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SCORE Sustainable Construction in Rural and Fragile Areas for Energy efficiency

med L'Europe en Méditerranée Europe in the Mediterranean

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BIO-CONSTRUCTION REGULATION IN SLOVENIA
Survey on MED level regulation – national level

INDEX:

Energy-efficient construction in Slovenia in the last few years is of intensive growth. Technological levels of energy-efficient new buildings are in good practice identified under the term "low energy", "passive« and now also has "plus energy" house.

The result of renovation the energy efficiency of buildings in parallel with effective new building is the increase in energy efficiency by a factor of 3 to 10. Slovenian legislation on energy efficiency in buildings has limited the maximum allowable building need for heating below 50 kWh/m^{2}a. More importantly, however, that the initial interest in more energy-efficient building is now much more emphasized by investors.

In the aspect of the development of demand and supply technologies differentiation for energy-efficient construction is among other influential factors of special interest also the introduction of financial incentives for low-energy construction. Slovenia has focused the policy of the Ministry of environment and financing mechanisms of Ekosklad (Ecofoundation) to stimulate energy efficient and sustainable building, for which has become widely recognized in public. In the first year the number of passive new buildings increased by passive factor of 10. A major impact of the project is the fact that in the general economic crisis energy-efficient construction has been increased, not decreased. The scope of the program of financial incentives on energy efficiency and renewable energy sources has been importantly expanded in this year also on the filed of the renovation of buildings. It also has made another step towards the promotion of passive multi-dwelling construction and promoting efficient individual housing construction with power consumption below 25 kWh/m^{2}a.

1. Increasing energy efficiency in building

1.1. The gradual tightening of legislation

In residential buildings is, concerning the precondition to provide living comfort, one of the key requirements ensuring the highest possible energy efficiency. In older residential buildings is also the use of thermal energy for heating buildings the largest item in the total annual energy use.
The most general way to ensure energy efficiency in a wider range of housing is to fix limits to the relevant legal regulations. Concerning the time value, and the state of the art related to the requirements relating to thermal insulation and energy efficiency, gradually escalating, with shifts usually quite pronounced and can reflect up to 30 percent tougher requirements on the previous state.
For example, development of requirements for residential buildings in Slovenia. The first important requirement relating to thermal insulation of building envelope has been given almost three decades ago in the standard JUS U.]5.600, regarding recent regulations and requirements for efficiency, it should be noted the expected adoption of the rules Regulations on energy efficiency in buildings (PURES-2):

- Buildings built before 1980, the typical energy-wasting buildings, built solid, but without effective systems of thermal protection. Average specific energy use for heating their value may exceed 150 kWh/m^2a and according to the current classification in the context of issuing energy performance of buildings could be classified in class F.
- In the period between 1980 and 2002, along the requirements of the standard and the wider application of thermal insulation has improve energy efficiency by approximately 30 percent - the need for heating was reduced to almost 100 kWh/m^2a. Buildings from this period could be placed in class E.
- The first major methodological shift in the actual evaluation of the energy efficiency of buildings has been the adoption of Regulations on thermal insulation and energy efficiency in buildings (PZTURES) in 2002. The method of limiting energy use for heating, valued in the unit heated floor area (the ratio of Qh / Au>), resulting from the calculation of annual energy balance and puts restrictions typically ranges from 60 to 80 kWh/m2a, whereby those newer buildings may have fall in energy class D. Over time, both requirements were tightened again to about 30 percent.
- A further step was the introduction of regulations PURES in 2008. This policy, together with the recast of 2010 has many other limitations that go beyond the requirements for maximum allowable energy use for heating (ratio QNH / Au). Among other things, the PURES treats also the building's energy needs for cooling (the ratio QNcI Au), the need for primary energy for the systems (the ratio QJ Au) and the introduction of a compulsory share of renewable energy sources in the supply of buildings. The renewed regulation provides for permissible restrictions of heat for the building at 50 kWh/m^2a, whereby

– such new construction may already be classified in the energy class B2 and C. Such a tightening of requirements in practice means that there should be effective for at least newly constructed residential building necessarily carried out in low-energy technology!

In the last period, the state of knowledge, services and techniques in residential construction is expected to exceed the statutory minimum energy performance requirements. Demand a wider range of investors during this time focusing on the achievement of low-energy classes B2 and B1, then the consumption of 15 to 35 kWh/m^{2}a. Meet the requirements of class A2 and A1, this is the use of the rank to 15 kWh/m^{2}a, as advocates for our current estimation less than a third of the demand for more energy-efficient housing.

1.2. Milestones in high efficiency energy-residential construction

Among the important milestones in the low-energy and passive housing construction in Slovenia certainly belongs the introduction of grants of financial incentives for newly constructed facilities. In 2008, on the market had been so necessary technology for the construction and implementation of systems and services design and implementation of high-efficiency buildings. There were necessary only a wider promotion and national financial incentive.
The project subsidizing energy-efficient construction began with the Ekosklad call in 2008. Key findings on the effects of construction after this call is taken from the literature [Praznik M., 2010, b]. The grant was allocated for building concerning the achieved energy efficiency class (building's energy requirements need for heating Qh <35 kWh/m^{2}a) and mainly used in building insulation materials (natural, mineral, synthetic) by the progressive scale.
The new construction is stone construction and has largely been insulated with materials of mineral origin, for a passive house is characterized the higher proportion has a assembly or construction of a wooden skeleton and that the main part of the heat-protected with insulation materials is of natural origin. This technique works primarily means much easier to achieve low thermal transfer assemblies while maintaining the small envelope thickness elements. The mere use of natural insulation materials is the result of the highest possible subsidy for the selection of materials. It notes also that the less efficient low-energy houses are often insulated with materials of synthetic origin, which reflects not only the savings of investors in the energy optimization phase of building envelope, but also on savings by choosing the most cost-effective solutions work. Due to the lower investment is also low financial incentive.

Financial incentives have caused an important shift in the scale-efficient housing construction, as it is in economic crisis has increased by a factor of 1O! In addition, incentives has been importantly contributed for further visibility of efficient construction and increased demand for it. On account of this the market of supply equipment and services has been promoted, with particular mention should be focused on improved attitude and knowledge of architects, engineers and contractors in this area. Also changed the preparation of projects for new construction - investors before the completion of the project documentation for passive or low-energy buildings with the designer

optimize the appropriate facility, so that, at the time of implementation there are no deviations from the solution, for ex. investment reasons. Among the findings for a group of buildings may be stated that the Slovenian low-energy and passive houses are still too large objects, since their average net heated area exceeding 200 m^2. This greatly affects the energy effects, since too large residential buildings due to changes in energy balance specifically are more wasteful than it would be otherwise. The average subsidy was about 70 € / m^2, which means the average incentive almost € 13,000 per facility. Maximum incentives for passive houses from natural materials amounted to € 25,000. The average subsidized building is four times more efficient than those required for construction during the project preparation.

The project subsidies in 2008-2009 the development hasn't stopped. In 2010, the program's financial incentives significantly extended to the rest of the field of housing, ie. the apartment building, where previously there was no progress has been demonstrated in family homes. Financial incentives were last year for the purchase of housing units in passive apartment blocks, amounting to € 250 / m^2. After publishing a call recorded a number of projects where the investors are building solutions on the cover and ventilation installations prilagali achieve the desired passive technology class. Accordingly, changes in legislation relating to energy efficiency were also tightened the conditions for applying family homes - an entry requirement for the energy efficiency was reduced by the value of Qh <35 to 25 kWh/m^2a.

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2. The use of renewable energy sources (RES) in the supply of buildings with energy and study the feasibility of alternative systems of energy supply of buildings

2.1. The history of strategies of introducing renewable energy sources in Slovenia

In Slovenia, a more detailed plan for implementing renewable energy sources is identified in the Resolution on the National Energy Program from year 2004. Deployment strategy for RES in the EU has undergone a modernization in 2008 with a new directive on the promotion of RES. In addition to electricity and transport, in the law was first included the segment 'heating and cooling'.

