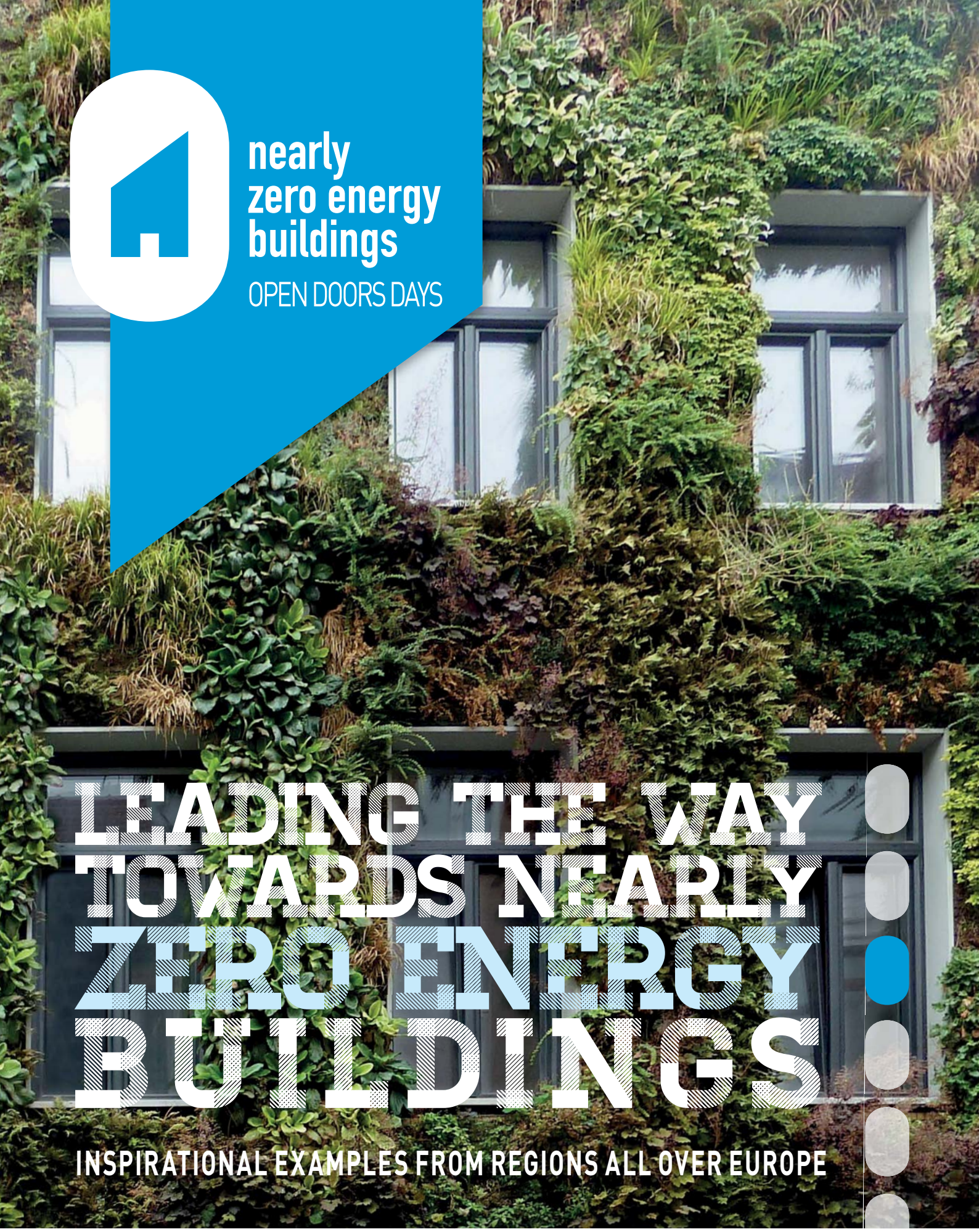


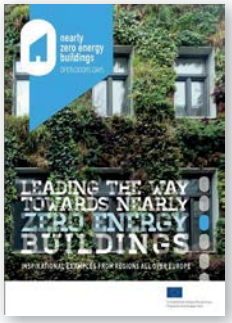
nearly
zero energy
buildings

OPEN DOORS DAYS

LEADING THE WAY TOWARDS NEARLY ZERO ENERGY BUILDINGS

INSPIRATIONAL EXAMPLES FROM REGIONS ALL OVER EUROPE

Co-funded by the Intelligent Energy Europe
Programme of the European Union



LEADING THE WAY TOWARDS NEARLY ZERO ENERGY BUILDINGS
Inspirational examples from regions all over Europe

Published in March 2014

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This brochure presents the progress to date of the NZB2021 'Doors Open Days' campaign – sharing experiences from low energy buildings to meet nearly zero building standards by 2021 project co-financed within the grant no. IEE/11/927/SI2.616379 of the Intelligent Energy Europe Programme.

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OPEN DOORS DAYS

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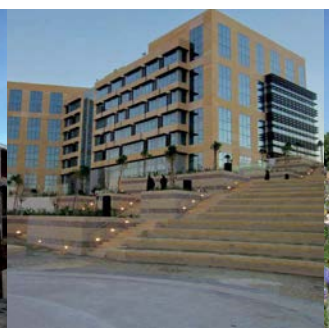



EDITOR'S MESSAGE

Dear Reader,

The next couple of pages will take you on a short tour around Nearly Zero Energy Buildings (NZEB) in 10 European countries. This tour is a part of a large European campaign promoting high energy efficiency standards in buildings. It is called "NZEB Doors Open Days" and is co-financed by the Intelligent Energy Europe Programme (IEE).

The aim of the campaign is to make nearly zero energy buildings more well-known and accessible to the broad public by giving the opportunity for hands on experience. The challenge of successfully implementing the concept of NZEB buildings in the European market can be met. Numerous examples of very low energy consumption buildings be it private or public, are already tested and operating successfully all over Europe.

In many cases NZEB construction has been stimulated by interesting and innovative support measures. In others it was all about the passion for environmentally friendly solutions and personal pursuit to have as low a carbon footprint as possible or simply the desire to lead the way in modern technology.

Over the last few years we have learnt a lot about the significance of the personal decisions that we make on a daily basis on the quality of the environment that we live in and will leave to our children. Wise decisions by a supportive public administration can give enormous leverage to those individual decisions and can help to scale up the energy standards of the building sector.

The exemplary role of public administration should be highlighted here. It concerns both, the decisions regarding their own infrastructure and also setting up national, regional and local initiatives that will help people make decisions based on energy efficiency. Why not make it natural - that upon building refurbishment or new building construction – very high energy standards are automatically considered in the decision process and are a key factor in the assessment of the investment's attractiveness.

If you haven't visited a nearly zero energy building yet, we'll be happy to host you during events organized in November 2014. Check with the national organizers on the additional opportunities for decision makers to join the study tours organized in spring 2014 in Austria, Belgium, Germany, Ireland and Sweden.

We hope that you will get inspired by what you read and see. We are looking forward to meeting you in our NZEB's.

NZEB2021 Doors Open Days team

EU REGULATIONS

European building stock comprises over 40% of the total energy consumption in Europe. Some of the Member states have long standing policies on energy use in buildings and well developed support measures serving this purpose. In others energy efficiency is competing with other political goals and is taking slower to find the right place in the agenda.

The energy saving potential from building renovations varies from country to country and is estimated at 55 to 80%. This makes the transformation of the building stock a great challenge and yet an amazing opportunity. It presents a chance to capture now the greatest cost-effective energy saving potential by taking appropriate measures and using available tools and technologies.

The current construction and retrofit practice needs to improve. Lack of proper cost and benefit analysis and basic know how of the achievable energy efficiency standards in buildings locks the energy efficiency potential for tens of years until the next modernization of the building can be considered. It is not only awareness of the technological solutions that plays a role here. It is also the quality of the construction work that may jeopardize reaching desired building standard.

European regulations respond to the current state of energy efficiency levels by imposing very specific obligations. The two directives that have most impact on the building sector are: the Energy Performance in Buildings Directive (2010) and the Energy Efficiency Directive. These regulations are challenging for the Member states. They haven't been implemented equally in all European countries.

