

ILETE

Initiative for Low Energy Training in Europe



Work Package 3 Vocational Training

**REPORT ON BUILDING PROFESSIONAL
KNOW-HOW AND ON THEIR TRAINING NEEDS**

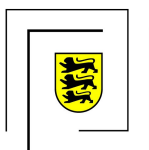


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Preface

The aim of the project ILETE is to promote know-how exchange on low energy consumption in buildings across Europe by implementing training programs targeting the Buildings Industry.

The objective, having the “passive house” model in mind, is to move very quickly towards a significant reduction in energy consumption in construction and to focus on renovation in which professionals play an essential role in forming public opinion.

To achieve this, ILETE project follows three priorities:

- To set up initial training on low consumption for architects and engineers;
- To set up ongoing training on low consumption to reach industry professionals and craftsmen;
- To inform the general public and contracting authorities on level A certification.

All training materials designed in the context of ILETE are freely available for all training institutions.

In order to design educational materials tailored to suit market needs, we seek support from as many professional institution and stakeholders in the field of low energy building technologies as possible.

In the first step, KEA sketched a questionnaire to find out the needs for education and advanced professional education concerning energy efficiency. Furthermore we wanted to identify the present trainings available on the market.

Individuals, engineering companies and institutions working in this specific field were questioned. Also the ILETE partners were asked. We consider this survey a very good market review.

Approach

In our questionnaire we asked questions concerning the needs for low energy training.

The questions deal with the sector of further education seminars within the range of lowest energy and passive houses.

The complete questionnaire is included in the annex.

We addressed 193 different institutions. These institutions include universities, training centres, energy agencies, building physics, architecture offices and associations of professionals. We got a feedback from 40 institutions.

They represent the following sectors:

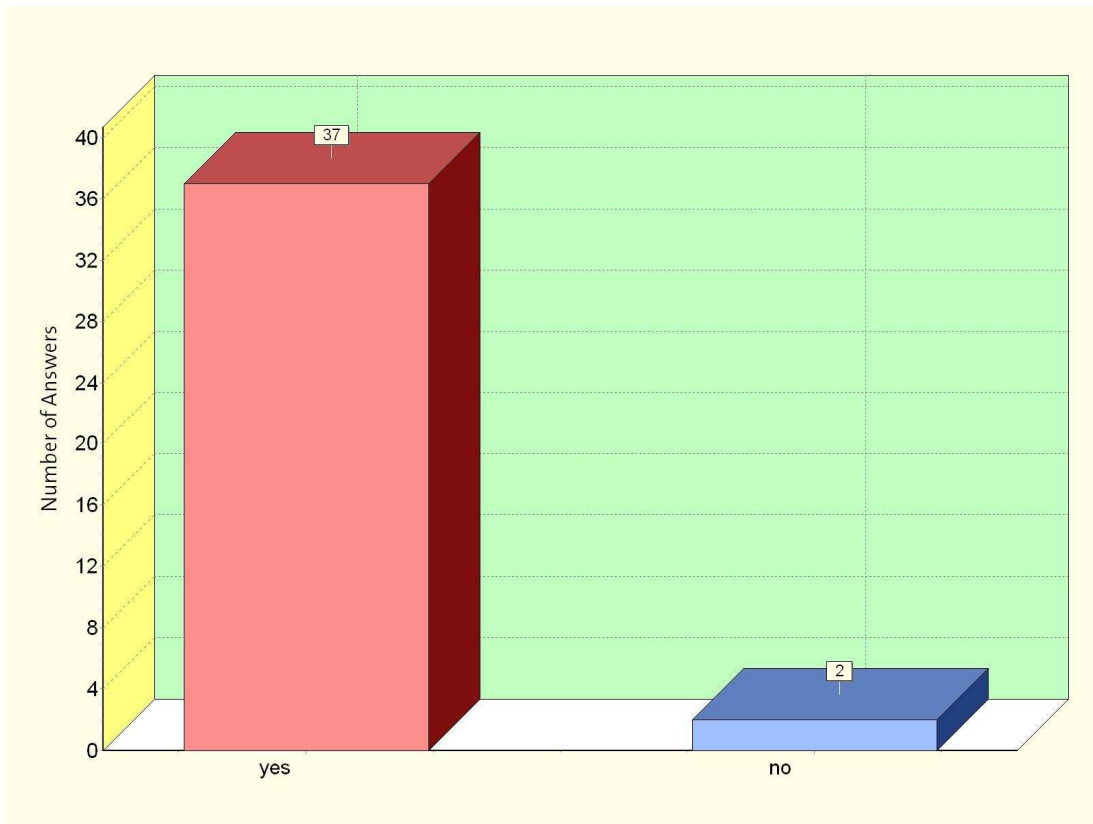
- Architects and engineers
- Associations of craftsmen
- Institutes for vocational training

from Baden-Wuerttemberg, remaining Germany and the ILETE countries: France, Austria, Italy, Spain, Poland and Romania. The partners were asked to pass on the questionnaires to suitable institutions.

At first, all questionnaires were evaluated together. In the second step we evaluated the feed-back from the stakeholders from Baden-Württemberg, Germany and the EU separately.

Results

Question 1: In your opinion, is there a need for low energy training?



