News at SEVEn

Energy efficiency news from the Czech Republic and EU

volume 25 number 1/18 May 2018

The development and impact of nearly zero energy buildings (nZEB)

nZEB requirements are gradually entering into force in the Czech Republic. They are based on Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings. At the Czech national level, some of the requirements of the European directive have been transposed by means of an amendment to Act No. 406/2000 Coll., on Energy Management, as amended. The technical part of the requirements is specified by Decree No. 78/2013 Coll., on the Energy Performance of Buildings, as amended by Decree No. 230/2015 Coll.

European Directive 2010/31/EU obliges EU Member States to establish a national nZEB definition according to their legislative conditions, customary construction procedures, technologies used, climatic conditions, etc. However, not all Member States can offer an approved national nZEB definition. For example, in Greece, Portugal and Poland the definition is still in the preparatory phase. The current state of the national nZEB definitions is depicted below.

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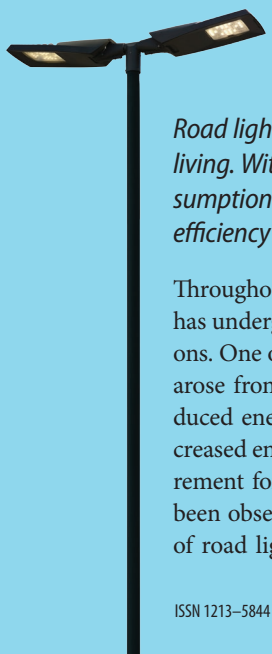

Quality road lighting

Road lighting is a service for citizens and has become an intrinsic part of modern living. With the sharp development of LED technology the average electricity consumption of road lighting has been reduced and the focus – formerly on energy efficiency criteria – has moved to the quality and comfort of road lighting.

Throughout its history, road lighting has undergone several transformations. One of the most recent changes arose from the general trend of reduced energy consumption and increased energy efficiency. The requirement for greater effectiveness has been observed in numerous aspects of road lighting, such as more efficient optical systems for luminaires and lower power input of discharge lamps. The fast pace of LED technology development has gradually led to a significant change of luminaires designed for road lighting. Traditional manufacturers completely overhauled the ranges of products they offered and consequently, new producers and importers entered the market.

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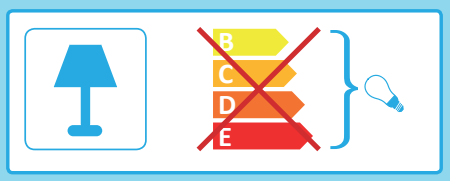
Changes in the forthcoming ecodesign of light sources

Ecodesign is a legislative tool used for certain product groups and their efficiency performance improvements, and since 2009 has also involved light sources. The ecodesign regulations pertaining to light sources were revised in 2017 and in 2019–2020 further changes and improvements in efficiency requirements can be expected.



Several European regulations are responsible for the ecodesign of light sources, ballasts and luminaires. Households are best acquainted with regulation 244/2009, which led to the gradual removal of inefficient incandescent lamps from the European market during the years 2009–2012. Regulation 245/2009 primarily regulated the sale of inefficient linear fluorescent lamps and high-intensity discharge lamps (HIDs) in the field of road lighting services. This regulation was followed by 1194/2012, encompassing directional light sources and light emitting diodes (LEDs). Current European regulation in the field of light sources is fairly complex and each type of lighting requires a different way of defining efficiency and functional parameters. Often in-depth studies of the regulations are needed to fully understand this market.

The European Commission has commenced preparatory

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Energy services in Přeštice have significantly increased the biogas share of heat supply

Energy Performance Contracting Plus

A highly innovative energy services project was carried out in the town of Přeštice last year. As a result – and for the first time in the Czech Republic – nearly 90% of the heat generated in the regional DHS (district heating system) came from biogas cogeneration units. Prior to the implementation of the project it was only 60%. The original district heating system has been extended so that more heat could be supplied by the biogas cogeneration devices, which leads to natural gas (a non-renewable source of energy) savings. The DHS has been fully modernised, including the installations of new heat transfer stations and interconnecting hot water piping between independent systems.

