AFFIRMATIVE INTEGRATED ENERGY DESIGN ACTION

AIDA

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D6.2 – 2nd feedback loop: Final project evaluation results
D6.3 – Lessons Learnt for the promotion of IED and nZEB

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1 INTRODUCTION

Feedback loops were used to guarantee a continuous improvement of the AIDA project. Troubles related to missing actions and failing proposed action and impact could so be managed and steps against this deficiency were taken.

This report includes the final project evaluation results and the lessons learnt from the study tours and the collaboration with the municipalities for the promotion of Integrated Energy Design (IED) and nearly zero-energy buildings (nZEBs). The final feedback loop at the end of the project identifies the success of the project (in quantity and quality) and helps to learn for future tasks.

To gain insight in the quality perception of the participants of the study tours, an evaluation by means of a questionnaire was carried out immediately after each study tour. An additional questionnaire, which was sent to the participants one year after the event, was used to evaluate the mid-term impact of the study tours.

Questionnaires and also continuous communication were used to gather feedback to the Integrated Energy Design (IED) process. The aim was to evaluate the application of the different tools used in the AIDA project and even more important the perception of municipalities on the cooperation with the project consortium and the municipalities´ needs.

D6.2/D6.3 is the documentation of the second feedback loop and includes the results over the entire project duration (month 1 to month 36) as well as the lessons learnt from the study tours and from the collaborations with the municipalities within the IED-process.

Please note: In WP2 (organisation of study tours) and WP3 (Integrated Energy Design in municipal Practice) are all AIDA consortium partners involved, except CIMNE. So therefore there are no results of CIMNE to be found in this report.

2 METHODOLOGY

2.1 Evaluation of the Study Tours

The evaluation of the study tours was realised with a questionnaire which was handed out to all study tour participants at the beginning of the event and collected at the end of the study tour. Thereby the technical tour / -site, the presentations, the general organisation of the study tour and some other additional and personal questions were included.

The used evaluation sheet was developed in following steps:

1. A first draft of the evaluation sheet was designed based on previous evaluation sheets and experience of the project partner AEE INTEC. This first draft was then presented and discussed at the first AIDA consortium meeting in Vienna.
2. Afterwards the consortium members had the opportunity to give feedback and additional inputs to this first draft.
3. All inputs and opinions were gathered and a second draft of the evaluation sheet was prepared. This second draft represented the first official version to be used in the first AIDA study tours in each country.
4. After the first AIDA study tours in the different consortium countries each partner could feed back his or her experience to the use of the evaluation sheet and deliver suggestions for improvements. Based on this feedback the evaluation sheet was optimized and the second version was prepared, which was used until the end of the AIDA project period.

Figure 1 shows the used evaluation sheet which can also be found in Appendix I of this deliverable.

Evaluation Sheet

AIDA – Study Tour

Affirmative Integrated Energy Design Action[1]

Date/Time: (to be filled in by the organizer)
Location Address/Country: (to be filled in by the organizer)
Building Type (Site): (e.g. new built or renovated public office building) (to be filled in by the organizer)

1. Please comment the technical tour / site (only if participated)

Do you think the site is worth to be visited as nZEB*?	☐ yes ☐ no
Do you think the site has potential as a European nZEB* front runner?	☐ yes ☐ no
Did you see interesting solutions regarding building services?	☐ yes ☐ no
Did you see an interesting solution regarding the building envelope?	☐ yes ☐ no
Did you find implemented innovations like prefabricated solutions, water reuse...?	☐ yes ☐ no

*nZEB = nearly Zero-Energy Building = energy efficient building that covers its very low energy consumption mostly by renewable energy sources

Comments

2. Please comment the presentations (only if participated)
(Marks: 5= very good to 1= insufficient)

Lecturer	Title of the presentations	Marks
1. Xxx (name)	To be filled in by the organizer	
2. Xxx (name)	To be filled in by the organizer	
3. Xxx (name)	To be filled in by the organizer	

Comments

[1] More information about this Intelligent Energy Europe Project: www.aidaproject.eu

3. Please comment the organisational points of the tour / workshop
(Marks: 5= very good to 1= insufficient)

	Marks	Comments
General organisation		
Tour guide (name)		
Catering / Lodging		
Tour / Workshop fee		
Announcement / Written information (if available)		
Translation service (for international)		

4. Are you interested to join another AIDA Study Tour?
☐ yes ☐ no ☐ maybe

5. Will you be able to use any of the presented information in your daily business?
☐ yes ☐ no ☐ maybe
If yes, which one: .....

6. May we contact you in one year with a second questionnaire to ask you about your impressions of this study tour again?
☐ yes ☐ no
Email address: .....

7. Some questions about your person:

What´s your profession?

Mayor	☐	Architect, Planner	☐
Municipal Representative	☐	Master builder	☐
Representative of (local) Authority	☐	Energy manager	☐
Association of municipalities/local authorities	☐	Civil / Environmental engineer	☐
Association of building professionals	☐	Student	☐

☐ other: .....

Your special interest regarding nZEB: .....

Do you wish to receive the biannual AIDA Newsletter? ☐ yes ☐ nein

Female: ☐ **Male:** ☐

Your Age: .....

Thank you very much!

Figure 1: AIDA study tour evaluation sheet (version of AEE INTEC)

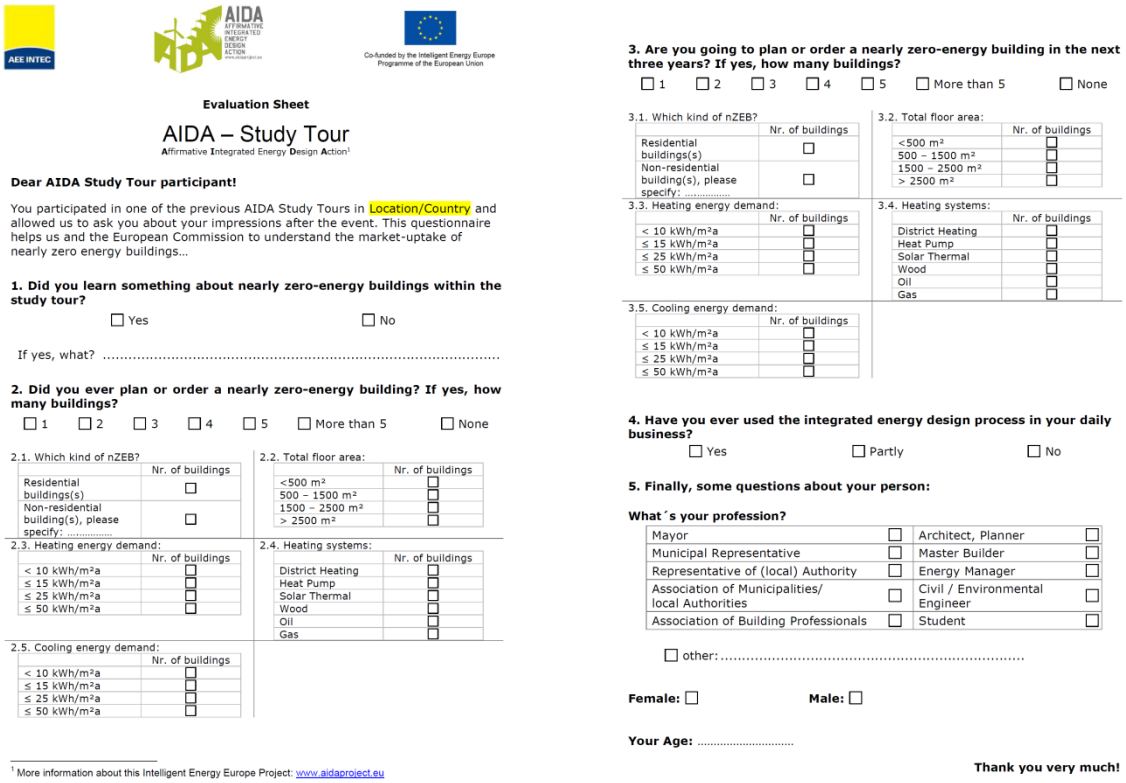
In addition an Excel file to summarize all evaluation results was developed and adapted to the evaluation sheet. With this Excel file a quick overview of the evaluation results and a comparison of the results with the objectives, defined for example in the performance indicators, were easily possible.

2.2 Questionnaire “ONE YEAR AFTER”

To gain insight into the mid-term impact of the study tours an additional questionnaire was prepared. The goal was to find out if the participants have learnt something about nearly zero-energy buildings within the study tour, if the participants have ever planned or ordered a nearly zero-energy building, respectively are going to do so in the next three years, and if an Integrated Energy Design process was ever used in their daily business.

The evaluation sheet was prepared as online version and was implemented in the AIDA homepage. The link to the online questionnaire was sent to all participants of the study tours who have agreed to receive the questionnaire one year after the event and who have also provided their email address.

Figure 2 shows the developed questionnaire “ONE YEAR AFTER” which was used to evaluate the mid-term impact of the study tours. The questionnaire is also available in Appendix II.



Evaluation Sheet

AIDA – Study Tour

Affirmative Integrated Energy Design Action[1]

Dear AIDA Study Tour participant!

You participated in one of the previous AIDA Study Tours in Location/Country and allowed us to ask you about your impressions after the event. This questionnaire helps us and the European Commission to understand the market-uptake of nearly zero energy buildings…

1. Did you learn something about nearly zero-energy buildings within the study tour?

☐ Yes ☐ No

If yes, what? ……

2. Did you ever plan or order a nearly zero-energy building? If yes, how many buildings?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐ None

2.1. Which kind of nZEB?

	Nr. of buildings
Residential buildings(s)	☐
Non-residential building(s), please specify: ……	☐

2.2. Total floor area:

	Nr. of buildings
<500 m²	☐
500 – 1500 m²	☐
1500 – 2500 m²	☐
> 2500 m²	☐

2.3. Heating energy demand:

	Nr. of buildings
< 10 kWh/m²a	☐
≤ 15 kWh/m²a	☐
≤ 25 kWh/m²a	☐
≤ 50 kWh/m²a	☐

2.4. Heating systems:

	Nr. of buildings
District Heating	☐
Heat Pump	☐
Solar Thermal	☐
Wood	☐
Oil	☐
Gas	☐

2.5. Cooling energy demand:

	Nr. of buildings
< 10 kWh/m²a	☐
≤ 15 kWh/m²a	☐
≤ 25 kWh/m²a	☐
≤ 50 kWh/m²a	☐

[1] More information about this Intelligent Energy Europe Project: www.aidaproject.eu

3. Are you going to plan or order a nearly zero-energy building in the next three years? If yes, how many buildings?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐ None

3.1. Which kind of nZEB?

	Nr. of buildings
Residential buildings(s)	☐
Non-residential building(s), please specify: ……	☐

3.2. Total floor area:

	Nr. of buildings
<500 m²	☐
500 – 1500 m²	☐
1500 – 2500 m²	☐
> 2500 m²	☐

3.3. Heating energy demand:

	Nr. of buildings
< 10 kWh/m²a	☐
≤ 15 kWh/m²a	☐
≤ 25 kWh/m²a	☐
≤ 50 kWh/m²a	☐

3.4. Heating systems:

	Nr. of buildings
District Heating	☐
Heat Pump	☐
Solar Thermal	☐
Wood	☐
Oil	☐
Gas	☐

3.5. Cooling energy demand:

	Nr. of buildings
< 10 kWh/m²a	☐
≤ 15 kWh/m²a	☐
≤ 25 kWh/m²a	☐
≤ 50 kWh/m²a	☐

4. Have you ever used the integrated energy design process in your daily business?

☐ Yes ☐ Partly ☐ No

5. Finally, some questions about your person:

What´s your profession?