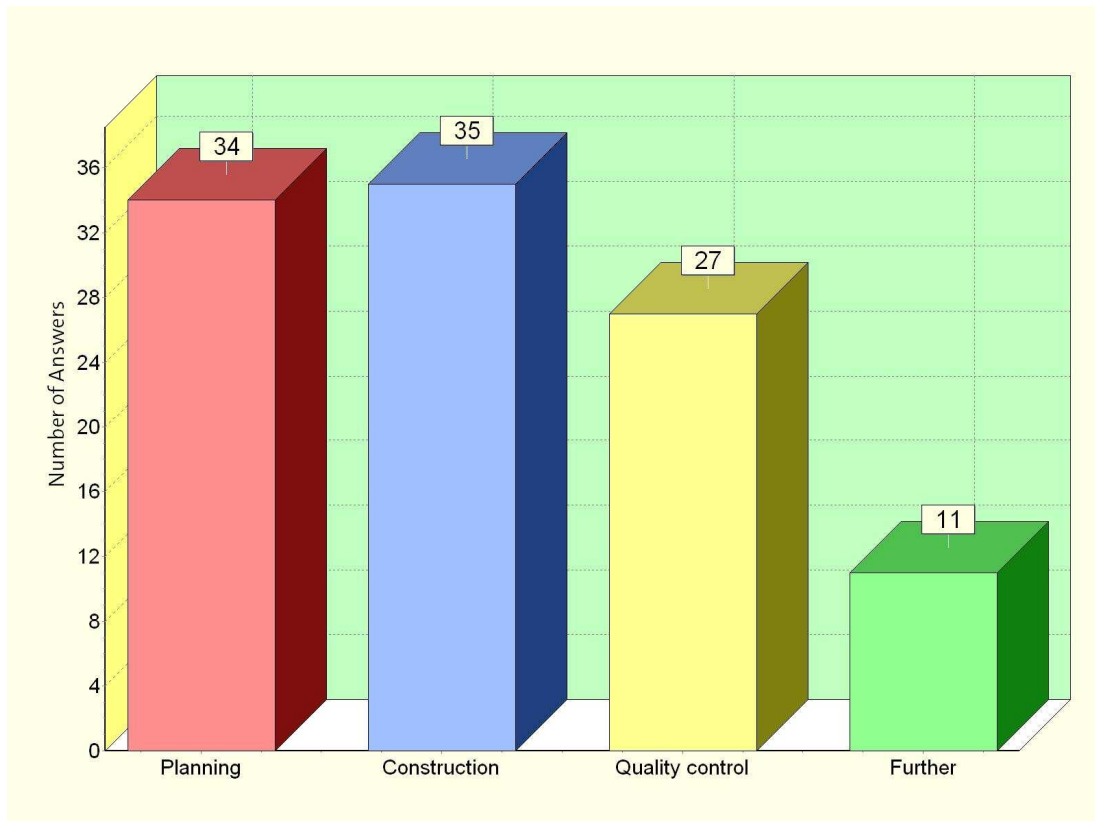
Picture 1: Answer to question 1 “In your opinion, is there a need for low energy training?”

The question for the need of training in the area of lowest energy and passive houses was answered very clearly.

At the moment, we see in Germany and Austria various different training programmes for energy advisers and some for passive house planners. The training programmes for energy advisers are designed very differently, depending on the focus of the organisation which is offering the training.

In addition, even the organisations, which offer already seminars within this range, are convinced of the further need of trainings.

Question 2: Which fields of training are the most important focused on low energy training?



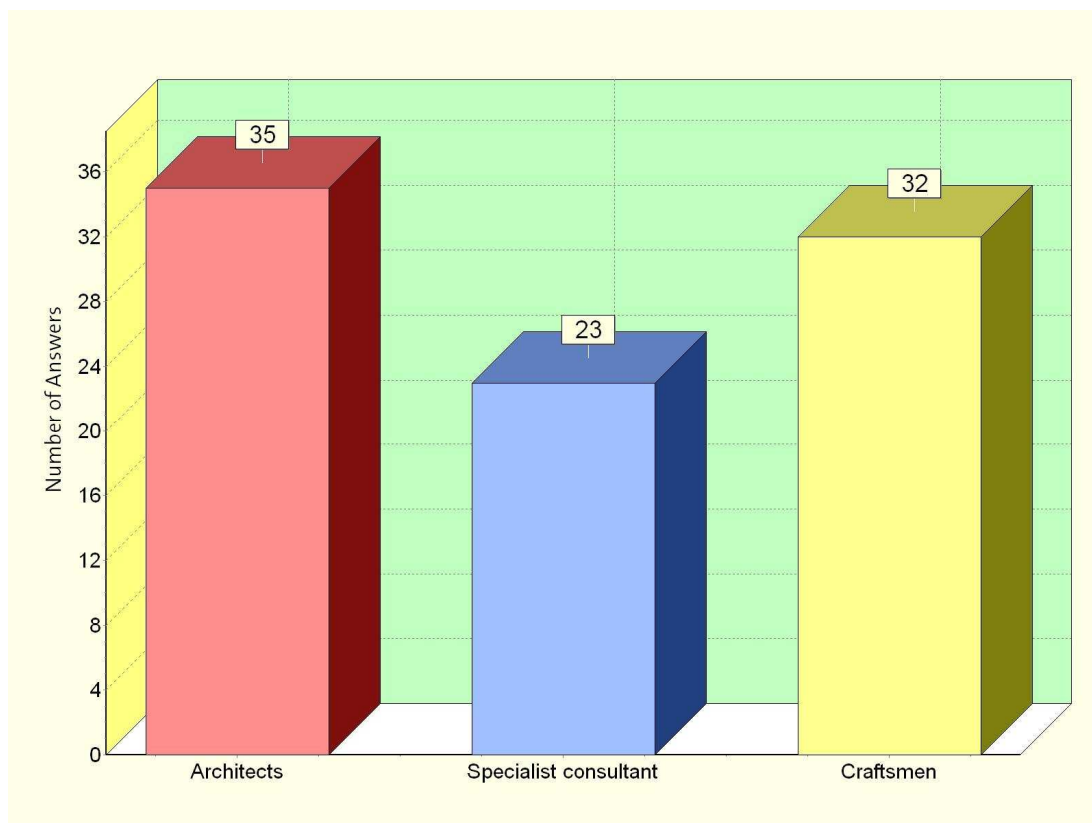
Picture 2: Answer to question 2 “Which fields of training are the most important focused on low energy training?”

The need of training in the fields of planning, construction and quality control is considered very high. Moreover, an additional need is seen in the following fields:

- **Energy consultants** are considered a very important target group
- **Standardization committees** (DIN EN, VDI etc.) are supposed to implement the results in the future standardization processes.
- **The final customers** are a key target group for future promotion. Well informed customers will increasingly ask for passive houses.
- **Chamber of handicrafts**
- **Refurbishment towards low energy/passive house**
- **Possibilities of further education**
- **Legal requirements**
- **Construction details**
- **Failure analysis**
- **Evaluation of measurements**
- **Use of electricity**
- **Economic efficiency**
- **Financing**

In the focus of the answers in the above mentioned fields there is no difference between Germany, Austria and the EU.