The entire project lasted more than a year after the contract was signed in March 2017. The guarantee audits carried out in March 2018 confirmed the ability of the DHS to cover most of the energy needs using the biogas cogeneration units with the potential to achieve a 95% share in the following years. Losses in the district heating system have also substantially decreased. The project will continue for at least another 10 years, unless the policy in the field of supplied purchasing prices changes. If, for some reason, there is not enough biogas, the shortfall can be made up with natural gas, which is a great advantage. In order to meet the requirements of the subsidy scheme, an annual monitoring report will be drawn up during the first three years after the commissioning of the devices. The report will include an evaluation of the results achieved.

Of the total investment costs of CZK 21 million, 60% were covered by the town of Přeštice and 40% by the Operational Programme Enterprise and Innovation for Competitiveness. SEVEn helped secure financial support and also participated in the preparations for the entire project. The Systherm Company carried out a preliminary analysis, developed a project design and negotiated with the client, i.e. B+T Přeštice s.r.o., which is owned solely by the town of Přeštice. Last but not least, Trival Ltd. provided technical devices for heat distribution and guarantees for the technical equipment.

Thanks to its successful implementation the project has become an example of best practice within the EPC+ project funded by the European programme Horizon 2020. Between the years 2015–2018, EPC+ was joined by 13 organisations from 11 EU countries. The project has fulfilled its highly ambitious goal to support the implementation of innovative energy services, particularly those that guarantee results (EPC). For more information, go to the project EPC plus webpage » http://czech.epcplus.org/.

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Examples of projects dealing with modernisation of systems relating to heat supply – projects supported by the Business and Innovations for Competitiveness Operational Programme (OPPIK)

Several interesting projects focused on modernisation of district heating systems (DH) have been created recently. The comprehensive support of investors in this field included the conceptual preparation and framework, submitting the application for an investment subsidy from the "OPPIK" programme, including the collection of all necessary documents (such as energy expert's opinion, a feasibility study or assisting with the project and budget treatment). Furthermore, a selection procedure was organised in order to select a contractor, and in some cases technical supervision of the builder had to be ensured.

Kolín municipality – Transition of a part of steam distribution to hot-water pipes

The investor is MTH Kolín spol. sro (Kolín Heat Management), a company providing final points of heat distribution, particularly in the residential area at the southern edge of the town. The goal of the project is the partial replacement of steam pipelines in the total length of approximately 3.5 km by new hot-water pipes with pre-insulated piping laid in the ground. Out of the original 16 steam/water block heat exchangers (HE) only three will remain in operation, while others will be either converted to water/water stations or will be cancelled. These measures should ensure a substantial reduction of pipeline and HE heat losses. In addition, comfort of heat supply will be increased.

The first stage of the project was successfully carried out in 2017 and included about 0.5 km of a new hot-water pipe, conversion of four HE and the installation of six new heat transfer stations (HTS). The costs amounted to about CZK 16 million and the project gained an investment subsidy from the second call of the Energy Savings in HSS programme under the OPPIK programme.

The second and third stages can be implemented in 2018 and 2019 and will encompass the installation of about 3 km of new hot-water pipes, improvements of nine HE and installation of 14 new heat transfer stations. The investment costs will amount to about CZK 70 million. The application for the subsidy will be submitted during the third call of the programme.

EUROPEAN UNION
European Fund for Regional Development
Operational Programme Enterprise and Innovations for Competitiveness

Přeštice – Modernisation of the heat supply system in the town

The project's investor is the local company B+T Přeštice, with its own sources and distribution network in the town. The company buys heat from cogeneration biogas units (CGU). The biogas is supplied through the piping from the biogas station. The project includes the modernisation of the two main gas boiler houses and the management system, network expansion (about 0.5 km interconnection of the two boiler rooms and connecting another CGU) and installation of about 25 HTS. The project focuses on the increase of the share of CGU heat supply from RES and thus on reducing natural gas consumption. The investment costs were about CZK 21 million and the project gained a subsidy from the Energy Savings in HSS programme under the OPPIK programme. The project was successfully implemented in 2017 in the form of a guaranteed savings contract (EPC), as described in another article in this magazine.