Mayor	☐	Architect, Planner	☐
Municipal Representative	☐	Master Builder	☐
Representative of (local) Authority	☐	Energy Manager	☐
Association of Municipalities/ local Authorities	☐	Civil / Environmental Engineer	☐
Association of Building Professionals	☐	Student	☐

☐ other: ……

Female: ☐ **Male:** ☐

Your Age: ……

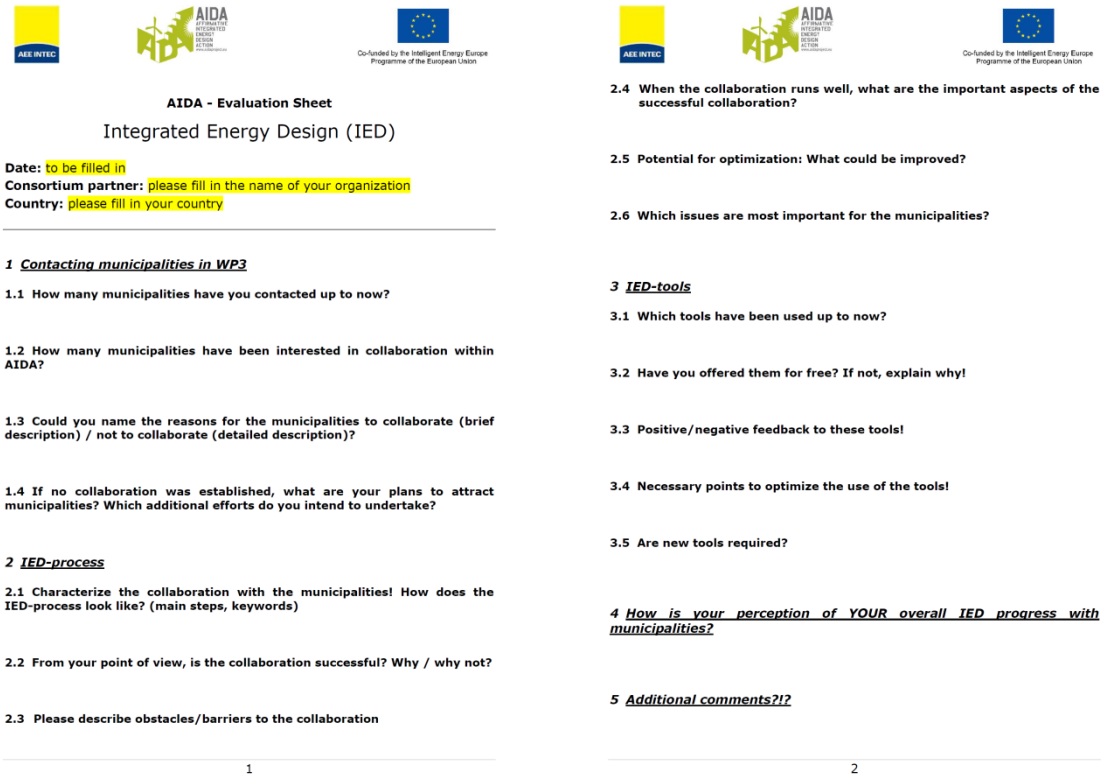
Thank you very much!

Figure 2: AIDA questionnaire “ONE YEAR AFTER”

2.3 Evaluation of the Integrated Energy Design Process in the municipalities

The evaluation of the Integrated Energy Design (IED) process was accomplished with a questionnaire for all AIDA consortium members and individualised questions for two municipalities (Bolzano and Merano). The goal was to assess the collaboration within AIDA from the consortiums´ point of view but also from the municipalities´ point of view as well as also to hear their opinion about nearly zero-energy buildings. The municipalities of Bolzano and Merano were chosen for the individualised questions because the progress of the collaboration was farthest advanced at the time of the evaluation and therefore the feedback from these municipalities should allow the clearest statement.

The questionnaire to assess the IED-process was developed by AEE INTEC. Feedback came from the consortium partners. The evaluation sheet included the main topics “contacting municipalities”, “IED-process”, “IED-tools” and “perception of overall IED progress” and is shown in Figure 3 as well as in the Appendix III of this report.



AIDA - Evaluation Sheet

Integrated Energy Design (IED)

Date: to be filled in
Consortium partner: please fill in the name of your organization
Country: please fill in your country

1 Contacting municipalities in WP3

1.1 How many municipalities have you contacted up to now?

1.2 How many municipalities have been interested in collaboration within AIDA?

1.3 Could you name the reasons for the municipalities to collaborate (brief description) / not to collaborate (detailed description)?

1.4 If no collaboration was established, what are your plans to attract municipalities? Which additional efforts do you intend to undertake?

2 IED-process

2.1 Characterize the collaboration with the municipalities! How does the IED-process look like? (main steps, keywords)

2.2 From your point of view, is the collaboration successful? Why / why not?

2.3 Please describe obstacles/barriers to the collaboration

1

2.4 When the collaboration runs well, what are the important aspects of the successful collaboration?

2.5 Potential for optimization: What could be improved?

2.6 Which issues are most important for the municipalities?

3 IED-tools

3.1 Which tools have been used up to now?

3.2 Have you offered them for free? If not, explain why!

3.3 Positive/negative feedback to these tools!

3.4 Necessary points to optimize the use of the tools!

3.5 Are new tools required?

4 How is your perception of YOUR overall IED progress with municipalities?

5 Additional comments?!?

2

Figure 3: evaluation sheet for the AIDA consortium partners to evaluate the IED-process in the municipalities (version of AEE INTEC)

2.4 Advisory Committee

The third task, beside the evaluation of the study tours and the IED-processes, was the installation of an advisory committee which should also help to guarantee the success of the proposed actions. It was planned to invite representatives of the target groups (mayors, municipal representatives, local authorities, architects and master builders), the key actors (associations of municipalities and associations of building professionals) and the building industry to join the advisory committee.

The advisory committee meeting with around 60 participants was organized as a workshop on 25 September 2013 within the frame of the 4th AIDA consortium meeting in Graz and prior to the Sustainable Buildings conference SB´13.

This workshop was organized together with the IEA EBC Annex 56 and the IEA EBC Annex 57. In this way the basis for an intensive knowledge exchange among the different experts was given. With these experts and the further workshop participants it was possible to discuss the objectives and the work programme of AIDA and to develop strategies for the improvement of the project. Figure 4 shows some impressions of the combined workshop in Graz.

Figure 4: impressions of the advisory committee workshop on 25. September 2013 in Graz

3 EVALUATION OF THE STUDY TOURS

3.1 Performance indicators

Within the AIDA project period, from 01.04.2012 to 31.03.2015, in total 86 study tours were organized with a total number of 3524 registered participants and 3207 participants actually attending the study tours. From these 3207 participants altogether 1659 evaluation sheets were received and analysed in detail. The results of this evaluation are presented in the chapters 3.2 and 3.3.

In following Figure 5 the main performance indicators of the study tour evaluations are visible. The red line indicates the set target numbers, which were:

- *at least 63 study tours organised at the end of the project*
- *with a minimum of 3000 participants*
- *and minimum 75% of the participants have completed an evaluation sheet*

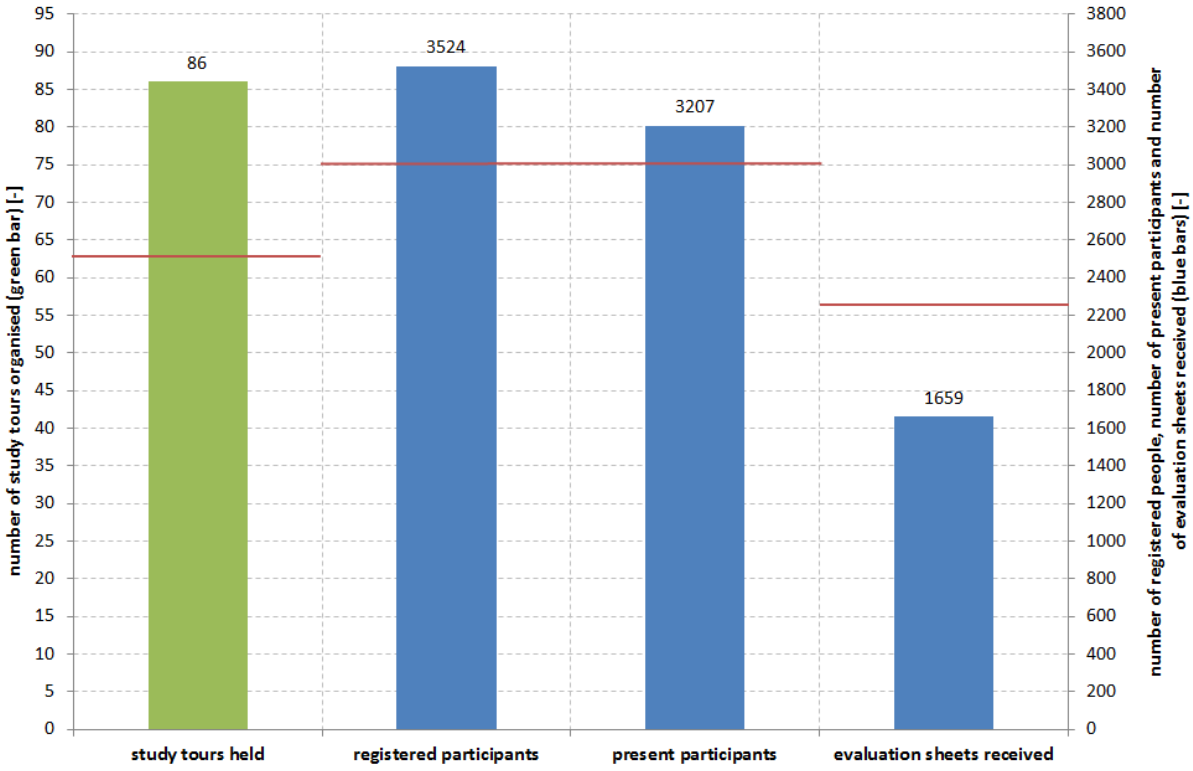


Figure 5: AIDA study tour performance indicators for the period 01.04.2012 to 31.03.2015

The analysis of the performance indicators in Figure 5 shows that almost all performance indicators were achieved. More study tours than originally planned were organised. Also the targeted number of participants was achieved. The results also show that 317 people have registered for the study tours but didn´t participate at the end. These were about 9% of the registered participants. Reasons for that non-attendance are diverse. Bad weather conditions, diseases and conflicting schedules were just a few reasons. All AIDA partners also noted the fact that the non-attendance rate was higher if the study tour was offered for free. If the participants had to pay for the study tour in advance, their actual appearance was more likely.

