

**BRINGING  
NEARLY  
ZERO-ENERGY  
BUILDINGS  
TO THE PUBLIC**

**ENGAGING BUILDING PROFESSIONALS  
AND MUNICIPALITIES IN INTEGRATED  
ENERGY DESIGN**

**GRANT AGREEMENT NUMBER:  
IEE/11/832/SI2.615932**

# The AIDA project

**AIDA** (stands for **AFFIRMATIVE INTEGRATED ENERGY DESIGN ACTION**) supports building professionals and local authorities all over Europe in designing nearly zero-energy buildings (nZEB). AIDA offer action tailored to these target groups, such as regular study tours to innovative buildings, best practice-learning from **operational success stories**, presentation of **innovative design software** and active support for municipalities via an integrated energy design (IED) process. 3207 building professionals and muni-

cipal representatives participated in 86 **study tours** and 54 municipalities were supported in Integrated Energy Design and/or the creation of **sustainable energy action plans (SEAPs)** within their Covenant of Mayors membership.

**FOR FURTHER INFORMATION**, please visit the **homepage** and the **Facebook page**.

[www.aidaproject.eu](http://www.aidaproject.eu)

**54+**

engaged municipalities

**80+**

innovative buildings  
visited

**86+**

study tours

**1500+**

buildings professionals  
engaged

**3207+**

visitors to study tours

**10000+**

people reach  
via internet

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# Executive Summary

In the past 3 years the fundamental aim of the AIDA project was to accelerate the market entry of nearly zero-energy buildings (nZEBs) in the partnering countries and in Europe as well. AIDA was to make up for the lack of intense actions to spread knowledge about nZEBs. For this reason the project's primary objective had been and still is today to raise awareness towards nZEBs among local authorities and building planners. To achieve this goal AIDA targeted municipal representatives as market multipliers on the demand side, and architects and master-builders on the supply side who are being actively involved.

AIDA offered and through its extensive network of cooperating organisations will offer in the future actions that are tailored to suit each of these primary target groups including study tours, introduction to operational success stories, presentation of existing design tools and methods, active support for municipalities in integrated energy design and close cooperation with key actors.

**IN SUMMARY:** The core objective of AIDA had been a widespread market adoption of nZEBs, to reduce energy consumption and carbon emissions, which are important factors to reach the 2020 targets. Thus, these AIDA achievements led to an increased number of nearly zero-energy buildings (new and refurbished) in Europe:

- Enabling the market uptake of nZEBs in Europe by assisting 28 municipalities in seven EU countries to develop tenders and feasibility studies for new and renovated nearly zero-energy buildings.
- Supporting 26 municipalities in the creation of sustainable energy action plans (SEAPs) within their Covenant of Mayors membership or similar roadmaps.
- Increasing the visibility of front runner buildings by offering 86 study tours for more than 3200 European building professionals and local decision makers.
- More than 1600 building professionals used the online tool on integrated energy design.
- 71.6 Million EUR investment made in nZEBs by municipalities and building professionals involved in AIDA, leading to 171 toe/yr Renewable Energy production, 486 toe/yr Primary energy savings and 1.482 tons CO<sub>2</sub> equ. emission reduction.

Enjoy reading our report!

# 1. Introduction

The project **“AFFIRMATIVE INTEGRATED ENERGY DESIGN ACTION – (AIDA)”** aimed to accelerate the market entry of nearly zero-energy buildings (nZEB) which are energy efficient buildings using renewable energy sources. AIDA was to make up for the lack of intense actions that are present at the moment to spread knowledge about nZEBs. Raising awareness towards nZEBs among local authorities and building planners was the project’s primary objective. Thus AIDA targeted municipal representatives as market multipliers on the demand side, and architects and master-builders on the supply side to achieve its main goal.

AIDA offered actions that were tailored to suit each of these groups including study tours, operational success stories, presentation of existing tools, active support for municipalities including Integrated Energy Design (IED) processes and close cooperation with key actors. The core objectives of AIDA were:

- increasing the visibility of front runner buildings (nZEBs) via study tours among European municipalities and building professionals
- a widespread adoption of integrated energy design and nearly zero-energy buildings in municipalities with reduced energy consumption and carbon emissions by supporting municipalities in setting up design tenders and municipal nZEB roadmaps such as Sustainable Energy Actions Plans (SEAPs)
- Promoting integrated energy design among building professionals to increase their knowledge of nZEBs by promoting online tools on integrated energy design.

**IN SUMMARY:** The AIDA’s prime objective was a widespread market adoption of nZEB, reducing energy consumption and carbon emissions. AIDA had a notable benefit for the target groups and contributed significantly to the EU’s 2020 targets to enable a sustainable future.

Visit [www.aidaproject.eu](http://www.aidaproject.eu) and [facebook](#) to learn more about AIDA!

## **THIS REPORT**

The aim of this report is to summarize the most important outcomes and experience gained from the work done within the AIDA project, in order to pass this experience on to relevant institutions and associations that will use this information after the lifetime of the project and to secure, in this way, the sustainability of the project’s outcomes and results.

The report starts with a chapter on the project activities such as study tours and support for municipalities. The most important outcomes, success stories and lessons learnt for each of the above mentioned activities through the implementation of the AIDA project are highlighted in a chapter on the project results and finally the conclusions chapter gives a résumé on AIDA.

## 2. Project Activities



The AIDA Project consortium

Based on the abovementioned objectives, the main activities of AIDA were

- a. to conduct study tours to front runner nZEBs for building professionals and municipal representatives,
- b. support municipalities with integrated energy design through feasibility studies and tenders and
- c. support municipalities in the development of nZEB roadmaps.

These activities including information on target groups, key actors and realisation, are described in the following subchapters.

### MAIN TARGET GROUPS

#### **MUNICIPAL OFFICIALS (ELECTED OR APPOINTED)**

– their desire for buildings meeting nZEB standards will encourage, or compel, consultants to high performance.

**ARCHITECTS** – their key role in the design of new buildings make them an essential target audience. Their nZEB vision will encourage all stakeholders to contribute their skills to reach building targets.

**ENGINEERING CONSULTANTS** – they provide the technical solutions that are needed to reach nZEB standards.

**BUILDING PROFESSIONALS** – on site, the quality of their work will be decisive.

**STUDENTS** – today's students are tomorrow's professionals. Teach them to work towards high performance goals as standard practice.

## 2.1 Study Tours – Seeing is believing



**Study tours** showcase to industry professionals technical and design solutions to reach nZEB standards.

It is commonly accepted that if people can see it, they can believe it. The most concrete way to demonstrate technical or operational innovation is to show that it has been done before. Study tours take participants on a tour of the possible and give them an intimate, close up look at how to do it as well as the participation of building architects, planners or engineers demonstrating to professionals that they too can build on their own knowledge to reach tangible targets such as those demonstrated on the study tours. Building owners attending study tours are also reassured by the knowledge that competent professionals have already built to the high standards they want to reach.