Pre-insulated piping joints connected to controlling conductors (left) and after the mounting of cuffs and foaming

Žamberk – Heat extraction from a biogas station

The investor is KAVEMA, a biogas station operator. At present, only the station's agricultural site is supplied with heat from the biogas station. The project will ensure the construction of a 1.5 km long remote hot-water pipe which will supply heat to the Albertinum sanatorium in Žamberk. The project gained a subsidy upon the second call of the Renewable Energy Sources OPPIK programme. The project is underway and its completion can be expected during summer 2018.

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Quality road lighting

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This situation led to severe pressure from the attendant lowering of costs. While customers would be expected to be satisfied with this state of affairs, the drawback of lower prices is readily apparent: a market filled with numerous low-quality products and suppliers offering systems not corresponding to standards and not meeting basic requirements imposed on road lighting (RL).

Although the market has partly consolidated over the past few years, satisfying quality criteria for road lighting solutions remains the only reliable protection against low-quality solutions. In view of this, the international non-profit initiative Premium Light Pro proposed a set of the most important criteria which will help eliminate low-quality products, unfair negotiation tactics, and ineffective luminaires. These criteria are of two kinds – technical and organizational and some of them are introduced below.

Technical criteria

For residential areas, it is recommended that colour temperature is no greater than 3000 K. This maximal limit guarantees that citizens will not be disturbed by extremely cold light. A maximum of 4000 K can be used for main roads.

Sufficient luminaire efficacy: for the year 2018 the minimum recommended Luminaire Efficacy Factor (LEF) is 120 lm/W with 4000 K, or 105 lm/W with 3000 K. It is desirable to ascertain that the value given by manufacturers pertains to a luminaire as a whole, not simply to its individual LED chips or modules.

Other technical criteria include factors such as ensuring zero radiation in the upper half space so as to eliminate undesirable lighting in the windows of neighbouring dwellings, minimum ingress protection (namely IP65) – which guarantees sufficient dust and moisture resistance – and a minimum lifetime of $L_{80}B_{10} \geq 100\,000$ h. As an accurate declaration of an LED luminaires´lifetime is difficult to acquire, it is recommended to demand of the supplier a detailed estimate of the luminous flux decrease and failure rate.

Organizational and economic criteria

Among the most important criteria is the adequacy of guarantees. In some European countries it is common to demand up to a 10-year guarantee for a road lighting system. If this is not attainable, then a minimum of 7-year guarantee should be demanded. The provision of a guarantee covering availability of spare parts (for a minimum of 15 years) is also important.

Generally, it is recommended to comply with existing applicable standards for road lighting systems, as this will ensure that the lighting is both sufficient and safe. Information on the assumed consumption should be obtained from the supplier by means of the new methodology known as PDI/AECI.

All the criteria necessary for those seeking optimal quality in road lighting systems can be downloaded from the Premium Light Pro Website, » www.premiumlight.cz

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Quality assurance system for Energy Performance Cotracting projects

Both the EU and the Czech Republic offer great potential for Energy Performance Contracting (EPC) projects (EPC) providing guarantee of energy savings. However, only a small part of the potential is used. The survey carried out by the QualitEE project among EPC providers and facilitators (consultants) in September 2017 involved 15 countries. It revealed that administrative barriers in the public sector, the complexity of the EPC concept/lack of information and a lack of trust in the providers are the most critical barriers preventing use of the EPC method in Europe.

