51, February 2017
http://qualicheck-platform.eu/2017/02/fact-sheet-51-increasing-the-expertise-of-building-professionals-for-a-better-quality-of-construction-the-french-programme-pacte/

Erhorn, H., Erhorn-Kluttig, H., Geissler, S., Wouters, P.: Source book on Guidelines for better enforcement of quality of the works, February 2017

http://qualicheck-platform.eu/2017/02/source-book-on-guidelines-for-better-enforcement-of-quality-of-the-works-final/

Voluntary control scheme developed by the province of Salzburg: building services systems declaration based on as-built characteristics - Susanne Geissler - QUALICHeCK Factsheet #34, December 2016
http://qualicheck-platform.eu/2016/12/fact-sheet-33-building-services-systems-declaration-based-on-as-built-characteristics-province-of-salzburg/

Selecting EPC input data for HVAC systems: a series of French guidance sheets – Dominique Hantz, François Durier, Valérie Laplagne - QUALICHeCK Fact Sheet #42, January 2017
http://qualicheck-platform.eu/2017/01/fact-sheet-42-selecting-epc-input-data-for-hvac-systems-a-series-of-french-guidance-sheets/

European certification of HVAC products can provide EPC input data - Michèle Mondot, Sandrine Marinhas - QUALICHeCK Fact Sheet #50, February 2017
http://qualicheck-platform.eu/2017/02/fact-sheet-50-european-certification-of-hvac-products-can-provide-epc-input-data/

3.6 Energy efficient lighting

3.6.1 Overview

In large commercial buildings, lighting is a major energy consumer. Currently, energy consumption due to lighting is not addressed at all.

Requirements for new buildings and existing buildings, and residential buildings and non-residential buildings may differ.

3.6.2 Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Κ.Δ.Π. 111/2006	In Κ.Δ.Π. 111/2006 lighting systems are not covered at all.

3.6.3 Comments

It is suggested that Κ.Δ.Π. 111/2006 is revised to include lighting design for large commercial buildings with the aim to improve overall energy efficiency and proper dimensioning at relevant lighting standards.

In general, lighting is an important aspect with regard to energy consumption and but also health of occupants, and provision of daylight is important from both viewpoints.

Good practice example:

The South African Building Energy Code provides minimum requirements in terms of W/m^2: Building Code Implementation - Country Summary South Africa. Prepared for the IPEEC Building Energy Efficiency Taskgroup – Project 3: International Collaboration for Building Energy Code Implementation,
http://www.gbpn.org/sites/default/files/South%20Africa_Country%20Summary_0.pdf

Useful information in the context of shading and using daylight at the same time:

European solar-shading database, ES-SDA - Ann Van Eycken - QUALICHeCK Fact Sheet #53, February 2017
http://qualicheck-platform.eu/2017/02/fact-sheet-53-european-solar-shading-database-es-sda/

3.7 Calculation methods and tools

3.7.1 Overview

A software based on European Standards is used by qualified expert to calculate the energy performance of the building and to verify whether the building complies or not. The calculation results in issuing the Energy Performance Certificate (EPC).

3.7.2 Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of scope and requirements of the basic framework: Annex IV (section 14) Common general framework for calculating the energy performance of buildings A 1. The energy performance of a building shall be determined on the basis of the estimated or actual annual energy consumed to meet the different needs associated with its typical use and shall include the energy needs for heating and cooling (energy needed to avoid overheating) to maintain desired temperature conditions of the building and cover domestic hot water needs.
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

3.7.3 Comments

The EPC is submitted electronically including input data, but input data used for calculation are not checked. A mechanism is needed to check input data.

4 Specific building categories

4.1 Public buildings

4.1.1 Overview

According to the Report[8] of the Concerted Action EPBD "Implementation of the EPBD in Cyprus – Status December 2014", public buildings (new and existing) have to comply with the same energy performance requirements as private buildings. The EPC must be displayed only if available.

From 1 January 2019, all new buildings housing public authorities or which are their property shall be nearly zero-energy buildings.

4.1.2 Cypriote legislation

Type of legislation	Short description
Draft on the Consolidation of the Streets and Buildings Regulations (StrBReg_Apr2015_EN)	It provides a definition: *"public building" means a building used or constructed or arranged for use, either ordinarily or occasionally, as a church, chapel, temple or other place of public worship, or as a hospital, public institution, college or school (not being merely a building so used), theatre, restaurant or coffee shop (the main hall of which covers an area not less than 100 square meters), hotel (with not less than eight bedrooms for guests and cubical content of not less than 1,400 cubic meters), public hall, hall for public concerts, public ball room, cabaret, public lecture room or public exhibition room, or as a place for public meetings of persons admitted thereto by ticket or otherwise, and whether on payment or not, or used or constructed or arranged for use, either ordinarily or occasionally, for any other public purpose;*
Number 210 (I) 2012 Law amending the regulation of Energy Performance of Buildings Law (L.210(1)_2012)	*(1) In buildings having a total useful floor area of more than five hundred square meters for which an energy performance certificate has been issued under subsection (1) of section 6 a and which are used by public authorities and are visited by the public, the energy performance of the building certificate shall be displayed in a prominent position.* *(2) In buildings having a total useful floor area of more than five hundred square meters for which an energy performance of the building certificate has been issued under subsection (1) of section 6 and which are visited by the public, the certificate shall be displayed in a prominent position.* *(4) For the purposes of subsection (1) and if the public authorities are housed in existing buildings, the energy performance calculations and the energy performance of building certificate issued, may be based on the actual annual energy consumed to meet the different needs associated with the typical use of this building."*
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of the scope and requirements of the basic framework: for example, addresses cost-optimal levels, **NZEB requirements:** *5A (1) For purposes of implementing the provisions of this Law all new buildings shall be nearly zero-energy buildings as from 1 January 2021*