### SUCCESS FACTORS & TECHNICAL ISSUES

#### SUCCESS FACTORS

- A tour program and calendar that builds on synergies with local events
- A comprehensive promotional plan to the target audience well in advance of the tour
- A well-documented, technically competent, building guide – for example, the project architect or engineering consultant
- Relevant workshop subjects
- Take home documentation
- Smooth travel and catering planning

#### TECHNICAL ISSUES

- Financing study tours
- Selection and access to building sites
- Building stakeholder participation
- Partnerships with professional organisations



**SOME nZEBs VISITED  
WITHIN AIDA**



**ÉMI Construction  
Knowledge Center,**  
Szentendre (HU)



**Solar house LOW3 at the  
ETSAV – UPC campus,**  
Barcelona (ES)



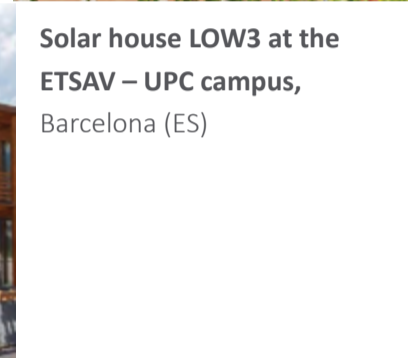
**Blood and Tissue Bank  
of Catalunya,**  
Barcelona (ES)



**CasaSalute's New HQ,**  
Bolzano (IT)



**Kehrerhof Siebeneich,**  
Bolzano (IT)



**Retrofitted multi-family  
house,**  
Kapfenberg (AT)



**OTE/Cosmote Building,**  
Paiania (GR)



**Oakmeadow Primary  
School,**  
Wolverhampton (UK)



**Naturaliabau,**  
Merano (IT)



**Raiffeisen Tower,**  
Vienna (AT)



## 2.2 Integrated Energy Design in Municipal Practice

The **INTEGRATED ENERGY DESIGN (IED)** is a multidisciplinary and collaborative process that analyses and integrates different aspects and knowledge during all phases of the development of a building: the architectural concept, design, construction, commissioning, operation and maintenance of the building. The ultimate goal is to achieve performance targets as defined by the customer (e.g. zero energy balance, high internal comfort, economy, functionality, aesthetic impact, etc.) to determine the most advantageous solution. This integrated approach is based on the team's collective knowledge to evaluate all decisions thanks to feedback mechanisms where different possibilities are considered. The choices are taken, not from a single expert, but from a work team choosing from a wide range of possibilities.

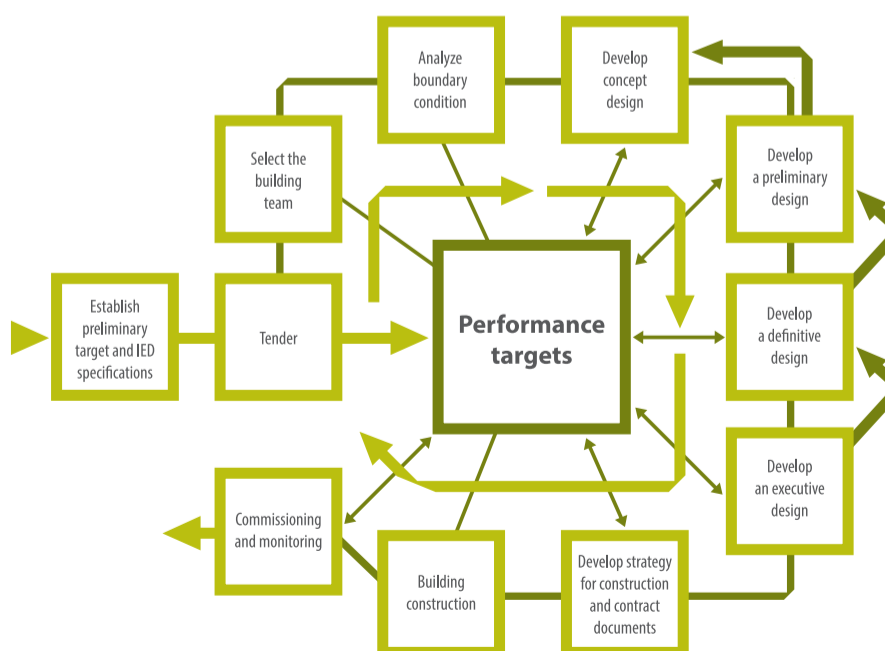
The integrated energy design process supports the design teams to integrate energy performance, renewable energies, indoor environmental quality and building liveability and to identify the best solution taking into account the

qualitative (high efficiency certification), economic (cost/benefit), functional and aesthetical aspects aimed to achieve. In public design tenders two main definitions have to be addressed:

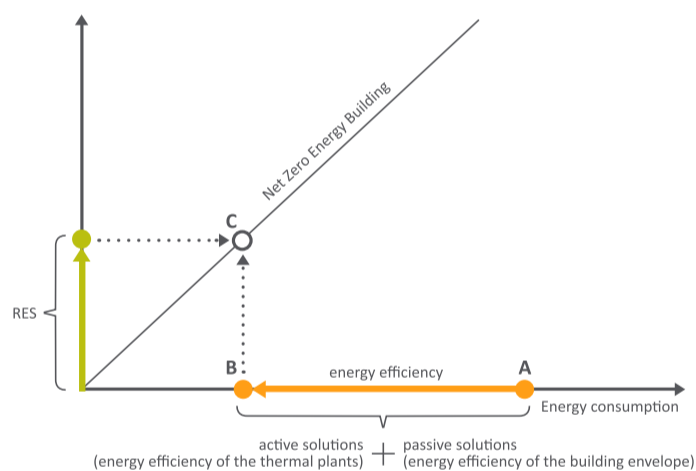
### 2.2.1. Definition of the nZEB target

The European Directive 2010/31/EU on energy performance of buildings defines a

*“nearly zero-energy building»  
(...) a building that has a very high energy performance (...). The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.”*



**FIGURE 1** describes how to increase the energy efficiency of the buildings starting from the state of the actual building stock (point A). On the x-axis there is the energy consumption of the buildings and on the z-axis the on-site energy production (thermal and electric) from RES. Through active and passive solutions, it is possible to increase the energy efficiency of the buildings and move from point A to point B, which is considered as a nearly zero-energy building. To achieve the NET zero energy target (point C), it is necessary to cover the energy consumption from energy (thermal and electrical) on-site generation plants from RES. When the point is close to the Net zero energy building line, above or below, the building is called nearly Net zero energy. When the final point exceeds the bisector the building is called an 'active' or 'plus-energy' building because more energy is generated (onsite) than consumed.