Although the States determine the share of renewable between segments by them, have the heating and cooling using RES certain advantages over the other two segments. Final energy use in buildings reach a shared one-third share, the majority of energy in buildings is converted for heating and cooling of buildings and hot water.

In Slovenia, according to a new directive there will be 25-percent share of energy from RES

ensured till 2010. Given that we are now lagging behind by almost 10 percentage points, the objective was only at the same time reducing energy end-use. The importance of reducing energy end-use illustrated example, the introduction of renewable energy for heating buildings and domestic hot water in three major buildings in the district heating system.
The share of buildings with heat supply from RES is significantly dependent on the quality of energy rehabilitation, as there will be increased by 9 percent compared with the present situation (buildings, constructed between 1953 and 1998) to 28 percent after rehabilitation according to the energy requirements of the Concerto and the 48 percent after the rehabilitation of buildings to the requirements of passive construction.
For the investor is important how big attention and what funds will invest in technology, efficiency and technology to exploit renewable energy sources. Therefore, the designer of the building has to acquaint investors with opportunities to exploit renewable energy sources, especially because modern buildings are not only more energy efficient, but there is significantly low also the required power for heating and cooling. This increases the economic viability of investments in renewable energy.

2.2. The requirements regarding the use of renewable energy in buildings, energy supply

In Slovenia, the requirements on the use of renewable energy in buildings, formally based on two documents:

- Regulations on energy efficiency in buildings (Official Journal 1. RS, 30. 6. 2010, page. 7840, PURES-2 2010) in
- Regulation on the methodology of construction and contents of the feasibility study of alternative systems of energy supply to buildings (Official Journal 1. RS, 8. 4. 2008, page. 3413).

A regulation on energy efficiency in buildings (Article 16) provides additional requirements:

- 25-percent share of RES in total final energy consumption to ensure the functioning of systems in the building, so heat and electricity for ventilation, heating, cooling, hot water and lighting. Doing so, the converted technology of RES should be integrated in the building or intended for supply energy. With the photovoltaic systems, intended for sale of electricity in the public service, does not satisfy this condition. The requirement of 25 per cent share of RES is valid for all new buildings and buildings that are renovated, if the reconstruction intervenes in at least 25 percent of the thermal envelope and the installation of systems for exploitation of renewable energy sources is technically feasible.
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- ensuring a minimum share of final energy consumption for heating, cooling and hot water, which is 25% for the installation of solar heating and cooling systems, 30% in the use of gaseous biomass, 50% in the use of solid biomass using heat or heat from the environment cogeneration of heat and electricity and 70% if the source of geothermal heat. Hot water heating is normally provided with the solar energy.

The investor can use of RES "avoid" if the building designer ensures that the annual heat required for heating buildings by 30 per cent lower than the threshold, which depends on the geometry of the compactness of the building and climate of the place where the building will be built.

The cost of investment in technologies for exploiting renewable energy sources, especially this applies to the manufacture and supply of heat reduces with the size of the devices. However, the decision about investment in these so-called alternative heating systems has to base on their economic viability. In order to assist investors in their decision was accepted in 2008 the Rules on the methodology of construction and contents of the feasibility study of alternative systems for the supply of buildings with energy. According to established rules must be to the investor of the facility with a useful surface area of more than 1000 m^2, along the construction of new buildings or upgrading the heating system in the building presented a separate study on the advisability of investment in the exploitation of RES.
Alternative systems for the supply of buildings with heat according to the agreement are:

- the decentralized systems for converting RES,
- the systems for combined heat and power or combined heat, cooling and power generation or cogeneration of heat and cold,
- district heating or cooling and
- Heat pump.

In order to assess investment performance, the manufacturer must prepare a study to investors at least two different proposals for the design, of which one proposal includes a proposal of an alternative system for supplying buildings with heat. Template(s) must(s) be determined to provide (s) the technical feasibility and cost of investment. In compiling the study the maker should take into account "local energy concept" of local communities. Proposals are evaluated by the indicator of energy efficiency (final energy consumption in kWh / year), indicators of environmental impact (CO_2 emissions in kg / year) and cost indicators - value of the investment, operating and maintenance costs (€ / kWh and € per m^2 floor area). Feasibility study is approved by the client and attached to the project for a building permit.

3. Construction Act and the efficient use of energy in buildings

3.1. The basic legislation relating to the built environment

The field in terms of the built environment covering essentially three laws: Law on Spatial Planning, Construction Act and the Act on the Construction Products.
Spatial Planning Act regulates spatial planning and related bodies, actions and measures, delimitates the jurisdiction of the State, local communities and future landscapes. It defines spatial planning documents and plans of the state and local communities (municipalities), spatial measures, which include restrictions on property rights (option county, expropriation, concentration), commands the gathering and organizing spatial data and sets conditions on the operation in spatial planning.

The law on the construction of the facilities is complementary law, which continues where the planning goes into the design, where we come from urban planning to construction. After defining the terms determined by the public interest that the state controls the building, defines the processes and participants in the construction, their roles and responsibilities, identify and arrange the issue of building permit, set up and edit two professional chambers - architects and engineers, determine the duties of the inspectorate and arrange for the smooth construction of the transition from the old to the new system.

Construction Products Act means the implementation of Council Directive from 21st of December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products (89/106/EEC). Thus represents a harmonized legislation. The law determines under what conditions should be the construction products placed on the construction market, if it concerns on the field that is regulated at European level as well as for cases where it refers to (yet) to the national field, which is not regulated by the harmonized technical specification. The law on spatial planning and Construction Act belong to the work of the Ministry of Environment and spatial planning. Construction Products Act was adopted in mid-2000, was prepared at the Ministry of Environment and Spatial Planning, and falls under the Ministry of Economy.

3.2. Construction Act and the essential requirements

As already mentioned, is the basis for regulating the construction of technical requirements set out in the Law on Construction (ZGO-1). This law already determines during the definition of terms that the building regulation are the technical regulations, which specify the essential requirements for certain types of facilities, conditions for the design, selected levels or classes of building products and materials that may be installed, and the methods of their installation, manner of

implementation of works, method of determining compliance with prescribed building built the essential requirements and other conditions and rules to ensure the security of the building throughout its life.

All constructed facilities must be consistent with the spatial planning documents, reliable and documented. The compliance with the spatial planning documents indicates that during the design and construction ensure adherence to the urban set, recorded in the current spatial planning documents, such as deviations from the borders of neighboring parcels, the size and orientation of objects, their size and design, particularly their intended use. Recording means that the post-construction facility has to be written in the national inventory.

For the building security from a technical point of view the ZGO-1 provides that the objects of its aim have to meet the following "essential requirements" which are further disaggregated by the building regulations:

- Mechanical resistance and stability (the planned construction does not cause failure, major malformations, damage to equipment and embedded parts, etc.).
- fire safety (facility will be constructed so that when fire is the supporting structure will maintain its fixed-term stability of the carrier to restrict the spread of fire to next buildings and to give people a quick evacuation, to rescuers a safety work).
- The hygiene and health protection and protection of the environment (not to leakage of toxic gases, dangerous particles, the emission of dangerous radiation, pollution and poisoning the soil, faulty elimination of waste and waste water, no moisture is present, lights working and living areas will be suitable).
- The use safety (in the building will not be excessive risk for slips, falls, burns, etc...)
- The protection against noise (the noise in the planned facility will be reduced to a level that will not threaten human health and allow them to rest and work, irrespective of whether the noise comes from the surrounding area from adjacent premises or caused by buildings devices).
- The energy saving and heat retention (for the operation and create a good indoor climate conditions in the facility will be used as little energy).