The only performance indicator which was not fully met is the number of received evaluation sheets. From the targeted number of 2250 received evaluation sheets only 1659 were collected. This is a feedback rate of about 52% of all participants or 55% measured against the target of 3000 study tour participants instead of the targeted feedback rate of 75%. Reasons for this deviation are also diverse. One of the main reasons was the privacy protection. Many people were concerned about the privacy invasion and therefore didn´t complete the questionnaire. Another reason was the fact that the importance of the evaluation (sheet) was not highlighted in a sufficient way during the study tours. The participants of the study tours didn´t take enough note of the questionnaire. Often it was also very difficult to collect all evaluation sheets at the end of the study tours, especially when study tours finished on-site and people could leave as they wished.
In this case it was also tried to send the participants the questionnaire per email afterwards but the feedback rates to these enquiries were very low. However, the achieved feedback on the questionnaires was high enough to ensure a detailed insight on the participant´s impression of the AIDA study tours, which is presented thereinafter. Thus, the lower feedback rate has no negative impact on the overall performance.

3.2 Overall results

This chapter includes the overall results of the organised 86 study tours within the AIDA project period. Therefore the specific results of each consortium partner were summed up respectively averaged to one overall result. Figure 6 to Figure 10 show these results.

The first figure (Figure 6) shows the results of the evaluation of the technical tour respectively of the site. Questions which should be answered were: a) Do you think the site is worth to be visited as nZEB? b) Do you think the site has potential as a European nZEB front runner? c) Did you see interesting solutions regarding the building services? d) Did you see an interesting solution regarding the building envelope? and e) Did you find the implemented innovations like prefabricated solutions, water reuse,…?

Summarized all results regarding the visited buildings were (very) good. 95% of the participants said that the chosen building was worth to be visited as nZEB. This militates for a good choice of the study tour buildings. 86% of the respondents also said that the chosen buildings have potentials to act as European nZEB front runners. 86% respectively 85% of the participants found interesting solutions regarding the building services and the building envelope. Despite this relative high percentage "only" 72% of the respondents found the implemented solutions also innovative. A reason for that lower rate could be that the innovations were not visible at first glance and/ or the specification of potential innovations in the questionnaire as example (e.g. prefabricated solutions, water reuse), which may have influenced people´s opinion and choice.

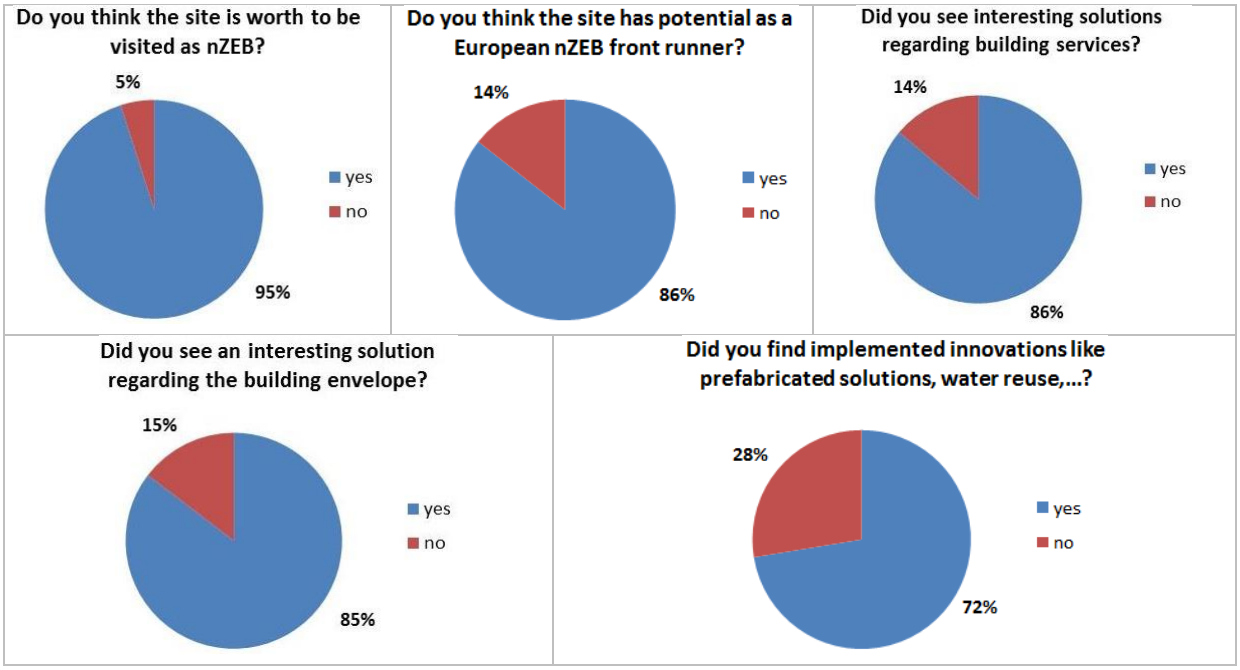


Figure 6: results of the evaluation of the technical tour / -site

Figure 7 shows the evaluation of the general organisation of the study tours, the tour guide, the catering respectively lodging, the tour and workshop fees, the announcement and written information as well as the evaluation of the provided translation service (relevant especially in the international study tours). In general the organisational issues were very good assessed. All results were higher than 4.1, where 5.0 would be the best value.

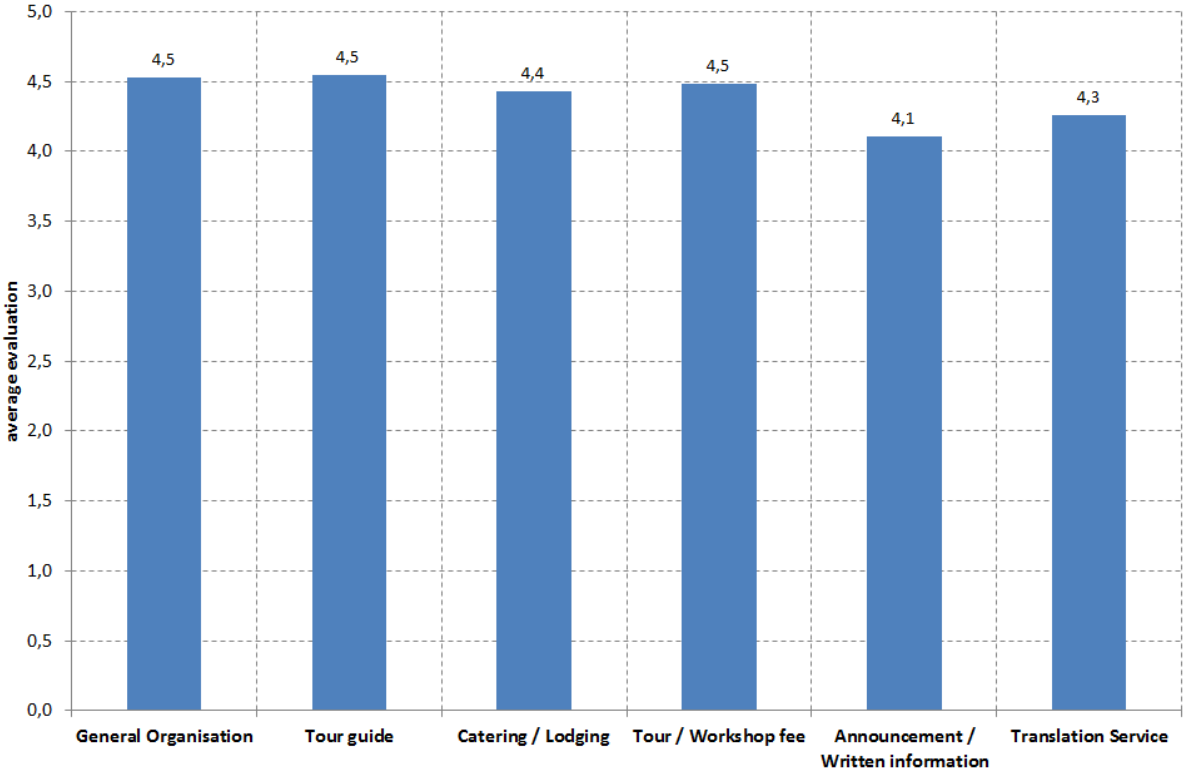
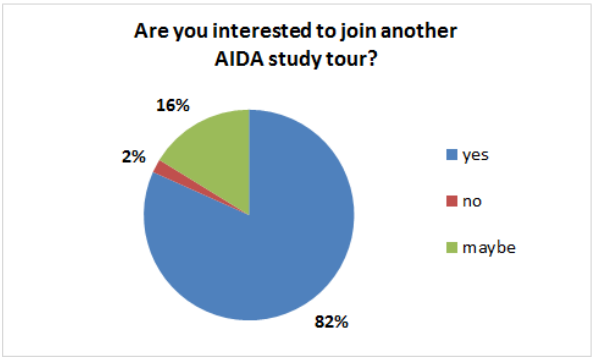


Figure 7: evaluation results of the general organisation of the study tours (0=very bad, 5=very good)

Another result shows that 82% of the participants said that they would definitely join another AIDA study tour and 16% are likely to do this. Only 2% of the participants refused to join another study tour (see Figure 8 – left chart).

Also 67% of the study tour participants said they could use the presented information in their daily business and 30% probably could. Here too the percentage of people negate the answer was very low. Only 3% of the participants said that they couldn´t use any of the presented information. See right chart in Figure 8.