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According to the survey, most energy efficiency services providers and facilitators in the Czech Republic (67%) encounter a lack of trust in energy efficiency services providers in almost half of cases (see graph 1). One way to generate greater trust and hence increased demand on the part of clients is quality improvement. This can be achieved by means of standardisation and certification of the energy service companies (ESCOs). The need to introduce certification of energy service providers also results from the Energy Efficiency Directive 2012/27/EU of the European Parliament and of the Council.

Various possibilities for the introduction of the quality assurance system for Energy Performance Contracting (EPC) in the Czech Republic have been analysed by the **Certification of Energy Savings and Services** study. The study was carried out for the Ministry of Industry and Trade (SEVEn, December 2017) and based the proposal primarily on EPC project certification. Thus the implementation of several projects which will gain **EPC project certification** is essential for the subsequent **certification of ESCOs** (energy service companies). The system proposed sets quality criteria for the preparation and implementation of EPC projects and stipulated requirements for EPC providers.

A detailed evaluation of EPC projects may be achieved with the help of a set of European technical criteria for the quality of energy efficiency services (EES)* (Leutgöb et al. 2017) developed within the QualitEE project funded by the European programme Horizon 2020. The set of criteria is based on the objective standard EN 16247-1. A similar version has already been applied to the Austrian system of association DECA (Dienstleister Energieeffizienz & Contracting Austria). A detailed analysis was carried out, based on which 17 criteria have been selected from the draft version of the European Technical Quality Criteria. In order to gain a certificate for an EPC projects in the Czech Republic, these criteria will have to be fulfilled. The criteria include the following fields: savings guarantee, verification of energy savings, maintenance and repair, communication with clients, compliance with users' comfort requirements, and comprehensive contractual arrangements.

A certified project has to be at the stage **after the first monitoring period of energy savings** so that not only project quality and contract comprehensiveness can be evaluated but also the level of achieved energy savings as well as the fulfilment of contractual parameters.

Assessment of evaluation criteria fulfilment in the process of a project certification is crucial. A project shall be certified only if all criteria that were set out have been met. Criteria cannot be only partially fulfilled. Provided that **all criteria** required for the EPC certificate have been met, the certification body shall issue the project certificate to the applicant.

A proper functioning of the system is dependent on the selection of appropriate organisations, which shall play three key roles. The first organisation sets out the criteria, requirements and rules of the certification system. The authorising body entrusts the certification authority with certification and the certification body certifies projects and/or the EPC provider.

Two types of certification schemes were considered for EPC projects certification and EPC providers. The first variant deals with accreditation of certification bodies under international standards; the second encompasses authorising certification bodies without regard to international standards. The final recommendation of the study is to choose the latter **variant independent of international standards**, which is simpler and means lower costs of certification. The decision followed consideration of all aspects of the two variants after discussion with the stakeholders.

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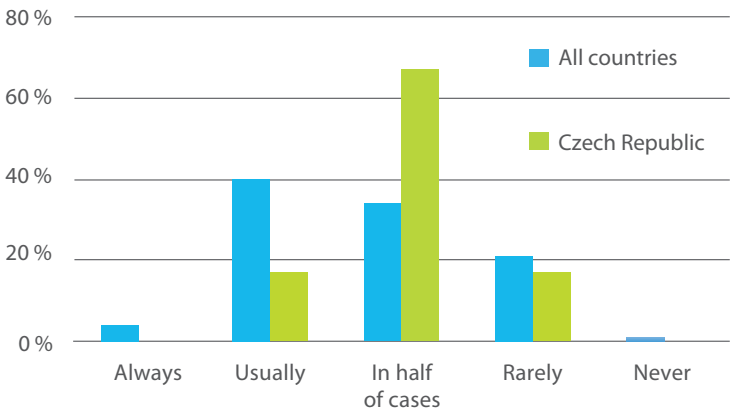
* Can be downloaded on the QualitEE project's webpage: https://qualitee.eu/cz/

Distrust of Provider

How often are energy services providers and facilitators confronted with a lack of trust in energy efficiency services providers?