**Figure 1: Calculation of the energy balance**

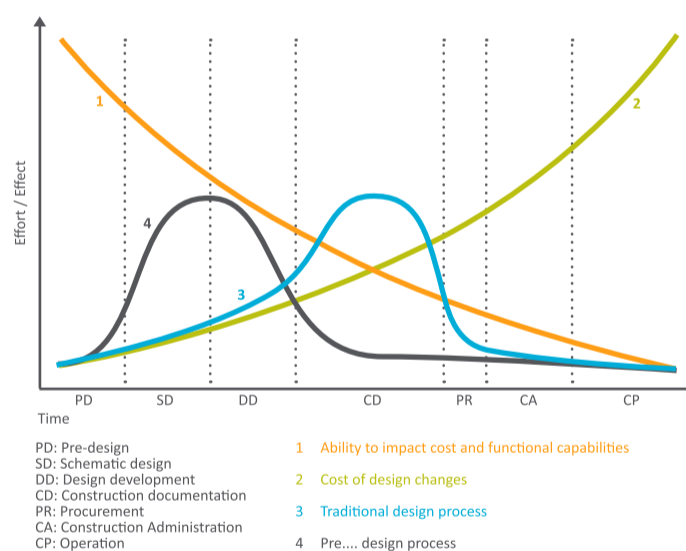
**Source:** L. Aelenei et al.: Passive cooling approaches in net-zero energy solar buildings: lessons learned from demonstration buildings. CISBAT Conference 2011, Lausanne, CH

## 2.2.2. Definition of the IED process

The IED approach is an effective way to realise nZEBs because it involves different people to discuss energy performance issues in the early stages of the design process.

**FIGURE 2** shows the difference between a traditional approach (blue line) and an IED process (black line). With the integrated design process the design phase whilst, at the same time, the cost's curve trend changes with the decision making time phase. In the IED approach it is high during the design phases (red line) while in a traditional approach (green line) it is high during the construction and operation phase due to project changes.

**FOR MORE INFORMATION** on realised design tenders and feasibility studies see the AIDA report **"Public buildings tenders for the several case studies with the nearly zero energy target"**.



**Figure 2: Difference between traditional design process and integrated design process.**

**Source:** Collaboration, Integrated Information, and the Project Lifecycle in Building Design, Construction and Operation, 2004

## ADDED INFORMATION ON PERFORMANCE CONTEXTS IN PUBLIC TENDERS

**NZEB TARGET** based on definition of IEE-AIDA project or national implementation of 2010/31/EU.

**ENERGY PERFORMANCE INDEXES** (better than official nZEB definitions) suggested by AIDA:

- Achievement of the highest standard class of the national or local energy performance classification of the building; usually called standard/class A.
- coverage of a minimum of 50% of the primary energy consumption by energy produced from RE sources;
- total primary energy consumption limit of 60 kWh/m<sup>2</sup>year;
- CO<sub>2</sub> emission limit of 8 kg CO<sub>2</sub>/m<sup>2</sup>year.

### PARTICIPANTS REQUIREMENTS:

At least one expert (Architect or Engineer) in energy efficient buildings is required in the team → This experience has to be documented by the participants reporting on a project, showing their technical competence and knowledge on high energy efficiency buildings, the energy performance analysis made, the tools used, the results obtained and the possible technical verifications, such as Blower door test, thermography, etc.

### ADD INTO THE RANKING LIST ACCORDING TO:

- nZEB criteria
- energy expert criteria

Higher scores will be assigned when the offer satisfies minimum energy performance indexes and participants requirements. However, the achievement of these points is no determinant to win the competition.

**EVALUATION COMMISSION** is usually composed of different professionals able to analyse and evaluate different criteria (aesthetic, structural, costs...). To guarantee a correct evaluation of the energy performance requirements part, it is necessary to include a technician with experience in high energy performance buildings in the decision making process. Otherwise, municipalities should require specific technical training or particular experience to demonstrate that they have the competency of an energy certifier. Furthermore, a professional specialising in building energy efficiency and renewable energies should be on the team.

## TECHNICAL ISSUES & MAIN KEY ACTORS

### TECHNICAL & FINANCIAL ISSUES

- Urban laws can support the building refurbishment measures and generate advantages or disadvantages.
- Municipalities should introduce an economic incentive to the design team if, after the first year of building monitoring, the energy balance is nearly zero. This is an additional motivation for design teams to pursue the nZEB target. The same can be proposed to the tenants. Municipalities should introduce a money incentive cutting their taxes if after one year of the energy balance monitoring the building achieves the nZEB target (this type of economic incentive should be designed separately for each country, depending on the national taxation).

### KEY ACTORS

- Municipalities and public experts
- Design teams
- Architects (designer, urban, ...)
- Engineers (electrical, civil, mechanical, etc.)
- Constructors
- Tenants

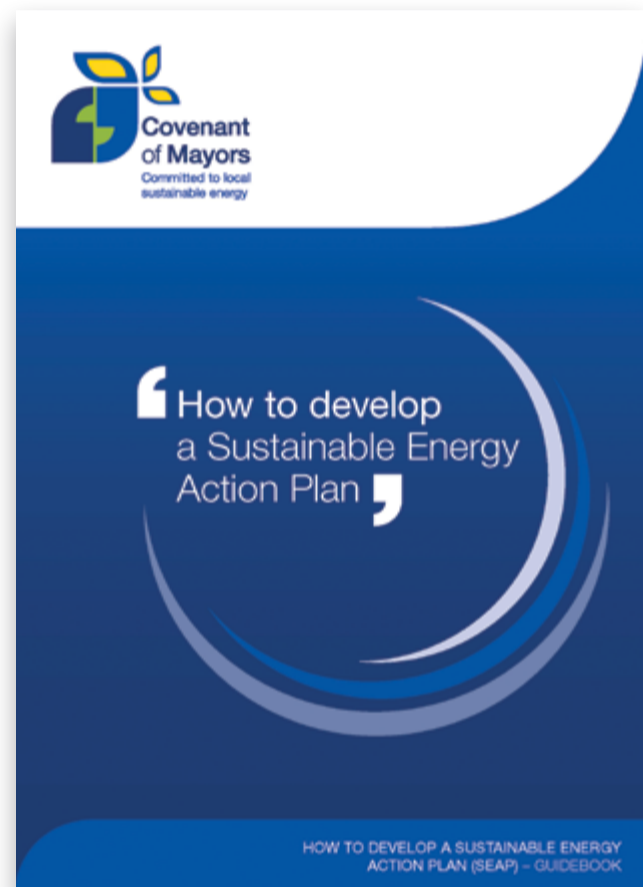


## 2.3 Municipal Roadmaps – The way to nZEBs

**Municipal roadmaps** have become a powerful tool for cities and regions to plan, implement, monitor and evaluate climate and energy policies, and in doing so contribute to global mitigation and adaptation achievements. Within roadmaps municipalities can implement measures in a structured and integrated way, allowing them to systematically monitor their efforts in going beyond national legislation in these fields. They are also an instrument for municipalities to communicate to their stakeholders the importance of energy and climate protection, and to encourage them and other relevant participants to contribute to these achievements.

