



Energy Management Training for European Plastics Processors

Project No: UK/09/LLP-LdV/TOI-163_230

Training Needs Analysis



This project has been funded with support from the European Commission. This document reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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Introduction

In connection with development of educational material, including e-learning programmes, to be used in the work with energy efficiency within companies, a questionnaire was prepared. The questionnaire has been designed so that it clarifies partly the company's present knowledge level within energy registration and efficiency and partly their experience with educational tools including web-based education. Furthermore, the questionnaire identifies the company's needs with regard to content, structure and implementation of the educational materials to be used in connection with their energy-saving initiatives.

The questionnaire was distributed to companies in the partner countries through networks and in collaboration with the plastics industry in the relevant countries. A total of 91 companies have completed the questionnaire - a rather limited number taking into consideration that the questionnaires have been sent to several hundred companies around Europe.

In the following report we have tried to summarise the results of the responses received, and the summary will be in accordance with the structure of the questionnaire.

The Results

The first part of the questionnaire related to the company's size and structure. The sizes of the companies, who have reflected on the questionnaire, are as shown below:

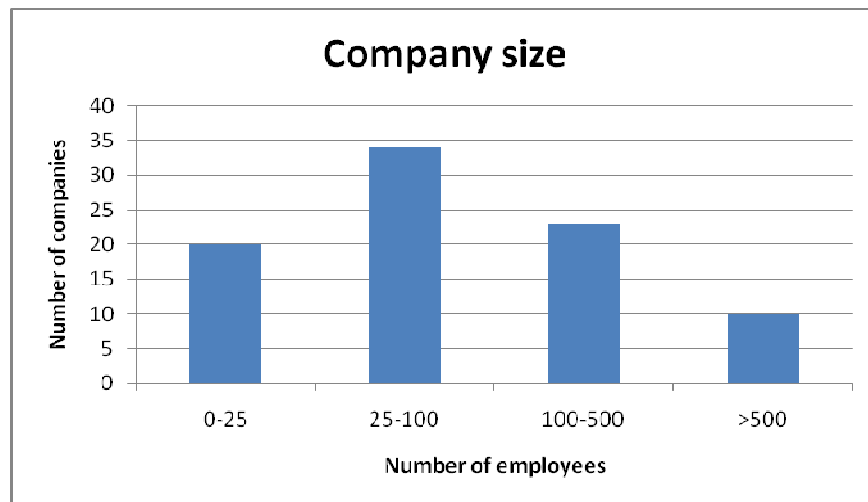


Figure 1

The majority of the answers have come from companies with up to 500 employees. The reason for this is that the share of small and medium-sized companies in the partner countries is relatively large, e.g., in Denmark there are very few companies in the plastics industry with more than 500 employees. The result also probably reflects that companies larger than these already have departments dealing with energy efficiency, and consequently they are not participating in the survey.

If we take a look at the company's core business segments, they are distributed among the following areas:

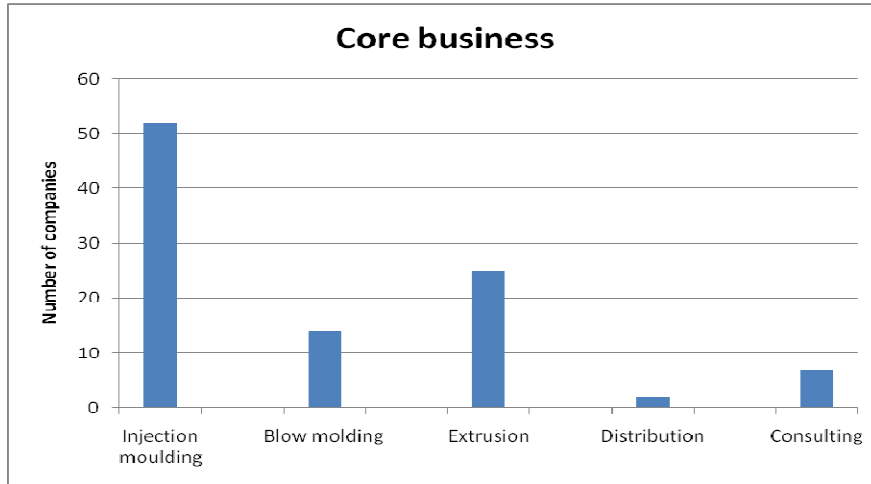


Figure 2

As it appears from the figure the vast majority of the companies participating in the survey are engaged within the injection moulding. The companies within the injection moulding segment are, compared to **Figure 1**, typically smaller companies who are observing a strong competition from low-salary areas like Eastern Europe and Asia, and who are consequently working intensively on finding potential savings, including energy savings, in the company.