[8] Report of the Concerted Action EPBD "Implementation of the EPBD in Cyprus – Status December 2014", http://www.epbd-ca.eu/countries/country-information

	while, as from 1 January 2019, all new buildings housing public authorities or which are their property shall be nearly zero-energy buildings.

4.1.3 Comments

According to the Report[9] of the Concerted Action EPBD "Implementation of the EPBD in Cyprus – Status December 2014", public buildings (new and existing) have to comply with the same energy performance requirements as private buildings.

Public buildings should have an exemplary role and represent good examples. It is important to display the Energy Performance Certificate in order to create awareness. Currently, only those Energy Performance Certificates must be displayed which were issued.

It is suggested to oblige public buildings to always display the EPC, even if the EPC must be issued only for this purpose.

Public buildings: Threshold 500 m^2 must be lowered to 250 m^2 (9^{th} July 2015 according to EPBD 2010/31/EU).

Public buildings are also addressed by Article 5 Energy Efficiency Directive 2012/27/EU, and implementation of the EPBD facilitates implementation of Article 5.

[9] Report of the Concerted Action EPBD "Implementation of the EPBD in Cyprus – Status December 2014", http://www.epbd-ca.eu/countries/country-information

4.2 Buildings under monument protection – historic buildings

4.2.1 Overview

Although there is an exemption for historic buildings regarding energy performance obligations set by the legislation implementing the EPBD, energy efficiency could be considered voluntarily.

4.2.2 Cypriote legislation

Energy Performance Regulations – The Regulation of Streets and Buildings Law R.A.A 429/2006 (Energy PerfReg_2014)	**Exemptions for historic buildings - buildings under monument protection:** *(2) These Regulations shall not apply to the following:* *(a) Buildings which are declared to be listed buildings in accordance with the Town and Country Planning Act or ancient monuments in accordance with the Antiquities Law, if their compliance with the provisions would materially alter, in the judgment of the Town Planning Authority or the Director of the Antiquities Department respectively, their character.* *4.(2)(c) in the case of buildings that undergo major renovation, where it is not possible to upgrade energy performance, a technological and economic study must be forwarded electronically to the Energy Service in order to substantiate this fact, …*

4.2.3 Comments

Energy efficiency could be considered voluntarily, based on a Technical Guideline which could be developed by Cypriote experts on historic buildings and experts on energy efficiency in historic buildings.

Resources in Cyprus:

Innovative Methods for Protection and Conservation of Sustainable Design Elements of Vernacular Architecture in the Historic Center of Nicosia:

- http://www.biovernacular.ac.cy/easyconsole.cfm/id/1/lang/en/
- http://www.biovernacular.ac.cy/easyconsole.cfm/id/125

Implementation of Sustainable Design Elements of Vernacular Architecture in the Rehabilitation of Traditional Buildings and in the Design of New Structures:

- http://www.biocultural.ac.cy/easyconsole.cfm/id/1/lang/en/
- http://www.biocultural.ac.cy/en/dissemination/publications

Examples from European countries:

Energy efficiency in historic buildings (buildings under monument protection) in Austria: Burghauptmannschaft manages historic buildings owned by the Austrian government. They are highly qualified facility managers and energy experts:

- http://www.burghauptmannschaft.at/php/portal.php?language=en

They also organize international conferences on historic buildings:

- http://www.burghauptmannschaft-kongress.at/en/Programm

The authority competent for monument protection Bundesdenkmalamt in Austria has published a guideline for energy efficiency in historic buildings (only available in German). It describes which measures can be carried out and how much impact the measure will have regarding aspects which could be under monument protection. It is a voluntary guideline which could serve as an example for a new Cypriote Technical Guideline on energy efficiency in historic buildings:

https://bda.gv.at/fileadmin/Medien/bda.gv.at/SERVICE_RECHT_DOWNLOAD/Richtlinie_Energieeffizienz_am_Baudenkmal.pdf

Historic England (the public body that looks after England's historic environment) also publishes material on how to avoid conflict between maintaining cultural heritage and achieving energy efficiency:

- https://historicengland.org.uk/advice/technical-advice/energy-efficiency-and-historic-buildings/
- https://historicengland.org.uk/images-books/publications/energy-efficiency-historic-buildings-ptl/

5 Other information for the construction sector and real estate sector

5.1 EPC and EPC-registry, qualified experts and experts registry

5.1.1 Overview

Experts have to meet defined requirements in order to be registered as qualified experts and entitled to issue EPCs for a specified class or classes of buildings. EPCs are collected in the EPC-registry in order to allow for checking and quality control. Quality assurance on the level of experts supports quality control on the level of EPCs.