Arising from the Buildings Directive (2010) from January, 2019 every new public building will have to be designed to nearly zero energy standards. Also, all other new buildings will have to comply with the new nearly zero energy building standards from January, 2021.

Nearly Zero Energy Building means in general a building that has a very high energy performance. The very low amount of energy required to sustain the building should to a significant extent come from renewable energy sources.

The member States have by now defined maximum building energy consumption limits as well as allowable renewable energy sources. It varies from one country to another depending on the economic, geographic and climate conditions as well as on political priorities. Though the targets may be individual the challenge of 2020 energy efficiency goals is common.

On 28 June 2013, the Commission published a report on the progress by member States towards Nearly Zero Energy Buildings. The conclusion of the report was that too little progress had been made by the Member States in their preparations towards NZEB's by 2020. They have to significantly step up their efforts to implement the requirements regarding NZEBs in the EPBD to ensure that the EU's longer-term climate objectives are not jeopardized and the building sector can take full advantage of the opportunities NZEB's present.

The Energy Efficiency Directive entered into force in December 2012. Most of its provisions will have to be implemented by the Member states by June2014. This Directive establishes a common framework of measures for the promotion of energy efficiency within the Union in order to ensure the achievement of the Union's 2020 20 % headline target on energy efficiency and to pave the way for further energy efficiency improvements beyond that date.

All EU-28 countries are thus required to use energy more efficiently at all stages of the energy chain – from the transformation of energy and its distribution to its final consumption. The Energy Efficiency Directive introduces new binding measures to step up the efforts to use energy more efficiently. Amongst others it emphasizes the role of the public sector.

The Public sector is to lead by example by renovating 3% of buildings owned and occupied by the central governments starting from 01 January 2014 and by including energy efficiency considerations in public procurement – insofar as certain conditions are met (e.g. cost-effectiveness, economic feasibility) – so as to purchase energy efficient buildings, products and services.

The way forward in this common European challenge is to increase the awareness amongst potential investors, both private and public, with regards to the technical possibilities of the current building stock, retrofitting solutions available and the future requirements regarding national NZEB building standards and practices.

Success stories are already out there. Why not follow the front runners?

nearly
zero energy
buildings

OPEN DOORS DAYS

NZEB

DOORS OPEN DAYS

In 1998 a Belgian NGO, Bond Beter Leefmilieu (BBL) developed the concept of "Ecobouwers Opendeur" to inspire builders and home owners to build and renovate their houses to a high energy standard. With more than 33,500 visitors over the past 15 years, Ecobouwers Open Doors Days has built a steady reputation as the biggest independent and non-commercial open house event in Flanders.

In 2012 BBL decided to scale up the initiative and joined organizations from 9 Member States to develop similar Open Doors events under the common name of NZB2021 'Doors Open Days'. The initiative is cofinanced by Intelligent Energy Europe programme.

The central idea of a Doors Open Day campaign is that visitors get non-commercial hands-on-experience with nearly zero energy buildings. During a visit, they get to know the living, working and building experiences of the owners and builders.

NZEB Open Doors events take place in Austria, Belgium, France, Germany, Hungary, Ireland, Malta, Poland, Slovenia and Sweden.

In 2013 637 buildings took part in the campaign and 11.258 visitors were counted.

Each campaign has a national web platform to acquire buildings for the Open Doors Days, to organize subscriptions and to give both general and specific information on NZEB's and the EPBD requirements. The websites present many inspiring examples of NZEB's. A set of mini-documentaries were recorded and uploaded online to promote energy efficient solutions in buildings from different parts of Europe.

"This campaign is fantastic! Without your initiatives and webforum we would never have managed to build an ecological house. Thanks a lot!

Stefan Vanstraelen,
Ecobouwers Opendeur Visitor 2013, Flanders

THE UPCOMING "NZEB 2021 DOORS OPEN DAYS" WILL TAKE PLACE IN NOVEMBER 2014!

AUSTRIA

OÖENERGIESPARVERBAND

Niedrigstenergiegebäude2013 Tag der offenen Tür "Heute schauen - morgen bauen"

"Visit today - Build tomorrow" was the motto of the first Upper Austria NZEB Open Door Days on 15 and 16 November 2013. The OÖ Energiesparverband, the Upper Austrian Energy Agency, invited interested individuals to visit the more than 80 participating NZEB buildings – single-family, multi-family, commercial and public buildings. The response was impressive: 1.090 visitors took advantage of this opportunity to learn hands-on about the buildings' energy-related aspects. Through this event, they were able to experience for themselves how it is to live in a nearly zero energy or passive buildings. More importantly, "Visit today – Build tomorrow" offered valuable technical information and concrete examples of NZEBs to those who plan to build or renovate in the near future.

www.haeuserschauen.at

> **This event, in this scale, is quite unique in Austria and significantly contributes to the understanding of Nearly Zero Energy Buildings.**
>
> Regional decision maker from Austria

INSIGHTS ON THE 2013

BELGIUM

Bond Beter Leefmilieu
KOEPEL VAN MILIEUVERENIGINGEN Vlaanderen

Bond Beter Leefmilieu – Ecobouwers Opendeur

The campaign Ecobouwers Opendeur is organized with support of many partners: the Flemish Passive House Association Passiefhuis Platform, the Flemish Institute for Bio-ecological Building VIBE, the city of Ghent, The Brussels Capital Region, the building magazine beter bouwen en verbouwen, Radio 2, second hand website 2dehands.be, building fair Hout en Groen Wonen, and the provincial supporting bodies for sustainable construction.

Ecobouwers Opendeur ran its 16th year in 2013. For the first time Doors Open Days were also organized in Wallonia by a new partner écoconso. Bond Beter Leefmilieu joined forces with this Wallonian NGO and together they carried out a bilingual Doors Open Days campaign in Brussels. The result: a truly national campaign with nearly 300 exhibited NZEBs and more than 6.600 visitors. In Flanders the campaign focussed on the city of Ghent where you could visit 18 houses. Ghent wants to be climate neutral by 2050 and supports its citizens to build and renovate to NZEB standards.

www.ecobouwers.be

FRANCE

prioriterre
Information et Conseil
Energie Eau Consommation

PORTES décOUVERTES, les bâtiments performants c'est maintenant!

NZB took place in the Region of Haute-Savoie a territory with 760.000 inhabitants. The 2013 campaign attracted more than 312 visitors. 35 buildings were registered all over the region for this first edition: 19 private houses, 1 public mutli-family building, 4 private offices and 11 public tertiary buildings (schools, city halls, etc.). It allowed a wide range of choice between renovated and new buildings for different types of visitors (professional, local authorities and private people). Every building, both new and renovated, followed an energy efficient standard. Some of them were certified Passive Hause, Minergie, or "BBC" (low consumption building). In Haute-Savoie, public buildings proved a great success and attracted nearly half of the visitors (145 people registered) on the week days thanks to organized guided tour and targeted communication.

Visitors were very pleased to be able to discover similar projects to theirs and to exchange experience and get information.

More than 83% of them rated the campaign as good, very good or excellent and are looking forward to visiting the Doors Open Days again in 2014.
More than 94% of the exhibitors appreciated being part of the campaign and found the organization was very satisfying. 72% of them are willing to participate again in 2014!

www.portesdecouvertes.fr

NATIONAL CAMPAIGNS

GERMANY

B&S.U.
BERATUNGS- UND SERVICE-GESELLSCHAFT UMWELT mbH

Niedrigstenergiehäuser – heute schauen – morgen bauen!

The German campaign attracted over 800 people visiting private and public buildings in Berlin, Brandenburg, Saxony and Baden-Württemberg. A wide range of new and existing buildings with nearly zero energy or passive house standard, such as schools, kindergartens, single family houses, tenement houses or office buildings took part and opened their doors for visitors of the first edition of the German Doors Open Days Campaign in 2013. Professionals, public stakeholders and the general public were pleased to receive non-commercial information on improving the energy performance of new or refurbished buildings. The objective and competent guidance of house owners and architects inspired many visitors to follow their lead in energy efficient building or renovating of buildings. More than 94% of the visitors rated the campaign as very good or excellent and are looking forward to visiting the Doors Open Days again in 2014.