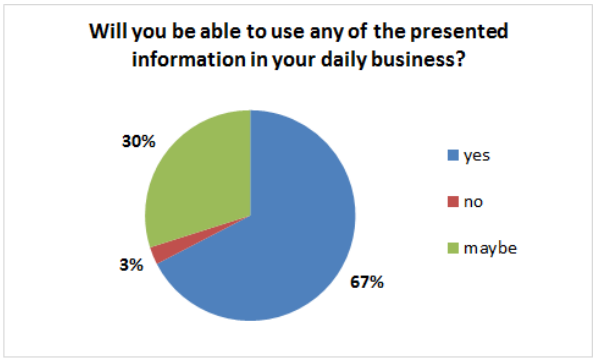


Figure 8: interest in another AIDA study tour (left chart) and ability to use presented information in daily business (right chart)

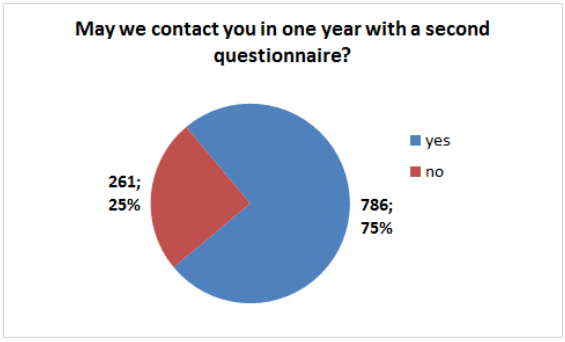


Figure 9: permission for a second questionnaire

To get insight in the mid-term impact of the study tours the participants were contacted via a second questionnaire one year after they attended the study tour (results see chapter 3.4). Therefore the participants were asked about their permission to send them a second questionnaire because only participants who provided their allowance were contacted again.

75% of the participants who answered this question did this with “yes”, 25% said that they don´t want to be contacted again (see Figure 9). Unfortunately not all participants who answered with “yes” also have provided their email addresses, so the correct number was actually a little bit lower.

Additionally some personal information of the study tour participants was gathered. These were the gender (see Figure 10) and the average age (see text below).

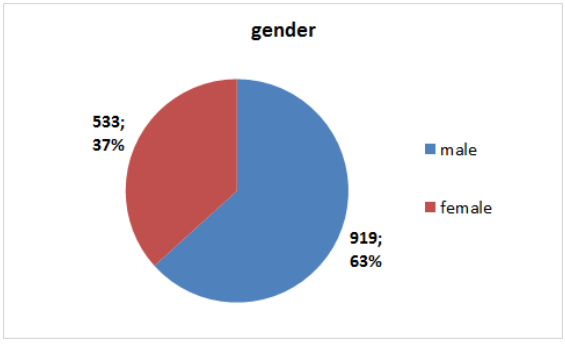


Figure 10: gender distribution

The results show that the participants were relative young, with an average age of all respondents of about 40 years, and the percentage of female participants was high compared to similar events in the building sector. 533 of the attendees, who have answered this question, were women. This represents a share of 37%.

3.3 Results for each country

Besides the overall results some evaluation results were worth to be analysed separately for each country. This chapter includes the most important results for each partner country.

Figure 11 shows the number of study tours which were organized by each country in the AIDA project period from 01.04.2012 to 31.03.2015. The defined target was 9 study tours per country. All partners have achieved this number. In Spain in fact 17 study tours were organised, which is almost a doubling of the target value.

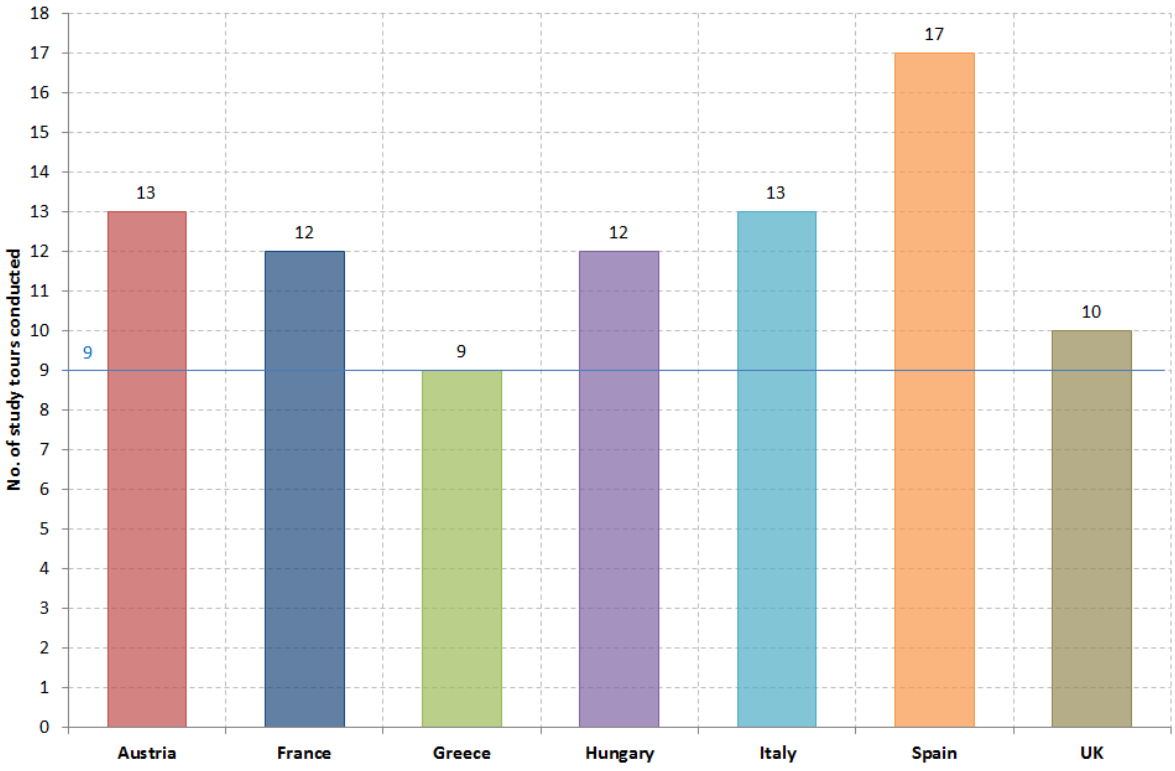


Figure 11: number of study tours organised per country in the AIDA project period

The AIDA study tour performance indicators, separated for each country, are visible in Figure 12.

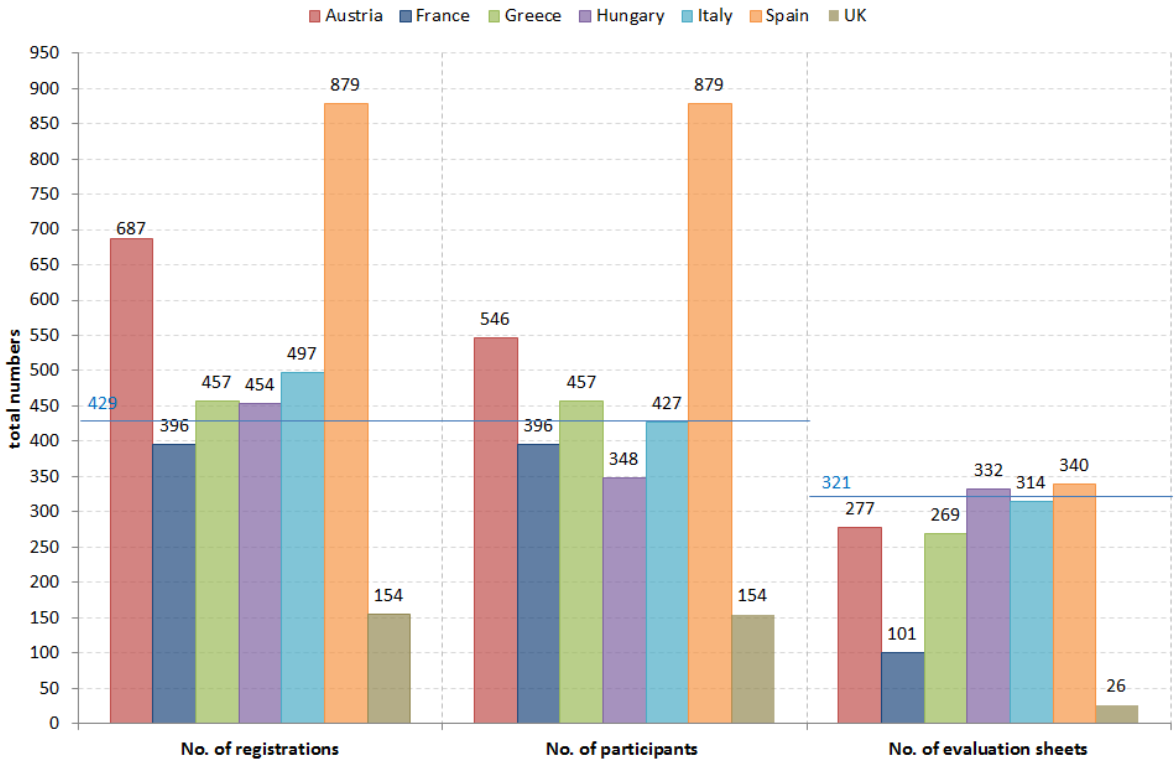


Figure 12: AIDA study tour performance indicators for each country

The target values, defined at the beginning of the project, were:

- *at least 429 participants per country attend the study tours*
- *at least 321 participants complete the questionnaire for the evaluation of the study tours (feedback rate of 75%)*

The results show that the target value of 429 registered participants was achieved in Austria, Greece, Hungary, Italy and Spain. In Austria, Greece, Italy and Spain also the number of participants actually attending the study tours was higher than the target value. In Hungary this number was lower. This means that enough people had registered for the study tours to achieve the target value but in the end too many people didn´t show up which leads to a minor deviation of the target value.

In France and in the UK the target value of 429 participants attending the study tours was not achieved, neither in the number of registrations nor in the number of the actual participants. However, France shows a minor deviation of the total number of participants, only 33 people below the target. Only in the United Kingdom the number of participants was very low, 154 people were attracted to join the AIDA study tours in the UK.

Looking at the results of the received evaluation sheets the figure shows that the target value of at least 321 completed questionnaires was only exceeded in Hungary and in Spain. In Italy the actual number is close to the target value, only 7 evaluation sheets were missing. In Austria and in Greece the gap is a little bit larger, with 44 (Austria) respectively 58 (Greece) missing evaluation sheets.
In France and in the UK the number of received evaluation sheets is very low, which means a failure of this target value. Nevertheless, the 26% response rate in France is sufficient for providing significant results.

Besides the analyses of the performance indicators further study tour evaluation results exist for each country. Those are presented on the next pages.