5.1.2 Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements. It contains provisions regarding the Energy Performance Certificate (EPC) of a building and the EPC registry, and states that … *19.-(1) (2) … regulations may provide for all or any of the following matters: a) the qualifications of qualified experts referred to in article 6(4), their registration procedure, the expiration, suspension or termination thereof, their obligations and duties and the procedures to follow for the issue of an energy performance certificate of a building; …* The law includes also provisions for the register of qualified experts.
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of the scope and requirements of the basic framework: *"Qualified expert" means a person who is registered by the competent authority in the qualified experts* ***register for a specified class or classes of buildings*** *and who, having prepared the energy performance calculations for the building, issues the energy performance certificate for the building, which includes also recommendations.*
(6)-R.A.A. 164_2009 The Regulation of the Energy Performance of Buildings	This regulation contains detailed specifications regarding qualified experts entitled to calculate and issue Energy Performance Certificates. Qualified experts must meet defined qualification requirements.

(Energy Certification of Buildings) Regulations of 2009 K.D.P 164/2009	It also contains specifications about the registration of experts and the EPC registry.
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

5.1.3 Comments

No comments.

5.2 Independent EPC control system according to Article 18 EPBD

5.2.1 Overview

The independent control system according to Article 18 EPBD has been implemented by MECIT. It is based on the EPC registry and the registry of qualified experts kept by MECIT. From 2010 to 2013, 10% of all issued EPCs went through a desk audit, and 21% of all EPCs went through an on-site check. As a result, 218 EPC were cancelled, and 3 qualified experts were suspended[10]. MECIT employs qualified staff to perform desk checks and on-site checks.

The competent authority is MECIT.

5.2.2 Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements. Provisions regarding control: *17. – (1) The Minister, upon the recommendation of the competent authority and pursuant to a decree, may appoint officers from the Energy Service of the Ministry of Commerce, Industry and Tourism as Authorized Inspectors for purposes of inspection and monitoring of the implementation of this Law.* *(2) The Authorized Inspector has the power-* *a) at any reasonable time to enter any building, premises or space and to examine and/or inspect documents, premises or equipment or space for the purposes of monitoring of the implementation of this Law,* *It is understood that the entry into a residence without the consent of the resident, is allowed only with a court order.* *b) to seize any relevant documents, goods or samples, in the event of reasonable suspicions that an offence was committed, as specified in the provisions of article 20, which are expected to be used as evidence,* *c) to request data and information regarding any study, certificate, confirmation or other document issued or used for the purposes of this Law.* *(3)(a) In the event where the competent authority discovers that the provisions of this law have not been complied with, the authority may, in its discretion, serve a notice to the appropriate person in which the infringement is specified and to invite that person to comply with the provisions, within a set period of time to be specified in the notice, depending on the nature of the infringement.* *(b) In the same notice the competent authority shall indicate the measures which should be taken for purposes of compliance with the provisions of this Law.*
Number 210 (I) 2012 Law amending the regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of the scope and requirements of the basic framework: ANNEX 111 (Sections 13B and 13C) Independent control systems for the energy performance certificates and inspection reports:

[10] Report of the Concerted Action EPBD "Implementation of the EPBD in Cyprus – Status December 2014", http://www.epbd-ca.eu/countries/country-information

	1. The competent authority shall carry out random sampling of at least a statistically significant percentage of all the energy performance certificates issued annually and verify them.
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

5.2.3 Comments

MECIT Energy Service checks EPCs on a random basis (board of 6 inspectors visiting the buildings during construction, in collaboration with municipalities); however, the sample is too small, the number of 6 inspectors is not sufficient, and therefore there is no clear picture about the real situation regarding EPC quality.

However, inspectors are very important because they "train" the staff on the construction site about changes in legislation. Example: Thermal insulation is new and there is resistance to implement it. Inspectors have an important informative role until thermal insulation becomes the norm.

A Code of Practice for checking is needed, including the checking of technical systems. Attention has to be paid to the qualification of installers (quality of the works).