The Doors Open Days in Germany is supported by the German Energy Agency (dena), Zukunft Altbau, CO2 online and BAKA.

www.haeuser-fuer-heute.de

> **Objective, competent and comprehensible guidance. Super! We'll gladly visit again next year.**
>
> Visitors of the German Campaign

HUNGARY

Hatékony Ház Napok - Úton a nulla energiaigényű házak felé

In Hungary the Hatékony Ház Napok (NZEB Open Doors) campaign was organized between 4 and 11 November when both public buildings and private exhibitors welcomed interested visitors. GreenDependent was able to attract many media sponsors and thus we had numerous articles published, radio interviews and also TV covering national, regional and local media.

As a result of the fruitful initial activities and the great help from the Hungarian Passive House Association we had 43 buildings opened up in the 2013 campaign all over Hungary, which provided a good opportunity for many visitors to visit passive houses, nearly zero energy buildings and exemplary retro fittings. As it is not enough just to have buildings open up, we were able to organize almost 700 individual visits to these buildings. We are proud of having the Budapest University of Technology and Economics as partner and also the Vice President of the Chamber of Hungarian Architects as a member of the Advisory Board of the project.

www.hatekonyhaz.hu

grEndependent Institute

INSIGHTS ON THE 2013

MALTA

> **The Open Doors Malta campaign is a great initiative to increase the visibility and understanding of NZEBs.**
>
> Ing. K. Alamango (Open Doors visitor in Malta, EPB assessor)

Open Doors Malta - Towards Nearly Zero Energy Buildings

In Malta, the NZEB Open Doors Days were organized as bus tours and attracted a large number of home owners, building professionals, architects, and public stakeholders from all over the Maltese islands. The bus tours gave participants the chance to visit multiple buildings in a short period of time and exchange their views and recommendations with other visitors in a relaxed atmosphere.

The campaign was organized with support from the Chamber of Architects and the Department of Engineering at the University of Malta. The buildings that could be visited ranged from small refurbished family homes, to newly built apartments, office and public buildings. More than 90% of visitors were very satisfied with the information they received and with the support provided by the campaign organizers. Similarly exhibitors were very pleased with the organization of the Open Doors Days in Malta and confirmed their willingness to host visitors again in 2014.

www.opendoorsmalta.eu

PIM PROJECTS IN MOTION

SWEDEN

Energikontor Sydost
Energy Agency for Southeast Sweden

> **I appreciated the support from the organizer that ensured that everything was well prepared.**
>
> Exhibitor from Sweden

Modernt och Miljöklokt – Besök ett lågenergihus

The Swedish slogan was "Visit a low energy house – modern and eco-smart" and took place during two weekends in November 2013: 8-9-10th and 22-23rd. Energy Agency for Southeast Sweden cooperated with the Swedish Passive House organization Passivhuscentrum. Together with Passivhuscentrum more than 30 buildings were recruited, single family, multi-family and public buildings. Most of the buildings were in south east and south west parts of Sweden, but buildings from all over Sweden were welcome to join. The campaign attracted 220 visitors. A rather large range of articles were placed in local and regional media. The articles in local and regional media turned out to be the best method to recruit visitors, as we could clearly link articles to number of visitors. Some of the buildings were certified passive houses; some of the houses had interesting and innovative energy solutions all of which qualified them as exhibitors. The exhibitors were very proud of their buildings and many of them will participate in the upcoming campaign.

www.miljoklokahus.se

NATIONAL CAMPAIGNS

SLOVENIA

ZRMK INSTITUT
Gradbeni inštitut ZRMK
Building and Civil Engineering Institute

Skoraj ničenergijske hiše: "Že danes obiščite hiše prihodnosti!"

In the first year's campaign in Slovenia, interest shown from general public exceeded all expectations. Twenty-two residential, eight public and four office buildings opened their doors to visitors. Almost six hundred visitors registered to attend these events and therefore the Slovenian coordinator, Gradbeni inštitut ZRMK, has even bigger plans for the 2014 campaign.

The campaign has made a remarkable impression on the visitors. Survey results, from a sample of 166 visitors, show that guided tours of the houses within the Slovenian NZEB 2021 campaign satisfied the expectations of 99% visitors. 37.3% planned to build, 11.8% planned to renovate their house soon and 8.1% were building a new house at the time of the campaign. Visitors' survey results show that the NZEB 2021 project offers an excellent business opportunity for professionals who have participated in the construction process of these buildings.

Separate survey for exhibitors was also carried out, and 94.7% of the exhibitors in the online survey said that they were satisfied with the experience they have acquired through participation in the NZEB 2021 campaign. None of them expressed dissatisfaction with the project coordination.

www.haeuser-fuer-heute.de

IRELAND

Nearly Zero Energy Buildings (NZEB) – Open Doors Weekend

The Irish NZEB Open Doors campaign took place on 8th, 9th and 10th November 2013. The event was organised in liaison with the Irish Passive House Association and was timed to coincide with the International Passive House Days event. The campaign also involved a partnership with Ireland's Eco Village in Cloughjordan County Tipperary where visits to multiple buildings were arranged during a single tour. The campaign hosted events in 17 of the 26 counties of the Republic of Ireland.

The combined number of private houses and public buildings provided 61 exhibitor buildings. The combined number of visitors was 787, just exceeding the target of 775. The event in Cloughjordan was jointly promoted in partnership with the Irish IEE SustainCo project partners, Tipperary Energy Agency. SustainCo provides NZEB technical and financial toolkits. For the vast majority of building owners, this was their first experience of opening their doors and all said they enjoyed the event and are open to participating again.

www.nearlyzeroopendoors.ie

INSIGHTS ON THE 2013 NATIONAL CAMPAIGNS

POLAND

> **I am convinced that this initiative will significantly contribute to the promotion of energy-efficient construction**
>
> M. Karpiński, (Ministry of Infrastructure, Poland)

Dni Otwartych Drzwi - odwiedź dziś budynki jutra

The Polish NZEB campaign is organized by The Polish National Energy Agency under the under the name "Dni Otwartych Drzwi – odwiedź dziś budynki jutra". It will be organized in three parts (2-3 months each) catching different seasons and enabling visitors to travel between the locations.

The Polish passive, nearly zero and energy efficient buildings will open doors in the following months:

- In spring 2014 – starting end of March until June
- In autumn 2014 – starting end of September until November and
- In winter 2015 – February and March.

To get more information on the upcoming events visit national website.

www.budynki-jutra.pl

Evelyne Huytebroeck ,
Minister of Environment,
Energy, Water Jurisdiction
and City Rejuvenation

INTERVIEW (...)

The ideal nearly zero energy building is an innovative combination that would make a high energy efficiency building as affordable as possible. It is not easy to select my favourite one because each one proposes this smart combination between performance and costs.

In 2013 Ecobouwers Opendeur / Portes Ouvertes Ecobâtisseurs was organized in The Brussels Capital Region as a bilingual campaign. Why did the Regional Government decide to support this campaign?

The Government of the Brussels Capital Region decided to strengthen the energy performance obligations for new buildings from 2015 onwards. These future buildings must achieve criteria close to the passive standard, which can reduce heating demand by a factor of ten. This standard is strongly supported in the Brussels Region since 2007. Today, about 800.000 m2 of buildings (will) respect the passive standard in Brussels. It's so important for people living or working in Brussels to discover passive buildings that we decided to support the Ecobouwers Opendeur / Portes Ouvertes Ecobâtisseurs initiative.

What are your impressions of this first edition in Brussels?

This first edition in Brussels has been a great success. Almost 1.000 people visited the 33 houses open in Brussels, which is a very good attendance compared to other regions (Ghent was the other one that attracted many visitors). Passive or exemplary buildings, new constructions and renovations, could be visited and presented by their inhabitants. This is always helpful, when people can ask their questions directly to other citizens, neighbours... who have made the step themselves and can comment on what worked well, what could be improved, the degree of satisfaction they have in living in an ecobuilt house. Those open doors days are also an opportunity to discover, besides the energy performance, how Brussels houses can integrate the different aspects of sustainable construction, like biodiversity, rainwater recovery...

The Brussels Capital Region is very active in the field of sustainable construction and has a very progressive energy policy. How do the Open Doors Days fit in the picture?