Figure 13 shows the evaluation results of the technical tour / -site. Every bar represents a separate country. The black line marks the overall average of all study tour evaluation sheets (compare with Figure 7). The analysis shows that most of the country results are quite similar (fluctuation of a few per cent). A larger fluctuation is noticeable regarding the question “Do you think the site has potential as a European nZEB front runner?” (France).

Figure 14 shows the evaluation results of the general organisation of the study tours in each country. The country results are all quite good and quite similar. There were no tour/workshop fees in Greece, Spain and partly in Austria. Therefore the results refer to the other countries only. Also the translation service was only evaluated in Austria, Hungary and Italy.

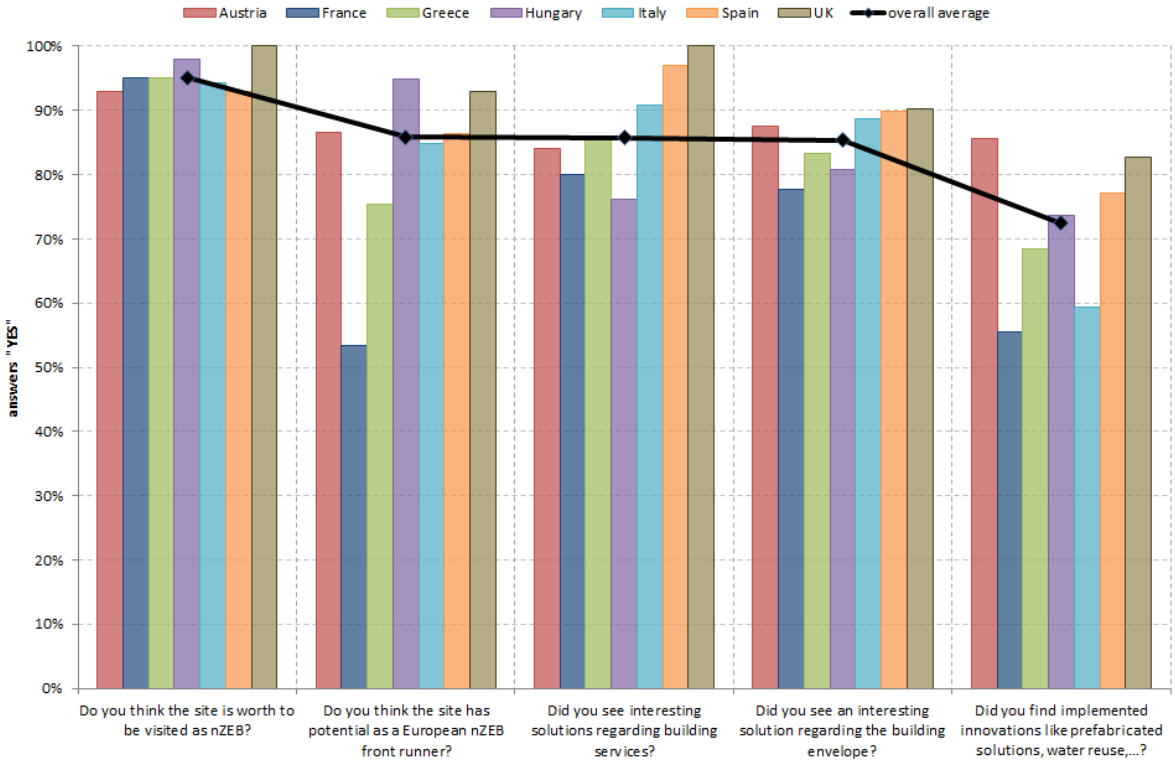


Figure 13: results of the evaluation of the technical tour / -site per country

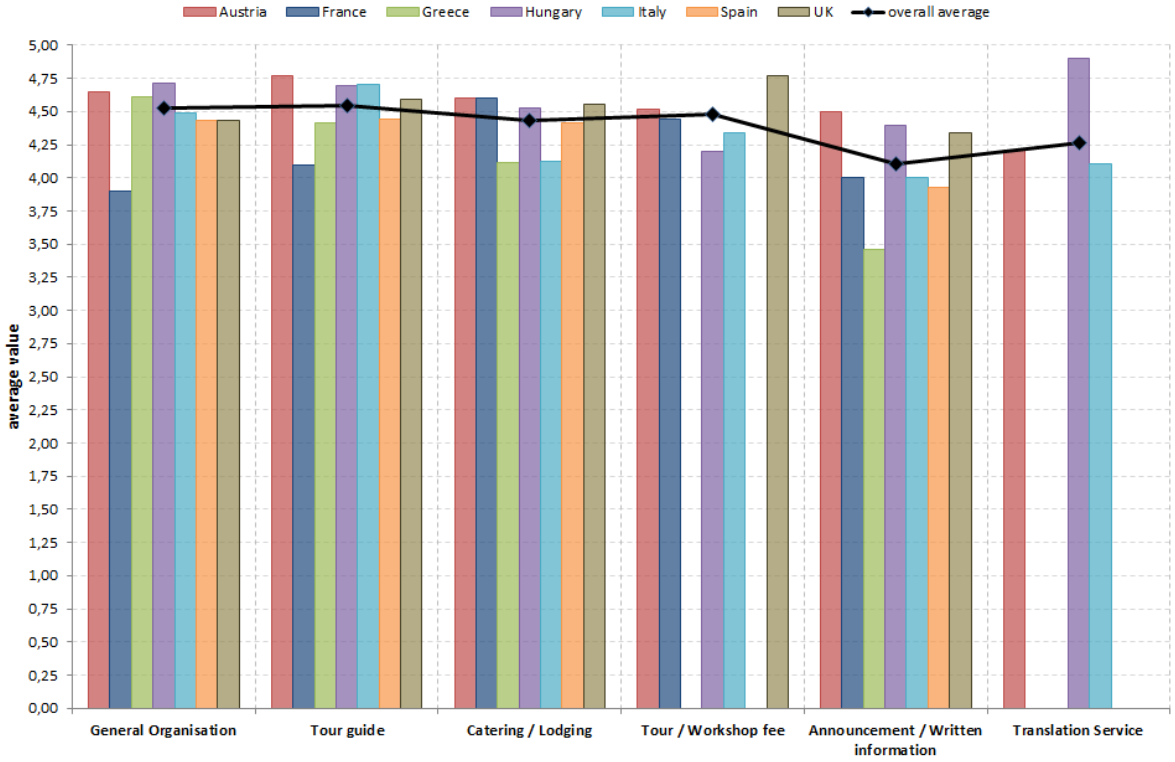


Figure 14: evaluation results of the general organisation of the study tours per country

The interest of the participants to join another AIDA study tour was very high in all countries (see Figure 15). In Greece, Hungary and Spain more than 85% of the participants said that they definitely would join another AIDA study tour. The remaining percentage answered with “maybe” which lead to a definitive refusal of only 1% of the participants.

In Austria, France, Italy and UK the number of definite positive answers was a little bit lower, ranging between 58% and 71%. The remaining percentage answered mostly with “maybe” which lead also in these countries to a low percentage of definitive refusals.

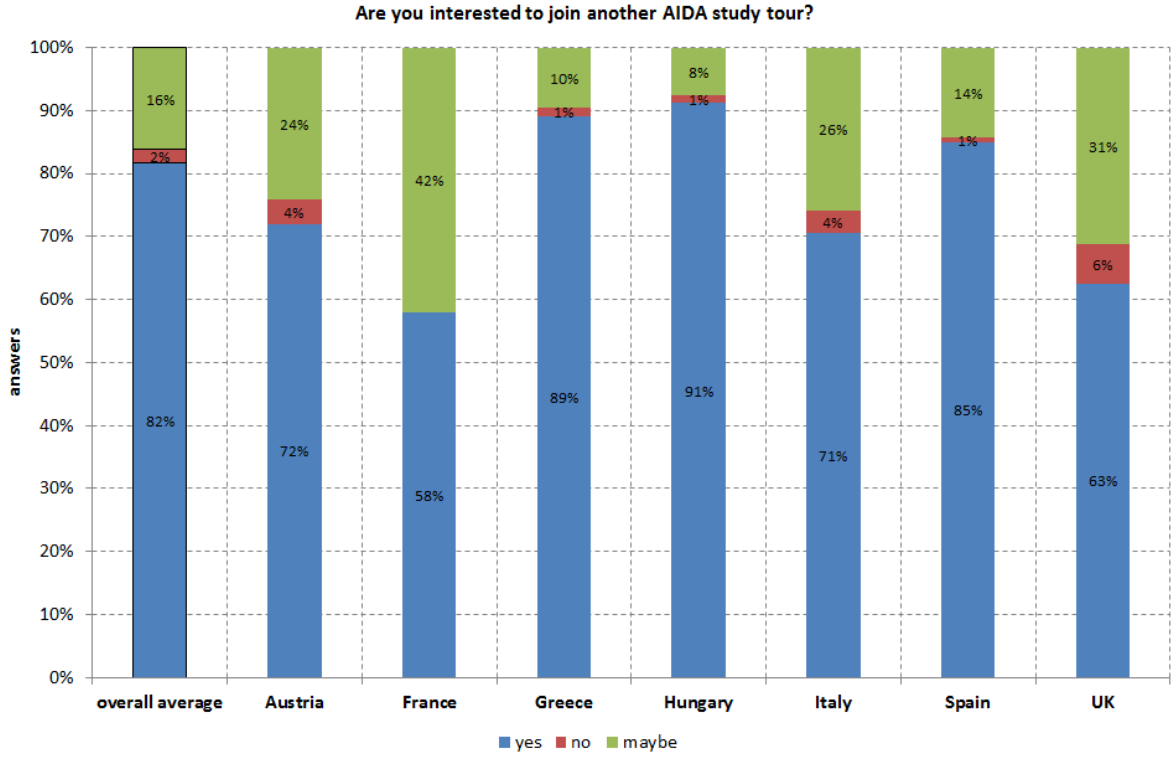


Figure 15: interest in joining another AIDA study tour per country

The ability to use the information, which was presented at the study tours, was highest in France (see Figure 16 on the next page). 78% said they could use the information in their daily business, only 6% denied this. France is followed by Italy, Hungary, Spain, Greece, Austria and finally the United Kingdom. In the UK only 53% of the study tour participants stated that they could use the presented information in their daily business. In general were the participants unsure about the use of the information because the values for the answers “maybe” were relative high in each country.