Question 3: Which is the most important target group for low energy training?



Picture 3: Answer to question 3 “Which is the most important target group for low energy training?”

Multiple responses were possible. The evaluation of the answers to the question concerning the target groups for the training shows, that all participants in the construction process must be taken into the account. It's not only the architect, who has to lead the construction process but as well the specialists and the craftsmen who are responsible for a building with high quality. Architects, professional engineers and craftsmen have to inform and train themselves continuously. Within the sector of the crafts, different specialists have to be considered. Explicit the following crafts were mentioned:

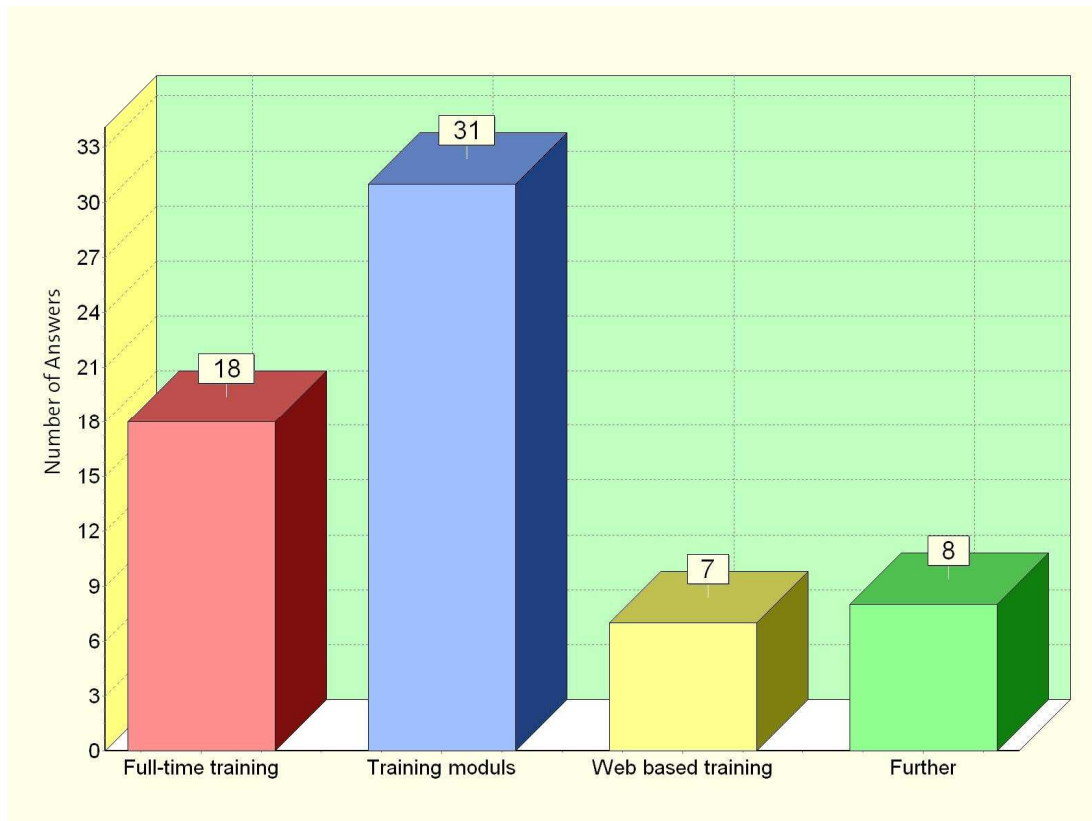
Structural worker	19
Carpenter	20
Glazier (window)	14
Plasterer	13
Heating/ventilation	21
House painter	1
Electrician	1

The craftsman must be trained on the importance of the airtight building envelope.

In this context the painters are important because at least in Germany they are allowed to apply thermal insulation systems.

Electricians are important because their cables often destroy the airtight envelope of the building. If we compare the answers from the different countries, we see no significant difference.

Question 4: Which structure of training would be the most practical one?



Picture 4: Answer to question 4 “Which structure of training would be the most practical one?”

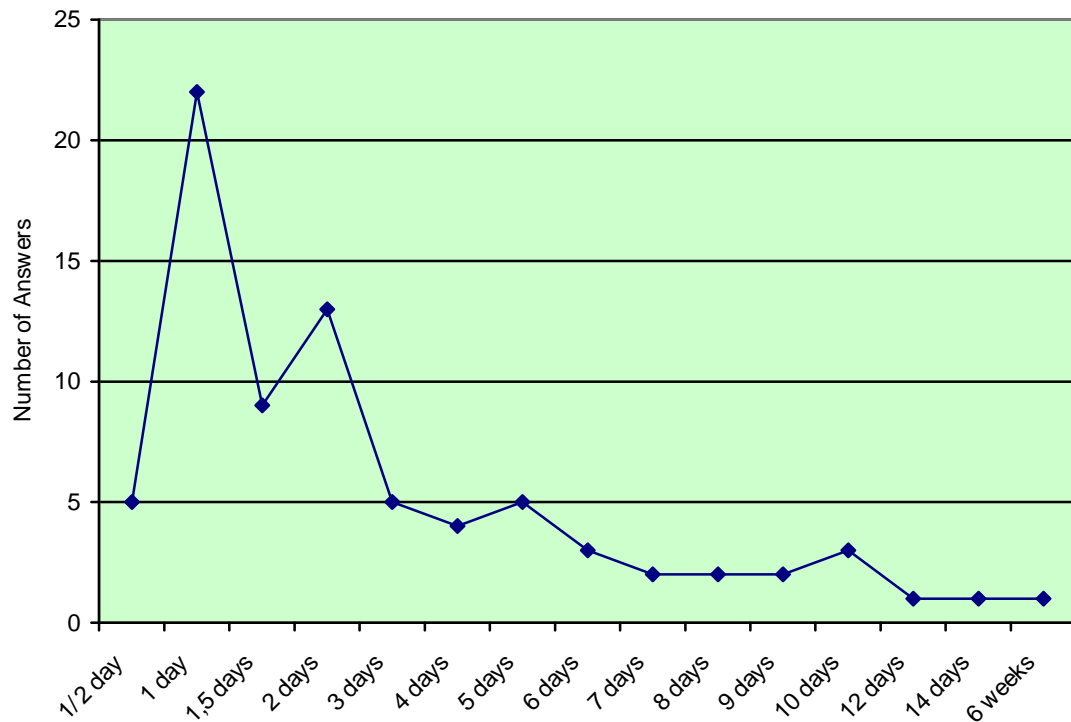
After the evaluation of the questionnaire a training consisting of various modules is considered to be the most successful.