The energy policy in the Brussels Capital Region implies a big step towards high energy performance for new buildings. The EPB 2015 requirements, close to the passive standard, are probably the last step in terms of high insulation, air tightness and

efficient ventilation. Asking more thickness of insulation than EPB 2015 requirements, for instance, seems to be not cost optimum. We can say that the EPB 2015 requirements in Brussels are the appropriate answer to the first part of the nearly zero energy building's European definition which states that "a building that has a very high energy performance". The second part of the definition, the "renewable sources covering", must be still defined in the Brussels energy policy for 2020. Ecobouwers Opendeur / Portes Ouvertes Ecobâtisseurs, showing passive (even zero energy) buildings to the public, is an important initiative which helps increase the understanding of these complex definitions by the future inhabitants.

How would you like to see the Ecobouwers Opendeur / Portes Ouvertes Ecobâtisseurs evolve?

The energy policy in the Brussels Capital Region focusses also on tertiary buildings (offices buildings, schools...). An interesting evolution of Ecobouwers Opendeur / Portes Ouvertes Ecobâtisseurs can be to also show these kinds of buildings to the public.

What is your favourite nearly zero energy building in Brussels? Why?

The ideal nearly zero energy building is an innovative combination that would make a high energy efficiency building as affordable as possible. Due to the Exemplary Buildings call of projects, launched in Brussels each year since 2007, there is a lot of such buildings in Brussels. It is not easy to select my favourite one because each one proposes this smart combination between performance and costs.

What would be your advice for other European Regions or Cities that want to promote Nearly Zero Energy Buildings?

My advice is the follow the same path we took from the beginning: first propose incentives and technical supports to invite the construction sector to find the best solutions to make affordable nearly zero energy buildings. Then, you can adopt strong energy policies based on the large amount of experience acquired by the sector.

"We highly appreciate the international character and range of the NZEB open doors initiative. I am convinced that the polish component of this European campaign will foster development of the energy efficient building construction and promotion..."

Małgorzata Skucha,
President of the Management Board,
National Fund for Environment Protection of Water Management,
Poland

NATIONAL, REGIONAL AND LOCAL SUPPORT MEASURES

Austria

THE UPPER AUSTRIAN SUSTAINABLE BUILDINGS PROGRAMME

Austria is a federal country which means that legislative competence is split between the national and the regional governments. Especially in energy issues (building related issues, financial support schemes), many responsibilities are within the regional levels. Therefore the regional government plays a very important role in building matters.

Upper Austria is a leading European region in sustainable buildings. Due to consistent policies, today there are more than 1.000 buildings meeting passive building standard and several thousand "lowest energy buildings". Local energy strategies are supporting this development. Upper Austria has set a target to meet 100% of its electricity and space heat demand by renewable energy sources and to reduce energy consumption for heating by 39% and CO2 emissions by 65% by 2030.

In the region of Upper Austria, a comprehensive building programme has cut energy consumption in 85% of all new homes by 50% since 1993. This was achieved through a soft loan programme which combines a financial incentive with targeted information. The calculation of an energy performance indicator, the participation in an individual energy advice session for the homeowners and an energy performance certificate for every building are the most important programme elements. If the requirements are met, the home owners receive a soft loan. From 1993 to 2012, more than 100.000 homes met the programme requirements, achieving an energy saving of several million kWh/year. The programme is also very attractive in economic terms: using the least-cost-planning calculation method, every kWh saved through energy efficiency measures costs only 1.8 cents.

Heating performance indicators as the basis for the building energy codes in Upper Austria.

Example: Sustainable housing programme for renovation

- renovation program 2010: 5.500 one-family homes
- energy savings: 235 GWh/a
- cost savings: 20 million €/a
- average life span: 20 years
- total savings: 5.000 GWh
- average indicator before renovation: 242 kWh/m²,a
- average indicator after renovation: 61 kWh/m²,a

Example: The Upper Austrian regional public buildings programme

For public buildings, the regional administration carries out a number of measures to increase energy efficiency and renewable energy sources. It covers primarily vocational schools, administration offices, nursing homes, museums, road and park maintenance with a total area of heated space of 771.653 m² and includes among others the following political and legal measures:

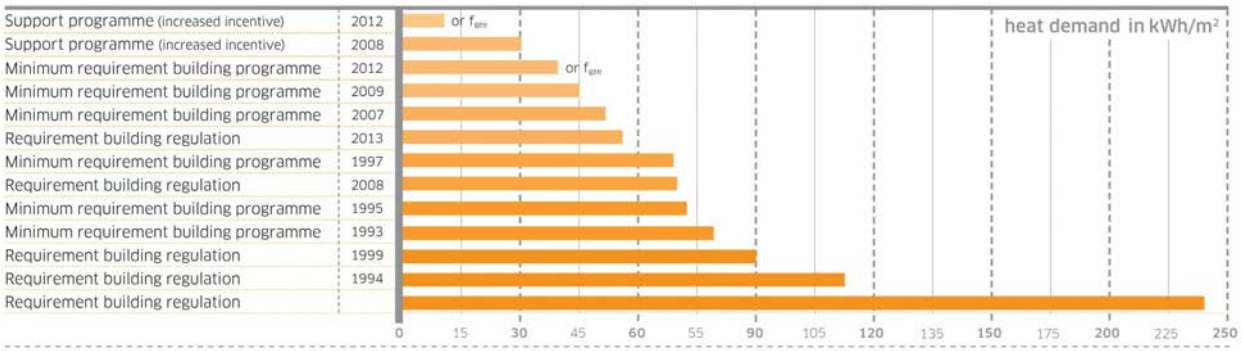
- 1,5 % target
- minimum performance requirements
- performance requirements in tender documents
- priority for RES for heating & hot water
- mandatory energy accounting in place for many years which allows monitoring of progress in energy efficiency and renewable energy systems

Benchmarking and monitoring of regional public buildings is done for all buildings owned by the regional administration and showed the following results:

- energy consumption per m² (heating & hot water) decreased by 18,5 % since 1994"
- electricity consumption stable despite "more IT"

Additionally for renovation of public buildings, Energy Contracting is used and on average 30% savings are achieved.

Building trends in Upper Austria – energy performance indicators for single family dwellings



PASSIVE HOUSE DECLARATION OF THE CITY OF WELS, UPPER AUSTRIA

The city of Wels/Upper Austria (59.000 inhabitants) has been very active in environment protection and energy saving for many years. It has developed an ambitious energy strategy (project "Energy city Wels") including the following objectives:

- increasing energy efficiency of heating and electricity by 16%
- increasing renewable energy source for heating and electricity up to 34% (by 2020) and to 100% (by 2030)
- reduction of CO2 emissions for heating and electricity by 16% (2020) and by 28,3% (2030)
- Additionally the city of Wels passed a "passive house declaration" (in 2008), including the following objectives for the building sector:
- to foresee renewable energy sources for heating in all new constructions and building renovations
- to aim at passive building standard in all new constructions of public buildings
- to use passive building components in all renovations of public buildings

Based on these targets, a detailed analysis of the energy situation was carried out and strategies and recommendations for the different sectors were developed. For example the following energy efficient buildings have been realized in recent years:

- Kindergarden Lichtenegg: passive building construction, PV and solar thermal systems
- Gymastic hall Pernau: NZEB construction, ventilation system with heat recovery, PV and solar thermal systems
- School building Lichtenegg ("VS 11"): passive building construction, PV plant
- Kindergarden Robert-Koch-Straße: passive building construction, PV plant
- School building Mauth ("VS 5"): passive building construction, PV and solar thermal systems
- New hall for trade show: passive building construction ("office tower"), NZEB hall, solar thermal collectors
- Church St. Franziskus: passive building construction, PV and solar thermal systems, pellets heating
- Home for elderly people ("Alten- und Pflegeheim Vogelweide"): passive building construction, PV and solar thermal systems, heat pump
- Energy science center "Welios": passive building construction, PV and solar thermal systems, green electricity
- Solar public buildings: PV plants mounted on 35 public buildings and in total more than 30.000 m² solar thermal systems

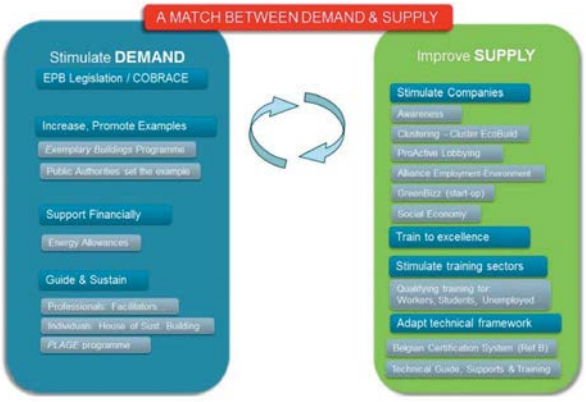
Belgium

BRUSSELS-CAPITAL ACTION PLAN FOR NZEBS

The housing stock in the Brussels-Capital Region (over one million inhabitants) is very compact (6.497 inhab/km²) but old: 78% of homes in Brussels were built before 1970. The Region is also characterized by a large proportion of tenants (58,6%).