Most energy efficiency services providers and consultants in the Czech Republic encounter a lack of trust in about half of cases (67% of respondents). This figure shows an increased level of trust compared with the results aggregated for all 15 EU countries involved in the survey, where most respondents (40%) revealed that they are usually confronted with a lack of trust.

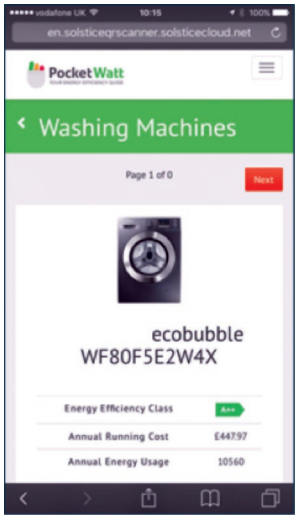
QualitEE survey, September 2017 in the Czech Republic and 14 other EU countries.



Co-financed from the EU Horizon 2020 programme

Digi-Label: A tool used to identify appliance operating costs

An energy label is a traditional tool that helps customers compare the energy performance of electrical appliances. Apart from the energy class it also gives the standardised annual energy consumption in kWh. However, for many customers a figure in kWh is not always relevant. Therefore, a new tool called PocketWatt was created within the Digi -Label project. PocketWatt should help customers easily display additional information, e.g. the costs of using an appliance and comparisons with similar appliances, either online or in the shop.



PocketWatt shows running costs of appliances in Czech crowns. Another advantage is that it is possible to set the number of washing cycles for washing machines and dishwashers per week (according to individual households' needs). Thus, a final value of operating costs for energy and water consumption can be calculated according to the particular consumer's use. The PocketWatt tool will be available for customers on the sellers' websites or in the form of a QR code in selected shops.

The customers' reactions to the new trial version of the web tool are fairly positive. The tool helps them choose energy efficient appliances, leading to reduced running energy costs, as a study of the Digi-Label project has shown. Shop assistants and customers who have tested PocketWatt praised the tool for its usability and availability. In addition, thanks to the tool they gained more knowledge about energy savings possibilities.

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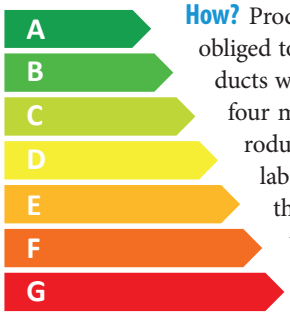
The new energy labels: Where are they going?

Energy labels for electrical appliances and products available on the European market will undergo several significant changes. Which are the most prominent ones?

What? Energy labels go back to the original A–G classification instead of the A plus classes (A+, A++, A+++). The use of QR codes is also being considered; the codes would be interconnected with official webpages, e.g. the EU Product Register Database.

When? In 2020 new labels will be distributed to shops for six product groups: household refrigerators, washing machines, washer-dryers, dishwashers, TVs and light sources. At present, the European Commission is working on the design and content of new energy labels for these products. The labels will be made public in November 2018. Labels for other products will be ready by 2025 at the latest, except in the field of heating, where the timing may be further delayed.



How? Producers and importers will be obliged to supply dealers of these products with new versions of the labels four months before the official introduction date for the new energy labels. Upon the introduction of the new labels, dealers will have two weeks to remove the old labels and replace them with the new ones. This should guarantee a quick transition, and in online shops the transition should be even faster.

For more information go to:
» http://www.digi-label.eu/

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New methodologies for effective market surveillance of large fans with the INTAS project

The goal of the INTAS project, funded by the EU's Horizon 2020 programme, is to provide technical and cooperative support, as well as capacity building activities to Market Surveillance Authorities (MSAs). The need for the project arises from the difficulty that authorities and market actors face in establishing and verifying compliance of large industrial products. Large fans are subject to energy performance requirements under the Ecodesign Directive and are one of the two products in the project's focus.