The kernel of the training should inform about the basic of the passive house concept: the very good insulation, the airtight envelope, the ventilation and the minimization of the thermal bridges.

The additional modules have to intensify the knowledge of the above mentioned topics.

A module to deepening subjects and, as far as possible, a practise module were requested. Also a module for interdisciplinary work of all assembly sections would be advantageous.

Question 5: How much time should be considered for this training?



Picture 5: Answer to question 5 “How much time should be considered for this training?”

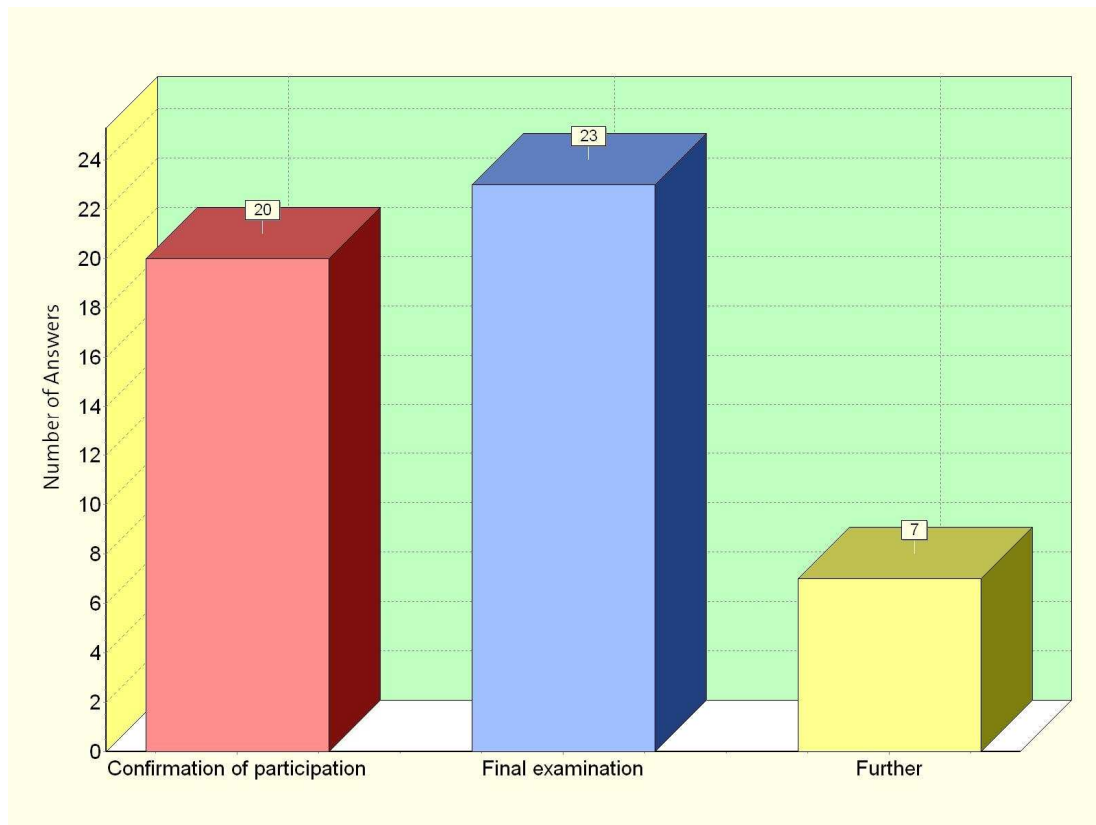
The duration of the training, i.e. the duration of the modules should amount 1-2 days. Most of the respondents ask for trainings on Fridays and/or Saturdays.

Most of the informants (28,2 %) ask for one day training. 62 % are convinced that a training module up to 2 days will be enough. 80,1 % considers a training of up to one week appropriate.

Only 6,4 % respondents feel that half day training is sufficient.

The remaining 19,2 % consider that a training of more than one week is necessary.

Question 6: In which way learning targets should be proven?



Picture 6: Answer to question 6 “In which way learning targets should be proven?”

While architects and engineers prefer to prove their new knowledge in a written exam, craftsmen consider that a participation certificate should be enough.

The following other exam possibilities are mentioned:

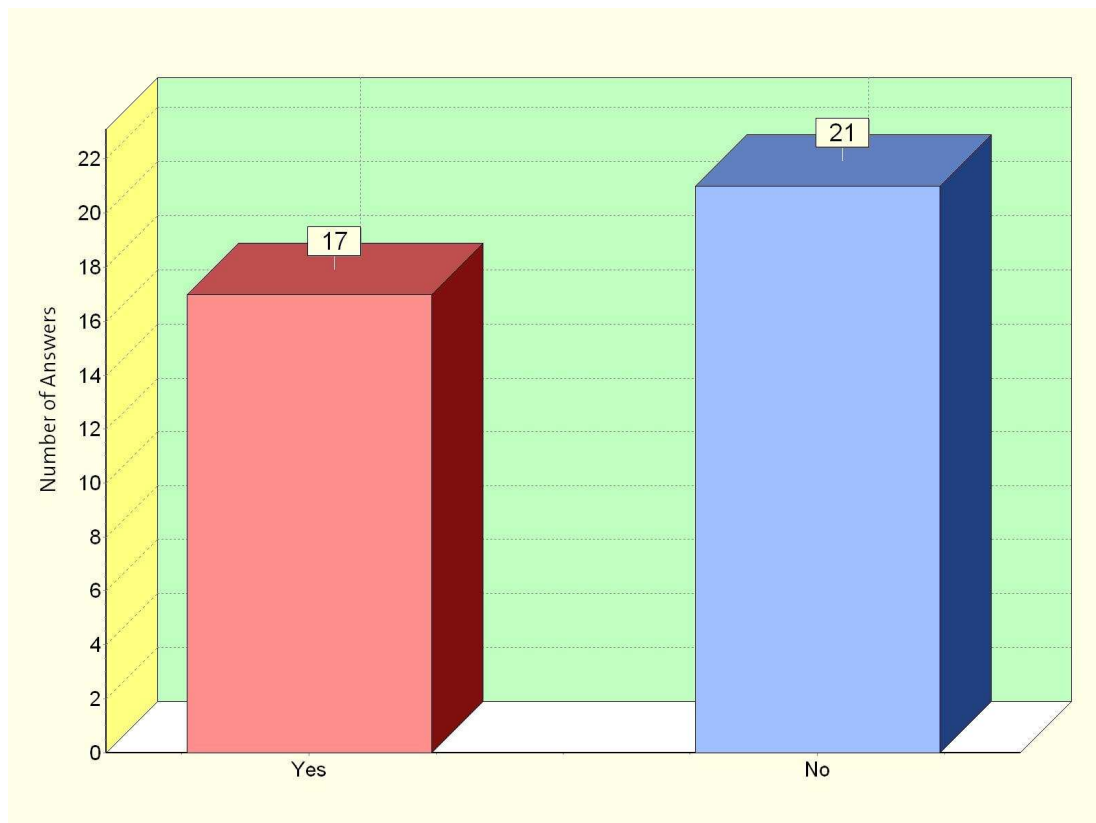
- Internet based test
- Workshop, Practical work , Seminar work (i.e. practical work on a building site for craftsmen)
- Project work (i.e. design of a passive house)
- Multiple choice tests
- Document of participation
- Voluntary certificate
- Assessment of an attended project

The certificate can consist of different parts according to the modules of the training.

We consider the following possibilities appropriate, because of the structure and the contents of the modules:

- Internet based test
- Multiple choice tests
- Document of participation

Question 7: Does your organisation offer trainings in the field of low energy building?



Picture 7: Answer to question 7 “Does your organisation offer trainings in the field of low energy building?”

As mentioned before, there are many offers for energy advisers and a few for passive house planners.

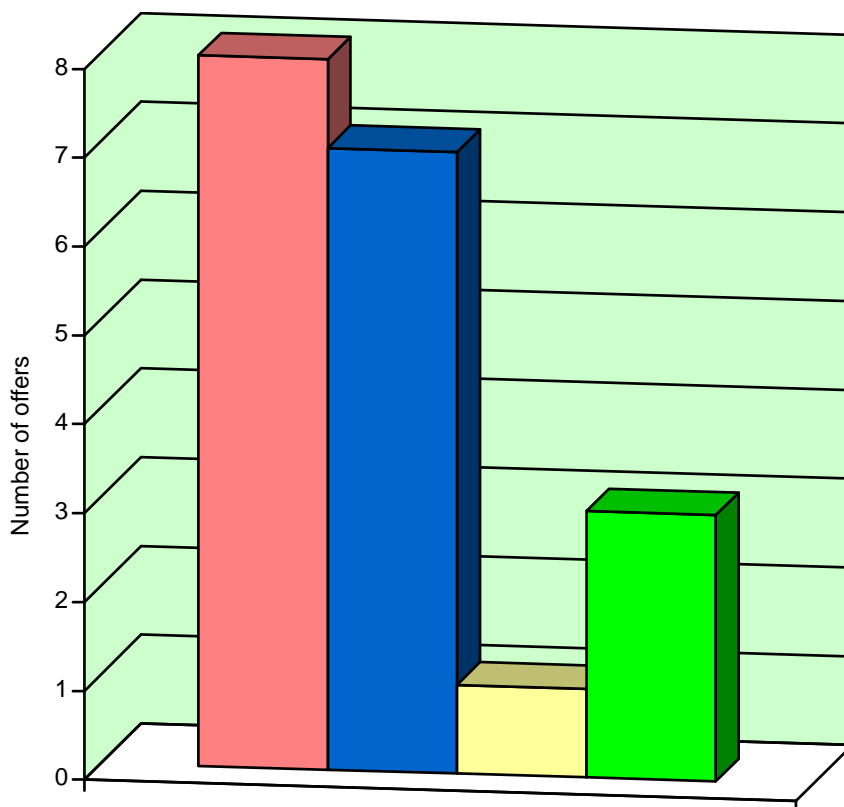
The majority you can find in Germany, especially in Baden-Württemberg. According to our survey there are a few offers available in Italy and Austria.

There is no specialised training offer for craftsmen in the direction of lowest energy or passive houses. There is no specialised training offer for refurbishment of existing houses to lowest energy and passive houses.

The aim of the existing training for energy advisers is the implementation of the present building standards (EnEV) in Germany.

In contrary to the existing trainings ILETE will focus in a better energetic standard and the specific problems that occur with significantly reduced heat losses.

Question 8: If your organisation offer trainings, please shortly describe this offer.



Picture 8: Evaluation about the fact where and how much Low Energy Training is offered

Most continuing education offers addresses architects, engineers and craftsmen. Offers for developers, i.e. representative of municipalities and regions, as well as private developers do not exist so far. To increase a higher demand for houses with very little energy consumption, we consider this target group as essential. This would make a lot of sense particularly in regions where passive houses are not as well known as in Baden-Wurtemberg, Bavaria and in Vorarlberg.

Also grants as well regional, federal and European level are not well-known enough. Neither architects and craftsmen nor the final customers nor the responsible officers in the municipalities are aware of the various grants available for low energy constructions.

The offers in the remaining European Union countries are of rather general nature and try to create a basic knowledge of low energy consumption.

In the region of Trento the energy agency offers advanced trainings in the area of low energy. The chamber of trade (handicrafts) is preparing a training course and the University of Trento started a 1-year postgraduate study for architects and engineers for integrated design concerning energy efficiency.

In Germany the education as a building energy adviser is in the focus (energetic building renovation) both for architects and craftsmen. Moreover, there are 2 training offers to the certificated passive house planner and 2 passive house planning seminars which do not offer this certification.