The **Covenant of Mayors (CoM)** initiative is a voluntary commitment by public authorities (regions and municipalities) to implement energy and climate change mitigation measures to reduce their overall CO<sub>2</sub> emissions by at least 20% by 2020. The implementation of the agreed measures should take place at the local level in the territory within the competence of the public authority and, where relevant, with the consultation and participation of national authorities. The political commitment undertaken by all CoM signatories is declared in the CoM core text, which must be approved by the municipal council (or equivalent body, including national authorities).

The **Sustainable Energy Action Plan (SEAP)** is the municipal roadmap document in which CoM signatories define concrete actions, responsibilities and timing to achieve the public authority's long-term energy consumption and CO<sub>2</sub> emissions reduction targets for their geographical area.



**Covenant of Mayors official's guidebook** for developing a Sustainable Energy Action Plan (SEAP).

CoM is not the only initiative used in Europe to define these actions. There are **other officially recognized frames depending on the country, region or municipality**, that can also provide municipal roadmaps with the same goals and similar objectives. Although the AIDA project's guidelines for nZEB promoting actions are oriented towards the CoM context, they may be used to assist the same actions in any other type of roadmaps and frames.

## PROMOTING nZEBs IN MUNICIPAL ROADMAPS

A Municipal roadmap is the doorway to creating nZEBs in the urban environment.

Different types of these roadmaps are regulated by several existing and official frames to include as many positive local actions as possible. Then, a roadmap becomes a reliable starting point to achieve the municipal objectives in a fixed time period. In the case of nZEB actions, two types of options may be considered: existing buildings as nZEB refurbishments and new constructions as genuine nZEBs. Roadmap guidelines have been developed and provided to public technicians to explain the process of nZEB promoting actions; **see AIDA's**

**Report of the actions carried out to engage municipalities.**

### SUPPORTING MUNICIPALITIES TO DEFINE THEIR OWN 'NEARLY' ZERO-ENERGY BUILDING ACTIONS

Actions promoting 'nearly' zero-energy buildings at municipal level are these four aspects:

#### A. nZEB CRITERIA BY ORDER OF FULFILMENT:

- Achievement of the highest energy efficiency class without the contribution of RES.
- High contribution of Renewable Energy Systems (RES) in the consumption of primary energy.
- Defining a limit of 'nearly' zero-energy consumption and a very low CO<sub>2</sub> emission level.

#### B. ACTION TEMPLATE TO BE USED AS STRUCTURE TO IMPLEMENT EACH NZEB ACTION.

#### C. ROADMAP INDICATORS (recommended by the AIDA project)

- Number of nZEBs or equivalent buildings
- Accumulated renewable energy production (MWh/y)
- Accumulated energy saving (MWh/y)
- Accumulated cost (€)
- Payback period average or per building (y)
- Abatement cost average per building (€/Kg CO<sub>2</sub> saved)

#### D. SOFTWARE TOOLS AND CALCULATION METHODS BY nZEB CRITERION:

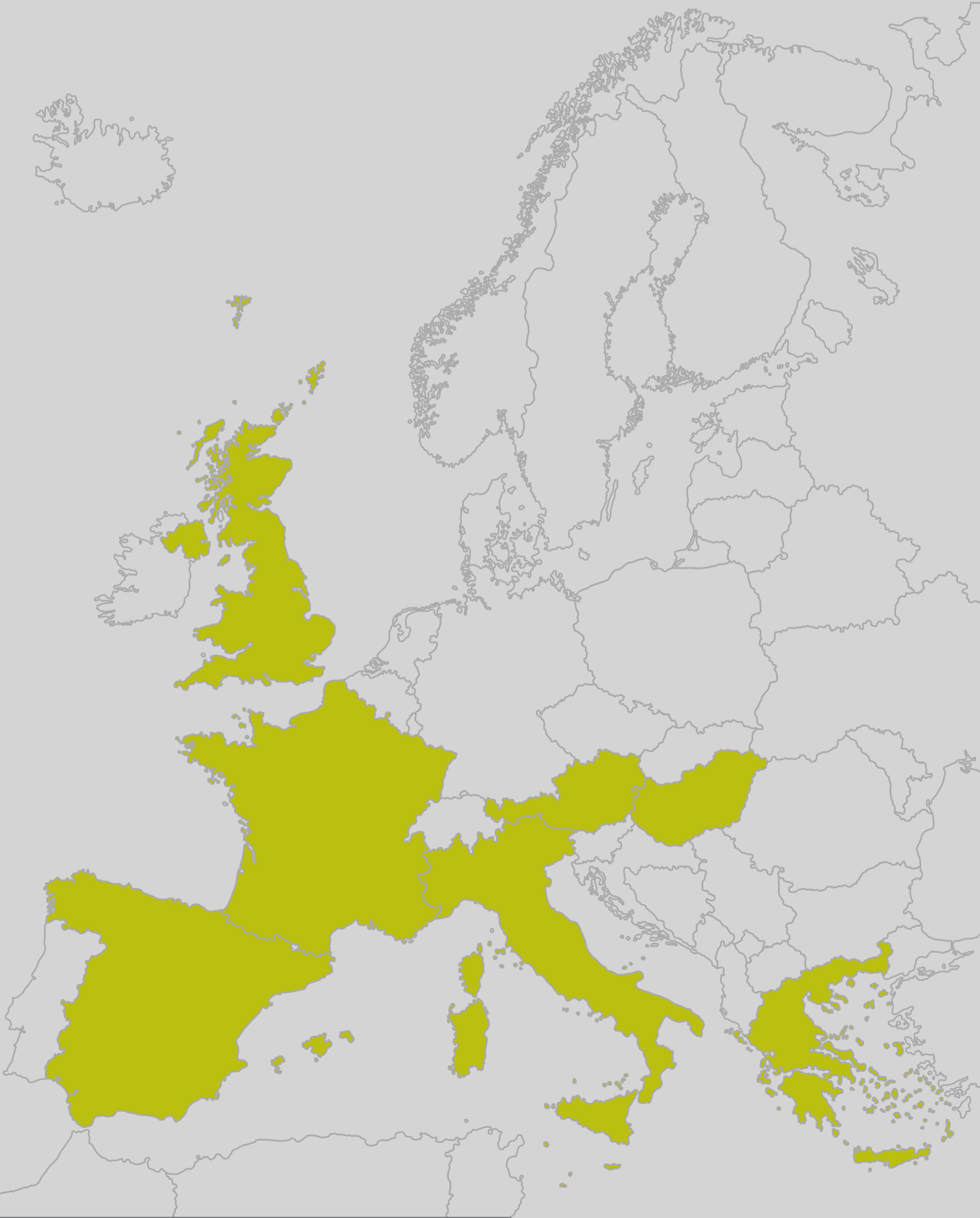
- Energy rating and auditing tools to calculate the Highest Class.
- Design tools to calculate RES contribution.
- International or European standards to calculate the energy balance and CO<sub>2</sub> emissions.