Specifically, INTAS aims to:

- Support European Member State MSAs deliver compliance for large fans;
- Support industry to be sure of what their obligations are under the Ecodesign Directive and to deliver compliance that will be broadly accepted by MSAs;
- Foster a common European approach to the delivery and verification of compliance for large fans.

In a first stage, INTAS has analysed the existing testing procedures in Europe and beyond, and explored test standards, facilities, procedures and methods already in place for large fans.

Currently, the project is in the phase of defining an effective compliance framework for MSAs and manufacturers and will also conduct real evaluation and testing exercises.

Testing and evaluation methods that INTAS is organising include:

1) Tests and verification based on current industry practices for which INTAS investigates the strengths and limitations of:
   a/ Scale-model testing, i.e. testing a smaller kW fan of the same design as part of a series of larger fans and extrapolate findings for the larger models of the same design.
   b/ Part load testing, i.e. testing a fan in a part load operational point and calculating/extrapolating performance at the best efficiency point and seeing if the performance of such approaches in independent laboratories might be suitable for ecodesign verification purposes.
2) Participation in witness tests or factory acceptance tests to define which procedures could be specified for MSAs to assist at manufacturers' premises tests.
3) Evaluation of a consolidated approach for auditing manufacturers' conformity assessment procedures (Art. 8 of DIR. 2009/125/EC) to define recommendations on required documentation of conformity assessment, in alignment with MSAs and industry.

INTAS will finally evaluate the results of the previous processes and ensure that the proposed methodology is valid and reliable for national authorities.

Throughout the entire project, INTAS will foster market surveillance collaboration between the authorities and raise awareness and exchange of product energy performance and market surveillance information among key stakeholders.

More information:

» http://intas-testing.eu/fans/introduction

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Innovative training programmes aimed at building renovations

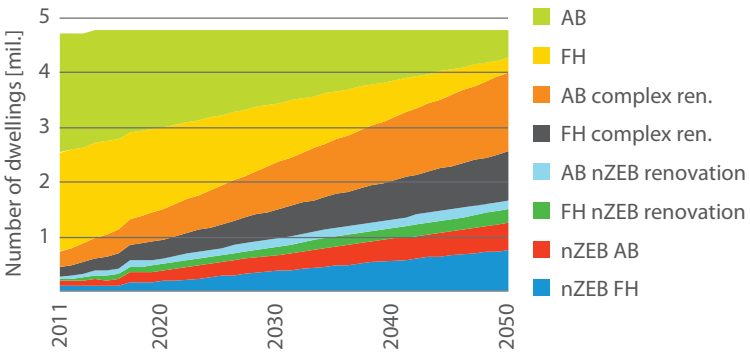
From the beginning of 2020 onwards, all new buildings in the Czech Republic will have to be nZEB (nearly Zero Energy Buildings). This obligation is based on European legislation and has already had a great influence on the whole building sector, as new demands have been imposed on building design and construction. From 1 January 2018, all newly built public buildings and all other buildings exceeding the energy reference area of 1,500 m² have to meet the nZEB standard. The nZEB parameters must be gradually met by all new buildings as well as existing buildings in the case of major changes (i.e. larger renovations).

It is assumed that by 2050 approximately 75% of European building stock will consist of existing buildings and 25% of new buildings constructed within the nZEB standard. Therefore, existing buildings represent considerable potential for increasing energy performance. In order to fully exploit this potential, it is necessary to train a sufficient number of building experts.

There are many international projects which involve quality training programmes aimed at increasing energy performance or focused directly on nZEB buildings. However, most cases considered the design and construction of new buildings, while existing buildings and their renovation were often neglected. The Fit-to-NZEB project intends to use the potential of energy efficient building refurbishment. The project involves educational programmes and aims to increase the competence and skills of building professionals in the field of existing building retrofits and their transformation to nZEB. The project uses the values and experience gained in the previous international project Train-to-NZEB, which is now followed by Fit-to-NZEB.