The advanced technical college of Erfurt will begin this year a post graduated course of studies in the area of Passive house planning.

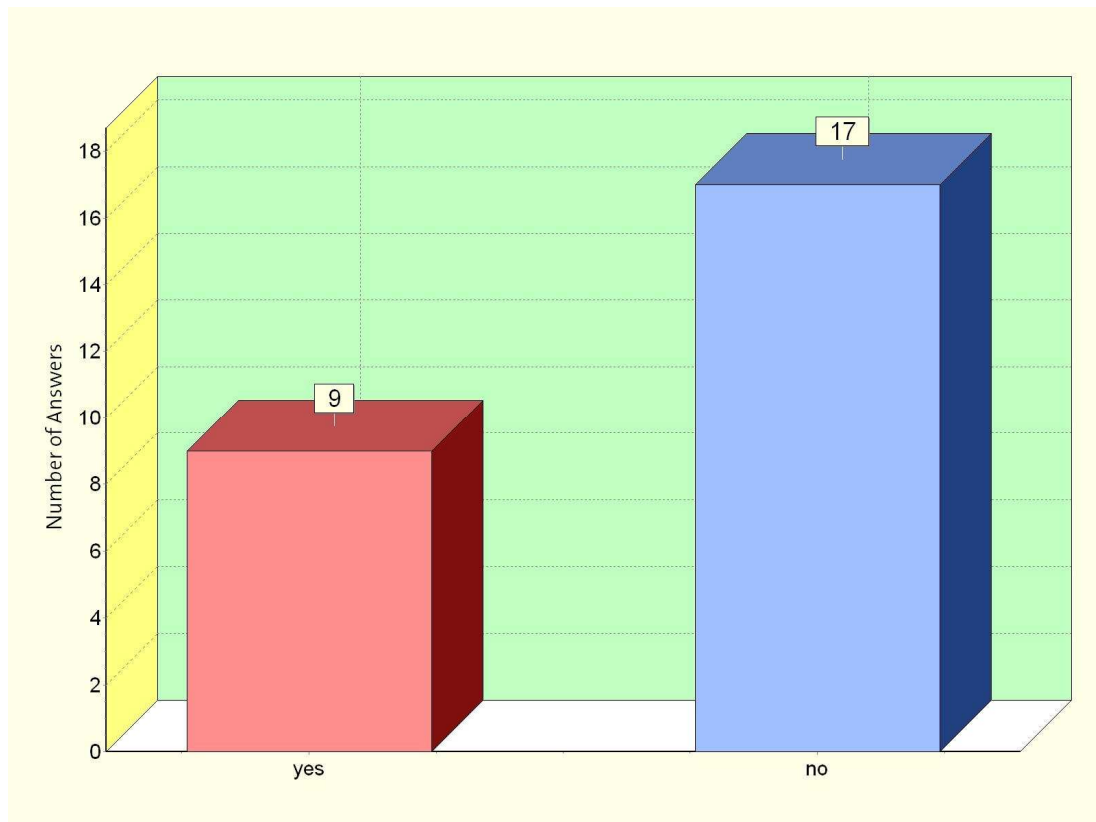
Furthermore the University of Innsbruck plans a similar course with the “father” of the passive house Wolfgang Feist as a teacher.

Vorarlberg and Bavaria, as well as Baden-Wuerttemberg share a role as pioneers in this field.

To stimulate the demand is at least as important as well trained architects and craftsmen.

In our opinion we must propagate the low-energy topic in the field of the municipalities and the regions. This can lead us to decisions as in, for example, Ansbach (Germany). Here the municipal council decided that all public buildings which have to be redeveloped should be renovated in the passive house standard. The decision was made for both environmental topics and cost efficiency. This could give the example for other European Municipalities.

Question 9: Could you provide us with training materials from already implemented training sessions?



Picture 9: Answer to question 9 “Could you provide us with training materials from already implemented training sessions?”

With the question concerning the training material various difficulties arise. On the one hand, many organisations offer education to become an energy adviser which differs, however, from the training to be provided. On the other hand, the organisations obviously see difficulties with copyright of their material.

For example the academy of engineers in Baden-Wuerttemberg is not allowed to give the materials to another organisation cause of contractual regulations.

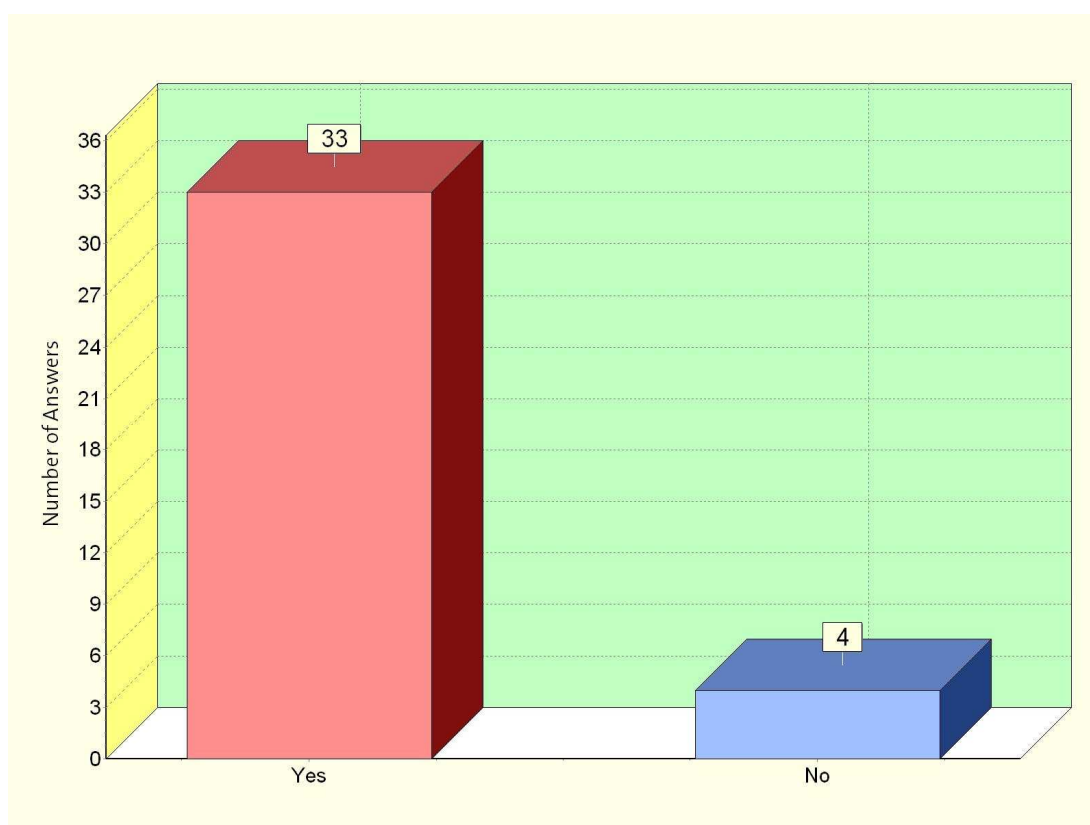
We try to obtain the training materials of the existing seminars. We would appreciate support from the EU.