3.2.1. Building technical regulations and technical guidelines for building

Along with the preparation of the new law on construction has been intensive preparation of reforms supporting the construction of technical regulations, where the ultimate objective is creating as many technical requirements, as far as the essential requirements are, and with one regulation “covered” one essential requirement. Work is kind of a half way, as shown by the recent construction adopted technical regulations.

- The first essential requirement: Rules on the mechanical resistance and stability of buildings (OJ L RS, 101/05), which in our legal system establishes a group of standards Eurocodes
- The second essential requirements of the Rules of fire safety in buildings (OJ L RS, no. 31/04, 10/05, 83/05 and 14/07),
- The fourth essential requirement: Rules on requirements for free access, entry and use of public buildings and apartment buildings (OJ L RS, no. 97/03 and 77/09 0dL U.S.), Rules of the requirements for low-voltage electrical installations in buildings (Coll. L RS, no. 41/09), Regulations on protection of buildings against thunderbolt (OJ L RS, no. 09/28).
- The fifth essential requirement: Rules on the sound insulation of buildings (OJ L RS, no. 14/99) and
- The sixth essential requirement: Regulations concerning energy efficiency in buildings (OJ L RS, no. 52/10).

Some of the regulations are supported by technical guidelines. These are a special document, which is defined in the ZGO-1, and before 2003, Slovenia wasn't known. In the second article of the Law it is defined as a document to which a particular type of facility arranged more precise definition of essential requirements, the conditions for the design, selected levels or classes of building products and materials that may be installed, and the methods of their installation and operation of building with a meaning to ensure the reliability of the structure throughout its lifetime, where appropriate, as well as the procedures by which to determine whether such requirements are met, and the use of Slovenian standards based on EU agreed and approved texts "CEN-standards" . Who and how technical guidelines for building (TSG) prepare is set out in paragraph 11 and 12 Article ZGO-1.

With the adoption of the ZGO-1 was first given the opportunity to develop technical guidance for construction. Thus, the possibility of preparing the document was given which is the link between regulations and standards - from the first minister takes responsibility for its preparation, from the other takes the technical content. As a support act was adopted legislation that determines the form and to some extent the contents of the technical guidelines for the construction, because the law leaves open the possibility that the guideline based on ZGO-1 prepare also another department and adopted by the minister of planning.

The new law is the first time enabled the preparation of technical regulations which, by their content is not wholly prescriptive, stating that the building (technical) regulations may provide that it shall be presumed that a particular item complies with the requirements of building regulations if it complies with the requirements of standards or technical guidelines.
Thus, since 2003 the regulations have been prepared in performances way according to the rule. This means that the text of the regulation, published in the Official Journal does not contain detailed technical requirements, the rule has no equations, graphs, drawings that were in the old technical rules expected. In the case of a new Regulation on energy efficiency in buildings performances record of requirements means for example, that the record is technically

somewhat indefinite: "The building should be designed and constructed so that the energy is properly oriented to the relationship between the surface heat of the building envelope and its preconditioned holding favorable views of the energy, that the spaces in the building are energy-optimal distributed and that materials and construction elements and the entire outer surface of the building facilitate the effective management of energy flows".

3.2.2. Responsibilities of participants in the construction

Since regulations on energy efficiency in buildings, like other laws that may not provide for new entrants to build on special powers it is not speech. This means that ensuring compliance of the sixth essential requirements assume direct responsibility of designers, and indirectly responsible project manager. Since the highly interdisciplinary, it will be typically divided between them the architect and mechanical engineer contractor, in more complex cases, between the designer of electrical installations. Often happens that teams of responsible designers hire expert of the subject, which, because of specific skills may not even have the status of the responsible developer. Construction Act allows such cooperation, while it remains clear that the responsibility for the proper design can not switch to unlicensed outside collaborator, but the solution in the framework of its work to assume one of the designers responsible, probably an architect.
The verification of compliance with the spatial planning documents and compliance with the essential requirements or the requirements imposed by building regulations in Slovenia merged into a single permit - building permit. Administrative authority in issuing this permit does not check again whether the designer ensure the requirements of building regulations, but decided on the basis of statements of licensed architect that all requirements are met. For those objects for which a review must be designated in addition to the designer statement has to be also the statement of the auditors. In contrast, the administrative authorities of project data verify compliance with the planned construction of a spatial act.

3.3. Efficient energy use and building permit

Like most recent technical regulations and construction regulations on energy efficiency in buildings (PURES -2) provides that the fulfillment of the requirements of the regulations have to show in a special elaborates and statements. Since policy is itself written in the performance form are concrete technical requirements described in the accompanying technical guidelines for the construction TSG-1-004: 2010 Energy Efficiency. In contrast with other technical guidelines, the mandatory use of these guidelines - the requirements of regulations can not prove otherwise, as if considering the provisions of the technical guidelines for building. Exemption is provided because the EPBD Directive specifically requires that the calculation methodology used, which is enshrined in the European EN-standards based on them, the methodology set out in one of the chapters of the guidelines.

Prescribed elaborate has a special title, "Elaborate of building physics in the field of energy efficiency in buildings or shorter Elaborate HOURS."
The content is provided in the second paragraph of Article 17 PURES-2 and must have:

1. input data
2. identifying the methods and default values
3. calculations from which it must be clear that the designed building construction and building as a whole meet the requirements of this Regulation,
4. interim results for the elements of energy efficiency in the 9. to 14. and 16. hereof,
5. annual primary energy necessary for the functioning of the building
6. CO_2 emissions resulting from the operation of systems in the building, and
7. indicators of the annual consumption of primary energy and CO_2 indicators.

The rule refers in the same article with explicit (mandatory) method on the standard EN 15 603, thus ensuring comparability of European energy performance of our buildings.
Rules on the project file in the project file for building permits in the 25th Article as a mandatory component specifically lists the "Elaborate physics building, implemented in accordance with regulations on thermal insulation and energy efficiency in buildings."
The calculation summaries from the elaborate necessary for the purposes of the issuance of building and operating permits also download in the "Statement of Energy Performance of Buildings", as defined in the 19th Article of PURES-2. During the preparation stage of the project to obtain a building permit, the statement inserted in leading the project folder to obtain a building permit for the location data and obtained copies of the consents and approvals for the connection.
The another paragraph of the 19th Article has to be specially emphases, which states that after the end of construction to determine the properties of the building again and once again fill in the form "Statement." In this statement, which is a mandatory part of the proof of the reliability of installation (before technical review is carried out), it must be demonstrated to meet the requirements of the regulations, but it is not necessary to show compliance with a design characteristics described in the phase of the project for building permission. This provision gives reasonable in substance and legal basis of the fact that new and reconstructed buildings energy performance certificates in the preparation of the statement referred to simply use the data and not have to acquire, which will mean less cost for the investor and facilitate the acquisition of energy performance certificates.

4. Transfer of the Directive on Energy efficiency of Buildings in Energy Act

4.1. Energy certificate for buildings

4.1.1. Introduction

Energy efficiency and promoting renewable energy is an integral part of energy policy. Economically justifiable measures to harness the potential of energy savings and renewable energy strategy for the implementation of energy policy as important as ensuring an adequate supply of energy from renewable sources.
The energy efficiency and renewable energy are supported by the state with education, information and public awareness of energy advice to energy audits and promotion of local energy concepts, the establishment of standards and technical regulations, fiscal measures and financial and other incentives.
A more important measure for promoting efficient use of renewable energy in buildings and building are undoubtedly energy performance certificates. As required by the European Union has been decreed by Directive on Energy Performance of Buildings (2002/91/EC) (EPBD).
In Slovenia, the energy certification system is prescribed in the Energy Act - there are given conditions, rules and manner of issuing and producing energy performance certificates. Cards are specifically prescribed by the Rules on the methodology of construction and the granting of certificates of buildings and the Rules of training, licenses and register licenses of independent experts to produce energy performance certificates. With the provisions in the mentioned Act and with the two policies the requirements of the Directive EPBD were transferred into the Slovenian legal order.