Good practice examples:

Belgium/Flemish region control and penalty scheme of the energy performance legislation: checking procedure and fines – Clarisse Mees - QUALICHeCK Fact Sheet #48, February 2017
http://qualicheck-platform.eu/2017/02/fact-sheet-48-belgiumflemish-region-control-and-penalty-scheme-of-the-energy-performance-legislation-checking-procedure-and-fines/

Voluntary control scheme developed by the province of Salzburg: building services systems declaration based on as-built characteristics - Susanne Geissler - QUALICHeCK Factsheet #34, December 2016
http://qualicheck-platform.eu/2016/12/fact-sheet-33-building-services-systems-declaration-based-on-as-built-characteristics-province-of-salzburg/

5.3 Energy indicators in real estate advertisements and handing over the EPC

5.3.1 Overview

There is the obligation to hand over the energy performance certificate or a copy thereof to the prospective tenant or buyer. There is the obligation to state the energy performance class of the energy performance certificate in all commercial advertising.

5.3.2 Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Number 210 (I) 2012 Law amending the regulation of Energy Performance of Buildings Law (L.210(1)_2012)	Update of scope and requirements of the basic framework: *(1) The owner of the building or the building unit shall see that an energy performance certificate for the building will be issued-* *(a) for buildings or building units under construction,* *(b) for buildings or building units available for sale and / or sold,* *(c) for buildings or building units available for lease and / or leased to a new tenants and* *(d) for buildings with a total useful area of more than five hundred square metres used by a public authority and visited by the public.* *(2) During the construction, sale or lease of the building or the building unit,* ***the energy performance certificate or a copy thereof shall be shown to the prospective tenant or buyer and handed over to the buyer or tenant.*** *(3) The energy performance of a building certificate shall include the energy performance of the building and reference values, such as the minimum energy performance requirements for the building so as to allow the owners or tenants of the building or building unit to compare and assess the energy performance of the building or building unit.* *8A. When available for sale or lease –* *(a) buildings that have energy performance certificate,* *(b) building units in a building having an energy performance certificate, and* *(c) building units having an energy performance certificate;* ***the energy performance class of the energy performance certificate shall be stated in all commercial advertising****.*

5.3.3 Comments

There are good examples from Portugal and Ireland how to collaborate with the real estate sector in implementing the above mentioned obligations.

Good practice examples:

How to make the best use of EPCs – Susanne Geissler, Naghmeh Altmann-Mavaddat – Report of the third Concerted Action EPBD, September 2015 www.epbd-ca.eu/ca-outcomes/2011-2015

Annex III b: Draft Guideline "Energy economy and heat retention"

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1 Introduction

This Guideline compiles energy-related requirements in accordance with the 6th basic requirement for construction works of the European Construction Product Regulation (CPR):

> "Energy economy and heat retention
>
> The construction works and their heating, cooling, lighting and ventilation installations must be designed and built in such a way that the amount of energy they require in use shall be low, when account is taken of the occupants and of the climatic conditions of the location. Construction works must also be energy-efficient, using as little energy as possible during their construction and dismantling."

Requirements are mostly covered by those ones defined as a consequence of the EPBD[11] implementation. If this is the case, a reference will be given to the respective existing legislation.

2 General definitions and abbreviations

2.1 General definitions

General definitions are available in the following legislation:

- Law amending the Regulation of Energy Performance of Buildings Law Number 210 (I) 2012 (L.210(1)_2012)
- Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)
- Energy Performance Regulations – The Regulation of Streets and Buildings Law R.A.A 429/2006 (Energy PerfReg_2014)

2.2 Abbreviations

CPR Construction Product Regulation (Regulation EU 305/2011)

EE Energy efficiency

EED Energy Efficiency Directive (Directive 2012/27/EU)

EPBD Energy Performance of Buildings Directive (Directive 2010/31/EU)

EPC Energy Performance Certificate

NZEB Nearly Zero Energy Building

PV Photovoltaic

RE Renewable energy

RES Renewable energy sources

[11] EPBD – Energy Performance of Buildings Directive, Directive 2010/31/EU

3 Scope

3.1 Buildings affected by energy-related requirements

3.1.1 General provisions

In principle, all buildings are subject to energy-related requirements. However, exemptions are possible.

3.1.2 New buildings

Energy-related requirements apply to any new building and any new building unit.

3.1.3 Existing buildings

In case of single renovation measures, energy-related requirements apply to a building element forming part of the envelope and to an element of the technical building systems including lighting installations.

In case of major renovations, energy-related requirements apply to a building or a building unit. “Major renovation" means the renovation of a building which undergoes renovation of more than 25% of the building envelope.