#### KEY ACTORS

Public authorities:

- Mayors
- Municipal representatives or technicians
- Local or Regional energy agencies
- Roadmap coordinators

# AIDA COUNTRIES

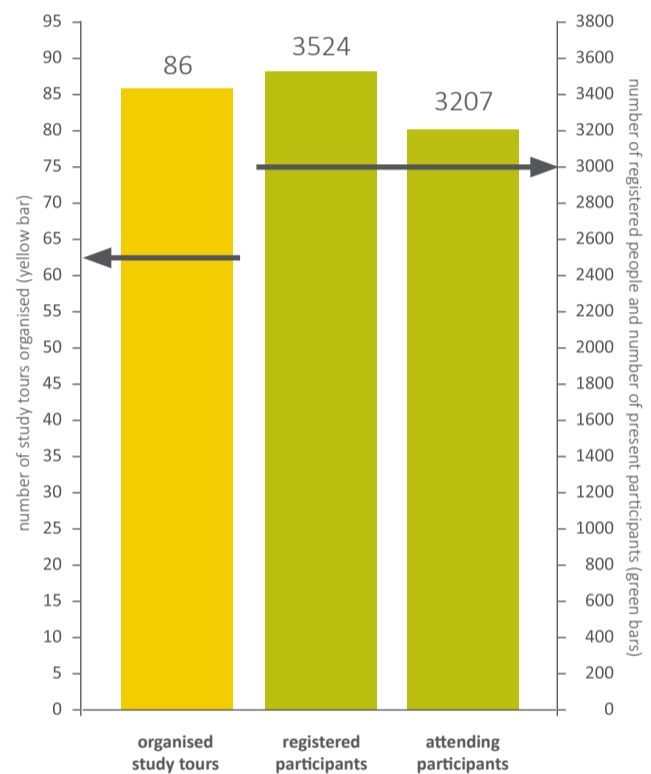


# 3. Results and success stories

AIDA offered and through its extensive network of cooperating organisations will offer in the future actions that are tailored to suit the needs of building professionals and municipalities as the primary target groups including study tours, introduction to operational success stories, presentation of existing design tools and methods, active support in integrated energy design and close cooperation with key actors.

**IN SUMMARY:** The core objective of AIDA was a widespread market adoption of nZEBs, to reduce energy consumption and carbon emissions, which are important factors to reach the 2020 targets. Thus, these AIDA achievements led to an increased number of nearly zero-energy buildings (new and refurbished) in Europe. The main results of AIDA are as follows:

- Enabling the market uptake of nZEBs in Europe by assisting 28 municipalities in seven EU countries to develop tenders and feasibility studies for new and renovated nearly zero-energy buildings.
- Supporting 26 municipalities in the creation of sustainable energy action plans (SEAPs) within their Covenant of Mayors membership or similar roadmaps.
- Increasing the visibility of front runner buildings by offering 86 study tours for more than 3200 European building professionals and local decision makers.
- More than 1600 building professionals used the online tools on integrated energy design
- 71.6 Million EUR investment made in nZEBs by municipalities and building professionals



## The AIDA study tours exceeded the targets

involved in AIDA, leading to 171 toe/yr Renewable Energy production, 486 toe/yr Primary energy savings and 1.482 tons CO<sub>2</sub> equ. emissions reduction

Moreover, building professionals and municipalities participating in AIDA were asked to share their opinion about AIDA via questionnaires. AIDA was well received by the target groups and they were very satisfied with the offers, in particular the study tours and the support for municipalities in integrated energy design and in developing municipal roadmaps. For instance, 81% of the participants have learnt something new about nZEB within the AIDA study tours and 97% of the participants are definitely or likely able to use the presented information in their da-



ily business. According to extrapolations of the responses 59% of the participants have already planned or ordered nearly zero-energy buildings with an average size of 708 m<sup>2</sup>. The heating demand in 16% of these buildings is lower than 10 kWh/m<sup>2</sup>a, in 56% between 10 kWh/m<sup>2</sup>a and 15 kWh/m<sup>2</sup>a and in 28% higher than 15 kWh/m<sup>2</sup>a but below 25 kWh/m<sup>2</sup>a. Most of the buildings are equipped with heat pumps and solar thermal installations in cover the heating demand followed by gas, wood and pellets boilers and a connection to the district heating network.

In addition, the participants were also asked if they are going to plan or order a nZEB in the next

three years. This was agreed by 81% of the participants. The average floor area of these planned buildings will be around 930 m<sup>2</sup>. The heating demand is intended to be lower than 10 kWh/m<sup>2</sup>a in 24% of these buildings, between 10 kWh/m<sup>2</sup>a and 15 kWh/m<sup>2</sup>a in 56%, in 16% of the buildings between 15 kWh/m<sup>2</sup>a and 25 kWh/m<sup>2</sup>a and higher than 25 kWh/m<sup>2</sup>a in 4%. The predominant heating system will be the heat pump followed by district heating, solar thermal installations, natural gas boilers and finally wood and pellets boilers. This means most of these buildings are better than the national building code requirements.

### 3.1 AIDA Success Story 1 – On the Forefront of nZEBs in Europe



Informing Building Professionals and municipalities is AIDA's core objective, ©AIDA



David Venus, Building Expert from the Austrian AIDA Partner AEE INTEC shows a plus-energy renovation in Styria, ©AIDA

Highlighting the ability of conscientious architects and design teams to meet the challenges set by building owners, the AIDA compilation of **SUCCESS STORIES** illustrates, through a dozen examples, real solutions to take building practice to nZEB standards, and provides recommendations on key success factors through People, Planning, Targets and Tests. The AIDA project, co-funded by the European Commission, supported building professionals and local authorities all over Europe in designing nearly zero-energy buildings (nZEB). Within the 86 study tours AIDA offered action tailored to these target groups, such as best practice-learning from operational success stories, presentation of innovative design software and active support for municipal representatives.

Melodie de l'Épine, **AIDA** manager at **HESPUL**, a non-profit research body in Lyon, says:

*"The AIDA study tours have given hundreds of building professionals and local authorities the opportunity to not only visit high performance nZEB buildings, but to also exchange with the stakeholders on the building techniques and materials chosen through the design process and into building occupation."*

Combined with the informative workshops, participants have been equipped with new insight into the feasibility and processes of nZEB building design.