4.1.2. Mandatory energy performance certificate

For newly constructed building, the investor must obtain an energy performance certificate before submitting the application for an operating permit in accordance with regulations governing construction. New-building energy performance certificate must reflect the requirements of the regulation governing energy efficiency in buildings. This now means compliance with the Regulation on energy efficiency in buildings. Energy performance certificate is a mandatory component of the project work undertaken.
The requirements for issuing energy performance certificates and the statement on energy efficiency are related on:

- buildings that were declared a monument under the regulations on the protection of cultural heritage, if they meet the requirements for energy efficiency regulations on construction would unacceptably alter their character or appearance
- buildings used for ceremony activities or religious ceremony; temporarily buldings with a planned time of two years or less, industrial buildings, workshop halls and non-residential agricultural buildings, residential buildings intended to be used less than four months per year;
- individual buildings or parts of buildings with a useful floor area of less than 50 m^2.

Quality of energy certification of buildings is provided so that it can be made only by authorized independent experts of the Ministry at the request of customers. In the implemenation of energy certification of buildings the independent experts have to consider the methodology prescribed by the Rules on energy efficiency in buildings (OJ L RS. 52/10).

Building energy performance certificate contains the reference value, such as applicable standards and benchmarks to enable comparison and evaluation of building energy performance. The certificates are required to be accompanied by recommendations for cost-effective energy efficiency improvements, except in the case of new buildings and rented by the owner.

The validity of energy performance is provided by law for 10 years. If the energy efficiency of buildings while change may costumer requests for a new energy performance certificate before the expiry of 10 years.

Especially to be noted that each building or part of the building can not have simultaneously two or more valid energy performance certificate.

The entire system of energy performance certificates will be organized in a transparent register of energy performance certificates, which will be led by the Ministry of Economy. The register will be enter particulars of the building or part of the building, information on energy performance data and information about the issuer of the independent expert, who has produced an energy performance certificate (ie the personal name of the expert and the number and date of issue of license). The register of energy performance certificates will be publicly visible and is expected to be linked with data from the building cadastre.

The system will be designed so that the energy performance certificate will be simultaneously edited and registered in the registry of the energy certificates.

A more detailed content, format and methodology for issuing energy performance certificates and data content, the method of keeping the register of energy performance certificates and how to apply the energy performance certificate issued for registration in the register of energy performance certificates are prescribed by the Rules on the methodology of construction and the granting of certificates of buildings and the Rules of the training, licensing and register of licenses of independent experts to produce energy performance certificates.

EPBD directive has decreed that in buildings with a total useful floor area over 1000 m^2 of which are owned by the state or local government and used by government agencies or local government authorities and organizations providing public services to many people and therefore they often visited, the building manager to install a valid energy performance certificate in a prominent position. In addition, the ranges of recommended and current indoor air temperatures and other

relevant climatic factors can be visibly, if applicable. The described application was later transferred to the Energy Law.
June 2010 adopted a recast Directive on Energy Performance of Buildings (2010/31/EU) (renewed EPBD), which is lower limit of 1000 m^2 to 500 m^2, and after five years on 250 m^2. With the implementation of the EPBD recast and the introduction of changes in the Energy Act, the number of issued cards will be increased.

4.1.3. Publishers and producers of energy performance certificates

Energy performance certificates authorized by law are issued by legal or natural persons who are named as contenders. The authorization to issue energy performance certificates will be awarded by the Ministry of Economy after a public procurement and will be granted as a public authority. It can be obtained by legal or natural person to issue energy performance certificates, if it is in the register or in the Business Register of Slovenia entered the business of designing or technical advice, and if has the employee to perform the tasks at least one independent expert or a work contract will guarantee the implementation of these tasks.
The tasks related to making energy performance certificates will be carried out by individuals with a valid license to perform these tasks by law appointed independent experts.
The issuers are required by law to issue energy performance certificate after every request for its issuance in accordance with the Energy Act. Energy performance contracting authority has to give to independent expert all necessary information and project and technical documentation in accordance with building regulations and allow him to visit the building to allow entry to the premises.
In the performing its tasks independent experts have to follow the rules on the issue of energy certificates and duties in accordance with professional rules, and independent from the influence of parties or other persons and the employer's instructions.
The independent expert may not produce energy performance certificates, if any one of the reasons for exclusion in accordance with the rules governing general administrative procedure. This means that an employee of the client or customer energy certificates, or is he in any other relationship under which it provides services for remuneration or work in a subsidiary relationship in accordance with the provisions of the Income Tax.
The independent expert has to deliver to the contracting party or a review subscriber a written statement, that there is no circumstances that would prevent them from producing energy performance certificates.
The government will order a price list with the highest price for the service of issuing energy performance certificates by independent experts in accordance with the Energy Act.

4.2. Feasibility studies of alternative systems of energy supply of buildings

Energy Act is consistent with the requirement 5th Articles of EPBD with a novel in November 2006 in his 68th but stipulates that the construction of new buildings with a useful floor area exceeding 1000 m^2, and the reconstruction of buildings with a useful floor area exceeding 1000 m^2 and replaces the energy supply system, should produce a feasibility study of alternative systems (AES) for supplying buildings with energy. In this study the technical, functional, environmental and economic feasibility of alternative systems of energy supply.
Under the terms of the Energy Act as alternative systems are:
– Decentralized systems based on renewable energy sources;
– cogeneration;
– district or block heating or cooling, if available;
– heat pump.

Alternative Energy Systems, as indicated by the EPBD directive, and in turn determines the Energy Act, include both systems of renewable energy systems, combined heat and power with high efficiency.
The Act states that the feasibility study for AES is mandatory component of the project to obtain a building permit in accordance with building regulations. The methodology for the construction and required contents of the feasibility study from April 2008 are prescribed by the Rules on the feasibility studies of AES.
Some buildings are exempt from this requirement, namely:

- –building, for which is a way of supply set out in the local energy concept;
- –buildings , for which is the way of energy supply provided by the regulation of 36th Article EZ (ie when the method for heating in industrial plants, if feasible from environmental, energy and technological aspects and the individual delineated areas with local communities or individual thereby provide a more intelligent use of energy);
- –buildings for ceremonial purposes, monuments, temporary buildings for shorter use and building for occasional use (buildings that are otherwise excluded from the directive EPBD);
- –buildings for which the regulation of local community defines the mandatory connection to a particular type of energy networks and the use of certain types of fuel

Renovated EPBD directive has to some of the mandatory feasibility study for AES brought stricter requirements, which will have to be transmitted into legal order. The threshold of useful floor area of 1000 m2 for the compulsory installation of a feasibility assessment of alternative energy systems is removed. The study must be after the transfer these requirements in our legislation (within two years) made for any new construction or major renovation.
The final decision on the selection system for the building's energy supply is still in the hands of the investor, however, this taking into account the regulations on energy efficiency, which provides 25-percent share of final energy for the functioning of the building from renewable sources in final

decision is also influenced by various incentive programs, the assessment of costs throughout the life cycle of building and environmental awareness of the investor.