Question 10: How did the participants react? How was the feedback to your training offers?

The response to the already existing offers was good to very good. Many participants showed interest concerning further seminars. The answers suggest an increasing need of such training courses.

In the region of Trento the subject is relatively new and creates a lot of interest. Here further education possibilities are requested.

Question 11: Are you interested in training materials designed in the context of ILETE?



Picture 10: Answer to question 11 “Are you interested in training materials designed in the context of ILETE?”

33 out of 37 respondents are interested in training materials developed during our project. This shows that the focus of our project meets the demand of the market.

With an appropriate training very low energy houses and passive houses can gain a momentum on the European market.

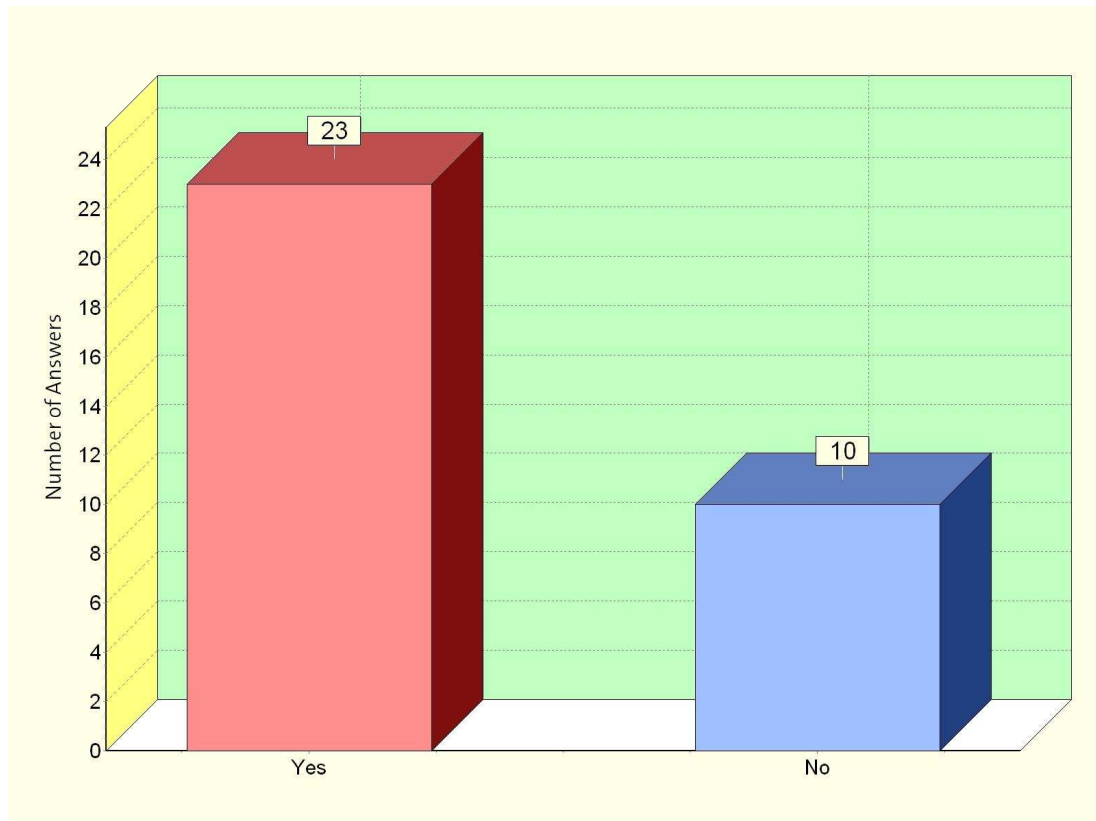
Question 12: How would you use these training materials?

The majority of the training institutions, that we questioned would like to check the training materials and, as far as possible, include them in their existing training. The materials should complement the existing advanced training possibilities, give new ideas and advanced training aims should be compared and be adapted. In regions where still no advanced training in this area exists, these materials should be used as a basis for a continuing education.

The material is supposed to be useful to:

- identify and use knowledge of other European Union countries
- improve the own knowledge
- increase the quality of own seminars
- supply arguments for the discussion with customers +authorities
- serve as a basis for employee's trainings
- serve as a basis for presentations/lectures
- serve as a basis for flyers and booklets
- serve as a basis for self-studies
- supplement the own knowledge
- set up an online platform for materials
- extend the offer of own courses
- serve as a basis for own course to be developed
- include it in the university education
- build up a training centre (Romania)

Question 13: Are you interested in offering low energy training as a pilot seminar?



Picture 11: Answer to question 13 “Are you interested in offering low energy training as a pilot seminar?”

The interest to carry out an ILETE pilot seminar is predominantly granted.

The advanced training institutions are obviously waiting for such an offer.

23 out of 40 institutions are ready to carry out an ILETE pilot seminar. We consider this an extremely high percentage.

This is a further prove for the fact that low energy and passive buildings will be the future design standard.