3.1.4 Existing Cypriote legislation

Type of legislation	Short description
The Regulation of Energy Performance of Buildings Law; Decree under section 15 (1) (R.A.A. 119/2016)	**New buildings:** Energy performance requirements apply to “any new building and any new building unit”. **Existing buildings:** Energy efficiency requirements apply to a building element forming part of the envelope of the building or the building unit when it is replaced or retrofitted or is added to an existing building.
Draft on the Consolidation of the Streets and Buildings Regulation Law (StrBLaw_Apr15_EN)	**Existing building is defined as follows:** *“Existing building” means the building or complex of buildings consisting of more than one units erected upon the issue of a construction permit under article 3, and which has been substantially completed and its individual unit is held or may be held independently and comfortably enjoyed as a unit, on the date of entry into force of the Streets and Buildings Regulation (Amending) Law of 2011.*
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	**Existing buildings:** Energy efficiency requirements apply to major renovations. “Major renovation" means the renovation of a building which undergoes renovation of more than 25% of the building envelope.
Energy Performance Regulations – The Regulation of Streets and Buildings Law (R.A.A 429/2006) (Energy PerfReg_2014)	**Exemptions are regulated as follows:** *3(1). These Regulations shall apply to all cases of new buildings or building units, as well as to cases of buildings or building units that undergo major renovation:* *Provided that, in the cases of buildings or building units that undergo major renovation, their energy performance is upgraded so as to meet the minimum energy performance requirements of the building, to the point where, in the judgment of the competent authority, this is technically, functionally and economically feasible.* *(2) These Regulations shall not apply to the following:* *(a) Buildings which are declared to be listed buildings in accordance with the Town and Country Planning Act or ancient monuments in*

	accordance with the Antiquities Law, if their compliance with the provisions would materially alter, in the judgment of the Town Planning Authority or the Director of the Antiquities Department respectively, their character. *4.(2)(c) in the case of buildings that undergo major renovation, where it is not possible to upgrade energy performance, a technological and economic study must be forwarded electronically to the Energy Service in order to substantiate this fact, …*
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	The building classes exempted from the obligation of minimum energy performance requirements and from securing energy performance of buildings certificates are specified in Appendix II (Section 8).

3.2 Synergies with other requirements than energy

Minimum energy performance requirement in buildings affect thermal comfort conditions, indoor air quality, and lighting comfort. Thus, energy performance of buildings is related with noise protection, health and hygiene in buildings. Building design shall be done in a way ensuring synergies in meeting the requirements and avoiding contradicting each other.

3.2.1 Existing Cypriote legislation

Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	Determining minimum energy requirements shall take into account: *(a) the general indoor climate so to avoid possible negative effects such as inadequate ventilation, as well as the local conditions and the designated function and the age of the building or building unit;*

4 Functional and technical requirements

Requirements refer to the building envelope, the technical building systems, the cooling energy demand, the lighting energy demand, the energy efficiency class, and a minimum share of renewable energy.

Different requirements may apply to new and existing buildings.

Different requirements may apply to residential buildings and non-residential buildings.

4.1 Minimum energy performance requirements for new buildings

4.1.1 Requirements addressing the building envelope and the energy efficiency class

Minimum energy performance requirements refer to the building envelope and the energy efficiency class. Different requirements may apply to residential buildings and non-residential buildings.

4.1.1.1 Existing Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Regulation of Energy Performance of Buildings Law (Minimum Energy Performance Requirements) Decree of 2016 Decree under section 15/1 (R.A.A. 119/2016)	This regulation contains more specifications, e.g. regarding the application of energy minimum requirements: *3. The minimum energy performance requirements for any new building and any new building unit are set out in Table 1.*
Guide to Thermal Insulation of Buildings according to R.A.A. 119/2016 The Regulation of Energy Performance of Buildings Law; Decree under section 15 (1)	"Guide to Thermal Insulation of Buildings" means the Guide issued by the Energy Service of the Ministry of Commerce, Industry and Tourism which sets out and explains the general principles of thermal insulation of the building envelope, the methodology of calculating the thermal transmittance rates and the presentation of calculations on thermal transmittance rates (U-value), and the methodology for calculating effective thermal capacity rates.
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

4.1.2 Requirements addressing the cooling energy demand

Minimum energy performance requirements refer to the cooling energy demand. Different requirements may apply to residential buildings and non-residential buildings.

No existing Cypriote legislation; suggested requirement as a starting point for discussion:

Minimum energy performance requirement for cooling (primary energy): 30 kWh/m^2, depending on the building type.

4.1.3 Requirements addressing the lighting energy demand

Minimum energy performance requirements refer to the lighting energy demand. Different requirements may apply to residential buildings and non-residential buildings.

No existing Cypriote legislation; suggested requirement as a starting point for discussion:

Restriction on lighting: 5W/m^2, depending on the building type.

4.2 Minimum energy performance requirements for existing buildings

4.2.1 Requirements addressing the building envelope and the energy efficiency class

Minimum energy performance requirements refer to the building envelope and the energy efficiency class. Different requirements may apply to residential buildings and non-residential buildings.