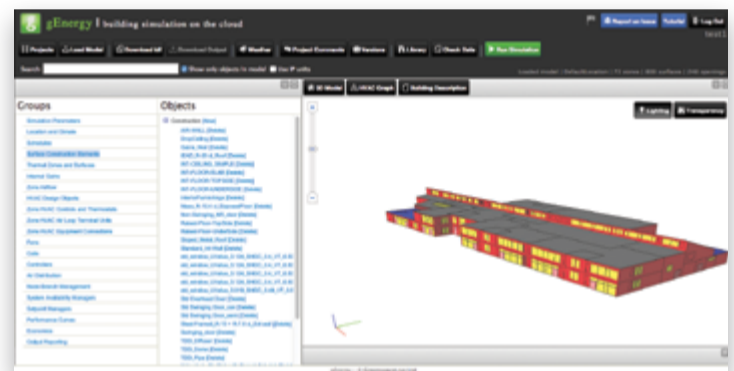
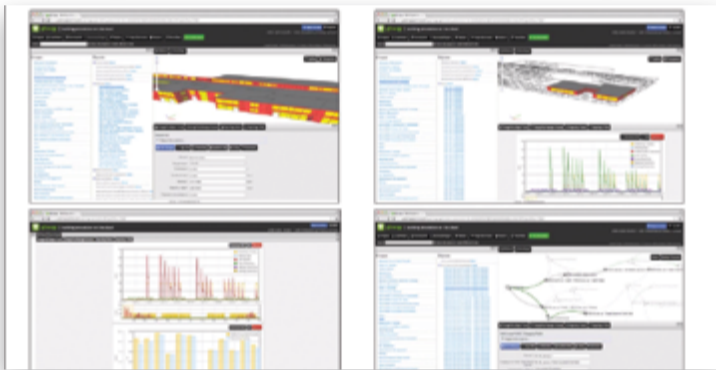
One of these tools presented in the workshops was gEnergy, developed by **GreenspaceLive**, an e-startup and AIDA partner based in Stornoway, Isle of Lewis. gEnergy is a powerful building information modelling (BIM) tool using the EnergyPlus platform.

*"Using on-line web collaboration, gEnergy users are able to train and support your colleagues and customers in EnergyPlus usage. Over 600 building objects, constructions and HVAC systems are supported, which can be commented on project or object level."*

– says Donald Macritchie, managing director of **GreenspaceLive**. Objects can be edited in bulk to save time. Integration with SketchUp comes through the use of the gModeller plugin. By using gbXML and existing IDF models in gEnergy, you get near instant results. With its rich reports and graphics, gEnergy provides building simulation as a service that is a simple, affordable solution. AIDA participants got an gEnergy trial for free!



**Donald Macritchie**,  
managing director of  
GreenspaceLive Ltd.



## 3.2 AIDA Success Story 2 – Promoting Integrated Energy Design and SEAPs among European Communities

The Integrated Energy Design (IED) concept is vital for a successful implementation of nearly zero-energy buildings (nZEB), involving different professions on achieving energy performance requirements since the very beginning of the design process of a building. The IED approach is used as a starting point to promote nZEBs within Sustainable Energy Action Plans (SEAPs) or within other municipal energy roadmaps such as Climate Alliance and e5-communities in Austria. Such SEAP development has been initiated within the frame of AIDA. Several meetings

and contacts with local authorities and consultancy companies were taken place in Spain, Italy, Greece, Austria, Hungary, France and the UK to spread the nZEB idea among European Communities. A total number of 26 municipalities were committed to retrofit and construct buildings following nZEB principles. As a result of this experience, a guideline to promote nZEBs within SEAPs (or other roadmaps) has been developed. This guide is also focused on including acceptance criteria to be achieved over all building construction stages.

nZEB action summary	Main original SEAP fields				Added fields by the AIDA project	
SEAP measures	Estimated costs per action / measure (€)	Expected energy saving per measure (MWh/y)	Expected renewable energy production per measure (MWh/y)	Expected CO <sub>2</sub> reduction per measure (tn CO <sub>2</sub> /y)	Payback period (y)	Abatement cost (€/kg CO <sub>2</sub> saved)
Class A retrofitting measures	43.548,14	48,61	0,00	17,46	3,24	0,77
RES system measures	23.900,00	0,00	14,00	3,78	7,15	0,88
<b>Overall nZEB action</b>	67.448,14	48,61	14,00	21,24	4,67	0,68

### Including nZEBs in SEAPs:

Energy and CO<sub>2</sub> savings, on-site renewable energy production and costs for the municipality are the main issues to be addressed; example of a Spanish municipality, ©AIDA

SEAPs allow for an easy integration of actions to promote nZEB, although close cooperation between local authorities and consultancy companies responsible of the SEAP development is needed. Jordi Cipriano from the Spanish AIDA partner CIMNE has been working for more than 15 years with local authorities and municipalities. Talking about the challenges, Mr. Cipriano says:

*“This approach is a clear example on how the Integrated Energy Design concept can be adapted to the initial stages of sustainable urban plans. However, these experiences have also shown that the concept of nZEB is not known by the majority of local authorities. Greater effort in information dissemination is needed as well as the resolution of uncertainties such as financing mechanisms and guarantee of commitment to long time scales are also vital to fulfil the EU 20-20-20 commitment.”*

The previously mentioned Integrated Energy Design concept is key to the successful implementation of nZEBs. The IED is a multidisciplinary, collaborative process that analyses the whole building process and integrates different aspects and knowledge during all phases of development of the building. The ultimate goal is the achievement of the performance targets defined by the customer (e.g. null energy balance, high internal comfort, economy, functionality, aesthetic impact, etc.) through a collaborative process for determining the most advantageous solutions. The IED work team consists of contractors, architects, engineers, constructors,



**Jordi Cipriano,**  
head of the Building  
Energy and Environment  
Group of CIMNE, Barcelo-  
na, during the interview  
©AIDA

sponsors and users, whose specific expertise, if effectively integrated, allows defining, analysing and evaluating different design solutions and their possible interactions. The choices are made through participatory decision making processes. Thanks to the IED process qualitative, economic, functional and aesthetical aspects of a wide range of design solutions can be taken into consideration to find the optimal building solution.

In addition to SEAPs, AIDA supported more than 28 municipalities all over Europe in developing nZEB design tenders and feasibility studies. For instance, EURAC, Italian AIDA partner, has proven that IED even succeeds in the mountainous regions of the South Tyrolean Alps. EURAC supported the municipality of Meran/Merano in preparing the tender documents for their new elementary school building in Sinigo. Close collaboration with the municipal representatives assured the introduction of energy performance requirements, appropriate methods for the energy balance calculation, energy award criteria, and other necessary specifications in the public tender. Giulia Paoletti, architect at EURAC, spoke about the IED performance requirements:



*“The Sinigo School in Merano requires 40% of its total primary energy consumption from renewable energy sources and a maximum of 20kg/m<sup>2</sup>a of CO<sub>2</sub>-emissions. In addition, electricity shall be supplied by PV.”*

**FURTHER INFORMATION** on Integrated Energy Design in municipal practice can be found in the AIDA reports available at [www.aidaproject.eu](http://www.aidaproject.eu).