In response to the question whether the company has previously worked with energy efficiency, 66% respond negatively, and the distribution of the answers in the individual partner countries is as follows:

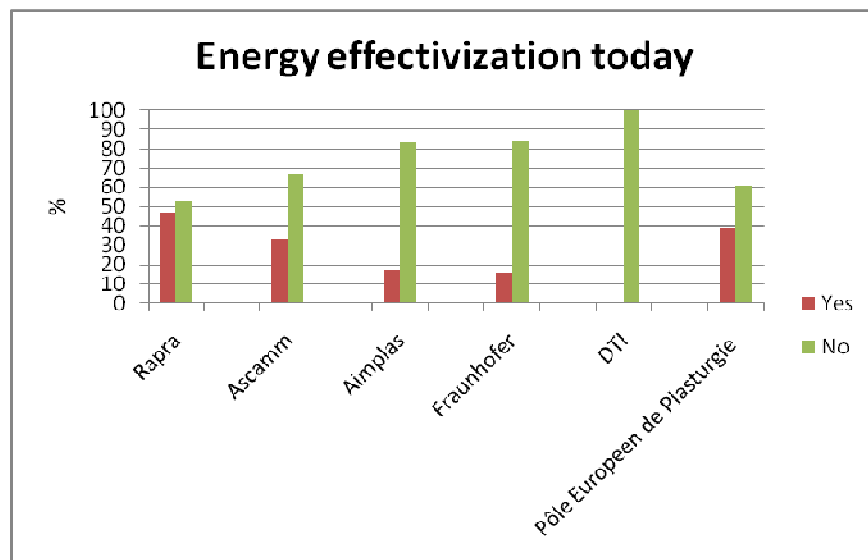


Figure 3

Most companies already working with energy efficiency have their focus on the production.

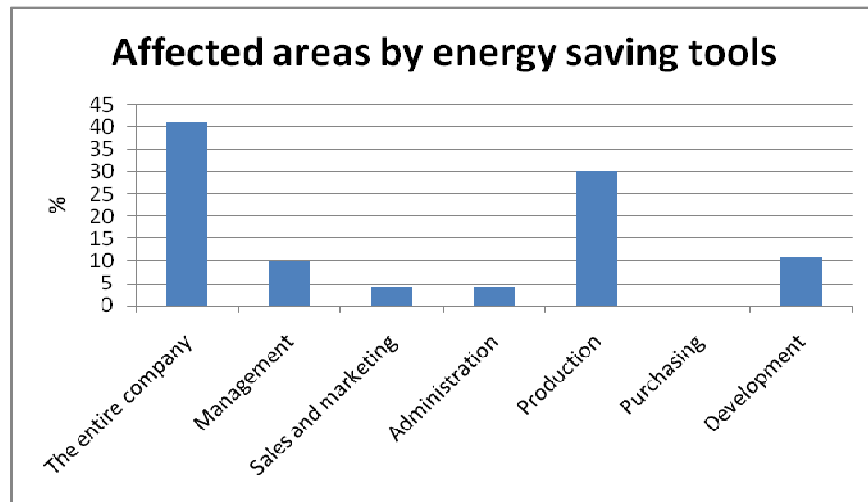


Figure 4

Regarding registration of the company's present energy consumption, the answers are distributed as follows:

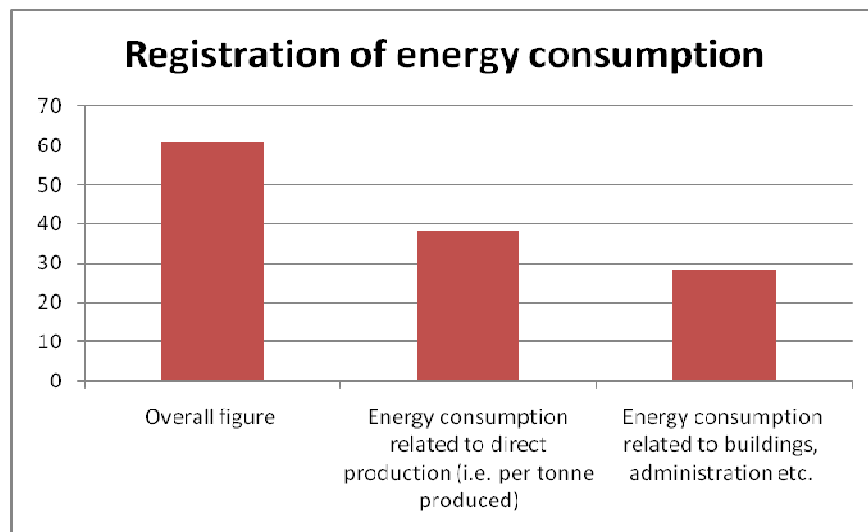


Figure 5

In response to the question whether the company is interested in further information on energy saving programmes and aids, 88% respond positively, which is quite natural because they respond actively to the survey.

In addition, 85% of the companies have no experience with e-learning programmes. Among the relatively few companies, who have used e-learning programmes as educational tools, the experience is predominantly

that the users have found the programmes to be simple to use and thus fulfilled the requirements for functionality and implementation. The few programmes mentioned are the following:

- SolidWorks
- Microsoft Office Live Meeting 2007
- HKPC
- SAP

Among the companies, who have had negative experiences, foreign language and heavy implementation process are mentioned as barriers for a successful use.

Half of the respondents use external consultants in their work to achieve energy savings in the company. These external energy consultants are typically the national energy companies and larger consultancy companies.

As to the question which areas in the company would gain the most of new knowledge on energy efficiency, the replies are:

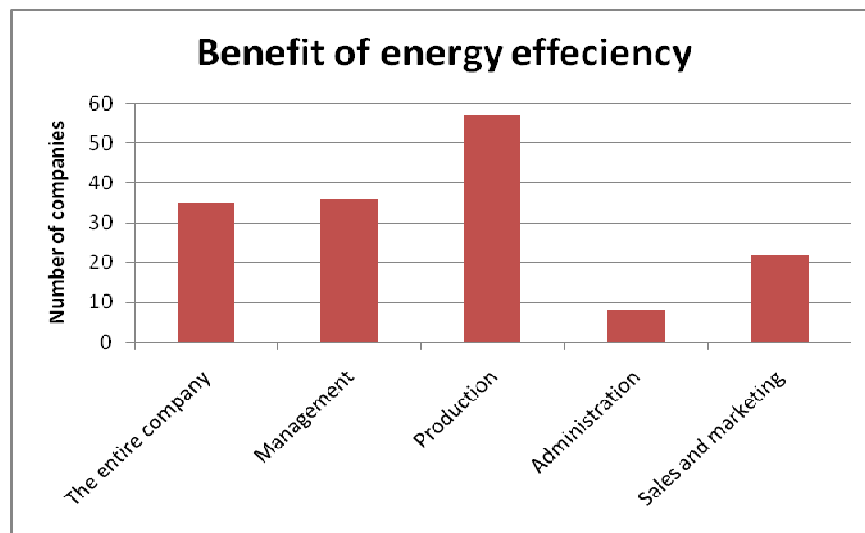


Figure 6

According to the companies, the most important advantages of further energy efficiency are among others:

- Cost reduction
- Improved competitiveness
- Energy reduction
- Process optimisation
- Better awareness regarding energy consumption among employees
- Ecology
- Product quality optimisation

As to the question how the companies wish to implement new knowledge on energy efficiency, most companies reply that a combination between training programmes and practical work is the most optimal solution. Consequently, the e-programme should be composed of a theoretical part followed by a practical part with exercises so that the theoretical matter can be demonstrated and the results seen. The distribution of the results is as follows:

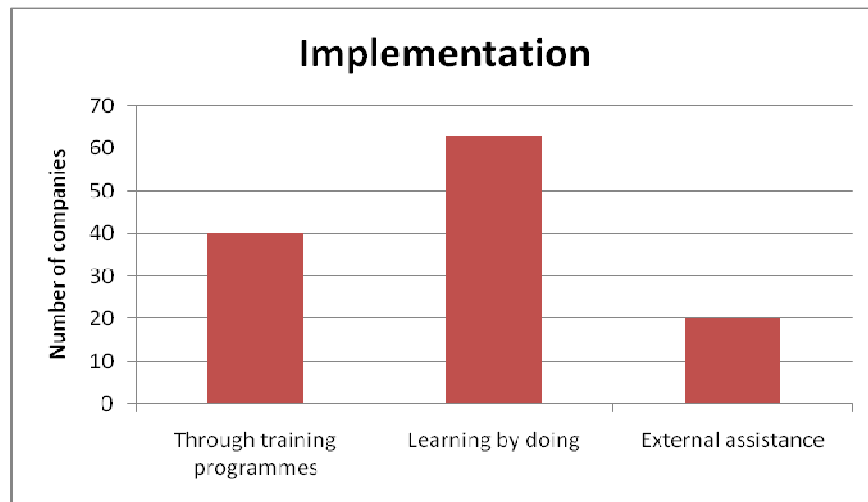


Figure 7

Regarding education management most companies want to have internal trainers and they want the education to be carried out in groups - preferably of inter-professional character.

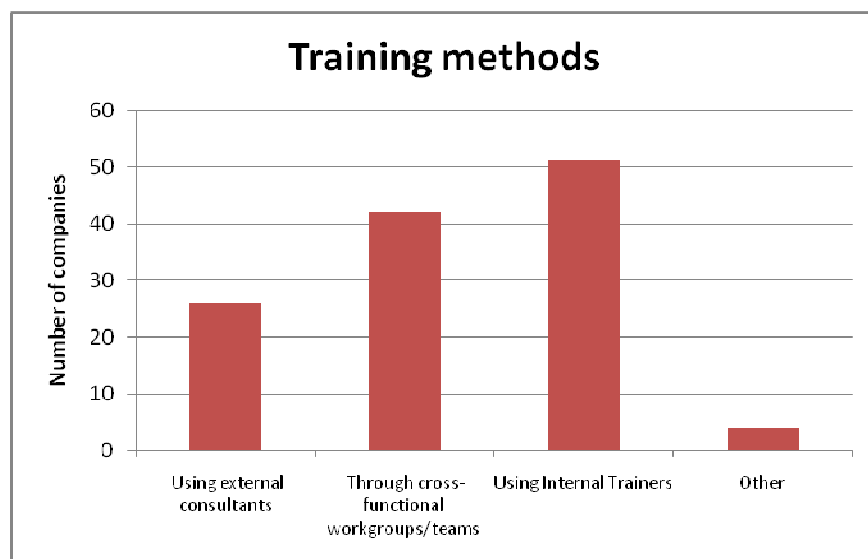


Figure 8

With regard to the basic composition and structure of the programme, the companies want a combination between web-based material and handbooks. This applies to all areas of the organisation. The results of the received answers are as follows:

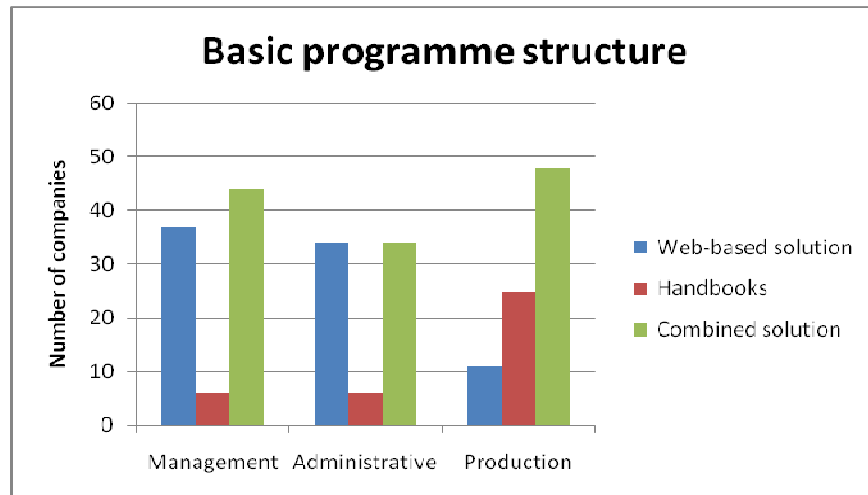


Figure 9

When being asked about the format and content of the programme, the response is once again a wish for a combination between a theoretical part and a practical part with exercises. The exercises may positively be based on 'best practice' within the individual areas of the programme. The theoretical section should, in its final part, contain cases, which support the purpose of the subsequent practical exercise. The results of the answers are as follows:

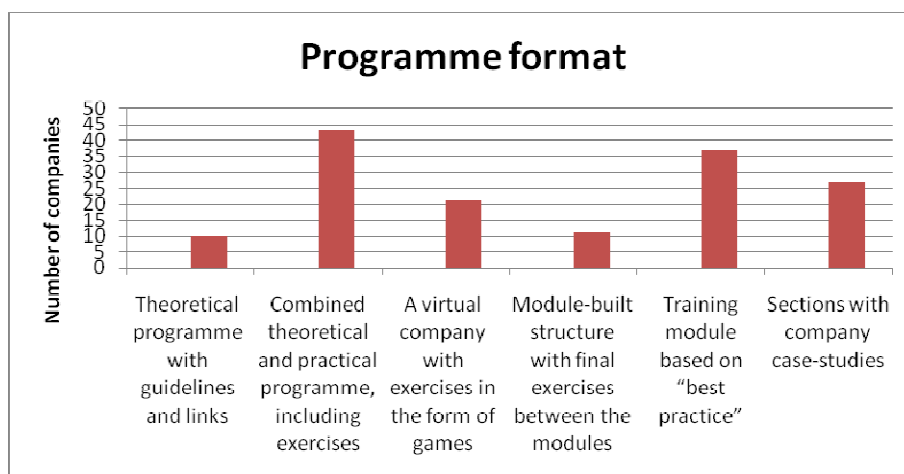


Figure 10

The introduction of the programme and the other educational material is preferred to be carried out by the company's energy manager, who has the overall responsibility for choice of focus areas for energy optimisation and execution of the various initiatives. In many smaller companies this person will be identical with the production manager and/or possibly the team leader, and hence these persons are mentioned in most of the replies.

The responses also show that it is preferred that the management in the company is the controlling part during implementation and supervision of the programme. This is also clearly disclosed in the question later in the survey regarding responsibility for execution of the programme and fulfilment of its objective. The result of the responses is as follows:

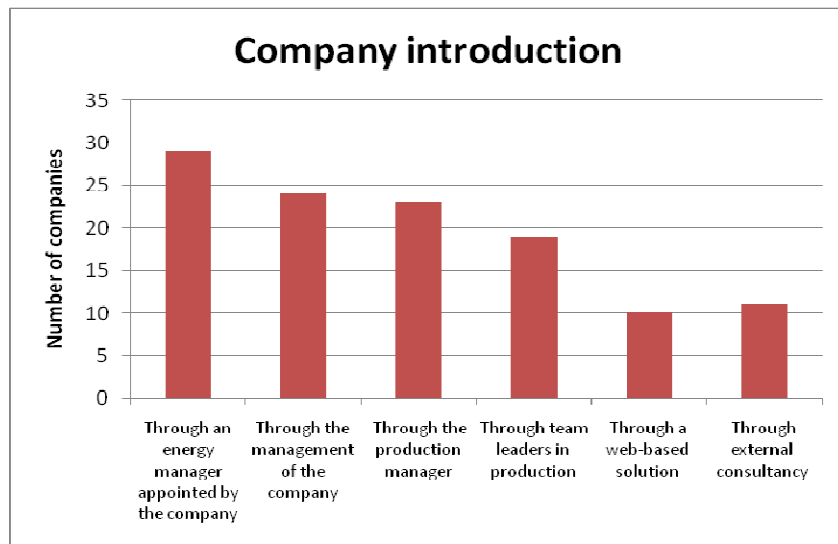


Figure 11

The responses from the companies as to which part of the organisation should be responsible for execution of the programme activities and securing the results showed the following clear result.