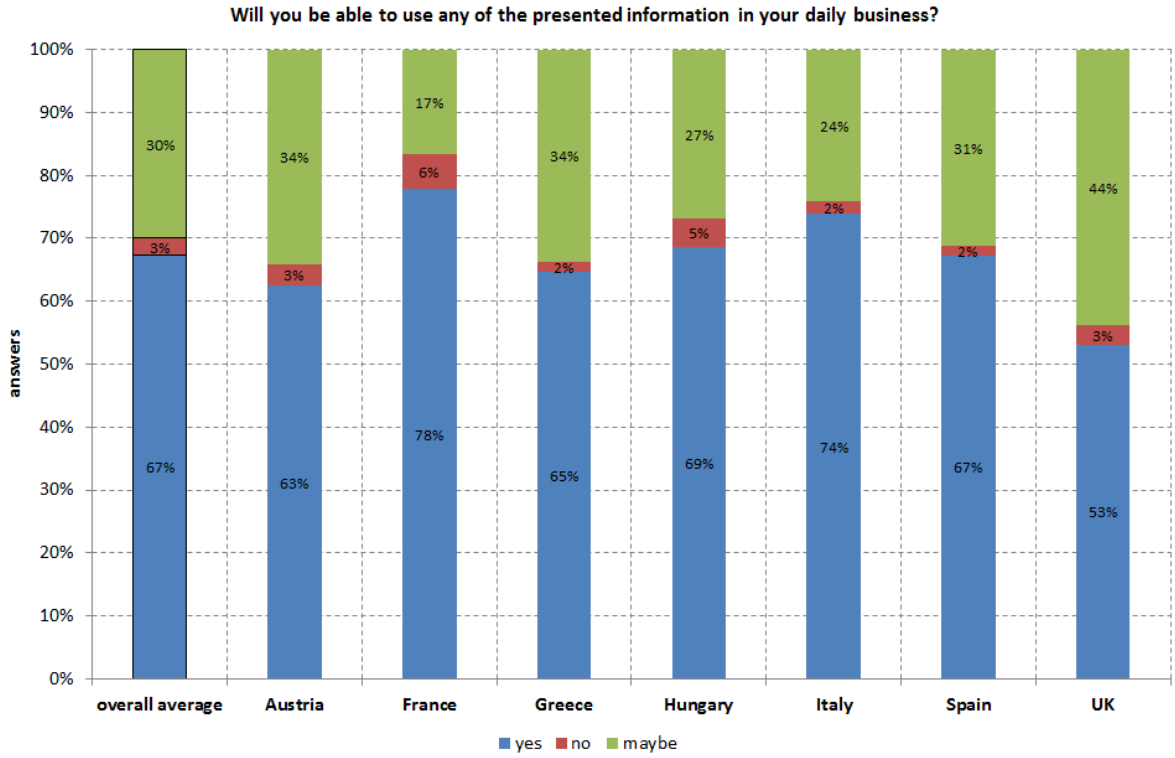


Figure 16: use of presented information in daily business per country

The permission to send the study tour participants a second questionnaire one year after the event was highest in Italy, where 93% of the participants agreed (see Figure 17 on the next page). The numbers in France (90%), Greece (90%) and Spain (86%) were also very high. Hungary and the UK were a little bit behind with consent of 69% and 79%. Far behind all other countries was Austria. At the Austrian study tours only 52% of the participants agreed to a second questionnaire. A reason for that might be the aversion to reveal personal data, which is a country specific phenomenon in the Austrian society (-> “data privacy”) and also observed in other European projects.

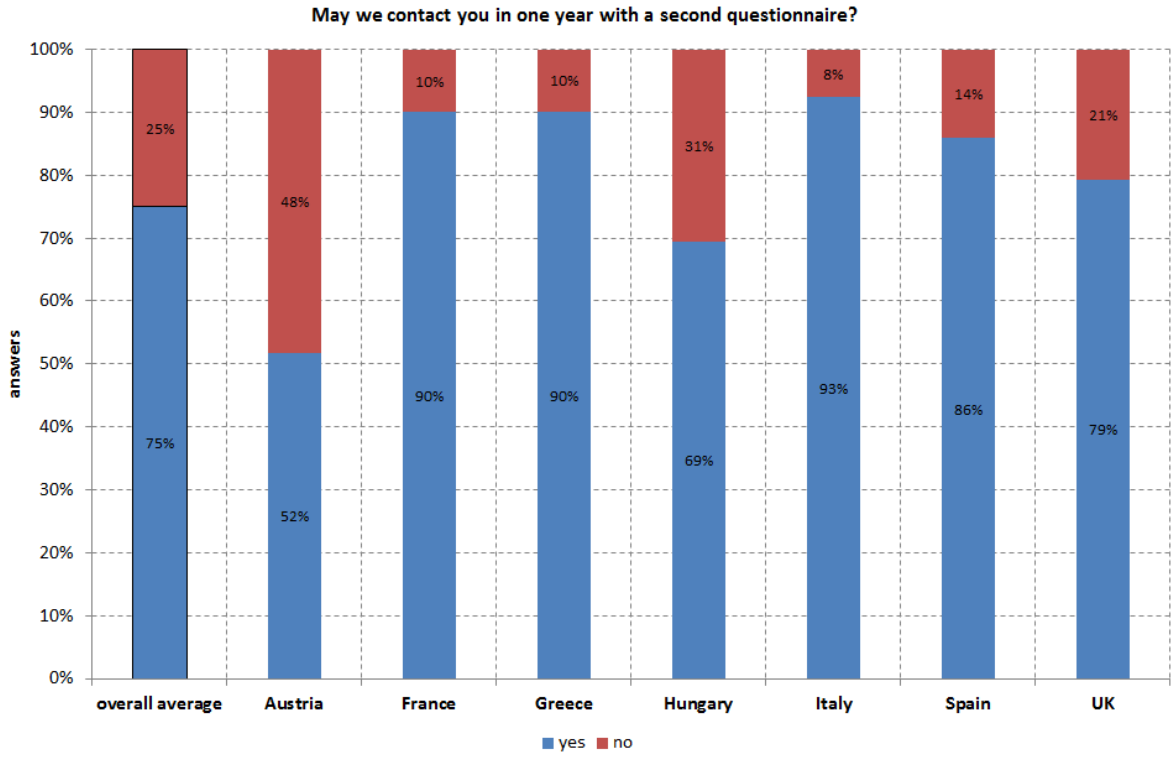


Figure 17: permission for a second questionnaire per country

The profession of the study tour participants is shown in Figure 18. The analysis of these values shows that most of the attendees were architects (520), followed by municipal and local authorities´ representatives (about 210), civil and environmental engineers (195) and students (about 180). Very positive is the relative high number of municipal or local authorities' representatives because the experience showed that the participation of these people is not to be taken for granted. It was easier to attract architects and planners. Probably those see more direct benefits from the study tours.

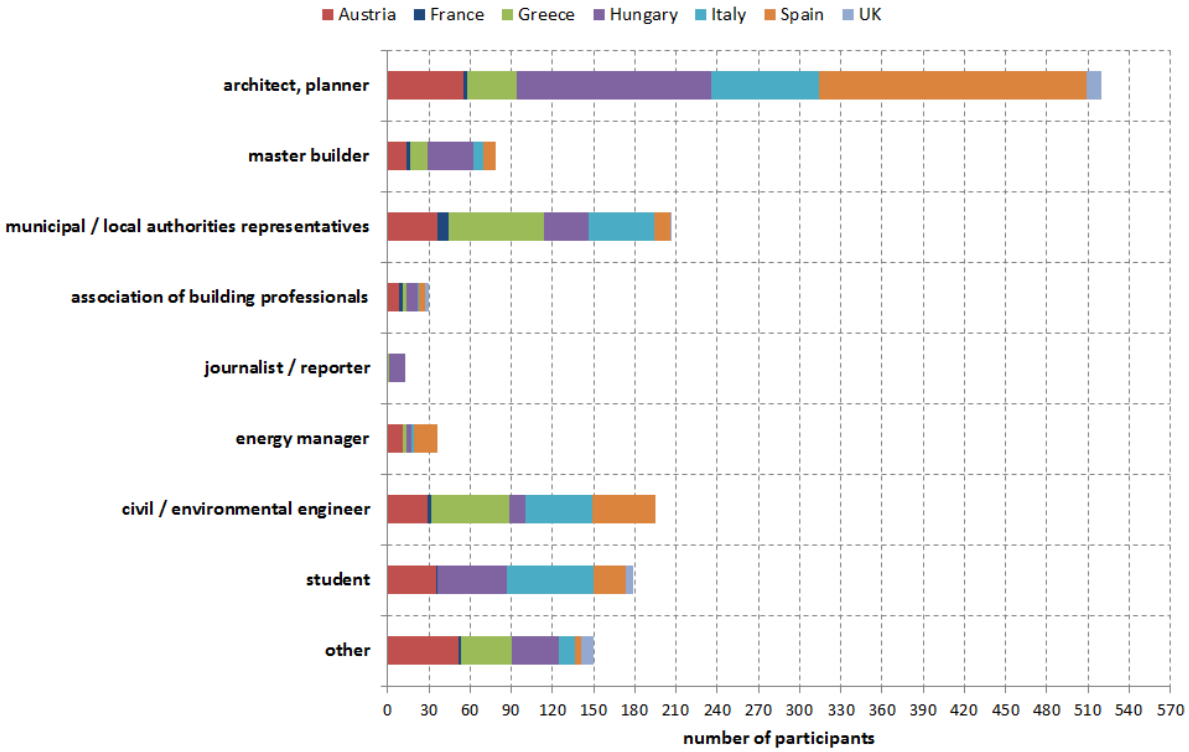


Figure 18: profession of the study tour participants

3.4 Results of the questionnaire ONE YEAR AFTER

As described in chapter 2.2 the goal of the questionnaire “one year after” was to gain insight into the mid-term impact of the study tours and to find out if the participants have learnt something about nearly zero-energy building within the study tours, if the participants have ever planned or ordered a nearly zero-energy building, respectively are going to do so in the next three years, and if an Integrated Energy Design process was ever used in their daily business.
Therefore the developed questionnaire (see Figure 2 and Appendix II) was sent to those participants of the study tours who have agreed to receive a second questionnaire and also provided their email address but it was not sent for all study tours, obviously for those, which were closed to the project´s end.

The questionnaire was sent to 529 study tour participants in total. 42 participants completed the questionnaire “one year after”, which is a feedback rate of about 8%, which is in line with many online surveys.
The results are presented in the following paragraphs:

- 34 participants (81%) have learnt something new about nZEB within the study tours. The remaining 8 participants (19%) did not.
- These 42 participants have planned or ordered 25 nearly zero-energy buildings until now: 22 residential buildings and 2 non-residential buildings. For the remaining building the usage was unknown.
- The total floor area of these buildings is in 12 buildings below 500 m², in 10 buildings between 500 m² and 1500 m² and in 2 buildings higher than 1500 m².
- The heating demand of these buildings is in 3 buildings lower than 10 kWh/m²a, in 10 buildings between 10 kWh/m²a and 15 kWh/m²a and in 5 buildings higher than 15 kWh/m²a. The heating demand of the remaining buildings is unknown.
- The heating systems used in these buildings are: district heating (2 answers), heat pump (7 answers), solar thermal installation (7 answers), wood heating (2 answers) and natural gas (4 answers).