**The elementary school of Lajen/Laion, South Tyrol;**  
an nZEB in an Alpine region and a shining example of Integrated Energy Design ©AIDA



### 3.3 AIDA Success Story 3 – AIDA contact points secure sustainability

Contact points for building professionals and municipalities play a significant role at local, national, and international level in accelerating the market uptake of nearly zero energy buildings all over Europe by providing information and support required to the target groups. Contact points provide information about roadmaps, tenders, study tours, tools for implementing nZEBs and find financing for nZEB projects. The AIDA consortium was in regular contact with many interested organisations and 20 national and 3 international organisations signed a so called "Memorandum of Understanding", stating that they are willing to establish an AIDA contact point and continue with one or more offers of AIDA.

Potential contact points include international, national, or regional organisations, already supporting municipalities, other organisations such as building owner associations, property owners, energy centres and energy agencies, private companies and university departments promoting nZEBs. One of the organisations

that signed a Memorandum of Understanding is Energy Cities, a French and Brussels based European association of local authorities in energy transition with more than 1,000 towns and cities in 30 countries. Peter Schilken, senior project manager at Energy Cities said about their involvement:

*"AIDA is very close to our daily business in assisting our members and helps us to enhance our offers".*

– Blandine Pidoux, responsible for Energy Cities' study tours, added that –

*"the AIDA study tours inspired us to focus our future study tours on nearly zero-energy buildings and integrated energy design."*



**Many workshops** to set up a network for exchange of experiences and best practices were conducted, ©AIDA

This promotion is targeted primarily at mayors, municipal representatives or technicians and local or regional roadmap coordinators. This successful example stands for many other contacts that were made during the whole project. Evi Tzanakaki, Greek AIDA manager at CRES, a non-profit research association in Athens, was responsible for establishing these contacts within AIDA.

*“Contact points extend the concept of Nearly Zero-Energy Buildings to municipalities across Europe, promote Integrated Design and alleviate barriers the contact point is a bridge bringing the needs of building professionals and municipalities together.”*

The years to come will show the real success of this initiative to promote nZEBs in Europe. The early results are very promising; several study tours were already planned and conducted by these new AIDA contact points and new contacts with municipalities made.



**Evi Tzanakaki,**  
architect and AIDA  
manager at the Centre  
for Renewable Energy  
Sources and Saving,  
Athens, ©AIDA



## 3.4 Lessons Learnt

In this section the most important lessons learnt from the experience gained through the AIDA project are summarized and presented. The recommendations concern the organisation of study tours, the Integrated Energy Design (IED) process and the drafting of Municipal Roadmaps. Within the three year project duration of AIDA, more than 80 study tours in the seven partner countries were organised and evaluated. About 3200 people participated in these study tours and in total more than 1500 evaluation sheets were collected. In addition over 50 municipalities were supported by AIDA partners.

One of the most important findings of AIDA is that building professionals and the public in general are genuinely interested in the latest

trends and technologies featured during the study tours. Experience also revealed that decision makers, municipal representatives and mayors (except for a few) have many barriers to overcome in the implementation of nZEB targets and IED process in tenders, including limited knowledge on nZEB, usually due to national and regional nZEB definitions that are still missing or diffuse. Focusing on Article 9 of the Energy Performance of Buildings Directive (EPBD) on nearly Zero-Energy Buildings as a future requirement to be implemented from 2019 onwards for public buildings and from 2021 onwards for all new buildings, the following lessons can be learnt:

**Primary school in Hausmannstätten, Styria, Austria**



## LESSONS LEARNT – STUDY TOURS

- Study tours are well received by building professionals all over Europe. There is great interest by the target group in the presented materials as well as the front-runner buildings and its solutions.
- The evaluation of the AIDA study tours showed that it is easier to bring architects and planners to the study tours than municipal representatives. If you want to motivate municipal representatives to come to the study tours you have to invite them personally and to highlight the benefit of such study tours directly on the phone or via personal meetings.
- Bringing the media to the study tours offers broad publicity but needs very good contacts and personal invitations.
- Direct collaborations with universities can bring increase the number of students – future building professionals – participating in the study tours.
- It is recommended to highlight the innovations of the buildings directly in the announcement of the study tours, so that the people know what they can expect and also get interested in the study tour.
- Multi-day study tours need co-financing and good partnership with co-organisation/events in order to guarantee a high number and quality of participants.
- Linking study tours to other relevant events increases visibility and draws participants from a coherent pool of interested parties. Conferences and expositions are good tie-in events.
- Co-organising with other organisations improves visibility and gives direct access to different target groups. Building and architect associations, scientific committees, local authorities all allow direct access to their members.
- Study tours designed for a single client (for example, a local authority) can be laborious to organise, as the decision process and publicity may no longer be in the organiser's control.
- For most key target groups, the best communication channel was direct email solicitations (email "word of mouth" and personal invitations), either by AIDA partners or co-organisers or partner event organisers.
- No clear consensus on the decision to impose a fee for participants was reached. The length and type of buildings visited, the country and the partner events are all factors to be considered before deciding to impose a fee.
- In some partner countries, a choice was made to propose workshops in a time frame available to self-employed people such as tradespeople, builders and architects (evenings or short 1/2 days). These people often have very full timetables and difficult budgets- it is important to give them the opportunity to engage in the nZEB learning process. For instance, in Spain and France, the choice was validated with good attendance from these target audiences in the workshops that were adapted to this goal.

## LESSONS LEARNT – INTEGRATED ENERGY DESIGN (IED) IN MUNICIPALITIES

- Municipalities are very interested in consultancy but financial constraints may hinder the implementation of actions. Therefore, potential contact points may keep in mind that co-funding for (small) municipalities is an issue.
- The most important argument respectively reason for the municipalities to collaborate within an IED process is the lack of (technical) knowledge or rather the need of expert knowledge to realize the imminent building projects. Despite this interest, there is often no budget available for having an energy expert in the team.
- The most important argument for the municipalities not collaborating is the unwillingness of some municipalities to take action as well as the fact that energy efficient buildings are not important issues for them and of course the financial situation which is very tight in many cases.
- The most important issues for the municipalities are the cost efficiency / cost ratio of an nZEB and the funding schemes and subsidies. i.e. the financing of the building project in general. The focus of future IED collaboration has to be stronger on these points to meet the requirements of the municipalities.
- Time is an important issue for tenders: it might take several years to get the tender documents officially published. Especially election campaigns may delay or even stop the process.
- The integrated energy design process needs proper (energy) targets to be set right at the beginning of the work with the municipality/local authority.
- Some municipalities have external factors to be considered when preparing materials for tenders; in some cases it may take several approaches to get the Integrated Energy Design into the tender documents.
- Country-specific conditions may influence the tender process and the cooperation with municipalities (e. g. the role of administrations).
- The amount of detail of a feasibility study depends on the building, the available budget and the time horizon of the project.