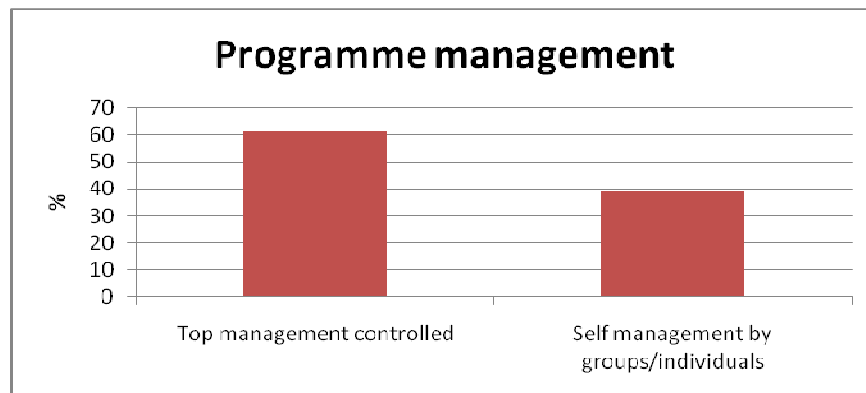


Figure 12

In connection with the work of the programme, the companies were asked which motivation factors should be the driving ones in the work with energy efficiency in the company. The answers from the majority of the companies (approximately 50%) were that an internal reward system is preferred. The reward shall be redeemed when the workers on their own initiative bring forward energy saving measures, and the kind and size of the very reward is agreed upon in the company's joint consultative committee or the like. The result of the responses is as follows:

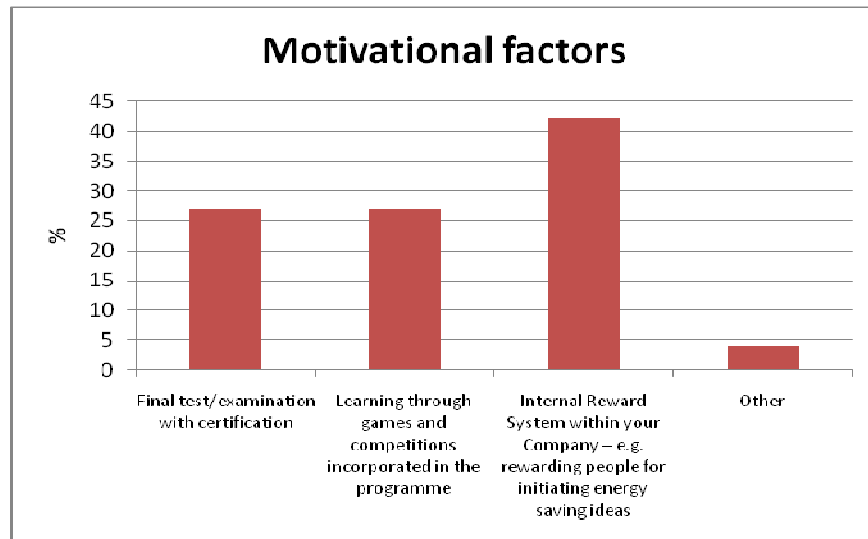


Figure 13

Under the group 'Other' it is mentioned that if the programme, while being used, is experienced to be efficient, exciting and with practical examples, which are used directly, this would be motivating in itself.

The current energy saving results must, of course, be visible during the use of the programme, in order for these to act as motivating.

As previously mentioned, the education is preferred to be carried out in groups instead of individually. The result is quite clearly shown below.

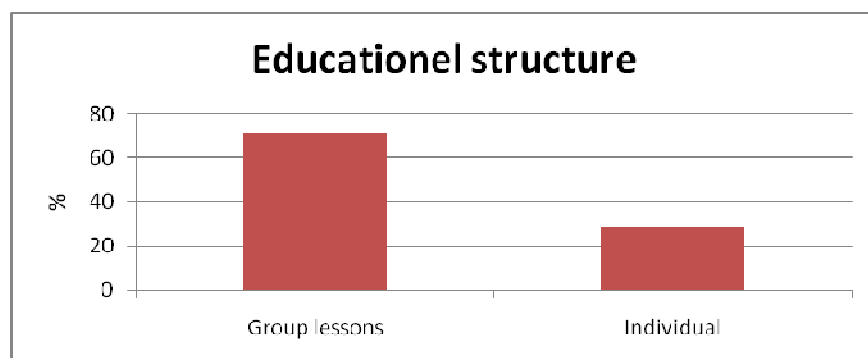


Figure 14

With regard to the temporal aspect of the implementation and the extent of the programme, the answer is somewhat vague. There is no obvious preference among the answers but the programme should be immediately composed of a relatively intensive introduction and implementation over a few months, possibly related to a certain project or subject in the company. After introduction the programme is going to be a natural part of the company's tools for energy surveillance and efficiency. The answers concerning the temporal implementation of the programme are as follows:

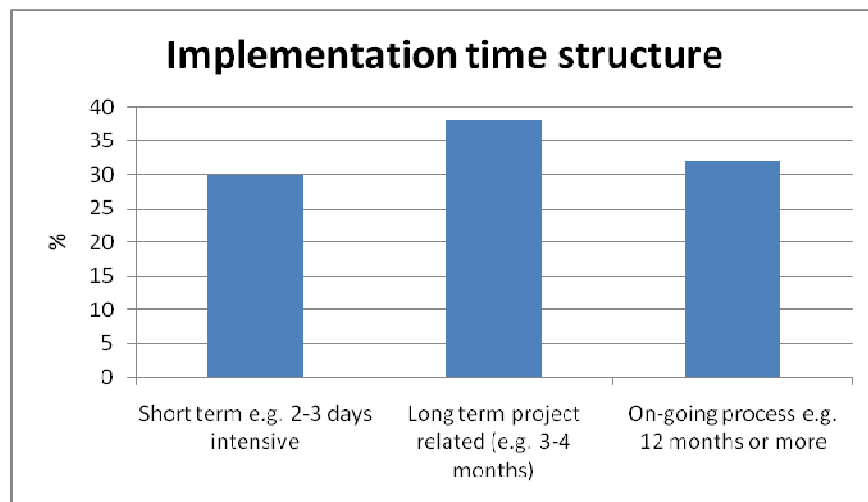


Figure 15

Conclusions

In the above there has not been focus on the difference in the answers from the individual partner countries. There are two reasons for this. Firstly, the number of answers from some of the partners is very limited, for which reason they cannot form the basis of a representative answer. Secondly, the result from RAPRA is based on answers from companies represented worldwide. Furthermore, the answers from the individual partner countries are not conclusively different, which justifies an overall assessment.

The result of the survey shows a great interest in implementation of educational tools to be used in the company's work with energy efficiency. At the same time, the result shows that only approximately one third of the companies today use other similar tools in their work with energy savings.

Only a very small part of the companies, approximately 15%, have experience with e-learning programmes, and the available experiences show that the programmes must be simple and efficient to use and must be targeted at the company's most energy-consuming areas – including the production.

Many companies work with the national energy suppliers, and it may be relevant that the content of the e-learning programme relates to these suppliers' focus areas. Process optimisation using efficiency of electric controls and pump equipment is an example of these focuses areas. Other examples are optimisation of ventilation plants in the company along with raw material management.

Based on the answers from the companies the access to the company should be through the management or the company's energy responsible person. The management of the education and the related activities are wished to be headed by the administration in the companies.

The companies want the educational material to be spread in the company through internal supervisors, and the teaching must take place in groups - preferably inter-professionally.

The educational material should be composed of a theoretical part followed by cases and practical exercises, in which the theoretical knowledge is used. The basis of the exercises could be 'best practice' examples. The material should consist of a combination of a web-based programme part and handbooks, and the content should be prepared so that the structure can be used in the entire organisation. The optimum solution will probably be to divide the educational material into a management oriented part and a co-worker part, potentially with some common areas which can form the basis of a joint objective.

The implementation and the extent of the material should be structured so that it can be implemented over a few months and subsequently be a part of the permanent procedure of current energy optimisation. An alternative

access with regard to implementation could be through the company's energy collaborators, who are typically the national energy supply companies and larger consultancy companies.

Concerning the conclusive motivation, which is going to make the educational material successful, there is a desire to have ideas and examples included in the material so that the companies may set up internal goals and success criteria. One goal could be 'best practice' values or the like.

Based on the results from the survey and the experiences from a recently arranged energy seminar at Danish Technological Institute with approximately 60 Danish plastics manufacturers, it is conclusive for the success of the educational material that it appears as efficient, practical related and user-friendly. The material must quickly and efficiently be able to yield results in the form of savings and a more efficient production. Furthermore, the material shall be used to create awareness in the company of the purpose of energy efficiency.

Annex I: Questionnaire



ENERGYWISE Plastics – helping you to reduce your energy consumption

The purpose of this questionnaire is to establish the existing level of knowledge within companies with regard to energy efficiency. The results will be used to develop educational tools in the form of e-learning programmes and handbooks which can be used in the effort to reduce energy consumption, thereby increasing profit and meeting environmental requirements. **When returning a complete questionnaire you will get free access to test our e-learning programme.**

Company Profile

Please would you give the following information about your company?