Question 14: Further notes:

Here the interviewees had the opportunity to express their own remarks, supplements and wishes on the subject. The answers suggested bringing in the knowledge of the passive house institute in Darmstadt as well as the energy institute of Vorarlberg, the two most renowned promoters of this design standard worldwide. It also appears to be important to have additional argument at hand when discussing with customers and authorities.

In addition we have to supply arguments to convince both private and public customers that the passive house standard guarantees minimal life cycle costs for a building and offers excellent working and living conditions.

Conclusion

Which conclusions can we draw from the survey?

The evaluation of the questionnaires has brought very clear results: There is a huge need for a training program in the field of lowest energy and passive houses even in a region where already several hundred Passive houses exist. Also the option, that this programme should be spread all over Europe, meets strong approval.

The target groups at which the training should be aimed at are architects and planners on the one side, and craftsmen of all crafts on the other side. Several remarks indicated, that customers, standardisation committees like CEN, DIN-EN or VDI are an important target group for this kind of training. In the near future there will be a demand for more energy efficient modernisations and renovations. Then the passive house standard will be the relevant standard and energy consultants will need passive house expert knowledge.

This result shows that ILETE is a project that perfectly fits to the market needs.

The inquiry concerning the kind of the training proved several important aspects. Concerning the design, of the building and its details, the construction and quality control, there is a lot of demand for further education. To yield an integral construction process, the cooperation between architect, specialist and craftsmen has to be much closer compared to a standard building.

A modular training seems to fit the market needs, arises from the offers at the moment available at the market and the inquiry, but also from the different target groups, as a training structure. The modular form is also suitable for an advanced training and the topic offers training material for much more than a week. The modules should be designed so that working people can attend the trainings. That means that each module should be presented during 1 or 2 days on the weekend (Friday and/or Saturday) Architects and planners should prove their knowledge with an exam. Craftsmen prefer a participation certificate. This still has to be discussed. Quality control should be discussed in cooperation with other ongoing EU funded projects in the field of passive house training like the Certified European Passive House Designer (CEP).

The modules should contain one or two introductory modules for architects, specialists and craftsmen and special seminars (e.g., PHPP for planners, ventilation, thermal bridges, the air-tightness concept ...). Project-accompanying knowledge, practical work, e.g., on test building sites and also here interdisciplinary work of all assembly sections are very welcome.

Currently there are already courses for passive house planners at the market (Germany and Austria). However, these are neither uniform, nor is the market saturated.

The organizations offering trainings observe a very big demand in this field.

The training should discuss not only the sector of new buildings but also the additional problems in refurbishment projects.

One very important aspect is the promotion of the passive house and lowest energy standard. Not only the final customer but also the politicians on all levels in the European countries are a key target group. Urban planning for example should take into account the necessities of a passive house.

In countries, where energy conservation is not yet common knowledge it is important to invest in capacity building on all levels. Training of experts is an essential part in this process.

We consider a real size model project, where the trainers can show the functions, the possible mistakes and the opportunities extremely helpful for the training. This is a fundamental factor for developers.

For the further work in WP3 the results of the survey have the following consequences:

- We will carry out two other investigations. On one hand architects and engineers and on the other hand craftsmen, who have already experiences in the design of lowest energy or passive houses, will be interviewed.,
- In the questioning special focus must be put on the experiences of the participants in planning, construction and implementation (e.g. how must a craftsman prepare his colleagues for the new duty? Which items must they particularly pay attention to?)
- The training has to be organised modular, 1-2 day per module.
- At the beginning a general part should be implemented, which describes the influence and importance of the passive house planning package to the topic of designing of lowest energy or passive houses. This should be understandable for both laities and construction workers. We consider that this part should be as well suitable as an introduction of this topic for customers and municipalities/districts etc. For architects and engineers will follow, explaining the passive house project package. We consider this tool helpful not only for passive houses but as well for lowest energy building design. It should be also demonstrated, how a change of an individual construction component, change the overall result. The interdisciplinary planning must be established as a basic principle.
- In each case two modules should deal with the design of detailed solutions in renovations. Special attention on the possibilities to improve the air tightness of the building envelope and to reduction of thermal bridges in the construction.
- One module should deal with the briefing of craftsmen before starting the building site. (What are the most important aspects building a lowest energy or passive house? How can I avoid/recognize/repair mistakes in the construction? What are the 'dos' and 'don't s' building a lowest energy or passive house?)
- One training module will deal with the workshop drawings of the craftsman.
- The training will have three toolboxes. The trainer will put the parts together and get the optimized training for each craft.
- The toolboxes are:
 1. Pictures, slides and drawings
The pictures, slides and drawings should be used for the training.
 2. Workbook for trainers
Remarks for the pictures and drawings
Sources of supply and using of the materials for the practical part of the training
Advices for the training content
 3. handbook for the craftsmen
Something the craftsmen can use after the training as a reminder and reference book.

Annex: Questionnaire on low energy training in Europe

1. In your opinion, is there a need for low energy training?
 Yes
 No
2. Which fields of training are the most important focused on low energy training?
(multiple answers possible!)
 Planning
 Construction
 Quality control
 Further: _____
3. Which is the most important target group for low energy training?
 Architects
 Specialist consultant
 Craftsmen
 - structural work
 - carpenter
 - glazier (window builder)
 - plasterer
 - heating and ventilation
4. Which structure of training would be the most practical one?
 Full-time training on several days
 Training modules, e.g. on weekends
 Web based training
 Further: _____
5. How much time should be considered for his training?
 Duration in days: _____
 Duration of modules (if training modules are preferred):

6. In which way learning targets should be proven?
 Confirmation of participation
 Final examination
 Further: _____
7. Does your organisation offer trainings in the field of low energy building?
 Yes
 No
8. If so, please shortly describe this offer (target groups/ structure/ learning targets/results/extend in days)!

9. Could you provide us with training materials from already implemented training sessions? (These documents are only used for internal documentation only and not for commercial purposes.)
- Yes (documents attached)
- No
10. How does the participant react? How was the feedback to your training offers?
11. Are you interested in training materials designed in the context of ILETE?
- Yes
- No
12. How would you use these training materials?
13. Are you interested in offering low energy training as a pilot seminar?
- Yes
- No
13. Further notes

Thanks for your assistance!