## LESSONS LEARNT – DRAFTING MUNICIPAL ROADMAPS AND SEAPS

- A municipal roadmap is the best option to encourage public authorities to take a first step towards fulfilment of the 20% reduction in CO<sub>2</sub> and for promoting “nearly” Zero-Energy Buildings construction in the near future according to the EPBD directives.
- Sustainable Energy Action Plans (SEAP) are not the only roadmap frame that can be used to define nZEB Actions at municipal level, but any other European or nationally recognized roadmap frames like the European Energy Roadmap or Plan Climat-Énergie Territorial (PCET) in France are also suitable for defining these measures.
- The willingness of municipalities to join the Covenant of Mayors (CoV) and introduce Sustainable Energy Action Plans (SEAPs) or alternative municipal networks is very high if it does not impose any additional costs.
- An AIDA contact point has the responsibility for providing information on nZEB promotion in the municipalities. Roadmaps, tenders and study tours developed by AIDA will boost the confidence of key actors in the reality of constructing nZEBs. However, when working with local authorities, you may need to be flexible in terms of which Roadmap they wish to engage in (e.g. in the case of France, specific legislation has meant that national instruments such as voluntary PCET and TEPOS / TEPCV were preferred as roadmap frames).
- If joint local authorities or “umbrella” organisations sign into a Roadmap, an important amount of work may be required to ensure that the commitments are upheld and adhered to by the local member authorities.

## LESSONS LEARNT – ROLE OF CONTACT POINTS FOR MUNICIPALITIES

- A Contact Point may play a significant role at local, national, and international level by providing information and support required. The needs and expectations of the target groups (mainly local or regional authorities) should not only be addressed but also expressed to relevant regional, national, and European authorities and the Contact Point may in this be the “voice” of the municipalities. This “voice” becomes stronger when the Contact Points collaborate and operate in a coordinated manner. For this, the establishment of a regional or national Network with regular meetings is highly recommended.
- One of the major tasks of a contact point is to facilitate communication between the supply and the demand side (in general building professionals and municipalities).
- Integrated Energy Design leads to better implementation results in the tendering process than traditional planning strategies. If this is communicated and finally foreseen in the tender it may increase the contact point’s credibility and thus a high willingness of potential adopters to collaborate with the contact point.
- The exchange of experiences among Contact Points may be complemented by activities bringing together all target groups, where key promotional, financial, organisational and other issues can be discussed and then further communicated.
- Financing promotional activities is not always easy, and for this either standard financing sources of the organization are used, or alternative financing needs to be foreseen such as financing via projects, membership fees, manipulation fees, etc.



## 4. Conclusions and recommendations

The AIDA project aimed to accelerate the market entry of nearly zero-energy buildings (nZEBs). Raising awareness of nZEBs among local authorities and building planners became a key factor. So, AIDA's specific target groups were municipal representatives as market multipliers on the demand side and architects and master-builders on the supply side. AIDA offered action tailored to suit each of these groups including study tours, operational success stories, presentation of existing tools, active support for municipalities in close cooperation with key participants. The core objective of AIDA was a widespread market adoption of nZEBs, reducing energy consumption and carbon emissions

which are important factors in reaching the EU's 2020 targets. In this context two assumptions can be drawn:

1. nZEBs will become a mainstream trend in Europe before 2020, if main stakeholders and the public are well informed and both consider sustainable building as a matter of course.
2. The wide-spread use of sustainable building technologies can be accelerated by creating local seeds as a starting point for technology diffusion all over Europe. These seeds, created in municipalities, are the beginnings of

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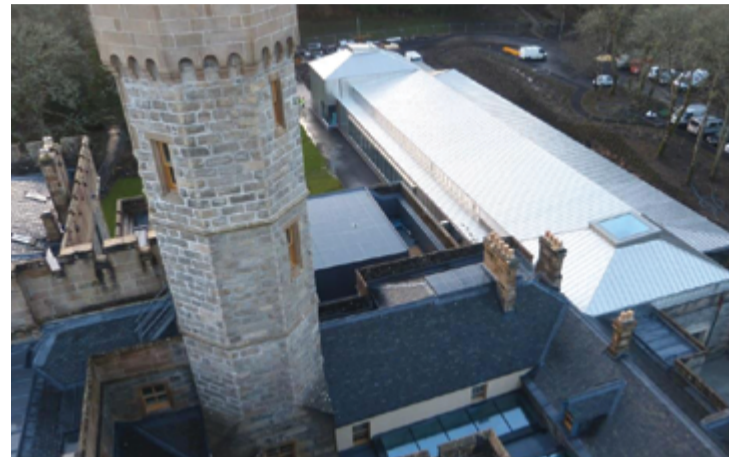


best-practice learning by common exchange of knowledge and transnational cooperation even beyond the project's timeline.

Study tour participants assessed the technical tours /-sites worth visiting as nZEBs, with the potential as European front runners. Interesting solutions regarding the building envelope and the building services have been shown. In addition, participants were very satisfied with the organisation of the study tours and were willing to join future AIDA study tours. Moreover, the results from the questionnaires indicate that most of the participants use the knowledge on nZEBs provided during the study tours in their daily business. Most of them have planned, built or placed an order for nZEBs. Most of these buildings are even more efficient than the national nearly zero-energy building code requirements.

The evaluation of the IED-process in the municipalities showed that the AIDA partners have contacted, between them, 277 municipalities and 32 of these were willing to collaborate with AIDA. Through these collaborations and the support of the AIDA team, the end result was: 11 design tenders were planned or already realised and 17 feasibility studies for future design tenders were prepared.

The lack of knowledge on nZEB and the IED by the municipalities' technicians, together with economic restrictions and the long time frame of public procedures, have been identified as the main limitation, even though nZEBs are becoming compulsory. The municipalities are usually very interested in energy consultancy and support regarding the Integrated Energy Design and nZEB, but country-specific conditions may often influence the tender process and the cooperation between municipalities and nZEB experts. In general, the support offered to the municipalities allowed us to develop an IED process and a continuous assessment of the design proposal from different points of view (energy efficiency, aesthetics, costs, tenant's needs...). Therefore, the final quality of the design pro-



**Lews Castle**, Stornoway, Scotland, ©AIDA

posals was higher than in a traditional process, since it was possible to discuss different aspects and define the best solutions during the project design. Moreover, the AIDA contact points will secure sustainability of such actions in the future.

Altogether increasing the visibility of front runners among European municipalities, local authorities and building professionals (e. g. architects, master-builders) as the core objective of AIDA went very well. In total, 86 study tours to nearly zero-energy buildings with more than 3200 participants were conducted. The economic crisis hampered the implementation of many municipal buildings but 28 municipalities were supported in integrated energy design via feasibility studies and design tenders, which was more than planned. Another 26 municipalities were assisted in creating nZEB roadmaps and many building professionals and municipal representatives were informed via dissemination events. Thus, all objectives were met or even exceeded and AIDA was a great success, which will be continued by the various offers of AIDA contact points after the end of the project.

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