Company name:

Address:

E-mail address:

Number of employees:

Staff composition: *Please give approximate numbers*

Unskilled Workers, approx.

Skilled Workers (i.e. skilled workers within plastics), approx.

Workers with Technical & Vocational qualifications (e.g. laboratory technicians etc.), approx.

Graduates, approx.

Professionally qualified (e.g. engineers, economist, lawyers, etc.), approx.

Please state your company's core business (e.g. injection moulding, thermoset, extrusion):



Contact person(s) responsible for or related to energy consumption in your company:

Name:

Title:

E-mail:

Part One – To establish the existing level of knowledge and experience within your company:

- Status on energy efficiency
- Experience with educational/ training tools

**1.1 Does your company currently work with energy saving tools?
(I.e. Best Practice Guides, E-learning Programmes)**

Yes No

If yes, which areas in the company are directly affected?

Tick all that apply

- The entire company Management Sales and marketing
 Administration Production Purchasing Development

1.2 How is energy consumption measured within your company?

Tick all that apply

- Overall figure Energy consumption related to direct production (i.e. per tonne produced)
 Energy consumption related to buildings, administration etc.
 Other, please give further information.

[Klik her for at angive tekst.](#)

1.3 Is your company interested in energy saving tools in the form of e-learning programmes?

Yes No

1.4 Does your company have any experience of using e-learning programmes?

Yes No

If yes – please comment on the points below:

User interface/functionality – was/were the programme(s) easy to use? Please describe briefly the strengths and weaknesses of the interface.

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Implementation and efficiency – did the content fulfil your expectations and did you achieve your objectives by using the programme? What was good and/or what went wrong?

Klik her for at angive tekst.

If possible, mention the programmes (e.g. Microsoft, Solid Works, SAP)

Klik her for at angive tekst.

1.5 Does your company use other tools or services, e.g. external consultancy?

Yes No

If yes – which ones? e.g. energy suppliers, energy consultants, government services etc.

Klik her for at angive tekst.

Part Two – E-Learning and Training Programmes:

To establish your company's requirements with regard to:

- Content
- Structure
- Implementation
- User interface

2.1 Which areas in your company are likely to benefit most from new information regarding energy efficiency? Choose 2 and briefly describe the most important benefits within those areas.

- The entire company Management Sales and marketing
 Administration Production

1. Klik her for at angive tekst.
2. Klik her for at angive tekst.

2.2 How does your company prefer to implement energy efficiency?

Tick all that apply.

- Through training programmes Learning by doing External assistance

2.3 How does your company prefer to provide training/education for its workforce?

Tick all that apply.

- Using external consultants Through cross-functional workgroups/teams
 Using Internal Trainers
 Other - please give further information [Klik her for at angive tekst.](#)

2.4 If using e-learning, what type of supporting material is/would be preferred within your organisation?

Level of personnel

- Management: Web-based solution Handbooks Combined solution
- Administrative: Web-based solution Handbooks Combined solution
- Production: Web-based solution Handbooks Combined solution

2.5 Which of the following would be your preferred format for an e-learning programme on Energy Saving?

- Theoretical programme with guidelines and links
- Combined theoretical and practical programme, including exercises
- A virtual company with exercises in the form of games
- Module-built structure with final exercises between the modules
- Training module based on “best practice”
- Sections with company case-studies

2.6 What would be the preferred way of introducing and monitoring an e-learning programme (on energy efficiency) within your company?

- Through an energy manager appointed by the company
- Through the management of the company
- Through the production manager
- Through team leaders in production
- Through a web-based solution
- Through external consultancy
- Through other sources such as: _____

2.7 What is the best way to ensure that the ongoing objectives and results are achieved throughout the programme?

Top management controlled

Self management by groups/individuals

2.8 Which motivational factors would be preferred in connection with the use of the programme? Tick all that apply.

Final test/examination with certification

Learning through games and competitions incorporated in the programme

Internal Reward System within your Company – e.g. rewarding people for initiating energy saving ideas

Other _____

2.9 Which educational structure is preferred by your company?

Group lessons

Individual

2.10 What sort of time structure would be preferred for the implementation of the training?

Short term e.g. 2-3 days intensive months)

Long term project related (e.g. 3-4

On-going process e.g. 12 months or more

2.11 Any additional comments

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