5. Energy efficiency of buildings in terms of the directive on energy efficiency and energy services

5.1. Introduction

Slovenia as a member of the European Union recognizes the great importance of achieving the strategic objectives of the EU on energy and reducing greenhouse gas (GHG) emissions. Increasing end-use efficiency in all sectors is an important potential for reducing GHG emissions; the EU contribution of EUR 40 per cent of total GHG emissions reductions needed to meet commitments under the Kyoto Protocol. In addition, the increase in energy efficiency also contributes to increased energy security, increased economic competitiveness, regional development, employment, etc. In this landmark meeting of the European Council in March 2007, at which they were adopted an ambitious EU targets for 2020 of greenhouse gas emissions, increase use of renewable energy sources and greater energy efficiency.
The EU has so far adopted a number of directives and regulations which are directly or indirectly related to energy efficiency. The comprehensive Directive in this area is undoubtedly the Directive 2006/32/EC on energy end use efficiency and energy services, which was adopted in December 2005. Beside this directive were adopted: Directive 2010/31/EU on Energy efficiency of Buildings (renovation) and Directive 2010/30/EU on consumption of energy and other resources by labeling and standard product information for products related to energy (renovation), Directive on energy labeling of household appliances and various other products, Directive 2009/125/EC on establishing a framework for the setting of ecodesign of energy-related (renovation), Directive on the requirements for minimum energy efficiency products and appliances, and now based Directive 2009/125/EC of the Commission issued a regulation on the requirements for ecodesign. In addition to this energy efficiency is extremely important, Directive 2004/8/EC on the promotion of combined heat and power based on useful heat demand in the internal energy market.

5.2. Amending the Energy Act

Directive 2006/32/EC was transmitted into our legal system primarily through changes of the Energy Act (hereinafter: EA). The second most important rule is the Green Public Procurement, which is being prepared. Below we present the main substantive amendments to the EA.

5.2.1. The obligation for energy suppliers to provide energy savings to end customers

Act Amending the Energy Act (hereinafter: the EA-C), as amended 66th b and 67th Article of EA for system operators and suppliers of electricity, heat from the distribution system, and gaseous and liquid fuels to end-customers (hereinafter taxpayers) introduces the obligation to provide energy savings to end customers. This obligation shall be to collect funds on the basis of contribution to improving the efficiency of electricity and add to the price of other energy products and the preparation and implementation of programs to improve energy efficiency. Smaller energy suppliers and suppliers of liquid fuel as propellant law requires only the collection of funds, programs to improve energy efficiency is instead of them carried out by the Eco Fund, the Slovenian Environmental Public Fund (hereinafter Eco Fund).

With this legal provision is in the implementation of measures to improve energy efficiency and energy services to final customers and energy customers include major new players – energy suppliers to final customers, which are directly related to the business, know the characteristics of their energy and have a professional staff. This will ensure that the part of measures to increase energy efficiency will implement without burdening the state budget.

The government orders to taxpayers and Eco Fund objects for energy savings, the type of energy services and measures, the scope and mandatory components of programming and content of the reports on the programs. The Government shall determine the amount of contributions to electricity and a price premium for the remaining energy products.

Taxpayers shall establish programs for energy efficiency improvement, certified by the Eco Fund. The methods for determining the energy savings achieved by individual measures to improve energy efficiency are prescribed by the minister responsible for energy.

The financial resources to implement programs to increase energy efficiency provide the final consumers of electricity with the contribution to increase the efficiency of electricity use. The financial resources to implement programs to increase the efficiency of heat distribution networks, gas and liquid fuels are provided by all end-user customers by adding to the cost of fuel for heat and increase energy efficiency.

In the relation to the obligation for energy suppliers to provide energy savings to end customers, as the Decree on the provision of energy savings to end customers and the Rules of the methods for determining energy savings to end customers were decreed.

5.2.2. The installation of heat meters and cost sharing for the heat to several buildings that are heated block

EA-C with amendments of 93rd EA Article defines that owner of buildings if the heat supplier supplies to multiple buildings simultaneously from a common substation or if more building use heating boiler has to provide heat measurement of each building.
The costs for the use of heat, which are determined, based on measurements of total heat substation measurements or total fuel consumed in the boiler room, are divided into individual buildings in the ratio of measured heat consumption of individual buildings.
With the installation of heat meters and appropriate sharing of heat costs is ensured that the building owners pay the heat cost per individual buildings according to actual consumption. This has stimulated building owners to implement measures to reduce heat consumption of buildings.

5.2.3. Mandatory installation of dividers and the sharing of costs and billing of heat according to actual consumption in buildings with several individual parts

EA-C with changes in 94th Article EA introduces compulsory distribution and billing of heating costs for actual use in apartment buildings and other buildings with at least four individual parts, which is supplied with heat from a common heating system. Costs for heating and hot water are accounted for largely on the basis of actual consumption of heat, determined on the basis of measuring devices, which allow indication of the actual heat consumption of each part of the building. Sharing and cost accounts for the heat is conducted under the Rules issued by the minister responsible for energy. The deadline for the installation of measuring devices and the introduction of the compulsory division, accounting for actual consumption of heat was 1st of October 2011.
With the costing for actual use, users will pay the heat cost according to actual consumption and will be motivated to tailor the heating use and hot water to their needs and implement measures to reduce consumption and energy costs. We expect that with this instrument without major investments will be floor owners' heat consumption of buildings in this segment decreased by 20 to 30 percent.

5.2.4. Energy accounting in public buildings

The Act Amending of the Energy Act (EA-D) introduces in the EA a new 66th c Article, which determines that for the public buildings with a useful floor area over 500 m^2 the government adopts the annual energy efficiency targets. For those building managers need to keep building energy accounting, which includes information on types, prices and quantities of energy

consumed. The rules on energy accounting in public buildings, prescribed by the minister responsible for energy, are in preparation.
With the implementation of this provision is expected that the monitoring and control energy consumption in public buildings without any major investments will decrease by 10 to 15 percent.

5.3. The Action Plan for Energy Efficiency

National Action Plan for Energy Efficiency for the period 2008-2016 (AP-EE) has been developed based on 14th Article of Directive 2006/32/EC. The Slovenian Government has accepted it in January 2008. This is the first of three action plans. The second action plan should be forwarded to the Commission by the end of June 2011.
With AP-EE will Slovenia during the 2008-2016 achieve cumulative savings of at least 9 percent over the baseline end-use or at least 4261 GWh, in the period 2008-2010 will be achieved savings of 1184 GWh (2.5 percent of baseline consumption). Actually the bigger cumulative savings will be achieved, as in the AP-EE several EE measures will be implemented, mainly horizontal, which effects of the lack of methods not yet be assessed. By implementing AP-EE will be achieved CO_2 reducing emissions by 1147 kt. The estimated energy savings in the public sector after the AP-EE are 496 GWh hours; consequently, in this sector since 2016 at least 22 million / year will be lower energy costs at the current level of energy prices. For the base end use of energy was chosen period 2001 - 2005 and amounted 47,349 GWh per year.
AP-EE based on the implementation of the 29 sectoral, multi-sectoral and horizontal instruments that will ensure the implementation of the measures proposed in the Directive 2006/32/EC. Included are measures that reduce the final energy consumption (eg actions on the building envelope, replacement boiler, refrigerator replacement, installation of the solar energy, etc.) or reducing the consumption of primary energy (combined heat and power, heat pumps). These instruments are removing many obstacles: institutional, legislative, administrative, economic, financial, human resources, the obstacles to the awareness of the others.
In AP-EE is foreseen a range of instruments relating to residential buildings and buildings in the tertiary sector. The main instruments for building are:

- financial incentives for energy-efficient renovation and sustainable construction of buildings, energy efficient heating and ventilation systems and efficient use of electricity, including the special scheme for low-income households,
- exemption from environmental taxes on air pollution from $C0_2$
- system favorable feed-in tariffs for electricity produced from renewable energy sources or combined heat and power cogeneration
- energy contracts
- regulations for energy efficiency in buildings
- regulations for energy efficiency in products
- green public procurement (purchase of equipment and vehicles, construction, purchase or rent energy-efficient buildings)
- monitor and control energy consumption in public buildings

- awareness, information, promotion and training and demonstration projects,
- informing consumers on energy use, transparent accounting and other information - this is carried out by the energy supply
- counseling network for households EN SVET,
- Co-financing the implementation of energy audits.