The energy policy of the Brussels-Capital Region in Belgium, initiated since 2004 imposes requirements aimed at nearly zero energy buildings for all new constructions as of 2015.

The Region has initiated numerous actions stimulating demand as well as improving supply.



bruxelles environnement leefmilieu brussel .brussels

Sustainable building and life cycling of buildings: Brussels Environment's projects, a match between demand and supply. Source: Bruxelles-Environnement 2012

The Region has:

- implemented a major training programme for architects, engineers, developers, project managers, energy managers, etc. (800 participants and 15.000 hours of training a year as of 2012);
- negotiated (2010-2012) and implemented (2011-2014) an Employment-Environment Alliance for the sustainable construction sector in order to stimulate the sector and adapt the knowledge and expertise of the workers
- set up an ambitious subsidy scheme for high energy construction and renovation.

Since 2007 Brussels has launched a yearly "Exemplary Buildings" project call with the intention of stimulating the construction or renovation of buildings. The projects selected must be remarkable according to four criteria: the best energy performance, the lowest environmental impact, the reproducibility of the solutions at a reasonable economic cost and, finally, the urban and architectural integration of the building into its urban context. The selected project receives funding (EUR 28 million since

2007) and support from an expert: 193 projects (29% collective housing, 28% single-family homes, 27% community facilities, 16% offices and shops) have already been selected, representing 520.000 m² (27% in renovation), i.e. 285.000 m² in new buildings meeting the passive criteria, with the others meeting very low energy consumption criteria. This project is a major driving force in the construction and renovation of buildings with a very high energy and environmental performance and it has already enabled the Region to impose the passive standard on all new public constructions as of 2010.

As a result of the Region's ambitious energy policy 2.365 high energy performance buildings of which 2.144 are passive buildings were built. 90,6% of these buildings are renovations. This represents 659.922 m² of passive building, 57.491 m² of (very) low energy buildings and 4.419 m² of Nearly Zero Energy Buildings. First results show a 10% reduction between 2004 and 2010 in energy consumption which is encouraging evidence for the Brussels energy policy. The Brussels energy policy was rewarded with the EUSEW Award by the European Commission in 2012.

www.ibgebim.be

France

FRENCH "JÉCO-RÉNOVE, J'ÉCONOMISE" BUILDING REFURBISHMENT PROGRAMME

French government has launched in September 2013 the "Guichet unique de la renovation": a wide energy efficient renovation plan called 'Jéco-rénove, j'économise". This plan answers to the government commitment to refurbish 500.000 private and social dwellings per year until 2017 and to lower the building sector energy consumption of 38% before 2020. The aim is to catch up the delay taken since Grenelle II: so far only 120.000 private dwelling and 25.000 social housing has been renovated every year. A large communication campaign was launched toward the French population end 2013.

The plan targets French households and has been set to help them in funding their energy efficient refurbishing works. A specific attention is given to moderate incomes families. Different grants and financial supports are available according to the annual income of the households and to the number and type of energy efficient improvement works planned.

For lower incomes households, financial grant together with a 3000€ incentives is available. For middle class households, a 1350€ incentives will be given.

There are two main incentives to help people to renovate their dwelling to energy efficient standard: a tax credit called CIDD (Crédit d'impôt développement durable) and a 0% loan (eco PTZ). They have no income restrictions. These government grants can be cumulated with local disposition or plans from local government or city halls. In order to advise people on these different kinds of financial aid, a unique phone number has been set up nationally.

www.renovation-info-service.gouv.fr

LOCAL FINANCIAL INCENTIVES IN ANNECY, HAUTE-SAVOIRE

Annecy, Haute-Savoie France has 80.000 inhabitants. Through its agenda21 and different incentives the city has been motivating owners to implement energy efficient renovation for 5 years now.

To encourage owners to make their dwelling more energy efficient, Annecy city is cutting property taxes by 50% (on the part that belongs to the city) for housing constructed before 1989, where owners have had an expense in excess of 10.000€ for energy efficient upgrades. The exoneration lasts for 5 years after the payment of invoices.

Together with the 0% eco loan agreed in the framework of Grenelle II, Annecy signed in April 2009 an agreement with 2 banks to offer better loan conditions to citizens proceeding with energy efficient insulation upgrades of their dwellings.

To promote solar energy, the city supports its citizens in installing solar systems. The city also pays a grant for material purchase. (20% on a 1.500€ purchase for private households and a 4.500€ grant for collective housing).

Germany

GERMAN ENVIRONMENTAL RELIEF PROGRAMME

The region of Berlin supports through its Environmental Relief Programme (Umweltentlastungsprogramm) innovative renovation of public buildings like schools or daycare centres. During the current funding period (2007-13), buildings have to undercut the German Energy Saving Regulation (EnEV) 2009 for new buildings by 10%.

One of the 72 projects that were supported is the Montessori primary school in Berlin Pankow, built in 1989 and listed for preservation. During 2009 and 2011 the windows have been exchanged, the façade and floor slab insulated, the roof renewed, a heat pump and a ventilation system with heat recovery installed and thus primary energy savings of 216 MWh/m²/a achieved. All in all, the renovation works including planning amounted to a cost of about 1.179.000 €.

The programme is equipped with 160,8 million € of which 50% originates from the European Regional Development Fund (ERDF). The remaining budget is provided through the region of Berlin and private donors. The major share of the programme's budget, 110 million €, is being used for energetic building renovations.

Montessori primary school in Berlin Pankow
Source: B.&S.U. mbH

DAY-CARE FACILITY AND GYM IN THE CITY OF LUDWIGSBURG

The city of Ludwigsburg has 88.000 inhabitants and is situated in the federal state of Baden-Württemberg. Ludwigsburg is an ambitious municipality with an integrated sustainable urban development approach. As an integral part to this development, the city is working in European cooperation projects to exchange and share information and aggregate sources of financing. In the framework of CEC5 project, the city of Ludwigsburg is creating a day-care facility and gym that will have parts and installations meeting the requirement of nearly zero buildings. The ERDF financing is pledging 280.000€ for the implementation of low energy characteristics such as thick insulation, high efficient triple glazing and mechanical ventilation system. "Gartenstraße 14" and the other six demo-buildings of the EU partners should serve as shining examples in order to promote the ambition to construct buildings with similar energy performances.

Day-care facility and gym in the City of Ludwigsburg
Source: City of Ludwigsburg

Hungary

PASSIVE BUILDING WITH 100 FLATS IN BUDAPEST

One of the district governments of Budapest started an exemplary unique initiative: a multi-flat building with 100 flats to be built in the 13th district by April 2014. The flats will remain local government property and will be rented out on a social basis. The building has certification from the Passive House Institute (PHI, Darmstadt).The five-storey block of flats will have 50 – square-meter flats on the average, and the flats focus on a closed green area,

which will also function as a green roof of the garage as well as a community yard.

The parking place will be under the yard. Between the building blocks there will be two vertical passageways, and the flats will be accessible from the gangway in the direction of the yard. The rooms of the flats are orientated outwards to the street. The glass surfaces are mostly east-west orientated, and the sunny side of the building blocks will be equipped with external blinds to prevent the flats from overheating in the summer. The designers took great care to minimize the heat-loss by using special building veneer and heat recovery ventilation, which recycle the 70-90% of the exhausted air. Renewable energy sources will be provided by heat pumps, and solar panels will produce a part of the hot water.