4.2.1.1 Existing Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of the scope and requirements of the basic framework: *(2) For every building or building unit undergoing major renovation, the energy performance of the building or the renovated part thereof shall be upgraded in order to meet the minimum energy performance requirements as these are set out in the minimum energy performance requirements of buildings decree.* *(3) Every building element that forms part of the building envelope and is part of an addition to the existing building shall meet the minimum energy performance requirements for the building, as specified in the minimum energy performance of buildings decree.*
The Regulation of Energy Performance of Buildings Law; Decree under section 15/1 (R.A.A. 119/2016)	This regulation contains more specifications, e.g. regarding the application of energy minimum requirements: *4. (1) The minimum energy performance requirements for any building and any building unit undergoing major renovation are set out in Table 2.* *(2) If the implementation of the minimum energy performance requirements is not possible in connection with a building or building unit undergoing major renovation, the consultant shall prepare a technical and economic analysis to substantiate this fact, which shall be sent to the Energy Service of the Ministry of Energy, Commerce, Industry and Tourism for approval.*
The Regulation of Energy Performance of Buildings Law; Decree under section 15 (1) (R.A.A. 119/2016)	*5. The minimum energy performance requirements of a building element forming part of the envelope of the building or the building unit when it is replaced or retrofitted or is added to an existing building, is set out in Table 3.*
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

4.2.2 Requirements addressing the cooling energy demand

Minimum energy performance requirements refer to the cooling energy demand. Different requirements may apply to residential buildings and non-residential buildings.

No existing Cypriote legislation; suggested requirement as a starting point for discussion:

Not applicable to existing buildings

4.2.3 Requirements addressing the lighting energy demand

Minimum energy performance requirements refer to the lighting energy demand. Different requirements may apply to residential buildings and non-residential buildings.

No existing Cypriote legislation; suggested requirement as a starting point for discussion:

Not applicable to existing buildings

4.3 Minimum renewable energy requirements for new buildings

In general, a minimum share of renewable energy is mandatory for all new buildings. Exemptions are possible.

Different requirements may apply to residential buildings and non-residential buildings.

Solar systems for hot water production are mandatory for new residential buildings (solar thermal systems).

4.3.1 Existing Cypriote legislation

Type of legislation	Short description
The Regulation of Energy Performance of Buildings Law Decree of 2016 Decree under section 15/1 (R.A.A. 119/2016)	The regulation contains specifications regarding the application of renewable energy systems: *3. The minimum energy performance requirements for any new building and any new building unit are set out in Table 1.* Table 1 includes provisions regarding renewable energy shares. Exemptions from the obligation to meet a specific share of renewable energy are possible ("no space or other legislative rules preventing it").
Regulation of Energy Performance of Buildings Regulatory Administrative Act 446/2009 Decree under section 15(1) (R.A.A. 446_2009)	The regulation contains specifications regarding the application of renewable energy systems: *4. (1) … for every new building that is used as a residence a solar system shall be installed in order to satisfy the hot water requirements, in accordance with the Technical Guide to Solar Systems and in accordance with the terms of the competent planning authority.* *7) Provision for the use of systems generating electricity from renewable energy sources (RES)* *Provision shall be made in consultation with the electricity supplier (EAC or other) and it shall include: (a) placing in the building a larger electricity measuring box, so as to allow for additional available space to install the RES meter, and (b) placing the suitable piping, which shall start from the meter box and end to the future potential position of installation of the RES system.*
Regulation of Streets and Buildings General Exemption Decree, Decree on the basis of section 4B (R.A.A.281_2013)	The Decree contains the definition of a PV system and defines the exemption of the building permit under specific conditions.
Regulation of Energy Performance of Buildings Decree under section 15(1) (R.A.A. 446_2009)	4. (1) It is regulated that for every new building that is used as a residence a solar system shall be installed in order to satisfy the hot water requirements, in accordance with the Technical Guide to Solar Systems and in accordance with the terms of the competent planning authority.
Technical Guide to Solar Systems according to R.A.A. 446 Regulation of Energy	Technical Guide to Solar Systems

Performance of Buildings Decree under section 15(1)	
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

4.4 Cost optimal levels and Nearly Zero Energy Buildings requirements

The minimum energy performance requirements for NZEBs are stricter than the current minimum energy performance requirements. All new buildings shall be nearly zero-energy buildings as from 1 January 2021.

Different requirements may apply to residential buildings and non-residential buildings.

4.4.1 Existing Cypriote legislation

Type of legislation	Short description
Number 210 (I) 2012 Law amending the regulation of Energy Performance of Buildings Law (L.210(1)_2012)	Addresses cost-optimal levels, NZEB requirements: *5A (1) For purposes of implementing the provisions of this Law all new buildings shall be nearly zero-energy buildings as from 1 January 2021 while, as from 1 January 2019, all new buildings housing public authorities or which are their property shall be nearly zero-energy buildings.* Determining minimum energy requirements shall take into account: *(c) the achievement of cost-optimal levels of the minimum energy performance of buildings' requirements;*
Number 210 (I) 2012 Law amending the regulation of Energy Performance of Buildings Law (L.210(1)_2012)	"ANNEX I" (Section 4) contains provisions concerning a comparative methodology framework for determining cost-optimal levels of energy performance requirements for buildings and building elements: *2. Detailed rules for applying the comparative methodology framework in determining the cost-optimal level requirements for energy performance in buildings and building elements, are set out in Annex I to Regulation (EU) No. 244/2012.*
Regulation (EU) No. 244/2012	Annex 1 to Regulation (EU) No. 244/2012 specifies detailed rules for applying the comparative methodology framework in determining the cost-optimal level requirements for energy performance in buildings and building elements.
NZEB Ministerial order of 2014 Κ.Δ.Π. 432/2013	The minimum energy performance requirements for NZEBs are stricter than the current minimum energy performance requirements: lower U-values, energy class A, a maximum consumption of primary energy (different for residential buildings and office buildings), at least 25% of the demand to be covered by RES, and a limitation of maximum average power lighting installed in office buildings.
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

4.5

4.6 Efficiency requirements for technical building systems

There are efficiency-related requirements for heating, ventilation, and air-conditioning systems.