To implement AP-EE will be needed 380 million euros in public funds. In these funds are included incentives for investment ranging from 15 to 40 percent. Estimated total investment costs without investing in transport account for 999 million euros, the total value of AP-EE is around 1097 million.

5.4. Financial incentives for investments in energy efficiency and renewable energy sources for buildings

5.4.1. Financial incentives from the development priorities of the Sustainable Energy use

The development priority Sustainable energy use (SEU) is part of the Operational Programme for the Development of environment and transport infrastructure for the period 2007-2013, whose implementation is 85 percent financed by the European Cohesion Fund. The purpose of the implementation of the SEU is to increase energy efficiency in industry, service and public sectors and significantly increasing the volume of environmentally friendly energy production from renewable sources and cogeneration systems, heat and power (CHP). The Implementation of SEU will contribute a significant share of Slovenia to meet the commitments to reduce greenhouse gas emissions under the Kyoto Protocol and the objectives arising from EU directives.

The main priority guidelines of SEU are:

- improving energy and sustainable construction of buildings in the public sector: energy-efficient sanitation of buildings, construction of low energy and passive buildings, the use of modern technologies for heating, ventilation and air conditioning of buildings and environmentally friendly decentralized energy supply systems with emphasis on renewable energy sources and cogeneration,
- efficient use of electricity: implementation of measures to reduce electricity consumption in industry and public service sectors,
- innovative systems for local energy supply: the larger individual systems and remote and joint systems to produce heat and electricity, with an emphasis on renewable energy and cogeneration,
- Demonstration projects, information and energy advice: to support the rest of the priority directions.

The total value of SEU, which is available for co-investment, is 188 million. Expected sources of funding are: the Cohesion Fund, the state budget and private sources. The main part of SEU is occupied by the energy sanitation and sustainable construction of buildings in the public sector, for which will be spent around 96 million.

5.4.2. The non-refundable financial incentives of Eco Fund for residential buildings

In 2010, the Eco Fund issued two calls for grant financial incentives for citizens to residential buildings totaling 15.5 million euros. These funds are provided through the collection of contribution to improving the efficiency of electricity and heat addition to the price or the price of fuels to increase energy efficiency, paid by final customers in accordance with the Regulation on the provision of energy savings to end customers (OJ 1. RS No. 114/09).

Public call for citizens of non-refundable financial incentives for new investments in renewable energy and greater energy efficiency in residential buildings.

The subject of the call, which was published in the Official Journal RS, No. 40/10, are non-refundable financial incentives for new investments in residential buildings, namely:

- installation of solar heating system
- installation of combustion plant for central heating using wood biomass
- installation of heat pumps for hot water and / or central heating
- installation of central heating system in the renovation of residential buildings connected to the district heating with a renewable energy source,
- replacement of external doors and windows in the renovation of residential buildings
- thermal insulation of the facades, roof or attic renovation
- one-or two-dwelling buildings
- installation of ventilation air heat recovery,
- construction or purchase of low energy and passive buildings
- Purchase of the residential units in an apartment building constructed or renovated in passive energy class.

Citizens can apply to call new investments for which the operator is issued an invoice, which will be made after submission of grant applications for financial incentives.

On this call is available 13.72 million. Private individual can apply in accordance with the terms of calls.

For the most investments, the amount of non-refundable financial incentives is total 25 percent of the recognized cost of investment. In addition, incentives are also limited in euros. For the construction or purchase of low energy and passive buildings is total maximum incentive of EUR 125 per square meter of net free area, for the purchase of housing units in an apartment building constructed or renovated in passive energy class 250 euros per square meter.

Public call for citizens of non-refundable financial incentives for new investments in renewable

energy and greater energy efficiency apartment buildings

The subject of the call, which was published in the Official Journal of RS, No. 40/10 is non-refundable financial incentives for new investment in buildings with three or more dwellings, including:

- Thermal insulation of the facades, roofs and attics in the renovation of residential buildings,
- replacement of external doors and windows in the hall,
- combustion installation for central heating using wood biomass
- installation of the thermostatic valves and hydraulic balancing of heating systems;
- cost-sharing system for heat according to actual consumption.

Citizens can apply to call new investments for which the operator is issued an invoice, which will be made after submission of grant applications for financial incentives.
On this call is available 1.78 million. Private individual can apply in accordance with the terms of calls.
For the most investments, the amount of non-refundable financial incentives is total 25 percent of the recognized cost of investment. In addition, incentives are also limited in euros. The amount of financial incentives for the socially weak citizens who enclose adequate proof is total 100 percent deductible expenses of the investment. This is a new incentive in the allocation of the Eco Fund. It is also socially weak households to be included in the process of reconstruction of buildings, which aims to reduce heating costs and improving housing conditions.

5.4.3. Eco Fund favorable loans for energy sanitation of buildings

In 2010, the Eco Fund issued two calls for favorable loans for environmental investments, especially for individuals and legal entities totaling 32 million euros.

The public call for financing environmental investment for citizens

The subject of the call, which was published in the Official Journal of RS, No. 7 / 10, is favorable loans for environmental investments for citizens. In relation to investments in renewable energy and energy efficiency of buildings are available loans for:

- installation of modern equipment and systems for space heating or hot water
- use of renewable sources of energy for space heating or hot water
- modern devices to generate electricity
- reduce heat loss in the renovation of residential buildings
- The construction of residential buildings in low-energy or passive technology.

The amount of funds under this call is EUR 12 million. The annual rate is 3.2, or 3.9 percent, depending on the duration of the repayment period, which is max. 10 years. Credit may be granted

to the recognized cost of investment and is maximum of 20,000 euros, in some cases up to 40,000 euros.

The call has been valid until the end of calls or no later than 28th of January 2011. It is available on: http://www.ekosklad.silhtml/razpisilmain.html.

Public call for corporate credit investments, private entrepreneurs and private person

The subject of the call, which was published in the Official Journal RS, No. 29/10, it is advantageous corporate lending for private entrepreneurs and private environmental investment. In relation to investments in renewable energy and energy efficiency of buildings are available loans for:

- installation or reconstruction of systems and equipment for space heating and cooling and hot water as the primary energy source using renewable energy sources
- construction or reconstruction of facilities for the production of electricity from renewable energy sources
- construction or reconstruction of facilities for heat and electricity from renewable sources, fossil fuels or a combination of fossil fuels and renewable or alternative fuels
- energy efficiency measures in manufacturing, commercial and public facilities
- renovation of lighting
- integrated energy recovery facilities in low-energy technology
- Construction of new facilities in low-energy or passive technology.

The amount of funds under this call is EUR 20 million. The minimum annual interest rate for loans is three-month Euribor + 1.5%. The repayment period is shorter or equal to the investment and repayment period can not exceed 15 years with included moratorium, which can be up to one year. Credit may be granted up to 90 percent of the recognized cost of investment and can not exceed two million.

The call was open till the use of sources no later than 29th of December 2010 and is available at: http://www.ekosklad.silhtrnl/razpisilmain.html.

6. Regulations on energy efficiency in buildings 2010 (PURES-2)

6.1. Platform

Ministry of Environment and Spatial Planning for the renovation of the Rules PURES 2008 decided on the basis of the decision of the Expert Council for energy efficiency, adopted in May 2009. Expert board has determined that:

- Due foreseen dynamics of the adoption of the revised Directive on the Energy Performance of Buildings (2010/31/EU) (EPBD recast) start the preparation of new regulations on energy efficiency in buildings
- Has to be ensured that the Regulation on the methodology of construction and the granting of certificates of buildings and the Regulation on energy efficiency in buildings use the same calculation methodology
- Has to be in national methodology use the European standards, which is or may be the result of a mandate issued in accordance with the Directive on Energy Performance of Buildings (EPBD CEN-standards)
- until the new or revised policy that takes account of the EPBD recast extended coexistence regulations PTZURES 2002 and 2008

6.2. Directive EPBD and revised EPBD

Crucial in the preparation of the revised Rules PURES-2 in 2010 were the EU policies and Slovenia to the EU climate and energy area. Such requirements for the construction of new buildings and major renovation of buildings have been specifically laid down in Directive EPBD and its revised version - revised EPBD, which was prepared at the same time as PURES-2 in 2010 and was adopted on 18 June 2010.