Ireland

IRISH BUILDING REGULATIONS

The 2011 Building Regulations require that at least 10 kWh/m2/a comes from renewable resources and impose ambitious minimum levels for fabric U values, thermal bridging and air tightness. The equivalent primary energy value for a standard 2-storey semi-detached home is 60 kWh/m2/a. A new NZEB standard with a primary energy value of 45 kWh/m2/a for the same type of house standard will be introduced in 2016.

Thus, as renewable technologies are required as a minimum by the current building regulations, the case for providing incentives or subsidies no longer applies. Grant programmes for low building energy building projects such as the Sustainable Energy Authority of Ireland's (SEAI) 'House of Tomorrow' programme ceased by 2010.

IRISH ENERGY EFFICIENCY GRANT PROGRAMMES

A range of grants are available through SEAI's Better Energy Homes scheme for owners of existing houses for wall insulation, roof insulation, boiler and heating control upgrades and solar thermal installations. The levels of grants available cover approximately 30%- 40% of the costs of the works. From 2009-2013, 150,000 houses have had upgrade measures through this scheme.

Malta

GRANTS FOR ROOF THERMAL INSULATION AND DOUBLE GLAZING IN MALTA

The Malta Resources Authority (MRA) have launched a new scheme to encourage the public to take energy saving measures by offering a grant on the installation of roof insulation and double glazing products. The scheme offers a grant on roof insulation and double glazing of up to 15,25% of eligible costs up to a maximum of 1.000€ . To date, more than 750 households in Malta benefitted from a grant under this scheme. These and other similar energy saving initiatives help reduce the emissions level generated by the energy sector which ultimately means improving the quality of our environment. For more information visit www.mra.org.mt373 and was extended to the 31 December 2014 by government notice GN 1141 of 2013.

PHOTOVOLTAIC ELECTRICITY GENERATION GRANT SCHEME IN MALTA

Photovoltaic Electricity Generation Grants aim to promote an increase in domestic electricity generation from small scale solar PV systems. The first scheme in Malta started in 2006 with a maximum capital grant of 1.164,69€ with an additional grant of 582,34€ for every additional installed kilowatt peak. In 2009, this was changed and a 50% grant was given up to a maximum of 3k€ A FIT scheme was introduced concurrently to support the uptake of this grant scheme which pays a guaranteed 0,22€ per kWh for 6 years.

The PV scheme was repeated yearly in 2010 and 2011. The latest scheme which was launched in 2013 provides a grant of 50% of eligible costs up to a maximum of 2.500€. The latest call for applications has a volume of 21million €.

Poland

SUBSIDIES FOR ENERGY EFFICIENT CONSTRUCTION IN POLAND

The first polish national programme supporting energy efficient construction is operated by the National Fund for Environment Protection and Water Management (NFOSIGW). It's operated since 2013 and has a 5 year financial framework. Altogether 300 Mio PLN has been allocated to the programme. It is foreseen that it will support construction of ca. 12.000 houses and flats, reaching energy savings of ca. 94.000 MWh/a and CO2 emission reduction by 32.000 t/a.

Support for natural persons is provided in the form of subsidies and bank credits.

There are 7 banks enlisted and entitled to deliver credit lines under the programme. The subsidies have the form of a non-performing loan, partial payment of the capital for the construction or purchase of an high energy efficiency standard house or flat.

The level of subsidy depends on the energy efficiency standard expressed by an annual rate of energy consumption for heating, ventilation and hot water production, calculated in accordance with the guidelines.

The subsidy amounts are set at the following level:

- Single family houses:
  Standard NF15 – EUco 15 kWh/(m2a) – subsidy of PLN 50.000.00 gross;
  Standard NF40 – EUco 40 kWh/(m2a) – subsidy of PLN 30.000 gross;
- Housing flats in multi-family houses:
  Standard NF40 – EUco 40 kWh/(m2a) – subsidy of PLN 11.000 gross;
  Standard NF15 – EUco 15 kWh/(m2a) – subsidy of PLN 16.000 gross.

More information: www.nfosigw.gov.pl/en

EXEMPLARY PUBLIC TENDER PROCEDURE FOR A PASSIVE BUILDING DESIGN OF LARGE MULTIPURPOSE COMPLEX IN MARKI, POLAND

Marki, is one of the most dynamically developing municipalities in Poland, with a dynamic growth of population. In 2012, the municipal council faced the necessity of taking a decision to build a new sports, recreation and education center to comply with the current population needs. Anticipating potentially high operating costs for such a center, decision was made to go for a passive standard. The municipality has appointed a team of experts to coordinate the tender for architectural design and construction planning. The rules of this tender were detailed and included all requirements and calculation methodologies enabling fair comparison of the projects with regards to the aspects relevant for energy efficiency. Green procurement and LCA is still not very common in public tenders in Poland. In vast majority of the tendering procedures the investment cost is still a decisive criterion. In this case the authorities were farsighted and focused on life cycle costs. This was reflected in the evaluation criteria and their weights:

- architecture - 55 %
- price - 10 %
- energy efficiency - 35 %.

This investment planning can serve a reference to other municipalities.

Visualisation of the sports, recreation and education center in Marki, Poland
Pracownia Architektury i Designu Piotr Kuś

Sweden

SWEDISH BUILDING REGULATIONS

The definition of NZEB standard is not set yet in Sweden. According to the 2013 Building Regulation the energy requirements is 90 kWh/m2, year in the southern parts of Sweden, and 130 kWh/m2, year in the northern parts. Technically it is possible to build 40-70 kWh/m2 and year. The Swedish government calls for a more solid base for a more stringent tightening of the Swedish building regulations and to set a specific level for a near zero energy building.

The Swedish National Board of Housing, Building and Planning and The Swedish Energy Agency will deliver a definition of the Swedish standard by June 2015. Even if the standard isn't settled yet, some municipalities are stimulating energy efficiency buildings, where the city of Växjö is a well-known example. www.vaxjo.se Växjö has a long run political strategy to reduce their impact of the climate chance and become fossil fuel free. But Växjö is not alone in the combat of climate changes, we can proudly present to smaller municipalities on the south east cost by the Baltic Sea who contributes to make the region greener.

FREE PERMITS FOR BUIDLINGS IN BORGHOLM MUNICIPALITY, KALMAR COUNTY SWEDEN

Borgholm, is a rural municipality in the county of Kalmar with 11000 citizens. It has taken a step forward to stimulate the construction of passive houses in the municipality by offering free permits for buildings with passive house standard. A training day for local builders and entrepreneurs was organized to raise the level of knowledge on the passive house technology. The stimulation for building low energy houses is an important part of the Borgholm's commitment to the Covenant of Mayors and to the membership in the Swedish Association of Ecomunicipalities.

More info at www.borgholm.se

PASSIVE STANDARD IN THE PUBLIC INVESTMENTS OF MÖNSTERÅS MUNICIPALITY, KALMAR COUNTY SWEDEN

Mönsterås passive building standard library.
(Gunnar Thernström, Mönsterås)

Roland Åkesson, the mayor of Mönsterås, trying an electrical moped during the "Electric vehicle tour" event in May 2013. (Gunnar Thernström, Mönsterås)

Mönsterås, in the county of Kalmar, has a population of 12.900 inhabitants. Mönsterås municipality is taking its responsibility to be a forerunner in implementing renewable energy sources and building low energy buildings. Like Borgholm it is also a member of the Swedish Association of Ecomunicipalities. Launching energy projects is very effective in this municipality thanks to joint political agreement to act to prevent climate changes and to use best available technology possible. At the city hall there is a large PV-plant with monitors showing the production levels at the entrance. The public library is hosted in a new passive standard building. During 2013-2014 a day-care centre for children will be built using passive house technology.

More info at www.monsteras.se

Slovenia

ENERGY AUDITS AND ENERGY ADVISORY NETWORKS IN THE MUNICIPALITY OF VRHNIKA

Vrhnika is a municipality in the Osrednjeslovenska region with the population of 16.277. It started to work on sustainable energy policies systematically in 2008, when the Local Energy concept was first adopted. It included an analysis of existing conditions in the field of energy use and supply (focused more on public buildings), and the possibilities for using local renewable energy sources. It also referred to the goals of the community in the energy field. The municipality also signed up to the Covenant of Mayors and therefore a Sustainable Energy Action Plan will be developed and submitted soon.