There are provisions regarding the inspection of technical systems including the qualification requirements for inspectors.

Requirements for new buildings and existing buildings and residential buildings and non-residential buildings may differ.

4.6.1 Existing Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of scope and requirements of the basic framework: *9A .- (1) New technical building systems building installed in existing buildings or building systems units, technical building systems being replaced in buildings and building units as well as existing technical building systems being upgraded shall meet the requirements concerning the overall energy performance, the proper installation, proper sizing, calibration and control in order to optimise the energy use of technical building systems.* *(2) The requirements to be met by the new technical building systems being installed in existing buildings, technical building systems being replaced, and technical building systems being upgraded, shall cover at least the following:* *(a) heating systems, (b) hot water systems, (c) air-conditioning systems, (d) large ventilation systems, or a combination thereof.* *(3) The installation of technical building systems shall be made by installers of technical building systems.* *(4) During the study and design of the technical systems described in subsection (1) provision shall be made for safe access for the purposes of installing and / or calibrating and / or controlling and / or testing and / and / or maintaining or inspecting the equipment of these systems through permanent suitable means of access.*
The Regulation of Energy Performance of Buildings Law (Inspection of air conditioning systems) R.A.A. 163/2009	It contains specifications regarding inspection of technical systems: staff inspecting air conditioning systems must meet defined qualification requirements.
Κ.Δ.Π. 111/2006 under the Streets and Buildings Regulations Law	It defines requirements for heating, ventilation and air-conditioning and regulates the type of drawings, calculations, etc. to be submitted to the building authority. It requires that for each new installation a study is provided.
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

5 Calculation methods and tools

5.1 EPC Software

A software based on European Standards is used by qualified experts to calculate the energy performance of the building and to verify whether the building complies or not. The calculation results in issuing the Energy Performance Certificate (EPC).

The "Methodology for Calculating the Energy Performance of Buildings" describes all the algorithms and assumptions used to calculate energy consumption. It includes heating, cooling, Domestic Hot Water, and lighting needs expressed in terms of primary energy.

5.1.1 Existing Cypriote legislation

Type of legislation	Short description
Law for the Regulation of the Energy Performance of Buildings 142 (I) of 2006 (EnergyPerfLaw _2009)	This law provides the basic framework for EPBD requirements.
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of scope and requirements of the basic framework: Annex IV (section 14) Common general framework for calculating the energy performance of buildings A 1. The energy performance of a building shall be determined on the basis of the estimated or actual annual energy consumed to meet the different needs associated with its typical use and shall include the energy needs for heating and cooling (energy needed to avoid overheating) to maintain desired temperature conditions of the building and cover domestic hot water needs.
MECIT	Detailed information regarding implementation: http://www.mcit.gov.cy/mcit/mcit.nsf/dmlperformance_gr/dmlperformance_gr?OpenDocument&Start=1&Count=1000&Collapse=14

5.2 Submission of EPC input data sheet

Input data used for the calculation of the energy performance shall be submitted to the authority to facilitate the checking procedure (compliance checks).

No existing Cypriote legislation; suggested requirement as a starting point for discussion:

EPC input data sheet used for EPC calculation to be submitted the authority for quality control based on a random sample.

6 Incentives

6.1 Incentives for energy saving measures

Incentives reward early adopters of ambitious energy-related requirements and support the development of a market for energy efficient products.

No existing Cypriote legislation; suggested as a starting point for discussion: incentives for specific energy efficiency measures such as the application of shading devices.

6.2 Incentives for renewable energy measures

Incentives reward early adopters of ambitious energy-related requirements and support the development of a market for renewable technologies.