The goal of the Fit-to-NZEB project is to increase the competence and skills of building professionals at all levels. The new innovative training programmes focus on retrofitting of existing buildings, faster recovery of building stock, and quality improvement of renovated buildings. The training pro-

Number of dwellings
in the Czech Republic by 2050



Training models for nZEB

grammes are designed for vocational schools, technical universities and for all workers in the construction field. The new programmes will be included in education at technical schools as well as in vocational trainings in the context of lifelong education. The training programmes strongly emphasise practical training involving work with models, using the experience of renowned Czech professionals and examples of best practices from abroad, particularly from Ireland and Austria. The project partners are, among others, four European universities, including the Czech Technical University. More information about the project can be found at »www.fit-to-nzeb.com.

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The development and impact of nZEB

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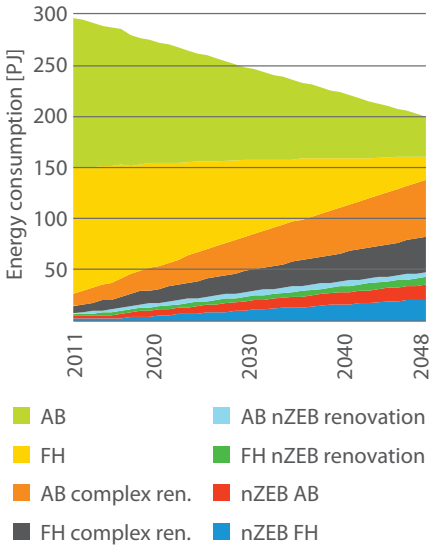
A pan-European comparison indicates that there are some countries left which still have not adopted the nZEB definition as no agreement at the national level has been reached. On the other hand, approaches to the definition differ, e.g. the approach to the classification of energy performance of buildings, the so-called reference building or specific values for various building types. Some countries have a given renewables share and indicator for CO_2 emissions.

Expected development of energy
consumption in residential buildings

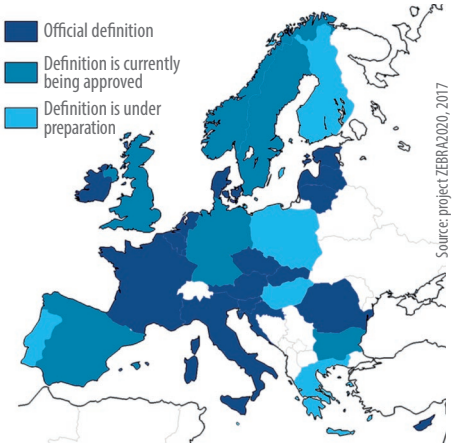


Over the long-term, directives on energy performance of buildings and energy efficiency definitely have a positive impact on the household sector, as the requirements defined by the directives lead to significant energy and financial savings. Generally, the main requirement for introducing measures is their economic, environmental and technical feasibility and appropriateness. Therefore, it is ensured that the requirements for introducing measures are meaningful, feasible and cost-effective.

A study called *Development and Impacts of nZEB Buildings Introduction* established under the Czech Ministry of industry's "Effect programme" (MPO Efekt) provides data on energy savings achieved by energy savings in buildings. Thanks to nZEB, total energy savings should be from 74 up to 114 PJ per year, depending on the specific development scenario. The new nZEB buildings savings alone represent 33–56 PJ per year. These savings pertain to the residential sector, while savings in the non-residential sector represent another potential component.

In terms of impact on the property market, no substantial change or problems retarding development should be expected. The extra costs for nZEB are marginal in terms of the overall costs and their higher purchase price will be offset by energy savings and reduced operating costs.

Moneywise, the increase of energy efficiency (which usually means higher RES share and reduced CO_2 emissions) is fairly demanding for households, but in the end brings lower operating costs. An optimal combination of the impact on energy efficiency and the amount of household expenses is given by a cost optimal level described in the study for several types of dwellings in the tertiary sector.