The participants were also asked if they are going to plan or order a nZEB in the next three years. If the answer was yes they were also asked to give some key figures to these buildings. The answers were as follows:

- 34 nearly zero-energy buildings will be built from these 42 participants in the next three years: 21 residential buildings, 4 non-residential buildings and 9 building where the usage is unknown.
- The total floor area of these buildings is in 13 buildings below 500 m², in 10 buildings between 500 m² and 1500 m² and in 2 buildings higher than 2500 m².
- The heating demand of these buildings is in 6 buildings lower than 10 kWh/m²a, in 14 buildings between 10 kWh/m²a and 15 kWh/m²a, in 4 buildings between 15 kWh/m²a and 25 kWh/m²a and in 1 building higher than 25 kWh/m²a. The heating demand of the remaining buildings is unknown.
- The heating systems which will be used in these buildings are: district heating (6 answers), heat pump (8 answers), solar thermal installation (5 answers), wood heating (3 answers) and natural gas (5 answers).

Furthermore 15 participants (36%) stated that they have used IED-processes in their daily business, 11 participants (26%) have partly used it and 16 participants (38%) never have used IED.

In the questionnaire also some personal questions were asked:

- 29 men and 12 women answered the questionnaire “one year after”.
- The average age of the respondents was 38 years.
- The professions of these people were: architect/planer (16 answers), municipal representatives (9 answers), civil/environmental engineer (9 answers), master builders (3 answers) and energy manager (1 answer).

4 EVALUATION OF THE INTEGRATED ENERGY DESIGN PROCESS IN MUNICIPALITIES

The first results concern the contacting of the municipalities. In total all AIDA partners together have contacted 277 municipalities. Thereby different ways of getting in touch with the municipalities were used. Personal talks at AIDA study tours and at AIDA information events and other congresses, but also emails and telephone calls were used to contact municipalities.
From these 277 contacted municipalities altogether 32 communities indicated interest to collaborate with the local AIDA partners.
Table 1 shows the number of contacted and collaborating municipalities per AIDA partner.

Table 1: number of contacted and collaborating municipalities per AIDA partner in WP3

AIDA partner	contacted municipalities	municipalities interested in collaboration
AEE INTEC	6	3
CRES	25	5
EURAC	116	4
Geonardo	42	1
Greenspace	60	6
HESPUL	13	2
IREC	13	9
TU Wien	2	2
Sum	**277**	**32**

For information Table 2 shows the number of municipalities per AIDA partner which showed commitment to collaborate in work package 4 and which also have signed an agreement to do so (see also report “D4.3 Signed agreements showing commitment of municipalities”, which summarizes the municipal agreements).

Table 2: number municipalities per AIDA partner which showed commitment in WP4 (see also report "D4.3 Signed agreements showing commitment of municipalities)

AIDA partner	municipality agreements
AEE INTEC	3
CIMNE	8
CRES	2
EURAC	3
Geonardo	1
Greenspace	2
HESPUL	1
TU Wien	2
Sum	**22**

Analysing the reasons why municipalities wanted to collaborate and also didn´t want to, demonstrates different causes and arguments. In following Table 3 it was attempted to summarize and to show the reasons for collaborating.

*Table 3: arguments and reasons of the municipalities **for** collaborating*

Argument / reason	Number of answers
Lack of (technical) knowledge respectively need of expert knowledge	5
Participation in (inter)national initiatives	3
Interested in nZEB and/or RES	2
Interested in reducing carbon and energy costs	2

Looking at the results in Table 3 it is obvious that the lack of (technical) knowledge respectively the need of expert knowledge to realise specific building projects was the driving force for the municipalities to collaborate. The general interest in nZEB and RES was also a more important fact as well as the participation of the municipalities in national or international initiatives, which forced them to take action.

In Table 4 it was attempted to summarize and to show the reasons for the municipalities **not** to collaborate.

*Table 4: arguments and reasons for the municipalities **against** collaborating*

Argument / reason	Number of answers
Financial situation	6
Municipalities unwilling to take action / energy efficient buildings no important issue	4
No building projects within AIDA timeframe	3
No technical persons in the municipalities to guide the AIDA collaboration	1
Lack of nZEB specification in legislation	1
Believing that the cost/benefit ratio is not good enough	1

The evaluation showed that two main reasons hindered the municipalities to cooperate: first of all the tensed financial situation, where the money is often needed for other investments and no money seems to be left for investments in energy efficient buildings. The second obstacle was the unwillingness of the municipalities to take action towards nZEB and RES. The experience had shown that energy efficient buildings were no important issue for the communities.
A further point, which was more often mentioned, was the circumstance that the municipalities didn´t have building projects, which were in line with the AIDA timeframe. For that reason the communities often forwent collaborating with the AIDA partners.

Even when collaboration with a municipality was accomplished, many obstacles had to be overcome. Following Table 5 shows these barriers and obstacles to the collaboration.

Table 5: barriers and obstacles to the collaboration

Obstacles / barriers	Number of answers
Missing funds / unresolved financial questions	4
Missing personal awareness of the mayor or high-level officials for nZEB	3
Not clear how and to what extend energy aspects are introduced	2
Doubts about the higher construction costs of nZEB	2

Obstacles / barriers	Number of answers
nZEB standard not established in municipalities	1
Project length / AIDA timeframe	1
Missing infrastructure (building projects)	1
Changes to thermal building regulations which bring adaptive difficulties	1
Missing (clear) definition of nZEB	1
IED and nZEB arriving to late in the project design phase	1
Lack of technical skills and knowledge	1

Again missing funds and unresolved financial questions represented the main obstacles to a successful collaboration. But also the missing personal awareness of mayors and other high-level officials as well as not established nZEB standards in the municipalities were bigger barriers.

But the evaluation of the IED-process in the municipalities also found some aspects which characterised a successful collaboration. These aspects are listed in Table 6.

Table 6: aspects of successful collaborations

Aspects	Number of answers
Set focus on on-going communication and active interaction	3
Motivate and interest the municipalities	2
Flexibility in IED work plan	2
Having a contact person at the right technical level in the municipality	2
Municipalities have to be convinced of the advantages of buildings with high energy performance and the collaboration within AIDA	1
Identify best cost/benefit ratio for different actions and potential design choices	1
Getting into the process very early	1
Establish heterogeneous team with varied expert knowledge	1
High level of technical interest on both sides and a high need for action of the municipalities	1

Very important for a successful collaboration was the on-going communication and active interaction as well as the motivation of the municipalities, a flexible IED work plan and an existing contact person at the right technical level in the municipality.

To establish a successful collaboration with the municipalities it was also necessary to know their most important issues (see Table 7).

Table 7: Most important issues for municipalities

Issues	**Number of answers**
Cost efficiency / cost ratio	6
Funding schemes and subsidies / financing	3
Technical support	2
Quality assurance to reach expected targets	2
Improve technical knowledge	2
Long-term support	1
Consulting services	1
Ease implementation for new processes	1
Doing sth. really innovative	1
Improve energy performance of buildings	1
Easy management of the whole building	1
Reduce problems and not increase them	1

From the consortium´s experience and point of view the cost efficiency respectively the cost ratio and the funding schemes and subsidies, respectively the financing in general were the most important issues.

Moreover, the municipalities of Bolzano and Merano were asked in separate questionnaires about their expectations to the collaboration with AIDA and also their opinions about nZEB and why energy efficient buildings were important for these municipalities.

The municipality of Bolzano only provided full response to the asked questions and therefore their opinion could be outlined.

First of all, the municipality of Bolzano decided to collaborate with AIDA because for them as representatives and as technicians of the public administration it was

important to build as energy efficient and resource efficient as possible and to sensitise planners. From the AIDA collaboration they expected project support to reach their defined objectives.

From nearly zero-energy the municipality expected primarily two things:

- a significant lower and optimised energy consumption
- significant higher construction costs

At the moment of the evaluation they saw the finding of necessary energy sources, which helped to equalise the total energy balance of the building, as the biggest obstacle. This obstacle kept the municipality off from constructing only nearly zero-energy buildings. That means that in their point of view not the financing or funding was the biggest obstacle, in fact it was a technical problem.

The evaluation of the IED-tools showed that different software has been used. These were tools for the national energy performance calculation as well as a tool for calculating the life-cycle costs of the building projects. Some AIDA partners also used some project management software like Bizagi, WebRatio and Microsoft Visio. Besides these software programmes also dynamic simulations with TRNSYS, TRANSOL and DAYSIM were carried out and the gModeller tool from GreenspaceLive was used to check the achievement of the building requirements.

The consensus among all AIDA partners was that a sufficient number of software programmes already exists and therefore no new tool was required. More important was to focus on a few of them and on the training and experience using these tools, than using a lot of different software programmes with less expert knowledge. Another important issue was to use the software tools “in the right place at the right time”. That means that it is necessary to know when to use which of the different tools to obtain optimum performance.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Study Tours

The most important parameters to evaluate the success of the study tours are the performance indicators. These performance indicators are target values which were defined at the beginning of the AIDA project. Summarized these were:

- Organisation of at least 63 study tours
- with a minimum of 3000 participants
- and minimum 75% of the participants complete an evaluation sheet.

Now at the end of the project the real numbers can be compared to these performance indicators and the results show that:

- ✓ the targeted number of study tours exceeded the target (86 study tours organised)
- ✓ the targeted number of participants actually attending the study tours also exceeded the target (3207 participants)
- ✘ the targeted number of received evaluation sheets was not achieved (only 52% of the participants completed an evaluation sheet)

Possible reasons for failing the target number of evaluation sheets are:

- Many people were concerned about the privacy invasion and therefore didn´t complete the questionnaire (see above).
- Another reason was the fact that the importance of the evaluation (sheet) was not highlighted sufficiently during some study tours. The participants of these study tours didn´t take enough note of the questionnaire.
- Often it was also very difficult to collect all evaluations sheets at the end of the study tours. The participants left the events when they wished and in different ways. In this case it was also tried to send the participants the questionnaire per email afterwards but the feedback rates to these enquiries were obviously low.

Nevertheless, the achieved feedback rate was fully sufficient to provide robust and significant results on the participant´s study tour perception.