The main public buildings in Vrhnika have undergone extended energy audits under the municipality plan to conserve energy. According to the findings of the local energy concept and extended energy audits the municipality started with measures that do not demand any financial investment (organizational measures) and measures that were listed as the most cost efficient. The municipality is also active in the field of raising public awareness, offering offices to ENSVET, Energy advisory network in Slovenia, where free expert counselling about energy efficient construction and renovation of buildings takes place. In 2010 Vrhnika was awarded as the most energy efficient middle sized municipality in Slovenia.

Source: green-twinning.eu/?page_id=51

> **I had a lot of pictures to show from the building process which was very appreciated by the visitors.**
>
> Exhibitor from Sweden

NZEB
BUILDING EXAMPLES

"HAUS 2019" BERLIN, GERMANY

Haus 2019, Federal Environment Agency (UBA)

Since 2013 The Federal Environment Agency (UBA) is based in an environmentally sound office building called ‚Haus 2019' in Berlin-Marienfelde. The goal for the model green building, which provides a workplace for 31 people, is particularly ambitious: it is a zero-energy house which will cover its entire energy needs by itself. Energy consumption is closely monitored.

Energy consumption is closely monitored. „In one year's time we will know if we have achieved our ambitious aim of showing a balanced energy budget as a result of the use of renewable energy sources and high standards in building and technology," said UBA President Jochen Flasbarth at the opening ceremony. UBA's President is confident of success after the one-year period of monitoring. „Renewable energies and energy efficiency in the building sector are key elements of the transformation of the energy system. Greater efforts must be made to reduce the greenhouse gas emissions of new buildings and in the existing stock. The new UBA building in Berlin-Marienfelde is meant to send a clear signal of this effort," said Flasbarth. At the least the office meets the requirements of compliance with the new EU standard for nearly zero-energy buildings, which will take effect in 2019 for public buildings.

Researchers at UBA will be moving into their new offices in ‚Haus 2019' in early September, after 20 months of construction. It is the Federal Government's first zero-energy building. Although the wood-panelled construction of the building took only a few weeks, the interior fittings and technical building equipment posed a special challenge. Quality of construction was a key prerequisite to the success of the project: testing of the building shell's air tightness surpasses even the highest of standards as does testing for indoor air quality.

The record of the building's energy production after one year should cover the building's operational needs. Energy is supplied exclusively from renewable sources of energy: photovoltaics and a heat pump that harnesses the energy of the groundwater pumped and needed for operation. On the consumption side all technical and work equipment was selected according to the highest standards of efficiency. These high standards of energy efficiency are not, however, to be borne at the expense of user convenience. The settings of the building automation system will therefore be checked against real conditions and actual user behaviour in the first service phase. This will allow for optimisation of the facility's operation and tailoring it to meet user needs as well as achieving a balanced energy budget. The building will be operated in close collaboration with its owner, the Institute for Federal Real Estate (BImA).

The name ‚Haus 2019' refers to the EU Directive on the energy performance of buildings. The Directive lays down the requirements for 'nearly zero-energy buildings'. This standard will already apply for public institutions as of 2019; as of 2021 for all other buildings. The Federal Environment Agency is setting a good example and is already applying this standard for its new construction.

REFURBISHMENT OF THE PUBLIC BUILDING IN ZWEVEGEM, BELGIUM

In 2007 the municipality of Zwevegem (West-Flanders, Belgium) carried out a feasibility study for the refurbishment of an office building to a public building for the local administration. Although the offices from the sixties had completely outdated insulation levels and technical equipment, the reinforced concrete structure offered great flexibility for the renovation. 5.150 m2 of office space allows the centralisation of all administrative personnel of the municipality and the social services. Optimal use of natural daylight, the combination of night ventilation and effective solar screens, advanced thermal insulation of walls and roof were the basis to transform this office to an energy efficient public building (E-30, K-30). Photovoltaic panels will provide the renewable energy and make it a nearly zero energy building.

Photo by: Klaas Verdru, Copyright: BURO II & ARCHI+I

WOODEN PASSIVE KINDERGARTEN BUILDING IN PREDDVOR, SLOVENIA

Kindergarten building in Preddvor (Jelovica HIŠE d.o.o.)

Wooden passive kindergarten in Preddvor, Slovenia was built in 2012, within just 6 months. It has a total area of 1.500m2. It makes an interesting and replicable example for technical and technological wooden construction solutions.

Kindergarten is designed as a modern wooden prefabricated construction, which combines the features of a passive building and construction from precast elements made from ecologically acceptable materials. This system enables quick installation of a facility, immediate inhabitancy and a lot of flexibility in size and building capacity according to the requirements and needs of the client, as well as allowing subsequent expansion of an additional number of sections. The innovative approach to design and the use of sustainable technologies and natural materials ensures high energy efficiency and optimisation of operating costs. The earthquake and fire safety of the construction are just two of many other benefits. A healthy living environment and energy efficiency are another two key arguments.

With the required standard, the facility ranks in the B1 energy class, with the space heating energy demand of 18 kWh/(m2a). Building envelope is extremely airtight. Fan pressurization test showed remarkable achievement as air exchange rate at 50 Pa pressure difference (n50) resulted in only 0,25 1/h. The required air tightness value for the passive standard is n50 ≤ 0,6 1/h. The excellent air tightness is the result of facility's design, proper construction and proper material selection, and the exceptional quality and precise manufacturing and assembly of the facility.

To ensure energy efficiency, the structural system of external walls Jelovica Termo Plus has been selected, with increased insulation of external walls, on the facade, the ceiling and roof construction, and under the foundation. According to the standard requirements, the insulation of the external doors and windows has also been improved, as the passive standard allows maximum U-value of 0.9 W/m2K. The built-in wooden doors and windows have triple glazing. Building is heated from an existing biomass boiler in Preddvor. Photovoltaic system with peak power of 96,7 kW is mounted on the roof assembly.

This building proves feasibility of using wood and wooden products for public buildings.

	CO_2 emissions
Passive kindergarten in Preddvor	15.182 t/a

Kindergarten has been made in an energy-positive (energy self-sufficient) process.

Text by Alenka Popp Vogelnik, Jelovica HIŠE d.o.o.

REFURBISHMENT OF THE VOCATIONAL SCHOOL IN LINZ, AUSTRIA

The refurbishment and extension work on the vocational school in Linz (300 students, 250-bed boarding section) was completed in 2010. The 19.300 m² building's heating supplied by district heating. In addition, the school is equipped with 50m² of façade integrated solar thermal collectors and a 3 kWp photovoltaic system. The building's thermal insulation was improved in the course of the refurbishment; a ventilation system and acoustic ceilings were installed in the classrooms and the lighting system was upgraded. Owing to these improvements, the school now fulfils high energy standards. Its energy performance indicator (HWB) is 21 kWh/m² a.

Vocational school in Linz, Austria (OÖ Energiesparverband)

PASSIVE DETACHED HOUSE – A TEST SITE FOR BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS STUDENTS

Passive detached house , Hungary (József Feiler)

The house is situated on a south downhill of a valley. This is a model house where the students of the Budapest University of Technology and Economics regularly carry out technical measurements. Electricity production is by photovoltaic panels which almost covers the full needs and the hot water is created by heat pump. The building is also provided with a heat-recovery ventilation system. The water supply is from a well and an infiltration is built for the degradation of wastewater on the plot.

Energy consumption: 13 kWh/m2/a

NUMEROUSLY AWARDED BUILDING OF BORD GAIS NETWORKS IN DUBLIN

Bord Gais Networks Services Centre, Dublin (Paul Tierney Photography)

The Bord Gais Networks Services Centre combines the Dublin operations of Bord Gais Networks in one single location on a 0,5 acre site. This landmark building achieved a BREEAM rating of ‚Excellent' and is the first office building in Ireland to achieve a post construction award of this rating under the BREEAM 2008 standard. This building has since won numerous design and sustainability awards.

The building has a super insulated envelope with a U-value of 0,15 W/m2K for roof and walls exceeding current Building Regulation standards and achieves a verified air-tightness of 1,82 m3/h/m2.