The renewed EPBD takes into account the "3 x 20% by 2020" of the European climate and environmental policy, even in buildings required a significant contribution to the 20-percent reduction in CO_2 emissions to 20 per cent increase energy efficiency (EE) and the 20-percent share of renewable energy sources (RES) in the primary energy balance. The essence of the revised EPBD is that seeks to enhance the effects of the original directive of 2002. The European Commission does note that the transfer took place late EPBD directive, that directive is unfortunately not capture all the buildings with the potential to provide a comparison between the buildings is not possible that there was a variety of computational methods for determining the energy and the minimum requirements were not always cost-effective. In the building is therefore necessary to reduce energy consumption, reduce CO_2 emissions, increase energy efficiency and increased use of renewable resources, thus revised Directive EPBD also contribute to improving security of energy supply, promoting technological development, create jobs and promote regional development.

6.3. Features of PURES-2 2010

The regulations on energy efficiency in buildings PURES-2 2010 was adopted on 30 June 2010 and entered into force on 1st July 2010. From that date has expired validity of the two previous policies, PTZURES 2002 and PURES 2008, both of which could be used for the preparation of project documentation for building permit until 31 December 2010.

The essential novelty of the rules comparing the new and the old one is in its structure, because the wording of the regulations is in the spirit of performance legislation. This indicates the key, overarching requirements that must meet energy-efficient building, and provides principles that should be considered in the design. The regulations also include technical guidelines for the construction TSG-1-004 Energy efficiency, which provides building measures and solutions to meet the minimum requirements of these Rules and provides the methodology for calculating the energy performance of buildings. The use of technical guidelines is mandatory.

6.4. Minimum requirements of PURES-2 2010

Rules PURES-2 2010 and technical guidance for the construction TSG-1-004 Energy efficiency in our construction law in the spirit of the revised EPBD redefine the minimum requirements for new construction and major renovations. PURES-2 2010 provides the design of the building and envelope with the principles of bioclimatic building design, so the need for heating and now also cooling building is minimized. It is obligated to provide 25 percent of total final energy consumption in buildings with renewable energy sources, while they are also new, simplified ways of meeting these requirements, linked to specific sources of renewable energy sources. For new public buildings is requires that there must be energy performance 10 percent better than the other.

According to the new building will be built in the averaged V-values for the outer wall about 0.2 W / m^2K (maximum value Vmax is 0.28 W/m^2K, but is still subject to strict limits for the coefficient of specific transmission heat loss H'T). Heat required for heating will have to be by the end of 2014 less than approximately 30 to 50 kWh/m^2 (for blocks smaller form factors (up to compact family houses in central Slovenia, ro from 0.3 to 0.6), since 2015 however, this limit will be reduced to the indicative 20 to 40 kWh/m^2a. In practice, we can expect the design slightly better values. The necessary cool for cooling residential buildings is limited too, at 50 kWh/m^2a after 2015 (70 kWh/m^2a to end of 2014). Maximum annual primary energy for the functioning of the building will be between 170 and 200 kWk/m^2a (as with the above requirements is also dependent on the location and shape of the building).

Under the new system will need to improve the thermal insulation of the building envelope, for example, in classical thermal systems installed on the outer wall between 16 and 20 cm of thermal insulation, triple glazing is not mandatory, but to achieve better energy class A or B energy performance is necessary, the same with mechanical ventilation with heat recovery air discarded.

The rule also prescribes more stringent requirements for the heating, ventilation, air conditioning and hot water. Under the new plan should be low-temperature heating and hot water usually prepared with solar energy.

6.5. Performance requirements of the regulations

The novelty rules is that, contrary to the current regulations provides performance series of requirements which supplement the details of the respective technical guidelines which must be applied. During performance requirements of new rules should be noted:

- **Boundary conditions**: In order to ensure efficient use of energy in the building should take account of its life, purpose, characteristics of external and internal environment and the materials, systems and energy sources (RES).
- **Architectural design**: The architectural design of buildings should respect the principles of bioclimatic building design.
- **Thermal protection**: thermal protection of buildings should be building-physical proper place; in particular it needs to avoid thermal bridges in the envelope.
- **Heating / cooling**: Devices and systems for heating and cooling should ensure thermal comfort in the most adverse circumstances, while to design energy-efficient components.
- **Cooling buildings**: Overheating of the building should be prevented by passive construction elements for shading, if that is not enough has to be provided night cooling or ventilation and alternatives. Only if these measures are insufficient, it may engineer the system to cool the building in accordance with the principles of energy efficiency of the system.
- **Ventilation**: Mechanical ventilation is necessary when the natural is not sufficient to achieve indoor air quality. The ventilation system must meet the requirements for the energy efficiency of the system and its components. Mechanical or hybrid systems should provide efficient heat recovery air. (Installation of mechanical ventilation with heat recovery air discarded in principle is not mandatory, but may prove necessary to meet the requirements on energy efficiency, especially in colder areas.)
- **Hot Water**: Requires the selection of energy efficient hot water storage tank and associated items. Hot water is usually provided by solar panels or an alternative system using renewable energy sources.
- **Lighting**: Day lighting has the advantage over artificial lighting, but must be based on the optimal use of energy efficient lamps and effective regulation. Consideration should be given room size and number of users.

6.6. Energy requirements from 2010 onwards

According to the new building, energy efficiency is achieved if the following conditions (Article 7) are fulfilled:

- average thermal transmittance of building envelope (Ht') is less than the maximum value is given as a function of climatic conditions at the location granularity of the building and glazing in the proportion of packaging,

- annual heat needed to heat buildings (Qnh) is less than the maximum value, but it also depends on climatic conditions at the site of the building,
- annual coolness needed for cooling buildings (Qnc) must be less than the allowed value
- for residential buildings is limited to the annual primary energy for the functioning of the building (Qp) (heating, cooling, ventilation, electricity for lighting)

must not be exceeded any of the thresholds for heat transfer (U) envelope components.
More stringent requirements since 2015: The above requirements relating to building energy use are prescribed in two levels of difficulty. Rules provides for a transitional period until the end of 2014 (21), at that time are a little softer minimum energy efficiency requirements for buildings. Stringent requirements of 7th Article will be mandatory from 1 January 2015.

6.7. Mandatory 25 percent renewable sources

At least 25 percent of total final energy for the functioning of the building must be secured by the use of renewable energy in the building (Article 16). This requirement may be met in other ways as well, which is proving somewhat easier to meet the requirements; if the share of final energy consumption for heating and cooling buildings and hot water produced by one of the following ways:

- at least 25 percent in bright sunshine,
- at least 30 percent of gaseous biomass
- at least 50 percent of solid biomass
- at least 70 percent from geothermal energy
- at least 50 percent of the heat of the environment,
- at least 50 percent of CHP plants with high efficiency in accordance with the regulations governing the support of electricity produced in combined heat and power cogeneration
- the building at least 50 percent supplied from the energy-efficient heating and cooling

The requirement shall be satisfied even if the necessary heat for heating buildings by at least 30 percent lower than the threshold in the 7th Article hereof, or in residential buildings: If the embedded at least 6 m^2 (bright areas) of solar energy with an annual income of at least 500 kWhl (m^{2}a).