Positive overall outcomes of the organised study tours beside the performance indicators were:

+ Good choice of visited buildings. People assessed the technical tours /-sites worth to be visited as nZEBs, with potential as European front runners and including interesting solutions regarding the building envelope and the building services.
+ Participants were happy with the organisation of the study tours and were willing to join another AIDA study tour.
+ Willingness to receive the questionnaire “one year after” was basically given. Unfortunately not all participants who gave their permission also have provided their email addresses.

Negative outcomes of the study tour evaluation results:

- UK clearly missed two-out-of-three target numbers for the study tours (number of participants attending the study tours and number of evaluation sheets received)
- Targeted number 75% questionnaire feedback rate was too ambitious

Finally lessons learnt from the study tours are:

- 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 a study tour in face-to-face meetings, on the phone or via personal meetings.
- Tailored study tours for municipalities representatives do not guarantee that decision makers are on board but can bring additional synergies and benefits for future collaborations.
- The evaluation of the AIDA study tours showed that it is easier to bring architects and planners to the study tours than municipal representatives. Probably architects and planners see more direct benefits from the study tours.
- Bringing the media to the study tours offers broad publicity but needs very good contacts and personal invitations.
- Direct collaborations with universities can bring students to 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.
- As stated above, the 75% target in AIDA was too ambitious. Thus, if the quality of study tours shall be evaluated by means of questionnaires, 25-50% feedback rate are fully sufficient to achieve robust results.
- Moreover, the targeted number of participants per study tour in AIDA (~50 participants) was too ambitious. Thus, we recommend planning more study tours with fewer participants to fulfil an overall target. Based on the target group and the circumstances, 20-35 participants seem to be more appropriate.
- The results of the questionnaire show that study tours are very important and helpful for building professionals and municipal representatives to learn about nZEBs.
- Moreover, the questionnaire "one year after" indicated 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, which are even more energy efficient than the national building codes according the transposition of the nZEB building directive 2010/31/EU.

5.2 Integrated Energy Design Process in the municipalities

The evaluation of the IED-process in the municipalities showed that the AIDA partners have contacted together 277 municipalities and 32 of these were at least willing to collaborate within AIDA. Through these collaborations and the support of the AIDA team at the end 6 design tenders were realized (including one oral agreement), 4 feasibility studies were finished, which are now ready to be introduced in the next public design tenders, and 17 additional feasibility studies, where the introduction in the public design tenders is unclear, were prepared.
For more information to the realized design tenders and feasibility studies see AIDA report "D3.2: Public buildings tenders for the several case studies with the nearly zero energy target".

The main conclusions from the evaluation of the IED-process in the municipalities and lessons learnt are:

- The most import argument/reason for the municipalities to collaborate is the lack of (technical) knowledge or rather the need of expert knowledge to realise the imminent building projects.
- The most important arguments/reasons for the municipalities not to collaborate are the unwillingness of the municipalities to take action respectively the fact that energy efficient buildings are no important issues for them and of course the financial situation which is very tensed in many cases.
- Asking the AIDA consortium partners to assess the most important issues for the municipalities the most frequently mentioned issues are the cost efficiency / cost ratio of a nZEB and the funding schemes and subsidies respectively the financing of the building project in general.
- The most important issue for the municipality of Bolzano was the finding if necessary and usable energy sources to equalise the total energy balance of the buildings. That means it is no economic topic they have to deal with, in fact it is a technical problem which has to be solved.
- Aspects of a good collaboration included the concentration on the on-going communication and active interaction, on the motivation and interest of the municipalities, on the flexibility in the IED work plan and on the provision of contact persons at the right technical level in the municipalities.

APPENDIX

Appendix I. Study tour evaluation sheet

Appendix II. Questionnaire ONE YEAR AFTER to evaluate the mid-term impact of the study tours one year after the event

Appendix III. Questionnaire for the evaluation of the IED-process (for consortium members)

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

Evaluation Sheet

AIDA – Study Tour

Affirmative **I**ntegrated Energy **D**esign **A**ction[1]

Date/Time: (to be filled in by the organizer)

Location Address/Country: (to be filled in by the organizer)

Building Type (Site): (e.g. new built or renovated public office building) (to be filled in by the organizer)

1. Please comment the technical tour / site (only if participated)

Do you think the site is worth to be visited as nZEB*?	☐ yes ☐ no
Do you think the site has potential as a European nZEB* front runner?	☐ yes ☐ no
Did you see interesting solutions regarding building services?	☐ yes ☐ no
Did you see an interesting solution regarding the building envelope?	☐ yes ☐ no
Did you find implemented innovations like prefabricated solutions, water reuse…?	☐ yes ☐ no

*nZEB = nearly Zero-Energy Building = energy efficient building that covers its very low energy consumption mostly by renewable energy sources

Comments

2. Please comment the presentations (only if participated)

(Marks: 5= very good to 1= insufficient)

Lecturer	Title of the presentations	Marks
1. Xxx (name)	To be filled in by the organizer	
2. Xxx (name)	To be filled in by the organizer	
3. Xxx (name)	To be filled in by the organizer	

Comments

[1] More information about this Intelligent Energy Europe Project: www.aidaproject.eu

3. Please comment the organisational points of the tour / workshop

(Marks: 5= very good to 1= insufficient)

	Marks	Comments
General organisation		
Tour guide (name)		
Catering / Lodging		
Tour / Workshop fee		
Announcement / Written information (if available)		
Translation service (for international)		

4. Are you interested to join another AIDA Study Tour?

☐ yes ☐ no ☐ maybe

5. Will you be able to use any of the presented information in your daily business?

☐ yes ☐ no ☐ maybe

If yes, which one: ……

6. May we contact you in one year with a second questionnaire to ask you about your impressions of this study tour again?

☐ yes ☐ no

Email address: ……

7. Some questions about your person:

What´s your profession?

Mayor	☐	Architect, Planner	☐
Municipal Representative	☐	Master builder	☐
Representative of (local) Authority	☐	Energy manager	☐
Association of municipalities/local authorities	☐	Civil / Environmental engineer	☐
Association of building professionals	☐	Student	☐

☐ other: ……

Your special interest regarding nZEB: ……

Do you wish to receive the biannual AIDA Newsletter? ☐ yes ☐ nein

Female: ☐ **Male:** ☐

Your Age: ……

Thank you very much!

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Evaluation Sheet

AIDA – Study Tour

Affirmative **I**ntegrated Energy **D**esign **A**ction[1]

Dear AIDA Study Tour participant!

You participated in one of the previous AIDA Study Tours in Location/Country and allowed us to ask you about your impressions after the event. This questionnaire helps us and the European Commission to understand the market-uptake of nearly zero energy buildings…

1. Did you learn something about nearly zero-energy buildings within the study tour?

☐ Yes ☐ No

If yes, what? .....

2. Did you ever plan or order a nearly zero-energy building? If yes, how many buildings?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐ None

2.1. Which kind of nZEB?

	Nr. of buildings
Residential buildings(s)	☐
Non-residential building(s), please specify: ……	☐

2.2. Total floor area:

	Nr. of buildings
<500 m²	☐
500 – 1500 m²	☐
1500 – 2500 m²	☐
> 2500 m²	☐

2.3. Heating energy demand:

	Nr. of buildings
< 10 kWh/m²a	☐
≤ 15 kWh/m²a	☐
≤ 25 kWh/m²a	☐
≤ 50 kWh/m²a	☐

2.4. Heating systems:

	Nr. of buildings
District Heating	☐
Heat Pump	☐
Solar Thermal	☐
Wood	☐
Oil	☐
Gas	☐

2.5. Cooling energy demand:

	Nr. of buildings
< 10 kWh/m²a	☐
≤ 15 kWh/m²a	☐
≤ 25 kWh/m²a	☐
≤ 50 kWh/m²a	☐

[1] More information about this Intelligent Energy Europe Project: www.aidaproject.eu

3. Are you going to plan or order a nearly zero-energy building in the next three years? If yes, how many buildings?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐ None

3.1. Which kind of nZEB?

	Nr. of buildings
Residential buildings(s)	☐
Non-residential building(s), please specify: ……	☐

3.2. Total floor area:

	Nr. of buildings
<500 m²	☐
500 – 1500 m²	☐
1500 – 2500 m²	☐
> 2500 m²	☐

3.3. Heating energy demand:

	Nr. of buildings
< 10 kWh/m²a	☐
≤ 15 kWh/m²a	☐
≤ 25 kWh/m²a	☐
≤ 50 kWh/m²a	☐

3.4. Heating systems:

	Nr. of buildings
District Heating	☐
Heat Pump	☐
Solar Thermal	☐
Wood	☐
Oil	☐
Gas	☐

3.5. Cooling energy demand:

	Nr. of buildings
< 10 kWh/m²a	☐
≤ 15 kWh/m²a	☐
≤ 25 kWh/m²a	☐
≤ 50 kWh/m²a	☐

4. Have you ever used the integrated energy design process in your daily business?

☐ Yes ☐ Partly ☐ No

5. Finally, some questions about your person:

What´s your profession?

Mayor	☐	Architect, Planner	☐
Municipal Representative	☐	Master Builder	☐
Representative of (local) Authority	☐	Energy Manager	☐
Association of Municipalities/ local Authorities	☐	Civil / Environmental Engineer	☐
Association of Building Professionals	☐	Student	☐

☐ other:.....

Female: ☐ **Male:** ☐

Your Age: ……

Thank you very much!

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

AIDA - Evaluation Sheet

Integrated Energy Design (IED)

Date: to be filled in
Consortium partner: please fill in the name of your organization
Country: please fill in your country

---

1 Contacting municipalities in WP3

1.1 How many municipalities have you contacted up to now?

1.2 How many municipalities have been interested in collaboration within AIDA?

1.3 Could you name the reasons for the municipalities to collaborate (brief description) / not to collaborate (detailed description)?

1.4 If no collaboration was established, what are your plans to attract municipalities? Which additional efforts do you intend to undertake?

2 IED-process

2.1 Characterize the collaboration with the municipalities! How does the IED-process look like? (main steps, keywords)

2.2 From your point of view, is the collaboration successful? Why / why not?

2.3 Please describe obstacles/barriers to the collaboration

2.4 When the collaboration runs well, what are the important aspects of the successful collaboration?

2.5 Potential for optimization: What could be improved?

2.6 Which issues are most important for the municipalities?

3 IED-tools

3.1 Which tools have been used up to now?

3.2 Have you offered them for free? If not, explain why!

3.3 Positive/negative feedback to these tools!

3.4 Necessary points to optimize the use of the tools!

3.5 Are new tools required?

4 How is your perception of YOUR overall IED progress with municipalities?

5 Additional comments?!?