6.2.1 Existing Cypriote legislation

The Town and Country Planning Law Mandate 1 of 2014 Use of renewable energy sources with regard to developments (Mandate 1_2014)	The Mandate is to establish incentives (or and conditions) to encourage the use of solar power plants (photovoltaic) and solar thermal installations. Provisions are as follows: b. PV: the entire installation shall be connected to the electricity distribution network of the Electricity Authority Cyprus (EAC). e. For all developments covered by this Mandate, the submission of the "Energy Performance Certificate" (as well as of the relevant documents/ calculations) to the Building Authority in accordance with the Regulation of Energy Performance of Buildings Law L.142(I)/2006 (and of its subsequent amendments) is mandatory, and includes all the existing developments regardless of size as well. f. The building coefficient (%) established as an incentive with this Mandate cannot be transferred to another property. 5. During the examination of the planning permission, the Planning Authority shall confirm, following a relevant consultation with the Energy Service, that the recommended RES technology, the required mechanical installations, surfaces, places and methods of installations (e.g. for solar panels etc.) shall be able to satisfy the minimum requirements for energy generation (in conjunction with the respective requirements of the development's energy performance) in accordance with the content of the Table below. 6.1 In submitting the application for the obtainment of the Construction Permit, the applicant must accompany his/her application with the "Certificate of Energy Performance", all of the remaining documents and calculations emanating from the implementation of the Regulation of Energy Performance of Buildings Law L.142(I)/2006 and an accompanying Letter which shall also be granted by the Energy Service and in which the contribution of the forms of RES determined in paragraph 2a of this Mandate shall be certified, to all the energy needs of the development. There is a TABLE OF INCENTIVES AND CONDITIONS REGARDING THE USE OF RES providing more information.
The Town and Country Planning Law Order no. 2 of 2006 in accordance with Article 6 of the Law (Mandate 2_2006)	Provisions are as follows: 5.1 PV systems installed in the shell of buildings with a purpose to partially or completely cover the energy needs for the uses of the construction … A planning permit is required in order to add such facilities in existing buildings, unless the Planning Authority deems that the installation of PV systems is a subtask in buildings that have already obtained approval under the Town and Country Planning General Development Order. Applications in relation to such installations will be considered favourably, provided that they are harmoniously incorporated into the building and do not harm the microclimate in their surroundings

	and neighbouring facilities and developments (reflection and glare, local temperature rise, etc.). Additionally, guidelines will also apply for the aesthetic improvement of the built environment.

7 Specific building categories

7.1 Public buildings

Public buildings (new and existing) have to comply with the same energy performance requirements as private buildings. However, regarding NZEB requirements, all new buildings housing public authorities or which are their property shall be nearly zero-energy buildings from 1 January 2019.

7.1.1 Existing Cypriote legislation

Type of legislation	Short description
Draft on the Consolidation of the Streets and Buildings Regulations (StrBReg_Apr2015_EN)	It provides a definition: *"public building" means a building used or constructed or arranged for use, either ordinarily or occasionally, as a church, chapel, temple or other place of public worship, or as a hospital, public institution, college or school (not being merely a building so used), theatre, restaurant or coffee shop (the main hall of which covers an area not less than 100 square meters), hotel (with not less than eight bedrooms for guests and cubical content of not less than 1,400 cubic meters), public hall, hall for public concerts, public ball room, cabaret, public lecture room or public exhibition room, or as a place for public meetings of persons admitted thereto by ticket or otherwise, and whether on payment or not, or used or constructed or arranged for use, either ordinarily or occasionally, for any other public purpose;*
Number 210 (I) 2012 Law amending the regulation of Energy Performance of Buildings Law (L.210(1)_2012)	*(1) In buildings having a total useful floor area of more than five hundred square meters for which an energy performance certificate has been issued under subsection (1) of section 6 a and which are used by public authorities and are visited by the public, the energy performance of the building certificate shall be displayed in a prominent position.* *(2) In buildings having a total useful floor area of more than five hundred square meters for which an energy performance of the building certificate has been issued under subsection (1) of section 6 and which are visited by the public, the certificate shall be displayed in a prominent position.* *(4) For the purposes of subsection (1) and if the public authorities are housed in existing buildings, the energy performance calculations and the energy performance of building certificate issued, may be based on the actual annual energy consumed to meet the different needs associated with the typical use of this building."*
Number 210 (I) 2012 Law amending the Regulation of Energy Performance of Buildings Law (L.210(1)_2012)	It provides an update of the scope and requirements of the basic framework: for example, addresses cost-optimal levels, NZEB requirements: *5A (1) For purposes of implementing the provisions of this Law all new buildings shall be nearly zero-energy buildings as from 1 January 2021 while, as from 1 January 2019, all new buildings housing public authorities or which are their property shall be nearly zero-energy buildings.*

7.2 Buildings under monument protection – historic buildings

Although there is an exemption for historic buildings regarding energy performance obligations set by the legislation implementing the EPBD, energy efficiency should be considered voluntarily wherever possible.

7.2.1 Existing Cypriote legislation

Energy Performance Regulations – The Regulation of Streets and Buildings Law R.A.A 429/2006 (Energy PerfReg_2014)	**Exemptions for historic buildings - buildings under monument protection:** *(2) These Regulations shall not apply to the following:* *(a) Buildings which are declared to be listed buildings in accordance with the Town and Country Planning Act or ancient monuments in accordance with the Antiquities Law, if their compliance with the provisions would materially alter, in the judgment of the Town Planning Authority or the Director of the Antiquities Department respectively, their character.* *4.(2)(c) in the case of buildings that undergo major renovation, where it is not possible to upgrade energy performance, a technological and economic study must be forwarded electronically to the Energy Service in order to substantiate this fact, …*