A key feature of the design is that the concrete slab construction contains an integral Thermo Active Building System (TABS) in-slab pipework that is used for both heating and cooling the building. A ground source heat pump (GSHP) provides heating during the winter and in summer provides cooling to the TABS and HVAC.

The building also hosts a low energy plant tower system with its southern elevation hosting 126 m2 of photovoltaic panels that supply up to 15% of the GSHP electricity requirement and 20m2 of solar panels providing 50% of the buildings hot water demand through a buffer vessel. The plant tower also has the ventilation exhaust plenum and has an integrated energy recovery system for the building connected to the ground floor air handling unit.

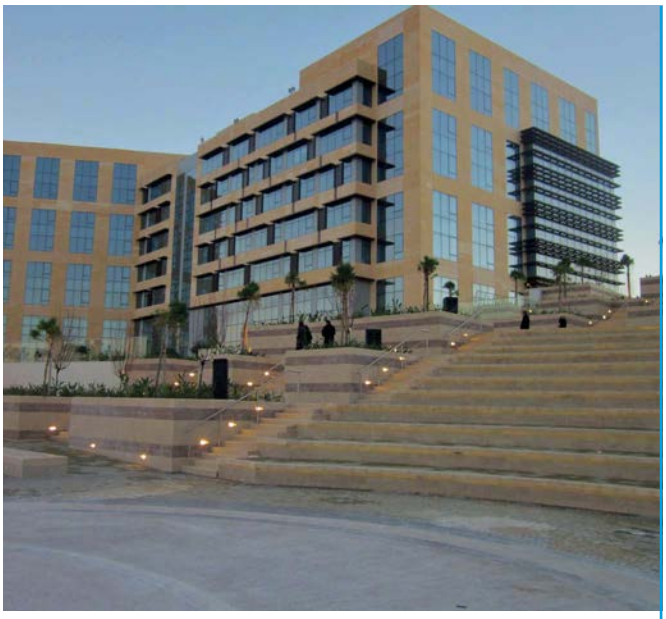
Throlux adaptive lighting and shading controller linked to the Building Energy Management System determines the most energy efficient requirements with regard to lighting, heating and cooling.

MALTA'S FIRST LEED SILVER CERTIFIED BUILDING

SmartCity Malta SCM01 has 12.888 m2. of built-up area. The building is designed to be a commercial building occupied by multiple tenants. SCM01 consists of 8 floors including commercial offices, retail outlets, conference centre and adjacent open spaces, and surface parking. The project implements several energy efficiency measures, including high efficiency glazing, external shading devices, efficient lighting, occupancy sensors, exhaust air energy recovery, demand-controlled ventilation, and a variable refrigerant flow HVAC system.

The building achieves 17,6% energy savings and is more efficient compared to baseline thresholds set in ASHRAE 90.1-2004. Moreover 10,02% of the total building material and products used have been extracted, harvested and manufactured within 500 miles of project site and 13,97% of that material is comprised exclusively of pre- and post-consumer recycled content.

As part of evaluating and measuring various energy conservation strategies, a computer based model was built using eQUEST energy simulation software. To encourage ongoing accountability and optimisation of tenant energy consumption, real-time submetering devices were installed. Smart City Malta SCM01 is Malta's first LEED Silver Certified Building.



Smart City Malta SCM01, Xhajra, Malta (Andrew Saliba, Urban Malta)

PUBLIC LIBRARY IN MÖNSTERÅS, SWEDEN

The PV on the roof produces the same energy amount that the building requires on a yearly basis, which corresponds to the electricity consumption of five households. The outdoor lighting is LED. The heating is supplied by district heating, produced by waste heat from the nearby pulp industry, based on biomass. The energy consumption is monitored in the entrance hall, including data of electricity heating consumption and the PV electricity production. The roof is partly sedum. The sedum roof insulates and minimizes the load on the water system since the rain water is drained to the groundwater. The thick walls, the airtight construction and well insulated walls guaranties a very low level of heat losses. Heating and ventilation is split up in sections to reduce the energy consumption and give the highest air quality possible. The heat recovery system on the exhaust air has 80% efficiency. The library has 70% less energy demand than a traditional building.

Classification	**Low energy new building**
Owner	**Mönsterås municipality**
Year of construction	**2013**
Architects	**Atrio Arkitekter i Kalmar AB**
Treated floor area	**1.100 m²**
Final heating demand	**40 kWh/(m²a)**
Primary energy demand	**40 kWh/(m²a)**
Construction	**Steel and wood frame, concrete**
Electricity production	**PV 20.000 kWh/year**
Ventilation	**Exhaust air heat exchanger**
Heating	**District heating**

Total costs appr. 3,3 million €

Public library in Mönsterås, Sweden (Lena Eckerberg)

SPORTS, RECREATION AND EDUCATION – SOON ALL UNDER ONE PASSIVE ROOF IN MARKI, POLAND

Sports hall, recreation and education center of the total area of 16.000 m^2 will soon be used by the inhabitants of Marki, Poland.

Final construction projects are currently being prepared for this investment. The picture presents the winning architectural design for this large, multipurpose passive building.

Apart from high energy efficiency standards and typical solutions for energy efficient lighting and heat recuperation from ventilation systems it implements several innovative solutions. It will use: integrated PVT collectors (solar collectors with PV panels), solar energy heat storage, cogeneration and heat pumps for waste heat utilization. In addition, to solve rainwater management problems - parts of the roof will be used as wetland system, characterized by a negative water balance (the amount of water evaporated during the year is greater than the sum of annual precipitation).

Sports, recreation and education center Marki, Poland
(Pracownia Architektury i Designu Piotr Kuś)

MUNICIPAL HOUSE FOR THE PLANET, MEYTHET IN HAUTE-SAVOIE, FRANCE

Maison Pour la Planète is a Public owned building rented by Prioriterre. It was built in 2008-2009. It has a Minergie Eco P label - energy efficiency standard.

Final energy consumption	< 15kWh/m2a for heating
Primary energy consumption	< than 30 kWh/m2a for heating, cooling, ventilation and hot water
Air tightness	< than 0,6 volume /hour
Energy-efficient appliances	A or A++ for the refrigerator

Type of RES used:

2,8 m^2 of Solar thermal panels for shower and dishwasher, completed by the geothermal system. 80m2 of photovoltaic panels that produce 9.000 kWh/a. IT is what we need for heating/cooling/ventilation and hot water.

other energy efficiency solutions used :

- Light (daylight optimized)
- Energy efficient appliances
- Rain water harvesting
- Local materials and artisans : Wood from the forests of the two Savoie (BQS brand – PEFC label)
- Materials with little or no toxic emissions :
  Insulation → cellulose / wood fiber,
  Boxes → Oriented Strand Board (OSB) with formaldehyde-free glue,
  Flooring → linoleum
- Materials with a low environmental impact during deconstruction :
  Insulation → cellulose / wood fiber
- Recycled and / or recyclable materials:
  Roof seal (recyclable), Cellulose (recycled)

Maison Pour la Planète
(Virginie Siegele, Prioriterre)

We are currently in the planning phase and found out that there was the possibility to visit these homes. The input that we received during these visits is very helpful and we are grateful for this opportunity.

Visitor from Austria

The organization of the 2014 campaigns is now underway. There will be many possibilities to get involved in the campaign, from partnerships, through participation in exhibitions, to sponsorship of activities and opening of your doors to visitors if you own a low energy building.

GET INVOLVED IN OUR 2014 CAMPAIGN!

- If you are a national, regional or local decision maker, visit our exhibitions, apply for the study tour and get inspired to make a change in your region
- If you are an owner of the NZEB, low energy, passive house, join the campaign by registering you house for the exhibitions – you can decide when and how many visitors you will host
- If you are a building professional and have a portfolio of NZEB, low energy, passive or energy plus house designs or constructions, share your projects and help us reach the house owners for the exhibitions
- If you are an NGO active in the field of sustainable buildings development, join our initiative. By combining efforts, we'll reaching higher audience levels.

If you would like to get more information about the national Nearly Zero Energy Buildings Open Doors campaigns in 2014, please contact the national organizers.

NATIONAL DOORS OPEN DAYS ORGANIZERS

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