The state of nZEB definition
for new buildings in EU + Norway

The impact of energy savings on Czech energy is crucial. They will influence so-called large energy, primary energy sources and their consumption as well as transformation processes (particularly as far as their volume and number of individual sources are concerned). Energy savings will also influence investments in new sources of heat and electricity.

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Energy efficiency in Armenian communities

The European Union is not the only place where increasing energy efficiency is a big issue. The Armenian government has set energy efficiency as one of the main priorities for future development. Municipalities and housing associations, as well as non-governmental organisations will be encouraged to define opportunities for the use of renewable energy and energy saving measures, and to implement them.

One of the Europe Aid projects in this field – EU for Civil Society: Energy efficiency in Armenian Communities – has recently started in Armenia with the involvement of SEVEn. The kick-off conference held in April 2018 in Yerevan attracted about 50 participants from local municipalities and NGOs. An awareness campaign has already started in five selected Armenian regions with the aim of informing communities about contemporary energy efficiency methods.

This year at least three training sessions for the communities' representatives will be organised by European partners involved in the project jointly with the Armenian National Social Housing Association. The result will be a long-term partnership on energy efficiency based between local municipalities, NGOs and media. At least 40 communities in target regions will gain support for the implementation of small energy efficiency initiatives. The main aim, however, is to support social partnership in introducing energy efficiency measures and up-to-date information on their proper use in a community.

Such cooperation is a good start to solving the problems of energy inefficient building stock that plague Armenia and the country's extremely high energy poverty. Final energy consumption in the residential sector in Armenia equalled 704 ktoe in 2015 (» www.iea.org/Sankey/#?c=Armenia&s=Final%20consumption).

Small initiatives implemented within the project will contribute to the development of an energy efficiency culture in households and enterprises, and create active citizen groups in urban and rural communities constantly working to increase energy efficiency awareness.

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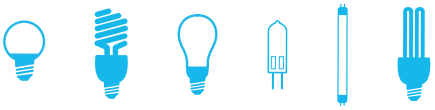
Changes in the forthcoming ecodesign of light sources



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work on the integration and unifying of regulation in the field of light sources. The new regulation should include a wide range of light sources, from incandescent lamps, fluorescent lamps and HIDs to LEDs. Furthermore, the regulation should specify when it is possible to offer a light source on the European market. In addition, further increases to the requirement for minimum efficiency should be considered. Apart from the new ecodesign regulation, a new regulation concerning energy labels for light sources is currently under preparation. This regulation will unify the appearance of these labels with the rest of the new labels. One of the substantial changes in labelling is the return to the original A–G energy efficiency classes (without the "pluses") and also the cancelling of energy labels for luminaires, as the labels defined only the compatibility of luminaires with light sources and did not consider luminaire efficiency.

The ecodesign regulation concerning light sources which is currently under preparation comes with a few significant and controversial changes. The final version of the regulation will probably not be known before autumn 2018; however, the issues discussed so far indicate the further direction of the light source ecodesign. The most prominent and hotly debated issue is the probable ban of T8 linear fluorescent lamps (with a tube diameter of 26 mm). These lamps would have to be substituted by LED tubes. Considering the improvements to and sharp increase in the numbers of LED replacements, linear fluorescent lamps are likely to be banned, either by 2020 as proposed or later. Another substantial proposal is the request for replaceable light sources. The proposal is a response to the minimum waste principle (in case of a failure the entire luminaire has to be replaced). On the other hand, this proposal may substantially affect the efficiency and lifespan of a luminaire and affects material intensity as well. As opposed to strict efficiency requirements, the proposal to ecodesign light sources comes with a significantly reduced number of functional requirement parameters. The parameters now excluded include the minimum lifespan, maximum decrease of luminous flux and minimum number of switching cycles. This can be explained by reduced demand for industry and market surveillance.

The concept of the ecodesign of light sources is currently being commented and the final version will likely differ from the proposal. In spite of that there may be further pressure to increase light source efficiency as well as tendencies towards sustainable economy and minimum waste principles.

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