6.8. Technical guideline TSG-1-004 Energy Efficiency

Technical guideline TSG-1-004 Energy Efficiency (its use is obligated) provides detailed technical specifications that explain how, in practice, will be fulfilled in the rule subscribed the performance requirements.
The bulk of technical guidelines is devoted to the calculation methodology for determining the use of power for the building. Calculation methodology is based on the standard SIST EN ISO 13790 and on the remaining CEN-EPBD standards, complemented with national simplifications and

default values, in particular in relation to calculating the energy input systems. This area is a new regulation, since the previous regulations did not provide an account of energy (which also takes into account the efficiency of systems and devices), but accounted for only a determination of the heat demand.

The calculation methodology is based on the standard SIST EN ISO 13790 and the remaining CEN-EPBD standards, complemented with national simplifications and default values, in particular in relation to calculating the energy input systems. This area is a new regulation, since the previous regulations did not provide an account of energy (which also takes into account the efficiency of systems and devices), but accounted for only a determination of the heat demand.

The methodology accounts for the operation of energy use in buildings covering roughly :

- calculating the annual required (useful) heat for heating buildings and the annual cooling energy required for cooling the building;
- calculate the energy for the operation of the building, which includes:
  - input (finally) of energy for heating and cooling and
  - input (final) of energy for hot water, lighting, ventilation and humidifying system;
- account on the basis of primary energy conversion factors for each source of energy;
- account of CO_2 emissions on the basis of the specific emission energy sources.

6.9. PURES-2 2010 valid for new constructions and renovation

The rules PURES-2 2010 valid for new construction and renovation of building or for its separate elements, where the intervention is performed on more than 25 percent of the surface thermal envelope. In renovation, affecting less than 25 percent of the envelope, and in investment and other maintenance work and in buildings with an area of less than 50 m_2 shall be fulfilled only minimum requirements for thermal protection envelope. In the reconstruction of buildings, which are exchanged or installing new systems, and maintenance of the systems should be considered minimum requirements for the systems. These technical minimum requirements are presented in the technical guideline.

The rule requires that the project to obtain a building permit shall also elaborate on the physics building energy efficiency (EE elaborate), which testifies to the fulfillment of the requirements of Regulation PURES-2 2010. Summary of the elaborate is recorded in the Statement of Energy Performance of Buildings. At the end of construction has to, based on the construction energy performance of buildings re-set and met the building's energy performance statement for the state executed. The statement of Energy Performance of Buildings is an obligatory part of the proof of the reliability of the facility and must provide proof that they meet the minimum requirements from 7 and 16 Article of the Rule.

7. The green procurement

The contracts in which a particular emphasis on energy and environmental attributes of products or services are and the evaluation of their long-term effects are known as green procurement. The term describes the procedures for green procurement, in which individual requirements or specifications for products and services are created with the help of the criteria to be considered for grant of various eco-labels. This implements the principle of obtaining adequate value for money (value for money-) while taking care to minimize the negative environmental impacts.
The green procurement in the lowest bid price is not the sole criterion for selection, but we decide on the basis of longer-term positive effects of the contract (qualitative evaluation and economically advantageous tender). These effects may be expressed in different ways, for example, with a longer product life, lower operating or maintenance costs or less environmental impact (eg CO_2 emissions). Therefore considering the economic and technical aspects, which appear throughout the foreseeable lifetime of the product or service duration. The minimum initial investment cost is still far from ensuring the most favorable financial or long-term energy and environmental impact of the most appropriate.

7.1. The legislative basis for green public procurement

7.1.1. The Slovenian legislation for (green) public procurement

The green public procurement in Slovenia has a very broad base in the strategic documents that have emerged and are emerging from European papers. The key documents may are:

- Slovenia's Development Strategy 2005-2013,
- The National Reform Programme for Achieving the Lisbon Strategy in the period 2008-2010 and
- The National Action Plan for Energy Efficiency (2008).

Specific Slovenian legislation for public procurement includes:

- Public Procurement Act (Z] N-2), OJ. 1. RS, No. 128/2006;
- The Law Amending the Law on Public Procurement (Z] N-2A), OJ. 1. RS, No. 16/2008;
- The Law Amending the Law on Public Procurement (Z] N-2B), Coll. 1st RS. 19/2010.

Completely specific for the Green Public Procurement are these two documents:

- The National Action Plan on Green Public Procurement 2009-2012 (2009);
- The regulation on the Green Public Procurement (2010).

7.1.2. The elements of green public procurement in the Public Procurement Act

Public Procurement Act (PPA) was in the National Assembly adopted on 23rd of November 2006 and entered into force on 8th of December 2006. It was published in the Official Journal RS No. 128/2006. This takes the Slovenian legal order above the European Directive on public procurement, but also set a milestone in the treatment of green principles in the procurement of goods, services and works. PPA-2, like its predecessor, and its later revised version, provided required management clients and suppliers to the procurement of goods, services and works. Moreover, this law was first directly introduced concepts such as environmental protection, environmental characteristics, eco-labels and such. PPA-2 is therefore set explicit legal basis for the implementation of green procurement.

It is now available to users unofficial consolidated text of PPA-2, which includes changes in PPA and PPA-2A and PPA-2B. The chapter on general rules on the definition of technical and other elements of public procurement (or at least its green features) has not significantly changed. Above 37th Article brings conditions that are intended to harmonize the law with the European directives which have been already mentioned above.

For the green procurement in the PPA-2B is also particularly important change in the relationship between price and other criteria. It now no longer fixed as 60 percent of the price and 40 percent for other criteria. The client is left to the matter of the contract and its own needs and strategic decisions alone or defines that relationship or determines the weighting factors (weights) for each criterion. Right this change in procurement procedures practically established the principle, which is actually the key to green procurement: in the introduction above to find the right value for money (value for money-) or analyzing the optimal ratio between price and quality of goods, services or construction. By deleting a mandatory fixed ratio also allows the implementation of the European Commission's guidelines regarding the integration of environmental and social considerations into public procurement procedures, which - if we keep to the narrower definitions of terms - already ordering the transition from green to sustainable procurement.

7.1.3. The Slovenian framework

Slovenia has adopted a long-term commitment to sustainable and energy efficient building and renovation. These commitments are noted in various national strategy documents and the relevant harmonized technical legislation. However, these commitments are basis for a minimum target for green procurement criteria in relation to construction or buildings, and it is right to mention them here. Between strategic documents are particularly important:

- Resolution on National Development Projects 2007-2023,
- Slovenia's Development Strategy 2005-2013,
- Operational Programme for Environmental and Transport Infrastructure (OP ETID) 2007-2013 - Sustainable Energy Programme,

- The National Action Plan for Energy Efficiency (2008-2016),
- The National Reform Programme for Achieving the Lisbon Strategy in the period 2008-2010,
- Action Plan to reduce greenhouse gas emissions by 2012 (IP TGP-L)
- National Energy Plan (adoption of the revised version is underway).

Aforementioned EPBD directive was transposed into Slovenian legislation with the changes of three laws and the preparation of various regulatory provisions:

Construction Act

- Rules for ventilation and cooling of buildings (OJ. 1. RS, No. 42/02),
- Regulations on energy efficiency in buildings (OJ. 1. RS, No. 52/10) and Technical guidance for the construction TSG-1-004: 2010 Energy efficiency.

Energy Law

- Rules for periodic reviews of air conditioning systems (OJ. 1. RS, No. 26/08),
- Rules on the feasibility studies of alternative systems of energy supply (OJ. 1. RS, No. 35/08)
- Rules on the methodology of producing and issuing of energy performance certification of buildings (OJ. 1. RS, No. 77/09).

Environmental Protection Act

- Decree on the method, subject and conditions for the implementation of mandatory public service implementation of measurement, inspection and cleaning boilers, flue ducts and vents to protect the environment and energy efficiency, protection of human health and fire protection (OJ. 1. RS, No. 129/04, 57/06, 105/07, 102/08).

Sources: Šijanec Zavrl, Vincenc Butala, Energetska učinkovitost in energetska izkaznica stavb, Založba Forum Media d.o.o., Maribor 2010.